

DEVELOPMENT OF A HOLISTIC WELLNESS MODEL FOR MANAGERS IN TERTIARY INSTITUTIONS

By

PETRUS ALBERTUS BOTHA

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DECLARATION

I hereby declare that the “DEVELOPMENT OF A HOLISTIC WELLNESS MODEL FOR MANAGERS IN TERTIARY INSTITUTIONS” is my own work and that all the sources that I used or quoted were indicated with complete references and acknowledgements.

SIGNATURE

PETRUS ALBERTUS BOTHA

SUMMARY

DEVELOPMENT OF A HOLISTIC WELLNESS MODEL FOR MANAGERS IN TERTIARY INSTITUTIONS

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PETRUS ALBERTUS BOTHA

PROMOTER: PROF HEIN BRAND

DEGREE: PHILOSOPHIAE DOCTOR (Organisational Behaviour)

Research into wellness literature identified the existence of various wellness models consisting of multiple dimensions, and found different relationships between these dimensions. In an attempt to expand on the theory of wellness, this study determined the wellness behaviour and health risk profile of managers at two South African higher education institutions.

A sample of 89 managers from two South African universities, a traditional academic university and a technology university, was used in the study. The sample comprised 40.45% respondents from the academic university and 59.55% from the technology university. Females accounted for 31.5% of the sample, while males accounted for 68.5%.

The Pearson product moment correlation coefficient was used to determine the relationship between the wellness behaviour levels and the health risk scores of managers. The results suggested that there were no significant correlations between the mean physical fitness and nutrition, medical self-care, safety, environmental wellness, social awareness, intellectual wellness, spirituality and values sub-dimensions and the health risk scores of managers. However, there was a significant negative relationship between sexuality and emotional awareness and the health risk scores. The negative correlation indicated that, with an increase in the sexuality and emotional awareness level, there would be a decrease in the health risk. There was a small negative relationship between emotional management and the health risk score. The low negative correlation indicated that with an increase in the emotional management level, there would be a decrease in the health risk. There was also a negative relationship between occupational wellness and the health risk score. The low negative correlation indicated that with an increase in the occupational wellness levels, there would be a decrease in the health risk.

T-tests were used to determine the relationship between the mean wellness behaviour levels and mean health risk scores of managers at the academic university and technology university, heads of academic departments and directors of support services, female and male managers, post-graduate and PhD graduate managers. The results indicated that there were no significant differences in the mean wellness behaviour levels and mean health risk scores of managers at the

academic university and technology university, heads of academic departments and directors of support services, female and male managers, post-graduate and PhD graduate managers. Thus, the null hypotheses postulating that there is no significant difference between the mean wellness behaviour levels and mean health risk scores of managers at the academic university and technology university, heads of academic departments and directors of support services, female and male managers, post-graduate and PhD graduate managers, could not be rejected. A one-way analysis (ANOVA) was conducted to determine the difference between the wellness behaviour levels and the mean health risk scores of the three age groups used in this study. The results indicated that the means of the three age groups did not differ significantly.

A wellness prediction model could not be used to measure wellness against the eleven independent variables. The data was of such a nature that a linear regression model could not be used, as the variables were not normally distributed. Therefore, the null hypothesis postulating that it is not possible to use a wellness prediction model as a holistic dependent variable, to measure wellness against all possible variables, could not be rejected.

The combined average wellness behaviour levels of managers at the academic university and technology university were 76.8% and the risk scores were 19.36%. These indicated high wellness behaviour levels and low health risk levels. The wellness behaviour and health risk model proposed in this study, may serve as a theoretical framework for future scientific wellness behaviour and health promotion surveys and data analysis to devise tailor-made interventions. The model postulates that wellness, as a dependent variable, is determined by eleven independent variables. These eleven independent variables are physical fitness and nutrition, medical self-care, safety, environmental wellness, social awareness, sexuality and emotional awareness, emotional management, intellectual wellness, occupational wellness, spirituality and values and the health risk score. This study identified the physical fitness and nutrition, and medical self-care wellness behaviour levels as weaknesses in managers at the two sample universities that necessitate interventions.

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TABLE OF CONTENTS

	PAGE
TITLE	i
DECLARATION	ii
SUMMARY	iii
ACKNOWLEDGEMENTS	v
TABLE OF CONTENTS	vi
LIST OF FIGURES	ix
LIST OF TABLES	x
CHAPTER ONE: OVERVIEW, RATIONALE AND RESEARCH OBJECTIVES	1
1.1 INTRODUCTION	1
1.2 BACKGROUND, MOTIVATION AND AIM	2
1.3 PRELIMINARY LITERATURE REVIEW	5
1.3.1 Health and wellness	5
1.3.2 Health risk assessment	18
1.4 PROBLEM STATEMENT AND HYPOTHESES	22
1.5 RESEARCH METHODOLOGY	24
1.5.1 Research approach	24
1.5.2 Research design	24
1.5.3 Sampling	25
1.5.4 Data analysis	25
1.6 FINDINGS AND RECOMMENDATIONS	26
1.7 CHAPTER OUTLINE	26
1.8 CLARIFICATION OF CONCEPTS	27
1.8.1 Health	27
1.8.2 Wellness	27
1.8.2.1 Emotional wellness	28
1.8.2.2 Intellectual wellness	28
1.8.2.3 Spiritual wellness	28
1.8.2.4 Occupational wellness	28
1.8.2.5 Social wellness	29
18.2.6 Physical wellness	29
1.8.3 Organisational health promotion	29
1.8.4 Wellness programme	29
1.8.5 Health risk appraisal	29
1.9 SUMMARY	30
CHAPTER TWO: LITERATURE REVIEW	31
2.1 INTRODUCTION	31
2.2 PHYSICAL WELLNESS	31
2.2.1 PHYSICAL FITNESS AND NUTRITION	31
2.2.1.1 WELLNESS BEHAVIOUR RISKS ASSOCIATED WITH A SEDENTARY LIFESTYLE AND OBESITY	35
2.2.1.2 PHYSICAL FITNESS AND NUTRITIONAL INTERVENTIONS	36
2.2.2 MEDICAL SELF-CARE	41
2.2.2.1 WELLNESS BEHAVIOUR RISKS ASSOCIATED WITH INADEQUATE MEDICAL SELF-CARE	48
2.2.2.2 MEDICAL SELF-CARE INTERVENTIONS	56
2.2.3 SAFETY AND LIFESTYLE	69
2.2.3.1 RISKS OF DRIVING UNDER THE INFLUENCE OF ALCOHOL	

AND DRUGS	70
2.2.3.2 INTERVENTIONS TO REDUCE ALCOHOL AND DRUG IMPAIRED DRIVING	72
2.3 SOCIAL WELLNESS	74
2.3.1 ENVIRONMENTAL WELLNESS	75
2.3.1.1 ADVERSE IMPACTS OF POLLUTION AND GLOBAL WARMING ON HEALTH AND WELLNESS	79
2.3.1.2 POLLUTION AND GLOBAL WARMING INTERVENTIONS	83
2.3.2 SOCIAL AWARENESS	86
2.3.2.1 WELLNESS BEHAVIOUR AND HEALTH RISKS ASSOCIATED WITH LOW LEVELS OF SOCIAL CAPITAL	88
2.3.2.2 SOCIAL CAPITAL HEALTH INTERVENTIONS	89
2.4 EMOTIONAL WELLNESS	91
2.4.1 EMOTIONAL MANAGEMENT	92
2.4.1.1 EMOTIONAL MANAGEMENT BEHAVIOUR RISKS ASSOCIATED WITH STRESS, BURNOUT, DEPRESSION AND ANXIETY	96
2.4.1.2 EMOTIONAL MANAGEMENT INTERVENTIONS	99
2.4.2 EMOTIONAL AWARENESS AND SEXUALITY	102
2.4.2.1 WELLNESS BEHAVIOUR RISKS ASSOCIATED WITH SEXUALLY TRANSMITTED DISEASES	110
2.4.2.2 RISK REDUCTION INTERVENTIONS FOR SEXUALLY TRANSMITTED DISEASES	112
2.5 INTELLECTUAL WELLNESS	114
2.5.1 WELLNESS BEHAVIOUR PROBLEMS ASSOCIATED WITH THE LACK OF INTELLECTUAL DEVELOPMENT	117
2.5.2 INTELLECTUAL DEVELOPMENT INTERVENTIONS	119
2.6 OCCUPATIONAL WELLNESS	122
2.6.1 WELLNESS BEHAVIOUR RISKS ASSOCIATED WITH WORK- LIFE IMBALANCES	132
2.6.2 WORK-LIFE BALANCE INTERVENTIONS	133
2.7 SPIRITUALITY AND VALUES	135
2.7.1 WELLNESS BEHAVIOUR RISKS ASSOCIATED WITH A LACK OF SPIRITUALITY AND VALUES	137
2.7.2 SPIRITUAL WELLNESS INTERVENTIONS	139
2.8 SUMMARY	141
CHAPTER THREE: RESEARCH METHODOLOGY	144
3.1 INTRODUCTION	144
3.2 RESEARCH DESIGN	144
3.3 PARTICIPANTS	145
3.3.1 The sample	145
3.3.2 Respondents' characteristics	146
3.4 MEASURING INSTRUMENT	148
3.5 PROCEDURES FOR DATA COLLECTION	150
3.5.1 Questionnaire administration	150
3.5.2 Handling of returned questionnaires and data	151
3.6 PROCEDURES FOR DATA ANALYSIS	153
3.6.1 Descriptive statistics	153
3.6.2 Cronbach's alpha coefficient	170
3.6.3 Pearson product moment correlation coefficient	171
3.6.4 T-tests to compare mean scores	172

3.6.5	One-way analysis of variance (ANOVA)	172
3.7	SUMMARY	173
	CHAPTER FOUR: RESEARCH FINDINGS	174
4.1	INTRODUCTION	174
4.2	RESULTS	175
4.2.1	Correlation between the health risk scores and wellness behaviour levels of managers	175
4.2.2	Comparison between the mean wellness behaviour levels and mean health risk scores of managers at the academic university and technology university	176
4.2.3	Comparison between the mean wellness behaviour levels and mean health risk scores of heads of academic departments and directors of support services	178
4.2.4	Comparison between the mean wellness behaviour levels and mean health risk scores of female and male managers	180
4.2.5	Comparison between the mean wellness behaviour levels and mean health risk scores of post-graduate and PhD graduate managers	182
4.2.6	Comparison between the mean wellness behaviour levels and mean health risk scores of the three age groups	184
4.2.7	A wellness prediction model	186
4.3	SUMMARY	188
	CHAPTER FIVE: SUMMARY AND RECOMMENDATIONS	189
5.1	INTRODUCTION	189
5.2	DISCUSSION OF FINDINGS	189
5.2.1	Discussion of the correlation between the health risk scores and wellness behaviour levels of managers	189
5.2.2	Discussion of the difference between the mean wellness behaviour levels and mean health risk scores of managers at the academic university and technology university	190
5.2.3	Discussion of the difference between the mean wellness behaviour levels and mean health risk scores of heads of academic departments and directors of support services	190
5.2.4	Discussion of the difference between the mean wellness behaviour levels and mean health risk scores of female and male managers	190
5.2.5	Discussion of the difference between the mean wellness behaviour levels and mean health risk scores of post-graduate and PhD graduate managers	191
5.2.6	Discussion of the difference between the mean wellness behaviour levels and mean health risk scores of the three age groups	191
5.2.7	Discussion of the fitting of a wellness prediction model	192
5.2.8	Combined health risk scores and wellness behaviour levels of managers at the sample universities	192
5.3	CONTRIBUTIONS OF THE CURRENT STUDY	195
5.4	IMPLICATIONS FOR HIGHER EDUCATION INSTITUTIONS	198
5.5	DIRECTIONS FOR FUTURE RESEARCH	200
5.6	LIMITATIONS OF THE STUDY	201
5.7	CONCLUSION	202
	ANNEXURE A: QUESTIONNAIRE	204
	REFERENCES	215

LIST OF FIGURES

Figure 1.1	Hettler's Wellness Model	6
Figure 1.2	Wheel of Wellness Model	8
Figure 1.3	A Preliminary Wellness Model for Managers	9
Figure 1.4	Organisation Development Process	13
Figure 3.1	Representation of Delivery Sites of the Technology University	154
Figure 3.2	University and Division Distribution of Respondents	155
Figure 3.3	Gender by Age Category of Respondents	156
Figure 3.4	Combined Race Distribution of the Academic and Technology University	157
Figure 3.5	Position and Highest Level of Education of Respondents	158
Figure 3.6	Average Number of Years per Job Position Category for the Academic University and Technology University	160
Figure 3.7	Average Number of Years in Current Position per Job Category of Respondents	161
Figure 3.8	BMI Categories by Gender	162
Figure 3.9	Average Hours Sleep per Night	164
Figure 3.10	The Self-Reported Health Status of Respondents	165
Figure 3.11	Blood Pressure Levels of Respondents	166
Figure 4.1	Mean Scores of Wellness Behaviour Levels of Managers at the Academic University and Technology University	178
Figure 4.2	Mean Scores of Wellness Behaviour Levels of Heads of Academic Departments and Directors of Support Services	180
Figure 4.3	Mean Scores of Wellness Behaviour Levels of Female and Male Managers	182
Figure 4.4	Mean Scores of Wellness Behaviour Levels of Post-Graduate and PhD Graduate Managers	184
Figure 4.5	Mean Scores of Wellness Behaviour Levels of the Three Age Groups	186
Figure 4.6	Combined Average Wellness Behaviour Levels of Managers at the Academic University and Technology University	187
Figure 4.7	Distribution of the Wellness Behaviour Levels of Managers	188
Figure 5.1	A Wellness Behaviour and Health Risk Model for Managers at South African Tertiary Institutions	196
Figure 5.2	Steps in the Implementation of Wellness Behaviour and Health Promotion Interventions	199

LIST OF TABLES

Table 2.1	USDA Food Guide and DASH Eating Plan	39
Table 2.2	UV Radiation Exposure Categories	45
Table 2.3	Blood Pressure Ranges	46
Table 2.4	ATP III Classification of LDL Total and HDL Cholesterol (mg/dL)	47
Table 2.5	Recommended Adult Immunization Schedule by Vaccine and Age Group, United States - October 2005 to September 2006	57
Table 2.6	Recommended Adult Immunization Schedules by Vaccine and Medical and Other Indications – October 2005 to September 2006	58
Table 2.7	Footnotes on the Immunization Schedule	58
Table 2.8	Factors of Job-Related Stress	92
Table 3.1	Demographic and Health Risk Variables of the Respondents	146
Table 3.2	Health Risk Factors	147
Table 3.3	Race of Respondents by University	156
Table 3.4	Average Span of Control per Job Category of Respondents	158
Table 3.5	Average Number of Years at Current Institution per Job Position Category of Respondents	159
Table 3.6	Frequency Distribution of Respondents' Smoking Status	162
Table 3.7	Smoking Status by Gender of Respondents	163
Table 3.8	Distribution of Respondents' Visits to Health Professionals	163
Table 3.9	Distributions of Respondents' Hours Sleep per Night	164
Table 3.10	Distribution of Respondents' Blood Pressure Level	165
Table 3.11	Reported Family History of Medical Conditions	168
Table 3.12	Self-reported Health Status by Reported Medical Conditions of Respondents	169
Table 3.13	Average Alcoholic Drinks Consumed per Day	170
Table 3.14	Cronbach's Alpha for the Wellness Sub-dimensions	171
Table 3.15	Guilford's Informal Interpretations of the Magnitude of r	172
Table 4.1	Variables Included in the Analysis	175
Table 4.2	Correlation between the Wellness Behaviour Levels and Health Risk Scores of Managers	176
Table 4.3	T -test of Mean Scores between the Wellness Behaviour Levels and Health Risk Scores of Managers at the Academic University and Technology University	177
Table 4.4	T -test of Mean Scores between the Wellness Behaviour Levels and Health Risk Scores of Heads of Academic Departments and Directors of Support Services	179
Table 4.5	T -test of Mean Scores between the Wellness Behaviour Levels and Health Risk Scores of Female and Male Managers	181
Table 4.6	T -test of Mean Scores between the Wellness Behaviour Levels and Health Risk Scores of Post-Graduate and PhD Graduate Managers	183
Table 4.7	ANOVA to Compare the Mean Scores between the Wellness Behaviour Levels and Health Risk Scores of the Three Age Groups	185
Table 5.1	Combined Average Wellness Behaviour Levels of Managers at the Two Sample Universities	193
Table 5.2	Comparison of Wellness Sub-dimension Scores	194

CHAPTER ONE: OVERVIEW, RATIONALE AND RESEARCH OBJECTIVES

1.1 INTRODUCTION

In November 2002, Cabinet approved proposals for the restructuring of higher education institutions, through mergers and incorporations. This reduced the number of higher education institutions from 36 to 21. Any major change process has an impact on employee well-being, since it is associated with increased uncertainty. It therefore produces increased perceptions of occupational stress, lower job satisfaction, high levels of absenteeism, a lack of trust and high mental and physical ill-health symptoms (Chunda & Cooper, 2002: 21-22; Gibson, Ivancevich & Donnelly, 2000).

The survival and longevity of the new higher education institutions will largely depend on the well-being of individual employees. To deal with the underlying stressors caused by the mergers and incorporations, higher education institutions should develop and implement wellness programmes as part of their strategic human resource plans. Since managers, as change agents, have to provide strategic direction and leadership to the new institutions, their wellness is of crucial importance for the continued survival of higher education institutions. When managers, as leaders, are not healthy, there may be the perception that the organisation they serve may not be healthy either (Grant & Mack, 2004).

This research study follows an explorative approach in developing a holistic wellness model for managers in higher education institutions. Two Gauteng based universities were selected to measure the perceived wellness behaviour levels and health risk factors of managers. The reason for selecting these two institutions was that one university, referred to as an academic university, is an example of an existing institution that only had to incorporate one small campus from another university, which would have little impact on the status quo. The other university selected, referred to as a technology university, was a new institution which came into being on 1 January 2004 following the merger of three former technikons. This research study thus focused on health risk behaviour variables, as predictors of unhealthy lifestyles and vulnerability to diseases, amongst managers at the

academic university and the technology university. In addition, the wellness levels of managers of these two institutions were compared. A holistic wellness behaviour assessment questionnaire was used to determine whether there is a need for wellness interventions by way of a comprehensive wellness programme. A wellness programme should be based on a thorough needs analysis. Baseline data should be gathered on demographics, health claim costs, disability claims, health risk and fitness levels, absenteeism reports, productivity and organisational culture. To obtain baseline data a variety of questionnaires may be used, such as employee interest surveys that solicit the employees' input to determine the kind of programmes in which employees would be likely to participate, while a behavioural health risk assessment survey may gather data on the current level of employee health risk factors.

No previous study, regarding the development of a wellness model for managers at higher education institutions, has been undertaken. A search via the *Nexus database system* for current and completed research revealed no records of any South African research directly related to the focus of this study (Nexus database, 2005).

1.2 BACKGROUND, MOTIVATION AND AIM

In the twenty-first century, leading causes of illness and death were not ascribed to infectious diseases, but to lifestyle diseases. According to Thomas (1978), modern lifestyles are killing people: *[The new theory is that most of today's human illnesses, the infectious ones aside, are multifactoral in nature, caused by two great arrays of causative mechanisms: the influence of things in the environment and one's personal lifestyle. For medicine to become effective in dealing with such diseases, it has become common belief that the environment will have to be changed and personal ways of living also have to be transformed, and radically.]*

Houlton (2003) and Murray and Lopez (1997) mention that the top ten global risks identified by the World Health Organisation are low birth and childhood weight; unsafe sex; high blood pressure; tobacco smoke; alcohol; unsafe water; sanitation and hygiene; high cholesterol; indoor smoke from solid fuels; iron deficiency and obesity. According to Serfontein (2003), research done by the American government on the impact of various factors of current living conditions on mortality rates,

indicates the following: lifestyle (51%), environment (20%), genetic factors (9%) and medical intervention (10%).

Lifestyle and environment factors are the most important causes of death. However, man is able to control these factors. Genetic factors play a less important role than expected, while medical intervention plays a relatively insignificant role in life expectancy. These and other scientific studies should convince human beings that a significant improvement in health is possible if behaviours were changed to avoid sickness and promote wellness. People cannot control the heredity and age factors in their lives, but lifestyle choices are controllable and by reducing risk factors through changing behaviours, people will improve their state of wellness. Pelletier (1979), in *Holistic Medicine*, suggests that there are four factors that impede health, namely stress caused by environmental demands, personality factors (psychological conflicts, mental attitudes and dispositions), diet and self-destructive behaviour (such as cigarette smoking, excessive alcohol and drug consumption and reckless driving).

The reasons for conducting this study were:

- ❑ Poor health leads to increased health care costs. Most of these costs are linked to health risk factors such as smoking, poor eating habits and sedentary lifestyle (Ozminkowski, Goetzel, Santoro, Saenz, Eley & Gorsky, 2004). The reduction of these risk factors, through wellness interventions, will make it possible for higher education institutions to take aggressive action toward reducing health care utilisation and thereby containing costs and reducing absenteeism as a result of illness.
- ❑ The leading causes of most illnesses are largely preventable and behind these illnesses are a host of preventable factors including the use of tobacco, high-risk alcohol consumption, sedentary lifestyles and poor nutritional habits (Orange County Business Journal, 2003). Besides identifying lifestyle risk factors, a holistic wellness behaviour assessment will also indicate which treatment should be provided to help managers avoid disabilities and premature deaths. In addition, managers will be made aware of and educated in the benefits of leading a healthy lifestyle.
- ❑ An ever-increasing work week poses a number of threats. Long working hours increase incidents of depression and other health problems such as stress, burnout, suicide, sleep disorders and anxiety (Bolan, 2000). A wellness

programme, based on a holistic wellness behaviour assessment, can alleviate some of these concerns.

- ❑ The increased reliance on technology has caused a host of new health concerns including repetitive stress injuries, lower back problems and compromised vision (Orange County Business Journal, 2003). In addition, a large percentage of the workforce spends the majority of their day seated at desks plugged into workstations. Sedentary lifestyles have become a major concern.
- ❑ This study will identify possible work stressors and interventions to deal with it effectively. Stress on the job can be a contributing factor to work place accidents and injuries, reduced productivity, unnecessary absenteeism, and increased medical care costs (Orange County Business Journal, 2003). Stress contributes to illnesses such as heart diseases and diabetes, high blood pressure, ulcers, irritability, difficulty in making routine decisions, loss of appetite, accident proneness and nervous disorders such as anxiety and depression (Robin, 2003; van Daalen & Odendaal, 2001). By implementing a stress management intervention as part of a wellness programme, stress can be reduced or eliminated.

This study will help higher education institutions to develop their own holistic wellness models, develop and implement wellness programmes for managers as part of the strategic human resource plans, create an awareness amongst employees that most illnesses can be avoided through preventive measures, alleviate the threats posed by expanding work weeks, help to reduce stress levels, reduce health care costs, increase employee satisfaction, enhance job performance, reduce employee turnover, reduce absenteeism, improve morale, increase employee productivity, attract and retain knowledgeable employees, improve the image of the organisation, increase employee loyalty, keep workers healthy and enhance the quality of life of employees both on and off the job (Sherman, 1990; DeFalco, 2001; Wellness Councils of America, 2001; Ho, 1997; Weston, 2003; Violette, 1990).

These are only some of the benefits of this research study for higher education institutions, but the question may be asked whether managers will benefit from it as well? According to Blassingame (2003) and Sherman (1990), the individual manager will benefit by being healthier, enjoying life more, communicating better, having more stamina, having better coping skills, having a greater commitment to his or her work, being more enthusiastic and productive, having a more positive outlook

on life, having a longer life and paying less for health care insurance. Both the organisation and individual, therefore, will benefit from being health conscious and changing their lifestyle behaviours.

The overall contribution of this study would be to develop a holistic wellness model that will serve as the foundation for a comprehensive wellness programme for managers in higher education institutions. It is proposed that an in-depth study will be done on the wellness and health risk behaviours of managers at the academic university and technology university by way of a comprehensive holistic wellness behaviour assessment. The research project thus aimed at empirically investigating the six dimensions influencing wellness amongst managers, and to examine the relationship between wellness behaviour levels and the scales of the probable risk involved in terms of current and future wellness problems of managers. This study will add value as the findings will be used to identify specific wellness interventions to solve wellness behaviour problems. Therefore, the aims of the study were to:

- Develop a holistic wellness model for managers in higher education institutions.
- Measure the wellness behaviour levels of managers by focusing on physical, emotional, intellectual, social, occupational and spiritual wellness dimensions.
- Identify the wellness behaviour and health risk factors of managers as related to the measured wellness behaviour.
- Propose wellness interventions as part of a holistic wellness programme.

1.3 PRELIMINARY LITERATURE REVIEW

An investigation into health, wellness and health risk behaviours provided the theoretical framework guiding the research process.

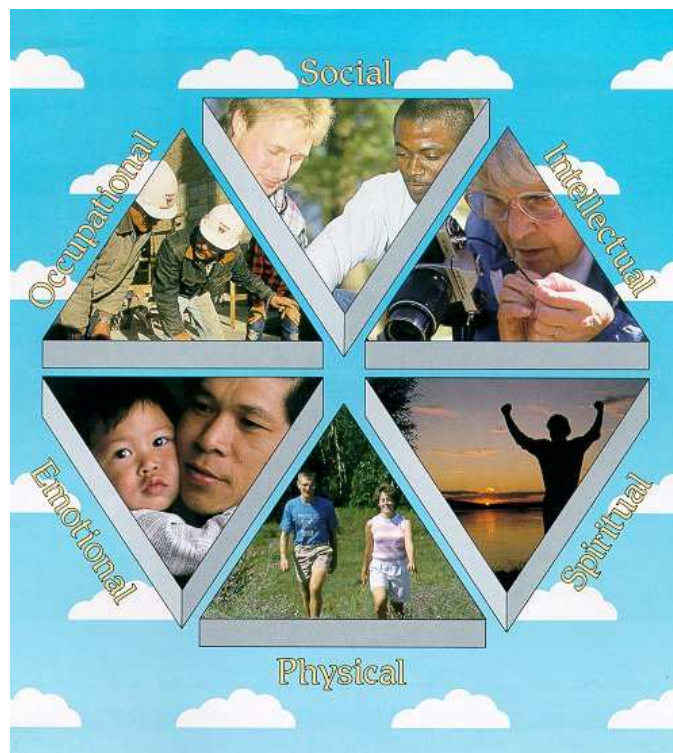
1.3.1 Health and wellness

To be responsible for one's own well-being, one must understand the meaning of the concepts health and wellness. Health is a state of complete physical and mental well-being and not merely the absence of disease or infirmity (World Health Organisation, 1947). Health is an integrated method of functioning which is oriented toward maximizing the potential of the individual. It requires that the

individual should maintain a continuum of balance and purposeful direction with the environment in which he or she is functioning. Wellness has been defined as an approach to personal health that emphasises individual responsibility for well-being through the practice of health-promoting lifestyle behaviours (Hurley & Schlaadt, 1992). Wellness refers to a holistic approach in which mind, body and spirit are integrated. It is a way of life oriented toward optimal health and well-being in which body, mind and spirit are integrated in a purposeful manner with the goal of living more fully within the human and natural community (Myers, Sweeney & Witmer, 2000:252). Wellness is a process that involves the striving for balance and integration in one's life, adding and refining skills and rethinking the appropriateness of previous beliefs and stances towards issues (Hatfield & Hatfield, 1992).

There are a number of theoretical wellness models that can serve as a foundation for wellness interventions. Hettler (1980) has developed a hexagon wellness model consisting of six dimensions (see figure 1.1).

Figure 1.1: Hettler's Wellness Model



(Hettler, 2005)

Leafgren and Elsenrath (1986) explain these six components as follows: Emotional wellness emphasizes an awareness and acceptance of one's feelings.

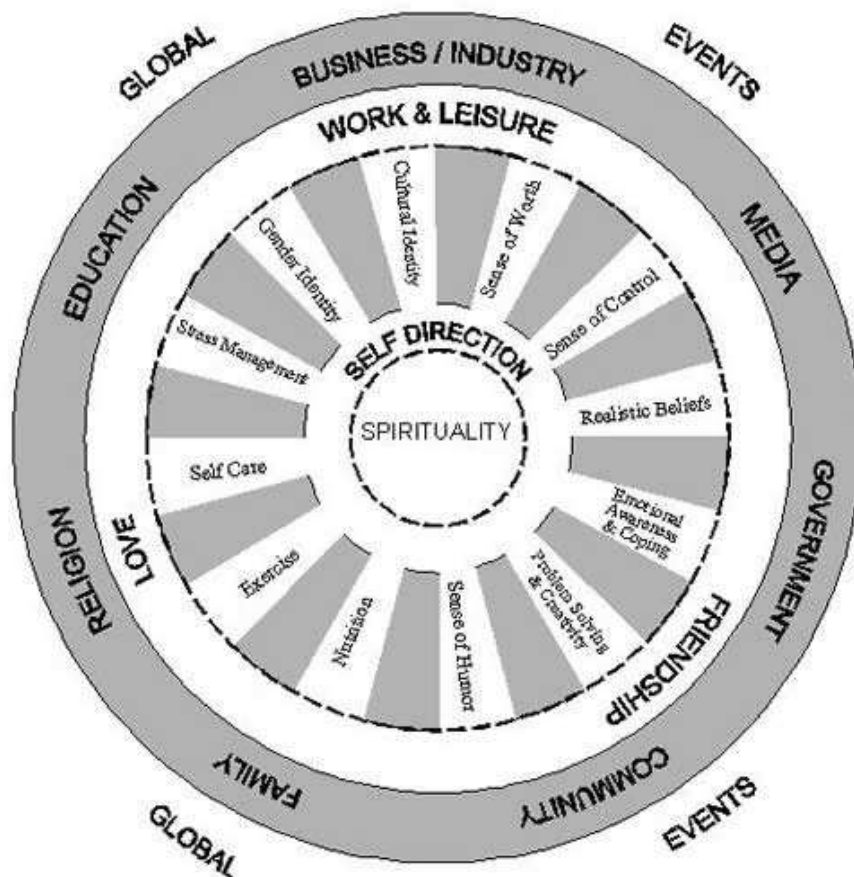
Emotional wellness includes the degree to which one feels positive about oneself and life. It includes the capacity to manage one's feelings and related behaviours, including the ability realistically to assess one's limitations and the ability to cope effectively with stress. The emotionally well person maintains satisfying relationships with others. Intellectual wellness encourages creative and stimulating mental activities. An intellectually well person uses the resources available to expand his or her knowledge in improved skills along with expanding his or her potential for sharing with others. An intellectually well person uses the intellectual and cultural activities in and beyond the classroom, as well as the human and learning resources available within the university community and the larger community. Physical wellness encourages regular physical activity to achieve cardiovascular fitness. It also emphasises the importance of balanced nutrition and discourages the use of tobacco and drugs and excessive alcohol consumption. It encourages healthy nutritional consumption and physical activities that contribute to overall wellness. Social wellness results in contributions to one's human and physical environment for the common welfare of one's community. It emphasizes the interdependence between people and with nature. It includes the pursuit of harmony in one's family life. Occupational wellness is the preparation for work in which one will gain personal satisfaction and find enrichment in one's life through work. It also relates to one's attitude to work. Spiritual wellness involves seeking meaning and purpose in human existence. It includes the development of a deep appreciation for the depth and expanse of life. According to Hattie, Myers and Sweeney (2004:354), two paper-and-pencil assessment instruments, the Lifestyle Assessment Questionnaire and the TestWell Wellness Inventory, designed by the National Wellness Institute, are based on the wellness model of Hettler.

Adams, Bezner, Drabbs, Zambarano and Steinhardt (2000:165-166) have presented a wellness model to conceptualise and measure the spiritual and psychological dimensions in a college population. Their model is founded on three principles common to all conceptualisation of wellness, namely multi-dimensionality, balance among dimensions and salutogenesis (defined as promoting health rather than illness). The model and measure include the physical, social, emotional, intellectual, spiritual and psychological dimensions of health and is dynamically bi-directional. It serves as the theoretical basis for the Perceived Wellness Survey,

which was conducted in a college population and was salutogenically rather than pathogenically focused (Adams *et al.*, 2000: 166).

Witmer and Sweeney (1992:140) incorporated the wellness theory and research concepts from psychology, anthropology, sociology, religion and education into a holistic model of wellness and illness prevention over the life span of an individual as a basis for counselling interventions. The results of research and theoretical perspectives from personality, social and clinical health, stress management, behavioural medicine, psychoneuroimmunology, ecology, contextualism and development psychology were foundations for the revised model (Hattie *et al.*, 2004: 355). The revised model proposes five life tasks, depicted in a wheel, which are interrelated and interconnected (see figure 1.2).

Figure 1.2: Wheel of Wellness Model



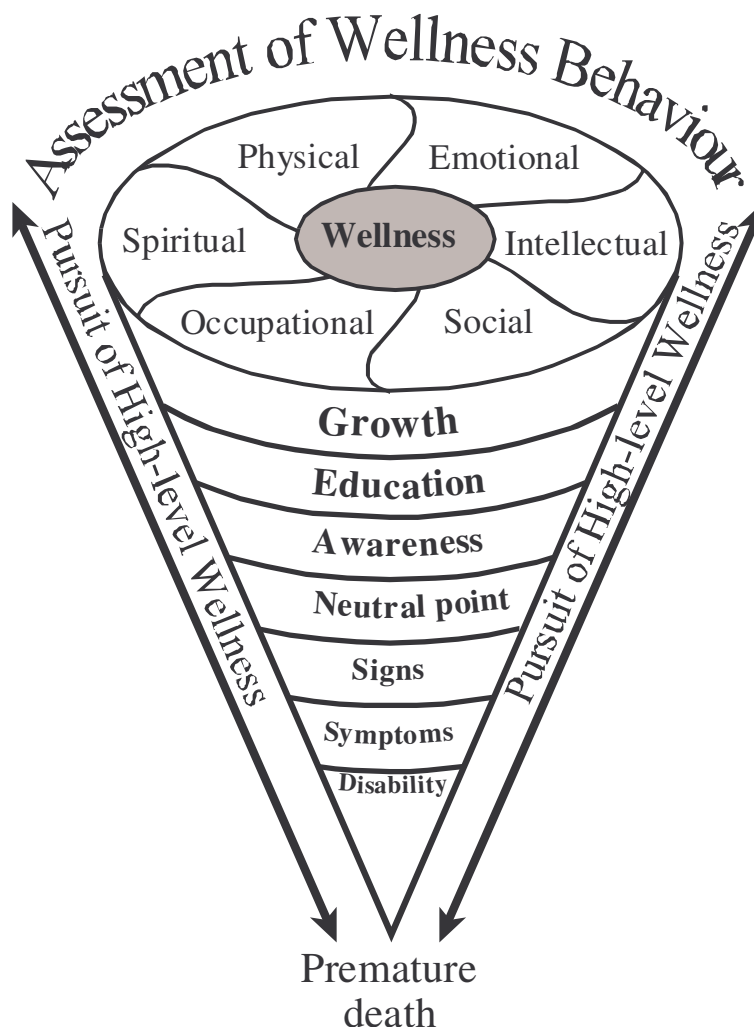
(Myers *et al.*, 2000:253)

These five tasks are spirituality, work and leisure, friendship, love and self-direction (Meyers *et al.*, 2000:252). According to Hattie *et al.* (2004:355), the life task of self-direction is further subdivided into the 12 tasks of (a) sense of worth, (b)

sense of control, (c) realistic beliefs, (d) emotional awareness and coping, (e) problem-solving and creativity, (f) sense of humour, (g) nutrition, (h) exercise, (i) self-care, (j) stress management, (k) gender identity and (l) cultural identity. These life tasks interact dynamically with a variety of life forces, including, but not limited to, one's family, community, religion, education, government, the media and business/industry. The Wellness Evaluation of Lifestyle (WEL) was developed to assess each of the individual characteristics in the Wheel of Wellness Model.

To conceptualise, explain and understand the complexity of wellness, a preliminary wellness model for managers, adapted from the models developed by Hettler (1980); Adams *et al.*, (2000); Edlin, Golanty and McCormack-Brown (1998:8); Witmer and Sweeney (1992:142) and Myers *et al.* (2000:252) was developed (see figure 1.3).

Figure 1.3: A Preliminary Wellness Model for Managers



This model forms the theoretical foundation for this research study. The preliminary wellness model for managers defines health in terms of the whole person and encompasses the emotional, intellectual, spiritual, occupational, social and physical dimensions of individuals (Hettler, 1980; Sapp, 2004; Edlin *et al.*, 1998; Herholdt, 2004; Davies, Davies & Heacock, 2003). The wellness model places great emphasis on the use of health promotion and environmental protection to maintain healthy communities and also stresses the importance of health education and disease prevention for individuals (Dobson & Lepnurm, 2000). The model focuses on optimal health, the prevention of disease, positive mental and emotional states, and proposes that health is a state of optimum wellness (Edlin *et al.*, 1998:8).

The wellness continuum allows one to visualise the difference between wellness and the medical approaches to health. Individuals move on this continuum toward disability and optimal wellness. The top of the model represents wellness while the bottom represents disability. Disability, in this model, may be a state of poor physical health, poor self-esteem, pessimism, existential frustration, a lack of intellectual stimulation, a negative sense of meaning and purpose in life, unhappy work life, unhealthy and conflicting relationships, an unsafe and unhealthy work environment, or any combination of these factors (Adams *et al.*, 2000). Any of these conditions could lead to physical illness or disease. There is also a relationship between the various dimensions of wellness. Ideally, they should be in a state of equilibrium. Wellness is a dynamic process that takes into account the decisions taken on a daily basis regarding a person's lifestyle and risk behaviour. These include the food one chooses to eat, the amount of exercise one gets and whether one wears a safety belt, smokes cigarettes, drinks alcohol, abuses drugs or resides in a polluted environment. To move towards a state of optimal wellness, individuals should make radical changes in their lifestyle choices and risk behaviour. These changes will empower individuals to live full, responsible, rewarding lives in an extremely complex world. A lifestyle behaviour change should be based on a psychological construct such as the Cognitive Learning Theory or Transtheoretical Model. According to Boyd and Goss (2003) and Proper, Hildebrandt, Van der Beek, Twisk and Van Mechelen (2003:219), the Transtheoretical Model (TTM) is an example of a behaviour theory. It has been broadly described as a behaviour change model consisting of a number of dimensions, one of which is temporal, indicating a continuum of five stages of change beginning with pre-contemplation where no

intention to change behaviour exists (for instance surface approach to learning) in the foreseeable future (Boyd & Goss, 2003). Contemplation is the next stage, in which the awareness of a need to change a behaviour exists in the near future (next 6 months), but not in the immediate future. Following this stage is preparation in which individuals plan to change behaviour in the near future (next 30 days) and have taken some steps towards change. The next stage is action during which major behavioural changes are made. If the changed behaviour continues (for instance for more than 6 months) the individual may be described as being in the maintenance stage. The relapse is described as regression to a previous stage. Significant empirical research in health-related domains has shown the TTM's applicability to health behaviour modification (Boyd & Goss, 2003). Goldstein, Whitlock and DePue (2004:74) state that any behavioural risk factor intervention should follow the 5A's approach that includes the following steps: (1) Assess refers to the assessment of the individual's knowledge, beliefs, attitudes and preferences by way of a health risk appraisal instrument such as questionnaires or interactive computer-based systems; (2) advice by a health expert related to an individual's symptoms, values and concerns; (3) agree is the important step of collaboratively identifying behavioural and self-management goals; (4) assist in providing behavioural counselling to help the individual concerned to develop an action plan to develop behavioural skills to change and maintain healthy behaviour and (5) arrange includes making arrangements for contacts with the health expert by way of face-to-face, telephone or internet contact.

The following assumptions may thus be derived from the discussed wellness model and wellness literature:

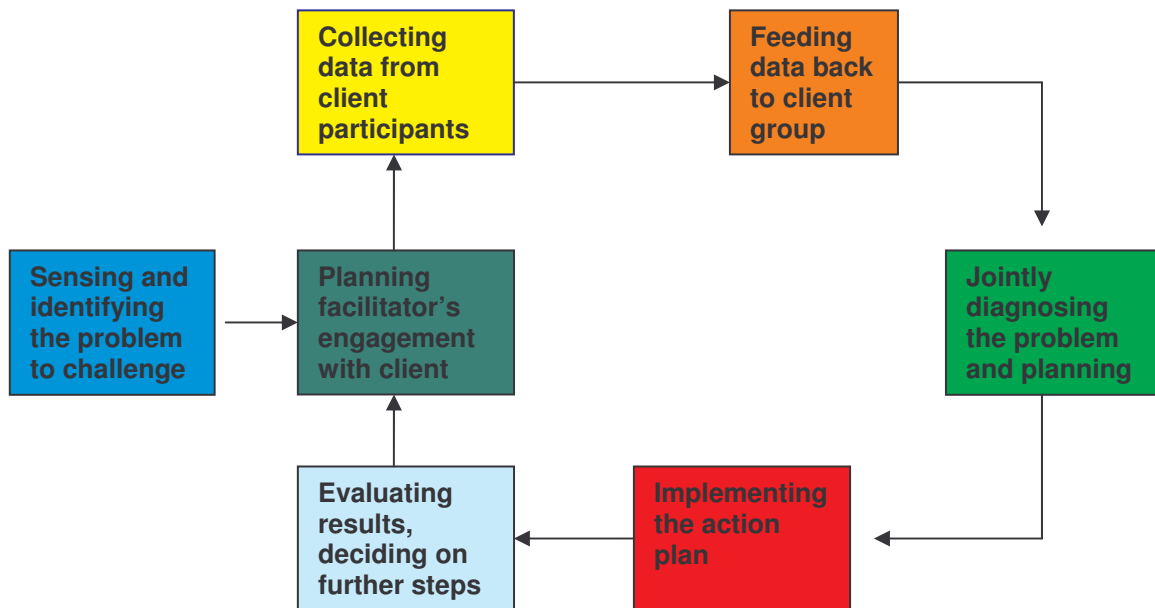
- The well-being of every individual within the organisation influences the well-being of the organisation and vice versa.
- The organisation should provide treatment programmes, for example wellness programmes, to help employees avoid disability or premature death.
- Treatment programmes provided by the organisation may, at best, only help employees to experience the absence of illness symptoms (a neutral point in the model).
- Employees should take responsibility for their own health by leading a healthy lifestyle and reducing their health risks.

- ❑ Through an organisational wellness programme intervention, individuals should be made aware of and educated in, the benefits of leading a healthy lifestyle.
- ❑ Creating awareness and providing education in wellness, as well as providing opportunities for personal growth and the development of employees.
- ❑ Ultimately the goal for an employee is to move to a high level of wellness where the various dimensions of wellness are in equilibrium.

As indicated, the preliminary wellness model for managers served as the theoretical foundation for this research study. The level of wellness dimensions was measured by a holistic wellness behaviour assessment questionnaire. Low-level scores measured on the various wellness dimensions indicated the need for specific wellness interventions in the form of a holistic wellness programme.

To promote wellness in the workplace, organisations should pro-actively promote health and wellness. Organisational health promotion is defined as a strategic effort to reduce the health risks of employees through planned changes in individual risk related behaviours and other organisationally related predisposing conditions (Gutknecht & Gutknecht, 1990). To attain organisational health, a healthy organisational climate must exist. The organisation's climate is defined as the general internal organisational environment that is determined by the organisation's structure, leadership, philosophy, technology, people, and culture (Bennet, 1995:198). Since the climate is determined in part by the culture, the organisational culture should be the target of change. According to Sherman and Bohlander (1992), the organisational climate has the following elements: physical, technological, social, political and economic. Each of them can have an effect on employee health. The organisational climate can only be changed if the culture is influenced by health promotion professionals or wellness consultants. An organisational development approach (OD) should be used to manage the change in culture. According to Cummings and Worley (2001:1), organisation development is a systemwide application of behavioural science knowledge to the planned development, improvement and a reinforcement of the strategies, structures and processes that lead to organisational effectiveness. Harvey and Brown (2001:4) state that OD is long-range efforts and programmes aimed at improving an organisation's ability to survive by changing its problem-solving and renewal processes. These steps are also illustrated by figure 1.4.

Figure 1.4: Organisation Development Process



(Cook & Hunsaker, 2001:547)

According to Wilson and Wagner (1997), the OD process can be used to make the organisation healthier and an internal or an external consultant may implement the health change process. In brief, the process should follow the following steps:

- ❑ The consultant must gather information concerning the organisation's culture.
- ❑ The accumulated data must be evaluated to diagnose the conditions in the organisation and to determine the changes needed to meet the organisation's health objectives.
- ❑ The data is collected and organised according to the health objectives of the organisation.
- ❑ The fourth step includes the planning and implementation of specific interventions to change the culture.
- ❑ The fifth step evaluates the interventions used to change the culture.
- ❑ Lastly, a periodic follow-up evaluation is employed to track progress and to develop possible suggestions for future interventions.

According to Nadler and Tushman (1990), Tribus (1989) and Jerome-Forget (1992), the major factors for successful organisational development are support by top management, additional leadership support and the fact that all managers should act as change agents. The best time to initiate organisational change is during

structural re-organisation. One of the strategies for health promotion in organisations is to develop and implement comprehensive wellness programmes.

Wellness programmes should be a part of the strategic human resource plan of an organisation (Ginn & Henry, 2003). Changes, emanating from the environment requiring organisations to adapt, present a major source of stress to employees who are forced to adapt repeatedly to new relationships, both inside and outside the organisation (Shortell & Kaluzny, 2000). Enabling employees to weather these changes, poses a challenge to its human resource management. Instituting wellness programmes can help employees to accept these changes. Such programmes cover a variety of activities that can be classified into risk assessment, fitness, health education and demand management (Conrad, 1988). Humanistic oriented organisations should consider health and wellness programmes as a means to retain scarce workers, keep them productive and save on health costs over a long term.

From an organisational behaviour perspective, a wellness programme intervention is a proactive human resource strategy to address signs and symptoms of diseases and to prevent disability. Furthermore, it should create an awareness of and education about leading healthy lifestyles and thus reduce health risks of individuals. According to van der Watt (2004), the core aspects of wellness are:

- ❑ Self-responsibility: Wellness is about making conscious choices towards the development of a proactive lifestyle.
- ❑ Continuous process: Wellness is a continuous process, regardless of age and lifestyle and not an end-state.
- ❑ Non-prescriptive: The criteria and goals for personal wellness need to be defined by the individual. It is a relative concept that varies from one person and context to the next.
- ❑ All spheres of life: Besides addressing all spheres of life (emotional, physical, intellectual, social, environmental, occupational and spiritual), it also implies these aspects.
- ❑ Maximization of potential: Wellness is not concerned with what is normal or adequate, or the absence of symptoms or disease, but about aiming for optimum health and well-being.

Davies *et al.* (2003:68-70), DeFalco (2001:79-81), Nonprofit Business Advisor (2003:6-8), Buffett (2002), and Jenkins (2001) recommend that, in order to be successful, a wellness programme needs the following building blocks:

❑ **An inside advocate to act as coordinator**

A person should be committed to the value of good nutrition and physical activity as a lifestyle. That does not mean aiming at living perfectly, but rather at setting a goal to work towards and being interested in talking to others about wellness in an effort to stimulate interest and participation (Worksite Wellness for Tompkins County, 2004). The wellness director should have a degree in wellness or a related field of discipline and needs a strong background in business management, human behaviour, physical sciences and counselling (Grant & Brisbin, 1992). Such a background may be acquired through experience, formal education, or a combination of both.

❑ **The support of top management**

Top management must support and participate actively in a wellness programme, especially in the early testing and assessment, as well as attending appropriate seminars on wellness (Violette, 1990). Senior level executives control the budgets, the organisational agenda and all the communication channels and as a result of these realities it is virtually impossible to succeed without the support of top management.

❑ **Steering committee or wellness teams**

In organisational settings, most decisions are currently made by teams. To ensure that the health promotion initiative is supported by all, it is imperative that all key role players should be involved. According to Hunnicutt (2001), one needs to include operations, senior level executives, finance, blue-collar workers, administration and clerical employees, other employees, sceptics and management of information systems (MIS).

❑ **Data to drive health efforts**

Collecting data is important, because these have proved to be major problem areas in employee wellness programmes. There are various sources of data including current lifestyle habits of employees, employees' interest in wellness, the level of productivity demographics, healthcare insurance costs and claims, absenteeism reports, disability/workers' compensation, health screenings, health risk appraisals, fitness levels of employees, facility assessment and culture audits (DeFalco, 2001;

Jenkins, 2001; Grant & Brisbin, 1992). According to Hunnicutt (2001), organisations need this data to see the whole picture. A person should not jump in simply because he or she has support, but should use a team to gather health data. Those who believe that they know what the facts are, should ensure that they verify the objectivity of their sources.

❑ **An operating plan**

An annual plan is a vehicle that articulates the strategic direction of the organisation and serves as a document against which all progress is ultimately measured (Wellness Councils of America, 2001). A business plan should be developed in order to stay on the right course and only to engage in activities that are supporting the organisational wellness objectives. Addressing the costs of absence, health problems, disability and workers' compensation is often one of the most pressing issues for organisations. These areas are business challenges with substantial financial considerations and, for many organisations, the combined annual cost/expense of absence, health problems (medical/Rx/dental), disability and workers' compensation is exceeded only by employee compensation (Johnson & Johnson, 2003).

❑ **Appropriate interventions**

When developing an organisational wellness programme the organisation should decide on the right intervention for identified problems. According to Jenkins (2001) and DeFalco (2001), there are various approaches to wellness interventions. These include self-study or home based study, peer support, group education as well as pharmaceutical and personal counselling. Group education seems to work best, while face-to-face intervention is very expensive.

❑ **A constant evaluation of outcomes**

Programme evaluation is the systematic assessment of the value or performance of a series of activities organised around a set of objectives and purposes. Different types of evaluation include process, impact and outcome. The evaluation may cover items such as cost benefits accruing to health care insurance, workers' compensation insurance, absenteeism, productivity, employee morale, increased levels of health and fitness and modified health risk factors (Grant & Brisbin, 1992).

The results of the evaluation may then be used to modify the programme to ensure the sustainable realisation of predetermined wellness goals by employees.

A survey conducted by the Wellness Junction indicates that health screening is the pre-eminent wellness intervention in the USA (Nonprofit Business Advisor, 2003). Health screening focuses on aspects such as breast cancer detection mammograms, cholesterol testing, blood pressure screenings, bone density and osteoporosis, diabetics testing, cardiac health screenings, body fat analyses, health risk analyses, peak flow, oxygen saturation, pulmonary function testing, hearing tests, vision testing, ECGs and glucose screenings (Nonprofit Business Advisor, 2003; Indiana Business Magazine, 2003). Other popular programmes include stress management, nutrition and exercise programmes, weight loss and weight management, smoking cessation, workstation assessment and ergonomic design, coronary health, individual counselling, parenting classes, health risk assessment, programmes on alternative medicine and holistic approaches, eye surgery options and immunisation clinics. A wellness programme should at least consist of physical fitness, stress management, psychological and mental health, nutrition and dietary related issues, as well as alcohol and chemical dependence education/treatment (Church & Robertson, 1999; Shephard, 2000; Grant & Brisbin, 1992). Weston (2003) recommends the following guidelines for developing a wellness programme: regard health as a strategic issue, ensure that your health programme manager targets the organisation's specific needs, ensure involvement from 'top to bottom' in the organisation, with management leadership for the programme, recognise the need for baseline data and assessments, reassure employees of the privacy of their detailed assessment information, set objectives for improvement across the organisation, define measures for success (such as attendance at workshops), productivity increases, positive employee feedback and fewer sick days or stress leave, tailor programmes and activities to desired outcomes, emphasise employees' personal responsibility for their health and run further assessments at regular intervals and report back on accumulated results.

To be successful, a wellness programme should strive for a participation rate of 75% or higher, give employees what they want, utilise a credible source to deliver content and have an enthusiastic coordinator (Ioma's Safety Director's Report, 2003; Violette, 1990). In addition, such a programme needs a sound business plan, horizontal integration, clarity on the purpose, focus on technology development and

a realisation of the importance of data and information management (Johnson & Johnson, 2003). Wellness programmes should focus on people who are already at high risk, for example, people who smoke or who are obese, thereby trying to reduce their risk profiles (Goetzal, 2002). A health risk appraisal helps organisations to assess their employee population as a whole and identify the kinds of education and intervention the employees need. Individuals should also take responsibility for their own wellness by practising quality in doing their jobs, setting priorities, establishing support groups, participating in community activities, maintaining a healthy lifestyle, fostering a healthy work environment, taking sufficient time off, dealing with anger, taking up a hobby, being honest and happy, stop worrying and practising self-compassion (Bintliff, 1997).

1.3.2 Health risk assessment

The concept of health risk is generally credited to Robbins, whose work on cervical cancer and heart disease prevention during the late 1940s led him to the idea that a medical doctor might record a patient's health hazards as a guide to preventative efforts. This in turn led to the creation of a simple health hazard chart that could give the medical examination a more prospective orientation (Beery, Schoenbach & Wagner, 1986). A Health Risk Appraisal (HRA) is a systematic approach to collecting information on individuals that identifies risk factors, provides individualised feedback and links the person with at least one intervention to promote health, sustain functions and/or prevent diseases.

Virtually all organisations will have to begin implementing an employee wellness programme by conducting a health risk appraisal or assessment using a questionnaire that asks employees about their habits, risk factors, current health issues and family history. The appraisal helps organisations to assess their employee population as a whole and identifies the kind of education and intervention the employees need (Kapp & Sharp, 2003). Through the early identification of behavioural risk factors and then changing the behaviour of people, it is possible to achieve substantial improvements in health.

One of the most obvious approaches is the implementation of a wellness programme based on a comprehensive health risk appraisal. An example is the Healthy People 2000 (HP2000) which is the American national agenda of health

promotion and disease prevention that provides objectives for improving the health of all Americans (National Centre for Health Statistics, 2000). The agenda delineates specific and measurable health behaviour goals within 22 priority areas, focusing on lifestyle or behavioural changes that reduce the risk of disabilities, improve the health status of vulnerable populations and reduce the incidents of disease (National Centre for Health Statistics, 2000). A typical Health Risk Assessment (HRA) instrument obtains information on demographic characteristics (sex, age and job), lifestyle (for example smoking, exercise, alcohol consumption and diet), personal medical history and a family medical history (Shekelle, Tucker, Maglione, Morton, Roth, Chao, Rhodes, Wu, Newberry, Gruman & Rubenstein, 2004).

Assessment instruments consist of between 40 and 80 questions designed to address multiple risk factors. The type of lifestyle or behavioural areas addressed include tobacco and alcohol use, nutrition or diet, physical activity or exercise, height and weight (Body Mass Index - BMI), self-care, motor vehicle use, safety, back care, preventive self-examinations and readiness to change (Babor, Sciamanna & Pronk, 2004). The logic behind HRA is that if employees understood the morbidity and mortality risks of unhealthy behaviour, a significant number would change to more healthy habits. It is also anticipated that HRA data would give the information needed to design intervention techniques and change high-risk behaviours amongst organisational employees. According to Scott (1999), these assumptions are flawed if based on evidence that shows that simply knowing about risk implications is not sufficient to change behaviour. For example, is there a single adult smoker who does not know the health risks of tobacco use or do the majority of the population who are inactive and eating high-fat diets not understand the risk of obesity? High risk individuals are often reluctant to change their drinking, sex, seat-belt and other poor lifestyle habits for fear of repercussion (Scott, 1999). According to Scott (1999), HRA should be replaced by a new approach called IRA (Interest/ Readiness Assessment) that asks individuals about their health interests and what behaviours they are ready to begin changing. The IRA should include, apart from demographic data, the following:

- Health and lifestyle interests, such as topics on men's and women's health issues, healthcare/self-care, workplace health, physical activity and life skills.
- Readiness assessment which is based on health practice questions, such as nutrition, body weight, physical activity, stress management and tobacco. It

should determine an individual's stage of readiness (pre-contemplation, contemplation, preparation, action, or maintenance).

- ❑ Chronic health condition interests which may include everything from allergies to osteoporosis as important areas.
- ❑ Perceived health. An individual's health perception correlates highly with his or her actual health, allowing time-over-time evaluation.
- ❑ Learning style preferences. Knowing these encourage investment in the appropriate resources.

The question is how reliable and valid are health risk appraisals? Reliability refers to the degree to which measurements are affected by random error, which may be assessed by the stability of the measures or scores produced by an instrument from one time period to another (Smith, Sonja, McKinley & McKinley, 1989). Validity, on the other hand, refers to the accuracy of a response in relation to some objective standard (Babor *et al.*, 2004).

Several studies have raised doubts about the reliability of HRA data. Research done by Best and Milsum (1978) found that participants in a smoking cessation programme reported numerous improbable changes in the body frame size, medical history and family history after six months. Another study done by Sacks, Krushat and Newman (1980) established that only 15 percent of the subjects in a clinical trial gave constant responses to HRA items at both baseline and follow-up interviews. Studies done by Elias and Dunton (1981), Lauzon (1978), Cioffi (1979) and Alexy (1985) reported test and re-test reliability coefficients exceeding 0.7 for selected risk factors and overall risk estimates, especially for follow-up periods of short duration (three days to one month). Smith *et al.* (1989) did a field trial to assess the reliability and validity of four HRA instruments, namely, Health Risk Appraisal (Centers for Disease Control), The Heart Test (Arizona Heart Association), RISK0 (American Heart Association) and Determine your Medical Age (Blue Cross/Blue Shield, New York). According to Smit *et al.* (1989), the results from the field trial indicate that reliability of HRA risk scores can vary greatly from one instrument to another and these findings have the following implications for organisations using HRAs:

- ❑ Computation errors may severely reduce the reliability of self-scored instruments. Smit *et al.* (1989) recommend that computerised HRAs may be the most desirable type unless manual calculations can be routinely checked for errors.

- ❑ More work needs to be done to improve the measurement of specific risk factors such as physical activity levels, dietary practices and physiologic status. The reliability of blood pressure and cholesterol levels can be increased by measuring these values during physical examinations rather than relying on self-reports.
- ❑ As the reliability of a HRA declines, it becomes increasingly difficult to distinguish changes in risk status from random reporting areas. Unreliability makes health promotion intervention efforts more difficult to detect and only HRAs for which reliability can be demonstrated should be considered for evaluation of the effectiveness of these interventions.

Wiley (1981) retrospectively computed HRA risk estimates using 13 characteristics that had been measured on the Alameda County Cohort. HRAs differentiated high-, middle- and low-risk subjects, although they overestimated by 26 deaths per 1000 the actual mortality experience. A study conducted by Chaves, Jennings, McKinlay & McKinlay (1985) at the American Institute for Research found that heart disease mortality risk estimates from seven basically similar HRAs instruments to correlate closely (above 0.87) with one another.

HRAs potentially have the following positive qualities for clinicians and health educators: preventive orientation, systematic approach, ability to emphasise modifiable factors and grounding in current scientific knowledge (Schoenbach, 1987). Anderson and Stauffer (1996) mention that HRAs are recommended in the context of education programmes and services that improve general awareness of health issues, provide practical knowledge and support individual efforts to change behaviour. In this context HRAs have a high degree of face validity. Although HRA instruments tend to provide an accurate determination of high and low-risk status, accuracy can be reduced under certain circumstances (Eddington, Yen & Braunstein, 1999). Reliability studies for HRA instruments indicate that for the vast majority of questions asked, the results appear to be relatively stable (Babor *et al.*, 2004). Research done by Sacks *et al.* (1980) found that self-reports tend to be unstable over a 6-month period. However, according to Elias and Dunton (1980), the instability of self-reports does not substantially affect risk calculations. Babor *et al.* (2004) are of the opinion that in the context of post-HRA, follow-up programmes may increase awareness and change behaviour, which, reported at a 6-month follow-up, would result in changes in HRA responses. According to Gazmararian, Foxman and

Yen (1991), HRAs accurately predict group-level mortality data, but perform poorly at predicting individual risk of dying. Szymanski, Pate and Dowda (1991) recommend that performance in predicting physiologic risk factors may be optimised if the HRA is combined with physiologic or biometric screening measures. Although the relationship between HRAs and medical costs has often been quantified, further research is necessary to explain the role of HRA-derived data in predicting future health care utilisation, medical care expenses and morbidity (Yen, Eddington & Witting, 1991; Pronk, Tan & O'Connor, 1999).

1.4 PROBLEM STATEMENT AND HYPOTHESES

As a background to the problem statement, a synopsis of the literature regarding wellness problems is given. A sedentary lifestyle, tobacco smoking, alcohol and drug abuse, unsafe sex, reckless driving and speeding, irresponsible use of firearms and obesity contribute to poor physical health and increase the mortality rate amongst employees. Environmental demands cause emotional disturbances such as stress, burnout, depression, anxiety and sleeping disorders. Limited opportunities for life-long learning hamper the need for self-actualisation and intellectual development. In today's fast changing and turbulent environment, employees become alienated and find it increasingly difficult to establish and sustain healthy relationships with others. In addition, employees find it difficult to incorporate their skills, interests and values to obtain high job satisfaction. Employees frequently lack a sense of purpose and struggle to balance their inner needs with the demands of the rest of the world. From an organisational behaviour perspective, the abovementioned problems may lead to high personnel turnover, low job satisfaction, absenteeism, low morale, increase in health care costs, lower productivity, inefficiency and ineffectiveness. However, individuals can control their lifestyle choices and reduce their health risk factors through changing their behaviours.

The research problem serves as the basis of a hypothesis. For the purpose of this study the problem statement is as follows: *The wellness behaviour of managers at two higher education institutions increases their health risks and necessitates wellness interventions.*

When an explanation for a phenomenon is sought, a tentative proposition is suggested to serve as a point of departure for the specific research study. Such a

tentative statement is called a hypothesis (Ruttkamp & Ally, 2000:41). A hypothesis that uniquely specifies the population parameter concerned is called a null hypothesis and is indicated by the symbol H_0 , while the alternative hypothesis, indicated by H_1 , specifies for the population parameter a set of values that is not specified by the null hypothesis and that is important to the specific problem (Steyn, Smit, Du Toit & Strasheim, 1994:406). For the purpose of the study, the following null and alternative hypotheses were postulated:

H_0 : There is no correlation between the health risk scores and the wellness behaviour levels of managers.

H_1 : There is a negative relationship between the wellness behaviour levels and the health risk scores of managers.

H_0 : There is no significant difference between the mean wellness behaviour levels and mean health risk scores of managers at the academic university and technology university.

H_1 : There is a difference between the mean wellness behaviour levels and mean health risk scores of managers at the academic university and technology university.

H_0 : There is no significant difference between the mean wellness behaviour levels and mean health risk scores of heads of academic departments and directors of support services.

H_1 : There is a difference between the mean wellness behaviour levels and mean health risk scores of heads of academic departments and directors of support services.

H_0 : There is no significant difference between the mean wellness behaviour levels and mean health risk scores of male and female managers.

H_1 : There is a difference between the mean wellness behaviour levels and mean health risk scores of male and female managers.

H_0 : There is no significant difference between the mean wellness behaviour levels and mean health risk scores of post-graduate and PhD graduate managers.

H_1 : There is a difference between the mean wellness behaviour levels and mean health risk scores of post-graduate and PhD graduate managers.

H_0 : There is no significant difference between the mean wellness behaviour levels and mean health risk scores of the three age groups used in this study.

H_1 : There is a difference between the mean wellness behaviour levels and mean health risk scores of the three age groups used in this study.

H₀: It is not possible to use a wellness prediction model, as a holistic dependent variable, to measure wellness against all possible independent variables.

H₁: A wellness prediction model can be used, as a holistic dependent variable, to measure wellness against all possible independent variables.

1.5 RESEARCH METHODOLOGY

1.5.1 Research approach

According to Leedy (1993:8-9), the term methodology merely means the way in which to proceed to solve problems, that is the research process. In the human sciences two basic methodological paradigms can be distinguished, namely, the quantitative and qualitative methodologies. Quantitative research is associated with analytical research and its purpose is to arrive at a universal statement (Brynard & Hanekom, 1997). Mouton and Marais (1988) describe the quantitative approach as that approach to research in the social sciences that is more highly formalised as well as more explicitly controlled, with a range that is more exactly defined than the qualitative approach and which, in terms of the methods used, is relatively close to the physical sciences. Quantitative research is designed to give numerical results, which can be reported in tables, graphs and charts indicating the number of something, the proportion of something or what certain trends are (Bouma, 1997). It requires methods such as experiments and surveys to describe and explain phenomena. These methods include techniques such as observation, pilot studies, quantitative analyses and questionnaires.

Against this background, the present study was conducted within the quantitative paradigm. By utilising a survey research approach, an attempt was made to understand and test the various hypotheses. Survey research involves acquiring information about one or more groups by asking them questions and tabulating their answers (Leedy & Ormrod, 2005:193).

1.5.2 Research design

A research design is a plan or blueprint of how the researcher intends to conduct the research (Mouton, 2001:55; Thyer, 1993:94). The purpose of this design

is to find an answer to the problem statement or hypothesis. This study used a single-stage sample survey of wellness behaviour levels of managers from heads of academic departments to top management at two leading tertiary education institutions in Gauteng. A holistic wellness behaviour assessment questionnaire consisting of close-ended questions was e-mailed to the total target population as the measuring instrument.

1.5.3 Sampling

The population was all managers (heads of academic departments, directors of support services and members of the rectorate) at two tertiary education institutions based in Gauteng. According to Seaberg (1988:240), a population can be defined as the total set from which the individuals of the study are chosen. The entire population was included in this study.

1.5.4 Data analysis

As a result of the quantitative approach followed, the analysis and interpretation of data were done by way of a deductive mode of reasoning, beginning with the hypothesis and moving towards proving it. Data analysis entails that the analyst breaks down data into consistent parts to obtain answers to the research questions and to test the research hypotheses (De Vos & Fouche, 2001:203). The data obtained from the holistic wellness behaviour assessment was used to determine specific wellness interventions for managers at higher education institutions.

As indicated, the pre-structured holistic wellness behaviour assessment questionnaire consisted of close-ended questions (numeric data) while the Statistical Products and Service Solutions (SPSS) was used for the analysis of the quantitative data in this study. The following methods of data analysis were used:

- Descriptive statistics (means, standard deviations, percentage and frequency tables and graphs) to describe the quantitative data.
- Pearson product moment correlation coefficients to measure the strength and the direction of the relationship between various variables and subscales in the hypotheses.

- T*-tests to compare the mean wellness behaviour levels and mean health risk scores, for example between male and female managers.
- One-way analysis of variance (ANOVA) to compare the mean scores between more than two groups.
- Reliability (Cronbach's alpha coefficient) to measure the internal consistency of the questionnaire.
- Other relevant statistical techniques.

1.6 FINDINGS AND RECOMMENDATIONS

The envisaged findings of the research were:

- There would be a negative correlation between the wellness behaviour levels and the health risk scores of managers. It was anticipated that managers that had high scores on their wellness behaviour levels, would have low health risk scores.
- That there would be a difference between the mean wellness behaviour levels and mean health risk scores of managers at the academic university and technology university, heads of academic departments and directors of support services, male and female managers, post-graduate and PhD graduate managers and the three age groups.
- That a wellness prediction model could be developed as a holistic dependent variable that would measure wellness against all possible independent variables or factors.
- To diagnose specific wellness behaviour weaknesses and health risks and to propose specific interventions, based on the measured wellness behaviour levels and health risk scores of managers.

1.7 CHAPTER OUTLINE

- Chapter 1: Overview, Rationale and Research Objectives
- Chapter 2: Literature Review
- Chapter 3: Research Methodology
- Chapter 4: Research Findings
- Chapter 5: Summary and Recommendations

1.8 CLARIFICATION OF CONCEPTS

1.8.1 Health

Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (World Health Organisation, 1947). The development of holistic thinking has led to the broadening of definitions of health to include social, environmental and economic influences. Health includes individuals' social and psychological resources as well as their physical capacities (Brooker, 2003:137). Health is a positive concept of well-being, a subjective feeling, physical fitness, normal functional capacity, resistance, as well as resilience or hardiness (Brooker, 2003:137).

1.8.2 Wellness

Wellness is a process of developing an awareness that there is no end-point but that health and happiness are possible every moment, here and now (Travis & Ryan, 1988). Myers *et al.* (2000) define wellness as a way of life oriented towards optimal health and well-being in which body, mind and spirit are integrated by the individual to live more fully within the human and natural community. According to van der Watt (2004), wellness can be described as a conscious and continuous process of holistic self-development based on personally determined goals for well-being, leading towards the enhancement of individual, organisational and community health and well-being. In addition, wellness has been defined as an approach to personal health that emphasizes individual responsibility for well-being through practising health-promoting lifestyle behaviours (Hurley & Schlaadt, 1992). According to Edlin *et al.* (1998), Herholdt (2004) and Davies *et al.* (2003), wellness and health generally consist of six dimensions that are integrated and function in a synergy to produce harmony. The six dimensions of wellness are the emotional, intellectual, spiritual, occupational, social and physical dimensions.

1.8.2.1 Emotional wellness

Emotional wellness concerns understanding and accepting one's own emotions and feelings and the emotions and feelings of others. Emotional wellness requires understanding and coping with problems that arise in everyday life.

1.8.2.2 Intellectual wellness

Intellectual wellness is continuing to learn new things throughout one's life. This also involves having a mind open to new ideas and concepts. If a person is intellectually healthy, he or she constantly seeks new experiences and challenges.

1.8.2.3 Spiritual wellness

There appears to be agreement on the central importance of meaning and purpose in life as a cornerstone of spiritual wellness (Frankl, 1984). Spirituality can be defined as the desire to find an ultimate purpose in life and to live accordingly, to experience a deep sense of wholeness or connectedness to the universe (Frankl, 1984; Myers *et al.*, 2000). Spiritual wellness is thus a state of harmony with oneself and others. It is the ability to balance one's inner needs with the demands of the rest of the world.

1.8.2.4 Occupational wellness

Occupational wellness is being able to enjoy what one is doing to earn a living and/or contribute to society, whether it is going to university, working as a secretary, doctor, construction manager, or accountant. In a job, it means having skills such as critical thinking, problem-solving and communicating well. It is also finding a way to incorporate one's skills, interests and values to obtain high job satisfaction. Employers should promote this as one of their main goals, since high job satisfaction leads to lower turnover rates. High turnover rates can be costly for employers (O'Donnell, 2002).

1.8.2.5 Social wellness

Social wellness refers to the ability to perform social roles effectively, comfortably and without harming others. Social wellness is being comfortable, accepting others and sustaining healthy relationships.

1.8.2.6 Physical wellness

Physical wellness is a healthy body maintained by eating right, exercising regularly, avoiding harmful habits, making informed and responsible decisions about health, seeking medical care when needed and participating in activities that help prevent illness.

1.8.3 Organisational health promotion

Organisational health promotion is defined as a strategic effort to reduce the health risks of employees through planned changes in individual risk related behaviours and other organisationally related predisposing conditions (Gutknecht & Gutknecht, 1990).

1.8.4 Wellness programme

Corporate wellness programmes are long-term organisational activities designed to promote the adoption of organisational practices and personal behaviour conducive to maintaining or improving employees' physiological, mental and social well-being (Wolfe & Parker, 1994). A wellness programme is preventive in nature and encourages self-directed lifestyle changes.

1.8.5 Health risk appraisal

A health risk appraisal is a process of gathering, analysing and comparing an individual's characteristic prognostics of health with those of a standard age group, thereby predicting the likelihood that a person may prematurely experience a health

problem associated with higher than average morbidity and mortality rates (Mosby's Medical, Nursing and Allied Health Dictionary, 1998).

1.9 SUMMARY

In this chapter, the researcher presented background information on the dependent variable, namely wellness and on the independent variables that are assumed to have an influence on the scale of wellness behaviour problems and health risks. The wellness independent variables are emotional, intellectual, spiritual, occupational, social and physical sub-dimensions. The literature has shown that wellness behaviour problems and health risks are multidimensional constructs with each of the constructs having multiple factors contributing to its development. The rest of the study will determine how the different dimensions of wellness relate to the different aspects of current and future wellness behaviour problems of managers.

In Chapter Two, the theoretical foundation of the six selected independent variables, the wellness behaviour risks associated with each, and risk reduction interventions will be discussed.

CHAPTER TWO: LITERATURE REVIEW

2.1 INTRODUCTION

The study proposes the development of a holistic wellness model for managers based on the assessment of wellness behaviour of managers at two tertiary institutions in Gauteng. The wellness behaviour of managers was measured on six dimensions of wellness to determine their overall wellness status. It is assumed that low levels of wellness behaviour on a specific dimension or dimensions will increase the scale of risk involved in terms of current and future wellness problems of managers.

The chapter focuses on the theoretical foundation of the six selected variables or dimensions of wellness, namely, physical, social, emotional, intellectual, occupational and spiritual. Physical wellness is divided into three sub-dimensions, namely, physical fitness and nutrition, medical self-care and safety and lifestyle. Social wellness is divided into two sub-dimensions, namely, environmental wellness and social awareness, while emotional wellness is divided into emotional awareness and sexuality and emotional management. There are ten sub-dimensions and the possible risk factors of each dimension were determined to indicate the impact of certain types of wellness behaviour risks, for example the risks involved with a sedentary lifestyle or obesity. To decrease the wellness behaviour risks of managers, specific individual and organisational interventions will be recommended.

2.2 PHYSICAL WELLNESS

The physical dimension encourages cardiovascular flexibility and strength, regular physical activity, knowledge about food and nutrition and medical self-care. It discourages the use of drugs and excessive alcohol consumption. The physical dimension consists of three sub-dimensions, namely, physical fitness and nutrition, medical self-care, and safety and lifestyle.

2.2.1. PHYSICAL FITNESS AND NUTRITION

Physical activity is no longer a requirement for human existence in the 21st

century. There is, however, a mismatch between humans' contemporary, sedentary lifestyles and their genetic make-up which has important pathophysiological implications, namely, coronary atherosclerosis, age-related fractures, obesity and syndrome x disorders related to insulin resistance (United States Department of Health and Human Services, 1996). Research has revealed that regular, moderate intensity physical activity offers significant health benefits such as reduction of blood pressure in those with hypertension and the maintenance of normal muscle strength and joint structure (Jacobson, Yenney & Bisgard, 1993). Physical fitness and health style habits have been reported to lower the risk of death from diseases and lower the risk of cardiovascular disease. At the same time they increase alertness, improve muscle tones, strengthen joints and bones, promote personal functioning and mental health, decrease the severity of physiological responses to stress and elevate mood states (Chang, 2003; Falkenberg, 1987).

Strenuous physicality from an early age promotes the formation of dense, well-mineralized bones while regular exercise retards bone mineral loss (Nelson, Fiatarone, Morganti, Trice, Greenborg & Evans, 1994). Research also indicated the existence of a strong, graded, inverse relationship between aerobic power and the risk of subsequent cardiac events such as non-fatal arrhythmia, myocardial infarction, incident angina pectoris and sudden cardiac death (Meyers, Prakash, Froelicher, Do, Partington & Atwood, 2002). According to Froelicher and Meyers (2000), aerobic exercise elevates blood levels of good high-density cholesterol, lowers blood pressure and resting heart rates, decreases platelet aggregability as well as the tendency for vasoconstriction and enhances endothelial health as determined by post-ischemic brachial artery vasodilatation. Weight and strengthening training enhance heart health while resistance training lowers blood pressure, beneficially influences serum lipids, positively effects body composition and insulin sensitivity (Kelley & Kelley, 2000). Seguin and Nelson (2003) suggest that strength training increases muscle mass, bone mass, muscle strength, aerobic endurance flexibility, dynamic balance, self-confidence and self-esteem. Regular physical activity has a positive impact on a variety of social and psychological factors including improved mood states, reduced depression/anxiety, increased self-confidence, expanded social interactions, improved cognitive functioning, self-esteem, happiness, self-concept and in general improves the quality of life (Rikli, 2005).

Physical exercise is associated with higher scores on well-being variables such

as life satisfaction, self-esteem and perceived health (O'Connor, Rousseau & Maki, 2004:181). Heyward (2002) reported that physical activity reduces the risk of dying prematurely, developing adult-onset diabetes, high blood pressure and colon cancer. It also leads to concomitant reductions of blood pressure in hypertensive individuals and feelings of depression and anxiety. It also assists in controlling body weight, building and maintaining healthy bones, muscles and joints. Finally, it aids in developing strength and agility in older adults to reduce the risk of falls while creating a sense of psychological well-being.

In terms of weight, a normal Body Mass Index (BMI) is between 18.5 and <25 kg/m², while a BMI between 25 and 29.9kg/m² is defined as overweight and individuals with BMI>30kg/m² as obese (Bray, 2005:3). Obesity has been defined as possessing a body fat greater than 30% for women and greater than 25% for men or if an individual's body mass index (BMI) is 30 or more (Living Disease Free, 2002; Ruhling, 2004:218; Kan & Tsai, 2004:908). According to the Centers for Disease Control and Prevention (2005), to calculate one's body mass index (BMI), you should take your weight in kilograms multiplied by 10000 divided by height in centimetres multiplied by height in centimetres for example BMI =

$$\frac{(\text{Weight in kilograms})}{(\text{Height in centimetres}) \times (\text{Height in centimetres}) \times 10000}$$

For example, a person who weighs 99.79 kilograms, is 1.905 metres (190.50 centimetres) tall, has a BMI of 27.5.

$$\begin{array}{r} \text{BMI} = \\ \frac{\text{Weight in kilograms}}{(\text{Height in meters}) \times (\text{Height in meters})} \\ \text{BMI} = 27.5 \\ \frac{99.79 \text{ Kg}}{(1.905) \times (1.905)} \end{array}$$

Overweight and obesity are not only the result of a sedentary lifestyle, but may also be caused by an energy imbalance in which energy intake exceeds energy expenditure (Hill, 2004). Dietary fat is the big culprit as it provides a very high-energy content per gram, produces fewer satiety signals, is less able to suppress hunger and has a higher capacity for storage in the body (Rössner, 2002). According to Rössner (2002), the three main contributing factors for being overweight or obese are genetic-predisposition, disruption in energy balance and environmental and social factors.

Calderon, Yucha and Schaffer (2005:4) have identified the lack of physical activity, unsafe neighbourhoods, the cost of participating in or the cost of sporting activities, television, high percentage fat calories of sugar and fat, access to commercially prepared fast foods and exposure to television advertising as contributing factors to obesity and overweight. Stress causes higher levels of cortisol and over a long period of time leads to excess weight gain, specifically truncal obesity (Cohen, Finch, Bower & Sastry, 2005). Obesity can also be the result of damage to the ventromedial part of the hypothalamus in the brain, Cushing's disease, treatment such as insulin, sulfonylureas or thiazolidinediones and drugs such as antidepressants, anti-epileptics and neuroleptics, eating a high fat diet and reduced energy expenditure (Bray, 2005:5-6).

According to Bray (2005:6), genetic factors contribute to the following forms of overweight and obesity. He mentions the Bardet-Biedl syndrome, characterised by retinal degeneration, mental retardation, obesity, polydactyly and hypogonadism. He then refers to the Alstrom syndrome that is characterised by pigmentary retinopathy, nerve deafness, obesity and diabetes mellitus. In addition, the Carpenter syndrome is characterised by acrocephaly, mental retardation, hypogonadism, obesity and preaxial syndactyly. Furthermore, the Cohen syndrome is characterised by mental retardation, obesity, hypotonia and characteristic facies; and the Prader-Willi syndrome, characterised by hypotonia, mental retardation, hypogonadism and obesity. He too notes the Pro-opiomelanocortin (POMC) syndrome that is characterised by defective production of POMC that is recognised as a redheaded fat child with a low plasma cortisol.

In terms of genetic susceptibility, research has shown that if both parents are obese, about 80% of their children will be obese. Leptin deficiency and deficiency of the leptin receptors are also associated with obesity (Bray, 2005:6). Research done by Puoane, Steyn, Bradshaw, Laubscher, Fourie, Lambert and Mbananga (2000:1044-1047) has shown that South African adults are predominantly overnourished, have high levels of obesity, more especially amongst African participants in urban areas than in non-urban settings. Africans perceive obesity as reflecting affluence and happiness. They tend to believe that it proves a husband's ability to care for his wife and family and shows that the person is not HIV infected. Data has also shown that 29.2% of South African men are overweight or obese and 9.2% have abdominal obesity, whereas 56.6% of the women are overweight or obese of which 42% had abdominal obesity (Puoane *et al.*, 2000:1038). Kaplan and Opie (2006:169) provide evidence that with urbanization,

black South Africans undergo a nutritional transition from traditional, rural, carbohydrate food with a low glycaemic index to a diet high in fat, poor-quality carbohydrate fast-foods, resulting in 58.5% of South African black women being overweight or obese, with some women's shapes augmented by the culturally desirable value of obesity.

2.2.1.1 WELLNESS BEHAVIOUR RISKS ASSOCIATED WITH A SEDENTARY LIFESTYLE AND OBESITY

There is a relationship between a sedentary lifestyle and both morbidity and mortality. Research done by Blair, Kampert, Kohl, Barlow, Macera, Paffenbarger and Gibbons (1996) have documented that low levels of physical fitness are associated with increasing mortality. A sedentary lifestyle may lead to chronic diseases such as cancer, cardiovascular disease, stroke, diabetes, high blood pressure, diabetes, bone loss and osteoporosis. Inactive people have a higher risk for cancer such as colon and prostate cancer (Creagan, 2004). According to Ruhling (2004:211), a sedentary lifestyle increases the risk of cardiovascular diseases, such as coronary heart disease (CHD) and hypertension; musculoskeletal disorders, including bone fractures, connective tissue tears, low back pain, osteoarthritis and osteoporosis; psychological disorders, such as anxiety, depression and mood changes; pulmonary diseases, including asthma, chronic bronchitis and emphysema; cancer, such as breast, colon, lung and prostate and metabolic disorders, including diabetes, obesity and being overweight.

Obesity is related to physical inactivity and being overweight is a risk factor for cardiovascular diseases, diabetes, high blood pressure, higher cholesterol, degenerative arthritis, hypertension, osteoarthritis, sleep apnoea and some types of cancers such as breast, colorectal, endometrial, prostate, kidney and gall bladder cancers (Proper *et al.*, 2003:218; Living Disease Free, 2002; Seefeldt, Malina & Clark, 2002:144; Crespo & Arbesman, 2003; Fontaine, Heo & Allison, 2005:694-695). Obesity also poses an increased risk of premature death (Lang & Froelicher, 2006:104). In South Africa, obesity is associated with increasing risks of developing hypertension, coronary heart diseases, diabetes, stroke and some form of cancer in both African and white populations (Puoane *et al.*, 2002:1038; Calderon, *et al.*, 2005:4-9). According to Lawrence and Kopelman (2004:296), obesity leads to type 2 diabetes mellitus to supervene in genetically susceptible individuals, while obese women (BMI>30) have a

28-fold greater relative risk of diabetes which increases to a 93-fold risk in the morbidly obese (BMI>35). In addition, type 2 diabetes mellitus is also associated with dermatologic conditions such as acanthosis nigricans and necrobiosis lipoidica diabetorum and causes dyslipidemia, hypertension, cardiovascular and thromboembolic diseases, sleep disordered breathing such as apnoea, fatty liver diseases such as hepatic steatosis, polycystic ovary syndrome, cancers such as breast and endometrium, renal cell carcinoma and colonic carcinoma and degenerative joint disease (osteoarthritis) as well (Lawrence & Kopelman, 2004: 296-301).

Apart from physical health risks, obesity is also associated with psychological risks. Research in the United States has indicated that obese women (not obese men) have a slightly higher rate of depression than normal weight women (Fabricatore & Wadden, 2004:332). Prejudice and discrimination towards obese people are increasing phenomena worldwide. A number of studies have shown that obese individuals are discriminated against, especially women in the work place in virtually all stages of employment including selection, placement, compensation, promotion, discipline and discharge. These prejudices and discriminations are chronic stressors that negatively affect the mental health of obese individuals (Fabricatore & Wadden, 2004:333).

Diet has an effect on mood and cognitive functioning, for example acute tryptophan depletion and folic acid deficiency correlate with depression, a low fat diet affects moods, increased dietary high fat intakes may lead to drowsiness, caffeine with decreased sleep, while increased dietary serine and lysine are linked to the development of major depressive disorders (Hakkarainen, Partonen, Haukka, Virtamo, Albanes & Lönnqvist, 2004). From an economic perspective, obese employees are more often absent from work than non-obese employees. Obesity, therefore, has a negative influence on productivity (Proper *et al.*, 2003:218).

2.2.1.2 PHYSICAL FITNESS AND NUTRITIONAL INTERVENTIONS

The question is how much physical activity is recommended as being beneficial to the individual? Over the years, several guidelines have been developed to assist health professionals and individuals in adopting a habit of regular physical activity. The 1990 guidelines from the American College of Sports Medicine (1990) recommended 20-60 minutes activity, 3-5 days per week, at an intensity of 60%-90% of a maximal heart rate. This can be accomplished by participating in various activities such as

walking, cycling, swimming and endurance games. According to the American College of Sports Medicine (1990), exercise is beneficial at an intensity level of 55%-90% of a maximum heart rate and a duration of 15-60 minutes. Exercise also includes activities such as housework, occupational-related work and leisure time activities.

The latest guidelines published in the American Surgeon General's Report recommend that each United States adult should accumulate at least 30 minutes of endurance-type, of at least moderate intensity, physical activity daily (U.S. Department of Health and Human Services, 2000). However, to help manage body weight and prevent gradual unhealthy body weight gain in adulthood, it is recommended to engage in approximately 60 minutes of moderate to vigorous intensity activity on most days of the week while not exceeding caloric intake requirements. To sustain weight loss during adulthood requires moderate intensity physical exercise of at least 60 to 90 minutes daily, while not exceeding caloric intakes (United States Department of Health and Human Services and United States Department of Agriculture, 2005: viii; Wallis & Mirinda, 2005).

According to Voit (2001), organisations are increasingly implementing health and fitness programmes in the workplace to improve and maintain the health of employees and to increase productivity. Work-sites are important settings for interventions to increase levels of physical activity, because employees spend most of their time at the work-site. Wellness Councils of America (2001) has proposed the following activities that can be implemented into any work-site to promote physical wellness, namely, keep cafeteria items nutritionally healthy, make a list of healthy restaurants that are close to the work-site, warn employees of the dangers of fatty diets, put nutritional information onto the vending machines, have water available throughout the work-site for employees to drink, start a walking club and offer safe walking gear, sponsor team sporting events, post Body Mass Index (BMI) charts around the work-site, provide health screenings, offer fitness and aerobic classes, have a weight gym, start a stair climbing challenge within the work-site, offer brochures on sexual health and on drug abuse and help to those abusing drugs or those who have family members that abuse them.

Excessive weight gain can be prevented by small changes in behaviour such as walking and eating smaller portions of food. According to Hill (2004:182), an individual may get an electronic step-counter (pedometer), walk 2000 additional steps each day and eliminate 100 kcal. Weight reduction surgery is the only form of therapy resulting in

sustained weight loss for the seriously obese (Livingston & Ko, 2005:16). According to Livingston and Ko (2005:20), pharmacological treatment of severe obesity generally results in modest transient weight loss, while surgical treatment results in greater and more sustained weight loss. Bariatric surgery is a viable option for psychologically stable, severely obese individuals (BMI of 40 or higher) or those with a BMI of 35 or higher if lifestyle modifications and pharmacotherapy have failed (Morantz & Torrey, 2004:2479).

A number of treatments for obesity and overweight have been developed, including behavioural modification techniques. According to Berkel, Poston, Reeves and Foreyt (2005:S35-S36) and Lang and Froelicher (2006:109-110), there are a number of key features of a behavioural modification programme. First, is self-monitoring where an individual keeps a detailed record of food intakes such as caloric and fat contents and physical activity recorded in minutes. Second, is goal setting where an individual is given calorie, fat gram and physical activity goals and third, nutrition which focuses on educating an individual on the roles of dietary fibre, complex carbohydrates, dietary fat, healthy cooking, recipe modification and eating out. These are followed by exercise where a number of lifestyle exercises such as walking, cycling, or running are recommended. In addition, stimulus control involves creating a conducive environment, for example by carrying high-fibre low-fat snacks with one. Problem solving techniques are also recommended where assistance is provided to the obese or overweight person by identifying potential barriers, solutions and implementation of such solutions. Cognitive restructuring where an individual is taught to recognise and modify his or her thoughts and beliefs related to weight is also recommended. A strong system of social support can facilitate weight reduction. For instance, family members, friends or colleagues can assist in maintaining motivation and providing positive reinforcement. Lastly, relapse prevention training (RPT) is useful where an individual is taught to keep lapses from becoming relapses. Other successful interventions include meal replacement programmes (drinks and shakes, frozen entrees, snack and meal bars), telephone counselling and the internet (Berkel *et al.*, 2005:S7-S41).

Obese or overweight individuals may seek help from a qualified dietician, health educator, or doctor. To improve the behavioural outcome, dietary counselling should include a thorough dietary assessment, enlisting family involvement, providing social support, using group counselling, emphasising food interaction, encouraging goal setting and using advice tailor-made for the individuals involved (Goldstein, Whitlock & DePue, 2004:65). The most sensible intervention is a healthy diet combined with a

moderate physical training programme. The United States Department of Health and Human Services and United States Department of Agriculture (2005) recommend two examples of health eating plans, namely, the USDA Food Guide and the DASH (Dietary Approaches to Stop Hypertension) eating plan (See table 2.1).

Table: 2.1 USDA Food Guide and DASH Eating Plan

Food Groups and Subgroups	USDA Food Guide Amount	DASH Eating Plan Amount	Equivalent Amounts
Fruit Group	2 cups (4 servings)	2 to 2.5 cups (4 to 5 servings)	½ cup equivalent is: * ½ cup fresh, frozen or canned fruit * 1 med fruit * ¼ cup dried fruit * USDA: ½ cup fruit juice * DASH: ¾ cup fruit juice
Vegetable group * Dark green vegetables * Orange vegetables * Legumes (dry beans) * Starchy vegetables * Other vegetables	2.5 cups (5 servings) 3 cups/week 2 cups/week 3 cups/week 3 cups/week 6.5 cups/week	2 to 2.5 cups (4 to 5 servings)	½ cup equivalent is: * ½ cup of cut-up raw or cooked vegetable * 1 cup raw leafy vegetable * USDA: ½ cup vegetable juice * DASH: ¾ cup vegetable juice
Grain Group * Whole grains * Other grains	6 ounce-equivalents 3 ounce-equivalents 3 ounce-equivalents	7 to 8 ounce-equivalents (7 to 8 servings)	1 ounce- equivalent is: * 1 slice bread * 1 cup dry cereal * ½ cup cooked rice, pasta, cereal * DASH: 1 oz dry cereal (½ - 1¼ cup depending on cereal type - check label)
Meat and beans group	5.5 ounce equivalents	6 ounces or less. Meat, poultry or fish 4 to 5 servings per week nuts, seeds and dry beans	1 ounce-equivalent is: * 1 ounce of cooked lean meat, poultry, fish * 1 egg * USDA: ¼ cup cooked dry beans or tofu, 1 tbsp peanut butter, ½ oz nuts or seeds * DASH: 1½ oz nuts, ½ oz seeds, ½ cup cooked dry beans

Milk Group	3 cups	2 to 3 cups	1 cup equivalent is: * 1 cup low-fat/free milk, yogurt * 1½ oz of low-fat or fat-free natural cheese *2 oz of low-fat or fat-free processed cheese
Oils	24 grams (6 tsp)	8 to 12 grams (2 to 3 tsp)	1 tsp equivalent is: *DASH: 1 tbsp soft margarine *1 tbsp low-fat mayo *2 tbsp light salad dressing *1 tbsp vegetable oil
Discretionary Calorie Allowance *Example of distribution Solid fat Added sugars	267 calories 18 grams 8 tsp	2 tbsp (5 tbsp per week)	1 tbsp added sugar equivalent is: *DASH: 1 tbsp jelly or jam *½ oz jelly beans *8 oz lemonade

The United States Department of Health and Human Services and United States Department of Agriculture (2005) recommend that individuals should consume a sufficient amount of fruit and vegetables while staying within the prescribed energy needs. Two cups of fruit and 2½ cups of vegetables per day are recommended for a reference 2000-calorie intake, with higher or lower amounts depending on the calorie level. Choose a variety of fruit and vegetables each day. In particular, select from all five vegetable subgroups (dark green, orange, legumes, starchy vegetables and other vegetables) several times a week. Consume 3 or more ounce-equivalents of whole-grain products per day, with the rest of the recommended grains coming from enriched or whole-grain products. In general, at least half the grains should come from whole grains. Consume 3 cups per day of fat-free or low-fat milk or equivalent milk products. Consume less than 10 percent of calories from saturated fatty acids and less than 300 mg/day of cholesterol and keep transfatty acid consumption as low as possible. Keep total fat intakes between 20 and 35 percent of calories, with most fats coming from sources of polyunsaturated and mono unsaturated fatty acids, such as fish, nuts and vegetable oils. When selecting and preparing meat, poultry, dry beans and milk or milk products, make choices that are lean, low fat or fat-free. Limit the intake of fats and oils high in saturated and/or transfatty acids and choose products low in such fats and oils.

Several studies have suggested that the Mediterranean diet is associated with lower incidences of cardiovascular disease and cancer and is characterised by a high

intake of fruit, vegetables, cereals, potatoes, poultry, beans, nuts, lean fish, dairy products and olive oil (Panagiotakos, 2005). Therefore, it is recommended that the Mediterranean diet may be adapted to improve the health of individuals. To prevent coronary heart disease the following dietary recommendations were made by Kromhout, Menotti, Kesteloot and Sans (2002:901): Keep an energy balance, indicated by a body mass index below 25 kg/mg; consume not more than 10% of energy from saturated fat, consume up to 2% of energy from transfat; eat fish (fatty) fish at least once a week, eat at least up to 400 grams of fruit and vegetables per day and limit salt consumption to a maximum of 6 grams a day.

2.2.2 MEDICAL SELF-CARE

Medical self-care is aimed at maintaining a healthy lifestyle and minimising wellness behaviour risks. Individual medical self-care should focus on the updating of one's immunization record, regular self-examination of testes for men and breasts for women, tobacco smoking cessation, considering the use of complementary and alternative medicines for chronic diseases, adequate water intake, maintaining oral hygiene, protecting one's skin from sun damage, maintaining blood pressure at normal levels and maintaining one's blood cholesterol levels within an acceptable range. For the purpose of the study, each of the abovementioned variables will be discussed, with specific reference to the wellness behaviour risks and interventions associated with each.

Vaccines are of the most important and effective tools for protecting the health of the public. Immunization is a successful strategy in preventive medicine. For example, smallpox has been eradicated, polio is on the verge of eradication while measles has been controlled or eliminated in numerous countries around the world (Orenstein, Douglas, Rodewald & Hinman, 2005:599). Temte (2005:2545) states that the benefits of immunization often extend well beyond individual patients, for example, a recent systematic review of pneumococcal vaccination in adults 55 years and older demonstrated a 53% effectiveness in reducing rates of invasive pneumococcal disease. Germs, that are called viruses or bacteria, cause most vaccine-preventable diseases. Vaccines to help prevent these diseases generally contain weakened or killed viruses or bacteria specific to the disease. Vaccines help one's body to recognise and fight these

germs to protect the individual each time he or she is exposed to someone who is suffering from any of these diseases. According to the Centers for Disease Control (2006), there are a series of steps that one's body goes through in fighting these diseases. First, a vaccine is given by a shot; over the next few weeks, the body makes antibodies and memory cells against the weakened or dead germs in the vaccine. The antibodies can then fight the real disease germs if the individual is exposed to the germs. If they invade the body, these antibodies will help destroy the germs and the individual will not become ill. Finally, the antibodies and memory cells stay on guard in the body for years after the vaccination to safeguard it from the real disease germs.

Testicular cancer (TC) is the most common solid tumour affecting males between the ages of 15 and 34, accounting for 20% of cancer diagnosis in this age group (Ward, Vander Weg, Read, Sell & Beech, 2005:386; Rew, McDougall, Riesch & Parker, 2005:59). Early diagnosis, improved treatment and increased awareness of risk factors may lead to a decrease in the mortality rate. Breast cancer is one of the leading causes of death among women and early detection methods such as mammography, clinical breast examination and breast self-examination, can play an important role in the reduction of deaths from breast cancer in the absence of primary prevention strategies (Norman & Brain, 2005:1-2; Jelinski, Maxwell, Onysko & Bancej, 2005:506). Norman and Brain (2005:2); Gaskie and Nashelsky (2005:803) and Secginli and Nahcivan (2006:521) are of the opinion that breast self-examination provides an alternative and relatively simple, low-cost method of early detection that can be performed in conjunction with mammography and/or clinical breast examination.

The negative public health impact of tobacco is staggering. Although numerous studies document the serious health effects of cigarette smoking, the youth and adults continue to initiate smoking at a high rate. In South Africa, smoking rates for adults among ethnic groups are Blacks – 19.3%, Coloureds – 46.7%, Whites – 32.6% and Indians – 26.9% (Panday, Reddy & Bergström, 2003:204). Cigarette smoking is the most important modifiable risk factor for premature mortality and is a risk factor for the four leading causes of death, namely, heart disease, cancer, stroke and chronic obstructive pulmonary disease (Karnath, 2002:399). Warnakulasuriya, Sutherland and Scully (2005:244) and Prochaska, Sorensen, Hall, Rossi, Redding, Rosen, Eisendrath and Meisner (2005:169) report that 4.9 million people died of tobacco-related illness in the year 2000 and predict that by the 2020s that figure will rise to 10 million per year, 70% of which will be in developing countries.

Nicotine dependence disorder is a form of substance abuse that leads to clinically important impairment or distress (Karnath, 2002:399). Nicotine addiction is one of the strongest obstacles to quitting smoking successfully and low-intensity smokers have a higher prospect of success to stop smoking than moderate or heavy smokers (Garcia, Fernandez, Schiaffino, Peris & Borràs, 2005:679). The power of nicotine addiction is so evident that millions of tobacco users have been unable to save themselves from the consequences of smoking despite the widespread recognition of its negative health effects (Khurana, Batra, Patkar & Leone, 2003:295). The smoke in cigarettes contains nitrogen oxide and carbon monoxide and when people inhale, they bring tar that includes 4000 chemicals such as cyanide, benzene, formaldehyde, methanol, acetylene and ammonia, into their lungs (A.D.A.M. Well-Connected Report, 2002:2).

Complementary medicine is used together with conventional medicine, while alternative medicine is used in place of conventional medicine (National Center for Complementary and Alternative Medicine, 2006; van Haselen, 2006:1). According to Saher and Lindeman (2005:1169) and Verhoef, Lewith, Ritenbaugh, Boon, Fleishman and Leis (2005:2007), complementary and alternative medicine is an umbrella term for a number of treatments beyond the scope of regular medical practice, including homeopathy, naturopathic medicine, traditional Chinese medicine, ayurveda, spiritual healing, energy healing, iridology, colour therapy and chiropractics.

In many Western societies, an increased use of complementary and alternative medicine (CAM) is evident because of the disillusionment with technology and bureaucracy of biomedicine and an increased questioning of its excessive invasiveness as well as heightened consumer awareness of the iatrogenic effects of modern medicine (Shmueli & Shaval, 2005). In addition, the growth in the expectations of quality service including structural changes in doctor–patient relationships, as well as the widespread demystification has led to considerable erosion of confidence in modern science as a means of solving problems. There is also an increase in the prevalence of chronic health problems that are less responsive to the methods of biomedicine.

Water is fundamental to human existence. An average person can live for about forty to forty-five days without food, but only three to five days without water. Water serves as the essential solvent for cellular and biochemical reactions and facilitates the thermal equilibrium of cells. It comprises about 63% of the entire body mass and 80% to 84% of kidney, lung and skeletal muscle tissues (Armstrong, 2005:40). Humans must consume water because the amount lost in metabolism exceeds the amount

synthesized by the body. Water plays a role in virtually every function of the body, from breathing to batting an eyelid or flexing your biceps. The main functions of water include regulating body temperature; enable breathing (in order to take in oxygen and eliminate carbon dioxide, one's lungs must be moistened by water); optimising brain functioning; lubricating and cushioning organs and joints; supporting the joints in the spinal column; helping kidneys to remove waste products such as urea, lactic acid, ammonia; carrying essential nutrients in the body cells and helping pregnant women to convey nutrients through the baby's blood and contributing to weight loss (Health24.com, 2006; Walsh, 2002:5; Colbert, 2002). Water is also an important source of essential minerals such as sodium, calcium and magnesium (Feldman, 2006:64).

The impact of fluoride, the change from traditional diets to high sugar diets in emerging economy nations and the ubiquity of alcohol and tobacco have resulted in an increase in oral diseases (Petersen & Kwan, 2004:319). Oral hygiene is the practice of keeping the mouth clean and healthy by brushing and flossing to prevent tooth decay and gum diseases (Thivierge, 2002). Oral hygiene includes brushing the teeth to remove food particles, bacteria and plaque; massaging the gums with a toothbrush, dental floss, or water irrigator to stimulate circulation and remove foreign matter and cleansing dentures and ensuring their proper fit to prevent irritation (Mosby's Medical, Nursing and Allied Health Dictionary, 1998:628). Careful and frequent tooth brushing and flossing help to prevent the build-up of plaque and calculus (tartar) that can lead to cavities (Wikipedia Encyclopedia, 2006).

Ultraviolet (UV) rays are a form of invisible energy given off by the sun, while ultraviolet radiation is divided into three types of rays, such as UVA rays that are involved in the ageing of cells; UVB rays that cause most skin cancers and UVC rays that do not penetrate the atmosphere and are therefore, not present in sunlight (American Cancer Society, 2006). Both UVA and UVB rays damage the skin and cause cancer. Breitbart, Greinert and Volkmer (2006:170) state that UV-exposure cannot and should not be avoided totally especially due to the beneficial health effects of UV-irradiation such as Vitamin D₃-production. Recommendations and information to the public should, however, be as clear and weighted as possible such as the message: "Love the sun and protect your skin." Sinclair (2006:174-175) is of the opinion that a balance is required between avoiding increases in skin cancer and maintaining adequate vitamin D to protect a person against osteoporosis and bone fractures.

To increase awareness of the damaging potential of ultraviolet radiation, a Global

Solar Index (UVI) was developed. The UVI is a measure of the intensity of UV radiation on the surface of the earth that is relevant to effects on the human skin and is measured on a scale from 1 to 11+ (American Cancer Society, 2006).

Table 2.2: UV Radiation Exposure Categories

EXPOSURE CATEGORY	UVI RANGE
LOW	< 2
MODERATE	3 TO 5
HIGH	6 TO 7
VERY HIGH	8 TO 10
EXTREME	11+

According to the World Health Organisation (2002:8), even for very sensitive fair-skinned people the risks of short-term and long-term UV radiation damage below a UVI of 3 is limited and under normal circumstances, no protective measures are needed. Above the threshold value of 3, protection is necessary and this message should be reinforced at UVI values of 8 and above. The Global UV index is a very useful tool to determine when sun protection is required and equally, when it is not necessary (Sinclair, 2006:175).

One's blood pressure is the force exerted by one's heart, against the resistance created by the arteries, to keep blood flowing through the body. High blood pressure occurs when the force is excessive. Blood pressure measurements are most commonly done with a sphygmomanometer and hypertension is usually defined in adults as a systolic blood pressure (SBP) of 140 mm Hg or higher, or a diastolic blood pressure (DBP) of 90 mm Hg or higher (U.S. Preventive Services Task Force, 2003:159). The blood pressure measurement consists of the systolic pressure, which occurs in the arteries during heart contraction and diastolic pressure that occurs during the period of heart relaxation between beats. The following table shows the normal ranges of blood pressure and stages of hypertension for South Africans (Health24.com, 2006).

Table 2.3: Blood Pressure Ranges

Blood pressure	Systolic (mm Hg)	Diastolic (mm Hg)

NORMAL RANGE		
Optimal	120 or less	80 or less
Normal	Less than 130	Less than 85
High Normal	130-139	85-89
HYPERTENSION		
Stage 1	140-159	90-99
Stage 2	160-179	100-109
Stage 3	180 or higher	110 or higher

According to Ben-Dov, Ben-Arie, Mekler and Bursztyn (2006:69.E13), the American Heart Association Council on High Blood Pressure Research has recommended that normal 24-hour ambulatory blood pressure be defined as less than 130/80 mm Hg while normal day time and night time blood pressure levels be defined as less than 135/85 mm Hg and less than 120/70 mm Hg, respectively. The World Health Organisation and the International Society of Hypertension have defined the optimal blood pressure as 120/80 mm Hg and 130/85 mm Hg as the limit between normal and high-normal blood pressure (Weisser, Mengden, Düsing, Vetter & Vetter, 2000:940).

Cholesterol is a fatty substance that is present in all cells of the human body and travels in the blood in particles called lipoproteins (Birtcher & Ballantyne, 2004:296). According to Birtcher and Ballantyne (2004:296), three of the common lipoproteins are low-density lipoproteins (LDL), high-density lipoproteins (HDL) and very low-density lipoproteins. The National Institutes of Health (2006) states that low-density lipoprotein (LDL) cholesterol is sometimes called bad cholesterol which leads to a build-up of cholesterol in the arteries and the higher the LDL level in your blood, the greater the chance you have of developing a heart disease. High-density lipoprotein (HDL) cholesterol is sometimes called good cholesterol and carries cholesterol from other parts of your body back to your liver that removes the cholesterol from your body. The higher your HDL cholesterol level, the lower your chance of getting a heart disease.

Persons aged 20 years and older should have a complete fasting lipid profile test (total cholesterol, low-density lipoprotein cholesterol (LDL), high-density lipoprotein

cholesterol (HDL) and triglycerides) done at least once every five years (Department of Health and Human Services Centers for Disease Control and Prevention, 2005). The National Cholesterol Education Program Expert Panel on Detection, Evaluation and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III) (2001:3) has classified LDL, Total and HDL cholesterol (mg/dL) as follows:

Table 2.4: ATP III Classification of LDL Total and HDL Cholesterol (mg/dL)

LDL Cholesterol	
<100	Optimal
100-129	Near optimal/above optimal
130-159	Borderline high
160-169	High
≥190	Very high
Total Cholesterol	
<200	Desirable
200-239	Borderline high
≥240	High
HDL Cholesterol	
<40	Low
≥60	High

According to the Department of Health and Human Services Centers for Disease Control and Prevention (2005), Birtcher and Ballantyne (2004:296-297), and the National Institutes of Health (2005), LDL levels of <100 mg/dL are considered optimal, while atherogenesis is more likely to occur when LDL levels are borderline high (130-159 mg/dL) and the risk for heart diseases increases at levels that are ≥160 mg/dL. Total cholesterol should be below 200 mg/dL, total cholesterol of 200-239 mg/dL is borderline high, while total cholesterol exceeding 240 mg/dL is high. HDL (good) cholesterol protects against heart diseases so that higher numbers are preferable. A level less than 40 mg/dL is low and is considered a major risk factor for developing a heart disease. HDL levels of 60 mg/dL or more help to lower the risks of heart diseases. Triglycerides levels that are borderline high (150-199 mg/dL) or high (200 mg/dL) can

also increase heart disease risk.

2.2.2.1 WELLNESS BEHAVIOUR RISKS ASSOCIATED WITH INADEQUATE MEDICAL SELF-CARE

If an adult is not vaccinated and exposed to a disease germ, the individual's body may not be strong enough to fight the disease and the person may die of diseases such as measles, polio or meningitis. According to the Centers for Disease Control (2006); Frenkel and Nielsen (2006) and Zimmerman, Middleton, Burns, Clover and Kimmel (2005:S9-S26), if a person has not been vaccinated and is exposed to the following viruses, serious health complications may follow. Hepatitis B Virus shows symptoms such as yellow skin or eyes, tiredness, stomach-ache, loss of appetite, nausea, or joint pain. If complications arise it can lead to liver disease and cancer. The Pertussis Virus may lead to complications such as pneumonia, seizures, encephalopathy and permanent brain damage. Tetanus is a disease of the nervous system caused by bacteria and the symptoms include lockjaw, stiffness in the neck and abdomen, difficulty in swallowing, fever, elevated blood pressure and severe muscle spasms, while the complication is death in one third of the cases. Diphtheria is a respiratory disease caused by bacteria with symptoms such as a sore throat and low-grade fever with complications such as airway obstruction, coma and death if not treated. Hepatitis A is a disease of the liver caused by the hepatitis A virus with symptoms such as fever, nausea, anorexia, malaise and jaundice, yellow skin or eyes, tiredness, stomach-ache, loss of appetite, while persons may die because of liver failure. Influenza (flu) presents symptoms such as fever and chills, dry coughs, runny nose, body aches, headache, sore throat, while the complication is pneumonia. Measles is a virus infection and shows symptoms such as rash, high fever, coughs, runny nose, red watery eyes, coryza, conjunctivitis, while the complications may include diarrhea, ear infections, pneumonia, encephalitis, seizures and death. Mumps is a disease of the lymph nodes caused by a virus. Its symptoms include fever, headache and muscle aches, swelling of the lymph nodes close to the jaw, which may lead to complications such as meningitis, inflammation of the testicles or ovaries, inflammation of the pancreas, deafness, or death. Pneumococcus is a type of bacteria with symptoms such as pneumococcal pneumonia, bacteraemia, meningitis and the complication may cause death. Polio is a

viral disease of the lymphatic and nervous systems. It presents symptoms such as fever, sore throat, nausea, headaches, stomach-aches, stiffness in the neck, back and legs, while the complication is paralysis that can lead to permanent disability and death. Rubella (German measles) is a respiratory disease caused by a virus with symptoms such as a rash, fever, posterior cervical adenopathy and arthralgia. The complications include birth defects, if acquired by pregnant woman, deafness, cataracts, heart defects, mental retardation and liver spleen damage (at least 20% chance of damage to the fetus if a woman is infected early in pregnancy). Varicella (chickenpox) is a virus of the herpes family with symptoms such as a skin rash of blister-like lesions on the face, scalp, or trunk, while serious complications include secondary bacterial skin infections, pneumonia, Reye's syndrome, encephal meningitis, glomerulonephritis, thrombocytopenia, pupura fulminans, cerebellar ataxia, arthritis and hepatitis.

Known risk factors for testicular cancer are cryptorchidism, a family history of cancer, a male who had a groin hernia, a hydrocele (accumulation of fluid in the scrotum), or pain and swelling of the testes during an episode of mumps (Postgraduate Medicine Online, 1999; Rew *et al.*, 2005:59). The Testicular Cancer Resource Center (2004), akronchildrens.org (2006) and The American Cancer Society (2005) point out that the symptoms of cancer may include a lump on the testicle, pain in the testicle, enlargement or swelling in the testicle, enlargement of male breasts or nipples, heavy sensation in the testicle or groin, a significant loss of size in one of the testicles, a dull ache in the lower abdomen and a sudden collection of fluid in the scrotum. Other abnormalities, which may not normally be signs of testicular cancer include symptoms such as a pimple, ingrown hair or rash on the scrotal skin, a free floating lump in the scrotum, a lump on the epididymus or tubes coming from the testicle that feels like a third testicle, pain or burning in the urination and blood in the urine or semen (The Testicular Cancer Resource Center, 2004).

In addition, some non-cancerous conditions that may affect the testicles include cysts (an abnormal yet harmless collection of fluid); varicocele (varicose veins), haematocele (a blood clot caused by trauma or injury to the testicles or scrotum), epididymo-orchitis (infection of the epididymis, testicle or both that causes inflammation and pain), testicular torsion (the cord that attaches the testicle to the body twists and cuts off the blood supply) and undescended testicles (either one or both testicles are missing from the scrotum and are lodged instead inside the lower abdomen) (Andrology Australia, 2006).

Known risk factors for breast cancer are age (risk increases over 50), ethnicity and race, inherited genetic factors and family history, over-exposure to estrogen, breast abnormalities, environmental factors, first childbirth after 30, viruses and insulin-like growth factor (A.D.A.M. Well-Connected Report, 2005:1-3; U.S. Preventive Services Task Force, 2002:345). One of the current methods for defining risks amongst women is the modified Gail Model which combines relative risks associated with age, race, age at menarche, number of previous breast biopsies, history of atypical ductal hyperplasia and family history of breast cancer in first-degree relatives for estimation of 5-year and lifetime risks of breast cancer development in an individual women (Mincey & Perez, 2004:811). The MayoClinic.com (2006); A.D.A.M. Well-Connected Report (2005:5) and WebMD Health Centers (2005) report that the symptoms of breast cancer or abnormalities include the change of colour of one's breast or nipple and may include wrinkling, dimpling or skin texture similar to an orange peel; thickening or puckering or an area that feels thickened; a nipple which may sink into the breast; a red, scaly rash or sore on the nipple; a discharge (especially blood) draining from the nipple; an unusual increase in the size of one breast and a lump in the breast tissue.

The health risks of smoking are comprehensive. According to the A.D.A.M. Wellness-Connected Report (2002); Tufts University Health and Nutrition Letter (2005:7); Chang, Sherritt and Knight (2005:517); Oncken, McKee, Krishnan-Sarin, O'Malley and Mazure (2005:780); Ong and Glantz (2004:33-35); Warnakulasuriya *et al.* (2005:244) and Maritz, Morley and Harding (2005:764-769) these health risks include an increase in heart diseases, accelerate complications of diabetes such as kidney diseases and heart disease and an increase in the risks of a stroke. Smoking increases the risk of lung cancer; cancer of the oral passages and upper airways, including the throat, mouth and esophagus; oral and pharyngeal cancer; skin cancers; breast cancer; leukaemia; cancer of the neck; cancer of the kidneys, pancreas and bladder; as well as colon and rectal cancer. Smoking increases the risk of Alzheimer's Disease; acute and chronic lung diseases such as pneumonia, flu, bronchitis, emphysema, asthma; the risk of infertility; earlier menopause; ectopic pregnancy and miscarriage; stillbirth; sudden infant death syndrome; prematurity and low birth weight and folate deficiencies in women and impotence in men. In addition, smoking has many harmful effects on bones and joints such as impaired formation of bone and loss of bone density and osteoporosis in women; degenerative disorders and injuries of the spine; low back pain; longer recovery after surgery and increased risks of developing rheumatoid arthritis.

Smoking increases the risks of developing diverticulitis; inflammatory bowel disease; peptic ulcers; hepatitis and cirrhosis. Moreover, smoking increases the risk of developing thyroid disease and systemic lupus erythematosus. Smokers are at increased risk for heart and circulation problems and delayed wound healing after surgery. Smoking also contributes to disorders related to aging such as cataracts, muscular degeneration, gum diseases (tooth loss, yellow/stained teeth), wrinkles, baldness, hearing loss and incontinence. Age-related muscular degeneration, caused by smoking, blurs the central vision by affecting the part of the eye that discerns details and is the leading cause of blindness in the elderly. Cigarette smoking has also been associated with depressive disorders. Ultimately smoking may lead to premature death or taking years off one's life and may lead to disability, for example, being unable to work or care for oneself.

In the realm of chronic diseases, modern medicine and drugs have achieved disappointing results (Haddad, Azar, Groom & Boivin, 2005:516). Adverse drug reactions (ADRs) may lead to higher mortality rates, be life-threatening, result in permanent or significant disability or require hospitalisation, contribute to a congenital anomaly or may require intervention to prevent permanent impairment or damage (Smith, Lawson & Tuteja, 2006:949). The adverse reactions have been identified as a significant factor in patient mortality and serious morbidity in the recent decades. Medication has become synthetic and patients' bodies are being subjected to "cocktails of xenobiotics" (from the Greek word "strange to life") that have an impact on the process responsible for breaking down and eliminating chemicals from the human system (Sørensen, 2002:294). Cytotoxic drugs and certain herbs such as garlic, echinacea, ginkgo, soy, ginseng, St. John's wort and grape seed have known negative suspected herb-cytotoxic interactions that may lead to fatal acute drug reactions (Lee, 2005:481-482; Niggemann & Grüber, 2003:708).

The classical symptoms of dehydration are dry lips and tongue; weakness, dizziness or exhaustion; thirst, cramps, low urine volume and darkly coloured urine (Walsh, 2002:6; Emma, 2006). The symptoms of acute dehydration vary with the degree of water deficit. For instance, fluid loss at 1% of body weight impairs thermoregulation and thirst occurs at this level of dehydration, while thirst increases at 2%, with a dry mouth appearing approximately at 3%; vague discomfort and loss of appetite appear at 2% and at 4% decrements of 20%-30% are seen in work capacity; difficulty in concentrating, headache and sleepiness are observed at 5%; tingling and numbness of

extremities can be detected at 6% while collapse can occur around 7% and a 10% loss of body water may be life-threatening (Grandjean, 2004:2; Bossingham, Carnell & Campbell, 2005:1342).

Dehydration has been associated with risks of kidney stone disease; cancers of the bladder, prostate, kidneys, testicles and colon; mitral valve prolapsus; fatal coronary heart disease; urinary tract infections, dental diseases and broncho-pulmonary disorders (Kleiner, 2004:1558; Grandjean, 2004). Batmanghelidj (quoted by Kendler, 2002:697) claims that water deficiency causes conditions such as hyperemesis gravidarum, allergies, asthma, rheumatoid arthritis, dyspepsia, constipation, colitis, lower back pain, intermittent claudication, angina, hypertension, elevated serum cholesterol, excess body weight, diabetes, migraine, hangover, consequences of stress, depression and Alzheimer's disease. Too much water may increase exposure to water-borne pollutants and may increase the risk of water intoxication (hyponatremia) (Eichenseher, 2004:35).

There are also some negative consequences resulting from improper brushing and flossing of teeth, for instance plaque, tartar, gingivitis, periodontitis and tooth decay (Thivierge, 2002). Any inherited or acquired disorder from the tissues surrounding and supporting the teeth (periodontium) can be classified as a periodontal disease that includes a variety of clinical manifestations characterised by an inflammatory process of the tooth's supporting structures such as the gingival, periodontal ligament, root and alveolar bone (Pihlstrom, Michalowicz & Johnson, 2005:1809; Beltran-Aguilar & Beltran-Neira, 2004:23). Periodontitis is a gum disease that destroys the structures supporting the teeth including the bone with symptoms such as red, swollen, bleeding gums; tooth loss; pus around the teeth and gums; pain while chewing; bad breath; a change in the way your teeth fit together when you bite and gums shrinking away from the teeth, leaving widening spaces between teeth and exposed root surfaces vulnerable to decay (Moloney, 2005).

Dental plaque is the soft, sticky layer of bacteria on the surface of gums and teeth that may cause gingivitis and periodontal diseases. The acid in plaque destroys the outer enamel of the tooth, leads to bleeding of the gums and produces foul breath (Thivierge, 2006). According to Visser (2006), bacterial plaque takes 12-24 hours to become harmful to the gum tissues when it starts to accumulate and together with saliva forms tartar (a hard crust like material). Gingivitis is an early form of periodontal disease, characterised by inflammation of the gums with painless bleeding during brushing and flossing and if left untreated, will progress into periodontitis (Hart, 2004). Tobacco,

alcohol, stress, lack of oral hygiene, sugar and acid, poorly contoured restorations, anatomical tooth abnormalities, wisdom teeth, intimacy, genetics, hormonal changes, poor nutrition, adults older than 55, HIV/Aids and xerostomia, are major risk factors for adult periodontal disease (Petersen, 2005:3; Visser, 2006). Periodontal disease is also associated with diabetes mellitus, cardiovascular diseases, stroke, pulmonary disease, osteoporosis, herpes-related gingivitis, HIV-associated gingivitis, autoimmune diseases, leukaemia, tuberculosis, syphilis, Wegener's granulomatosis, amyloidosis and oral cancer (Pihlstrom *et al.*, 2005:1810-1815; Moloney, 2005).

Photoaging is usually a reflection of chronic exposure to ultraviolet radiation and includes an acceleration of intrinsic skin aging such as wrinkling and drying of the skin, decrease of elasticity and telangiectasia (cutis rhomboidalis nuchae condition) (Nemec, 2004:56). According to the World Health Organization (2002:15-17) and the American Academy of Dermatology (2005), excessive UV radiation, apart from skin cancer, also promotes eye damage such as photokeratitis and photoconjunctivitis, cataracts, that are the leading cause of blindness, and has a systematic immunosuppressive effect on humans. A history of numerous sunburns is associated with increased risk of developing malignant melanoma as an adult and just one serious sunburn during childhood can double the risk of malignant melanoma (Turner & Mermelstein, 2005:77). Solar radiation causes cutaneous malignant melanoma and nonmelanocytic cancer (Koh & Geller, 2004:484). Sunlight induces skin cancer by damaging DNA, the molecule found in cells that encode genetic information. Sunlight produces activated oxygen molecules that harm DNA and other structures in the cells and suppresses immune function around the area of sun damage, thereby impeding the body's own natural defences against cancer (Lesch, 2006). Three types of skin cancer account for nearly 100% of all diagnosed cases. They are basal cell carcinoma (BCC), squamous cell carcinoma (SCC) and melanoma, as well as, other skin cancers such as Merkel cell carcinoma, dermatofibrosarcoma protuberans, Paget's disease and cutaneous T-cell lymphoma (American Academy of Dermatology, 2005; Lesch, 2006). High levels of exposure to ultraviolet radiation (UVR) increase the risks of all three major forms of skin cancer, since approximately 65% to 90% of melanomas are caused by UV exposure (Glanz & Mayer, 2005:131).

Other risks factors for skin cancer include a family history of skin cancer; red or blonde hair; propensity to burn; inability to tan; preventable risk factors such as intermittent (for cutaneous malignment melanoma and basal cell carcinoma) or

cumulative exposure to ultraviolet (UV rays) and radiation for squamous cell carcinoma; live or vacation at high altitudes; work or spend much time outdoors; have certain autoimmune diseases; have an organ transplant; take medicines that lower your immunity; take oral contraceptives; take tetracycline, sulfa drugs and certain antibiotics; take naproxen sodium or certain other nonsteroidal anti-inflammatory drugs; take phenothiazines (major tranquilizers and anti-nausea drugs); take tricyclic antidepressants; take thiazide diuretics (medicines used for high blood pressure and some heart conditions and take sulfonylureas (a form of oral anti-diabetic medication) (Centers for Disease Control, 2003:1; American Cancer Society, 2006). According to Wolpowitz and Gilchrest (2006:303-304), Lips (2006:4-5) and Holick (2006:52), the health risk factor consequences of Vitamin D deficiency include rickets in children and osteomalacia in adults; osteoporosis; higher cancer prevalence (prostate, breast, colon, ovarian, esophageal and non-Hodgkin's lymphoma) and auto-immune diseases such as multiple sclerosis and diabetes.

More than 6,2 million South Africans have blood pressure of more than 140/90 mm Hg that can ultimately lead to gradual organ damage (Hudson, 2006). Hypertension is projected to be one of the major risk factors underlying the global burden of disease in 2020 and will then be the most common risk factor for death and disability globally (Reid & Thrift, 2005:375). The occurrence of persistent hypertension is increased by the following environmental factors: excessive dietary sodium, weight gains from increased caloric intake and physical inactivity, excessive alcohol intake, low potassium intake and excess psychological stress (Kaplan & Opie, 2006:168; MacGregor & He, 2005:14). Essential hypertension rarely has any symptoms. If people are diagnosed with high blood pressure, the most important complaints include symptoms such as chest pain, shortness of breath, dyspnea, dizziness, headache (especially pulsating headaches behind the eyes), focal neurological deficit, nosebleed, blurred vision, nausea and vomiting and disturbed levels of consciousness such as sleepiness and even seizures in severe cases (Health24.com, 2006; Karras, Ufberg, Harrigan, Wald, Botros & McNamara, 2005:108). High blood pressure is the most important risk factor worldwide for cardiovascular disease, accounting for 62% of strokes and 49% ischemic heart disease deaths. It also accelerates the atherosclerotic process, a major cause of plaque instability and, hence, of rupture or fissuring, causing direct damage within the brain. It can cause cerebral haemorrhage and small vessel disease that leads directly to a stroke, transient ischemic attacks or dementia; heart failure and kidney disease and

myocardial infarction (MacGregor & He, 2005:13-14; Wilson, Freeman, Kazda, Andrews, Berry, Vaeth & Victor, 2002:26). Additional complications of hypertension include end-stage renal disease, retinopathy and aortic aneurysm (U.S. Preventive Services Task Force, 2003:160).

High blood cholesterol (total cholesterol ≥ 240 mg/dL) is one of the major risk factors for heart disease (U.S. Department of Health and Human Services, 2005; Department of Health and Human Services Centers for Disease Control and Prevention, 2005). Cholesterol build-up on the walls of the arteries (blood vessels that carry blood from the heart to other parts of the body) and this plaque can cause narrowing of the arteries called atherosclerosis or hardening of the arteries (National Institutes of Health, 2006). According to Toth (2005:89), atherosclerosis can reduce the flow of blood to the heart muscle, which can result in the development of chest pain and angina or a heart attack. It also predisposes people to a stroke, peripheral vascular disease, lower-extremity amputation and loss of kidney function. The risk factors for atherosclerosis, such as dyslipidemia, hypertension and insulin resistance also contribute significantly to the acceleration of atherosclerosis (Madhavan, Pandey, Misra, Vikram, Dhingra, Luthra & Wasir, 2005). Atherosclerosis is influenced by several lifestyle-related factors such as smoking, lack of physical activity and psychosocial conditions (Polychronopoulos, Panagiotakos & Polystipiotti, 2005). The most important risk factors affecting LDL are cigarette smoking, high blood pressure (140/90 mg/dL or higher), low high-density lipoprotein (HDL) cholesterol (less than 40 mg/dL), a family history of early heart disease and age (men 45 years or older and women 55 years or older) (National Institutes of Health, 2006). According to Soeda, Terao, Iwata, Abe Uchida and Nakamura (2006:140), very low cholesterol may have a negative impact on mental health, particularly with respect to depression and suicide.

2.2.2.2 MEDICAL SELF-CARE INTERVENTIONS

The Centers for Disease Control (2006) recommend the Hepatitis B, Measles-Mumps-Rubella, Tetanus-Diphtheria, Travel, Varicella (Chickenpox), Influenza (50 years and older), pneumococcal (65 and older) vaccines for adults. The Advisory Committee on Immunization Practices (ACIP) recommends eight vaccines such as for influenza; pneumococcal polysaccharide; measles; mumps and rubella (MMR); meningococcal; tetanus-diphtheria; Varicella; hepatitis A and hepatitis B for adults (Fishbein, Willis,


Cassidy, Marioneaux, Bachino, Waddington & Wortley, 2006:804).

To increase adult immunization rates, Szilagyi, Shone, Barth, Kouides, Long, Humiston, Jennings and Bennett (2005:158) suggest some physician practice-based strategies such as policy to assess vaccination at all visits and stamp chart reminders; direct patient reminders about needed vaccinations and improved tracking systems for vaccinations. Health-system-level strategies include enhanced reimbursement for vaccinations, managed care plans (medical schemes) to send reminders directly to patients, or to send lists of unimmunised patients directly to primary care practices, and enhanced education of patients, particularly regarding vaccine safety.

In the United States of America, the Advisory Committee on Immunization Practices (ACIP) annually reviews the recommended Adult Immunization schedule. In June 2005 a new Adult Immunization Schedule for October 2005 – September 2006 was approved by the ACIP, the American Academy of Family Physicians and the American College of Obstetricians and Gynecologists (Temte, 2005:2546-2548; Campos-Outcalt, 2006:232-234; Centers for Disease Control, 2005; Davis, Halasyamani, Sneller, Bishop & Clark, 2005:35-37). Adults may use this schedule to ensure that their vaccinations are regularly updated to prevent diseases.

Table 2.5: Recommended Adult Immunization Schedule by Vaccine and Age Group, United States - October 2005 to September 2006. NOTE: These recommendations must be read along with the footnotes in table 2.7.

Vaccine	Age group (yrs)		
	19–49	50–64	≥65
Tetanus, diphtheria (Td) ^{1*}	1-dose booster every 10 yrs		
Measles, mumps, rubella (MMR) ^{2*}	1 or 2 doses	1 dose	
Varicella ^{3*}	2 doses (0, 4–8 wks)	2 doses (0, 4–8 wks)	
Influenza ^{4*}	1 dose annually	1 dose annually	
Pneumococcal (polysaccharide) ^{5,6}	1–2 doses		1 dose
Hepatitis A ^{7*}	2 doses (0, 6–12 mos, or 0, 6–18 mos)		
Hepatitis B ^{8*}	3 doses (0, 1–2, 4–6 mos)		
Meningococcal ⁹	1 or more doses		

 For all persons in this category who meet the age requirements and who lack evidence of immunity (e.g., lack documentation of vaccination or have no evidence of prior infection)


 Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indications)

Table 2.6: Recommended Adult Immunization Schedules by Vaccine and Medical and Other Indications – October 2005 to September 2006

Vaccine	Indication						
	Pregnancy	Congenital immunodeficiency, leukemia, ¹⁰ lymphoma, generalized malignancy, therapy with alkylating agents, antimetabolites, cerebrospinal fluid leaks, radiation, or large amounts of corticosteroids	Diabetes, heart disease, chronic pulmonary disease, or chronic liver disease, including chronic alcoholism	Asplenia ¹⁰ (including elective splenectomy and terminal complement component deficiencies)	Kidney failure, end-stage renal disease, or recipients of hemodialysis or clotting factor concentrates	Human immunodeficiency virus (HIV) infection 2, ¹⁰	Health-care workers
Tetanus, diphtheria (Td) ^{1*}	1-dose booster every 10 yrs						
Measles, mumps, rubella (MMR) ^{2*}	1 or 2 doses						
Varicella ^{3*}	2 doses (0, 4–8 wks)						2 doses
Influenza ^{4*}	1 dose annually			1 dose annually	1 dose annually		
Pneumococcal (polysaccharide) ^{5,6}	1–2 doses	1–2 doses					1–2 doses
Hepatitis A ^{7*}	2 doses (0, 6–12 mos, or 0, 6–18 mos)						
Hepatitis B ^{8*}	3 doses (0, 1–2, 4–6 mos)				3 doses (0, 1–2, 4–6 mos)		
Meningococcal ⁹	1 dose			1 dose	1 dose		

For all persons in this category who meet the age requirements and who lack evidence of immunity (e.g., lack documentation of vaccination or have no evidence of prior infection)
 Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indications)
 Contraindicated

Table 2.7: Footnotes on the Immunization Schedule

1. Tetanus and diphtheria (Td) vaccination. Adults with uncertain histories of a complete primary vaccination series with diphtheria and tetanus toxoid--containing vaccines should receive a primary series using combined Td toxoid. A primary series for adults is 3 doses; administer the first 2 doses at least 4 weeks apart and the third dose 6--12 months after the second. Administer 1 dose if the person received the primary series and if the last vaccination was received ≥ 10 years previously. Consult the ACIP statement for recommendations for administering Td as prophylaxis in wound management (<http://www.cdc.gov/mmwr/preview/mmwrhtml/00041645.htm>). The American College of Physicians Task Force on Adult Immunization supports a second option for Td use in adults: a single Td booster at age 50 years for persons who have completed the full pediatric series, including the teenage/young adult booster. A newly licensed tetanus-diphtheria-acellular--pertussis vaccine is available for adults. ACIP recommendations for its use will be published.

2. Measles, mumps, rubella (MMR) vaccination. Measles component: adults born before 1957 can be considered immune to measles. Adults born during or after 1957 should receive ≥ 1 dose of MMR unless they have a medical contraindication, documentation of ≥ 1 dose, history of measles based on health-care provider diagnosis, or laboratory evidence of immunity. A second dose of MMR is recommended for adults who 1) were recently exposed to measles or in an outbreak setting; 2) were previously vaccinated with killed measles vaccine; 3) were vaccinated with an unknown type of measles vaccine during 1963--1967; 4) are students in postsecondary educational institutions; 5) work in a health-care facility; or 6) plan to travel internationally. Withhold MMR or other measles-containing vaccines from HIV-infected persons with severe immunosuppression. Mumps component: 1 dose of MMR vaccine should be adequate for protection for those born during or after 1957 who lack a history of mumps based on health-care provider diagnosis or who lack laboratory evidence of immunity. Rubella component: administer 1 dose of MMR vaccine to women whose rubella vaccination history is unreliable or who lack laboratory evidence of immunity. For women of childbearing age, regardless of birth year, routinely determine rubella immunity and counsel women regarding congenital rubella syndrome. Do not vaccinate women who are pregnant or who might become pregnant within 4 weeks of receiving vaccine. Women who do not have evidence of immunity should receive MMR vaccine upon completion or termination of pregnancy and before discharge from the health-care facility.

3. Varicella vaccination. Varicella vaccination is recommended for all adults without evidence of immunity to varicella. Special consideration should be given to those who 1) have close contact with persons at high risk for severe disease (health-care workers and family contacts of immunocompromised persons) or 2) are at high risk for exposure or transmission (e.g., teachers of young children; child care employees; residents and staff members of institutional settings, including correctional institutions; college students; military personnel; adolescents and adults living in households with children; nonpregnant women of childbearing age and international travelers). Evidence of immunity to varicella in adults includes any of the following: 1) documented age-appropriate

varicella vaccination (i.e., receipt of 1 dose before age 13 years or receipt of 2 doses [administered at least 4 weeks apart] after age 13 years); 2) U.S.-born before 1966 or history of varicella disease before 1966 for non-U.S.-born persons; 3) history of varicella based on health-care provider diagnosis or parental or self-report of typical varicella disease for persons born during 1966--1997 (for a patient reporting a history of an atypical, mild case, health-care providers should seek either an epidemiologic link with a typical varicella case or evidence of laboratory confirmation, if it was performed at the time of acute disease); 4) history of herpes zoster based on health-care provider diagnosis; or 5) laboratory evidence of immunity. Do not vaccinate women who are pregnant or who might become pregnant within 4 weeks of receiving the vaccine. Assess pregnant women for evidence of varicella immunity. Women who do not have evidence of immunity should receive dose 1 of varicella vaccine upon completion or termination of pregnancy and before discharge from the health-care facility. Dose 2 should be administered 4--8 weeks after dose 1.

4. Influenza vaccination. Medical indications: chronic disorders of the cardiovascular or pulmonary systems, including asthma; chronic metabolic diseases, including diabetes mellitus, renal dysfunction, hemoglobinopathies, or immunosuppression (including immunosuppression caused by medications or HIV); any condition (e.g., cognitive dysfunction, spinal cord injury, seizure disorder, or other neuromuscular disorder) that compromises respiratory function or the handling of respiratory secretions or that can increase the risk for aspiration and pregnancy during the influenza season. No data exist on the risk for severe or complicated influenza disease among persons with asplenia; however, influenza is a risk factor for secondary bacterial infections that can cause severe disease among persons with asplenia. Occupational indications: health-care workers and employees of long-term-care and assisted living facilities. Other indications: residents of nursing homes and other long-term-care and assisted living facilities; persons likely to transmit influenza to persons at high risk (i.e., in-home household contacts and caregivers of children aged 0--23 months, or persons of all ages with high-risk conditions) and anyone who wishes to be vaccinated. For healthy, nonpregnant persons aged 5--49 years without high-risk conditions who are not contacts of severely immunocompromised persons in special care units, intranasally administered influenza vaccine (FluMist[®]) may be administered in lieu of inactivated vaccine.

5. Pneumococcal polysaccharide vaccination. Medical indications: chronic disorders of the pulmonary system (excluding asthma); cardiovascular diseases; diabetes mellitus; chronic liver diseases, including liver disease as a result of alcohol abuse (e.g., cirrhosis); chronic renal failure or nephrotic syndrome; functional or anatomic asplenia (e.g., sickle cell disease or splenectomy [if elective splenectomy is planned, vaccinate at least 2 weeks before surgery]); immunosuppressive conditions (e.g., congenital immunodeficiency, HIV infection [vaccinate as close to diagnosis as possible when CD4 cell counts are highest], leukemia, lymphoma, multiple myeloma, Hodgkin disease, generalized malignancy, or organ or bone marrow transplantation); chemotherapy with alkylating agents, antimetabolites, or long-term systemic corticosteroids and cochlear implants. Other indications: Alaska Natives and certain American Indian populations; residents of nursing homes and other long-term-care facilities.

6. Revaccination with pneumococcal polysaccharide vaccine. One-time revaccination after 5 years for persons with chronic renal failure or nephritic syndrome; functional or anatomic asplenia (e.g., sickle cell disease or splenectomy); immunosuppressive conditions (e.g., congenital immunodeficiency, HIV infection, leukemia, lymphoma, multiple myeloma, Hodgkin disease, generalized malignancy, or organ or bone marrow transplantation); or chemotherapy with alkylating agents, antimetabolites, or long-term systemic corticosteroids. For persons aged ≥ 65 years, one-time revaccination if they were vaccinated ≥ 5 years previously and were aged < 65 years at the time of primary vaccination.

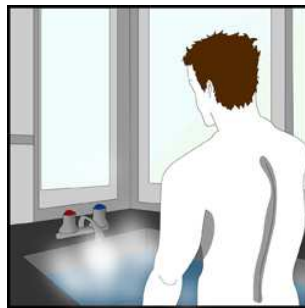
7. Hepatitis A vaccination. Medical indications: persons with clotting-factor disorders or chronic liver disease. Behavioural indications: men who have sex with men or users of illegal drugs. Occupational indications: Persons working with hepatitis A virus (HAV)--infected primates or with HAV in a research laboratory setting. Other indications: persons traveling to or working in countries that have high or intermediate endemicity of hepatitis A (for list of countries, see <http://www.cdc.gov/travel/diseases.htm#hepa>) as well as any person wishing to obtain immunity. Current vaccines should be administered in a 2-dose series at either 0 and 6--12 months, or 0 and 6--18 months. If the combined hepatitis A and hepatitis B vaccine is used, administer 3 doses at 0, 1 and 6 months.

8. Hepatitis B vaccination. Medical indications: hemodialysis patients (use special formulation [40 $\mu\text{g}/\text{mL}$] or two 20- $\mu\text{g}/\text{mL}$ doses) or patients who receive clotting-factor concentrates. Occupational indications: health-care workers and public-safety workers who have exposure to blood in the workplace and persons in training in schools of medicine, dentistry, nursing, laboratory technology and other allied health professions. Behavioural indications: injection-drug users; persons with more than one sex partner during the previous 6 months; persons with a recently acquired sexually transmitted disease (STD) and men who have sex with men. Other indications: household contacts and sex partners of persons with chronic hepatitis B virus (HBV) infection; clients and staff members of institutions for developmentally disabled persons; all clients of STD clinics; inmates of correctional facilities and international travelers who will be in countries with high or intermediate prevalence of chronic HBV infection for more than 6 months (for list of countries, see <http://www.cdc.gov/travel/diseases.htm#hepa>).

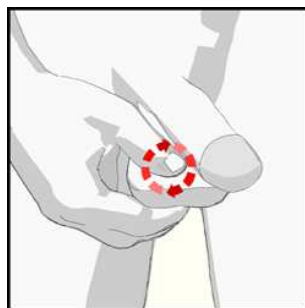
9. Meningococcal vaccination. Medical indications: adults with anatomic or functional asplenia or terminal complement component deficiencies. Other indications: first-year college students living in dormitories; microbiologists who are routinely exposed to isolates of *Neisseria meningitidis*; military recruits and persons who travel to or reside in countries in which meningococcal disease is hyperendemic or epidemic (e.g., the "meningitis belt" of sub-Saharan Africa during the dry season [December--June]), particularly if contact with local populations will be prolonged. The government of Saudi Arabia for all travelers to Mecca requires vaccination during the annual Hajj. Meningococcal conjugate vaccine is preferred for adults meeting any of the above indications who are aged ≤ 55 years, although meningococcal polysaccharide vaccine (MPSV4) is an acceptable alternative. Revaccination after 5 years might be indicated for adults previously vaccinated with MPSV4 who remain at high risk for infection (e.g., persons residing in areas in which disease is epidemic).

10. Selected conditions for which *Haemophilus influenzae* type b (Hib) vaccine may be used. Hib conjugate vaccines are licensed for children aged 6--7 months. No efficacy data are available on which to base a recommendation concerning use of Hib vaccine for older children and adults with the chronic conditions associated with an increased risk for Hib disease. However, studies suggest good immunogenicity in patients who have sickle cell disease, leukemia, or HIV infection or who have had splenectomies; administering vaccine to these patients is not contraindicated.

Steadman and Quine (2004:480) and Rew *et al.* (2005:59) argue that, from puberty (age 15), males should conduct monthly testicular self-examination (TSE) to check for abnormalities, such as hard, small swellings. TSE is a valuable and relatively inexpensive method of enhancing health awareness. However, knowledge of testicular cancer risks, symptoms and correct TSE procedure is an important prerequisite for performing self-assessment or examination (McCullagh & Warlow, 2005:41). According to Andrology Australia (2006), Postgraduate Medicine Online (1999), Health24.com (2006), The American Cancer Society (2005), MenWeb (2006) and Dowshen (2006), the testicular self-examination may include the following steps: Step 1 - TSE should be performed once a month after a warm bath or shower. The warm water temperature and water cause the scrotal skin to relax and allows it to hang further from the body, thus making it easier to find a lump or mass. Stand naked in front of a mirror and make sure there is sufficient light to see your genitals clearly. Soap on your hands increases your sense of touch. Begin by feeling one testicle at a time. Place your thumbs over the top of your testicles, with the index and middle fingers of each hand behind the testicle and slowly roll it between your fingers while applying a small amount of pressure and feel for small, painless lumps or other abnormalities.

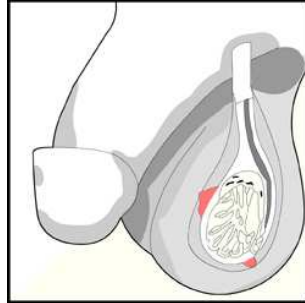


Step 2 – The second part of the TSE is the examination of the epididymis, the comma-shaped cord found behind your testes. This is where the sperm is stored and transported. It is the place where most noncancerous problems are found and it may be tender when touched.

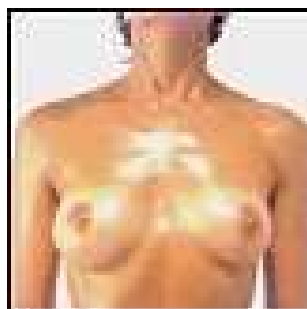


Step 3 – Continue examining the vas, the tube that carries sperm from your

epididymis. The vas normally feels like a firm but moveable tube. After you have finished the three steps of the TSE, repeat the exam on the other side. If you notice any swelling, lumps, or changes in the size or colour of a testicle, or if you have any pain or achy areas in your groin, contact your doctor for a check-up immediately.



Luszczynska (2004:95) recommends that women should be performing breast self-examination once a month. Champion (2003:723) states that beginning in their 20s, women should be told about the benefits and limitations of BSE. According to MayoClinic.com (2006), WebMD Health Centers (2005), Farham (2004), Health24.com, (2006) and A.D.A.M. Well-Connected Report (2005), BSE consists of the following steps. Step 1 – Pick a time of the month that is easy to remember and perform self-examination at that time each month. The best time to do breast self-examination is about a week after one's periods, because that is when a woman's breasts are least likely to be tender or swollen. Step 2 – Stand in front of a mirror with your arms at your sides. Breasts should be the same size (one may be slightly larger than the other). Check for changes or redness in the nipple area. Look for changes in the appearance of the skin. With hands on the hips, push the pelvis forward, pull the shoulders back and observe the breasts for irregularities such as signs of puckering, dimpling, or changes in size, shape, or symmetry. Repeat the observation with hands behind the head and move each arm and shoulder forward.



Step 3 - Lie down on the back with a rolled towel or pillow under one shoulder and apply lotion or bath oil over the breast area.



The finger action should be as follows: Use the 2nd, 3rd and 4th finger pads (not tips) held together and make small circles. Press lightly first to feel the breast area and then press harder using a circular motion. Using this motion, start from the collarbone and move downward to underneath the breast. Shift fingers slightly over, slightly overlapping the previously checked region and work upward back to the collarbone. Repeat this up-and-down examination until the entire breast area has been examined. Be sure to cover the entire area from the collarbone to the bottom of the breast area and from the middle of the chest to the armpits. Move the towel or pillow under the other shoulder and repeat the procedure. Examine the nipple area by gently lifting and squeezing each nipple and checking for discharge.



Step 4- Repeat step 3 in an upright position, preferably in the shower and use plenty of soap.



According to Karnath (2002:399), one of the most popular recommendations for doctors to treat patients who smoke involves the so-called 5 As step process that includes: Step 1 - Ask about smoking. Doctors should ask every patient on every visit about their smoking status. Step 2 - Advise about smoking cessation. Strongly advise all who smoke to quit by personalising the advice towards the patient's clinical situation. Step 3 – Assess the patient's willingness to quit smoking by asking the patient if he or she is willing too attempt to quit. If the patient is not ready, then provide motivational intervention to promote future attempts. Step 4 – Assist patients who are willing to stop by assessing the need for nicotine replacement. Step 5 – Arrange a close follow-up. A follow-up visit around the date of smoking cessation will assure the patient that assistance and counselling are available.

Smoking prevention and intervention programmes are based on theoretical models of health and health-related behaviour such as the Social Cognitive Theory, the Health Belief Model, the Theory of Reasoned Action, the Theory of Planned Behaviour, the Self-Regulation Theory and the Subjective Culture and Interpersonal Theory that postulate that individuals' perceptions about the consequences of their actions and perceptions of vulnerability to those consequences play a key role in behaviour and behaviour change (Halpern-Felsher, Biehl, Kropp & Rubinstein, 2004:559). There is a wide spectrum of other intervention strategies available to quit smoking. The A.D.A.M. Wellness Connected Report (2002); Warnakulasuriya *et al.* (2005:249-257); Audrey, Holliday and Campbell (2006:321); Karnath (2002:400-403); Haddock, Lando, Klesges and Peterson (2004:35-36); Hall (2005:139-140) and Khurana, Batra and Leone (2003:298-300) have identified and recommended the following interventions: the "cold turkey" method is the sudden cessation of smoking. Nicotine replacement therapy provides an alternative source of nicotine to smokers and helps prevent severe nicotine withdrawal symptoms. The most popular nicotine replacements available are nicotine gum, nicotine patch (transdermal), nicotine nasal spray, nicotine inhaler, nicotine lozenges and nicotine sub-lingual tablets. The unique antidepressant bupropion (Zyban) as well nortriptyline, chlonidine and naltrexone have proved to be a strong aid in the quitting process. Behavioural interventions such as supportive care by a clinician and counselling programmes that offer solving or coping strategies are also important aids. Risk reduction strategies such as exercise, diet, vitamin supplements and regular check-ups may help a person as well. Alternative interventions include hypnosis, acupuncture

and acupuncture. Scheduled reduction is the process of gradually reducing the number of cigarettes one is smoking over a period to reduce withdrawal symptoms. Finally, denormalization such as introducing laws making smoking inaccessible in public places, raising prices and stricter limitations on cigarette advertising are additional means to force people to stop or reduce smoking.

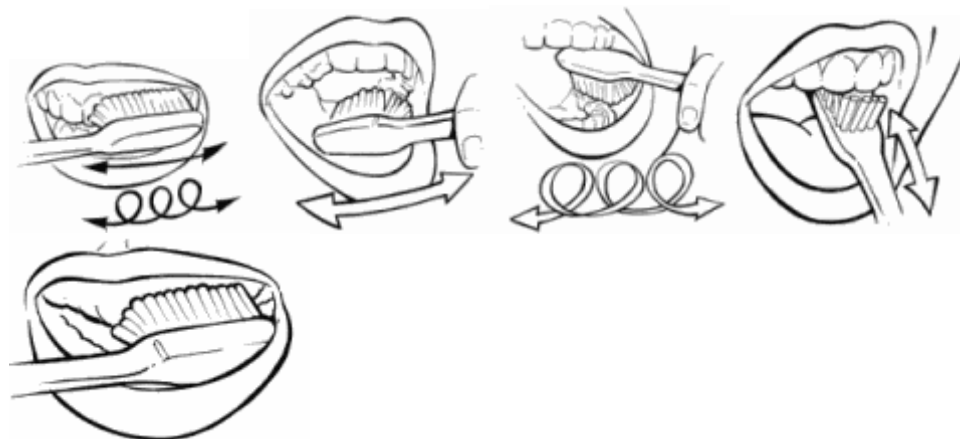
Chronic diseases such as cancer, pain, prostatitis, pelvic pain syndrome and menopause-related symptoms may be treated by a variety of CAM modalities or therapies. According to Braun, Bearinger, Halcón and Pettingell (2005:76.E3); Tsao and Zelzer (2005:150-157); National Center for Complementary and Alternative Medicine (2006) and Carpenter and Neal (2005:110-116), the most important CAM intervention therapies include acupuncture; Ayurveda; biofeedback such as Thermal-and EMG-biofeedback; chelation therapy; chiropractic care; deep breathing exercises; diet-based therapies such as Vegetarian, Macrobiotic, Atkins, Pritikin, Ornish and Zone diets; energy healing therapy; folk medicine/guided imaginary; homeopathic treatment; hypnosis; massage therapy; creative arts and music; osteopathy; meditation; megavitamin therapy; natural products, for instance, nonvitamin and nonmineral, such as herbs and other products from plants and enzymes; naturopathy; prayer; progressive relaxation; Qi gong; Reiki; Tai chi; yoga; bio-electromagnetics; reflexology and magnets.

A contentious question is how much water humans need. According to Van Heerden (2006), adults need 2500ml to 3000ml of water to stay healthy and prevent dehydration, which translates to 10 to 12 glasses (250ml) a day. According to Kenney (2004) and Grandjean (2004), the Institute of Medicine and the World Health Organisation have established the adequate intake of water as 3.7L/day for males and 2.7L/day for females, while a person expending 2000kcal per day will require 2 litres of water, whereas someone expending 6000kcal/day requires 6 litres of water. Research done by Sawka, Chevront and Carter (2005:S32) shows the daily needs for sedentary adults as 2.5L which increases to about 3.2L if performing modest physical activity, while more active adults living in a warm environment have daily water needs of about 6L. Ultimately, adults should be guided by their thirst. When thirsty drink plain, cold water, since it enters the bloodstream faster than other drinks and does not deplete minerals the way caffeinated drinks such as coffee do.

According to the American Dental Hygienists Association (2005); A.D.A.M. Periodontal Disease Report (2005); Christensen (2005:1142) and Sgan-Cohen (2005:56-57), healthy habits and oral hygiene are crucial for preventing periodontal

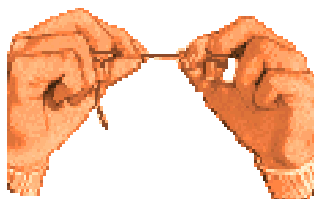
disease. They recommend the following intervention strategies, namely, dietary changes by limiting sugar intake and increasing cheese, peanuts, lean protein, sugar-free chewing gum and high-fibre fruit and vegetables and drinking more saliva-enriched water. Quitting smoking is one of the most important steps towards regaining periodontal health. Use fluoride treatments such as toothpastes, gel and mouthwash rinses. In terms of daily dental care, brush your teeth at least twice a day for at least 2 minutes with an electric or regular brush. Use dental floss to clean those areas between your teeth. Have regular oral health check-ups.

To brush your teeth correctly the A.D.A.M. Periodontal Disease Report (2005) proposes the following guidelines for brushing: Use a dry brush. Place the brush where the gum meets the tooth, with bristles resting along each tooth at a 45-degree angle.



Begin by brushing the inside of the bottom row of teeth, then the inner top teeth and lastly the outer surfaces for 1-2 minutes. Wiggle the brush back and forth, so that the bristles extend under the gum line. Scrub the broad, biting surfaces of the back teeth. Apply a paste and rebrush in the same way. The tongue should be scrubbed for a total of about 30 seconds. Rinse the toothbrush and finish with flossing or a mouthwash.

The A.D.A.M. Periodontal Disease Report (2005) and the American Dental Association (2006) recommend the following guidelines for flossing: Break off about 45-50 cm of floss and wind most of it (30 cm) around one of your middle fingers.

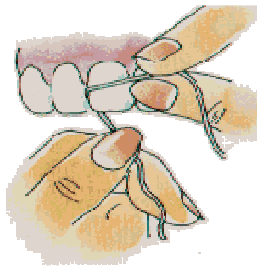


Wind the remaining floss around the same finger of the opposite hand. This finger will take up the floss as it becomes dirty. Hold the floss tightly between your thumbs and

forefingers, leaving 3 cm of floss between your hands. Guide the floss to the space between your teeth using a gentle rubbing motion. Never snap the floss into the gums to avoid injuries.



When the floss reaches the gum line, curve it into a C shape against one tooth. Gently slide it into the space between the gum and the tooth.



Hold the floss tightly against the tooth. Gently rub the side of the tooth, moving the floss away from the gum with up and down motions. Repeat this method on the rest of your teeth. Do not forget the back surface of your last tooth.

Another intervention concerns the use of sun protection interventions. They are needed to raise an awareness of the health consequences of UV radiation and to achieve changes in lifestyle that will address the trends towards increasing skin cancers. However, there needs to be recognition that sensible sun exposure followed by good sun protection should be encouraged. According to Guttman (2005:70); Centers for Disease Control and Prevention (2003:14-16); American Academy of Dermatology (2005); Skin Cancer Foundation (2006); American Cancer Society (2006); Lesch (2006); Koh and Geller (2004:484-485); Robinson, Silk, Parrot, Steiner, Morris and Honeycutt (2004:255); Eli and Fasciano (2006:1154) and Hiom (2006:162), the most effective sun protection interventions include campaigns such as the SunSmart campaign in the United Kingdom and the Period Of Life programme in Germany that aim to increase knowledge about skin cancer and the importance of early detection. These intervention also increase awareness of preventative actions and influence positively attitudes of sun protection actions. The application of botanical agents such as vitamins E and C, carotenoids, selenium, proanthocyanidins and ginkgo biloba may reduce the risk of skin

cancer. Nutrition such as green tea, apigenin, curcumin, resveratrol and silymarin also helps. Avoiding deliberate tanning or burning and limiting exposure to the sun between 10 a.m. and 4 p.m. is necessary, while avoiding tanning under a sunlamp and a tanning bed is crucial. In addition, use a sunscreen with an SPF of 15 or higher every day. Cover up with clothing, including a broad brimmed hat and UV-blocking sunglasses. Conduct skin self-examination from head-to-toe on a monthly basis. Community and worksite educational interventions are also effective for increasing the use of skin protective measures. See a dermatologist every year for a professional skin examination.

Kaplan and Opie (2006:169-170) are of the opinion that lifestyle changes such as weight loss, reduced dietary sodium and alcohol intake and exercise are successful interventions to reduce blood pressure. Results of the DASH diet (see Table 2.1) and a low 4 g/day salt intake showed the greatest decrease in blood pressure which led to uniform agreement that individuals need to reduce their table salt intake to less than 6 g/day and increase their potassium to 3.5 g/day (MacGregor & He, 2005:15; Ajani, Dunbar, Ford, Mokdad & Mensah, 2005:66). The effectiveness of the DASH diet with a low-sodium intake to lower blood pressure was also confirmed by a study conducted by Champagne (2006:56). A number of pharmacologic agents are available to treat high blood pressure. According to Roberts (2005:1465), there are 66 antihypertensive drugs with 27 combinations (24 with diuretic) for treating patients with systematic hypertension. Clinical trials have demonstrated that drugs such as Thiazide diuretics, chlorthalidone, spironolactone, eplerenone, drospirenone, beta and alpha-beat adrenergic blockers such as Tenormin, Lopresor, Minipress; ACE inhibitors and angiotensin receptor blockers such as Capoten, Tritace and Renitec and calcium channel blockers such as AdalatXL and Norvasc are successful in lowering blood pressure (MacGregor & He, 2005:16; Health24.com, 2006; Whitworth & Chalmers, 2004:750).

Apart from antihypertensive therapy, other treatment modalities such as smoking cessation, dietary habit changes, aspirin use and lipid lowering therapies may also be effective interventions for hypertension and cardiovascular diseases (Volpe, Alderman, Furberg, Jackson, Kostis, Laragh, Psaty & Ruilope, 2004:1071). Whelton, Beevers and Sonkodi (2004:564) recommend that education should be provided to the general population by using simple, action-oriented messages that identify the risks of untreated

hypertension, the benefits and ease of appropriate treatment and the positive consequences of a healthy lifestyle. Various studies have revealed that aerobic exercise significantly reduces blood pressure (Tsai, Yang, Wang, Hsieh, Chen, Kao, Kao, Wang & Chan, 2004; Ketelhut, Franz & Scholze, 2004; Ishikawa-Takata, Ohta & Tanaka, 2003). According to Tattelman (2005:104), a meta-analysis assessing the effect of garlic on hypertension showed significant reductions in systolic as well as diastolic blood pressure.

The National Cholesterol Education Program Expert Panel on Detection, Evaluation, Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III) (2001:10-11) and Birtcher and Ballantyne (2004:297) recommend a multifaceted lifestyle approach to reduce the risk of CHD and designated therapeutic lifestyle changes (TLC). Its essential features are: Reduced intakes of saturated fats (<7% of total calories) and cholesterol (<200 mg per day); therapeutic options for enhancing LDL lowering such as plant stanols/sterols (2 g/day) and increased viscous (soluble) fibre (10-25 g/day); weight reduction; smoking cessation and increased physical activity. Toth (2005:90) recommends the Mediterranean diet (a diet enriched with fruit, vegetables, whole grains, olive oil and legumes) and moderate consumption of wine to raise HDL cholesterol. In addition to a healthy lifestyle, drug therapy may help. The most effective and widely tested cholesterol drugs are called statins (lovastatin, pravastatin, simvastatin, fluvastatin and atorvastatin). These drugs block the formation of cholesterol in the liver and increase the production of receptors on liver cells that clean the bad cholesterol from the blood (Gotto, 2002:1514). Statins inhibit HMG-CoA reductase competitively, reduce LDC levels, modestly increase HDL and lower triglyceride levels in hypertriglyceridemic patients (Aliyu, Yousif, Plantholt, Salihu, Erinle & Plantholt, 2004). Apart from statin drugs, alternative medicines to lower cholesterol levels include bile acid sequestrants (BAS), fibrates, niacin, plant sterols, ezetimibe and nicotinic acid (National Institutes of Health, 2006; de Jong, Simojoki, Laatikainen, Tapanainen, Valsta, Lahti-Koski, Uutela & Vartiainen, 2004:849-850).

2.2.3 SAFETY AND LIFESTYLE

Motor vehicle accidents (MVAs) are a major cause of mortality, resulting in approximately 300 000 deaths throughout the world each year (Kelly, Darke & Ross, 2004:319). During 2005, 14 126 people died on South African roads and the number of

fatal crashes from 1 January to 30 April 2006 was 4 537 (driver fatalities 1 254, passenger fatalities 1 616 and pedestrian fatalities 1 667) (Road Traffic Management Corporation, 2006:33-43). According to the Road Traffic Management Corporation (2006:52), the cost of fatal crashes was estimated at R9.99 billion in 2005. In December alone, it was about R1.02 billion, a large portion of which was directly paid for by road users themselves in fuel levies to the Road Accident Fund. According to the provisions of the South African Road Traffic Act, 1989, it is an offence to drive a vehicle under the influence of intoxicating liquor or a drug having a narcotic effect, or with a blood alcohol concentration of 0.05 gram or more per 100 millilitres of blood for all drivers, while the BAC limit for professional drivers is 0.02 gram per 100 millilitres (Drive Alive, 2006). Peltzer and Renner (quoted by Vanlaar & Yannis, 2006:155-156) have surveyed a sample of 130 taxi drivers in South Africa to determine the causes of accidents and the three most important perceived causes were insufficient knowledge of traffic rules, dangerous parking and drug or alcohol consumption, while the three least important were bad luck, absence of pavements and sanctions being too lenient.

Alcohol is generally recognised as a leading contributor to road trauma. However, driving under the influence of drugs other than alcohol is becoming a significant problem worldwide. Recent research indicates that driving under the influence of drugs other than alcohol is common, although drugged drivers are less frequently detected or treated for substance abuse compared to drunken drivers (Walsh, Flegal, Cangianelli, Atkins, Soderstrom & Kerns, 2004:254). Cannabis is the most prevalent illegal drug detected in impaired drivers, fatally injured drivers and motor vehicle crash victims followed by benzodiazepines, cocaine, opiates, marijuana and amphetamines (Walsh *et al.*, 2004:255; Walsh, Flegel, Atkins, Cangianelli, Cooper, Welsh & Kerns, 2005:895; Hausken, Skurtveit & Christophersen, 2005:423). In a screening test for the presence of drugs in drivers involved in accidents in the Netherlands revealed opiates, amphetamines, cocaine, cannabinoids and methadone as well as medicinal drugs such as benzodiazepines, barbiturates and tricyclic antidepressants in the drivers' blood samples (Smink, Ruiters, Lusthof, de Gier, Uges and Egberts, 2005:429).

2.2.3.1 RISKS OF DRIVING UNDER THE INFLUENCE OF ALCOHOL AND DRUGS

Alcohol involvement in crashes has been clearly demonstrated by a number of studies which show substantial increases in crash risks when the blood alcohol concentration (BAC) exceeds 0.10 g per 100ml (%) (Drummer, Gerostamoulos, Batziris, Chu, Caplehorn, Robertson & Swann, 2003). For a given cause of injury, the risk of fatality increases with the BAC level (Chen, Baker & Li, 2005:245). Chen *et al.* (2005:246) state that alcohol could lead to high-risk behaviours such as speeding, reducing a person's ability to perceive and responding to a hazard such as an approaching vehicle. This effect increases with increasing blood alcohol concentration and even when there is no measurable alcohol in the blood, a hangover or any other chronic effect of alcohol may increase the risk of injury. Results from driving simulators, close circuit and on-road driving show evidence of deficits in various skills after alcohol use, including brake reaction time, collision frequency, speed control, indicator use, steering responsiveness, lane control, changes in risk-taking behaviour, decision-making and planning, and an increase in simulated accidents (Kelly, Darke & Ross, 2004:321). Ogden and Moskowitz (2004:187) and Harrison and Fillmore (2005:887-888) provide evidence that alcohol adversely affects reaction time, impairs tracking (car control), interferes with learning and adoption to unfamiliar tasks and increases error rates. It also impairs the ability to perform a secondary task; negatively influences vision (abnormal eye movements, difficulty in accurate eye tracking of moving objects, impaired colour discrimination, tunnel vision and temporary blindness) and leads to impaired driving skills.

The combination of alcohol, drugs and prescription medicines such as pain relievers, sleeping pills or anti-anxiety medication affects a driver's ability to operate a motor vehicle (National Highway Traffic Safety Administration, 2004). Many central nervous system drugs such as cannabis, benzodiazepines, barbiturates and the sedating antihistamines reduce lane control by increasing the standard deviation of lateral position, while carisoprodol, a skeletal muscle relaxant, leads to impairment with symptoms of intoxication similar to alcohol (Drummer *et al.*, 2003:1). Butters, Smart, Mann and Asbridge (2005:174) have found that road ragers demonstrated significant elevations on measures of illicit drug use, alcohol use and alcohol problems, which supports the hypothesis of a link between illicit drug use and road rage behaviour.

Studies have shown that the principle psychoactive component of cannabis (marijuana), delta-9-tetra-hydrocannabinol (THC), significantly leads to driving impairments such as tracking, attention reaction time, short-term memory, hand-eye

coordination, vigilance, time and distance perception, decision-making, concentration and impairment of vehicle control, including steering, headway control (regulating the distance between one's own vehicle and the vehicle in front), car following, reaction time and lateral position variability (Kelly *et al.*, 2004:32; Drummer *et al.*, 2003:7-9; Ramaekers, Berghaus, van Laar & Drummer, 2004:117). Marijuana impaired cognitive skills related to driving such as attentiveness, perception of time and speed and the ability to draw on information obtained through experiences and the impairment, increase significantly when combined with alcohol (National Institute on Drug Abuse, 2005:3). Studies on the effects of marijuana on simulated driver performance showed that subjects have delayed or inappropriate reactions, attention deficits, poor speed and distance judgment, poor hazard perception, tend to hit obstacles, miss signs, have delayed responses to the need to change speed (both braking and accelerating are inappropriate) and drive more slowly than when unaffected (Ogden & Moskowitz, 2004:193; Papafotiou, Carter & Stough, 2005:176-177).

The party drug ecstasy (3,4 methylenedioxymethamphetamine, MDMA) is frequently used in combination with substances such as cannabis, amphetamine or alcohol. According to Kuypers, Samyn and Ramaekers (2006), several fatal and non-fatal accidents have been reported in which MDMA was found in the plasma of drivers and case reports have described erratic driving behaviours such as ignoring traffic signs and traffic lights as well as speeding. Experimental studies of the acute effects of MDMA on psychomotor performance and actual driving behaviour have shown that certain aspects, such as tracking in a compensatory tracking task and weaving in an on-road, improved after a single dose, whereas other aspects like time to contact estimation in a dual attention task and gain, a parameter modelling speed adaptations in an on-road car following task and judgement deteriorated (Kuypers *et al.*, 2006). Brookhuis, de Waard and Samyn (2004:440) argue that MDMA impaired cognitive performance including reduced accuracy in performance and concentration, depressed mood and anxiety impulsiveness can all lead to higher risks for causing accidents.

Movig, Mathijssen, Nagel, van Egmond, de Gier, Leufkens and Egberts (2004:633-635) provide evidence that the use of alcohol, amphetamines, benzodiazepines, cocaine and opiates increases the risks of motor vehicle accidents. Users of drug-drug combinations were at a sixfold increased risk, drivers using benzodiazepines a fivefold increased accident risk and users of opioids such as morphine and codeine a twofold risk of traffic accidents. Amphetamines cause deficits in

divided attention tasks and perception in the peripheral visual fields (Ogden & Moskowitz, 2004:194). Drug and alcohol users are prone to engage in risky and illegal driving practices, associated with attitudes encouraging driving violations. This assumption is confirmed by the report of Hausken *et al.* (2005:427) that revealed that drivers who tested positively for traffic hazardous medicinal drugs only or in combination with alcohol showed a considerable higher mortality rate compared to the general population. The mortality rate was about 16 and 20 times higher for male and female drivers, respectively.

2.2.3.2 INTERVENTIONS TO REDUCE ALCOHOL AND DRUG IMPAIRED DRIVING

Road traffic injuries are a man-made problem which can be controlled by proven interventions such as re-engineering cars with impact-absorbing front ends, collapsible steering columns, seatbelts and airbags; painting lines in the middle and on the edges of the road with reflective material; placing barriers between traffic going in opposite directions; separating bicycles and pedestrians from fast vehicles; passing and enforcing tough laws for speeding and driving while drinking alcohol and a variety of educational interventions for road users (Rosenberg, McIntyre & Sloan, 2004:141).

Toxicology test results, especially the use of rapid point of collection devices to routinely test for commonly abused drugs, could provide valuable epidemiological data to document the prevalence of drugged driving and serve as an efficient and timely way to identify substance abusers for treatment intervention (Walsh *et al.*, 2005:900). According to Yu, Evans and Clark (2006:165-166), criminal justice sanctions for drinking and driving such as fines, licence actions and jail sentences, have failed to combat the prevalent practices and recommend that drinking drivers and other drug and alcohol offenders should be screened for substance abuse problems and provided with treatment. Simpson, Beirness, Robertson, Mayhew and Hedlund (2004:266-267) and Nochajski and Stasiewicz (2006:185-186) recommend seven categories of interventions for so-called “hard core drinking drivers” (drivers who have driven with a BAC of 0.15% or above or drivers with more than one recorded alcohol-impaired driving offence). These include training and education for law enforcement officers in Standardised Field Sobriety Tests; communication and cooperation between all role players in the criminal justice system; up to date drivers’ licenses, while criminal and probation records should

be easily accessible. In addition, technology such as preliminary breath tests (PBTs) and laptops in traffic police cars should be used to access records timely. Moreover, legislation should provide for the suspension and revoking of licenses, eliminating plea bargains, imposing severe sanctions, confiscating or impounding vehicles or tagging and house arrest and alcohol assessment, treatment and monitoring.

Rehabilitation efforts should include education programmes, such as drink-driving programmes, and substance abuse treatment to increase problem awareness and treat underlying substance abuse problems. Adequate resources too are critical to enhance the effective operation of each portion of the criminal justice system. Sweedler, Biecheler, Laurell, Kroj, Lerner, Mathijssen, Mayhew and Tunbridge (2004:183), National Center for Injury Prevention and Control (2006) and the Centers for Disease Control and Prevention (2001:348-363) report that the key interventions to reduce impaired driving include a good legislative framework (lowering the illegal per se blood alcohol concentration), enforcement efforts (sobriety checkpoints and zero tolerance laws), alcohol policy (higher taxes on alcohol) and public awareness through media campaigns. Davey, Davies, French, Williams and Laing (2005:69) are of the opinion that public education programmes in the area of drink-driving should make individuals aware of the likelihood of being caught. These education programmes should be combined with other enforcement strategies. Successful harm reduction strategies should be considered to encourage intoxicated people to find safe transport alternatives as well as random breathing testing, low permitted blood alcohol concentration for drivers and zero BACs for learning drivers (Stockwell, 2006:275).

To prevent alcohol-related traffic injury, Howat, Sleet, Elder and Maycock (2004:210-215) maintain that a health promotion approach, consisting of an economic, organisational policy, health education, school and community interventions, should be implemented. Economic interventions include pricing policies and taxation on alcoholic beverages. Organisational interventions include the licensing of sellers of alcoholic beverages, restricting availability by controlling hours and days of liquor sales, as well as the number, types and location of outlets. Server intervention programmes such as the training of staff of these outlets to prevent intoxication and drink-driving by their clients should be implemented. Server litigation should be promoted where servers are held liable for serving dangerous amounts of alcohol. Policy interventions should include drink-driving legislation, reducing BAC limits, sobriety checkpoints, increase penalties for drink-driving, increasing the legal drinking age, multiple alcohol control policies,

restrictions on the advertising and promotion of alcohol beverages and health and safety warning labels on alcoholic beverages. Health education programmes should be offered with the aim of altering driver behaviours. Various school-based programmes based on different approaches such as educational and behavioural change theories and life skills training to target drink-driving behaviours of drivers and passengers should be offered. Mass media campaigns can play an important role in raising awareness about alcohol issues and generating public debate; reinforcing health-related messages; changing perceived norms regarding alcohol use and drink-driving and providing support for other health promotion initiatives, including policies and environmental and organisational changes. Lastly, community mobilisation or community action projects involving local groups can contribute to changes related to reducing alcohol-related harm. Community groups such as Mothers Against Drunk Driving may form a powerful interest group to influence alcohol-related policies.

2.3 SOCIAL WELLNESS

The social wellness dimension encourages one to contribute to one's human and physical environment, and emphasizes the interdependence with other people and nature. Social wellness consists of two sub-dimensions, namely, environmental wellness and social awareness. Social capital encapsulates social awareness, therefore, for the purpose of the study the focus will be on the broader concept of social capital.

2.3.1 ENVIRONMENTAL WELLNESS

Environmental health comprises those aspects of human health, including quality of life, that are determined by physical, chemical, biological, social and psychosocial factors in the environment. It also refers to the theory and practice of assessing, correcting, controlling and preventing those factors in the environment that can potentially affect the health of present and future generations adversely (World Health Organization, 1993). According to Miller (1996:20-21), the key environmental factors affecting human health and wellness are climate change from global warming, acid rain, depletion of stratospheric ozone and air pollution resulting from chemicals (mostly from burning fossil fuels) released into the atmosphere. Continued poisoning of the soil, water

and air by pesticides and numerous other toxic wastes. Depletion of non-renewable minerals (especially oil), depletion and contamination of groundwater, deforestation, soil erosion, conversion of productive cropland and grazing lands to deserts (desertification and biodiversity depletion). Lastly, population growth and environmentally harmful forms of economic growth intensify these environmental problems. For the purpose of this study, environmental wellness will focus on pollution, specifically solid waste, air and water pollution, and global warming.

Holdgate (1979) defines pollution as the introduction, by man, into the environment of substances or energy liable to cause hazards to human health, harm to living resources and ecological systems, damage to structure or amenity, or interference with legitimate uses of the environment. The most critical forms of pollution can be broadly classified as solid waste pollution, air pollution and water pollution. None of the pollutants discussed stands completely on its own. A source of pollution usually brings with it more than one problem.

Little is known about many toxins. The usual measure of a compound's toxicity is its LD50 (lethal dose, 50), the concentration of the toxin that kills 50% of a group of test organisms. In the United States approximately 70,000 artificial organic compounds are produced commercially. Less than 1% has been tested for toxicity. One common example of ignorance is pesticides that occur in the food we buy. There is often no knowledge of whether a large percentage of the pesticides used are toxic to humans or what the long term effects of these pesticides may be (Arms, 1990:399). Solid waste is the waste that cannot be disposed of as a liquid by way of a sewage system. Most waste produced by pre-industrial societies is biodegradable, but in today's industrial societies much of our waste is non-degradable and often hazardous. Solid waste can be divided into mining, agricultural, industrial and municipal waste. Arms (1990:159-160) states that these industries produce the following type of waste: toxic heavy metals are elements such as mercury, cadmium, zinc, and lead that are poisonous to organisms when they occur in high enough concentrations. Heavy metals occur naturally in the environment in small concentration, but during industrial and agricultural processes these elements concentrated to levels at which they become toxic. Mercury is another common example. About 10 000 ton of mercury are mined each year, and approximately half of this is lost into the environment. Mercury is mostly used to separate gold from sediments in gold mining. Many industrial processes involve non salt

compounds that can only dissolve in organic solvents. These solvents include compounds of carbon and hydrogen, such as benzene and xylene and can also be formed by burning gasoline and garbage. Waste organic solvents from industry are often disposed of by storing them in 200 litre steel drums, which eventually corrode, spilling the solvents into the environment. Dioxins and related chemicals are unwanted by-products of the manufacture of some OHs used in making pesticides, wood preservatives, and other products. They often remain as contaminants in the finished product. Organohalogens (OHs) are used as solvents, fire-retardants, herbicides, and pesticides, such as DDT. There are various toxins that are common, but do not fit into any of the previous categories. They include arsenic, fluoride and asbestos.

The World Health Organization (WHO) estimates that worldwide about 1.3 billion people, mostly in LDCs, live in areas where outdoor air is unhealthy to breathe, causing 300,000-700,000 deaths per year (Miller, 1998:444). Particulate matter in the air consists of either particles of solid matter or droplets of liquid that are small and light enough to remain suspended in the atmosphere for short (large particles) or long (small particles) periods of times. Miller (1998:432) and Curtis, Rea, Smith-Willis, Fenyves and Pan (2006:816-818) classify the major air pollutants into nine categories. Particulates comprise a wide range of materials that are solid or liquid in the air particles and include dust from soil and roads, diesel exhaust, emissions from combustion and industrial plants, construction and demolition, powdered pesticides, bioaerosols and volcanic ash. Ozone (O_3), which at ground levels is toxic to humans, are produced by lightning, electronic devices such as photocopiers and by atmospheric reactions involving volatile organic chemicals, nitrogen oxides and sunlight. Carbon monoxide (CO) is a colourless, odourless and toxic gas released into the air when carbon-containing fuel does not burn completely. The burning of coal, vehicle emissions and emissions from oil/gas fields and refineries produces Sulphur oxides (SO_2 , SO_3). Hydrogen sulfide (H_2S) is produced by industrial processes and by decomposition of oil and dead vegetation. Sulphur containing compounds such as sulfur dioxide and mercaptans are produced in papermaking, rayon manufacturing, coke ovens and from volcanic emissions. Acid gases such as hydrochloric acid (HCl) and hydrofluoric acid (HF) are produced by waste combustion and by several industries. Nitrogen oxides, such as nitric oxides and nitrogen dioxide, are produced by industrial/vehicle combustion and by oxidation of nitrogen fertilizers. Volatile organics, solvents, pesticides and methane (CH_4) easily evaporated into air and their major sources include petroleum refining, petrochemicals,

vehicle exhaust, natural gas fields and distribution lines, storage of fuels and wastes, household products, pesticides, combustion, many industries and volatile emissions from coniferous forests. Lead (Pb) and other metals such as mercury, cadmium and arsenic are released into the environment by waste and coal burning, metal mining and smelting, other industrial processes and volcanic emissions. Bioaerosols are such as pollen seeds, bacteria, gram negative bacterial endotoxins, molds, algae, protozoans, flour, latex and animal dander/waste products, are airborne particles produced by living organisms. Radiation by radioactive compounds enter the atmosphere by natural decay of radioactive compounds, from nuclear power plants and nuclear weapons testing and from radioisotopes used in industrial, research and nuclear medicine facilities.

According to Jeffreys and Mills (1990:36), the main types of water pollution include the following: disease causing agents (pathogens) originate mainly from human or animal waste and comprise bacteria, viruses, protozoa and parasitic worms. Oxygen demanding waste is mainly caused by the discharge of organic waste through sewage and domestic waste systems, agriculture, food processing and processing industries. Water soluble inorganic chemicals are sourced from industrial processes, particularly those concerned with the mining and processing of metal ores, acids, salts, heavy metals (such as zinc, copper, cadmium, and mercury). These pollutants can lead to the acidification of soil and water which consequently is linked to different forms of cancer. Organic chemicals are products of most pesticides, oil cleaning detergents, organochlorine insecticides and polychlorinated biphenyls (PCBs). Water soluble radioactive isotopes are your typical nuclear related pollution resulting from Strontium 90 and Cesium 137. It magnifies in the food chains and causes cell mutations and cancers. Thermal pollution is related to electricity plants.

Earth's biogeochemical cycles work fine as long as we do not disrupt them by overloading them at certain points or by removing too many vital chemicals at other points. However, our activities are in fact disrupting the gaseous parts of some of these cycles. We produce, for example, one fourth as much CO₂ as the rest of nature does, as we burn up nature's one-time-only deposit of fossil fuels and as we clear forests. Certain gases trap heat in the lower atmosphere (troposphere), a phenomenon that has been confirmed by numerous laboratory experiments and atmospheric measurements, such as by satellites equipped with infrared detectors that measure outgoing radiation (Miller, 1998:205).

The amount of heat trapped in the troposphere depends primarily on the

concentrations of heat-trapping or greenhouse gases and the length of time they stay in the atmosphere. The major greenhouse gases are water vapour, carbon dioxide, ozone, methane, nitrous oxide, and chlorofluorocarbons (CFCs). Even though there is no doubt about the validity of the greenhouse effect, there is much debate over the extent to which human activities are intensifying the natural greenhouse effect and how soon and much the temperature might rise. Species on earth, including humans, currently benefit from a comfortable level of greenhouse gases that typically undergo, under natural circumstances, slow fluctuations over hundreds to thousands of years. However, mathematical models of Earth's climate indicate that global warming (or cooling) taking place over a few decades, whether natural or because of humans' emissions of gases into the atmosphere, could be disastrous. Furthermore, even though some theories believe that there is an improvement in the hole in the ozone layer, the depletion of ozone still allows more than previously ultraviolet radiation to reach the earth.

2.3.1.1 ADVERSE IMPACTS OF POLLUTION AND GLOBAL WARMING ON HEALTH AND WELLNESS

Most of the solid waste substances mentioned serve as cancer causing agents. Heavy metals interfere with the actions of enzymes in cells. Cadmium, for instance, used in metal plating and batteries are linked to kidney problems, bone marrow diseases and emphysema. A further well known example is lead, which binds to thiol (SH) chemical groups in enzymes. As a result, it reduces the body's ability to synthesize enzymes needed for respiration which causes brain damage and can even be fatal. Organohalogenes are exceedingly persistent, remaining in the environment for many years after they have been used. A well known dioxin TCDD, is found in the herbicide 2,4,5-T, and is better known by its code name, Agent Orange. Agent Orange was used as a defoliant in the Vietnam War and caused amongst other, genetic disorders and birth defects. Organic solvents dissolve the body's membranes and fat, and could be the cause of nerve damage. They also include some of the most powerful known carcinogens.

The respiratory system has a number of mechanisms that help protect one from air pollution, but years of smoking or exposure to air pollutants can overload or break

down these natural defences, causing or contributing to respiratory diseases such as lung cancer, asthma (typically an allergic reaction causing constriction of the bronchial tubes, causing mucus build-up, coughing, and shortness of breath), chronic bronchitis (damage to the cells lining the bronchial tubes, causing mucus build-up, coughing, and shortness of breath), and emphysema (damage to air sacs leading to abnormal dilation of air spaces, loss of lung elasticity, and acute shortness of breath) (Miller, 1998:443). Elderly people, infants, pregnant women, people with heart disease, asthma, or other respiratory diseases are especially vulnerable to air pollution.

The health effects of air pollution are well documented. According to Hattingh (2006:479); Curtis *et al.* (2006:818-824); Evans and Smith (2005:499-501); Zhang, Song and Cai (2007:101); Nel (2005:804-805) and Bai, Khazaei, van Eeden and Laher (2007:17-23), the general diseases associated with air pollution include chronic obstructive pulmonary diseases, which include obstructive airway diseases, such as emphysema and bronchitis, asthma, acute respiratory infections, cardiovascular diseases and cancers. Air polluted with NO₂ and SO₂ may cause acute respiratory tract infections. It also leads to throat irritation, shortness of breath, sinusitis, hay fever as well as increases the risk of hospital admissions for pneumonia and Chronic Obstructive Pulmonary Disease for persons over the age of 65. Headaches may also occur due to ozone pollution. The pulmonary effects of particulate matter include the triggering of inflammation in the smaller airways that can lead to asthma and chronic bronchitis, chronic phlegm, chronic cough, airway obstruction and decreased gas exchange. PM is a cardiovascular risk factor and associated with heart attacks, stroke, heart rhythm disturbances and sudden death as well as lung cancer. Common pollutants, such as PM₁₀ or PM_{2.5}, O₃, SO₂, NO₂ and benzene are associated with higher levels of rhinitis, asthma symptoms, asthma consultations and hospital admissions, pneumonia, acute bronchitis, reduced lung function. High airborne levels of mold, pollen and other bioaerosols have been linked to higher rates of asthma mortality, higher asthma incidences and asthma hospital admissions. Volcanic emission may worsen asthma and may lead to breathing difficulties, headaches and watery eyes. Volatile organic chemicals may lead to decreased lung function, wheezing and skin/eye/nose/throat irritation.

In developing countries, an average of 13 700 people a day are prematurely killed directly or indirectly by diseases such as typhoid fever and cholera, which are results of disease causing pathogens in water. Eutrophication of water resources results

from inorganic plant nutrients and Oxygen demanding wastes. Contaminated water further lead to various water related problems and cannot be used for water consumption. Water-soluble inorganic chemicals lead to the acidification of soil and water that consequently is related to different forms of cancer. Impaired learning behaviour and brain damage are linked to organic chemicals. Water-soluble radioactive isotopes magnify in the food chains and cause cell mutations and cancers. Camargo and Alonso (2006:841-843) and Maduka (2006), maintain that certain toxic chemicals released into water, such as Pb, Cu, Zn, Hg and CN, may have adverse impacts on human health. These health impacts may include mercury poisoning that is characterised by severe damage to the nervous system leading to ataxia, paraesthesia, loss of vision and hearing and ultimately death. Cadmium in water may lead to itai disease characterised by brittleness of bones, muscular weakness, and loss of appetite. Pb in water may lead to Pb poisoning characterised by central nervous system damage, anaemia and deposition of Pb in bones and teeth. Excessive concentrations of iron may damage the inner lining of the gastrointestinal tract, while the toxic effects of zinc include heartburn and serous circulatory and gastrointestinal disorders. Microbial pollution in water may lead to diseases such as dysentery, diarrhoea, cholera, typhoid fever and mycosis. Ingested nitrates and nitrites may induce methemoglobinemia with symptoms such as cyanosis, headaches, stupor, fatigue, tachycardia, coma, convulsions, asphyxia and ultimately death. Ingested nitrates and nitrites can cause cancers of the digestive track, result in mutagenicity, teratogenicity and birth defects. They also increase the risks of non-Hodgkin's lymphoma, coronary heart disease, bladder and ovarian cancers, and play a role in insulin-dependent diabetes mellitus and in the development of thyroid hypertrophy, which cause spontaneous abortions and respiratory tract infections.

Doctors and scientists around the world are becoming increasingly alarmed about global warming's impact on human health and well-being. Abnormal and extreme weather, which scientists have long predicted would be an early effect of global warming, has claimed hundreds of lives across the world in recent years. Our warming climate is also creating the ideal conditions for the spread of infectious disease, putting millions of people at risk. Scientists use computer-based models to predict the effects on global climate of different levels of greenhouse gases in the atmosphere. According to the most recent projections of the Intergovernmental Panel on Climate Change (IPCC), a United Nations sponsored organization made up of over 2500 of the world's leading scientists, the global mean temperature could increase by 1.4°C to 5.8°C

between 1990 and 2100. According to the Australian Academy of Science (2004:1), the climatic effects of such a temperature increase might include more frequent extreme high maximum temperatures and less frequent extreme low minimum temperatures; an increase in the variability of climate, with changes to both the frequency and severity of extreme weather events; alterations to the natural biological range of certain infectious diseases; and rising sea levels.

As part of its research the IPCC examined the impacts global warming will likely have on human health. They concluded that human induced climate change is likely to have wide-ranging and mostly adverse impacts on human health, with significant loss of life. McMichael, Woodruff and Hales (2006:860-866); Kovats, Campbell-Lendrum and Matthies (2005:1441) and Haines, Kovats, Campbell-Lendrum and Corvalan (2006:586-592), identified the following adverse effects of climate change on human health. Extreme temperatures such as heat waves may lead to an increase in mortality rate due to cardiovascular, cerebrovascular and respiratory causes, while extreme colds may lead to increased infectious agents such as influenza, respiratory syncytial virus and seasonal haematological changes. The effects of floods, droughts and storms range from immediate effects of physical injury and morbidity and mortality to effects on mental health. Floods can lead to an increase in diarrhoeal and respiratory diseases. Droughts are associated with an increased risk of disease and malnutrition. Higher temperatures also lead to an increase in aero-allergen production that can lead to an increase in allergic disorders such as hay fever and asthma due to a longer pollen season. Higher temperatures shorten the development time of pathogen in vectors and increase the potential transmission to humans. It leads to an increase in vector-borne diseases such as malaria tick-borne infections and dengue fevers, yellow fever as well as salmonella. Water warming and flooding may also lead to an increase in water-borne infections such as cholera. If global warming is not curbed, malaria, dengue fever and encephalitis could become common threats, not only in tropical areas, but everywhere in the world. As temperatures rise, disease-carrying mosquitoes and rodents increase in number, infecting people in their wake. Projections are made that global warming could put as much as 65 percent of the world's population at risk of infection by malaria (Australian Academy of Science, 2004:1). Climate-related increases in sea surface temperatures and sea level can lead to higher incidence of water-borne infectious and toxin-related illnesses such as cholera and shellfish poisoning. Zoo plankton, which can

harbour cholera, proliferates in warmer water temperatures, and provides a potential environmental reservoir for the diseases. The IPCC projects that more frequent and more severe heat waves will further be one lethal effect of global warming (Sierra Club, 2005a:1). Extreme floods and droughts are projected to become more severe as global warming worsens. These extremes may threaten the availability and supply of safe drinking water. Diseases associated with flooding, such as cryptosporidiosis, could affect millions more people every year. Extreme weather events, like the abnormal storms and flooding that have devastated many communities across the world in recent years, may also become more common. As the number and severity of these events increase they will pose not only an immediate threat to human health and well-being, but also bring dangerous long-term consequences.

Most computer models generated by scientists indicate that the future climate will be more variable than in the past, and that droughts and floods will be more severe. In addition, some of the health effects of weather-related disasters include an increase psychological stress, depression, and feelings of isolation amongst people affected by natural disasters. Decreases in nutrition due to poorer agricultural yields are caused, for example, by prolonged drought and problems of food distribution. Increases in disease transmission due to a breakdown in sewerage and garbage services are also caused by weather related disasters. For example, cholera is one disease that thrives in such situations, particularly when flooding causes the contamination of drinking water by sewerage systems (Sierra Club, 2005a:1). Broadly speaking, the causes of death fall into two categories: non-infectious health effects, such as heat waves and crop failures; and infectious diseases such as malaria, dengue fever, and even salmonella. In particular, there's a strong correlation between patterns of infectious diseases and the El Niño-Southern Oscillation (ENSO) weather pattern. To the degree that global warming exacerbates ENSO, it boosts the likelihood of related epidemics. Some of the health effects, such as heat waves, could hit anywhere, but the ENSO-related diseases disproportionately affect the South Asia/Pacific region and South America. There's some evidence that ENSO affects diseases in Africa, as well (Patz, Campbell-Lendrum, Holloway, & Foley, 2005:310-311). Developing nations are hardest hit by climate-related health problems for reasons of both geography and politics.

The World Health Organization (WHO) estimates that the climate-change-induced excess risks of the various health outcomes will more than double by the year

2030. Large increases are predicted for the relative risk of flooding. More modest changes are predicted in diseases such as malaria, malnutrition and diarrhoea. However, it is important to note that these small relative changes may actually cause far greater aggregate disease burdens. In sub-Saharan Africa, for example, flooding currently kills less than one person per million annually, while malaria kills over 1,600 per million and diarrhoea kills over 1,000 per million (Patz, *et al.*, 2005:312).

2.3.1.2 POLLUTION AND GLOBAL WARMING INTERVENTIONS

In all environmental issues, prevention is better than cure. There is no doubt that the best way to manage waste is to prevent it at source wherever this is possible. The well known “three R’s” principle applies, namely reduce, re-use and re-cycle. Furthermore, it is cheaper to dispose of toxic waste safely in the first place than to clean it up later. Toxic waste is often disposed of unsafely, firstly because the technology of toxic waste disposal is not very advanced, so companies sometimes simply do not know how to dispose of waste safely, such as nuclear waste and bomb production. Secondly, producers and waste disposal companies try to avoid the cost of disposing of their waste safely (Middleton, 1999:248). Since heavy metals are elements, they cannot be broken down, thus the only way to disposal is dilution to levels at which they are no longer toxic or to try to treat them with chemicals that convert them into less toxic compounds. The only way to safely dispose of organic solvents is to convert them chemically into less toxic substances or to purify them for re-use. We need to develop new methods and materials for that create fewer toxic and non-degradable wastes. Our solid waste problem can be solved by incentives that encourage recovery of resources, conservation, recycling and composting. Cleaner production is achieved by examining all phases of a product’s life cycle, from raw material extraction to its ultimate disposal, and reducing the wastefulness of any particular phase. Middleton (1999:248) proposes cleaner production, which encompasses aims such as conservation of energy and raw materials, reduction in the use of toxic or environmentally harmful substances, reduction of the quantity and toxicity of wastes and pollutant discharges and extension of product durability. The efforts to clean up polluted surface waters generally involve preventing polluted water from reaching the waterway and leaving nature to do the rest. Pollution can either have a point source, where the discharge is from a specific location, or a non-

point source, where the source cannot be traced to a single site. In cases of a point source, such as an industry, the source can be traced and measures taken to stop the pollution of the water source. Non-point sources are more difficult to treat though, and usually involve the habits of people that have an influence on the water quality of the source. Pollution from a source such as fertilizers used in the agricultural sector, for example, will need a whole different approach to agriculture so as to reduce the problem.

Regulation plays an important part in dealing with pollution. Numerous treaties and conventions exist, such as the Convention on the Prevention of Marine Pollution by Dumping of Wastes and other matter, 1972 (London Convention), which control pollution from a global platform (Kidd, 1993:78). Regional and national policy and legislation play an important role in pollution control, but even more so does the practical implementation of legislation. Many countries are implementing a form of green taxation, through which industries that contribute to pollution are penalised by paying higher rates. Disparities exist between the treatment of pollution between developing and developed countries. It is important to harmonize national and regional policies and legislation. In areas where there is a high frequency of immune deficiency diseases, high priority is needed in the treatment of any form of pollution (Dippenaar, *et al.*, 2005).

If the pollution of greenhouse gasses is curbed, global warming will decrease. Likewise, the same international treaties and conventions, and national and regional regulation and taxation, against pollution, could where relevant be applied for the curbing of greenhouse gasses. Global development and environmental sustainability are interconnected. Efforts like the Millennium Development Goals, which aim to reduce poverty and improve health care in the world's poorest nations, are demonstrably critical tools for environmental response, as well. Similarly, the need to slow the pace of global warming and avoid its harshest results is as much an issue of humanitarian responsibility as it is environmental stewardship. Even if we stop adding greenhouse gases to the atmosphere today, current models project that what we have already added could warm the earth by 0.5-1.8°C. Implementing all of the key measures for slowing or responding to climate change would be costly. Nevertheless, we can protect future generations from the most harmful effects of global warming by reducing emissions from power plants, cars, factories and other sources by 15 to 20 percent by 2020 and 75 to 80 percent by 2050 (U.S. PIRG:1). Choosing environmentally friendly technology can reduce the use of fossil fuels and help protect the planet. The Sierra

Club (2005b:1-2) contends that there are certain choices individuals can make to help curb global warming, save money, and create a safer environment. It suggests the following interventions: walk, cycle, use public transport or drive cars that have low fossil fuel consumption. Fuel Economy standards can be raised if governments are forced to do so. Thus, consumer pressure is needed. Clean renewable energy should be supported, such as wind or solar energy. The individual could make small changes in everyday life, such as changing ordinary light bulbs to compact fluorescent bulbs, curb water consumption, using energy-efficient electronics and appliances and raise a voice for the protection of a forest or wetland. The concept of reduce, reuse and recycle needs to be promoted and practiced from government level to individuals.

2.3.2 SOCIAL AWARENESS

Social well-being is the appraisal of one's circumstances and functioning in society and the dimensions of social wellness include social integration, social acceptance, social contribution, social actualisation and social coherence (Keys, 1998:122-123). According to Keys (1998:122), healthy individuals feel they are part of their communities or societies, trust and accept other people, believe that they can contribute value, are hopeful about the conditions and future of society and care about as well as understand the world in which they live. Research showed that social well-being correlates positively with health, level of education and marital status and not very well with income, while interpersonal trust and political stability strongly correlated with higher social well-being (Vemuri & Costanza, 2006:121-122). The concept, social capital, encapsulates social awareness. Social capital refers to social networks (and the associated norms of reciprocity and trust) that have powerful effects on the level and efficiency of production and well-being (Helliwell & Putman, 2004:1436). Social capital can be embodied in bonds among family, friends and neighbours, in the workplace, at church and in community organisations (Helliwell & Putman, 2004:1436). Results from the Social Capital Community Benchmark survey conducted in the United States revealed 11 dimensions of social capital, namely, social trust, inter-racial trust, conventional politics participation, civic leadership, associational involvement, informal socializing and diversity of friendships, giving and volunteering, faith-based engagement and equality of civic engagement across the community (O'Brien, Burdsal & Molgaard, 2004:1208).

McElroy, Jorna and van Engelen (2006:127-129) identified five major forms of

social capital, namely, trust, shared beliefs, norms, rules and networks. Trust is an essential part of social capital and can be broadly defined as positive or confident expectations about another party and a willingness to accept vulnerability in the relationship, under conditions of interdependence and risk (Lewicki, Tomlinson & Gillespie, 2006:1014). Shared beliefs allow people to communicate their ideas and to make sense of common experiences. Norms specify what actions are regarded by a set of persons as proper or correct, or improper or incorrect (Coleman, 1990:242). Rules such as a rule of law or a democratic dispensation are the results of human beings' efforts to establish order and increase the predictability of social outcomes (Ostrom & Ahn, 2003). Networks refer to connections among individuals and these networks are based on the norms of reciprocity and trustworthiness (Putman, 2000:81).

Carpiano (2006:171) is of the opinion that social support is a critical component for health, while social connections offer information that can be used to maintain or improve individuals' quality of life and pursue social mobility. Informal social control, to combat social disorder, can have positive health benefits by generating actual and perceived neighbourhood safety, while community organisation participation can also benefit health for example trash clean-ups or organising neighbourhood social events can have a positive impact on health and well-being as well as enhancing a psychological sense of community and sense of community empowerment (Carpiano, 2006:171). Social capital, including caring social relationships and meaningful community connections, have beneficial effects on health; preserve health by maintaining social cohesion in the light of rapid technologic, economic and social change and facilitate community self-help, allowing community cooperation in solving collective health problems (Wakefield & Poland, 2005:2822). In addition, Veenstra, Luginaah, Wakefield, Birch, Eyles and Elliott (2005:2800-2801) are of the opinion that social capital effects health in at least three major ways. Firstly, social networks provide support, exert social influence, encourage social engagement and facilitate interpersonal bonding of members. Thus, social networks influence the health of members by influencing physiological stress responses, self esteem and security, health behaviours such as smoking, exercise, high-risk sexual activity, health service utilization and exposure to infectious disease agents. Secondly, social capital could affect health by influencing a community's access to economic resources and material goods such as jobs and economic opportunities, housing and institutional contacts. Thirdly, at the group level, social capital may interact with neighbourhood wealth as a determinant of

population health. The health effects of collective wealth, for example, less violent crime and more green space, may be more salient in contexts with a dense mapping of networks of associations, as residents in such places have resources to deal better with the consequences of crime and networks enabling greater use of green space. At the individual level the participation in social networks may provide opportunities for health related education. Kim, Subramanian and Kawachi (2006:116) assert that social capital may be linked to health through certain mechanisms that include, for example, the faster dissemination of knowledge about health related innovations, maintenance of healthy norms, promotion to local services and contributions to psychosocial processes that provide affective support and mutual respect.

2.3.2.1 WELLNESS BEHAVIOUR AND HEALTH RISKS ASSOCIATED WITH LOW LEVELS OF SOCIAL CAPITAL

People who have close friends, friendly neighbours and supportive colleagues are less likely to experience sadness, loneliness, low self-esteem and problems with eating and sleeping (Helliwell & Putman, 2004:1437). Agneessens, Waeye and Lievens (2006:42) echo these views by stating that social support correlates to lower stress levels, emotional and psychological well-being, physical well-being, health and the longevity of individuals. Cohen, Syme and Hanson (quoted by Kritsotakis & Gamarnikow, 2004:46) reported that good social support and social networks were related to decreased mortality. Research conducted by Locke and Colligan (quoted by Kritsotakis & Gamarnikow, 2004:46) showed that those who were the most socially isolated had four times the mortality rate of those who were socially involved. Research conducted by Sen in the United States of America (quoted by Kritsotakis & Gamarnikow, 2004:45), reported that African Americans have a lower life expectancy rate than people in other countries, while Kawachi (quoted by Kritsotakis & Gamarnikow, 2004:46) established that people living in poor areas with low social capital are more likely to score poorly on self-rated health measures such as low income, low educational levels, lack of access to health care, smoking and obesity. These results are supported by other studies in the United States of America that have shown that increased mortality and poor self-rated health are associated with low social capital as measured by membership of groups, civic trust and helpfulness to others. Veenstra (quoted by Liukkonen, Virtanen, Kivimäki, Pentti & Vahtera, 2004:2448) revealed an inverse

relationship between social capital and high mortality rate. Kawachi *et al.* found that people living in states with a low level of social trust reported lower levels of subjective health than people living in states with medium or high levels of trust, while Putman indicated that states in the United States scoring high on capital index also score higher on a public health index and have lower age-adjusted all-cause mortality rates (quoted by Poortinga, 2006:293). Research findings by Poortinga (2006:300) show that people with higher levels of trust as well as people with higher levels of civic participation were more likely to report good or very good health compared to people with lower levels of social trust and civic participation. The research findings of Veenstra *et al.* (2005:2812) showed that overweight and underweight respondents were the least likely to be involved in voluntary associations and postulate that more involvement in networks of associations correspond with a lower likelihood of being overweight.

Research done by Cattell (2001:1508) on two housing estates in East London, the United Kingdom, revealed that those with more restricted networks were more likely to express feelings associated with negative health outcomes such as anxiety, depression, suffering from headaches and stomachs complaints, as well as a variety of other physical complaints. In addition, socially excluded groups shared certain attributes such as feelings of fatalism and hopelessness. According to Kaplan (quoted by Cattell, 2001:1513), hopelessness has been linked to increased risk of heart disease. Wilkinson (quoted by Cattell, 2001:1513) states that a lack of social cohesion may have negative health effects that manifest through mechanisms such as shame, social anxiety and perceptions of inferiority. Wilkinson, Kawachi and Kennedy (1998) reported that social capital is inversely proportional to rates of violent crime, for example, the lower the levels of social capital, the higher the rate of violent crime. Veenstra (2005:2067-2069) reports that poorer, older and those respondents who professed less political trust reported higher long-term limiting illnesses or handicaps, while younger and poorer respondents, those with less community and political trust reported depressive symptoms. Older and poorer respondents as well as those who indicated lower levels of community and political trust had significant higher reported fair or poor self-rated health statuses (Veenstra, 2005:2068-2069). Loneliness, the subjective experience of social isolation, is a risk factor for health problems such as heart disease, depression, low self-reported health statuses and psychosomatic illness (Lauder, Mummery & Sharkey, 2006).

2.3.2.2 SOCIAL CAPITAL HEALTH INTERVENTIONS

Health and wellness education is not sufficient to change health and wellness behaviours of people such as smoking, diet, exercise, reckless driving and speeding and alcohol and drug abuse. High levels of wellness and health may be promoted by developing programmes and policies that enhance the levels of social capital in communities. Campbell (2001) declares that a community development approach should be followed which involved the participation and representation of local people in health promotional interventions. Empowered social networks may enhance the self-efficacy and influence the health-related behavioural norms of community members. Campbell (2001) also recommended more structural interventions and enabling approaches, which would create circumstances that enable behaviour changes to occur. An enabling approach is followed by the Health Cities Movement, practiced in a number of cities throughout the world, which is based on the insight that health promotion must include the adaptation and transformation of those structures that foster ill-health and that community participation is the most powerful method of attaining this goal (Campbell, 2001).

According to the Cullen and Whiteford (2001:13), interventions to build social capital may include: strengthening social networks such as a community health worker who mobilises resources within social networks; as well as brings resources into communities; building social organisations such as non-government or community based organisations; strengthening community ties, for example, bridging groups normally divided along class, caste, race/ethnicity, or religious grounds; strengthening civil society, for example, informing decision-makers about the social consequences of macro-economic or health policies. One of the consequences of social exclusion or isolation is loneliness. Health professionals should follow an integrated approach to address loneliness such as community building and development, family networks, counselling, social inclusion partnerships and neighbourhood renewal projects (Lauder *et al.*, 2006:339).

Kritsotakis *et al.* (2004:47) declare that a bottom-up approach should be followed in targeting communities with low social capital scores to improve their health care. Community participation should follow a utilitarian approach by promoting the rights and choices of minorities, redistributing of power, address social injustice and health services should reorient themselves from health institutions to family and community

environments (Kritsotakis *et al.*, 2004:47). Hawe and Shiell (2000:879-880) support these views by emphasising the importance of building relational ties through the creation of settings that promote a sense of community. Furthermore, capacity building should focus on empowering communities through the process of conscientisation whereby people develop the skills of critical analysis and recognise the roles they may take in changing their social conditions. Societies and government should create conducive environments and policies to health promotion (Hawe & Shiell, 2000:879-880).

Lomas (1998:1182-1183), proposed six intervention possibilities moving in a continuum from highly individualised to more community-focussed interventions to prevent death from heart disease. These ranged from interventions to rescue individuals through medical care such as coronary artery bypass surgery; routine medical care such as cholesterol-lowering drugs and hypertension control and improved access to health to all potentially sick individuals. It also includes traditional public health approaches that target individuals in order to discourage risky behaviour that makes people sick, immunisation programmes and to modify physical risk factors in their environment such as polluted water, air or food. The next possible intervention is to provide family and support services such as child welfare, home visitor programmes and other forms of state generated social support to needy individuals or families. At the end of the continuum are interventions to ensure and promote social cohesion such as the preservation and advancement of social structures, for example, meeting places, sport clubs, associations and all other elements of a community that allow for the exchange of views and values and strengthened mutual trust.

2.4 EMOTIONAL WELLNESS

Leafgren and Elsenrath (1986) define emotional wellness as an awareness and acceptance of one's feelings; the degree to which one feels positive about oneself and life; the capacity to manage one's feelings and related behaviours, including the ability realistically to assess one's limitations and the ability to cope effectively with stress. To experience and positively manage one's emotions enables healthy functioning. For the purpose of the study, the focus will be on emotional management with specific reference to stress management, burnout, anxiety and depression and emotional awareness and

sexuality.

2.4.1 EMOTIONAL MANAGEMENT

This section on emotional management will focus on work related stressors or strains, burnout, anxiety and depression. A number of models have been developed to relate job characteristics to the health and well-being of working populations. Two of these theoretical models have been successful in generating and guiding job stress research, namely, the Job Demand-Control Model and the Model of Effort-Reward Imbalance at Work (de Jonge, Bosma, Peter & Siegrist, 2000:1317-1318).

Selye (as quoted by Sharpley, Reynolds, Acosta & Dua, 1996:73) defined stress as the non-specific response of the body to any demand and the responses include endocrinal, psychological and physical reactivity to demands that can, if intense enough or repeated frequently enough, upset the homeostasis of the body. In such cases, the individual is said to have become hyper-reactive to stress – a condition that has been associated with decreased performance on a range of physical and psychological tasks and with illness and disease via prolonged arousal of the sympatric nervous system and its endocrinal and psychophysiological sequella (Sharpley *et al.*, 1996:73). Stress is a dynamic condition in which the individual is confronted with an opportunity, constraint, or demand related to what he or she desires and of which the outcome is perceived to be both uncertain and important (van Daalen & Odendaal, 2003:420).

There are a number of work-related stressors that have been linked to an increased likelihood of an individual experiencing a negative stress outcome. The ASSET model, developed by Robertson and Cooper (quoted by Johnson, Cooper, Cartwright, Donald, Taylor & Millet, 2005:178), has identified twelve factors of job-related stress. Table 2.8 outlines the twelve factors measured by the ASSET questionnaire.

Table 2.8: Factors of Job-Related Stress

Factor	Description
Work relationships	Sources of stress relating to the contact people have at work with their colleagues/managers.

Job	Sources of stress relating to the fundamental nature of the job itself.
Overload	Sources of stress relating to workload and time pressures.
Control	Sources of stress relating to the amount of control people have over their work.
Job security	Sources of stress relating to the level of job security perceived by people.
Resources and communication	Sources of stress relating to the equipment/resources available at work and the effectiveness of communication in the workplace.
Work–life balance	Sources of stress relating to the extent to which the demands of work interfere with people’s personal and home life.
Pay and benefits	Sources of stress relating to pay and benefits.
Commitment of the organisation to the employee	The extent to which people feel their organisation is committed to them.
Commitment of the employee to the organisation	The extent to which people are loyal and dedicated to their organisation.
Physical health	Physical symptoms associated with stress.
Psychological well-being	Clinical symptoms indicative of stress-induced mental ill health.

From an organisational behaviour perspective, stressors can be classified into three main categories: individual, group and organisational and environmental. According to Ivancevich and Matteson (2002:270–275); van Daalen and Odendaal (2003:420–422); Gibson, Ivancevich, Donnelly and Konopaske (2003:194–199); Bloisi, Cook and Hunsaker (2003:279–286) and Cook and Hunsaker (2001:587–596), individual factors include role conflict, which occurs when an individual’s compliance with one set of expectations conflicts with another set of expectations. Work overload, namely, qualitative overload, occurs when people feel they lack the ability to complete a job or that performance standards are too high, while quantitative overload results from having too many things to do or insufficient time to complete a job. Personal problems, such as family conflict, financial problems, poor relationships with the spouse or children and health problems also hamper performance. Personality types, such as people with a Type A personality, are more prone to stress because they are impatient, restless, competitive, aggressive, under intense perceived time pressure and always attempting to accomplish several things at once. Finally, amount of life change, which means that overwhelming amounts of change have to be faced, can be very stressful as well.

Group and organisational factors include high stress occupations, which allow incumbents little control over their jobs, impose relentless time pressures, have

threatening or unpleasant physical conditions, or carry weighty responsibilities. Job role stressors, which include a lack of group cohesiveness, a lack of social support and responsibility for others, cause stress. People in supervisory positions are especially more susceptible to such disorders as ulcers and hypertension. Poor working conditions such as continuous exposure to extreme heat, cold, noise or crowding, high visibility, lack of privacy and rotating work shifts are also harmful while organisational politics such as political activities, game playing and power struggles cause additional stress. Poor work relationships with co-workers and between groups are severe sources of stress. Environmental stressors include economic uncertainties such as downsizing, rightsizing and reductions in head count. Technological changes such as automation, computers and technological innovations, can make an employee's skills and experience obsolete and may, in turn, increase the stress levels of individuals. Political uncertainty too, tends to create stress amongst employees.

Prolonged stress at work can lead to emotional disorders such as burnout, depression, insomnia, anxiety, suicidal behaviour and anger. Burnout can be conceptualised as a crisis in one's relations with work (Ahola, Honkonen, Isometsä, Kalimo, Nykyri, Aromaa & and Lönnqvist, 2005:56). Chronic burnout is characterised by exhaustion, sleeping problems and depersonalisation and overlaps with other disorders such as chronic fatigue syndrome (CFS), fibromyalgia and major depression (Sandström, Rhodin, Lundberg, Olsson & Nyberg, 2005:271–272). According to Nyklíýek and Pop (2005:64) and Langelaan, Bakker, van Dooren and Schaufeli (2006:522), burnout consists of three qualitative dimensions. They are exhaustion (draining of mental energy), cynicism (a negative attitude towards work) and reduced personal accomplishment or professional efficacy (the belief that one is no longer effective in fulfilling one's job responsibilities). Exhaustion refers to feelings of overstrain, tiredness or fatigue resulting from long-term involvement in an over-demanding work situation. Cynicism reflects an indifferent attitude towards work, disengagement from it and a lack of enthusiasm. Reduced professional efficacy is characterised by diminishing the feelings of competence, successful achievement and accomplishment in one's work (Ahola *et al.*, 2005:56; Bakker, Van der Zee, Lewig & Dollard, 2006:32).

Depression is a neurodegenerative disorder, disrupting the structure and function of the brain cells, destroying nerve cell connections and even killing certain brain cells. These factors precipitate cognitive decline, set up neural roadblocks to the processing of information and keep one from responding to life's challenges (Paul, 2003:31). Anxiety

and depression disorders frequently co-exist and the symptoms of anxiety may include worry, restlessness, abdominal discomfort, diarrhoea, dry mouth, rapid heartbeat or palpitations, tightness or pain in chest, shortness of breath, dizziness, frequent urination, muscular tension/aches, fatigue, visual disturbances, insomnia, irritability, anger, inability to concentrate/mind going blank, fear of madness, easily frightened, fear of dying, feeling on edge, confusion, poor decision-making, nausea, trembling, tiredness, lack of motivation, alcohol and drug abuse, recurring nightmares and loss of sex drive (King, 2006; Haslam, Atkinson, Brown & Haslam, 2004:206–208).

There are various types of anxiety disorders, such as panic disorder, phobia, obsessive-compulsive disorder, post-traumatic stress disorder and generalised anxiety disorder. The core symptom of panic disorder is a panic attack, which is an overwhelming combination of physical and psychological distress and includes the following symptoms: pounding heart or chest pain, sweating, trembling, shaking, shortness of breath, sensation of choking, nausea or abdominal pain, dizziness or light-headedness, feeling unreal or disconnected, fear of losing control, going crazy or dying, numbness, chills, or hot flushes (American Psychiatric Association, 2005b). A phobia is excessive and persistent fear of a specific object, situation, or activity. These fears cause such distress that some people go to extreme lengths to avoid what they fear. According to Edlin, *et al.* (1998:62), some common phobias are fear of heights (acrophobia), fear of open places (agoraphobia), fear of closed spaces (claustrophobia), fear of dirt and germs (mysophobia), fear of snakes (ophediophobia) and fear of animals (zoophobia).

Phobias produce severe, often incapacitating, anxiety and even panic reactions. Social phobia is significant, and discomfort about being embarrassed or looked down upon in social or performance situations, such as public speaking, meeting people, or using public rest rooms. Symptoms of Social Anxiety Disorder include fear of strangers, fear of being observed and feelings of shame and humiliation (Sloman, Farvolden, Gilbert & Price, 2006:97). Obsessive-compulsive disorders are upsetting and irrational thoughts that keep recurring, such as preoccupations with dirt or germs, nagging doubts or a need to have things organised in a very particular order. To minimise these obsessions, many people with obsessive-compulsive disorder (OCD) engage in repeated behaviour, or compulsions, such as repeated hand washing, constant rechecking to satisfy doubts and following rigid rules of order (American Psychiatric Association, 2005b). Post-traumatic stress disorder (PTSD) occurs in individuals who

have survived a severe or terrifying physical or emotional event. It includes symptoms such as recurrent nightmares, intrusive memories or flashbacks, feeling numb or detached, trouble with sleeping, feeling jittery or on guard and irritability (American Psychiatric Association, 2005b). Events that can trigger PTSD include military combat, a violent personal attack, natural-disaster tragedies (such as a plane crash), physical or sexual abuse during childhood, or witnessing another person's injury. People with generalised anxiety disorder (GAD) have ongoing, severe tension that interferes with their daily functioning. They worry constantly and feel helpless to control these worries. Their worries frequently focus on job responsibilities, family, health, or minor matters such as chores, car repairs, or appointments. They may have problems with sleeping, muscle aches/tension and feeling shaky, weak and headachy. Goodwin (2002:1123) provides evidence that simple phobia, obsessive-compulsive disorder, agoraphobia and panic attack each make an independent contribution to the risk of the first-onset of depression, within twelve months, among adults in a community-based sample.

2.4.1.1 EMOTIONAL MANAGEMENT BEHAVIOUR RISKS ASSOCIATED WITH STRESS, BURNOUT, DEPRESSION AND ANXIETY

A variety of physiological, psychological and behavioural changes can affect a person who is experiencing unhealthy, chronic stress. Stress can produce a number of psychological consequences such as anxiety, frustration, apathy, lowered self-esteem, tension, irritability, job dissatisfaction, aggression and depression (Gibson *et al.*, 2003:200). All these detract from feelings of well-being, contribute to poor concentration, indecision and decreased attention spans. If these stressors cannot be altered, people may resort to psychological substitutes such as negativism, anger, feelings of persecution, criticism, displacement, denial, apathy, fantasy, hopelessness, withdrawal, forgetfulness, or procrastination (Bloisi *et al.*, 2003:286). Physiological symptoms of stress include elevated blood pressure, increased heart rate, sweating, hot flushes, headaches, gastrointestinal disorders, increased blood glucose levels, increased cholesterol levels and hypertension (Bloisi *et al.*, 2003:286). The behavioural consequences of stress are sleep disorders, changes in eating habits, increased smoking and more alcohol consumption, nervous mannerisms such as rapid speech, fidgeting, rudeness and changes in productivity, absence and turnover (Bloisi *et al.*,

2003:286). Various illnesses such as peptic ulcers, ulcerative colitis, irritable bowel syndrome, cardiovascular diseases, asthma, headaches, skin disorders for instance, eczema, acne, psoriasis and hair loss and breaking down of the immune system are associated with stress (Sharpley *et al.*, 1996:73).

Dua (as quoted by Sharpley *et al.*, 1996:74) has found that higher levels of job stress are associated with dissatisfaction regarding work, psychological distress, negative affect, anxiety and poor health, as measured by absence through illness, visits to a medical practitioner and self-rating of overall physical health. Stress can also lead to other negative behaviours such as more tobacco smoking, excessive alcohol or caffeine consumption and skipping meals, which can contribute to health problems (Johnson *et al.*, 2005:181). According to Stinchcomb (2004:265), stress has a diminishing effect on job satisfaction and morale of police officers in the United States of America and ultimately leads to physical, emotional or personal problems such as chronic fatigue, over-eating, loss of appetite, muscle tension, backache, irritability, hostility, anger, organisational alienation, increased sick-related absences, premature retirement and conflicting relationships in the family. Kinman and Jones (2005:112–114) investigated the consequences of stress on employees and indicated outcomes such as negative psychological outcomes including tension, anxiety, worry, depression, sleeplessness, lack of motivation, nervous breakdown, personality change; negative behavioural outcomes, for instance irritability with co-workers, marital difficulties, absenteeism, reduced levels of sociability, difficulty in maintaining work-life balance and relationships; negative physical outcomes such as poor physical health, tiredness, aches and pains, digestive problems, high blood pressure and heart disease and negative cognitive outcomes such as poor standard of work, poor concentration, irrational thoughts and irrational and disordered thinking.

More than one hundred symptoms and possible consequences have been associated with burnout, ranging from anxiety to a lack of zeal. Schaufeli and Buunk (2005) have grouped these consequences into the following five major categories; affective manifestations which include a gloomy, depressed mood, aggression and anxiety; cognitive manifestations such as a feeling of helplessness, hopelessness and powerlessness, a sense of failure, insufficiency, impotence, poor job-related self-esteem, impaired cognitive skills, for instance memory and attention loss, negativism, pessimism, lessened empathy, distrust and hyper-critical attitude towards management, peers and supervisors; physical manifestations which include somatic complaints,

regular flu episodes, higher cholesterol levels (a risk factor for cardiovascular disease), higher levels of cortisol and coronary heart disease; behavioural manifestations which lead to an increase in substance abuse (alcohol, drugs and cigarettes), absenteeism, job turnover and impaired performance; and motivational manifestations which include the decline and loss of intrinsic motivation such as zeal, enthusiasm, interest and idealism; so that disillusionment, disappointment and resignation set in; as well as physical and mental withdrawal and interpersonal conflicts.

A person experiencing depression may show some common symptoms, for instance persistent sadness, anxious empty moods; sleeping disorders such as sleeping too little, early morning awakening or sleeping too much; reduced appetite and/or weight loss, or increased appetite and weight gain; restlessness and irritability; persistent physical symptoms that do not respond to treatment (such as headaches, chronic pain or digestive disorders); difficulty in concentrating, remembering or making decisions; fatigue or loss of energy; feeling guilty, hopeless or worthless; loss of interest in sex; withdrawal from social contacts; lowered self-esteem; thoughts of suicide or death and loss of interest in activities once enjoyed (Paul 2003:32; Edlin *et al.*, 1998:63). These symptoms may lead to impaired work performance. Myers, Sweeney and Witmer (2000:254) provide evidence of the relationship between thoughts, feelings and illnesses, with positive emotionality being a major component of mental and subjective well-being, a negative correlation with depression and an accurate predictor of physical and psychological health. Negative emotions such as anxiety and depression are associated with immune system suppression and a consequent increase in the potential of illness. Hostility has been shown as a major contributor to high blood pressure, coronary artery disease and death, particularly among individuals with a Type A personality. By contrast, the appropriate expression of negative emotions combined with the presence of positive emotions, seems to strengthen the immune function (Myers *et al.*, 2000:254).

Anxiety disorders are associated with an increased risk of major depression in both clinical and community-based samples of youth and adults (Goodwin, 2002:1121). Findings from Bowen, Baetz, Hawkes and Bowen (2006:4) clearly confirm that depressed and anxious mood variability is higher in patients with anxiety disorders than in control subjects. According to Paul (2003:32–33), Seedat (2006) and Wang, Beck, Berglund, McKenas, Pronk, Simon and Kessler (2004:1887–1889), the impact or consequences of depression and anxiety in the workplace include higher health

insurance costs; higher absenteeism and turnover; declining productivity; poor interpersonal relations; cognitive decline; reduced information processing; low motivation and slowed movements; loss of interest and goal focus; reduced ability to think and concentrate; impaired short-term memory; reduced ability to adapt, change or see alternatives; increased number and severity of accidents; higher worker compensation insurance costs; increased alcohol and drug abuse; anxiety and overreaction to stress; reduced morale and job satisfaction; increased tendency to focus on negative events; more severe illnesses; higher rates of suicide; more chronic diseases and slower recovery; sleep disturbance; loss of appetite; more frequent doctor and clinic visits and a reduced desire to cooperate.

Findings from Marciniak, Lage, Landbloom, Dunayevich and Bowman (2004:114-119) clearly indicate that employees who were diagnosed with anxiety, compared to the control group, were significantly more likely to be diagnosed with other mental illnesses such as acute reaction to stress, adjustment disorder and depression; be diagnosed with asthma, irritable bowel syndrome, hypertension; visit mental health professionals more frequently; visit other medical specialists such as cardiologists, neurologists, gastro-enterologists, dermatologists, otolaryngologists and rheumatologists; visit outpatient specialists and visit the emergency room; be unofficially absent from work; have higher costs such as higher outpatient and prescription drugs as well as higher costs related to absenteeism and short-term disability claims; change jobs or become unemployed (thereby increasing the search and training costs for employers); require greater effort to function at work and have decreased productivity and become an increased caregiver burden for employers.

2.4.1.2 EMOTIONAL MANAGEMENT INTERVENTIONS

Interventions designed to reduce occupational stress can be categorised as aiming at increasing individual psychological resources or responses, or at changing the occupational context. The first category of intervention is usually referred to as stress-management training, which is a common denominator of a wide spectrum of interventions ranging from relaxation methods to cognitive behavioural interventions and client centred therapy. The second category refers to interventions such as organisational development and job redesign (Van der Klink, Blonk, Schene & Van Dijk,

2001:270). The British Occupational Health Research Foundation (2005:21–22) has identified stress-management interventions comprising a range of different, but complementary approaches, which focus on acquiring problem-solving skills, reducing negative coping skills, identifying potential stressors at work and developing strategies to minimise their impact and developing self-awareness in relation to stressors. Multi-modal approaches are characterised by interventions that combine a range of methods such as education, role-play and exercise, as well as the acquisition of particular skills such as muscle relaxation or improved communication skills. Organisational approaches are characterised by changes to the work environment, such as work practices, involvement of employees in assessing and ameliorating work practices that might be harmful to mental health, or skills training to improve working relations.

According to Kompier (2004), the most important stress interventions in organisations are work-directed interventions such as work redesign, ergonomics and technology, social work environment, management style and work time schedules, as well as person-directed interventions such as the training of employees, promoting a healthy lifestyle and training of management. An investigation into preventive measures taken by organisations to reduce job stress in the Netherlands has revealed that training (for instance stress management and skills training) and education (for instance didactical stress management) are used most frequently (9%), followed by the introduction of team meetings (8%), alleviating the individual's work load (7%), training of supervisors in social leadership (7%), task rotation (5%) and task enrichment (5%) (Schaufeli & Kompier, 2001).

According to Ivancevich and Matteson (2002:287–293), Cook and Hunsaker (2001:559–602), van Daalen and Odendaal (2003: 424–426), Bloise *et al.* (2003:290–292), Gibson *et al.* (2003:207–214), Luthans (2002:414–418), Arthur (2004:1610) and Gardner, Rose, Mason, Tyler and Cusway (2005:139), individual intervention strategies include cognitive techniques; relaxation; meditation; biofeedback; time management; counselling; changing jobs; exercise; recreation; companionship; expanding a social support network. Organisational intervention strategies, in turn, include improved selection and placement criteria; redesigning jobs; improved organisational communication; providing work-life balance programmes; introducing wellness or employee assistance programmes; ergonomic interventions; body-awareness programmes; using realistic goal setting; increasing employee involvement; equitable and fair performance evaluations; limitation on formalisation and specialisation;

providing a safe and healthy work environment and implementing work-life balance programmes.

According to Schaufeli and Bakker (2004:19–20), Schaufeli and Buunk (2005:45–47), Strümpfer (2003:73–76) and Salmela-Aro, Näätänen and Nurmi (2004:211–212), organisational and individual interventions which deal with burnout include job redesign; flexible work schedules; job enlargement; job rotation; job enrichment; goal setting; participative management; increasing social support; team building; and cognitive behavioural techniques. Examples of cognitive behavioural techniques are Stress Inoculation Training, Rationale Emotive Therapy, cognitive restructuring and behavioural rehearsals; group-based intervention programmes; interpersonal skills training; relaxation exercises; psychotherapeutic methods such as experiential group therapy and psychoanalytic group therapy; time management; balancing work and private life; physical training; dieting; improving social and interpersonal skills especially assertiveness; training courses on dealing with difficult and violent customers; career development and career counselling; improved communication between management and employees; conflict management; time-outs and sabbatical leave; organisational development to facilitate change; as well as music, meditation and religious rituals.

Employers need to be aware of the serious impact of depression and anxiety on the workplace and should develop programmes to identify persons who are depressed and ensure that depressed persons receive effective treatment (Elinson, Houck, Marcus & Pincus, 2004:33). According to the American Psychiatric Association (2005a), depression and anxiety may be treated by medication such as antidepressants to correct the imbalance in the levels of chemicals in the brain and/or by psychotherapy ('talk therapy'). However, recent research has indicated that the newer generation antidepressants for example serotonin-boosting medicines have serious side effects such as facial and whole-body tics, sexual dysfunction, insomnia, dizziness, nausea, dyspepsia and anxiety (Haslam *et al.*, 2004:211). Seedat (2006) argues that cognitive behaviour therapy has been shown to be effective for both depression and anxiety disorders and can be used in combination with antidepressants such as selective serotonin-reuptake inhibitors (for instance citalopram, fluoxetine, fluvoxamine, paroxetine and sertraline) and serotonin norepinephrine reuptake inhibitors (for example, venlafaxine).

Haslam, Atkinson, Brown and Haslam (2005:213-214); Elinson *et al.* (2004:33); Paul (2003:35-36) and Kirkwood, Rampes, Tuffrey, Richardson and Pilkington

(2005:889) recommend that mental health issues should be an integral part of health and safety training, while organisations should conduct risk assessments relating to mental health. They should maintain workers with anxiety and depression at work or rehabilitate workers following sickness absence. This requires coordination between managers and staff from occupational health and health and safety. They should also educate the workforce about depression and anxiety to remove the stigma attached to these conditions. They should also create awareness by distributing information leaflets, training and education; promote effective treatment through benefit packages and health insurance; provide a safe and healthy work environment; assist with employee stress management; promote free and open communication; reduce personal conflict in the workplace; provide autonomy and self-control over work; ensure an adequate staffing and expense budget to prevent work overload and provide human relations programmes that are family-friendly. They should provide competitive personal leave, flexible work hours and vacation benefits; reduce the amount of red tape; recognize and reward accomplishments; provide an employee assistance or wellness programme as well as a quality of work-life programme and promote exercise programmes such as yoga.

2.4.2 EMOTIONAL AWARENESS AND SEXUALITY

Developing healthy, intimate and sexual relationships involves the simultaneous expression of mind, body and spirit. The World Health Organisation (quoted by Sandfort & Ehrhardt, 2004:183) states that sexual health is a state of physical, emotional, mental and social well-being related to sexuality. It is not merely the absence of disease, dysfunction or infirmity. Sexual health thus requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sex experiences, free of coercion, discrimination and violence. For sexual health to be attained and maintained, the sexual rights of a person must be respected, protected and fulfilled. From a health and wellness perspective, sexuality is an area that an individual can control by exercising one's choice when and with whom to have sex and the feelings one wants to express in sexual ways. With some fundamental knowledge about sex, sexuality, gender identity and gender role, sexual orientation, sexual dysfunctions, intimate sexual relationships and sexually transmitted diseases, an

individual may be able to conduct his or her sexual life in a responsible manner, thus avoiding unnecessary physical (sexually transmitted diseases), emotional, social and mental health problems.

For the purpose of this study the concepts sex, sexuality, gender identity and gender role, sexual orientation, sexual dysfunctions and intimate sexual relationships will be explained. However, the focus will be on sexually transmitted diseases with specific reference to wellness behaviour risks and risk reduction interventions. Sex can refer to an individual's classification as male or female as determined by the presence of certain anatomical and physiological characteristics, a set of behaviours and the experience of erotic pleasure (Edlin *et al.*, 1998:147). According to Langfeldt and Porter (quoted by Edwards & Coleman, 2004:191) sexuality is an integral part of the personality of everyone: man, woman and child. It is a basic need and aspect of being human that cannot be separated from other aspects of life. Sexuality is not synonymous with sexual intercourse; not about whether a person has orgasms or not and not the sum total of a person's erotic life. These may be part of a person's sexuality but may equally not be. Sexuality is much more. It is in the energy that motivates a person to find love, contact, warmth and intimacy; it is expressed in the way that a person feels, moves, touches and is touched. It thus concerns being sensual as well as sexual. Sexuality influences thoughts, feelings, actions, interactions and a person's mental and physical health. Holland, Ramazanoglu, Sharpe and Thomson (1999:458) view sexuality not only in sexual practices, but also in what people believe about sex, particularly what they think is natural, proper and desirable and includes people's sexual identities in all their cultural and historical variety. Sexual intercourse is regarded as a meeting of bodies, where these bodily practices are given meaning by ideas and values and are situated in social relationships. Sexuality is the sum of the physical, functional and psychologic attributes that are expressed by one's gender identity and sexual behaviour, whether or not related to the sex organs or procreation or the genital characteristics that distinguish male from female (Mosby's Medical Nursing and Allied Health Dictionary, 1998:45).

Gender identity has been described as a basic, existential conviction that one is male or female, a secure sense or conviction of one's own maleness or femaleness and the individual's awareness and satisfaction with being male or female. Confidence and comfort with being either male or female in essence reflects an individual's concept of himself or herself as male or female (Hoffman, Borders & Hattie, 2000:478). Gender

roles are perceived differently by men and women, with men scoring higher on scales that assess masculinity and women scoring higher on scales that assess femininity (Damji & Lee, 1994:215). Hines, Brook and Conway (2004:75) mention that the human psychosexual development involves three primary components: core gender identity (the sense of self as male or female); sexual orientation (erotic interest in individuals of the same or other sex) and gender role behaviours (the myriad characteristics that are associated with being male or female or that differ on average for males and females).

There are different sexual orientations such as heterosexuals, homosexuals or transsexuals. According to FritzGerald (2000:435-436), heterosexuality is the sexual engagement between human males and human females and could be erotic mouth kissing, oral or finger caresses of the sexually sensitive areas of the body, copulation, or mutually rubbing genitals in stimulated coitus, while homosexuality is any of the abovementioned between members of the same sex. A transsexual is a person who feels like a woman trapped in a man's body or vice versa, while the transvestic experiences sexual arousal by wearing the clothing of the opposite sex and is usually a man, although he may be or may not be homosexual (FritzGerald, 2000:436). Sexual identity is the act of self-labelling based on what society recognises as communicating something meaningful about one's sexual preferences while common labels attached to sexual identity are gay, straight, bisexual, or lesbian (Yarhouse & Tan, 2005:60).

The core features of sexual health imply reproductive health, the absence of sexual illnesses or disorders and psychosexual well-being (Bakewell & Volker, 2005:697). As Wakley (2005:42-45) and Lewis, Fugl-Meyer, Bosch, Fugl-Meyer, Laumann, Lizza and Martin-Morales (2004:36) report, the most common sexual dysfunctions are the lack of knowledge, a lack of desire, a lack of performance, vaginismus, vulval pain, infertility, a hysterectomy and other operations, pregnancy and childbirth; menopause and associations. Sexual interest dysfunctions are diminished or absent feelings of sexual interest or desire, absent sexual thoughts or fantasies and a lack of responsive desire. Sexual arousal disorders in women can be divided into three types: a genital sexual arousal dysfunction, which is absent or impaired genital sexual arousal (characterised by minimal vulval swelling or vaginal lubrication); a subjective sexual arousal dysfunction is the absence of or markedly diminished feelings of sexual arousal, sexual excitement and sexual pleasure, from any type of sexual stimulation and combined genitally and a subjective arousal dysfunction, which is an absence of markedly diminished feelings of sexual arousal (sexual excitement and sexual pleasure)

from any type of sexual stimulation as well as complaints of absent or impaired genital arousal. An erectile dysfunction in men is an arousal disorder defined as a consistent or recurrent inability of a man to attain and/or maintain penile erection sufficient for sexual activity, while a persistent sexual arousal dysfunction is spontaneous, intrusive and unwanted genital arousal in the absence of sexual interest and arousal. Early ejaculation in men refers to the ejaculation sooner than desired, either before or shortly after penetration over which the sufferer has minimal or no control. Delayed ejaculation is undue delay in reaching a climax during sexual activity, while orgasmic dysfunctions, in either men or women, are a lack of orgasm, markedly diminished intensity of orgasmic sensations or a marked delay of orgasm from any kind of stimulation. Anejaculation in men is the absence of ejaculation during orgasm. Dyspareunia is persistent or recurrent pain with attempted or complete vaginal entry and/or penile vaginal intercourse. Vaginismus is the persistent or recurrent difficulties of a woman to allow vaginal entry of the penis, a finger and/or any object, despite the woman's expressed wish to do so. Sexual aversion disorder is extreme anxiety and/or disgust at the anticipation of/ or attempts to have any sexual activity.

Developing intimate sexual relationships involves a feeling of closeness, trust and openness with another person that tells a person his or her innermost self can be shared without fear of attack or emotional hurt and that a person is understood in the deepest sense possible (Edlin *et al.*, 1998:162). Research has shown that there is a strong positive relationship between relationship satisfaction and sexual satisfaction while experiences of unresolved conflicts and not feeling loved as well as emotional distance have been shown to be associated with lower sexual satisfaction (Byers, 2005:113). The lack of an intimate relationship may lead to anger, depression and anxiety that adversely affect physical health as well as emotions and feelings (Edlin *et al.*, 1998:162). Offman and Matheson (2005:32) are of the opinion that sexual depression involves feeling distressed or disappointed about the quality of one's sex life, or disheartened about a lack of sexual relations with the intimate partner, while sexual anxiety entails feelings of worry, uneasiness or nervousness related to sexual behaviour and is reflected in feelings of discomfort or tension about one's sexual life.

Sexually Transmitted Infections or Diseases (STIs or STDs) are currently a major health problem. The most important STDs and infectious agents are the Human immunodeficiency virus (HIV), Hepatitis B virus, *Treponema pallidum*, *Neisseria gonorrhoea*, *Chlamydia trachomatis*, *Trichomonas vaginalis*, *Haemophilus ducreyi*,

Herpes simplex virus and Human papillomavirus (Memish & Osoba, 2006:86-87; Downs, de Bruin, Murray & Fischhoff, 2006:65). These STDs are transmitted by sexual exposure to an infected partner. The high rate of STDs among adolescents may be contributed to personal behaviour factors such as early age of sexual debuts, a large number of partners, concurrent partners, older partners, frequent change of partners, partners from groups with a high prevalence of STDs, inconsistent condom use, sex associated with substance abuse, sex traded for drugs or money and the inability to notify partners when appropriate that they need to be treated. They are also caused by social factors such as a lack of parental supervision and poor parent adolescent communication, insufficient sex education, a lack of health insurance, absence of user-friendly and some confidential sources of health care, dating violence, incarceration and media content. Biological factors such as the presence of an exposed columnar epithelium on the cervix (ectopy or ectropion), a lack of protective antibodies resulting from previous infections, decreased levels of IgG during the follicular phase of the menstrual cycle compared to normal adults and in younger adolescents fewer protective hydrogen's peroxide-producing lactobacilli cause this deficiency as well (Risser, Bortot, Bejamins, Feldmann, Barratt, Eissa & Risser, 2005:161).

Numerous studies have established an association between sildenafil (Viagra) use and increased sexual risk behaviour, including unprotected anal sex with a partner of unknown HIV status. HIV-positive sildenafil users are more likely to be diagnosed with STDs (gonorrhoea, chlamydia or syphilis) and more than twice likely to be diagnosed with HIV infection (Swearingen & Klausner, 2005:574-575). Swearingen and Klausner (2005:575) are of the opinion that sildenafil as such does not cause these infections, but the increased duration of an erection, increased blood flow and subsequent increased mucosal susceptibility may increase the risk of acquiring these infections if having sex with an infected partner. In the next section eight sexually transmitted diseases, namely, Chlamydia, Gonorrhoea, Syphilis, Herpes simplex virus, Pelvic inflammatory disease, Human immunodeficiency virus (HIV), Human papillomavirus and Trichomonas vaginalis infection, will be discussed.

Chlamydia manifests in males as a urethritis after a 7 to 21 day incubation period and the symptoms may include dysuria and a clear white urethral discharge, although approximately one-quarter of infected men may report no symptoms (Benson & Hergenroeder, 2005: 184). In sexual active males chlamydia may cause epididymitis which present with unilateral scrotal pain and swelling, fever and tenderness on

examination while in female bisexual and lesbian people, chlamydial infections manifest in cervicitis, urethritis, Bartholinitis, endometritis, pelvic inflammatory disease (PID), or salpingitis and perihepatitis. Chlamydial infections in male to male anal intercourse show symptoms such as rectal bleeding or pain, diarrhea, tenesmus or a mucous-like rectal discharge and chlamydia proctitis (Benson & Hergenroeder, 2005:184; Risser *et al.*, 2005:162-163).

Gonorrhoea is a worldwide sexually transmitted disease caused by *Neisseria gonorrhoea*. The symptoms of gonorrhoea in women include pain and burning when urinating, purulent vaginal discharge, dysuria and vaginal bleeding between periods as well as developing pelvic inflammatory disease (PID) (Little, 2006:139). According to Little (2006:139), women who practise orogenital or anal sex can develop signs and symptoms of pharyngitis, tonsillitis or proctitis. In both women and men gonococcal proctitis can be painful with purulent rectal discharge, bleeding may occur and bowel movements may be painful. The most prominent symptoms in men are mild dysuria and mucopurulent discharge, while urethritis, epididymitis (presented with unilateral testicular pain, swelling and fever) and proctitis can result from gonococcal infection (Little, 2006:140). Gonococcal pharyngitis, tonsillitis and anorectal infections can occur in homosexual and bisexual men and in both men and women sore throats and cervical lymphadenopathy are common complaints and, in some individuals, dissemination of *Neisseria gonorrhoea* can occur. Disseminated gonococcal infection (DGI) can result in myalgia, arthralgia, polyarthritits and dermatitis (consisting of papular, vesicular or pustular skin lesions) with the hands, wrists and knees as the most frequently affected areas (Little, 2006:140).

According to Benson and Hergenroeder (2005:186), primary and secondary syphilis constitute early syphilis. Primary syphilis occurs 14 to 21 days after the inoculation of the *Treponema pallidum* into the site of the infection, where a small painless papule expands over several days and ulcerates into a characteristic chancre that occurs in the anogenital region, but may also develop at any dermal or mucosal site of exposure. The first evidence may be the secondary stage, manifesting itself as a symmetric reddish-to-reddish-brown, often a scaly, papular rash of the trunk and extremities that do not spare the palms or soles. Characteristic condyloma lata may be evident as well as other nondermatologic symptoms such as sore throat, malaise, headache, weight loss, fever and palpable lymphadenopathy (Benson & Hergenroeder, 2005:186). The secondary stage is followed by the latent stage, which can last for years

or even decades, in which no symptoms appear. In the tertiary stage (final stage) three main types of devastating and fatal symptoms, namely, benign tertiary syphilis, cardiovascular syphilis and neurosyphilis can occur. The symptoms of benign tertiary syphilis are the development of lumps, called gummas, anywhere in the body such as in the bones, skin and mucous membranes, while cardiovascular syphilis may lead to the development of an aneurysm, a leakage of the aorta or leaking of some of the heart valves that may cause heart failure and/or death (Whitelaw, 2006).

A syphilis infection may also lead to neurological symptoms that can be diagnosed by a lumbar puncture (Sebitloane, 2005:233). There are three types of neurosyphilis, namely, tabetic neurosyphilis in which part of the spinal cord is damaged leading to problems with sensation in the lower half of the body with common symptoms such as odd movements when walking, urinary incontinence and general tremors; parietic neurosyphilis with mood swings, lack of insight into reality and convulsions as the most common symptoms; while meningovascular neurosyphilis is a chronic form of meningitis with dizziness, disorientation, a lack of muscle control and general wasting as the most common symptoms (Whitelaw, 2006).

The Herpes simplex virus is the most common cause of infectious genital ulcer disease (Sebitloane, 2005:232). Most individuals with antibodies to Herpes simplex virus (HSV) may not recognise the symptoms. Systemic symptoms of HSV include fever and headache as well as genitourinary symptoms such as painful ulcerations or blisters, itching and dysuria, while the psychological impact on the individual may be the experience of anxiety, depression, anger and lowered self-esteem (Auslander, Biro & Rosenthal, 2005:26-27).

Pelvic inflammatory disease (PID) is caused by chlamydial and gonorrhoeal infections. The symptoms include low abdominal pain, fever, malaise, dysuria, abnormal vaginal discharge, vaginal bleeding, nausea and vomiting (if temperature is higher than 38°C) and anorexia (Little, 2006:139; Hill, 2005). PID also causes serious long-term consequences, including ectopic pregnancy, tubal factor infertility and chronic abdominal or pelvic pain (Viberga, Odland, Lazdane, Kroica, Berglund & Olofsson, 2005:183; Mahon, Temkit, Wang, Rosenman & Katz, 2005:191).

The Human immunodeficiency virus (HIV) has a significant number of physical and psychological symptoms. A study amongst 743 men and women living with HIV/AIDS in Botswana, Lesotho, South Africa and Swaziland has revealed 64 physical and psychological symptoms such as fatigue, weakness, concerns over weight loss,

fear/ worries, painful joints, coughing, lack of appetite, headaches, muscle aches, night sweats, depression, dry mouth, numbness/tingling of feet, thirst, itchy skin, rash, fever, insomnia/cannot sleep, shortness of breath with activity, white spots in the mouth/thrush, numbness/tingling of legs, dizziness, diarrhoea, difficulty in concentrating, nausea, chest pain, abdominal pain, memory loss, anxiety, mouth ulcers, numbness/tingling of hands and fingers, swollen glands, skinny arms and legs, shortness of breath at rest, burning with urination, vomiting, swollen feet, sore throat, loose stools, painful swallowing, day sweats, numbness/tingling of arms, blurred vision, chills, constipation, sores or lumps on genitals, heart racing, sore/bleeding gums, gas/bloating, rectal itching, prominent leg veins, nosebleed, wheezing, blood in spit/sputum, easy bruising, weight gain in stomach area, concern over weight gain, flushing, rectal bleeding, hump on back of neck/shoulders, seizures/tremors, breast pain/changes, rectal discharge and nipple discharge (Makoe, Seboni, Molosiwa, Moleko, Human, Sukati & Holzemer, 2005:26-28). Another study conducted amongst 64 HIV-positive South African patients provides evidence that the five most prevalent physical symptoms reported were localised pain (n= 57; 89%), fungal or yeast infection (n=52; 81%), forgetfulness (n=48; 75%), skin problems (n=46; 72%) and fatigue (n=42; 65%), while the five most prevalent psychological symptoms were decreases in sexual interest (n=56; 88%), feelings of anger (n=42; 66%), loneliness (n=32; 50%), nervousness and anxiety (n=32; 50%) and decrease in social activity (n=31; 48%) (Shawn, Campbell, Mnguni, Defilippi & Williams, 2005:16-19).

Human papillomaviruses are a very distinctive group of DNA viruses and more than 130 types of HPV have been identified to date while only one third cause anogenital, oral or laryngeal infections (Sinclair, Woods, Kirse & Sinal, 2005). Many types infect the skin, but about 30 types cause infection of genital and other squamous mucosal sites including the cervix, vagina, vulva, per-anal skin, nasopharyngeal, oropharyngeal and laryngeal mucosa (Jenkins, 2001:55).

Trichomoniasis, caused by the flagellated protozoan parasite *Trichomonas vaginalis*, is the most common non-viral, sexually transmitted infection (Radonjic, Dzamic, Mirovic, Arsenijevic, Popadic & Kranjic Zec, 2005). The disease shows a wide variety of symptoms and generally affects women. The infection affects the vulva, vagina, uterine cervix and secondarily the urinary tract (Radonjic *et al.*, 2005). Symptoms in women include vaginitis and acute inflammatory disease of the genital mucosa, a copious leukorrhoea yellowish-green (or variation of colour) frothy discharge

which may have a musty or fishy smell; the appearance of the vagina and cervix, termed some macular colpitis or strawberry cervix; abdominal pain; itching, soreness and inflammation in and around the vagina; or pain when passing urine or having sex (Simões-Barbosa, Lobo, Xavier, Carvalho & Leornadecz, 2005:108-109; Perkins, 2004). According to Perkins (2004), the symptoms in men include a thin, whitish discharge from the tip of the penis, pain or burning when passing urine, inflammation such as balanitis, balanoposthitis and physical findings of epididymitis and prostatitis.

2.4.2.1 WELLNESS BEHAVIOUR RISKS ASSOCIATED WITH SEXUALLY TRANSMITTED DISEASES

STDs in pregnant women can result in prematurity, stillbirth and neonatal infections, gonococcal ophthalmia (a disease that blinds) and congenital syphilis causing up to 25% of perinatal mortality in some developing countries (Memish & Osoba, 2006:87). An estimated 20%-40% of women diagnosed with Chlamydia Trachomatis and Neisseria gonorrhoea also experience pelvic inflammatory disease (PID), which can lead to the serious long-term sequelae of infertility, ectopic pregnancy or chronic pelvic pain (Risser *et al.*, 2005:163; Boyer, Shafer, Shaffer, Brodine, Pollack, Betsinger, Chang, Kraft & Schachter, 2005:421).

Pregnant women with gonorrhoea are at high risk of infection and transmitting the disease to the newborn causing gonococcal ophthalmia neonatorum (gonococcal conjunctivitis), a condition that may lead to blindness (Little, 2006:139; Einwalter, Ritchie, Ault & Smith, 2005:135). STDs are major causes of some acute and chronic illnesses such as infertility or ectopic pregnancy due to pelvic inflammatory disease, genital ulcerations and mutilation by lymphogranuloma venereum, gonococcal urethritis followed by urethral strictures and chronic liver disease caused by the Hepatitis B or C virus, genital cancer caused by papillomavirus and premature death from Human immunodeficiency virus (HIV) (Memish & Osoba, 2006:90). The Herpes simplex virus is related to typical clinical encephalitis/myelitis, meningitis and neurological conditions such as migraine with seizures or sudden deafness (Schoever, Fréchin, Fritsch, Freitag, Fuchs, Gut & Stoll-Keller, 2006:458).

The Human papillomavirus is linked to a variety of diseases such as genital or skin warts, cervical and oral cancer, vertical transmission from mothers to newborn babies that can cause papillomas of the larynx in the affected children and can lead to

different malignancies and miscarriages (Worda, Huber, Hudelist, Schatten, Leipold, Czerwenka & Eppel, 2005:440). Apart from causing cervical cancer, genital tract cancers in women (vaginal and vulvar cancers) and in men (penile cancer), anal cancer in both sexes as well as a subset of head and neck cancer, especially an oropharyngeal carcinoma of the tonsillar region, have been associated with HPV infection (Jenkins, 2001:55). According to Martin and Carrington (2005:510), Hepatitis B and C viruses may lead to chronic infection that causes cirrhosis, liver failure or hepatocellular carcinoma.

Trichomoniasis can lead to inflammatory small pelvic disease and reproductive dysfunctions; increase the risk of premature rupture of fetal membranes; result in low birth weight and increase infant mortality, as well as predisposing to Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS) and cervical cancer (Upcroft, Delgadillo-Correa, Dunne, Sturm, Johnson & Upcroft, 2006; Radonjic *et al.*, 2005; Boyer *et al.*, 2005:421). If HIV remains untreated, almost all infected persons will eventually develop Acquired Immunodeficiency Syndrome (AIDS), defined by opportunistic infection or severe immune dysfunction (U.S. Preventive Service Task Force, 2005:2289). In the 1980s and early 1990s, patients infected with HIV had a life survival of 1 to 7 years, but with new drug therapy HIV has become more of a chronic disease as opposed to the acute, life threatening condition it once was (Review of Optometry, 2005:62). Numerous studies have found that the perceived threat of AIDS has diminished among gay and bisexual men because of new kinds of HIV treatment and that men, both HIV-positive and HIV-negative, are more inclined to engage in unprotected receptive anal sex which espouses beliefs that the new kinds of HIV treatment reduce the risks of HIV infection (Peterson & Bakeman, 2006:38).

2.4.2.2 RISK REDUCTION INTERVENTIONS FOR SEXUALLY TRANSMITTED DISEASES

Robin, Dittus, Whitaker, Crosby, Ethier, Ches, Miller and Pappas-Deluca (2004:17) and DiClemente, Milhausen, Sales, Salazar and Crosby (2004:202-205) have found that most interventions to reduce HIV, STDs and pregnancy amongst adolescents were based on a number of theories such as Social Cognitive Theories, the Theory of Reasoned Action, the Self-regulation Model of Illness Behaviour, the Self-efficacy

Theory, the Theory of Gender and Power, the Information-motivational Behavioural Skills Model, the Social Science Theory, the Transtheoretical Model of Behaviour Change, the Health Belief Model, the Social Learning Theories and Social Influence Theories. A Cognitive-behavioural Theory, based on the information, motivation and behavioural skills model (IBM) are the primary determinant of STD preventive behaviour and the requisite skills to engage in preventative behaviours which include the ability effectively to communicate with one's sexual partner, to refuse to participate in unsafe sexual practices and to use condoms properly (Boyer *et al.*, 2005:422). Kalichman, Leickness, Simbayi, Cain, Jooste, Skinner and Cherry (2006:182) assert that HIV/STD risk reduction counselling in South Africa should encompass all elements of the IMB model and may be enhanced by addressing AIDS stigmas. Robin *et al.* (2004:18) have found that the contents of intervention programmes were diverse, ranging from volunteer work, career planning, parent education; condom use skills; information on HIV and STDs, pregnancy, violence prevention and sexuality information, communication skills, problem-solving and decision-making.

DiClemente, Salazar, Crosby and Rosenthal (2005:829-831) and DiClemente, Wingood and Crosby (2003:369-372) have classified five levels of STD risks reduction interventions such as individual-level behavioural programmes which emphasise motivational factors, provide skills training, including partner communication, sexual negotiation, resistance skills and condom application and attempt to modify peer norms. Relational level interventions directly address salient relational influences associated with STD risk and protective behaviours, while also transferring the burden to initiate STD-protective behaviours from one person to the dyad. Family level interventions typically promote increased communication between adolescents and parents about STD prevention. At community level, programmes are implemented with the aim of creating social norms that promote safer sex practices by creating an awareness of STD prevalence, influencing preventive behaviours (for example condom use and abstinence), promoting parent adolescent discussions, providing information about STD-related prevention services and changing perceptions of norms supportive of STD-preventive behaviours. Clinic-based screening programmes, sexual networks and enhancing social capital, defined as the levels of trust; reciprocity and connectedness to a social network are also examples of community interventions. At societal level, mass media campaigns can be an effective tool for reaching people, changing attitudes to promote safer sex practices and behaviour, while public health care policies should

ensure that everyone has access to and receive services for STD prevention, testing and treatment. The study by Manhart and Holmes (2005:15:18) identifies a number of clinical interventions to prevent or reduce sexually transmitted infections such as behavioural change, oral antimicrobial prophylaxis, STI vaccines or passive immunization, topical microbicides used intravaginally, male circumcision, suppressive antiretroviral therapy, risk-based screening, provision of male and female condoms, mixed modalities and syndromic or mass treatment.

Notwithstanding the different types and levels of intervention, DiClemente *et al.*, (2004:215) have identified a number of key characteristics of effective STD risk reduction intervention programmes such as providing timely and accurate information in clear and understandable language, developing and mastering social (for example sexual negotiation/communication) and technical competency (for example condom application) skills through observational learning and active learning techniques (for example role playing, preferably in a series of graded-intensity of high-risk situations), enhancing individuals' self-efficacy to communicate assertively and effectively with sex partners, motivating individuals to use newly acquired STD-prevention knowledge and risk-reduction skills and tailoring all the aforementioned messages and activities for the different genders and races. From an organisational behaviour perspective, organisations should conduct a risk assessment of sexually transmitted diseases and develop appropriate risk reduction interventions for employees as part of an overall wellness or employment assistance programme. Employees should be educated in the wellness risks associated with unsafe sex and should have access to screening, treatment and counselling services.

2.5 INTELLECTUAL WELLNESS

Intellectual wellness encourages continued learning, problem-solving and creativity. It involves improving writing and verbal skills; showing interest in scientific discoveries; keeping abreast of social and political issues and reading books, magazines and newspapers (Griffin, 2005). According to Myers, Sweeney and Witmer (2000:254), intellectual stimulation, including problem solving and creativity, is necessary for healthy brain functioning and hence quality of life across the life span. Paavola and Hakkarainen (2005:535) state that knowledge-intensive work requires that

individuals continuously surpass themselves, develop new competencies, advance their knowledge and understanding as well as produce innovations and create new knowledge.

Parker and Wall (quoted by Mikkelsen, Øgaard & Landsbergis, 2005:156) have identified five major changes in job content such as increased work interdependence, increased demands on operational knowledge, increased customer interface, increased demands on cognitive and abstract knowledge and increased demand on social competence. The human capital theory emphasises the importance of people as the repositories of knowledge and focuses on the investment in skills and education made by employees (Ratten & Suseno, 2006:61). Davis (2006:77-78) defines intellectual capital as consisting of three factors, namely, human capital involving all the individual capabilities, knowledge, skills and experiences of employees; structural capital that includes information systems, patents, intellectual property rights and processes such as quality assurance and customer care; while customer capital refers to the value of the relationship between the organisation and its customers. The top management team in any organisation is a crucial source of the organisation's success in terms of its strategic decisions and implementation. There are increasing intellectual demands on managers that necessitate opportunities for further personal growth and the acquisition of leading-edge skills, knowledge and competencies well beyond their earlier qualifications (Dealtry, 2005:77). Managers should acquire certain competencies, but to conceptualise competence is problematic.

Ruth (2006:212) is of the opinion that situational factors vary so much that it is impossible to make a generic list of managerial competencies that are relevant to most managerial positions. In spite of variances and emphases on different competencies, some generic competencies have been categorised in a number of competency models. According to Grzeda (2004:532), competence has been most commonly understood either as a combination of skills, knowledge and attitudes or as underlying characteristics of the individual that impact on individual performance. Managers should acquire competencies through training, life-long learning and different learning styles (Grzeda, 2004:539). Research findings by Carmeli and Tishler (2006:28-29) provide evidence that both intellectual abilities and human resource skills possessed by managers are important to organisational performance and that persuasiveness is the most critical skill of top managers, followed by administrative ability and fluency of speaking, diplomacy and tactfulness, knowledge about group tasks, creativity, social

skills and conceptual skills. Intellectual capital lies at the heart of what organisations do with their individual and collective intellectual labour, the underlying element behind which is an invisible ability to select or choose (Chaharbaghi & Cripps, 2006:39).

Garavan and McGuire (quoted by Viitala, 2005:439-442) have identified six clusters of managerial competencies, based on different competency models. Technical competencies, namely, those a manager needs in handling the contents of the process or functions he or she is responsible for such as finance and accounting, computing, engineering and chemistry. Business competencies are needed in management-related work in any business and include, for example, strategic perception; decision-making and board management; the ability to think in systems and knowing how to lead systems; as well as giving vision, meaning and direction of focus to the organisation; leveraging of internal and external resources to respond to customer needs; planning; monitoring budgets; forecasting costs and revenues; cutting costs; mapping out strategies; evaluating performance and writing reports. Knowledge management competencies require managers to be proficient in information handling on a personal level, as well as being capable in the management of information processing, as well as learning and development at the group and organisational level. Knowledge management competencies include, for example, information search; concept formation and conceptual flexibility; analytical understanding; complex problem-solving skills; solution construction skills; an understanding of learning, development and improvement; as well as facilitating and tutoring the learning of others. Leadership and supervisory competencies refer to a manager's capability to direct people, support people and allow people to participate, facilitate people and empower people. They also comprise the competencies needed in creating a common purpose with subordinates, managing diversity, supporting creativity and creating a sense of community. Social competencies refer to coping with the manager's social relations and include the ability to build and maintain relationships with different stakeholders by understanding people and their behaviours, communication and interacting with others, motivating people, handling conflicts and influencing skills. Social or interpersonal skills have been categorised into four components: a disposition to put oneself in the place of the other person, the skill to get it right when one tries to anticipate the other person's expectations, the skill to incorporate the information about the other person's expectations into one's subsequent behaviour and self-control to stay focused on the other person's expectations. Intrapersonal competencies are embodied in the

manager's personality and are associated with the trait approach to leadership, along with traits, the social role, self-image, motives and values. The most important capabilities are self-confidence, proactive orientation and achievement orientation, social judgement skills, conflict resolution skills, as well as tolerating and mastering uncertainty. Intrapersonal competencies contain three main components, namely, core self-esteem, attitudes towards authority and self-control. Yang, Wu, Shu and Yang (2006:67-68) devised the process-oriented core competency identifying model that includes 22 competency items such as problem-solving, global vision, sense of safety and environment protection, planning, innovation, customer focus, adaptability to change, team-building, communication, leadership, cultivating the subordinates, coaching, proactive action, IT skills, quality management, self-management, emotion management, learning ability, business negotiation, decision-making, organising resources and domain knowledge.

In addition, managers in higher education institutions, as learning organisations, need competencies such as leadership, team development, cultural proficiency, knowledge management, strategic thinking and planning, ethical decision-making, learning how to learn and community development in order to facilitate organisational change through transformational management (White & Weathersby, 2005:295). According to Merrick (2002:2), Kacena (2002:21–23) and Birchfield (2001:37–39), managers should acquire competencies such as pathfinding, aligning, empowering, communication and interpersonal skills, ethical or spiritual orientation, the ability to manage change, the ability to motivate, analytical and problem solving skills, being a strategic/visionary manager, persisting in overcoming difficulties, managing the knowledge worker, working hard, being passionate about work, managing diversity, retaining employees and negotiation and persuasion skills.

2.5.1 WELLNESS BEHAVIOUR PROBLEMS ASSOCIATED WITH THE LACK OF INTELLECTUAL DEVELOPMENT

The Job Demand Control Model postulates two psychological work characteristics that determine health and well-being, namely, job demands (pace, amount of work and work complexity) and control that consists of decision authority or autonomy and skills discretion or utilisation (van der Hulst, Veldhoven & Beckers, 2006:12). Therefore, in the Job Demands Control Model, decision authority and learning

opportunities are part of the control concept. Mikkelsen, Saksvik, Eriksen and Ursin (1999:22) illustrate the relationship between decision authority and learning opportunities as follows: high levels of decision authority and high levels of learning opportunities may make the individual feel in control of the learning process and are conducive to higher-level learning and participation-based development. By contrast, low levels of decision-making authority and low levels of learning opportunities may result in a situation of routine work, low task variety, no influence on how and when to do the job, problems that have already been defined, new learning based on predetermined instructions, single loop learning and a potential loss of skills. In situations with high learning opportunities and low-level decision authority, the employees are trained and developed, but there is still management control of the learning process. If decision authority is high and the opportunities to learn low, a situation may arise, that is characterised by a lack of challenge and boredom. Jobs with cognitive decision or learning demands may be related to job stress and health complaints such as pseudoneurological problems (sadness, depression, anxiety, sleep problems, tiredness and dizziness), muscle pains, cold or influenza, allergy and gastrointestinal problems (Mikkelsen *et al.*, 2005:155-163).

The research findings from van der Hulst *et al.* (2006:14) indicate that overtime and long working hours were associated with high demands and high control jobs with employees reporting a higher pace and amount of work, a higher emotional load and more skills variety. The long working hours were associated with adverse health consequences such as cardiovascular disease, diabetes, poor physical health, fatigue, short sleeping hours, high heart rate, high blood pressure and decreased immunity. Research findings by Taris, Kompier, De Lange, Schaufeli and Schreurs (2003:15) confirm the beneficial effects of high job control on learning behaviour, but revealed negative effects of job demands on learning, such that higher levels of job demands were associated with lower levels of learning. Strain inhibits learning and the adverse effects of excessively high demands on learning can be set off by increasing job control and at the same time prevent excessive job demands as far as possible (Taris *et al.*, 2003:17-18). A lack of employee development can contribute to a skill depletion that may lead to employee dissatisfaction, poor motivation, little commitment and a loss of productivity due to a non-optimal utilisation of knowledge, skills and abilities (Bhattacharya & Wright, 2005:935).

High levels of skills utilisation contribute strongly to job-related affective well-

being and mental health while skills underutilisation result in lowered self-esteem, discouragement, futility and feelings of failure and inferiority, depression, decrease in organisational commitment, increased stress and lowered self-efficacy (Morrison, Cordery, Girardi & Payne, 2005:61-62). Rau (2006:174) provides evidence that health is associated with learning opportunities at work. Her findings revealed that more learning opportunities at work resulted in stronger proportional reduction in heart rate at night; while participants with high learning opportunities had a significantly lower risk of being nondippers (dippers were participants with healthy blood pressure recovery, while nondippers were those with nonhealthy recovery) than those with low learning opportunities. People without learning opportunities had high strain levels associated with elevated blood pressure, heart rate and delayed recovery. The results also showed that with high job demands the risks of not being able to relax increased. The more learning opportunities the job had, the higher the rating of vocational success.

2.5.2 INTELLECTUAL DEVELOPMENT INTERVENTIONS

Pfeffer (2005:100-101) is of the opinion that organisations may produce sustainable competitive advantage through training and skills development, as well as with cross-utilisation and cross training of managers. Lee and Bruvold (2003:983) state that the investment in employee development means equipping employees with new skills and knowledge that will enable them to anticipate and be ready for new job requirements. Competence is shown when employees have the right type and levels of skills, abilities, knowledge, experience and proven competence to meet specific job requirements and performance standards (Smith, 2005:9). Investments in employee development have a beneficial impact on productivity, financial performance and competitive advantage; enhance employee retention and morale as well as employee empowerment (Lee & Bruvold, 2003:983). To create a climate of learning, managers should exercise symbiotic leadership in which they help their subordinates set mutually beneficial goals, provide a forum to achieve them and to undertake key activities such as showing role modelling behaviours, providing learning opportunities; building learning into organisational processes and acting as a learning champion (Van der Sluis, 2004:11). Van der Sluis (2004:11-12) also recommends project based-learning; challenging work environment (high level of responsibility, new tasks and working in teams); establishing linking mechanisms such as joint problem-solving teams or matrix organisations, committees and task forces, project managers and formal meetings;

creating a strong egalitarian learning culture and changing the organisational structure, strategies and practices.

Management training is one of the most effective ways to develop the core competencies of managers and a distinction can be made between formal training where learners are removed from the day-to-day work to engage in lectures, discussions, simulation, role plays and other instructional activities and informal learning that includes strategies such as self-directed learning, networking, coaching, mentoring, performance planning systems that are used for developmental purposes and trail-and-error (Terrion, 2005:184). Longenecker and Fink (2006:16-18) maintain that management training sometimes fails due to various reasons such as that management training is not a top management priority; unwillingness to take time to train/educate; over-reliance on trail-and-error learning; organisations assume that managers are already competent; accept no accountability for training and development; reluctance to spend money; no formal training process; believing that training is solely the manager's responsibility; failing to clarify the skills set needed for managerial job success and a lack of qualified trainers.

Shefy and Sadler-Smith (2006:370-373) postulate that holistic principles should be applied in management development. The following six principles include quieting in mind by emptying the mind and by letting-go of any tension or doubt, fear or expectation; harmony and balance between Yin and Yang and other opposites in life; relinquishing the desire to control by recognising that chaotic systems cannot be controlled or manipulated and acceptance of the lack of control; transcending the ego means the wisdom of self-awareness and identifying your own strengths and weaknesses; centeredness means creating a balance and harmony which allow for flexibility and emotional control and lastly, the power of softness towards employees and clients.

Fuller and Unwin (quoted by Lynch, Leo & Downing, 2006:16) propose five models of learning in the workplace such as the Transmission Model where workplace experts pass down their learning to subordinates; Experiential Learning that regards learning as an informal process that takes place for individuals through their experiences of work; the Communities of Practice Model that places informal learning in its social settings of work relationships and group dynamics such as small group activities and projects; the Competence or Outcomes-based Approach that encapsulates the national qualifications framework (NQF) and employment focussed

learning. In addition, the Activity Theory recognises the benefit of academic learning and the importance of the organisational context. Large numbers of professional managers are returning to higher education institutions to seek new careers or to refresh their skills and knowledge. To accommodate these professionals, universities have turned to problem-based learning that applies methods that develop creative and independent problem-solvers that are able to enhance their creativity through organising and planning as well as fostering learning, encouraging participative, cooperative, reflective and informed engagement of students (Fenwick, 2002:6-7). Jamali (2004:111) recommends action learning that involves a group of managers, offering mutual support, criticism and questioning in order to suggest solutions to individual management problems; organisationally based projects and consultancy assignments. Turner, Mavin and Minocha (2006:400-401) and Call (2005:21) distinguish between different individual learning levels such as a not learning level that takes place when individuals are isolated, fail to receive feedback on their actions and fail to receive and/or process new information. Single loop learning describes a process where errors are detected and corrected in a continuous improvement process, but the individual does not challenge the way things are done in the organisation and is, therefore, counter productive while double loop learning entails individuals questioning and challenging the success recipes of the organisation, which enable risk-taking and resultant learning. Double loop learning contributes to the development of the individual, norms, policies, objectives, ad hoc cognitive strategies, attitudes, creativity and transformation of the organisation. Deutero learning refers to an organisation's capacity for learning and a strategically potent organisational process that can positively influence the management of technology, employee effectiveness and the intelligence of the organisation (Templeton, Morris, Snyder & Lewis, 2004:270).

From a human resource management perspective, findings from López, Peón and Ordás (2006:231:232) clearly indicate a positive relation between selective hiring and organisational learning. Organisations should match new employees to their requirements and attract people with creative ideas and the willingness to learn. Their research also indicates that strategic training plays an important role in maintaining and developing capabilities and confirms that employee participation is an important element in learning organisations. To retain critical skills, competencies, knowledge and to prevent skills obsolescence, human capital loss and loss of productivity, organisations should create a greater number of growth and learning opportunities through practices

such as training for new or upgraded skills, fostering learning, selectively in recruitment for broad-based learning and skill-based compensation plans, competitive pay, employee stock options, participation programmes, voice mechanisms, attractive benefits, job rotation, team-based work and performance-based incentive plans (Bhattacharya & Wright, 2005:939-944). Selective recruitment should focus on identifying specific qualities in people such as self-efficacy, thus identifying people who know that they have the ability to do a job or to reach a specific performance level; emotional intelligence which is a good predictor of personal and professional success and achievement motivation as well as a desire for competence or mastery (Smith, 2005:15-16). To stay relevant for the changing needs of the labour market managers should take care of their personal health, safety and fitness; create a personally satisfying work-life balance; be actively involved in life-long learning; use opportunities for personal learning and development; be curious, communicate and share experiences and use modern IT for knowledge sharing and learning (Litschka, Markom & Schunder, 2006:171).

2.6 OCCUPATIONAL WELLNESS

Leafgren and Elsenrath (1986) defined occupational wellness as the preparation for work in which an individual will gain personal satisfaction and find enrichment in one's life through work. For the purpose of this study, the focus will be on two themes related to occupational wellness, namely, job satisfaction and work-life balance. Job satisfaction is an attitude people have towards their jobs, the results from their perception of their jobs and the degree to which there is a good fit between the individual and the organisation (Ivancevich & Matteson, 2002:121). Job satisfaction has been found to have a significant, beneficial relationship with factors such as hardiness, commitment, challenge, change, less stress, less anxiety, fewer physical symptoms, finding meaning in life, longevity and greater productivity (Witmer & Sweeney, 1992:144). Work Life Balance (WLB), from an employee perspective, is the maintenance of a balance between responsibilities at work and at home (De Cieri, Holmes, Abbott & Pettit, 2005:90).

Work is an important source of people's well-being. According to Brewer (2001), work is something produced or accomplished by effort, exertion or exercise of skill or

creative talent and is energy expended for productive use. The meaning of work is determined by the choices and experiences of individuals and by the organisational and environmental context in which they work and live (MOW - International Research Team, 1987). The MOW Model portrays the meaning of work in terms of the following six dimensions: work centrality, entitlement norm, obligation norm, instrumental orientations, intrinsic orientation and interpersonal relations (MOW - International Research Team, 1987). Work centrality refers to the degree of general importance that working has in one's life at any given time. Individuals with high work centrality seem to be more committed to their organisations and derive purpose and contentment from their jobs (Harpaz, 2002:178). Entitlement norms represent the underlying rights of individuals and the work-related responsibilities of society and organisations to all individuals. An obligation norm represents duties individuals have to their organisations and to society (Harpaz, 2002:179). According to Harpaz (2002:180), if a society generally holds positive norms and attitudes towards work, work would tend to be central and highly cherished and it would be considered as a deviation from the norm to stay away from work, or not actively seek employment. Instrumental orientation means that individuals work for, are motivated by and enjoy obtaining the instrumental aspects of their work context. According to the MOW - International Research Team (1987), the most important role of work is that of providing income for sustaining life and fulfilling other important needs. Intrinsic work aspects such as an interesting job, variety, autonomy, challenging work and job-ability match are important for the development of a strong job involvement or work centrality among employees (Kanungo and Pinder as quoted by Harpaz, 2002:180). Harpaz (2002:180) is of the opinion that satisfaction from interpersonal contacts and the need for belonging are fulfilled in work settings and through continued work involvement, rather than away from work. It therefore seems that individuals will prefer to continue working in order to realise their need for social interaction, rather than relinquish working even if there were no economic necessity for working. In the Meaning of Work (MOW) project, an eight-country comparative study conducted in the early 1980s, respondents from Japan and Yugoslavia ranked work as their most important life aspect, taking precedence over family, leisure, community and religion. In the other six countries, namely, Belgium, Britain, Germany, Israel, Netherlands and United States of America, work was ranked second only to family (MOW - International Research Team, 1987). A second examination of the meaning of work in Belgium, Germany, Israel, Japan and the United States of America carried out in

the late 1980s and 1990s showed a similar pattern, work was ranked second in importance following family in all countries except Germany where leisure was second to family and work was third (Harpaz & Fu, 2002:640).

Engagement of work was conceptualised by Kahn (as quoted by May, Gilson & Harter, 2004:12) as the harnessing of organisational members' selves to their work roles. In these engagements, people employ and express themselves physically, cognitively and emotionally during role performances while disengagement can be regarded as the decoupling of the self from the work role and involves people withdrawing and defending themselves during role performance. It may lead to apathetic behaviour. It is important for managers to cultivate engagement because alienation may result in a lack of commitment and motivation while meaningless work is associated with apathy and detachment from one's work. Providing meaningful work enhances personal motivation and personal growth. Research has indicated that engagement in meaningful work leads to potential benefits such as lower employee turnover, customer satisfaction as well as loyalty, safety, productivity and profitability (May, *et al.*, 2004:13). In addition, work engagement promotes the well-being and work behaviour of an employee for several reasons such as work engagement is a positive work experience in itself, related to good health and positive work effects. It helps individuals to derive benefits from stressful work; is positively related to organisational commitment and is expected to affect employee performance (Sonnetag, 2003:518). Kahn (as quoted by May *et al.*, 2004:13-14) formulated a theoretical framework of the psychological conditions for engagement, namely, meaningfulness, safety and availability. Psychological meaningfulness is the value of a work goal or purpose, judged in relation to an individual's own ideals or standards (Hackman & Oldham, 1980). There are three dimensions that influence psychological meaningfulness, namely, job enrichment, work fit role and co-worker relations. The characteristics of an individual's job could influence the degree of meaningfulness an employee experiences at work. According to the Job Characteristic Model, employees exhibit positive personal and work outcomes (internal work motivation, general job satisfaction, growth satisfaction and work effectiveness) if they experience three psychological states, namely, they perceive their work as meaningful, experience responsibility for the results of their work and have knowledge of the results of their work. These are enhanced by the presence of five specific job characteristics, namely, skill variety, task identity, task significance, autonomy and feedback (Boonzaier, Ficker & Rust, 2001:12).

The Job Characteristic Model attempts to explain the interrelationship between certain job characteristics, psychological states, job outcomes and moderator variables. According to Hackman and Oldham (1980), the model refers to internal work motivation as the extent to which the employee is self-motivated to perform effectively on the job, that is, the employee experiences positive internal feelings when performing effectively on the job and negative internal feelings when doing poorly. General job satisfaction refers to the degree to which an individual is satisfied with the opportunities for growth in the job. Experiencing meaningfulness in the work refers to the degree to which the employee experiences the job as generally meaningful, valuable and worthwhile. Experiencing responsibility for work outcomes is defined as the degree to which the employee feels accountable and responsible for the results of the work he or she is doing. Knowledge of results is the degree to which the employee knows and understands, on a continuous basis, how effectively he or she is performing on the job. Skills variety refers to the degree to which the job requires a variety of different activities in carrying out the work, which involves the application of a number of different skills and talents of the employee. Task identity is defined as the degree to which a job requires completion of the whole and identifiable piece of work, in other words, doing the job from the beginning to end with a tangible outcome. Task significance represents the degree to which the job has a substantial impact on the lives or work of other people, whether in the immediate organisation or in the external environment. Autonomy represents the extent to which the job allows substantial freedom, independence and discretion in scheduling the work and determining the procedures to be used in carrying it out. Feedback refers to the extent to which performing the work activities required by the job results in the employee obtaining direct and clear information from the job about the effectiveness of his or her performance. In terms of the moderator, variables growth-need strength refers to workers' needs for personal accomplishment, for learning and for developing themselves beyond where they are at present. Pay satisfaction refers to the degree of satisfaction with basic compensation and benefits, as well as satisfaction with the extent to which the organisation's compensation relates to the individual's contribution to the organisation. Security satisfaction is the degree of satisfaction with the amount of general security experienced, as well as with the prospect of future security. Co-worker satisfaction reflects the degree of satisfaction with other workers with whom contact is made in the work situation, as well as satisfaction with opportunities to get to know and to help other people. Supervision satisfaction

refers to the degree of satisfaction with the treatment, support and guidance received from supervisors, as well as the degree to which the general quality of supervision is considered satisfactory. Knowledge and skills as a moderator are not specifically defined, as they are unique to particular work settings. Finally, implementing the Job Characteristic Model in a particular situation begins with a study of existing job perceptions by means of the job diagnostic survey (Ivancevich & Matteson, 2002:249).

The enrichment of the five core job dimensions of the Job Characteristic Model of Hackman and Oldham (1980) can influence the meaningfulness experienced by employees. According to May *et al.* (2004:15), research indicates that work roles that are aligned with individuals' self-concepts can be associated with a more meaningful work experience, while individuals who have rewarding interpersonal interactions with their co-workers experience greater meaning in their work. According to Kahn (as quoted in May *et al.*, 2004:15), psychological safety is defined as feeling able to show and employ oneself without fear of negative consequences to one's self-image, status or career. The determinants of psychological safety include supervisory relations, co-worker relations and co-worker norms. According to May *et al.* (2004:16-17), the relation with one's supervisor can have a dramatic impact on an individual's perception of the safety of a work environment, while interpersonal relations amongst employees who are supportive and trusting should promote psychological safety since organisational and group norms tend to govern behaviour, attitudes and the emotional dimensions of work. According to Kahn (as quoted in May *et al.*, 2004:17-18), physiological availability is defined as an individual's belief that he or she has the physical, emotional or cognitive resources to engage the self at work. Factors that may influence such beliefs include the individual's resources such as physical, emotional and cognitive demands, work role security and outside activities such as membership of outside organisations.

There is a link and positive relationship between job characteristics, personality traits and job satisfaction. Personality factors can be reduced or categorised under the umbrella of a Five-factor Model of Personality. The Big Five Factors are summarised by Barrick and Mount (as quoted by de Jong, van der Velde & Jansen, 2001:350) as: agreeableness (being flexible, trusting, good-natured, cooperative and tolerant); conscientiousness (being careful, thorough, responsible and organised); extroversion (being sociable, gregarious, assertive, talkative and active); emotional stability or neuroticism (associated conversely with being anxious, depressed, angry, embarrassed, worried and insecure) and openness to experience (being imaginative, curious, original,

broad-minded and intelligent).

According to de Jong *et al.* (2001:350-351), research has indicated that conscientiousness is related to performance in different jobs, while openness to experience is related to performance only in training situations; conscientiousness and extroversion appear to be depending on autonomy and the more autonomy, the stronger the relation. Agreeable persons are cooperative (trusting of others and caring) as well as likeable (caring, good-natured, cheerful and gentle). Conscientiousness is manifested in three related facets, namely, achievement orientation (hardworking and persistent), dependability (responsible and careful) and orderliness (planful and organised) and is related to an individual's degree of self-control, as well as need for achievement, order and persistence (Judge, Higgins, Thoresen & Barrick, 1999:623-625). Extroverts tend to be socially oriented (outgoing and gregarious), but also surgent (dominant and ambitious) and active (adventuresome and assertive). Extroverts are related to positive emotions and are more likely to take on leadership roles and to have a greater number of close friends (Watson & Clark, 1997). Neuroticism refers to a lack of positive psychological adjustment and emotional stability. Costa and McCrae's (as quoted by Judge *et al.*, 1999:624) measure of the Big Five Traits breaks up neuroticism into six dimensions, namely, anxiety, hostility, depression, self-consciousness, vulnerability and impulsiveness. Individuals, who score high on neuroticism, are more likely to experience problems such as negative moods (anxiety, fear, depression and irritability) and physical symptoms (Judge *et al.*, 1999:624). Openness to experience is characterised by intelligence (philosophical and intellectual) and unconventionality (imaginative, autonomous and nonconforming) (Judge *et al.*, 1999:624).

Research also suggests that a broad personality trait, termed core self-evaluation, is a significant predictor of job satisfaction. Judge, Erez, Bono and Thoresen (2003) regard core self-evaluation as a broad, latent higher-order trait indicated by self-esteem (the overall value that one places on oneself as a person), generalised self-efficacy (an evaluation of how well one can perform across a variety of situations), neuroticism (the tendency to have a negativistic cognitive/explanatory style and to focus on the negative aspects of the self) and locus of control (beliefs about the causes of events on one's life while locus is internal when individuals see events for being contingent with their own behaviour).

There is a relationship between job satisfaction and organisational commitment. Jernigan, Beggs and Kohut (2002:564) contend that commitment represents both an

attitude that describes the individual's linkage to the organisation and a set of behaviours by which individuals manifest that link. Research suggests that organisational commitment can have a beneficial impact on organisations such as reduced turnover, lower absenteeism and increased productivity (Jernigan *et al.*, 2002:564). Meyer and Allen (1997:11) have identified three components of commitment, namely, affective commitment that refers to the individual's attachment to, identification with and involvement in the organisation; continuance commitment that refers to an awareness of the cost associated with leaving the organisation and normative commitment that reflects a feeling of obligation to continue employment. According to Meyer and Allen (1997:11), employees with a strong affective commitment continue employment with an organisation because they want to do so, while employees whose primary link to the organisation is based on continuance commitment remain because they need to do so. Employees with a high level of normative commitment feel that they ought to remain with the organisation.

For an occupation to be experienced as meaningful, it should be attached to some kind of value such as a concrete value, symbolic value or self-reward value. Concrete value refers to concrete and tangible features of occupations such as when the outcome is a product that brings satisfaction to the worker or a newly learned skill, symbolic value is characterised by what an occupation signifies to an individual, while in a self-rewarding occupation an individual chooses to perform because he or she simply enjoys doing it (Eklund, 2004:137). When a workplace is designed and managed to create meaning for its workers they tend to be healthier and happier than when the opposite happens. This ultimately leads to higher productivity. Being happy and positive in one's outlook on work and life, leads to a healthier and longer life. To find real happiness in life individuals must be happy at work. This idea is linked to Aristotle's argument that human living is best characterised as a longing and desire for some good life. People can achieve the good life if they work for good organisations. Happiness is a holistic ideal that can be derived from three key defining characteristics, namely, freedom where happiness results from an individual's ability to make choices and is given a great deal of autonomy and discretion; knowledge that indicates that happiness requires information, knowledge and the ability to reason. They need to know how to make intelligent decisions by means of practical reasoning. To facilitate these, organisations should focus on communication, education and training and virtue. Happiness requires moral character and ethical decisions while good decisions in turn

result in authentic and justifiable pride, self-esteem, self-respect, self-approval, self-admiration and self-actualisation that are essential for reducing the negative impact of stress, enhancing coping abilities and promoting a strong sense of self-efficacy (Gavin & Mason, 2004:388-399). Happiness or physiological well-being is a subjective experience in the sense that people are happy to the extent that they believe themselves to be happy. Happiness includes both the relative presence of positive emotions and the absence of relative negative emotions and is a global judgement that refers to one's life as a whole (Wright & Cropanzano, 2004:341). Happiness increases overall job performance, for example one study involved MBA student participants, showed that a high degree of well-being is revealed by superior decision-makers who demonstrated better interpersonal behaviours and received higher overall performance ratings than those possessing a low degree of happiness. Positive emotional interest fosters the desire to assimilate new experiences, to encounter new information, to grow and to create an urge to play and think creatively outside the box (Wright & Cropanzano, 2004:341). Positive emotion benefits the individual by creating an urge to explore, take in new information and expand oneself while at organisational level it can facilitate meaningful interpersonal encounters that may result in enhanced social connections and team-building behaviour. Individuals who see positive meaning in their work tend to view their jobs as a calling.

Positive psychology has emerged to help individuals find genuine happiness in their everyday lives by not wasting their lives dreaming of something that they may never achieve, but to focus on prevention on three levels, namely, subjective experiences (feelings) such as well-being, contentment and satisfaction, hope and optimism and energy flow and happiness; individual traits such as the capacity to love and vocation, courage, interpersonal skills, aesthetic sensibility, perseverance, forgiveness, originality, future mindedness, spirituality, talent and wisdom and organisation levels which are about civic virtues that move individuals to practice better citizenship such as responsibility, nurturance, altruism, civility, moderation, tolerance and work ethics (Gavin & Mason, 2004:389). Wright and Cropanzano, (2004:346-347) are of the opinion that a happy work force can be built by composition or selection which focuses on selecting and placement of people into appropriate positions, training such as stress management, constructive self-talk, cognitive restructuring techniques; while situational engineering involves interventions to change the work environment flexi time, childcare programmes and family-friendly policies, work attitude (commitment) and

dealing with work related stress.

The United Kingdom's Department of Trade and Industry (as quoted by Maxwell, 2005:179) defined work-life balance as being about adjusting working patterns regardless of age, race or gender, [so] everyone can find rhythm to help them combine work with their other responsibilities or aspirations, while Sturges and Guest (2004) define work-life balance as satisfaction and good functioning at work and at home with a minimum of role conflict. Finally, the SHRM Research Quarterly (2003:2) regards work-life balance as a state of equilibrium in which the demands of both a person's job and personal life are equal. Meeting employee work-life balance is a strategic imperative for organisations to attract and retain talent. According to Greenblatt (2002:178-179); Maxwell and McDougall (2004:378-381); De Cieri *et al.* (2005:92-93); Maxwell (2005:180-181) and Burke (2000:81), the key influences behind the need for work-life balance include economic and political changes; increasing proportion of women, dual earner couples and single parents in the workforce; changing employee perceptions of work whereby employees, especially Generation X, have a desire to have a harmonious balance between career, family life and leisure activities; changes in technology have also been a driver in the expansion of 24x7 business and long working hours, while simultaneously enabling a more flexible approach to when and where work should be carried out; the introduction of models of flexibility such as the Atkinson's Model of the flexible firm to facilitate flexible working hours and lastly, globalization has caused heightened competition between organisations and as a result, employees are experiencing increasing performance pressures and longer working hours.

Life balance and imbalance usually refer to work and family, but other dimensions including social interactions and friendships, physical and emotional health and fitness, spirituality, intellectual enrichment and community involvement can be added to the balance mix, all of which make it difficult to provide a comprehensive theoretical definition of the two concepts (Stoner, Robin & Russel-Chapin, 2005:339). Greenhaus, Collins and Shaw (2003:513) define work-family balance as the extent to which an individual is equally engaged in and equally satisfied with his or her work role and family role and propose three components of work-family balance, namely, time balance, an equal amount of time devoted to work and family roles; involvement balance, an equal level of psychological involvement in work and family roles and satisfaction balance, an equal level of satisfaction with work and family roles.

The key to work-life balance employment terms is a range of flexible work

arrangements framed in policies and procedures, such as part-time working, temporary working, job sharing, home and teleworking, flexi-time and flexible work hours, compressed working weeks, annualized hours, career breaks and outsourcing (Maxwell & McDougall, 2004:378). According to Maxwell and McDougall (2004:378), the term work-life balance includes a number of aspects such as, how long people work (flexibility in the number of hours worked); when people work (flexibility in the arrangement of hours); where people work (flexibility in the place of work); developing people through training so that they can manage the balance better; providing back-up support and breaks from work. Maxwell and McDougall (2004:381-382) and the SHRM Research Quarterly (2003:6-7) state that there are a number of organisational benefits of work-life balance, namely, improved retention and recruitment; easier service delivery; enhanced quality service; decreased staff turnover and absenteeism; enhanced employee capability; employee flexibility and skills to succeed in rapidly changing markets and decreased health care costs and stress-related illnesses. At the individual level the potential benefits of work-life balance include aspects such as less role conflict for working mothers and carers, more quality time with dependants; maximization of employees' control over their lives; happier staff; improved productivity; motivation and commitment (Maxwell & McDougall, 2004:382-383).

The study by Hyman and Summers (2003:420) identifies seven principle work-life balance obstacles and deficiencies facing employees and employers. They are uneven adoption of formal written WLB policies. The existence of these policies are closely related to the type, culture and size of the workplace in which employees are located. A lack of formalisation indicates that many policies are informal and unwritten, under direct control of line managers, many of whom are untrained and lack awareness and understanding of family-friendly and work-life balance issues. Individuals have little voice individually and collectively, in establishing, implementing and influencing policies in the workplace. Business pressure influences employers to introduce WLB for competitive reasons such as being a tool to retain and attract the best employees. Temporal flexibility of working time has had little impact on working hours. WLB is interpreted and implemented by employers through temporal adjustments, such as flexi-time while evidence indicates that actual working hours are increasing rather than decreasing. The persistence of the second shift for women indicate that significant numbers of them return home exhausted, can suffer impaired sleep, worry about work and are generally stressed.

2.6.1 WELLNESS BEHAVIOUR RISKS ASSOCIATED WITH WORK-LIFE IMBALANCES

Work-life conflict is defined as a form of inner role conflict in which the role pressures from the work and other life domains, such as family, are mutually incompatible in some respects, whereby participation in one's role is made more difficult by virtue of participation in the other (De Cieri *et al.*, 2005:91). Conflict between an individual's work responsibilities and family responsibilities can significantly affect all aspects of the individual's life. As the amount of work-family conflict that an individual is experiencing increases, his or her job satisfaction and life satisfaction drop and these individuals report lower levels of general happiness and subjective well-being, increase psychological distress levels, higher levels of depression and alcohol abuse, less commitment and decreased levels of attachment, higher intentions to leave their current organisations, increased reports of actual turnover, lower levels of marital satisfaction, increased instances of divorce, parental problems such as juvenile delinquency and violence and increased stress and tension (Quick, Henley & Quick, 2004:427; Grant-Vallone & Ensher, 2001:263). Work-life imbalances may lead to increasing levels of stress that in turn, rapidly lead to low employee morale, poor productivity and decreasing job satisfaction. Butler, Grzywacz, Bass and Linney (2005:156) provide evidence that on days of high work stress, individuals were more likely to experience parent-child conflict, emotional withdrawal from children, emotional withdrawal from one's spouse and more marital conflict. In addition, the negative symptoms of work-life imbalances include aspects such as the abuse of sick leave, cheating, chronic absenteeism, distrust, embezzlement, organisational sabotage, tardiness, task avoidance, violence in the workplace, depression, alcohol and drug abuse, marital and financial problems, compulsive eating disorders and employee burnout (SHRM Research Quarterly, 2003:4).

The 24-7 Work-Life Balance survey conducted amongst employees in the United Kingdom in 2004 indicated that expanding workloads and the inability to cope are endangering their health. The forms of illness reported include fatigue (66.3% of the respondents); sleeplessness (60.8%); increased irritability (58%); headaches or migraines (47.8%); depression (44%); concentration problems (44.3%) and anxiety or panic attacks (31.8%) (Hurst & Baker, 2005). When long working hours, job involvement

and high performance are taken to the extreme, these behaviours can become destructive. For example, workaholics often suffer from chronic fatigue, obsessive worry, short temper, poor communication, insomnia and mood fluctuations that may all negatively affect their performance at work (Quick *et al.*, 2004:435). As Stoner *et al.* (2005:341-343) report, there are certain cues indicating personal imbalances and their assessment of managers has led to five categories of cues. These are inner emotional tension which manifests in stress, anxiety and lack of inner peace; general moodiness which has a behavioural impact such as worrying; a myopic focus which often manifests as a tendency to disengage interpersonally and to become overwhelmed with the amount of work; frustration and anger which manifest in being quick tempered which elevates the potential for conflict and physiological responses such as sleep difficulties, poor nutrition habits and stop exercising. Employee work-life imbalances may lead to poor performance, stress, job insecurity and declining loyalty (Maxwell, 2005:182).

2.6.2 WORK-LIFE BALANCE INTERVENTIONS

An organisation's need to attract and retain valued employees in a highly competitive labour market is a strong motivating factor for increased awareness and action with regard to human resource policies and practices that address work-life balance. Work-life strategies or interventions have been defined as those that enhance the autonomy of workers in the process of co-ordinating and integrating work and non-work aspects of their lives (De Cieri *et al.*, 2005:90). According to De Cieri *et al.* (2005:94), the most important organisational strategies or interventions include aspects such as part-time work, study leave, flexible starting and finishing times, work from home on an ad hoc basis, job sharing, rostered days off, paid parental leave, flexi-time, using flexi days or rostered days off as half days, telecommuting, 48/52 working year, career break and compression of work week. Other strategies include special shift arrangements such as shift swapping, non-standard working weeks, compressed working hours, voluntary reduced hours, term time and variable hours working, emergency leave, public/community service leave, a maternity phase back, sick children leave, child care arrangements, employee assistance programmes, health promotion, winding down to retirement, cafeteria benefits and holiday banking (Maxwell, 2005:181-184).

However, De Cieri *et al.* (2005:93) identified some obstacles to the implementation of WLB strategies such as an organisational culture which emphasises and rewards long hours and high organisational commitment (to the neglect of other life commitments); an isolated, hostile and unsupportive working environment for employees with life commitments external to the organisation; attitudes and resistance of supervisors and middle management; preference of senior management involved in recruiting to deal with people perceived as similar to them and lack of communication and education about WLB strategies and interventions. To prevent the destructive consequences of work-life imbalance, Stoner *et al.* (2005:343-345) recommend a three-step balance decision process for managers. First, managers should step away or disengage, for example by taking time away from work or engaging in physical activities such as running, yoga or aerobics. The second part of the balance decision process is to prioritise by considering what is important in their lives, as well as the degree to which these assumed priorities were being met. To gain perspective, managers may focus on two or more balance anchors such as personal spirituality and family. The third step is to redirect one's focus and energies by taking a conscious choice to take action to address the imbalance and realise that it is your personal responsibility and commitment for redirecting priorities.

The study by Drew and Murtagh (2005:275-277) identifies six strategies to improve WLB such as establishing good practice by exercising top management leadership support that is demonstrating acceptance of WLB. Review WLB policies, practise and create an awareness amongst staff of what is available and how to avail themselves of the options. Challenge the prevalence of long hours, for example, reduce the number of and time allotted to meetings, schedule meetings to be conducted within core hours, make some days meeting-free to facilitate managers/staff who work from home/or part-time, pilot working from home/compressed hours and support time off in lieu. Make appropriate use of ICT such as drawing up a code of conduct or guidelines to eliminate intrusive and excessive use of ICT through compressed e-mailing lists for only those who need to be consulted and limit contacting staff outside office hours on land-line and mobile phones. Institute training programmes to support WLB such as conducting meetings, chairing, time keeping, setting and keeping to a tight agenda, management of WLB, time management, parenting skills/child development and stress management. Change the corporate culture to depart from the prevailing reliance on presenteeism to one that places emphasis on performance results/outcomes. An

individual should take an active role in the management of his or her work responsibilities, for example, effective time management, communication within the family to enhance social support and self-management (Quick *et al.*, 2004:433-436).

2.7 SPIRITUALITY AND VALUES

Spirituality and religion are overlapping but distinct concepts. Religion involves beliefs, doctrines and rituals that distinguish one group from another and recognises the involvement in a faith community and responsibility for one another in that community, while spirituality is individual and personal beliefs that can be any kind of belief (Koenig, 2004). This view is also supported by King and Crowther (2004:85) who define religion as an organised system of beliefs, practices, rituals and symbols designed to facilitate closeness to the sacred or transcend (God, higher power or ultimate truth/reality) and to foster an understanding of one's relation and responsibility to others living together in a community, while spirituality is the personal quest for understanding questions about life, about meaning and about relationships to the sacred or transcendent, which may (or may not) lead to the development of religious rituals and the formation of community. A study conducted by Kinjerski and Skrypnik (2004:37) has led to a definition for the concept spirit at work and includes a physical sensation characterised by a positive state of arousal or energy; positive effect characterised by a profound feeling of well-being and joy; cognitive features involving a sense of being authentic, an awareness of alignment between one's values and beliefs and one's work and a belief that one is engaged in meaningful work that has a higher purpose; an interpersonal dimension characterised by a sense of connection to others and common purposes; a spiritual presence characterised by a sense of connection to something larger than self, such as a higher power, the Universe, nature or humanity and a mystical dimension characterised by a sense of perfection, transcendence, living in a moment and experiences that are awe-inspiring, mysterious or sacred.

Values are an important dimension of spirituality. Values are defined as principles, standards or qualities considered worthwhile (Banhegyi, 2002:40). According to Kreitner and Kinicki (1998: 76-77), values possess five key components, namely, values are concepts or beliefs, pertain to desirable end state of behaviours, transcend specific situations, guide selection, or evaluation of behaviour and events and are

ordered by relative importance. An organisation's values are crucial to its competitive success. When people's personal values are congruent with their organisational values, their personal lives are qualitative and they feel more optimistic about their jobs (Digh, 1998:105). According to Karp and Abramms (1992:6), the functions of values are to define meaning for the individual or organisation. Values should be freely chosen and define who you are and must be acted upon. Ultimately, values serve as internal standards that guide behaviour, keep evaluating reality, distinguish between right and wrong and provide guidance in resolving conflicts. They are in addition motivational forces that push individuals towards attaining their goals (Dekker, 2001:461). Lichtman (1998:121) has identified eight core values, namely, loyalty, honesty, fairness, caring, respect, tolerance, duty and moral courage. Managers should apply these principles as ground rules for behaviour when dealing with people, family, friends, co-workers and subordinates. Valuelessness is the ultimate disease of our time and leads to value illness (such as apathy, hopelessness and cynicism). These conditions can become physical, psychological and social illnesses (Witmer & Sweeney, 1992:141).

Koenig (2004) is of the opinion that spiritual beliefs may or may not involve adherence to any particular doctrine, moral, or ethical principle, or hold one accountable to others. To define spirituality in absolute terms is impossible as illustrated by the argument of the historian Marty (quoted by Moberg, 2002: 57) that there will not and cannot be a universally satisfying or even locally precise meaning of spiritual. Although there are different conceptualisations of the spiritual dimension of wellness among theorists, there are some common dimensions such as a sense of meaning and purpose in life, connectedness to self, the environment or a higher power, a belief in a unifying life force, hope, honesty, compassion, forgiveness, rituals and recognition of what is held to be sacred (Adams *et al.*, 2000:167; Ingersoll & Bauer, 2004). The behaviours of a spiritually well person manifest a positive energy or optimism, the tendency to pursue the truth (honesty), ethical conduct, belief in God or a Higher Power, respect, understanding, openness, self-motivation, creativity, giving to others, trust, kindness, team orientation, few organisational barriers, a sense of peace and harmony, aesthetically pleasing workplace, interconnectedness, encouraging diversity and acceptance (Ingersoll & Bauer, 2004; Marques, Dhiman & King, 2005:86).

2.7.1 WELLNESS BEHAVIOUR RISKS ASSOCIATED WITH A LACK OF SPIRITUALITY AND VALUES

One of the suggestions for the existence of a public interest in spirituality is a symptom of increasing levels of isolation, disconnection and existential frustration in current society (Adams, *et al.*, 2000:166). According to Chandler, Holden and Kolander (1992:172), a sense of spiritual being often occurs in the aftermath of near-death experiences or near death-like experiences. White (2000) argues that there is amongst people a low-grade chronic anxiety and depression based on a sense of helplessness and hopelessness that the world is somehow out of control. The 21st century necessitates a more humanistic approach to management that focuses on the holistic well-being of individuals concentrating on their mind, body and spirit. Beyond the physical and emotional stresses, individuals experience pain caused by a lack of fulfilment and need to achieve more meaning in their lives (Comeau-Kirschner, 2000). Additional reasons for a growing interest in spirituality are downsizing, re-engineering and layoffs of the last decade that have caused the demoralisation of the workforce; the workplace is increasingly being seen as a primary source of community for many people because of the decline of neighbourhoods, churches, civic groups and extended families as principal places for feeling connected; the increased access and enhanced curiosity about Pacific Rim cultures and Eastern philosophies such as Zen Buddhism and Confucianism, which encourage meditation and stress values such as group loyalty and finding one's spiritual centre in any activity becoming more acceptable; the baby boomers are now ageing and developing a need to find the meaning of life; global competition which prompts organisational leaders to realize that employee creativity needs nurturing; the arrival of the new millennium; the increased search for meaning through work; the quest for stability in an unstable world; the movement towards a more holistic living, the greater influx of women in the workplace and the progression of developed countries from belly needs to brain needs (Marques, Dhiman & King, 2005:83-84; Kinjerski & Skrypnek, 2004:26).

Organisations often embrace spirituality because they need help (Benefiel, 2002). According to Neal *et al.* (quoted by Heaton, Schmidt-Wilk & Travis, 2004:62), the management field will benefit greatly from incorporating a spiritual perspective into management theories, research and the theory development process. Heaton *et al.* (2004:62) are of the opinion that organisational change management can benefit by incorporating a spiritual perspective in changing the behaviour of people. Organisations have realised that downsizing and re-engineering had not accomplished what was

intended and are looking for new ways to gain the competitive edge. One of the new approaches is to integrate spirituality into the management of the organisation, integration of spiritual values into organisations, spirituality and self-leadership, organisational cultures that engage the best employees have to offer (corporate soul), ways organisations can be religious or spiritual, as well as spirituality and transformational leadership (Kinjerski & Skrypnek, 2004:27-29).

Research suggests that the encouragement of spirituality in the workplace can lead to benefits such as increased intuition and creativity, honesty and trust, personal fulfilment and commitment, which will ultimately lead to increased organisational performance (Krishnakumar & Neck, 2002:156-159). Marques *et al.* (2005:87) formulated the following holistic definition of spirituality in the workplace, namely, that spirituality in the workplace is an experience of interconnectedness, shared by all those involved in a work process, initially triggered by the awareness that each is individually driven by an inner power, which raises and maintains his or her sense of honesty, creativeness, pro-activity, kindness, dependability, confidence and courage; consequently leading to the collective creation of an aesthetically motivational environment characterized by a sense of purpose, high ethical standards, acceptance, peace, trust, respect, understanding, appreciation, care, involvement, helpfulness, encouragement, achievement and perspective, thus establishing an atmosphere of enhanced team performance and overall harmony and ultimately guiding the organisation to become a leader in its industry and community, through its exudation of fairness, cooperativeness, vision, responsibility, charity, creativity, high productivity and accomplishment. The connectivity experiences and effects of spirituality in the workplace accordingly reward each involved individual with the attainment of increased job satisfaction and self-esteem.

In the last decade, psychologists have produced vast amounts of scientific evidence that links optimism to good health and pessimism to poor health (Adams *et al.*, 2000). In terms of physical health, Koenig (2004) states that studies have found that religious beliefs and practices are associated with better immune functioning; reported that people who are more religious are less likely to die of cancer; found lower systolic or diastolic blood pressure among those who were more religiously active; reported less coronary artery disease, lower likelihood to CAD-related death, or better survival after open-heart surgery in those that are more religious; while religious attendance correlated with lower stroke incidences amongst a sample of 2800 adults in Connecticut.

In terms of health behaviour, research amongst more religious people indicated lower rates of smoking, increased likelihood of exercise, lower cholesterol levels and better sleep patterns. Studies on sexual behaviour have found that religious involvement is inversely related to favourable attitudes towards non-marital sex and premarital and extramarital activity, while mortality studies have reported longer survival for the more religious. There is also a positive relation between religion and well-being, hope, optimism, purpose and meaning in marital satisfaction, lower levels of depression, lower rates of suicide, fewer anxiety symptoms, moderate effects of stress and less drug and alcohol use (Koenig, 2004; Jurkovic & Walker, 2006:30).

2.7.2 SPIRITUAL WELLNESS INTERVENTIONS

The question may be asked what interventions can individuals or the organisation take to enhance spiritual awareness and movement towards greater spiritual wellness? There are a number of techniques available to foster spiritual wellness, such as meditation and prayer; belonging to a faith tradition; participating in associated community-based activities; ritual and symbolic practices and other forms of worship; reading scripture, sacred music (listening to, singing and playing) including songs, hymns, psalms and devotional chants; deep reflection; creative visualisation; appreciation for the arts; maintaining stable family relationships and friendships; group or team sports, recreational or other activities involving a special quality of fellowship; engaging with and enjoying nature; contemplative reading; rhythmic breathing; jogging; walking; Tai Chi; Yoga; work in the garden; showers; massage; acupuncture; relaxation; positive daily affirmations; dietary changes and humour (Chandler *et al.*, 1992:172-173; Ingersoll & Bauer, 2004; Culliford & Powell, 2005).

Organisations can establish a spiritually satisfying workplace by helping employees connect with nature by bringing in natural features such as plants; holding outdoor meetings when possible; allowing staff to take exercise breaks to promote physical and spiritual wellness; stage frequent company celebrations to acknowledge milestones and achievements; create an evolving mission statement employees are proud to live by; rotating those allowed to attend outside events; start holding meetings in the round; thereby creating feelings of egalitarianism; encouraging employees to get to know each other better (hobbies, likes and dislikes) and encourage employees to take turns at answering customer correspondence (Chappel, 1993). Rosner (2001:83)

proposes a four-step action plan to promote spirituality at work, namely, Step 1 - Make it safe, permissible and comfortable to have a conversation about spirituality in the workplace, if people choose to do so. Begin talking, writing and communicating in a gentle, non-threatening, non-dogmatic manner. Respect others' points of view and the degree to which they wish to participate. Step 2 - Seek help from the many resources available. There are a myriad of sources filled with ideas, conferences, books, speakers and discussion groups. Step 3 - Allow a system to evolve to help expand spirituality in your workplace. This can be anything from a regular discussion group to a shared project or activity to a speaker series. Agree on a method and time. Step 4 - Evaluate what is working and what is not working. Then correct what is not working and nurture what is. In addition, do not forget to celebrate. Some organisations have introduced contemplative practices to promote spirituality in the workplace such as meditation and centering prayer.

According to Duerr (2004:50), organisations incorporate contemplative practices such as the use of silence and dialogue in meetings; contemplative breaks during the day; creation of special places to pray or mediate; use contemplative techniques such as a council circle to conduct strategic planning sessions; stocking meditation books and tapes in the library; learning modules on the web site on mindful practices; reflecting on vision and values; moving between cycles of action and reflection; balancing of process with a product by stressing the importance of relationships rather than tasks and structuring of the organisation to reflect contemplative values such as flexibility; spontaneity and less hierarchy.

Research done on the physiological and sociological effects of the Maharishi Transcendental Meditation and TM-Shidi programmes has established that spiritual development makes one more resistant to stress and stress related health disorders and enhances the growth of happiness, wisdom and fulfilment (Heaton *et al.*, 2004:70-72). Research findings have also indicated that TM has improved the mental abilities of an individual such as increased intelligence, increased creativity, improved learning ability, improved memory, improved reaction time, higher levels of moral reasoning, improved academic achievement, greater orderliness of brain functioning and increased self-actualisation (Scientific Research on Transcendental Meditation and TM-Sidhi Programmes, 2005). According to Heaton *et al.* (2004: 70-72), TM is positively associated with cardiovascular health, lower health care utilisation and costs, reduced anxiety, reduced alcohol and drug abuse, reduced physical complaints and increased

longevity. In addition, TM research findings have indicated improved social behaviour such as self-confidence, reduced anxiety, improved family life, improved relationships at home and work, increased tolerance, improved job performance, increased job satisfaction, trust, openness and team cohesiveness and alignment (Scientific Research on Transcendental Meditation and TM-Sidhi Programmes, 2005).

2.8 SUMMARY

In this chapter, the researcher aimed to provide a review on the literature regarding the ten sub-dimensions of wellness. The physical dimension has focused on physical fitness and nutrition, medical self-care and safety. The most important health benefits of physical fitness and a healthy diet were discussed. Managers should be aware that a sedentary lifestyle and obesity lead to physiological and psychological risks. A number of guidelines were proposed to assist managers in adapting a habit of regular exercise and healthy nutrition. Medical self-care included the regular update of one's immunization record; regular testes and breast self-examination; tobacco smoking cessation; complementary and alternative medicine use; adequate water consumption; maintaining oral hygiene; sun protection and maintaining normal range blood pressure and cholesterol levels. The wellness behaviour risks associated with inadequate medical self-care and possible interventions were discussed to educate and to create awareness amongst managers.

There is a correlation between alcohol and drug use and road accidents. The impact of alcohol and other narcotic substances leads to high-risk behaviours and the loss of various driving related skills. Managers should be aware of the impact of alcohol and drugs on their driving ability. To prevent alcohol and drug related vehicle accidents a number of interventions have been proposed to reduce alcohol and drug impaired driving.

Social wellness was divided into to sub-dimensions, namely, environmental wellness and social awareness. To achieve optimal health and wellness, people must live in a high quality environment and prevent the deterioration of our planet through pollution and the depletion of environmental resources. Pollution, with specific reference to solid waste, air, water and pollution as well as global warming were discussed. The adverse impacts of pollution and global warming on human health as well as certain interventions were discussed. For the purpose of this study, social capital encapsulates

social awareness. The social capital theory was discussed with specific reference to the importance of relationships for individual health and well-being, wellness behaviour and health risks associated with low levels of social capital, and social capital health interventions.

In this study, emotional wellness has focused on emotional management and emotional awareness and sexuality. Emotional management was discussed with specific reference to the negative impact of stress, burnout, anxiety and depression on the well-being of managers. To reduce the negative impact of these conditions a number of individual and organisational interventions were recommended.

Emotional awareness and sexuality were discussed with specific reference to the concepts of sex, sexuality, gender identity and gender role, sexual orientation, sexual dysfunctions, intimate sexual relationships and sexually transmitted diseases. However, the focus was on sexually transmitted diseases. In this study, the theoretical foundation of the eight most common sexually transmitted diseases as well as risks associated with each and risk reduction interventions were discussed.

The intellectual wellness sub-dimension referred to the importance of continued learning and the development of new competencies. Research has indicated that the lack of intellectual development has a negative impact on the health and well-being of individuals. Training and skills development are crucial to the competitive advantage of organisations. A number of individual and organisational intellectual development interventions for managers have been proposed.

Occupational wellness has been discussed as well. It refers to personal satisfaction and enrichment in one's life through work. Job satisfaction is a central theme in occupational wellness and consists of various factors or variables. One of the strategies to enhance job satisfaction is to promote and enhance work-life balance (WLB). Work-life imbalances may have a negative impact on the well-being of managers. In order to attract and retain valued managers, organisations should implement work-life interventions, because work-life imbalances contribute to the development of dysfunctional wellness behaviours such as depression, violence, burnout and anxiety. To address the negative consequences of work-life imbalances, organisations should develop and implement interventions for managers in order to integrate work and non-work aspects of their lives. Spirituality and values refer to a sense of connectedness to a higher power and an alignment between one's values and beliefs. However, to define spirituality and values in absolute terms is impossible. There

is currently a renewed interest in spirituality and values because of increasing levels of isolation, disconnection and existential frustration. The lack of spirituality and values may contribute to physical and emotional health risks. To enhance spiritual awareness and to move to higher levels of spiritual well-being, organisations should implement interventions to foster spiritual wellness.

The literature review has enabled the researcher to design a wellness behaviour and health risk model for managers (see figure 5.1). The theoretical foundations of the ten sub-dimensions, with specific reference to the wellness behaviour and health risks associated with each and possible interventions to decrease possible risks, were discussed.

The research methodology to measure the wellness behaviour levels and health risks of managers will be discussed in Chapter Three.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 INTRODUCTION

The purpose of this chapter is to address the methods used in this study. Aspects of these methods that were addressed include the research design, population and sampling, instrumentation, reliability and validity of the instrumentation, scoring techniques, data-gathering procedures and statistical analysis methods used.

3.2 RESEARCH DESIGN

Often the best and sometimes the only way, to learn what people think or how they act, is to ask them. Manheim and Rich (quoted by Booysen, 2003:127) argue that the acceptance of this fact has made survey research one of the most fully developed and extensively used methods in the social sciences. Virtually all surveys aim at describing the characteristics or opinions of a population using a representative sample. According to May (1997:82-83), one can distinguish between factual, attitudinal, social psychological and explanatory surveys. Tredoux and Smith (2006:167-170) identified two research design types, namely, descriptive research and relational research. The key aim of descriptive research is to describe, for example, the distribution of attributes in a population or the social practices of a particular group. Relational research investigates the relationships between things for example, between cigarette smoking and heart attacks or between obesity and diabetes. Survey research captures a fleeting moment in time, much as a camera that takes a single-frame photograph of an ongoing activity (Leedy & Ormrod, 2005:184). The current study is a relational survey that seeks to explore the relationship between the wellness behaviour levels of managers and their risk for current and future wellness problems.

3.3 PARTICIPANTS

The population for this study were managers (heads of academic departments, directors of support services and members of the rectorate) at an academic university and a technology university. The impact of the incorporation of a small campus of a previously existing academic university had a minimal impact on the status quo. The technology university is a new institution that came into being on 1 January 2004 because of the merger between three former technikons. Therefore, the academic university represents an existing institution that only incorporated one small institution, while the technology university represents a total transformed institution consisting of three former independent technikons.

3.3.1 The sample

In the present study, the population were managers (academic section heads; directors of support services and rectorate) at the academic university and the technology university. The sample frame was the list of names of managers that were provided by the respective human resource departments of the two institutions. The total population of managers at the academic university were one hundred and sixty-four (164) and at the technology university one hundred and sixty (160). In view of the relatively small number of managers, a census was done on the whole population. The list of managers provided by the respective human resource departments included their e-mail addresses. The researcher created two separate e-mail address lists, one for each participating university. The self-administering questionnaires were sent by way of e-mail attachments to all the listed respondents. Three hundred and twenty-four (324) questionnaires were sent out to the listed managers at the two institutions. The returned number of questionnaires from the technology university was 57 (36%). Of these, four (2%) were not usable, as several items were not answered. The returned number of questionnaires from the academic university was 42 (26%). Of these 6 (4%) were not usable, as several items were not answered. This brought the average response rate to 28% (N = 89).

3.3.2 Respondents' characteristics

The demographic and health risk assessment variables of the respondents are presented in order to obtain a clear picture of the research group. The demographic and health risk assessment information of the respondents is indicated in table 3.1.

Table 3.1: Demographic and Health Risk Variables of the Respondents

At which university you are employed
Academic university participants indicate at which campus are you employed
Technology university participants indicate at which delivery site you are employed
Which faculty (academic) or division(support services)
Gender
Race
Age
Level of education
Job title
Number of staff responsible for
Total number of years in current institution
Number of years in current position
Body weight and height
Tobacco smoking status
Number of cigarettes/pipes/cigars per day
Frequency of doctor or health care professional visits
Number of hours sleep at night
Overall physical condition
Level of systolic and diastolic blood pressure
Family medical conditions such as high blood pressure, diabetes, heart attack or angina, stroke and high blood cholesterol
Diagnosed with medical conditions such as high blood pressure, diabetes, heart attack or angina, stroke and high blood cholesterol
Frequency of alcoholic beverages consumed
Number and types of alcoholic drinks per day

For the purpose of the study, nine (9) health risk indicators were included in the questionnaire such as a Body Mass Index (BMI); smoking status; number of doctor or health professional visits; total sleeping hours per night; reported health status; elevated blood pressure; family history of medical conditions such as high blood pressure, diabetes, heart attack or angina, stroke and high blood cholesterol; self-reported (diagnosed with) medical conditions such as high blood pressure, diabetes, heart attack or angina, stroke and high blood cholesterol and alcoholic

drinks consumed per day. These identified health risk factors were based on the Behavioral Risks Surveillance System and the National Health Interview Survey that were designed for the assessment of health risk behaviours (Thompson, Nelson, Caldwell & Harris, 1998:50-53). Of the nine health risk factors, only 6 were utilized to determine the health risk score of the respondents (BMI in view of unreliable self-reported values; high blood pressure in view of too many missing values and number of alcoholic drinks consumed per day in view of too many missing values, were excluded). To determine the high health risk category amongst the respondents the following health risk indicators were included, namely, all current and ex-smokers; those who paid more than five visits to a doctor or health professional per year; those sleeping for less than 7 hours a night; those who reported fair or poor physical health status; those with an indication of a family history of high blood pressure, diabetes, heart attack or angina, stroke, high blood cholesterol and those diagnosed with medical conditions such as high blood pressure, diabetes, heart attack or angina, stroke, high blood cholesterol. The statistician and researcher decided that for each condition indicated by the respondent, a score of one was to be allocated. A maximum score of 14 was attainable. The health risk factors are summarized in table 3.2.

Table 3.2: Health Risk Factors

HEALTH RISK FACTORS	RISK SCORE
Smoker or ex-smoker	1
More than five visits to a doctor or health professional	1
Sleep > 7 hours per night	1
Fair or poor physical health status	1
Family history of:	
High blood pressure	1
Diabetes	1
Heart attack or angina	1
Stroke	1
High blood cholesterol	1
Diagnosed with a medical condition such as:	
High blood pressure	1
Diabetes	1
Heart attack or angina	1
Stroke	1
High blood cholesterol	1
Total risk score	14

3.4 MEASURING INSTRUMENT

The main aim of this study was to determine the relationship between the wellness behaviour levels of managers and the scale of risks involved in terms of their current and future wellness problems. The TestWell Wellness Inventory for Adults was used in a survey to measure the extent to which wellness behaviours reflect wellness risks and problems. The instrument, the TestWell Wellness Inventory for Adults, was designed by the National Wellness Institute in the United States of America and is based on the six dimensional wellness model of Hettler (National Wellness Institute, 2005). The TestWell Wellness Inventory reportedly measures the extent to which lifestyle behaviours reflect potential risks and hazards (National Wellness Institute, 1992). The TWI (A) is a 100-item inventory divided into 10 subscales of 10 items each (National Wellness Institute, 2005).

The pre-structured questionnaire included demographic information, a health risk assessment and also focused on the perceived wellness of managers covering the physical, emotional, intellectual, social, occupational and spiritual dimensions (see annexure A). The physical, social and emotional dimensions were divided into subcategories by the developers of the questionnaire. The subscales physical fitness and nutrition, medical self-care and safety and lifestyle belong to the physical dimension. The social dimension was subdivided into the subscales of environmental wellness and social awareness. The subscales emotional awareness and sexuality and emotional management were placed under the emotional dimension, while the intellectual, occupational and spiritual wellness were not subdivided. Therefore, the 10 subscales were physical fitness and nutrition, medical self-care, safety and lifestyle, environmental wellness, social awareness, emotional awareness and sexuality, emotional management, intellectual wellness, occupational wellness and spirituality and values (Stewart, Rowe & LaLance, 2000:160). Each item in the questionnaire is a statement to which the participant responded using the 5-point Likert scale ranging from 1-5 (1. Almost never - less than 10% of the time; 2. Occasionally - approximately 25% of the time, 3. Often - approximately 50% of the time; 4. Very often - approximately 75% of the time and 5. Almost always - 90% of the time). The totals for each subscale can range between a minimum of 10 to a maximum of 50. The total scores for the questionnaire may thus range from 100 to 500. According to Wright (2006), TestWell was designed primarily as an educational

and awareness tool. The cut-off points are: 0-59 (shows a need for improvement); 60-79 (good) and 80-100 (excellent) (Wright, 2006). The National Wellness Institute (2005) states that the wellness group results provide an overview of the strengths and weaknesses while scores lower than 60% may need careful attention in the design and implementation of interventions through an organisational wellness programme.

Owen (1999:181-182) used Cronbach's coefficient alpha and split-half reliability statistical tests to determine TestWell's reliability. The split-half reliability of TestWell was 0.87, while the reliability of the full TestWell scale, determined by Cronbach's coefficient alpha, was 0.92 (Owen, 1999:181). The reliability of TestWell was also confirmed in a study conducted by Stewart *et al.* (2000:161), in which Cronbach's alphas ranging between 0.67 to 0.89 were obtained for the 10 subscales, while Jones and Frazier (1995:834) calculated an average Cronbach's coefficient alpha of 0.84 for TestWell. The construct validity of TestWell was determined by computing Pearson product moment correlation coefficients between the total TestWell score and TestWell's 10 subscales. Correlations between TestWell's subscales and the total TestWell score ranging from 0.44 (safety) to 0.72 (medical self-care), were all statistically significant at the 0.001 alpha level (Owen, 1999:182). Owen (1999:182) also determined construct validity by using Pearson product moment correlation coefficients to correlate TestWell item scores with the total TestWell score. Twenty (20%) of the 100 items correlated 0.24 or less with the total TestWell score. According to Owen (1999:182), there were no negative correlations between TestWell item scores and the total TestWell score. All 10 TestWell subscale scores significantly correlated with the total TestWell score at the 0.001 alpha level. Palombi (1992:222-225) investigated the psychometric properties of TestWell and in terms of reliability the alpha coefficient for the total score was 0.93. Coefficient alphas above 0.74 were obtained for 8 of the 10 subscale scores (nutrition, drugs and driving, emotional awareness, emotional control, intellectual, occupational, social and spiritual). The exceptions to these were the subscale scores concerning physical fitness (0.64) and medical self-care (0.68), which, although having statistically significant correlations with the other subscale scores, demonstrated observably lower inter-scale reliability. The inter-correlations among the total score and 10 subscale scores ranged from 0.42 to 0.68. Each was significant at a 0.001 alpha level, which suggests that the instrument could be

measuring a multidimensional construct. The content validity indicated a coefficient alpha of 0.93 that confirms internal consistency validity.

Based on previous research results, it may be concluded that TestWell is measuring a multidimensional construct wellness. Wellness is an observable and measurable behaviour. Therefore, TestWell is a reliable and valid instrument for use by researchers in assessing the wellness levels of individuals or groups and also indicating the areas in which improvement may be needed.

3.5 PROCEDURES FOR DATA COLLECTION

3.5.1 Questionnaire administration

The researcher designed a self-administered questionnaire, based on the TestWell Wellness Inventory for Adults. A section on demographics was added for gathering background, personal and health-related information. This format could be completed as a pencil-and-paper instrument. Each questionnaire was accompanied by a covering letter explaining the purpose of the study to the prospective participant. A letter of consent was attached that included a description of the research, protection of confidentiality and voluntary participation, the importance of participation, potential benefits, contact information and consent. General instructions on completing the questionnaire were included.

The questionnaire was divided into Section A (Demographic Section consisting of twenty-three ((23)) questions) and Section B (A holistic wellness behaviour assessment tool consisting of one hundred ((100)) questions). In line with the recommendations of Leedy and Ormrod (2005:191), clear instructions for both sections were provided. The 5-point Likert scale was used in Section B and the number that best identified the response was clearly explained. In Section B, the instrument, TestWell Wellness Inventory for Adults, had pre-existing scales that were standardised. However, it was decided to change the wording and concepts of some items to make them more understandable and applicable to the South African context without deviating from their original meanings and context. Apart from this, the items were not modified in any way so that original response scales were maintained.

A letter to request permission to use managerial staff members as respondents in the study was sent to the human resource departments and the ethics research committees of the academic university and the technology university. Once permission had been granted, 324 questionnaires were sent out by e-mail attachment to all the listed respondents. The advantages of an e-mail survey include the following: it helps gaining access to respondents normally difficult to reach; is useful when issues that are researched are particularly sensitive; is more attractive to young people which may lead to a higher response rate when compared to paper-and-pencil surveys; e-mail surveys are inexpensive; data collection is fast; it helps to improve reach potential respondents especially if they are distributed across a large geographical region; the absence of interviewer bias; the removal of the need for data entry in as much as the respondents directly enter data into an electronic file and is convenient for respondents (Van Selm & Jankowski, 2006:436-439; Akl, Maroun, Klocke, Montori & Schünemann, 2005:427-428). The completed questionnaires were then returned to the researcher via internal mail, fax, personal collection and e-mail attachments. An e-mail reminder was sent to all non-respondents to complete and return the questionnaires every fortnight.

3.5.2 Handling of returned questionnaires and data

The returned questionnaires were coded and the raw data processed into the Microsoft® Excel Program. As the data had been collected through a self-administrated questionnaire, it was not possible for the researcher to confirm the completion of all the survey items by the respondents. As already indicated, a total of 10 questionnaires were incomplete due to unanswered items. Finchilescu (2005:209-210) postulates that missing scores, due to unanswered items, can be dealt with by either removing the respondent from the data file or replacing the missing number with the average of the respondent's other scores. He recommends that the rule of thumb is that every respondent should complete at least 75% of the items and if more than 25% is missing, the respondent should be dropped from the sample. As a result, only eighty-nine (89) questionnaires were usable, providing an average return rate of 28%. The response rate of 28% is low when compared with the guidelines in the literature. According to Babbie and Mouton (2001:261), a response rate of 50% is adequate for analysis and reporting, 60% good and 70% very good. Welman and

Kruger (2001:147) state that postal surveys have the lowest response rates of all survey methods. Frankfort-Nachmias and Nachmias (1996:116) state that the response rate for a mail survey without follow-up is between 20% and 40% and that a low response rate makes it difficult to make generalisations. Akl *et al.* (2005:428) report that postal surveys tend to have higher response rates than e-mail surveys. Porter and Whitcomb (2005:132-133) point out that the non-response rate of e-mail surveys has been increasing due to several reasons such as that more affluent or educated individuals are more likely to participate than less affluent and educated individuals; women responding in greater proportions than men; whites responding more often than non-whites; older individuals are less likely to participate while the relevance of the survey topic also differs between respondents and non-respondents. An e-mail list may provide a researcher with a sampling frame, but certain obstacles, such as multiple e-mail addresses for the same respondent, invalid/inactive e-mail addresses and self-selection bias where some individuals are more likely than others to complete an online survey, can be problematic (Wright, 2006). The response rate in this study was low despite the sending of various reminders and personal visits to deliver and collect the questionnaires.

There are multiple reasons to which the low response rate can be attributed. The high non-response rate may be attributed to the length of the questionnaire (Delport, 2005:167). The questionnaire used in the study was 12 pages long and contained 123 questions. The negative influence of the length of the questionnaire was confirmed by the comments received from some of the respondents, for example, a respondent who returned the questionnaire that had nearly been completed, but stopped after half an hour as the instructions indicated that it would take only 30 minutes to complete. Another reason was the negative attitude of the respondents. Regular e-mail, telephonic and personal face-to-face requests and reminders were made. Some respondents indicated that the health and wellness questions were too sensitive and personal in nature, while others were more offended and stated that the questions were intrusive and irrelevant to their jobs, some were sceptical about confidentiality, or felt uncomfortable and as a result had either withdrawn from participation or chose not to respond.

The main objection towards online surveys is the issue of sampling bias (Van Selm & Jankowski, 2006:439). The response rate is an important indication of the success of a survey research study. Ideally, all the listed managers in the population

of 324 should have completed and returned their questionnaires. The low response rate of 28% thus created a response and representative bias problem that made it difficult to generalise the results obtained to the entire managerial population of the academic university and the technology university. The low response rate restricted the usefulness of the research survey in the sense that the results may be deemed as not being sufficiently representative of the whole population.

3.6 PROCEDURES FOR DATA ANALYSIS

The statistical analysis of the data was done at the Department of Statistics at the University of Limpopo and the University of Pretoria. The researcher, the study leader and a statistics practitioner were involved in the planning and execution of the analysis. The Statistical Package for the Social Sciences (SPSS) was used for data management and analysis.

The following statistical procedures were used:

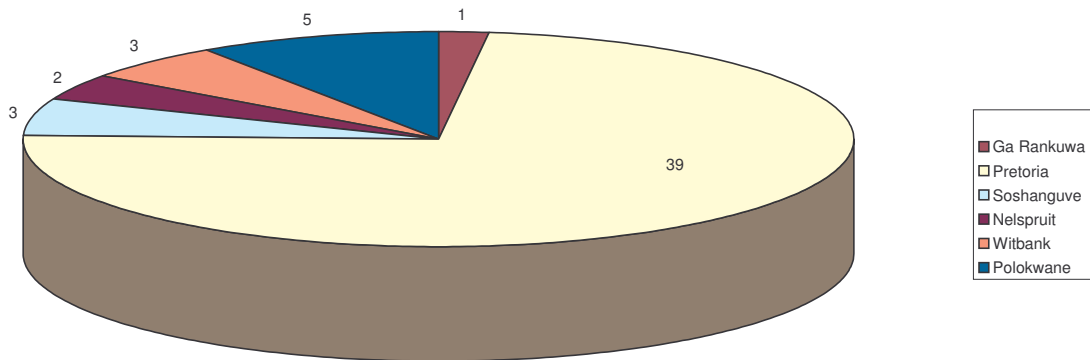
- Descriptive statistics such as tables, graphs, means and standard deviations;
- Cronbach's alpha coefficient to measure the internal consistency of the instrument;
- Pearson product moment correlation coefficient to measure the relationship between the wellness sub-dimension scores and the health risk scores;
- T*-tests to compare the mean scores of the various groups; and
- One-way analysis of variance (ANOVA) to compare the mean wellness sub-dimension and health risk scores between the three age groups.

3.6.1 Descriptive statistics

Institution and campus: The respondents were requested to indicate at which university and campus they were employed. Of the 89 respondents, 36 (40.45%) were employed by the academic university (AU), while 53 (59.55%) were working at the technology university (TU). Of the 36 academic university respondents, 1 was from the satellite campus, while 35 were from the Pretoria campus. Of the 53 technology university respondents, 1 was from Ga-Rankuwa, 39 from Pretoria, 3 from Soshanguve, 2 from Nelspruit, 3 from Witbank and 5 from

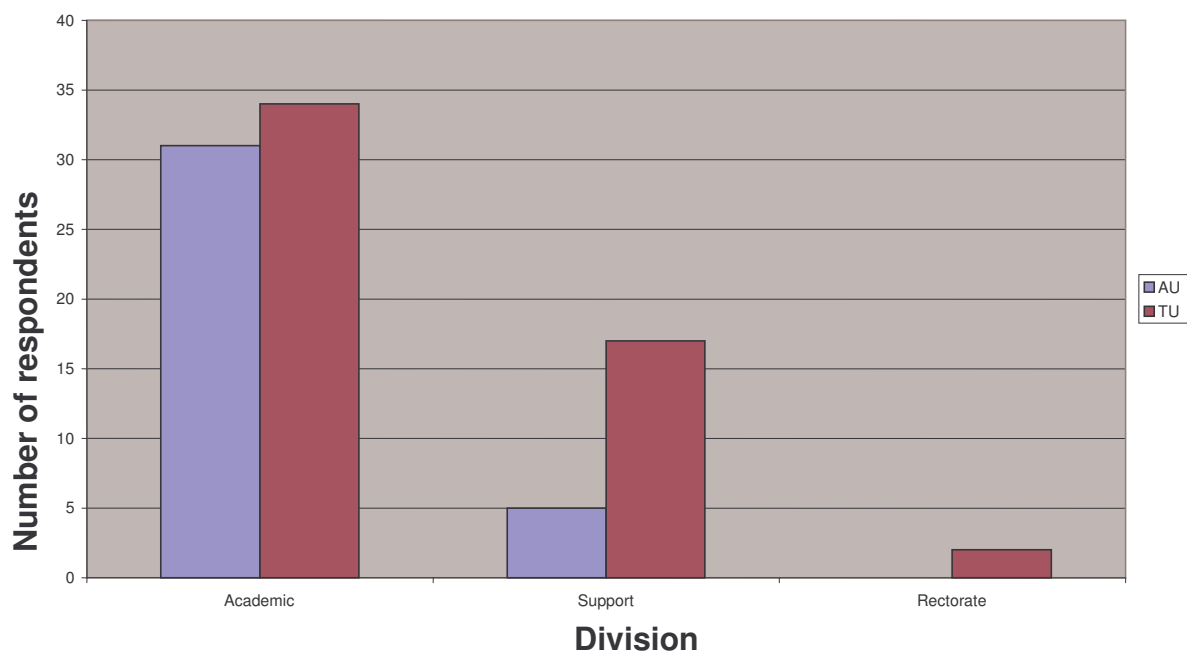
Polokwane. The distribution of the technology university respondents is reflected in Figure 3.1.

Figure 3.1: Representation of Delivery Sites of the Technology University



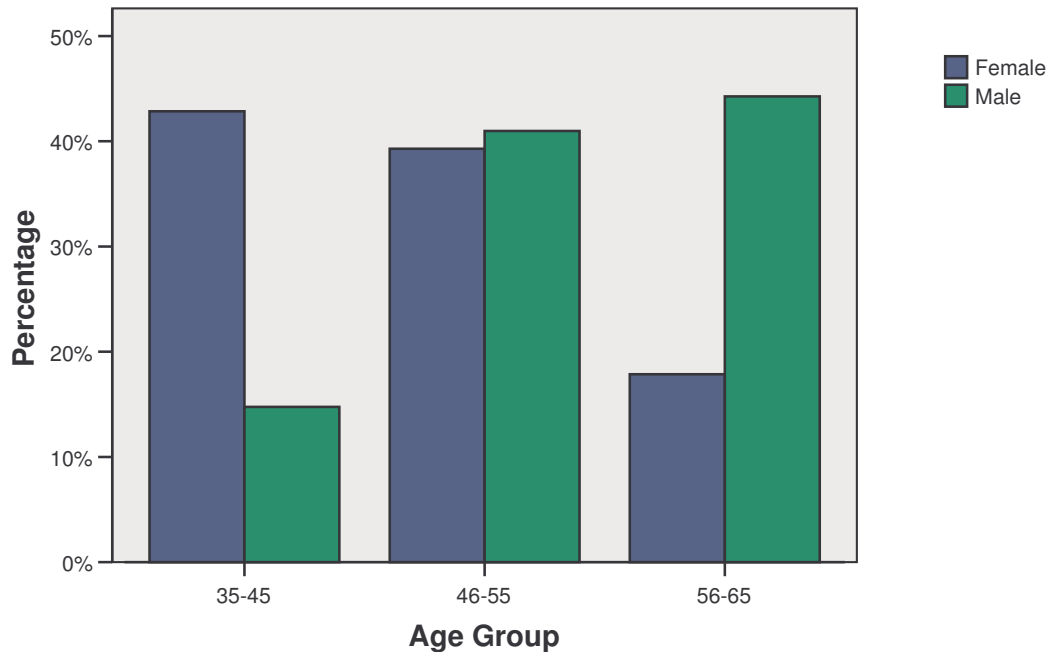
Division or faculty: The respondents were requested to indicate if they resorted under academic, support services, or the rectorate. The distribution of the academic university was academic 86.1% (31); support services 13.9% (5) and the rectorate 0% (none). The distribution of the technology university was academic 64.2% (34); support services 32.1% (17) and the rectorate 3.8% (2). Of the total of 89 respondents, 73% (65) were from academic faculties, 24.7% (22) support services and 2.2% (2) from the rectorate. The distribution of the respondents per faculty or division and university is shown in figure 3.2.

Figure 3.2: University and Division Distribution of Respondents



Gender: In addition, the respondents were asked to state their gender. The majority of the respondents were male, representing 61 (68.5%) of the 89 respondents. Females made up 28 (31.5%) of the 89 respondents. The gender distribution of the AU respondents were 10 females (27.8%) and 26 males (72.2%) while the TU respondents consisted of 18 females (34%) and 35 males (66%). The respondents' ages varied between a minimum age of 35 years and a maximum of 64 years. In terms of age groups 21 (23.6%) were in the age group 35-45; 36 (40.4%) in the age group 46-55 and 32 (36%) in the age group 56-55. From the respondents of the AU, 4 (11.1%) and the TU 17 (32.1%) were in the age group 35-45, while at the AU 17 (47.2%) and TU 19 (35.8%) were in the age group 46-55. In the age group 56-65 there were 15 (41.7%) from the respondents from the AU and 17 (32.1%) from the TU. From the aforementioned data, it can be deduced that the managers at the technology university are on average younger than their counterparts at the academic university. The gender and age distribution of the respondents are shown in Figure 3.3.

Figure 3.3: Gender by Age Category of Respondents

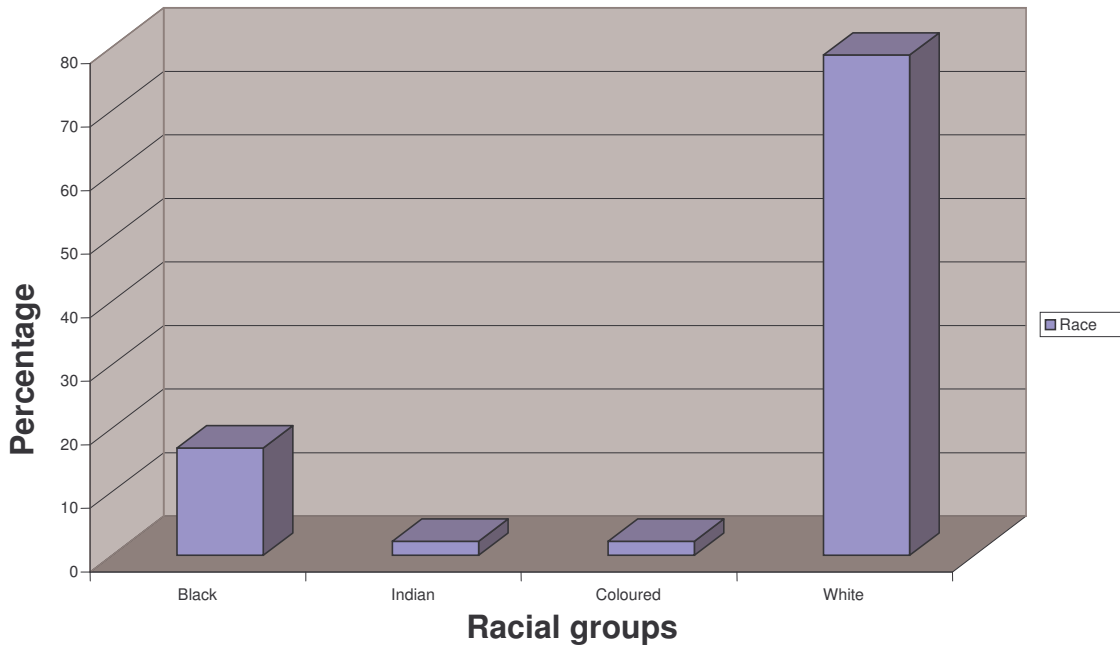


Race: When the respondents were asked to state their race, of the 36 AU respondents, 4 were Black, 1 Indian, 1 Coloured and 30 White. Of the 53 TU respondents, 11 were Black, 1 Indian, 1 Coloured and 40 White. The race distribution of the respondents is shown in Table 3.2 while the combined race distribution of the two institutions is illustrated by figure 3.4.

Table 3.3: Race of Respondents by University

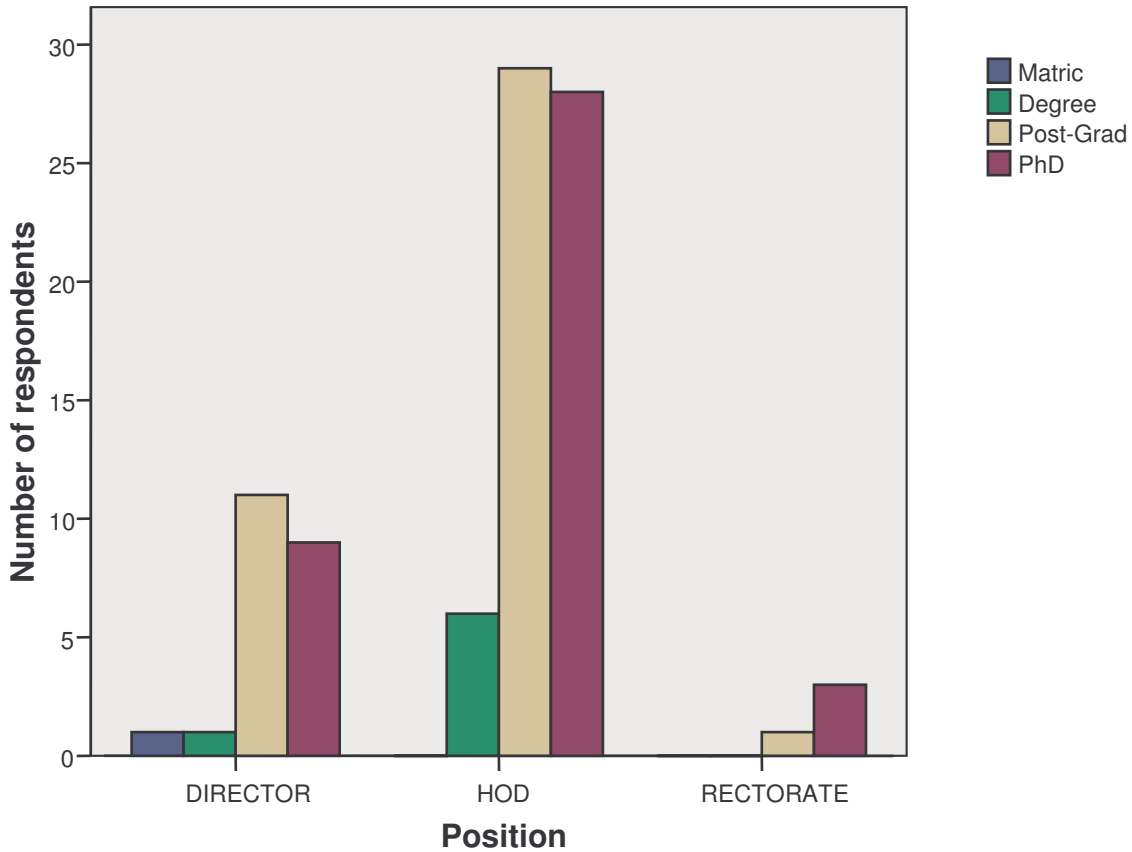
RACE	University			
	AU		TU	
	Count	Col %	Count	Col %
Black	4	11.1%	11	20.8%
Indian	1	2.8%	1	1.9%
Coloured	1	2.8%	1	1.9%
White	30	83.3%	40	75.5%

Figure 3.4: Combined Race Distribution of the Academic and Technology University



Level of education and position: The respondents were asked to indicate their highest level of education and job title (position). Of the 89 respondents, 1 had matric (1.1%) and 7 (7.9%) had degrees. The largest single group of respondents, 41 (46.1%) had a post-graduate degree, while 41 (44.9%) respondents had doctoral degrees. Three possible job titles were given. These were director, head of department and rectorate. Of the total respondents, 65 (73.03%) were heads of academic departments, 22 (24.7%) directors of support services and 2 (2.24%) were from the rectorate. The distribution of the respondents' level of education and position is shown in figure 3.5.

Figure 3.5: Position and Highest Level of Education of Respondents



Number of staff responsible for (span of control): In response to this question requesting the number of staff members they were responsible for, the average number of people that the heads of academic departments were responsible for was 23, directors 45 and the rectorate 229. The average span of control for the three job categories is reflected in table 3.4.

Table 3.4: Average Span of Control per Job Category of Respondents

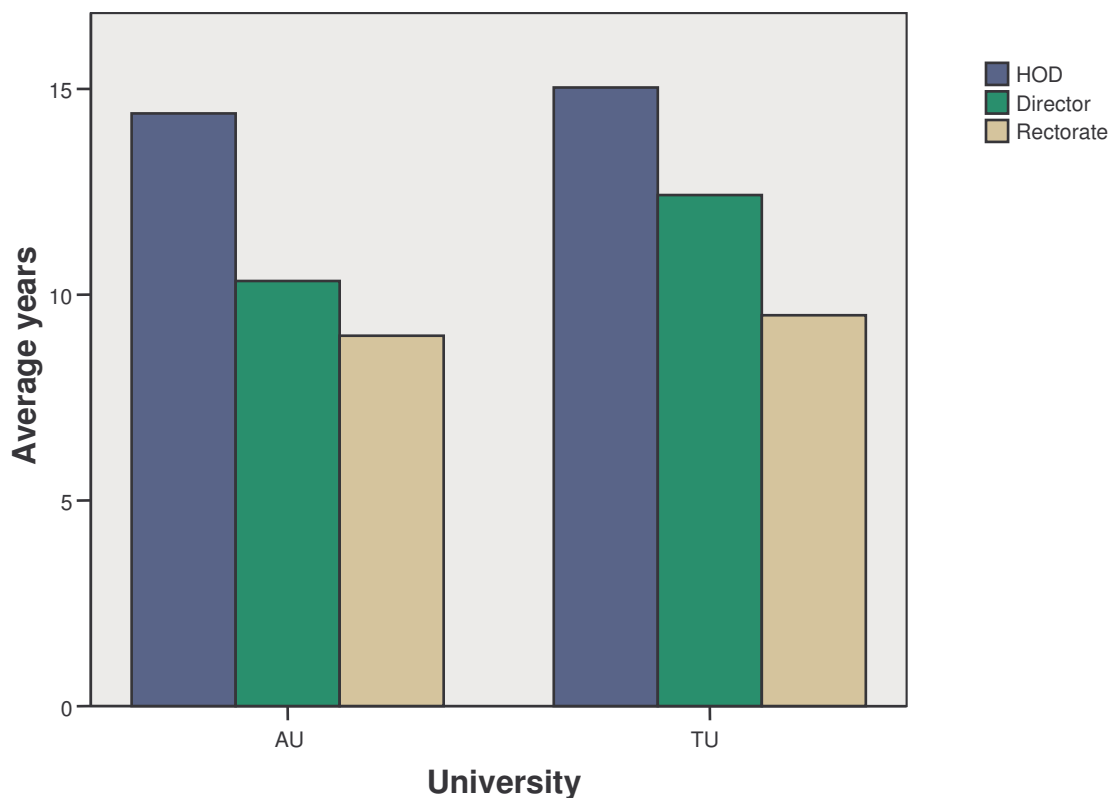
Job Category	Mean	N	Std. Deviation	Minimum	Maximum
HOD	23.38	65	25.284	1	140
Director	44.77	22	87.104	0	400
Rectorate	229.00	2	225.386	4	512
Total	37.91	89	76.259	0	512

Number of years working for current institution: The following information was given when the respondents were asked to report on how many years they were working at their current institution. The average number of years for heads of academic departments was 15 years, directors 12 years and members of the rectorate 9 years. The average number of years at the current institution for each job category is indicated in table 3.5, while the average number of years at the current institution per job position category for the AU and TU is illustrated by figure 3.6.

Table 3.5: Average Number of Years at Current Institution per Job Position Category of Respondents

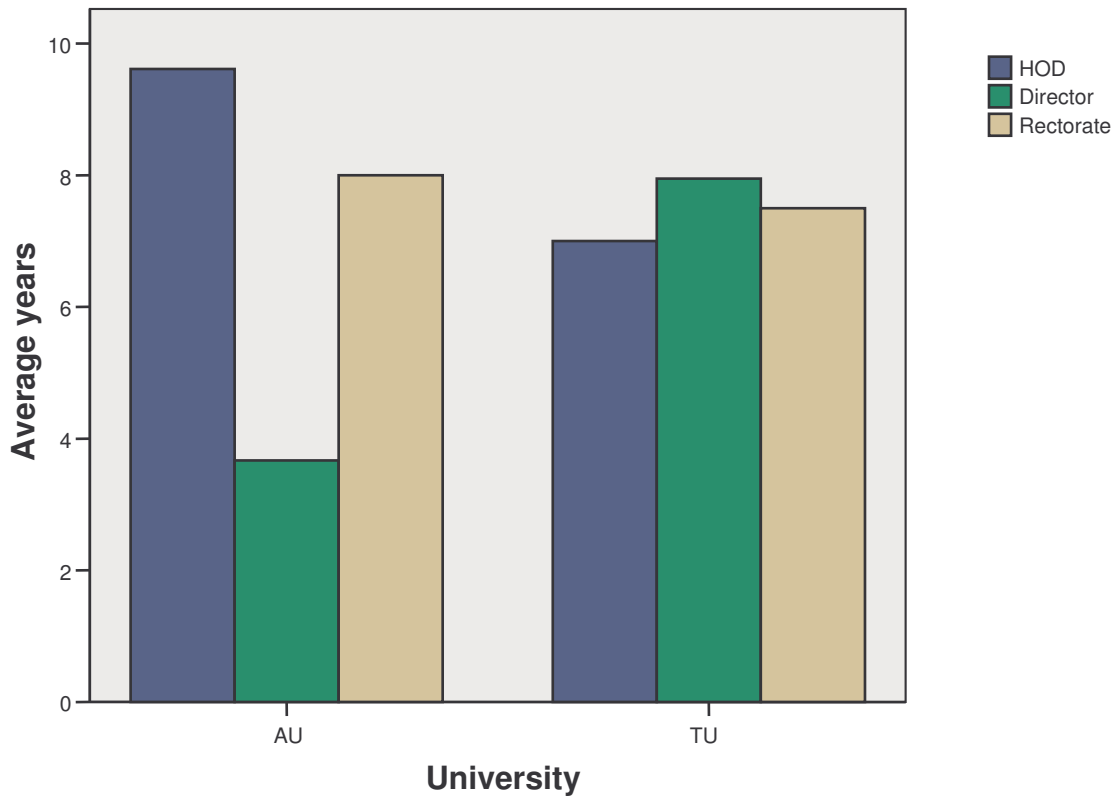
Job Category	Mean	N	Std. Deviation	Minimum	Maximum
HOD	14.72	65	8.780	1	36
Director	12.14	22	6.735	2	25
Rectorate	9.25	2	5.500	4	14
Total	13.84	89	8.271	1	36

Figure 3.6: Average Number of Years per Job Position Category for the Academic University and the Technology University



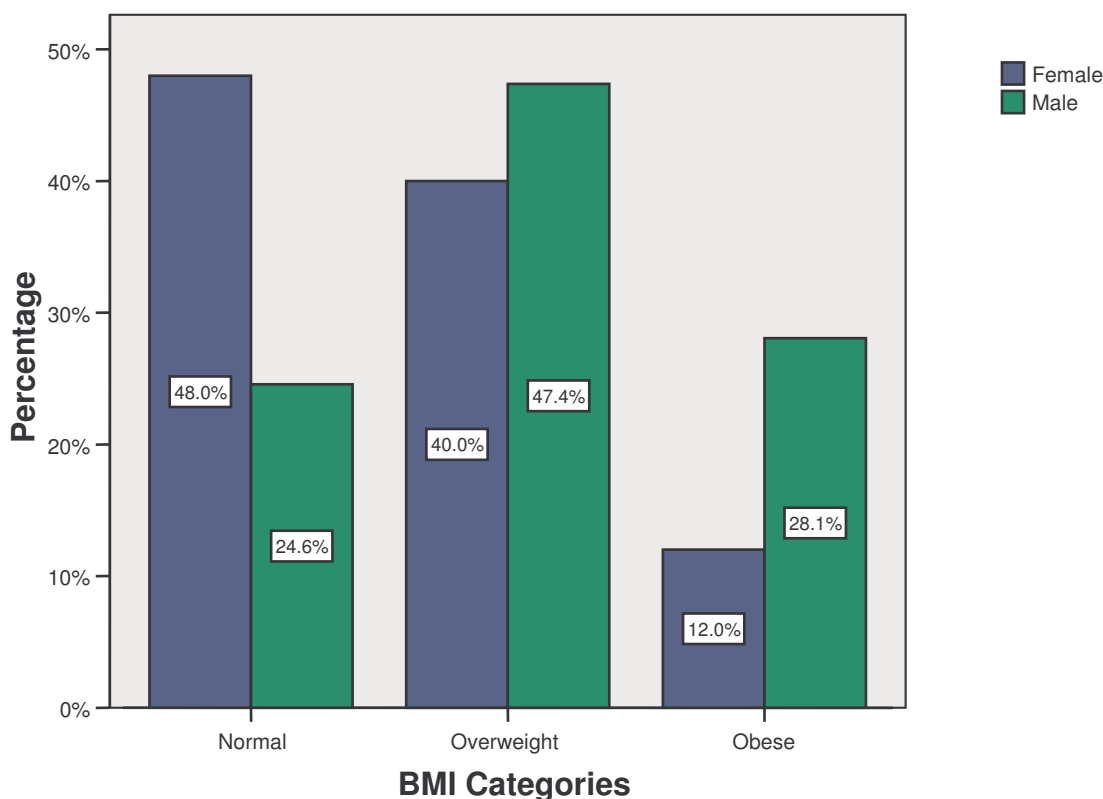
Number of years in current position: The respondents were then asked to state the number of years they had been appointed in their current position. The heads of academic departments had an average service period of 8, directors of support services 7 and members of the rectorate 8 years in their current positions. The average number of years is summarised in figure 3.7.

Figure 3.7: Average Number of Years in Current Position per Job Category of Respondents



Body weight and height: The respondents were asked to indicate their body weight and height without shoes. The reason for asking their body weight and height was to calculate their Body Mass Index. The BMI calculation enabled the researcher to determine which respondents had a normal weight, were overweight or obese. Being overweight and obese increase an individual's risk for developing various medical conditions. In total, 92% of the 89 respondents reported their weight and height (BMI). Of these respondents 29% had a normal weight, 42% were overweight while 21% were obese. A comparison between the females and males indicated the following BMI categories: 48% of the females and 25% of the males had reported a normal weight, 40% of the females and 47% of the males were overweight, while 12% of the females and 28% of the males were obese. The BMI categories by gender are summarised in figure 3.8.

Figure 3.8: BMI Categories by Gender



Tobacco smoking: The next question was intended to indicate if the respondents were smokers, ex-smokers, or non-smokers. Only 10 (11.2%) of the respondents reported that they were smokers, 18 (20.2%) were ex-smokers and 61 (68.5%) were non-smokers. The smoking statuses by gender were as follows: 3 (10.7%) females and 7 (11.5%) males were smokers; 5 (17.9%) females and 13 (21.3%) males were ex-smokers and 20 (71.4%) females and 41 (67.2%) males were non-smokers. The smoking status of the total respondents is summarised in table 3.6, while table 3.7 indicates the smoking status by gender.

Table 3.6: Frequency Distribution of Respondent's Smoking Status

Smoking status	Frequency	Percent	Valid Percent	Cumulative Percent
Smoker	10	11.2%	11.2	11.2%
Ex-smoker	18	20.2%	20.2	31.5%
Non-smoker	61	68.5%	68.5	100.0%
Total	89	100.0%	100.0	

Table 3.7: Smoking Status by Gender of Respondents

Smoking status	Gender			
	Female		Male	
	Count	Col %	Count	Col %
Smoker	3	10.7%	7	11.5%
Ex-smoker	5	17.9%	13	21.3%
Non-smoker	20	71.4%	41	67.2%

Visits to medical doctor and other health professionals: The respondents were requested to indicate how many times they had consulted a medical doctor or other health care professional during the previous 12 months. The number of visits to health professionals is indicated in table 3.8.

Table 3.8: Distribution of Respondents' Visits to Health Professionals

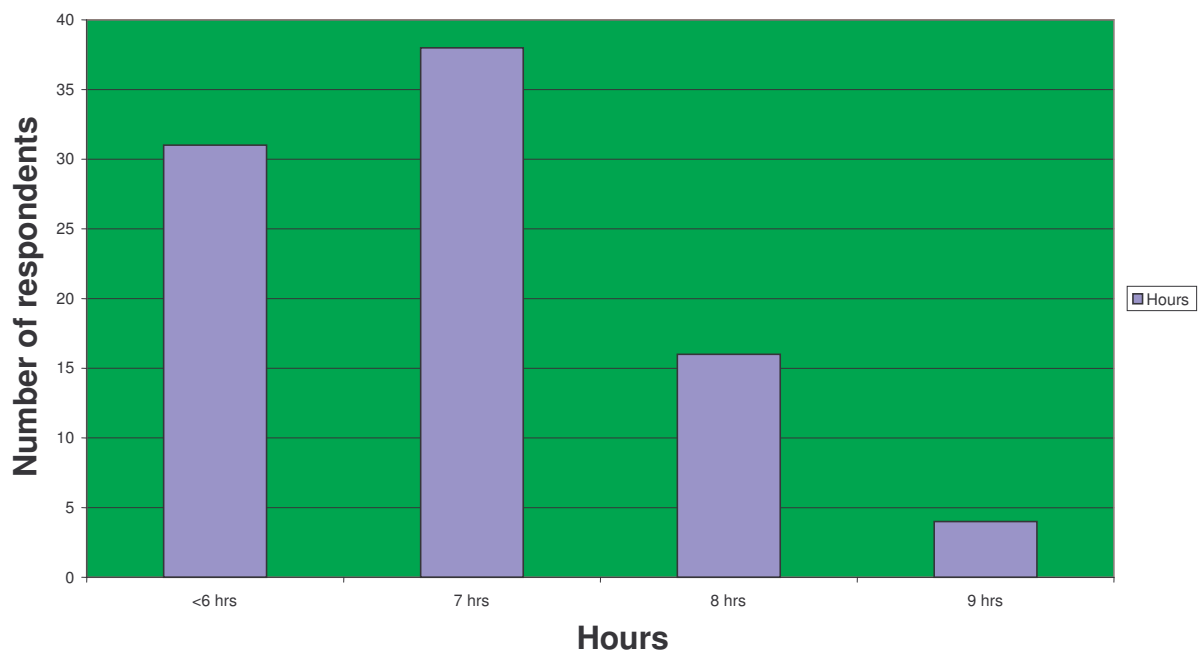
Number of visits	Frequency	Percent	Valid Percent	Cumulative Percent
0	46	51.7%	59.0%	59.0%
2	18	20.2%	23.1%	82.1%
4	3	3.4%	3.8%	85.9%
5	4	4.5%	5.1%	91.0%
6	4	4.5%	5.1%	96.2%
7	1	1.1%	1.3%	97.4%
20	2	2.2%	2.6%	100.0%
Total	78	87.6%	100.0%	
Missing	11	12.4%		
Total	89	100.0%		

Hours of sleep per night: The following responses were given when the respondents were asked to indicate the number of hours they usually slept at night. Four options were offered, namely, 6 hours or less, 7 hours, 8 hours and 9 hours. Of the total respondents of 89, 31 (34.8%) reported less than six hours' sleep per night; 38 (42.7%) seven hours' per night; 16 (18%) eight hours' per night and 4 (4.5%) nine hours per night. Table 3.9 indicates the average number of hours sleep per night.

Table 3.9: Distributions of Respondents' Hours Sleep per Night

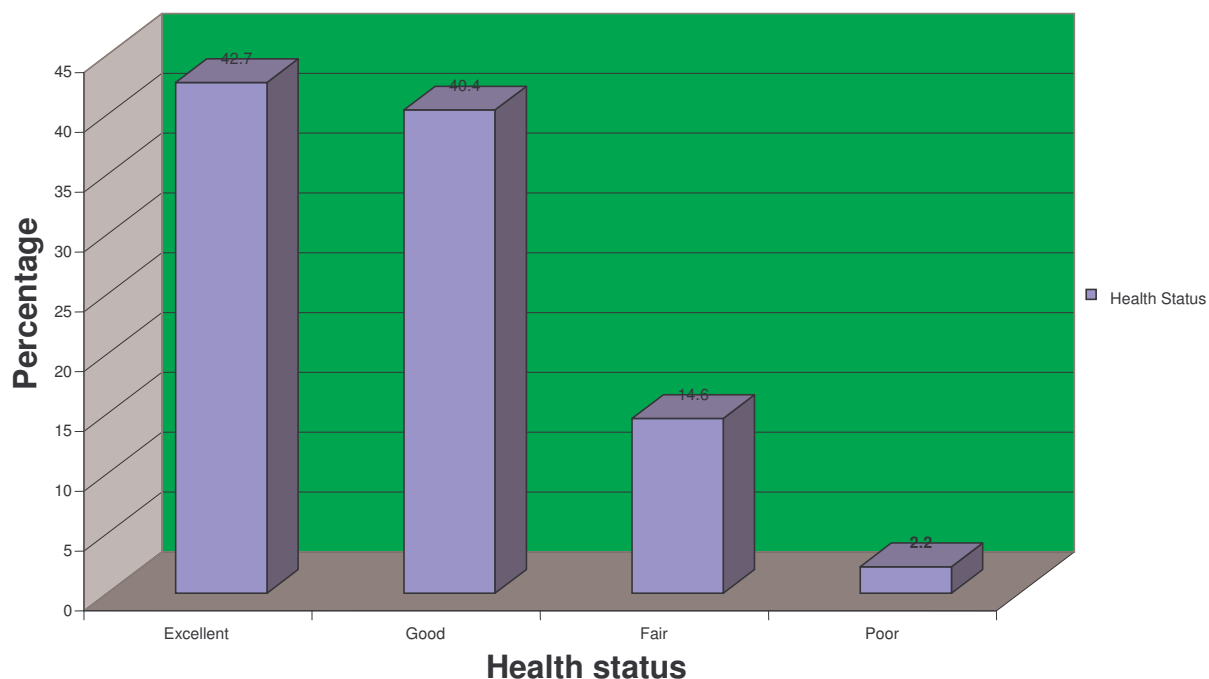
Number of hours sleep per night	Frequency	Percent	Valid Percent	Cumulative Percent
<6 hrs	31	34.8%	34.8%	34.8%
7 hrs	38	42.7%	42.7%	77.5%
8 hrs	16	18.0%	18.0%	95.5%
9 hrs	4	4.5%	4.5%	100.0%
Total	89	100.0%	100.0%	

Figure 3.9: Average Hours Sleep per Night



Physical health status: The respondents were requested to report on their physical health status. Four options were offered, namely, excellent, good, fair and poor. The health ratings were 38 (42.7%) excellent, 36 (40.4%) good, 13 (14.6%) fair and 2 (2.2%) poor. The respondents from the academic university reported as follows on their health status: 10 (27.8%) excellent, 18 (50%) good, 8 (22.2%) fair and poor none. The respondents from the technology university reported as follows on their health status: 28 (52.8%) excellent, 18 (34%) good, 5 (9.4%) fair and 2 (3.8%) poor. The health status of the respondents is indicated by figure 3.10.

Figure 3.10: The Self-Reported Health Status of Respondents

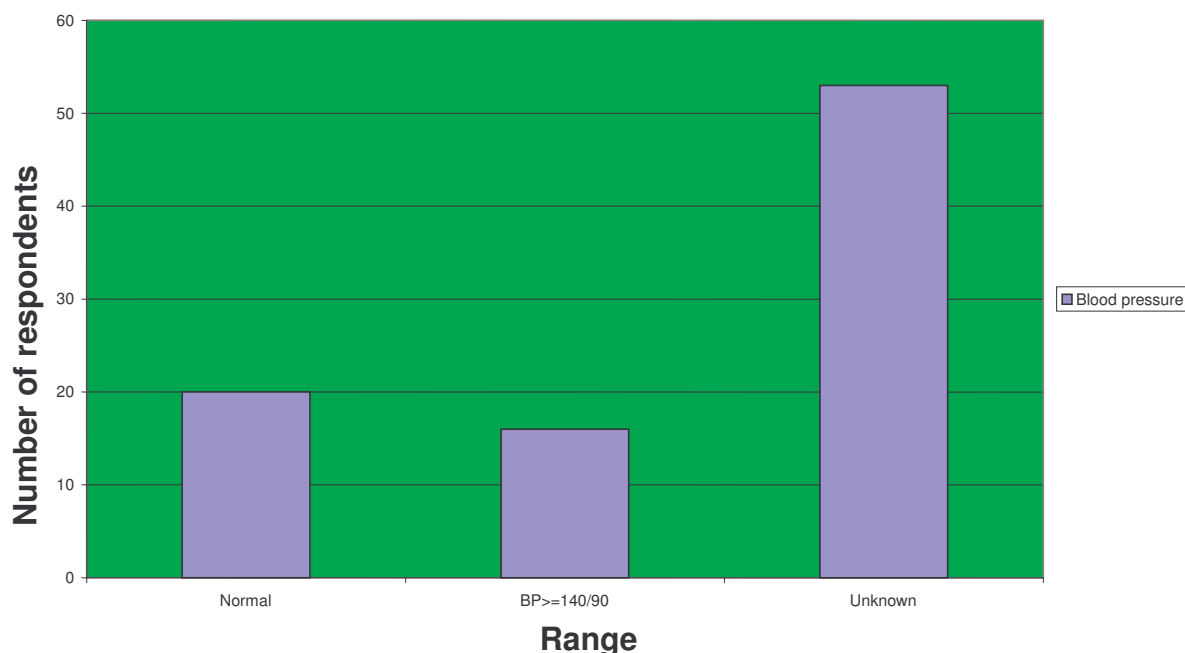


Blood pressure: Only 36 (40.4%) of the respondents indicated their blood pressure levels. Of these, 20 (22.5%) had a normal blood pressure, while 16 (18%) had hypertension or high blood pressure. The blood pressure level of the respondents is indicated in table 3.10 and visually illustrated by figure 3.11.

Table 3.10: Distribution of Respondents' Blood Pressure Level

Blood pressure category	Frequency	Percent	Valid Percent	Cumulative Percent
Normal	20	22.5%	55.6%	55.6%
BP >= 140/90	16	18.0%	44.4%	100.0%
Total	36	40.4%	100.0%	
Unknown	53	59.6%		
Total	89	100.0%		

Figure 3.11: Blood Pressure Levels of Respondents



Family history of medical conditions such as high blood pressure, diabetes, heart attack or angina, stroke and high blood cholesterol: The respondents were requested to report if any close relatives had been diagnosed with any of the aforementioned medical conditions. The respondents reported the number of family medical conditions as follows: hypertension 49, diabetes 19, heart attack or angina 22, stroke 17 and cholesterol 23. Of the 38 respondents that indicated an excellent health status, 19 (50%) reported hypertension as a family medical condition. Of the 36 reported a good health status, 17 (47.2%) revealed a family condition of hypertension. Hypertension was also reported by 11 (84.6%) of the 13 respondents that indicated a fair health status. Only 2 respondents mentioned having a poor health status and both (100%) reported hypertension as a family condition.

Of the 38 respondents that indicated an excellent health status, 7(18.4%) reported diabetes as a family medical condition. Of the 36 that indicated a good health status, 6 (16.7%) mentioned a family condition of diabetes. Diabetes was also reported by 5 (38.5%) of the 13 respondents that indicated a fair health status. Of the two respondents that revealed having a poor health status, both (100%) reported diabetes as a family condition. Of the 38 respondents that indicated an excellent health status, 8 (21.1%) reported a heart attack or angina as a family medical condition. Of the 36 that indicated a good health status, 9 (25.7%) reported a family

condition of heart attack or angina. A heart attack or angina was also reported by 3 (23.1%) of the 13 respondents that indicated a fair health status. Of the 2 respondents that mentioned a poor health status, both (100%) reported a heart attack or angina as a family condition.

Of the 38 respondents that indicated an excellent health status, 6 (15.8%) reported stroke as a family medical condition. Of the 36 that indicated a good health status, 8 (22.2%) reported a family condition of having a stroke. A stroke as a family condition was also reported by 1 (7.7%) of the 13 respondents that indicated a fair health status. Of the 2 respondents that mentioned a poor health status, both (100%) reported a stroke as a family condition.

Finally, of the 38 respondents that indicated an excellent health status, 9 (23.7%) reported high cholesterol as a family medical condition while of the 36 that indicated a good health status, 10 (27.8%) reported a family condition of high cholesterol. High cholesterol was also reported by 2 (15.4%) of the 13 respondents that indicated a fair health status. The 2 respondents that revealed a poor health status both (100%) reported high cholesterol as a family condition.

From the aforementioned discussion, it can be deduced that there is a correlation between the self-reported health status and family history of medical conditions. With the decline in reported health statuses, there is an increase in family medical conditions. The family history of medical conditions is indicated by table 3.11.

Table 3.11: Reported Family History of Medical Conditions

Family history of medical conditions		REPORTED HEALTH STATUS							
		Excellent		Good		Fair		Poor	
		Count	Col %	Count	Col %	Count	Col %	Count	Col %
Hypertension	No	19	50%	19	52.8%	2	15.4%	0	0%
	Yes	19	50%	17	47.2%	11	84.6%	2	100%
Diabetes	No	31	81.6%	30	83.3%	8	61.5%	1	50%
	Yes	7	18.4%	6	16.7%	5	38.5%	1	50%
Heart attack / angina	No	30	78.9%	26	74.3%	10	76.9%	0	0%
	Yes	8	21.1%	9	25.7%	3	23.1%	2	100%
Stroke	No	32	84.2%	28	77.8%	12	92.3%	0	0%
	Yes	6	15.8%	8	22.2%	1	7.7%	2	100%
High cholesterol	No	29	76.3%	26	72.2%	11	84.6%	0	0%
	Yes	9	23.7%	10	27.8%	2	15.4%	2	100%

Current medical conditions such as high blood pressure, diabetes, heart attack or angina, stroke and high blood cholesterol: The respondents were requested to indicate if they had ever been diagnosed with any of the aforementioned conditions. The respondents reported the number of diagnosed medical conditions as follows: hypertension 22; diabetes 5; heart attack or angina 4; stroke 0 and high cholesterol 21. Of the 38 respondents that indicated an excellent health status, 5 (13.2%) reported a diagnosed condition of hypertension and of the 36 that stated a good health status, 9 (25%) reported a diagnosed condition of hypertension. Hypertension was also reported by 7 (53.8%) of the 13 respondents who indicated a fair health status while the 2 respondents who indicated a poor health status, 1 reported being diagnosed with hypertension.

Among the 38 respondents that indicated an excellent health status, 1 (2.6%) reported to be diagnosed with diabetes while the 36 who reported a good health status, none had diabetes as a diagnosed medical condition. A diagnosed condition of diabetes was reported by 4 (30.8%) of the 13 respondents that indicated a fair health status, while none was reported by respondents with a poor health status.

Only 1 (2.6%) of the 38 respondents who indicated an excellent health status, reported a diagnosed heart attack or angina and of the 36 that revealed a good health status, 2 (5.6%) reported being diagnosed with a heart attack or angina. None of the 13 fair health status respondents reported a heart attack or angina, while 1 (50%) of the poor health status respondents reported a diagnosed heart attack or angina. None of the respondents responded that they had been diagnosed with a stroke.

Only 7 (18.4%) of the 38 excellent health status respondents reported high cholesterol as a diagnosed medical condition. Of the 36 good health status respondents, 8 (22.2%) reported being diagnosed with high cholesterol levels. Having been diagnosed with high cholesterol was also reported by 4 (30.8%) of the 13 fair health status respondents. The 2 poor health status respondents both (100%) reported being diagnosed with high cholesterol.

This discussion thus shows that there is a correlation between the self-reported health statuses and diagnosed medical conditions. With the decline in reported health status there is an increase in diagnosed medical conditions. The diagnosed medical conditions are indicated by table 3.12.

Table 3.12: Self-reported Health Status by Reported Medical Conditions of Respondents

Diagnosed with medical conditions		REPORTED HEALTH STATUS							
		Excellent		Good		Fair		Poor	
		Count	Col %	Count	Col %	Count	Col %	Count	Col %
Hypertension	No	33	86.8%	27	75.0%	6	46.2%	1	50.0%
	Yes	5	13.2%	9	25.0%	7	53.8%	1	50.0%
Diabetes	No	37	97.4%	36	100.0%	9	69.2%	2	100.0%
	Yes	1	2.6%			4	30.8%		
Heart attack / angina	No	37	97.4%	34	94.4%	13	100.0%	1	50.0%
	Yes	1	2.6%	2	5.6%			1	50.0%
Stroke	No	38	100.0%	36	100.0%	13	100.0%	2	100.0%
High cholesterol	No	31	81.6%	28	77.8%	9	69.2%		
	Yes	7	18.4%	8	22.2%	4	30.8%	2	100.0%

Number of alcoholic drinks per day: Finally, the respondents were asked to indicate how many glasses of beer, wine or mixed drinks they consumed per day. Only 60 (67.4%) of the respondents reported their alcohol consumption habits. Of these, 17 (19.1%) consumed 1 drink per day, 29 (32.6%) 2 drinks per day, 9 (10.1%) 3 drinks per day, 1 (1.1%) 4 drinks per day, 3 (3.4%) 5 drinks per day and 1 (1.1%) 6 drinks per day. Table 3.13 indicates the average alcoholic drinks consumed per day.

Table 3.13: Average Alcoholic Drinks Consumed per Day

Total drinks per day	Frequency	Percent	Valid Percent	Cumulative Percent
1	17	19.1%	28.3%	28.3%
2	29	32.6%	48.3%	76.7%
3	9	10.1%	15.0%	91.7%
4	1	1.1%	1.7%	93.3%
5	3	3.4%	5.0%	98.3%
6	1	1.1%	1.7%	100.0%
Total	60	67.4%	100.0%	
Unknown	29	32.6%		
Total	89	100.0%		

3.6.2 Cronbach's alpha coefficient

The researcher used an instrument that had been developed and validated with samples outside the South African context. The researcher conducted a reliability test (Cronbach's alpha coefficient) to ensure the internal consistency of the questionnaire. Aiken (quoted by Finchilescu, 2005:216) argues that if the scale is to be used to compare groups of people, then a reliability of 0.65 is sufficient and if an individual's score is to be compared with another's, or against a set of norms, the reliability should be at least 0.85. Durrheim and Painter (2006:154) are of the opinion that, as a rule of thumb, questionnaire-type scales with an alpha value of greater than 0.75 are considered reliable (internally consistent).

The reliability test of the ten sub-dimensions of the instrument showed a Cronbach's alpha of 0.69 for physical fitness and nutrition; 0.67 for medical self-care, 0.76 for safety and lifestyle, 0.71 for environmental wellness, 0.77 for social awareness, 0.81 for sexuality and emotional awareness, 0.84 for emotional management, 0.82 for intellectual wellness, 0.87 for occupational wellness and 0.85 for spirituality and values. The reliability of the full TestWell scale, determined by Cronbach's coefficient alpha was 0.93. The Cronbach's alpha of each wellness sub-dimension is shown in table 3.14.

Table 3.14: Cronbach's Alpha for the Wellness Sub-dimensions

Wellness sub-dimension	Cronbach's Alpha	N of Items
Physical fitness and nutrition	0.69	10
Medical self-care	0.67	10
Safety	0.76	10
Environmental wellness	0.71	10
Social awareness	0.77	10
Sexuality and emotional awareness	0.81	10
Emotional management	0.84	10
Intellectual wellness	0.82	10
Occupational wellness	0.87	10
Spirituality and values	0.85	10
Full TestWell score	0.93	100

3.6.3 Pearson product moment correlation coefficient

Correlation is a measure of the strength of the linear association between two variables, X and Y (Siegel & Morgan, 1996:532). Pearson product moment correlation coefficient was used to determine if any association existed between the ten sub-dimensions of wellness scores and the health risk scores.

The formula for r is:

$$r = \frac{S_{xy}}{S_x S_y}$$

Where: x is the variable on the horizontal axis

Y is the variable on the vertical axis

S_x and S_y are the standard deviations of x and y , respectively

S_{xy} is the co-variance between x and y

The formula to calculate the co-variance between x and y is:

$$S_{xy} = \frac{\sum x \sum y}{n - 1}$$

According to Lachenicht (2005:184) and Triola (1998:482), the product-moment correlation formula was devised in such a way to ensure that the value of r will fall within the range of -1 to +1. An r of -1 means a perfect negative correlation (a perfect inverse relationship where, as the value of x rises, the value of y falls); an r of +1 means a perfect positive correlation (where the values of x and y rise or fall together); while an r of 0 means zero correlation, which means that there is no relationship between x and y . Guilford (quoted by Lachenicht, 2005:184) offers

informal interpretations for statistically significant Pearson correlations of various sizes as visually represented in table 3.15.

Table 3.15: Guilford's Informal Interpretations of the Magnitude of r

Value of r (+ or -)	Informal interpretation
<0.2	Slight; almost no relationship
0.2 – 0.4	Low correlation, definite but small relationship
0.4 – 0.7	Moderate correlation; substantial relationship
0.7 – 0.9	High correlation; strong relationship
0.9 – 1.0	Very high correlation; very dependable relationship

3.6.4 *T*-tests to compare mean scores

The *T*-test is used to compare two (estimated) population means and aims at comparing distributions that are normally distributed (Nunez, 2005:143). The researcher conducted *T*-tests to compare the mean wellness behaviour levels and mean health risk scores of various groups.

The first *T*-test was done to compare the mean wellness behaviour levels and mean health risk scores of managers at the academic university and technology university. A second *T*-test was done to compare the mean wellness behaviour levels and mean health risk scores of heads of academic departments and directors of support services. Members of the rectorate were excluded in view of their small representation (2.2% of respondents). A third *T*-test was done to compare the mean wellness behaviour levels and mean health risk scores of males and females. Lastly, a *T*-test was done to compare the mean wellness behaviour levels and mean health risk scores of post-graduate (46.1%) and PhD graduate (44.9%) managers. In view of the insignificant representation, those with matric (1.1%) and degrees (7.9%) were excluded from the *T*-test.

3.6.5 One-way analysis of variance (ANOVA)

ANOVA allows one to compare the means of more than two independent groups of subjects (Durrheim, 2005:252). Thus, One-way analysis of variance is

used to test whether the population means of the groups are different (Siegel & Morgan, 1996:433).

For the purpose of this study, the researcher conducted a one-way analysis of variance to determine the difference between the mean wellness behaviour levels and mean health risk scores of the three age groups (35-45; 46-55 and 56-65).

3.7 SUMMARY

This chapter has provided a description of the research methodology used in this study. An overview was given of the research design, respondents and population. To provide a clear picture of the respondents the identified demographic variables were summarized. The nine health risk variables of the population were discussed with specific reference to how the health risk scores were calculated. The psychometric properties of the research instrument used in the study were reported.

In terms of procedures for data collection, the questionnaire administration and handling of returned questionnaires and data were explained. The procedures for data analysis were reported with specific reference to the statistical procedures that were followed, namely, descriptive statistics such as tables, graphs, means and standard deviations; Cronbach's alpha coefficient to measure the internal consistency of the instrument; Pearson product moment correlation coefficient to measure the relationship between the ten wellness sub-dimension scores and health risk scores; *T*-tests to compare the mean scores of various independent groups and One-way analysis of variance to compare the mean wellness sub-dimension and health risk scores between the three age groups.

The results obtained and the interpretation of the results will be discussed in Chapter Four.

CHAPTER FOUR: RESEARCH FINDINGS

4.1 INTRODUCTION

The main aim of this research study was to develop a holistic wellness model for managers at higher education institutions. The secondary aims were to measure the wellness behaviour levels of managers by focussing on the various wellness sub-dimensions, to identify their health risk factors, to calculate the health risk scores and to propose wellness interventions based on the measurement of wellness behaviour levels and the health risk scores. To accomplish these research aims or objectives, this study was designed to explore the following research questions:

- 1) What is the correlation between the health risk scores and the wellness behaviour levels of managers?
- 2) Is there a difference between the mean wellness behaviour levels and mean health risk scores of managers at the academic university and the technology university?
- 3) Is there a difference between the mean wellness behaviour levels and mean health risk scores of heads of academic departments and directors of support services?
- 4) Is there a difference between the mean wellness behaviour levels and mean health risk scores of male and female managers?
- 5) Is there a difference between the mean wellness behaviour levels and mean health risk scores of post-graduate and PhD graduate managers?
- 6) Is there a difference between the mean wellness behaviour levels and mean health risk scores of managers according to their age groups?
- 7) Can a wellness prediction model be used, as a holistic dependant variable, to measure wellness against all possible independent variables?

The psychometrically measured variables, as well as the demographic and health risk variables to be used in further analysis are shown in Table 4.1.

Table 4.1: Variables Included in the Analysis

VARIABLES	DESCRIPTION
Demographic variables	
A1	At which university are you employed
A5	Gender
A7	Age
A8	Level of education
A9	Job title
Health risk variables included to calculate health risk scores	
A14	Smoking status
A16	Visits to doctors or health care professionals
A17	Hours sleep per night
A18	Physical health status
A20	Family history of medical conditions (high blood pressure, diabetes, heart attack or angina, stroke and high blood cholesterol)
A21	Diagnosed with medical conditions (high blood pressure, diabetes, heart attack or angina, stroke and high blood cholesterol)
A14-A21 = HRS	Health risk scores
Wellness sub-dimension variables	
PFN	Physical fitness and nutrition
MSC	Medical self-care
STY	Safety
EW	Environmental wellness
SA	Social awareness
SEX	Sexuality and emotional awareness
EM	Emotional management
IW	Intellectual wellness
OW	Occupational wellness
SV	Spirituality and values

4.2 RESULTS

4.2.1 Correlation between the health risk scores and wellness behaviour levels of managers

Research question 1: What is the correlation between the health risk scores and the wellness behaviour levels of managers? The Pearson product moment correlation coefficient was used to determine the relationship between the wellness behaviour levels and the health risk scores of managers. The results are shown in table 4.2.

Table 4.2: Correlation between the Wellness Behaviour Levels and Health Risk Scores of Managers

Wellness sub-dimension	Health risk scores Pearson product moment correlation coefficient Value of (<i>r</i>)	P-values
Physical fitness and nutrition	-.140	0.189
Medical self-care	.068	0.528
Safety	-.042	0.697
Environmental wellness	-.026	0.808
Social awareness	-.162	0.130
Sexuality and emotional awareness	-.401**	0.000
Emotional management	-.297**	0.005
Intellectual wellness	-.073	0.497
Occupational wellness	-.323**	0.002
Spirituality and values	-.195	0.067

There was no correlation between the mean physical fitness and nutrition, medical self-care, safety, environmental wellness, social awareness, intellectual wellness, spirituality and values and the health risk scores of managers. There was a significant negative relationship between sexuality and emotional awareness and the health risk scores. The negative correlation indicates that with an increase in the sexuality and emotional awareness level, there will be a decrease in the health risk. There was a small negative relationship between emotional management and the health risk score. The low negative correlation indicates that with an increase in the emotional management level, there will be a decrease in the health risk. In addition, there was a negative relationship between occupational wellness and health risk. The low negative correlation indicates that with an increase in the occupational wellness level, there will be a decrease in the health risk.

4.2.2 Comparison between the mean wellness behaviour levels and mean health risk scores of managers at the academic university and technology university

Research question 2: Is there a difference between the mean wellness behaviour levels and mean health risk scores of managers at the academic university and the technology university? To compare the mean wellness behaviour

levels and mean health risk scores of managers at the academic university and the technology university, a *T*-test was used to compare the mean scores. The results are shown in table 4.3.

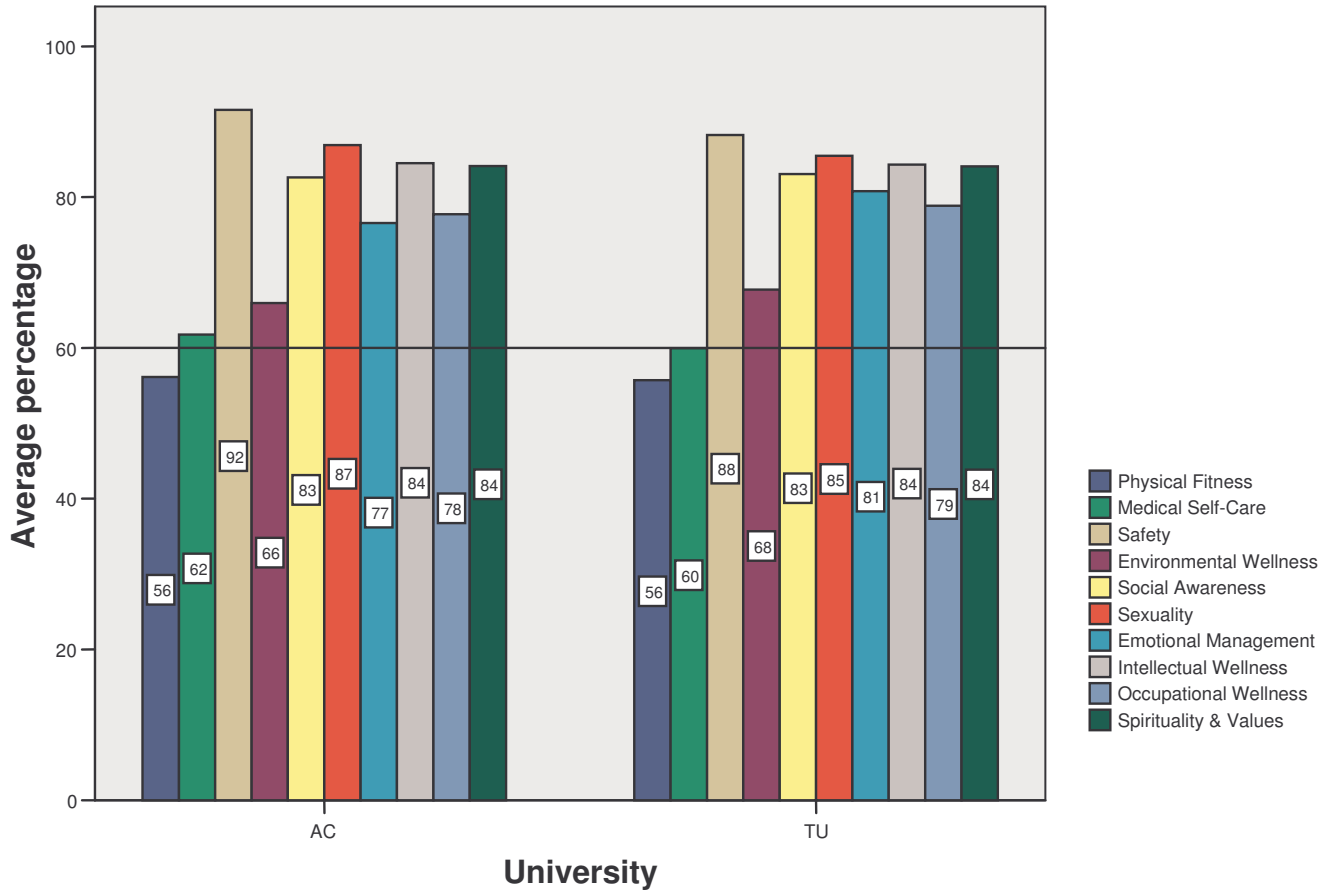
Table 4.3: *T*-test of Mean Scores between the Wellness Behaviour Levels and Health Risk Scores of Managers at the Academic University and Technology University

Wellness sub-dimension	Academic University		Technology University		P-value
	Mean	SD	Mean	SD	
Physical fitness and nutrition	28.06	7.034	27.85	6.998	0.892
Medical self-care	30.89	6.907	29.98	7.752	0.573
Safety	45.78	5.504	44.11	5.780	0.178
Environmental wellness	32.97	6.217	33.87	7.144	0.543
Social awareness	41.31	5.047	41.53	4.734	0.833
Sexuality and emotional awareness	43.44	5.289	42.74	5.460	0.544
Emotional management	38.28	5.844	40.40	6.017	0.103
Intellectual wellness	42.25	4.819	42.15	5.859	0.933
Occupational wellness	38.86	6.634	39.43	6.999	0.700
Spirituality and values	42.06	7.059	42.04	5.244	0.989
Health risk scores	2.56	1.796	2.85	2.397	0.534

The mean scores on the wellness behaviour levels and health risk between managers at the academic university and technology university were very similar, with the exception of emotional management. The average score on emotional management for the technology university managers was 40.40 out of a possible 50 (80.8%), while the average score for managers at the academic university was 38.28 out of a possible 50 (76.56%). On average the emotional management score of the technology managers was 4.24% higher than their counterparts at the academic university.

Since all the p-values are greater than 0.05, the null hypothesis of no difference between the mean scores could not be rejected. Thus, the observed means of the two universities did not differ significantly.

Figure 4.1: Mean Scores of Wellness Behaviour Levels of Managers at the Academic University and Technology University



4.2.3 Comparison between the mean wellness behaviour levels and mean health risk scores of heads of academic departments and directors of support services

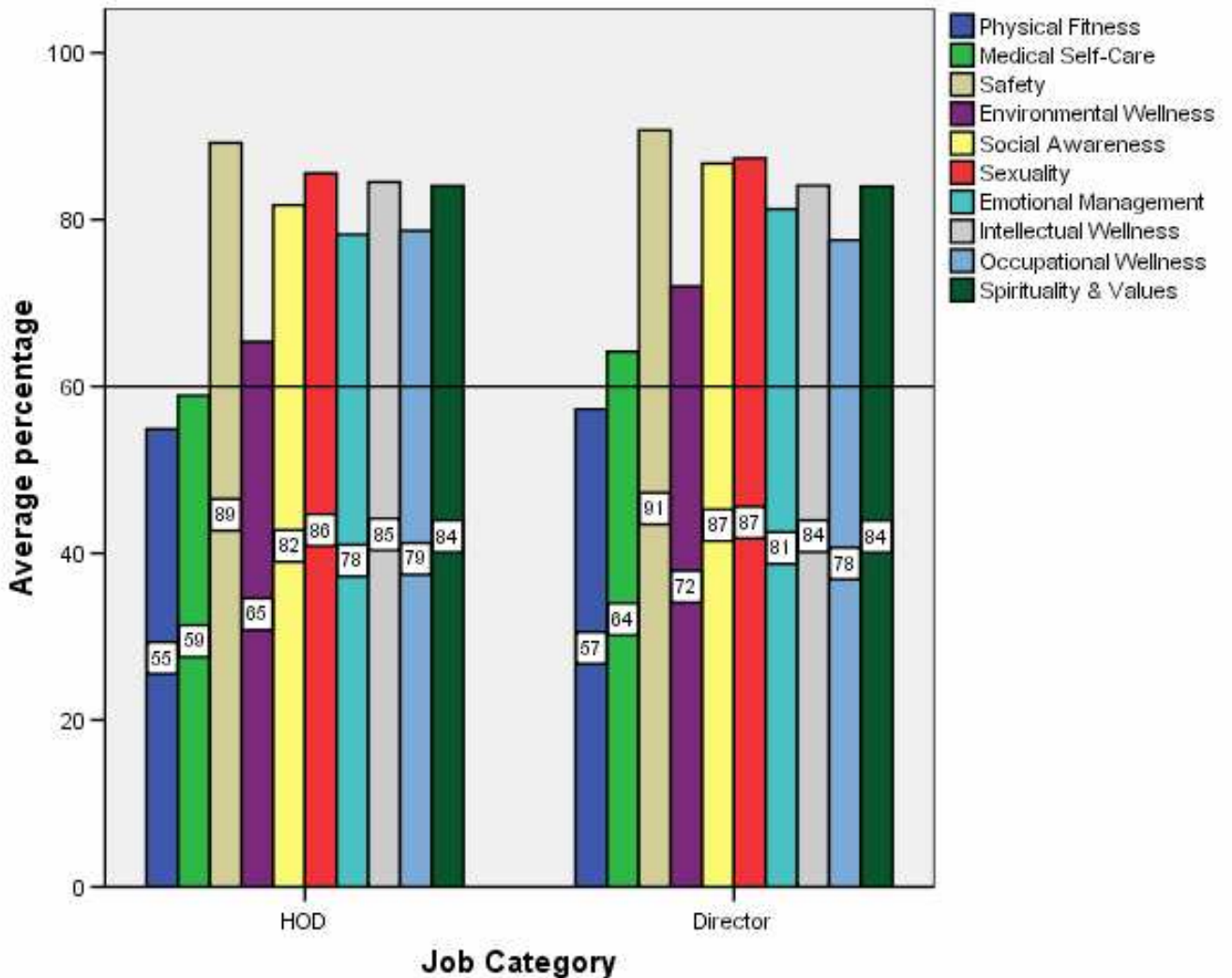
Research question 3: Is there a difference between the mean wellness behaviour levels and mean health risk scores of heads of academic departments and directors of support services? To compare the mean wellness behaviour levels and mean health risk scores of heads of academic departments and directors of support services, a *T*-test was done to compare the mean scores. The results are shown in table 4.4.

Table 4.4: T-test of Mean Scores between the Wellness Behaviour Levels and Health Risk Scores of Heads of Academic Departments and Directors of Support Services

Wellness sub-dimension	Heads of Academic Departments		Directors of Support Services		P-value
	Mean	SD	Mean	SD	
Physical fitness and nutrition	27.54	6.892	29.18	7.513	0.347
Medical self-care	29.95	6.967	31.68	8.632	0.347
Safety	44.82	5.769	44.86	5.784	0.973
Environmental wellness	32.74	6.389	35.64	7.719	0.085
Social awareness	41.05	4.728	42.41	5.234	0.259
Sexuality and emotional awareness	42.75	5.417	43.59	5.509	0.534
Emotional management	38.95	5.991	40.82	6.037	0.211
Intellectual wellness	42.32	5.403	41.64	5.835	0.615
Occupational wellness	38.98	6.639	39.77	7.445	0.642
Spirituality and values	42.11	6.011	41.45	6.224	0.663
Health risk scores	2.88	2.240	2.23	1.998	0.231

Since all the p-values were greater than 0.05, the null hypothesis of no difference between the mean scores could not be rejected. Thus, the observed means of heads of academic departments and directors of support services did not differ significantly.

Figure 4.2: Mean Scores of Wellness Behaviour Levels of Heads of Academic Departments and Directors of Support Services



4.2.4 Comparison between the mean wellness behaviour levels and mean health risk scores of female and male managers

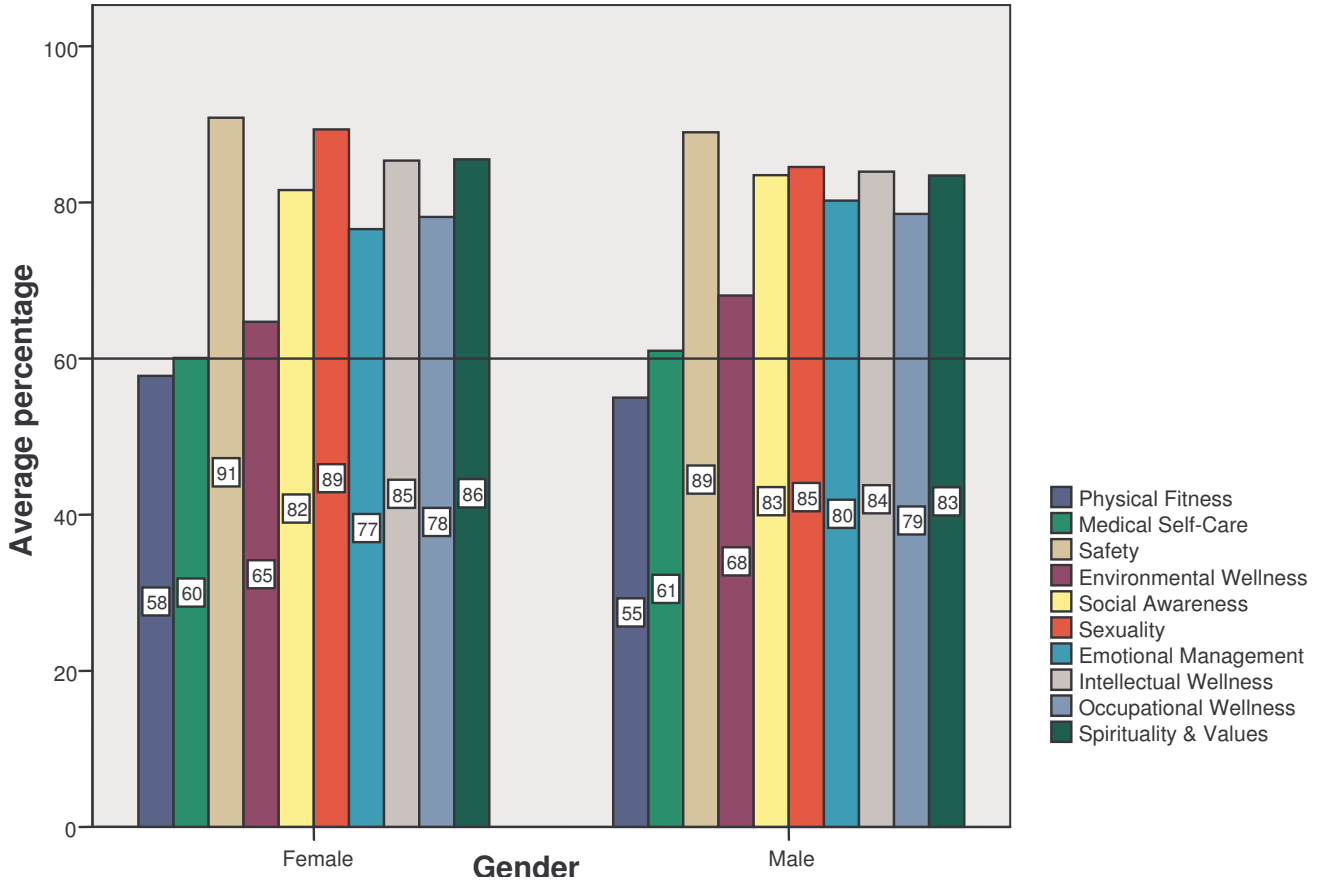
Research question 4: Is there a difference between the mean wellness behaviour levels and mean health risk scores of male and female managers? To compare the mean wellness behaviour levels and mean health risk scores of female and male managers, a *T*-test was done to compare the mean scores. The results are shown in table 4.5.

Table 4.5: T-test of Mean Scores between the Wellness Behaviour Levels and Health Risk Scores of Female and Male Managers

Wellness sub-dimension	Female		Male		P-value
	Mean	SD	Mean	SD	
Physical fitness and nutrition	28.89	7.593	27.49	6.690	0.382
Medical self-care	30.04	7.162	30.49	7.553	0.789
Safety	45.43	6.691	44.49	5.214	0.475
Environmental wellness	32.36	7.689	34.03	6.290	0.280
Social awareness	40.79	5.209	41.74	4.669	0.392
Sexuality and emotional awareness	44.68	5.651	42.26	5.108	0.048
Emotional management	38.29	5.792	40.11	6.061	0.184
Intellectual wellness	42.68	4.603	41.97	5.796	0.569
Occupational wellness	39.07	6.733	39.26	6.916	0.903
Spirituality and values	42.75	5.739	41.72	6.143	0.456
Health risk scores	2.50	2.152	2.84	2.185	0.500

Since all the p-values, except the p-value of 0.048 for sexuality and emotional awareness were greater than 0.05, the null hypothesis of no difference between the mean scores could not be rejected. Thus, the observed means of female and male managers did not differ significantly.

Figure 4.3: Mean Scores of Wellness Behaviour Levels of Female and Male Managers



4.2.5 Comparison between the mean wellness behaviour levels and mean health risk scores of post-graduate and PhD graduate managers

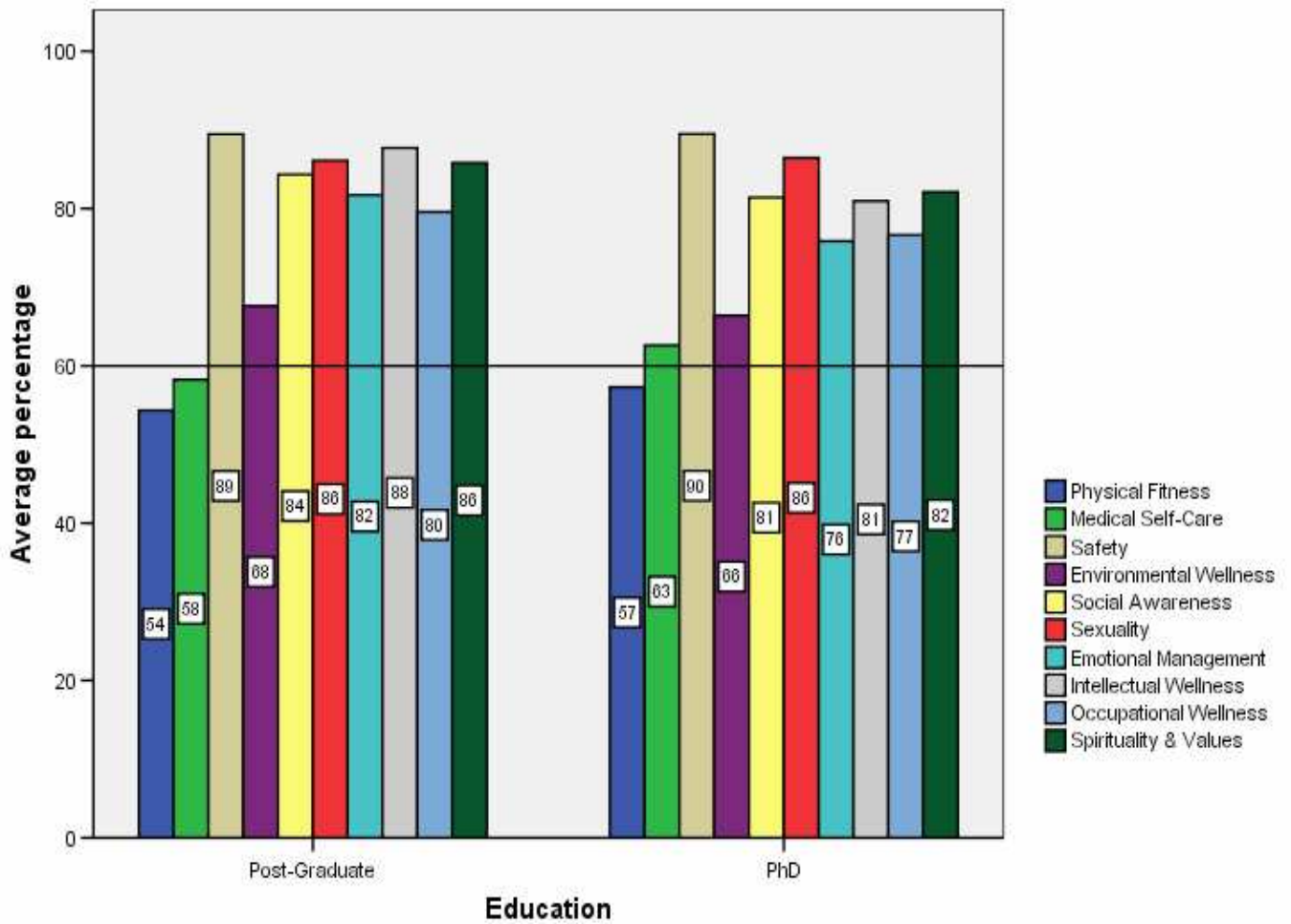
Research question 5: Is there a difference between the mean wellness behaviour levels and mean health risk scores of post-graduate and PhD graduate managers? To compare the mean wellness behaviour levels and mean health risk scores of post-graduate and PhD graduate managers, a *T*-test was done to compare the mean scores. The results are shown in table 4.6.

Table 4.6: T-test of Mean Scores between the Wellness Behaviour Levels and Health Risk Scores of Post-Graduate and PhD Graduate Managers

Wellness sub-dimension	Post-graduate		PhD graduate		P-value
	Mean	SD	Mean	SD	
Physical fitness and nutrition	27.17	7.307	28.65	6.875	0.351
Medical self-care	29.12	8.880	31.30	6.153	0.203
Safety	44.73	5.119	44.75	6.547	0.989
Environmental wellness	33.80	7.260	33.20	6.014	0.685
Social awareness	42.17	4.324	40.70	5.244	0.172
Sexuality and emotional awareness	43.05	5.468	43.23	5.250	0.883
Emotional management	40.85	6.540	37.93	5.446	0.032
Intellectual wellness	43.85	4.942	40.48	5.164	0.004
Occupational wellness	39.78	6.962	38.33	6.498	0.334
Spirituality and values	42.90	4.989	41.05	6.835	0.167
Health risk scores	2.80	2.261	2.55	1.921	0.586

Since all the p-values, except the p-values of 0.032 for emotional management and of 0.004 for intellectual wellness, were greater than 0.05, the null hypothesis of no difference between the mean scores could not be rejected. Thus, the observed means of post-graduate and PhD graduate managers did not differ significantly.

Figure 4.4: Mean Scores of Wellness Behaviour Levels of Post-Graduate and PhD Graduate Managers



4.2.6 Comparison between the mean wellness behaviour levels and mean health risk scores of the three age groups

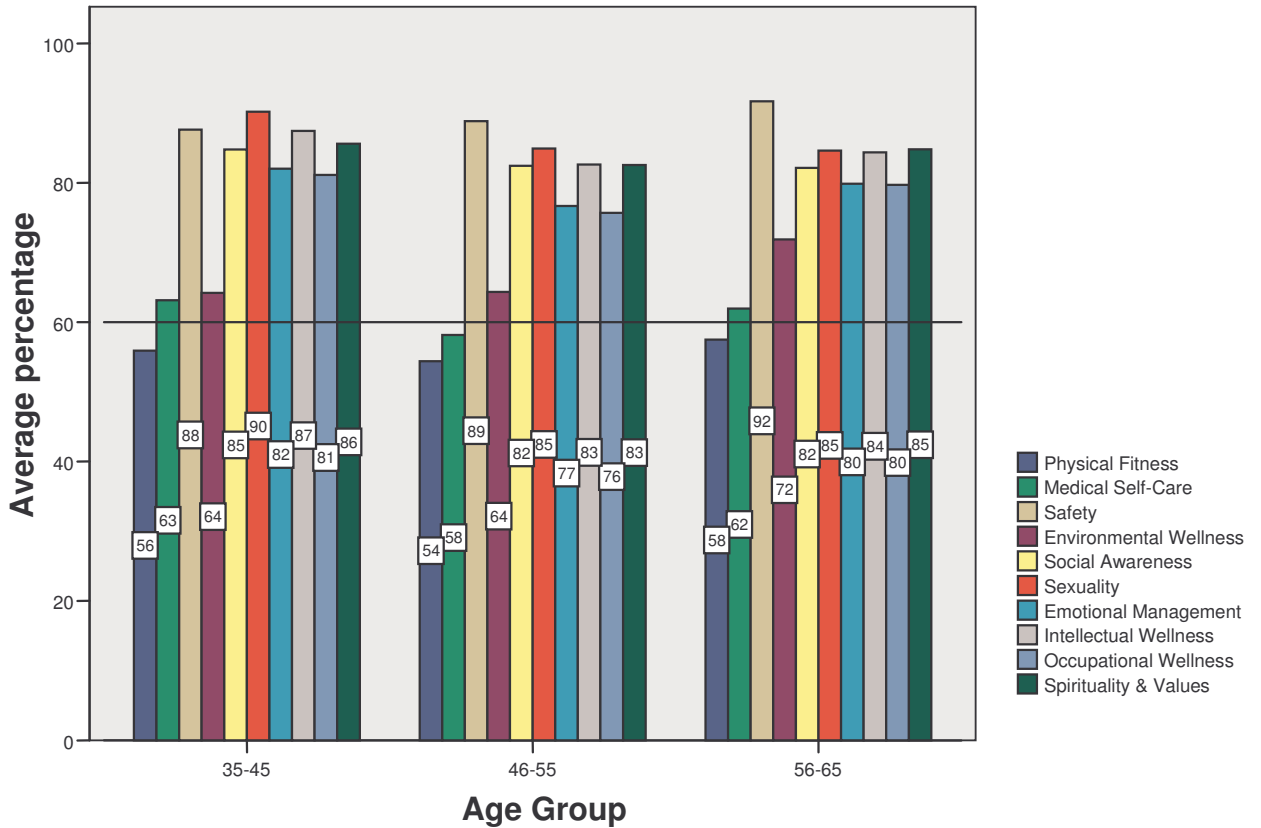
Research question 6: Is there a difference between the mean wellness behaviour levels and mean health risk scores of managers according to their age groups? A one-way analysis of variance was done to compare the means of the three age groups (35-45, 46-55 and 56-65). The results are reflected in table 4.7.

Table 4.7: ANOVA to Compare the Mean Scores between the Wellness Behaviour Levels and Health Risk Scores of the Three Age Groups

Wellness sub-dimension	AGE (Years)						P-value
	35-45		46-55		56-65		
	Mean	SD	Mean	SD	Mean	SD	
Physical fitness and nutrition	27.95	9.552	27.19	6.476	28.75	5.524	0.661
Medical self-care	31.57	8.750	29.08	6.185	30.97	7.706	0.400
Safety	43.81	6.030	44.42	6.299	45.84	4.684	0.397
Environmental wellness	32.10	7.341	32.17	6.092	35.94	6.604	0.038
Social awareness	42.38	5.035	41.22	5.249	41.06	4.257	0.593
Sexuality and emotional awareness	45.10	5.019	42.44	5.521	42.31	5.239	0.128
Emotional management	41.00	5.683	38.33	6.113	39.94	6.005	0.245
Intellectual wellness	43.71	4.233	41.31	6.122	42.19	5.239	0.274
Occupational wellness	40.57	5.372	37.83	7.755	39.84	6.456	0.278
Spirituality and values	42.81	3.970	41.28	6.755	42.41	6.283	0.599
Health risk scores	2.52	2.228	2.58	2.285	3.03	2.024	0.620

Since all the p-values were greater than 0.05, the null hypothesis of no difference between the mean scores could not be rejected. For environmental wellness it can be concluded that the means are not all equal, since $p = 0.038$. However, from the Post Hoc Tests, the p-value of 0.122 between age group 56-65 and 35-45 and the p-value of 0.062 between age group 56-65 and 46-55 indicated that there was not a significant difference in the mean environmental wellness scores between the age group 56-65 and the other two age groups. Thus, the observed means of the three age groups did not differ significantly.

Figure 4.5: Mean Scores of Wellness Behaviour Levels of the Three Age Groups



4.2.7 A wellness prediction model

Research question 7: Can a wellness prediction model be used, as a holistic dependant variable, to measure wellness against all possible independent variables or factors? The data was of such a nature that a linear regression model could not be used, as the variables were not normally distributed. A logistical regression could only be done if a comparison is made between two groups of managers, namely, one group with high wellness behaviour levels and low health risk scores and one group with low wellness behaviour levels and high health risk scores. However, all the managers had fallen into one group characterised by high wellness behaviour levels and low health risk scores. Thus, a comparison was not possible.

The combined wellness behaviour levels of managers at the academic university and the technology university were high with an average of 76.80% (see figure 4.7). The only wellness sub-dimension under the 60th percentile was physical fitness and nutrition. From an organisational development perspective, attention

should be given to an intervention strategy to deal with the low physical fitness and nutritional levels amongst managers at both the sample universities (see figure 4.6).

Figure 4.6: Combined Average Wellness Behaviour Levels of Managers at the Academic University and Technology University

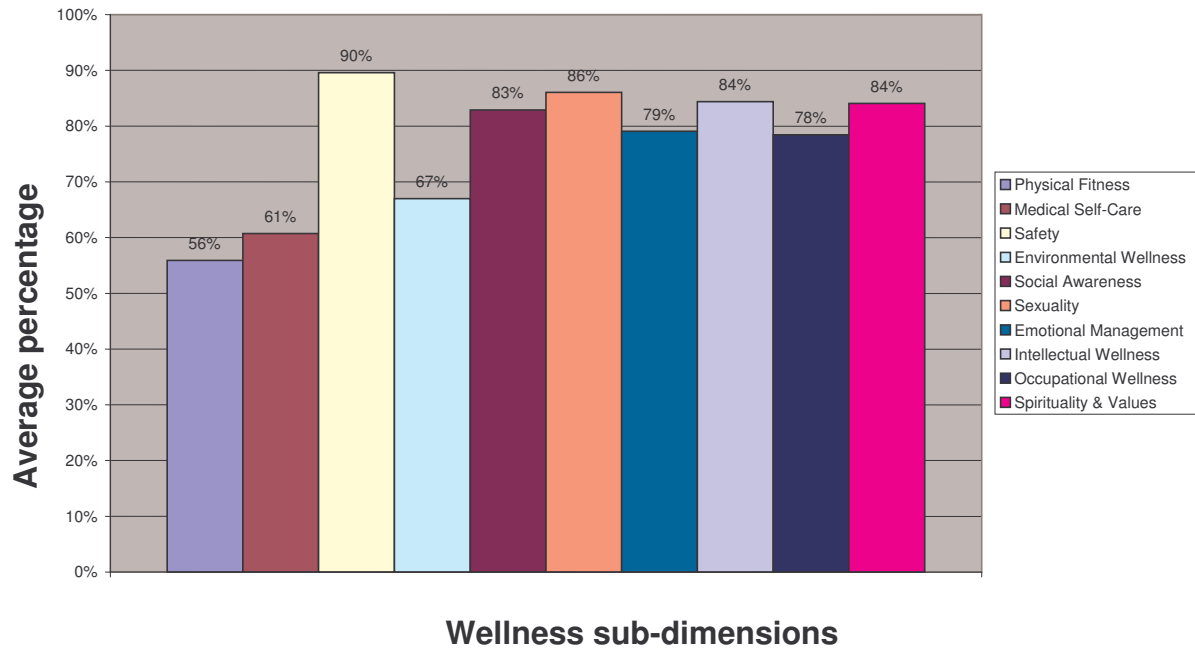
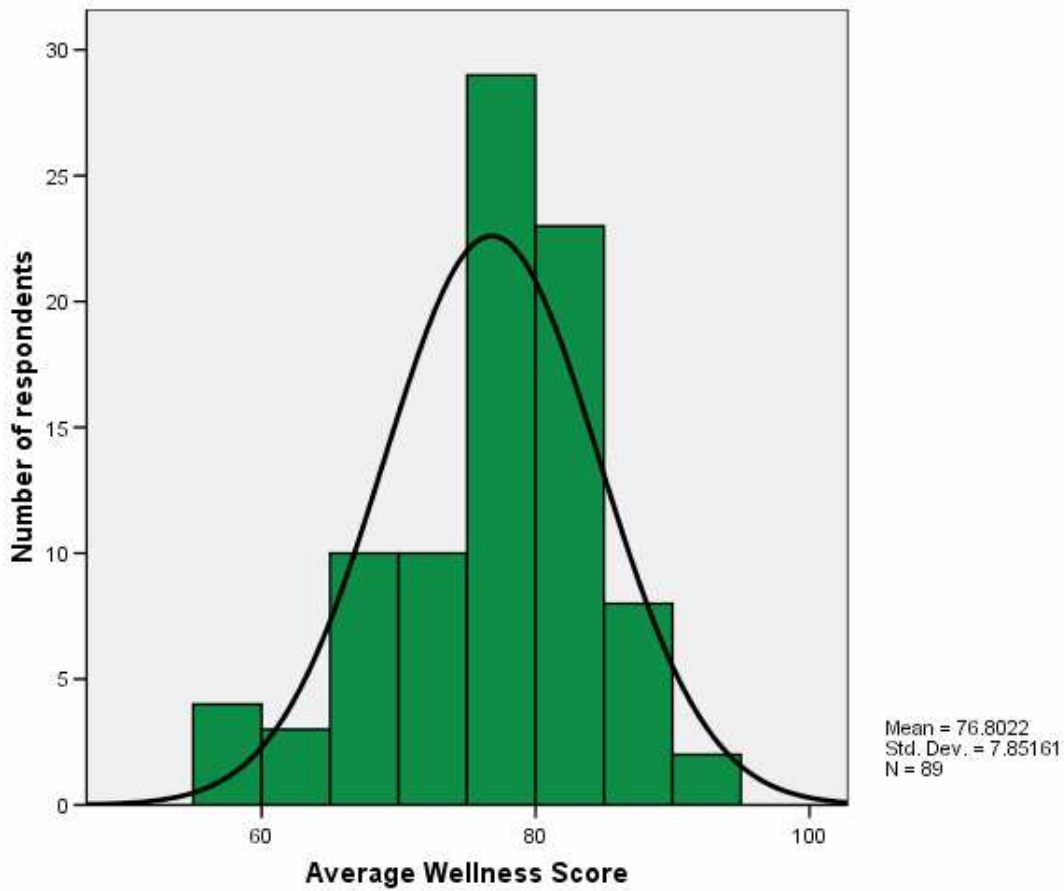


Figure 4.7: Distribution of the Wellness Behaviour Levels of Managers



The wellness behaviour levels of managers ranged between 56% and 90% with an average score of 76.80%. The two lowest scores were physical fitness and nutrition (56%) and medical self-care (61%), while safety had obtained the highest score (90%).

4.3 SUMMARY

This chapter has provided the results of the research study. The findings on the seven research questions were briefly discussed. These findings will be further discussed in Chapter Five.

CHAPTER 5: SUMMARY AND RECOMMENDATIONS

5.1 INTRODUCTION

In this final chapter, the major findings and contributions of the current study, its implications for higher education institutions, directions for future research and the limitations of the present study will be presented.

5.2 DISCUSSION OF FINDINGS

5.2.1 Discussion of the correlation between the health risk scores and wellness behaviour levels of managers

The first research question concerned the correlation between the health risk scores and the wellness behaviour levels of managers. The results suggested that there was no significant correlation between the mean physical fitness and nutrition, medical self-care, safety, environmental wellness, social awareness, intellectual wellness, spirituality and values sub-dimensions and the health risk scores of managers. However, there was a significant negative relationship between sexuality and emotional awareness and the health risk scores. The negative correlation indicated that with an increase in the sexuality and emotional awareness level, there would be a decrease in the health risk. There was a small negative relationship between emotional management and the health risk score. The low negative correlation indicated that with an increase in the emotional management level, there would be a decrease in the health risk. There was also a negative relationship between occupational wellness and the health risk score. The low negative correlation indicated that with an increase in the occupational wellness levels, there would be a decrease in the health risk.

5.2.2 Discussion of the difference between the mean wellness behaviour levels and mean health risk scores of managers at the academic university and technology university

The second research question investigated the difference between the mean wellness behaviour levels and the mean health risk scores of managers at the academic university and technology university. The results indicated that the wellness behaviour levels and health risk scores between managers at the academic university and technology university were very similar. The p-values were all greater than 0.05, confirming the null hypothesis. This shows that there is no significant difference between the mean wellness behaviour levels and health risk scores of managers at the academic university and technology university.

5.2.3 Discussion of the difference between the mean wellness behaviour levels and mean health risk scores of heads of academic departments and directors of support services

The third research question concerned the difference between the mean wellness behaviour levels and mean health risk scores of heads of academic departments and directors of support services. The results indicated that there was no significant difference in the mean wellness behaviour levels and mean health risk scores of heads of academic departments and directors of support services. Thus, the null hypothesis postulating that there is no significant difference between the mean wellness behaviour levels and mean health risk scores of heads of academic departments and directors of support services, could not be rejected.

5.2.4 Discussion of the difference between the mean wellness behaviour levels and mean health risk scores of female and male managers

This research question was aimed at establishing if there was a difference between the mean wellness behaviour levels and mean health risk scores of male and female managers. Only in one wellness behaviour sub-dimension, namely, sexuality and emotional awareness, the p-value of 0.048, was less than 0.05. Thus,

there were no significant differences between the mean scores of nine of the ten wellness behaviour levels and the mean health risk scores of female and male managers. The exception was sexuality and emotional awareness. Since there were no significant differences between the mean scores of nine of the ten wellness behaviour levels and the mean health risk scores, the null hypothesis postulating that there is no significant difference between the mean wellness behaviour levels and mean health risk scores of male and female managers could not be rejected.

5.2.5 Discussion of the difference between the mean wellness behaviour levels and mean health risk scores of post-graduate and PhD graduate managers

The fifth research question looked at the difference between the mean wellness behaviour levels and the mean health risk scores of post-graduate and PhD graduate managers. The results indicated that there were no differences between the mean physical fitness and nutrition, medical self-care, safety, environmental wellness, social awareness, sexuality and emotional awareness, occupational wellness, spirituality and values and the health risk scores. However, the exceptions were the emotional management (p-value of 0.032) and intellectual wellness (p-value of 0.004) sub-dimensions. Since the results had shown no significant difference between the mean of eight of the ten behaviour levels and the health risk scores, the null hypothesis stating that there is no significant difference between the mean wellness behaviour levels and mean health risk scores between post-graduate and PhD graduate managers could not be rejected.

5.2.6 Discussion of the difference between the mean wellness behaviour levels and mean health risk scores of the three age groups

In this respect, the difference between the mean wellness behaviour levels and mean health risk scores of managers according to their age groups were examined. There were no differences in the mean physical fitness and nutrition, medical self-care, safety, social awareness, sexuality and emotional awareness, emotional management, intellectual wellness, occupational wellness, spirituality and

values and the health risk scores. Although an ANOVA indicated that the mean environmental wellness scores of the three age groups were different, the Post-hoc tests did not indicate which age groups differed. Thus, the null hypothesis stating that there is no significant difference between the mean wellness behaviour levels and mean health risk scores, was maintained.

5.2.7 Discussion of the fitting of a wellness prediction model

The last research question was aimed at establishing whether a wellness prediction model could be used, as a holistic dependant variable, to measure wellness against the independent variables such as physical fitness and nutrition, medical self-care, safety, environmental wellness, social awareness, sexuality and emotional awareness, emotional management, intellectual wellness, occupational wellness, spirituality and values and the health risk scores.

The data was of such a nature that a linear regression model could not be used, as the variables were not normally distributed. A logistical regression could only be done if a comparison was made between two groups of managers, namely, one group with high wellness behaviour levels and low health risk scores and one group with low wellness behaviour levels and high health risk scores. However, all the managers fell into one group characterised by high wellness behaviour levels and low health risk scores and as a result a comparison was not possible.

The null hypothesis postulating that it is not possible to use a wellness prediction model as a holistic dependant variable to measure wellness against all possible variables, could not be rejected.

5.2.8 Combined health risk scores and wellness behaviour levels of managers at the sample universities

The results of the data analysis indicated that there was no significant difference in the health risk scores of managers. As such, the wellness behaviour levels and health risk scores of managers at the two sample universities were combined to determine their overall wellness status. The combined health risk scores were an average of 2.71 out of a possible 14 (19.36%), while the combined

average wellness behaviour levels of managers at the two sample universities was 76.80%. The combined wellness behaviour levels are shown in Table 5.1.

Table 5.1: Combined Average Wellness Behaviour Levels of Managers at the Two Sample Universities

Wellness sub-dimension	N	Minimum	Maximum	Mean	Std. Deviation
Physical fitness and nutrition	89	12	46	27.93	6.974
Medical self-care	89	11	49	30.35	7.395
Safety	89	26	50	44.79	5.698
Environmental wellness	89	20	50	33.51	6.762
Social awareness	89	28	50	41.44	4.836
Sexuality and emotional awareness	89	27	50	43.02	5.372
Emotional management	89	22	50	39.54	6.006
Intellectual wellness	89	26	50	42.19	5.433
Occupational wellness	89	17	49	39.20	6.821
Spirituality and values	89	22	50	42.04	6.006

Similar research studies were done to measure the extent to which wellness behaviour reflects potential health risks and hazards. The instrument, the TestWell Wellness Inventory, was used in a number of studies to measure the mean wellness behaviour levels of high school and college students (Stewart *et al.*, 2000:157-173; Owen, 1999:180-182; DiMonda, 2005). Although the target populations were different, the scores of the wellness behaviour levels of this study were compared with those of the abovementioned studies. The comparison is shown in table 5.2.

Table 5.2: Comparison of Wellness Sub-dimension Scores

Wellness sub-dimension	Botha (2006) Population = managers			Stewart <i>et al.</i> (2000:162) Population = high school students			Owen (1999:181) Population = college students		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
Physical fitness and nutrition	89	27.93	6.974	426	30.74	7.99	184	32.67	8.36
Medical self-care	89	30.35	7.395	422	28.22	7.41	185	33.23	8.04
Safety	89	44.79	5.698	425	37.29	8.69	185	44.38	3.98
Environmental wellness	89	33.51	6.762	427	33.04	7.87	185	33.40	6.90
Social awareness	89	41.44	4.836	427	34.07	7.84	185	40.02	5.55
Sexuality and emotional awareness	89	43.02	5.372	418	40.27	6.73	185	43.05	5.91
Emotional management	89	39.54	6.006	432	39.26	7.23	185	38.90	5.30
Intellectual wellness	89	42.19	5.433	431	33.61	9.14	185	42.31	4.90
Occupational wellness	89	39.20	6.821	432	40.08	7.68	182	39.75	6.29
Spirituality and values	89	42.04	6.006	431	39.20	7.64	184	40.73	6.25

The comparison of the three research studies revealed similar mean wellness behaviour levels on the environmental wellness, emotional wellness management and occupational wellness sub-dimensions. The mean physical and nutrition levels of managers in this study are lower than those mean scores of the high school and college students in the other two research studies. A possible explanation for this trend may be a higher participation rate in physical activities and more time available for recreational activities amongst the high school and college students. The mean wellness behaviour levels on safety are similar between managers in this study and the college student population, while the mean wellness behaviour levels on safety amongst the high school population are considerably lower. A possible explanation is that adolescents or teenagers are more susceptible to risky behaviour.

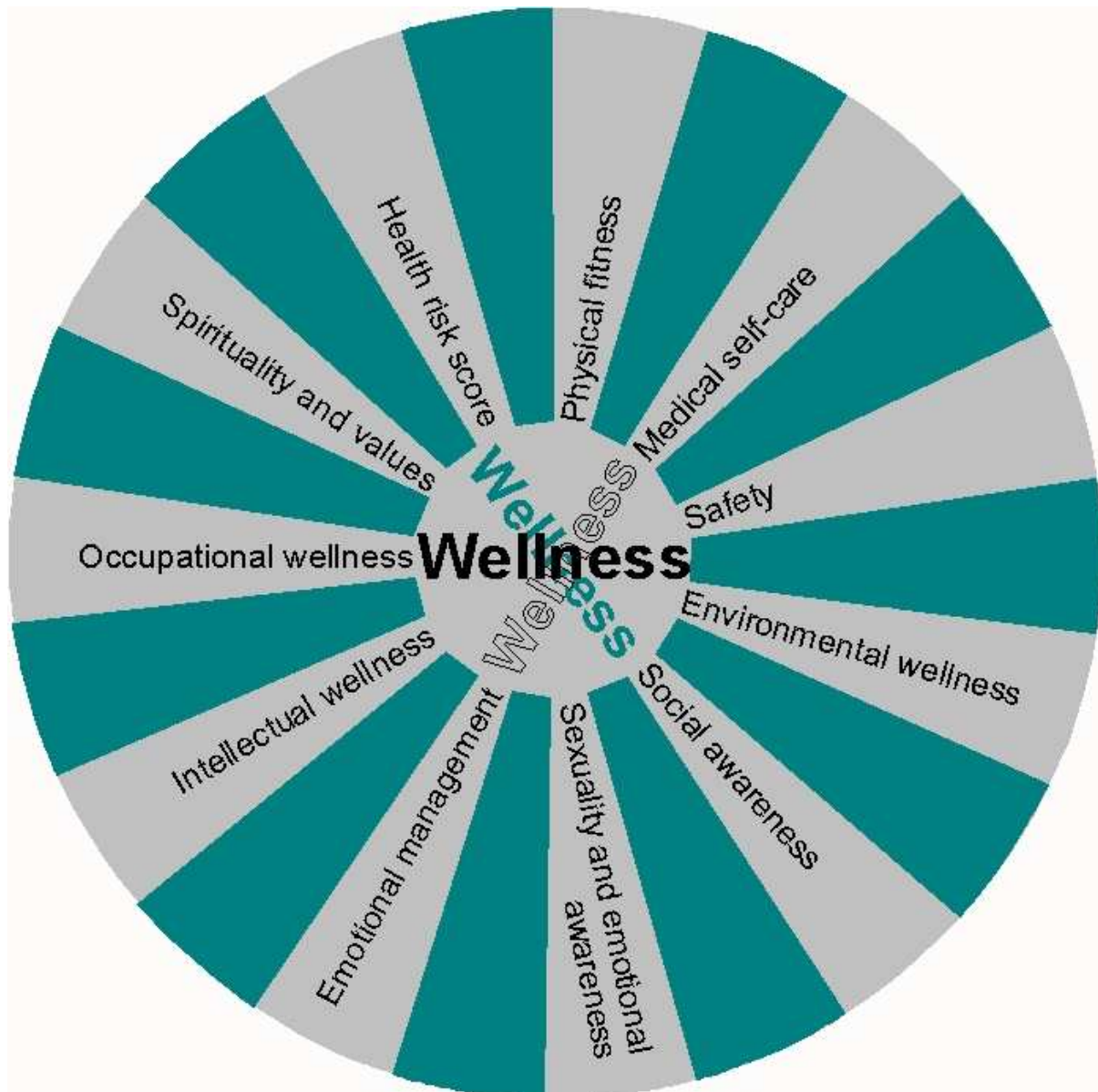
The mean social awareness scores between the managerial and college student populations were similar, while the mean score of the high school population was considerably lower. A possible reason for this may be the general immaturity

and selfishness of teenagers and the lack of valuing the importance of interpersonal skills and relationships. The mean scores on the intellectual wellness sub-dimension for high school students were also lower compared to the managerial and college students' population. A possible explanation may be the fact that intellectual growth is coupled to life long learning and becomes more important when individuals join the labour market.

5.3 CONTRIBUTIONS OF THE CURRENT STUDY

Firstly, this study was important in the sense that it contributed to the development of a holistic wellness behaviour and health risk model for managers at South African tertiary institutions. The model is based on the holistic wellness behaviour assessment questionnaire used in this study. The wellness behaviour of managers was measured on ten wellness sub-dimensions. The questionnaire included nine health risks assessment questions to determine the health risk score. Of these nine, only six were used to measure the health risk scores of managers. Thus, the health risk score is the eleventh independent variable influencing wellness as a dependent variable. This model is visually illustrated in figure 5.1.

Figure 5.1: A Wellness Behaviour and Health Risk Model for Managers at South African Tertiary Institutions



The model consists of eleven independent variables, namely, physical fitness and nutrition, medical self-care, safety, environmental wellness, social awareness, sexuality and emotional awareness, emotional management, intellectual wellness, occupational wellness, spirituality and values and the health risk score. Wellness, as a dependent variable, is a multi-dimensional construct determined by a number of variables or factors. In this study, wellness, as a dependent variable, was determined by the eleven independent variables mentioned. The theoretical foundations of the ten sub-dimensions of wellness were discussed in Chapter Two. Each sub-dimension was discussed with specific reference to the possible risk factors

associated with each, as well as individual and organisational interventions to decrease the wellness behaviour risks of managers. Chapter Two thus served as the theoretical foundation of the sub-dimensions of wellness included in the proposed model. In addition, the literature review served as an educational tool to inform and make managers aware of their wellness behaviour, health risks associated with their behaviour, possible behaviour change interventions and the advantages of healthy wellness behavioural habits.

The second major contribution of this study was the adaptation of an existing measuring instrument, the TestWell Wellness Inventory for Adults designed by the National Wellness Institute in the United States of America that measured the wellness behaviour levels and health risk scores of managers. The results of the research study provided a cross-sectional picture of the wellness status of managers at the two sample universities. It also enabled management at the two sample universities to devise and implement structured wellness interventions based on scientific verifiable and reliable data.

The third contribution was that the research findings indicated high wellness behaviour levels (average score of 76.80%) amongst managers at the two sample universities. The only exceptions were physical fitness and nutrition (average score of 56%) and, as a borderline, medical self-care (average score of 61%). In addition, the combined health risk scores of managers were very low with an average of 2.7 out of a possible score of 14 (19.36%). This indicates that the managers at the two sample universities had high levels of wellness and low levels of health risks.

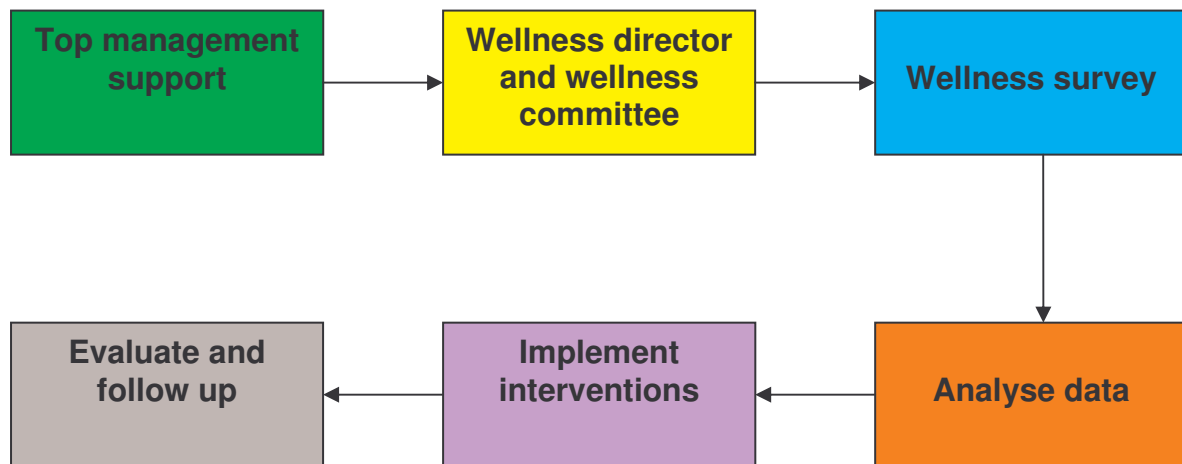
Finally, the research study identified physical fitness and nutrition (56% - less than the 60th percentile) as a wellness behaviour weakness amongst managers. This necessitates an intervention strategy. The low physical fitness and nutritional levels were also confirmed by the Body Mass Index levels of the managers. Of the 92.1% respondents who indicated their height and weight, 42% were overweight and 21% obese. The borderline score for medical self-care (61%) which includes aspects such as the updating of one's immunization record, regular self-examination of testes for men and breasts for women, tobacco smoking cessation, the use of complementary and alternative medicines for chronic diseases, adequate water intake, maintaining oral hygiene, protecting one's skin from sun damage, maintaining blood pressure at normal levels and maintaining one's blood cholesterol levels within an acceptable range also necessitates a pro-active intervention strategy.

5.4 IMPLICATIONS FOR HIGHER EDUCATION INSTITUTIONS

Managers at higher education institutions are supposed to be change agents who provide strategic direction and leadership to their institutions. If managers are not healthy, there may be the perception that the universities they serve may not be healthy either. To promote the health and the well-being of managers, tertiary institutions should design and implement wellness behaviour and health promotion interventions as part of their strategic human resource plans.

The wellness behaviour model, proposed in this study, can serve as a theoretical framework for such intervention programmes. The first requirement for health and wellness promotion is top management's support for the implementation, for example, of physical fitness and nutrition and medical self-care interventions. Secondly, a wellness director should be appointed and a wellness committee consisting of all role players should be established. Thirdly, a survey should be conducted to determine the wellness behaviour problems and health risks of managers. A wellness behaviour and health risk assessment questionnaire should be used to measure the wellness behaviour levels and health risks of managers. The questionnaire can consist of a demographic, health risk and wellness behaviour assessment section (see annexure A, as an example). Ideally a health risk assessment should be done by way of a physical health screening test. The next step will be to analyse the data to determine the wellness behaviour levels and to calculate the health risk scores. Wellness behaviour weaknesses based on the measurement of the wellness sub-dimension levels should be diagnosed while the health risk scores based on the measured health risk variables should be determined. Wellness behaviour and health promotion interventions should be developed and implemented. These interventions should be evaluated to quantify their impact, for example, on stress, health care costs, satisfaction and motivation, performance, turnover, absenteeism, morale, productivity, retention, loyalty and quality of life. The process of implementing the proposed interventions, emanating from the wellness behaviour and health risk model, is summarised in figure 5.2.

Figure 5.2: Steps in the Implementation of Wellness Behaviour and Health Promotion Interventions



Higher education institutions need to reflect on their current employee assistance and wellness programmes. Health and wellness promotion should be a part of a human resource strategy that aims at reducing the health risks of managers through planned changes in individual risk related behaviours and other organisationally related predisposing conditions. Top management should play a crucial role in creating a healthy organisational climate. The organisational climate can only be changed if the organisational culture is changed. From an organisational behaviour perspective wellness behaviour and health promotion interventions are a pro-active human resource strategy to address signs and symptoms of diseases and prevent disability amongst managers. In addition, these strategies create an awareness of and education about, leading healthy lifestyles and as a result can reduce the health risks of managers. To educate managers and to create an increasing wellness behaviour awareness amongst managers is no guarantee for their adaptation of a healthy lifestyle. To change their wellness behaviour, interventions should be based on behavioural change models such as the Cognitive Learning Theory and Transtheoretical Model (refer to section 1.3.1 – health and wellness). Top management at the academic university should take cognisance that their managerial workforce is on average older (47.2% in age group 46-55 and

41.7% in age group 56-65) than their counterparts at the technology university. The ageing managerial component at the academic university may increase the health risks of managers in the long term. Thus, to reduce the health risks and to prevent diseases and disability amongst the ageing managerial component, top management at the academic university should make wellness promotion a strategic priority.

5.5 DIRECTIONS FOR FUTURE RESEARCH

The current study showed that there is a relationship between the wellness behaviour levels and the health risk scores of managers. The combined wellness behaviour levels and health risk scores of managers provided a clear picture of their overall wellness status. The data analysis indicated physical fitness and nutrition and, as a borderline case, medical self-care, to be wellness behaviour weaknesses amongst managers at the sample universities. Therefore, this study was only a starting point for wellness behaviour and health promotion interventions, as well as for future research in this and related areas.

Future directions could include, amongst others:

- ❑ Longitudinal studies to measure the impact of physical fitness and nutrition and medical self-care interventions on stress, health care costs, satisfaction and motivation, performance, turnover, absenteeism, morale, productivity, retention, loyalty and quality of life.
- ❑ To gain top management's support to invest in wellness and health promotion, research should be done on the return on investment (ROI) of the proposed interventions.
- ❑ To determine the impact of environmental factors, such as social environment, on healthy wellness behaviours. The relationship between social capital and health in the South African context is also a potential topic for future research.
- ❑ To undertake research on behavioural modification theories or models such as the Cognitive Learning Theory, Transtheoretical Model and Health Belief Model.
- ❑ To enhance external validity, future research should obtain a representative sample of more tertiary institutions.

- ❑ To identify other possible independent variables that might influence and determine wellness as a dependent variable.
- ❑ Research should be done on health screening that focusses on breast cancer detection mammograms, cholesterol testing, blood pressure testing, bone density and osteoporosis, diabetics testing, cardiac health screenings, body fat analyses (BMI), peak flow oxygen saturation, pulmonary function testing, hearing tests, vision testing, ECGs and glucose screenings. In addition, research should be done on how to calculate a health risk score based on the health screening test results.
- ❑ Finally, future studies, with samples from other universities, should be conducted a factorial analysis in order to enhance the psychometric properties of the TestWell Wellness Inventory for Adults instrument.

5.6 LIMITATIONS OF THE STUDY

The findings of this study should be viewed with a few limitations in mind. The questionnaire used was a pencil-and paper instrument. The respondents were self-reporting on their wellness behaviour and health risks status. This might have caused a sampling bias. The danger may also exist that the self-reported values were based on the respondents' own perceptions of their wellness behaviour and health risk status and not on factual information. In view of unreliable self-reported values, only six of the nine health risk factors were included in the analysis to calculate the health risk scores. The sampling bias was strengthened by the fact that there was an over-representation of respondents from the technology university, white males and heads of academic departments. Thus, these findings cannot be generalizable to the higher education institutions included in the sample or to the other nineteen South African higher education institutions. In view of the relatively small number of respondents a factor analysis on the TestWell's Wellness Inventory for Adults instrument could not be done.

The low response rate created a response and representative bias problem that made it difficult to generalise the results obtained to the entire managerial population of the two sample universities. This restricted the usefulness of the research survey in the sense that the results may not be deemed as representative of the whole tertiary population.

Despite these limitations, these findings will undeniably contribute to the extension of the literature and theory on variables associated with wellness. The proposed wellness model will also serve as a theoretical foundation to determine the wellness behaviour and health risk profile of managers at South African higher education institutions.

5.7 CONCLUSION

This study has contributed to the growing literature on wellness and healthy lifestyle behaviour because it provides empirical evidence to support theoretical wellness models. The holistic wellness behaviour assessment provides managers at the two sample universities with an indication of their wellness behaviour levels and the areas that need improvement. This study has shown that the instrument used was valid and reliable for assessing the wellness status of managers. In addition, the instrument has identified nine health risk factors of which six were used to measure the health risk scores of managers.

However, the small sample (28% response rate) is indicative of the ignorance of managers about the importance of wellness and health. There is seemingly poor insight into and understanding of the relationship between wellness and work-life. The poor participation also shows the unwillingness of managers to reveal personal information to enable research to be undertaken that can lead to effective health management interventions. This reluctance to participate necessitates a comprehensive education effort to explain the benefits of leading a healthy lifestyle. For instance, the relationship between personal health and productivity. To retain competent and able staff, higher education institutions should focus on wellness and health promotion programmes. Because of the ageing tertiary population, people have to work longer, therefore, health becomes a crucial human resource issue in organisations.

The wellness behaviour and health risk model, proposed in this study, may serve as a theoretical framework for future scientific wellness behaviour and health promotion surveys and data analysis to devise tailor made interventions. The model postulates that wellness, as a dependent variable, is determined by eleven independent variables. These eleven independent variables are physical fitness and nutrition, medical self-care, safety, environmental wellness, social awareness,

sexuality and emotional awareness, emotional management, intellectual wellness, occupational wellness, spirituality and values and the health risk score. This study has identified the physical fitness and nutrition, and medical self-care wellness behaviour levels as weaknesses amongst managers at the two sample universities that necessitate interventions.

ANNEXURE A: QUESTIONNAIRE



University of Pretoria

Pretoria 0002 Republic of South Africa Tel (012)4204111
<http://www.up.ac.za>

Faculty of Economic and Management Sciences
DEPARTMENT OF HUMAN RESOURCES MANAGEMENT
TELEPHONE: 012- 420-3433
Email: hein.brand@up.ac.za
Cell: 072-660-3940

1 June 2006

***All persons asked to participate in the undermentioned
PhD (Organizational Behaviour) research study***

Dear Colleagues:

As study leader of candidate PA Botha for his PhD (Organizational Behaviour) research with the project title: *Development of a holistic wellness model for managers in tertiary education institutions*, I politely and sincerely ask you to please take a few moments of your time to complete the wellness-questionnaire sent to you. Although some of the information required can be interpreted as “personal”, you can by no means be personally identified, and the data provided by you cannot be used “against you” in any way, but will eventually be utilized in important strategic planning relating to employee wellness management in your institution. This research is done with the official approval and support of top management of your institution.

Please give us your co-operation and support. The candidate’s successful completion of his study is dependent thereupon.

You are welcome to contact me should you have any enquiries or need further information.

Yours sincerely

Prof.H.E Brand

Directorate of Research

Department of R&D Administrative Support
Department of Statistical Support

28 November 2005

Mr PA Botha
Senior Lecturer
Department Public Management
Tshwane University of Technology
Polokwane Delivery Site

Dear Mr. Botha,

RE-APPLICATION FOR THE DISTRIBUTION OF A QUESTIONNAIRE

With reference to your request for the approval and distribution of a questionnaire among academic managers and support managers at Tshwane University of Technology.

We take cognizance that the National Wellness Institute has developed the instrument being used in this study and that reliability and validity have been proved in the course of similar studies. We are satisfied that the recommendations made by the reviewers were addressed.

Your amended questionnaire has been evaluated and we are pleased to confirm that the questionnaire is approved for distribution.

Please direct all enquiries to the undersigned.

Yours faithfully,



Prof Amanda Lourens
Director of Research & Development

PBotha re-evaluation feedback 281105

RESEARCH ON THE DEVELOPMENT OF A HOLISTIC WELLNESS MODEL FOR MANAGERS IN TERTIARY INSTITUTIONS

Dear Participant

I, PA Botha, lecturer at Tshwane University of Technology, Polokwane Delivery Site, am currently undertaking research on the Development of a Holistic Wellness Model for Managers in Tertiary Institutions in South Africa for my PhD thesis in Organisational Behaviour at the University of Pretoria. The study has the approval of the University of Pretoria and the Tshwane University of Technology.

The purpose of the study is to investigate the wellness behaviour levels of managers and to identify specific wellness interventions in Higher Education Institutions. As part of this study your name has been randomly selected by the researcher as one of the representative sample of managers in your institution selected to complete a questionnaire. I wish to assure you that all information I receive will remain confidential and that your participation will remain anonymous. Your contribution to this study is extremely important to ensure the success of the project.

The questionnaire has been structured in such a way that it facilitates quick and easy completion. In trial runs it was determined that it will only take 30 minutes to complete. Your task is to work through the questionnaire as quickly as you can, and answer the questions as accurately and honestly as possible. Full details are provided on how to complete the questionnaire.

Please return the completed questionnaire before 15th June 2006 via e-mail to bothapa@tut.ac.za or internal mail: **PA Botha, Tshwane University of Technology, Polokwane Delivery Site, Polokwane, 0700.**

Once the data have been analyzed, summary findings will be presented to participating institutions, and I will cooperate with them on how to respond to the results. In this way, your contribution to the research should benefit you and your institution in future. The value and outcome of this research depends on your willingness to take part in this project. If you have any queries, which I have not addressed and would like to discuss these with me, please contact me: PA Botha: (w) 015 – 287 0717, cell: 083 326 8542, fax: 015-287 0720 or e-mail: bothapa@tut.ac.za. A letter of consent is attached (one original and one duplicate). Sign the original and send it back with the questionnaire while keeping the duplicate for your own personal record.

Yours faithfully
PA Botha
Researcher

ORIGINAL COPY (SENT BACK WITH QUESTIONNAIRE) Consent Form for Participation in a Research Study University of Pretoria

The Department of Human Resources, Faculty of Economic and Management Sciences, University of Pretoria.

RESEARCH ON THE DEVELOPMENT OF A HOLISTIC WELLNESS MODEL FOR MANAGERS IN TERTIARY INSTITUTIONS

Description of the research

You are invited to participate in a research study conducted by Petrus Albertus Botha under the direction of Prof. Hein Brand of the Department of Human Resources, Faculty of Economic and Management Sciences, University of Pretoria.

The purpose of the study is to investigate the wellness behaviour levels of managers and to identify specific wellness interventions in Higher Education Institutions. For the purpose of this study your name has been randomly selected by the researcher as one of the representative sample of managers in your institution selected to complete a questionnaire.

Protection of confidentiality and voluntary participation

I wish to assure you that all information I receive will remain confidential and that your participation will remain anonymous. Your contribution to this study is extremely important to ensure the success of the project. Your participation in this research study is, however, voluntary. You may choose not to participate and you may

withdraw your consent to participate at any time. You will not be penalized in any way should you decide to withdraw from this study.

Your participation

The questionnaire has been structured in such a way that it facilitates quick and easy completion. In trial runs it was determined that it will only take 30 minutes to complete. Your task is to work through the questionnaire as quickly as you can, and answer the questions as accurately and honestly as possible. Full details are provided on how to complete the questionnaire.

Please send the completed questionnaire back before 15th June 2006 via e-mail to bothapa@tut.ac.za or internal mail to the address below: **PA Botha, Tshwane University of Technology, Polokwane Delivery Site, Polokwane, 0700.**

Potential benefits

Once the data have been analyzed, summary findings will be presented to participating institutions, and I will cooperate with them on how to respond to the results. In this way, your contribution to the research should benefit you and your institution in future. The value and outcome of the research depend on your willingness to take part in this project.

Contact information

If you have any questions or concerns about this study or if any problems arise, please contact:

- * Professor Hein Brand at 012- 420 3433; e-mail hebrand@hakuna.up.ac.za.
- * PA Botha: (w) 015- 2870717; cell: 0833268542; fax: 015-2870720; e-mail: bothapa@tut.ac.za.

Consent

I have read this consent form and have been given the opportunity to ask questions. I give my consent to participate in this study.

Participant's name and surname (block letters) _____

Participant's signature _____ Date _____

Yours faithfully

PA BOTHA
Researcher

The questionnaire consists of the following parts.

- A demographic questionnaire – (Section A)
- The TestWell (which measures your wellness levels on 10 sub-scales) - (Section B)

Instructions on how to complete the questionnaire

- Please read all questions or statements and please answer all the questions.
- Please use a black pen.
- Please give your first and natural answer – try not to dwell too long on each question.
- Please base your answers on how you have been feeling recently (the last 3 months), unless the question asks you to do otherwise.

SECTION A
DEMOGRAPHIC QUESTIONNAIRE

(Mark all answers with X in the appropriate box)

1. Indicate at which University are you employed.

1. University of Pretoria	2. Tshwane University of Technology
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2. If you have marked the University of Pretoria, indicate on which campus are you employed.

1. Mamelodi	2. Pretoria
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3. If you are employed by Tshwane University of Technology indicate at which delivery site are you situated.

1. Ga- Rankuwa	2. Pretoria	3. Soshanguve	4. Nelspruit	5. Witbank	6. Polokwane
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4. Please state the faculty or division under which you resort:

1. Academic	2. Support services
Specify:	

5. Gender:

1. Female	2. Male
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6. Please indicate your race:

1. Black	2. Indian	3. Coloured	4. White	5. Other
				Specify:

7. Please state your age (in years):

8. Please indicate your highest level of education/qualifications:

1. Matric
2. Diploma
3. Degree
4. Post-graduate degree
5. PhD
6. Other: Specify

9. Please indicate your job title:

10. How many staff members are you responsible for?

11. How many years have you been employed at your current institution?

12. How many years have you been employed in your current job?

13. Please indicate your body weight and height.

Weight (without shoes)	Height (without shoes)
<input type="text"/>	<input type="text"/>

14. In terms of tobacco smoking are you a:

1. Smoker	2. Ex-smoker	3. Non-smoker
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15. If you are a smoker or ex-smoker enter average number of cigarettes/pipes/cigars smoked per day in the past five years (ex-smoker should use the last five years before quitting).

Cigarettes per day	
Pipes/cigars per day	

16. During the past 12 months, how many times have you seen a doctor or other health care professional about your own health at a doctor's surgery, a clinic, or some other place? Do not include times you were hospitalized overnight, visits to hospital emergency rooms, home visits, or telephone calls.

1. None
2. _____ times
3. Do not know
4. Refuse

17. How many hours of sleep do you usually get at night?

1. 6 hours or less
2. 7 hours
3. 8 hours
4. 9 hours

18. Considering your age, how will you describe your overall physical health?

1. Excellent
2. Good
3. Fair
4. Poor

19. What is your blood pressure (if known, otherwise leave blank)?

Systolic (high number)	
Diastolic (low number)	

20. Do you have a close relative (father, mother, brother, sister or child) who has or had any of the following conditions?

1. High blood pressure	1. Yes	2. No	3. Do not know
2. Diabetes	1. Yes	2. No	3. Do not know
3. Heart attack, angina	1. Yes	2. No	3. Do not know
4. Stroke	1. Yes	2. No	3. Do not know
5. High blood cholesterol	1. Yes	2. No	3. Do not know

21. Have you been diagnosed with any of the following conditions?

1. High blood pressure	1. Yes	2. No	3. Do not know
2. Diabetes	1. Yes	2. No	3. Do not know
3. Heart attack, angina	1. Yes	2. No	3. Do not know
4. Stroke	1. Yes	2. No	3. Do not know
5. High blood cholesterol	1. Yes	2. No	3. Do not know

22. During the past month, how many days per week or per month did you drink any alcoholic beverages, on the average?

1. Days per week
2.. Days per month
3. None
4. Do not know

23. If you drink alcohol how many drinks did you drink on average per day?

_____ bottles of beer per day
_____ glasses of wine per day
_____ mixed drinks or shots of liquor per day

SECTION B: A HOLISTIC WELLNESS BEHAVIOUR ASSESSEMENT TOOL

INSTRUCTIONS: Please cross the number that best identifies your response to each corresponding statement.

1. **Almost never (less than 10% of the time) – a.n.**
2. **Occasionally (approximately 25% of the time) – occ.**
3. **Often (approximately 50% of the time) –oft.**
4. **Very often (approximately 75% of the time) – v.o.**
5. **Almost always (90% of the time) – a.a.**

	QUESTIONS	A.N.	OCC.	OFT.	V.O.	A.A.
1.	I do exercise aerobic exercises (continuous, vigorous, sweat producing exercise for 20-30 minutes) at least three times per week.	1	2	3	4	5
2.	Stretching is a routine part of my exercise programme. (If you hardly exercise, answer 1).	1	2	3	4	5
3.	I increase my physical activity by walking or cycling whenever possible.	1	2	3	4	5
4.	My exercise programme includes an adequate amount of each of the three major fitness components: endurance (aerobics), strength (weight training) and flexibility (stretching).	1	2	3	4	5
5.	If I am not in shape, I avoid sporadic (once a week or less) strenuous exercise.	1	2	3	4	5
6.	I avoid eating foods that are high in fat (fatty cuts of meat, whole milk, dairy products, fried foods, hamburgers, hot dogs, processed foods, rich desserts, and creamy sauces).	1	2	3	4	5
7.	I eat at/from fast food restaurants less than once per week.	1	2	3	4	5
8.	I intentionally include foods high in fibre in my diet on a daily basis such as whole grain bread, cereals and beans.	1	2	3	4	5
9.	I maintain my weight within the recommendations for my height and gender.	1	2	3	4	5
10.	I eat at least four servings (one serving equals ½ cup) of fruit and/or vegetables every day.	1	2	3	4	5
11.	I maintain an up-to-date immunization record. (For example regular flu vaccination.)	1	2	3	4	5
12.	I examine my breasts or testes on a monthly basis.	1	2	3	4	5
13.	I take action to minimize my exposure to tobacco smoke.	1	2	3	4	5
14.	I consider alternatives to taking medication when ill.	1	2	3	4	5
15.	I drink enough water (6-8) glasses per day to keep my urine light yellow.	1	2	3	4	5
16.	I floss my teeth once per day.	1	2	3	4	5
17.	I engage in an adequate amount of physical activity to keep my resting heart rate at 60 beats or less per minute.	1	2	3	4	5
18.	I protect my skin from sun damage by using sunscreen or by taking other precautions to prevent overexposure to the sun.	1	2	3	4	5
19.	I maintain my blood pressure within the range recommended by my doctor. (If you do not have your blood pressure checked, answer "1").	1	2	3	4	5
20.	I maintain my blood cholesterol level within the range recommended by my doctor. (If you have never had your cholesterol checked, answer "1").	1	2	3	4	5
21.	I do not drive a vehicle while I am under the influence of alcohol or other drugs.	1	2	3	4	5
22.	I do not ride with vehicle drivers who are under the influence of alcohol or other drugs.	1	2	3	4	5
23.	If I should exceed the speed limit, I stay within ten kilometres per hour of the speed limit.	1	2	3	4	5
24.	I wear my seat belt while travelling.	1	2	3	4	5

25.	The vehicles I drive are maintained to assure safety.	1	2	3	4	5
26.	I enjoy myself without the use of drugs or alcohol.	1	2	3	4	5
27.	I use approved child restrainers for all children riding in my vehicle. (If children do not ride in your vehicle, answer "5").	1	2	3	4	5
28.	I refrain from using drugs obtained from unlicensed sources.	1	2	3	4	5
29.	I use the recommended safety equipment for any activity in which I participate.	1	2	3	4	5
30.	When I travel on a motorcycle, bicycle or quad bike (four wheel motorcycle), I wear a helmet.	1	2	3	4	5
31.	To conserve energy, I turn off lights and electrical appliances when I am not using them.	1	2	3	4	5
32.	I avoid purchasing food that is packaged in Styrofoam.	1	2	3	4	5
33.	I operate fuel-efficient motor vehicles. (If you do not operate a motor vehicle, answer "5").	1	2	3	4	5
34.	During the winter I keep the temperature in my home at an acceptable level by using a heater or other heating devices.	1	2	3	4	5
35.	When I go shopping, I take my own reusable (non-plastic) bag to carry my purchases rather than accept plastic or paper bags.	1	2	3	4	5
36.	I do not let the water tap run while I am brushing my teeth, shaving or washing my car.	1	2	3	4	5
37.	I regularly recycle my paper, plastic, glass and aluminium, should it be required from me.	1	2	3	4	5
38.	I am involved in learning more about how I can protect the environment.	1	2	3	4	5
39.	I encourage others to support efforts to protect the environment.	1	2	3	4	5
40.	I prefer to purchase products made from recycled materials whenever possible.	1	2	3	4	5
41.	My behaviour reflects fairness and justice.	1	2	3	4	5
42.	I contribute to the feeling of acceptance with my family, friends and co-workers.	1	2	3	4	5
43.	I resolve conflict in a positive and respectful manner.	1	2	3	4	5
44.	I use my creativity in constructive ways.	1	2	3	4	5
45.	I exercise my right to vote.	1	2	3	4	5
46.	I take time to play with and enjoy my family and friends.	1	2	3	4	5
47.	I help others in need (for example, providing financial or emotional support).	1	2	3	4	5
48.	When I notice a safety hazard, I take action to correct the situation.	1	2	3	4	5
49.	I contribute time and/or money to at least one organization that strives to better the community in which live.	1	2	3	4	5
50.	I participate in community events.	1	2	3	4	5
51.	I am comfortable with my level of sexual involvement.	1	2	3	4	5
52.	I feel positive about myself as a sexual person.	1	2	3	4	5
53.	My sexual relationships and behaviours are maintained in a manner that is healthy for me and for others.	1	2	3	4	5
54.	I am able to develop close, intimate, personal relationships.	1	2	3	4	5
55.	My sexual needs are satisfied without conflicting with other needs in my life.	1	2	3	4	5

56.	I am tolerant of others who have different sexual orientations.	1	2	3	4	5
57.	I am able to love others without expecting them to “earn” my love.	1	2	3	4	5
58.	I have positive relationships (not referring to sexual relationships) with men in my life.	1	2	3	4	5
59.	I have positive relationships (not referring to sexual relationships) with women in my life.	1	2	3	4	5
60.	When engaging in sexual behaviour, I take steps to minimize the risk of spreading or contracting sexually transmitted diseases.	1	2	3	4	5
61.	I express my feelings of anger in ways that are not hurtful to others.	1	2	3	4	5
62.	I can say “no” without feeling guilty.	1	2	3	4	5
63.	I make decisions with a minimum of stress and worry.	1	2	3	4	5
64.	I do not feel unreasonably hurried in my daily routine.	1	2	3	4	5
65.	I include relaxation time as part of my daily routine.	1	2	3	4	5
66.	When I make mistakes, I learn from them.	1	2	3	4	5
67.	I set realistic objectives for myself.	1	2	3	4	5
68.	I can relax my body and mind without the use of drugs and alcohol.	1	2	3	4	5
69.	I can accept responsibility for my actions.	1	2	3	4	5
70.	I accept responsibility for creating my own feelings.	1	2	3	4	5
71.	I keep informed about social and political issues.	1	2	3	4	5
72.	I am interested in learning about scientific discoveries.	1	2	3	4	5
73.	I make an effort to maintain and improve my writing and verbal skills.	1	2	3	4	5
74.	I seek opportunities to learn new things.	1	2	3	4	5
75.	I participate in activities such as visiting museums, exhibitions and zoos, or attend plays and concerts, at least three times a year.	1	2	3	4	5
76.	I watch educational programmes on television.	1	2	3	4	5
77.	I maintain a continuing education programme relative to my occupation or activities.	1	2	3	4	5
78.	I read about different topics from a variety of newspapers, magazines or books.	1	2	3	4	5
79.	I gather information from several sources before making important decisions.	1	2	3	4	5
80.	I am interested in understanding the views of others.	1	2	3	4	5
81.	I enjoy my work.	1	2	3	4	5
82.	I take advantage of opportunities to learn new skills in my work.	1	2	3	4	5
83.	There is an acceptable amount of challenge in my work.	1	2	3	4	5
84.	I perform my work in a satisfactory manner.	1	2	3	4	5
85.	I look forward to doing my job.	1	2	3	4	5
86.	I am satisfied with the balance between my work time and leisure time.	1	2	3	4	5
87.	I am satisfied with my ability to manage and control my workload.	1	2	3	4	5

88.	My work is consistent with my values.	1	2	3	4	5
89.	The level of stress in my work environment is comfortable to me.	1	2	3	4	5
90.	At work my level of authority is consistent with my level of responsibility.	1	2	3	4	5
91.	I feel that my life has a positive purpose.	1	2	3	4	5
92.	I spend a portion of every day in prayer, meditation and/or personal reflection.	1	2	3	4	5
93.	My values guide my daily life.	1	2	3	4	5
94.	I am mainly guided by my "inner self" rather than the expectation of others.	1	2	3	4	5
95.	I am concerned about humanitarian issues.	1	2	3	4	5
96.	My spiritual awareness occurs at times other than during a crisis.	1	2	3	4	5
97.	My leisure time activities are consistent with my values.	1	2	3	4	5
98.	I am tolerant of the values and beliefs of others.	1	2	3	4	5
99.	I am able to discuss my own death with my family and friends.	1	2	3	4	5
100.	I am satisfied with my spiritual life.	1	2	3	4	5

**YOUR COPY (FILE FOR YOUR OWN PERSONAL RECORD)
Consent Form for Participation in a Research Study
University of Pretoria**

The Department of Human Resources, Faculty of Economic and Management Sciences, University of Pretoria.

RESEARCH ON THE DEVELOPMENT OF A HOLISTIC WELLNESS MODEL FOR MANAGERS IN TERTIARY INSTITUTIONS

Description of the research

You are invited to participate in a research study conducted by Petrus Albertus Botha under the direction of Prof. Hein Brand of the Department of Human Resources, Faculty of Economic and Management Sciences, University of Pretoria.

The purpose of the study is to investigate the wellness levels of managers and to identify specific wellness interventions in Higher Education Institutions. For the purpose of this study your name has been randomly selected by the researcher as one of the representative sample of managers in your institution selected to complete a questionnaire.

Protection of confidentiality and voluntary participation

I wish to assure you that all information I receive will remain confidential and that your participation will remain anonymous. Your contribution to this study is extremely important to ensure the success of the project. Your participation in this research study is, however, voluntary. You may choose not to participate and you may withdraw your consent to participate at any time. You will not be penalized in any way should you decide to withdraw from this study.

Your participation

The questionnaire has been structured in such a way that it facilitates quick and easy completion. In trial runs it was determined that it will only take 30 minutes to complete. Your task is to work through the questionnaire as quickly as you can, and answer the questions as accurately and honestly as possible. Full details are provided on how to complete the questionnaire.

Please send the completed questionnaire back before 15th June 2006 via e-mail to bothapa@tut.ac.za or internal mail to the address below: **PA Botha, Tshwane University of Technology, Polokwane Delivery Site, Polokwane, 0700.**

Potential benefits

Once the data have been analyzed, summary findings will be presented to participating institutions, and I will cooperate with them on how to respond to the results. In this way, your contribution to the research should benefit you and your institution in future. The value and outcome of the research depend on your willingness to take part in this project.

Contact information

If you have any questions or concerns about this study or if any problems arise, please contact:

* Professor Hein Brand at 012- 420 3433; e-mail hebrand@hakuna.up.ac.za.

* PA Botha: (w) 015- 2870717; cell: 0833268542; fax: 015-2870720; e-mail: bothapa@tut.ac.za.

Consent

I have read this consent form and have been given the opportunity to ask questions. I give my consent to participate in this study.

Participant's name and surname (block letters) _____

Participant's signature _____ Date _____

Yours faithfully

PA BOTHA (Researcher)

REFERENCES

A.D.A.M. Well-Connected Report. 2002. Smoking. [Online] Available from: www.well-connected.com [Accessed: 2006-05-30].

A.D.A.M. Well-Connected Report. 2005. Breast Cancer. [Online] Available from: www.well-connected.com [Accessed: 2006-05-14].

A.D.A.M. Periodontal Disease Report. 2005. [Online] Available from: www.well-connected.com [Accessed: 2006-06-06].

Adams, T.B., Bezner, J.R., Drabbs, M.E., Zambarano, R.J. & Steinhardt, M.A. 2000. Conceptualization and Measurement of the Spiritual and Psychological Dimensions of Wellness in a College Population. *Journal of American College Health*, 48:165-173.

Agneessens, F., Waeye, H. & Lievens, J. 2006. Diversity in social support by roles: A typology. *Social Networks*, 28:427-441.

Ahola, K., Honkonen, T., Isometsä, E., Kalimo, R., Nykyri, E., Aromaa, A. & Lönnqvist, J. 2005. The relationship between job-related burnout and depressive disorders - results from the Finish Health 2000 Study. *Journal of Affective Disorders*, 88:55-62.

Ajani, U.A., Dunbar, S.B., Ford, E.S., Mokdad, A.H. & Mensah, G.A. 2005. Sodium Intake among People with Normal and High Blood Pressure. *American Journal of Preventive Medicine*, 29(5S1):63-67.

Akl, E.A., Maroun, N., Klocke, R.A., Montori, V. & Schünemann, H.J. 2005. Electronic mail was not better than postal mail for surveying residents and faculty. *Journal of Clinical Epidemiology*, 58:425-429.

Alexy, B.J. 1985. Health Risk Appraisal: Reliability demonstrated. In: *Proceedings of the 20th Meeting of Society of Prospective Medicine*. Bethesda: Society of Prospective Medicine.

Aliyu, Z.Y., Yousif, S.B., Plantholt, K., Salihu, H.M., Erinle, A. & Planholt, S. 2004. Assessing compliance of cardiologists with the national cholesterol education program (NCEP) III guidelines in an ambulatory care setting. *Lipids in Health and Disease*, 3(9):1-4.

American College of Sports Medicine. 1990. Position stand on the recommended quantity and quality of exercise for developing and maintaining cardiorespiratory and muscular fitness in healthy adults. *Medicine and Science in Sport and Exercise*, 22:265-274.

American Academy of Dermatology. 2005. [Online] Available from: <http://www.skincarephysicians.com/skincancernet/whatis.html> [Accessed: 2006-07-11].

American Dental Association. 2006. Cleaning your teeth and gums. [Online] Available from: http://www.ada.org/public/topics/cleaning_faq.asp [Accessed: 2006-06-05].

American Psychiatric Association. 2005b. Let's Talk Facts About Anxiety Disorders. [Online] Available from: www.healthy minds.org [Accessed: 2006-03-05].

American Psychiatric Association. 2005a. Let's Talk Facts About Depression. [Online] Available from: www.healthy minds.org [Accessed: 2006-03-05].

American Cancer Society. 2006. Sun Safety: Protect yourself and your family all year around. [Online] Available from: <http://www.skincancer.org/prevention/index.php> [Accessed: 2006-07-11].

Anderson, D.R. & Staufacker, M.J. 1996. The impact of worksite-based health risk appraisal on health-related outcomes: a review of the literature. *American Journal of Health Promotion*, 10:499-508.

Andrology Australia. 2006. Testicular Self-examination (TSE). [Online] Available from: <http://www.ontumor.com/testicular/selfexam.htm> [Accessed: 2006-04-28].

Anon. 2003. Wellness Defined: What a workplace-Wellness Program might include. *Indiana Business Magazine*, June:6-7.

Anon. 2003. *Orange County Business Journal*, August:27.

Anon. 2003. New Study Shows How to Fine-Tune Wellness Programs. *Nonprofit Business Advisor*, March:6-8.

Anon. 2005. HIV and Aids. *Review of Optometry*, March:60A-63A.

Anon. 2003. Work/Life Balance: Challenges and Solutions. *SHRM Research Quarterly*, 2-10.

Anon. 2002. Take charge of your health. *Living Disease Free*, 4-18.

Anon. 2006. Tips to Grow By. Testicular Self-Exam. [Online] Available from: <http://www.akronchildrens.org> [Accessed: 2006-04-28].

Anon. 2006. Medication for hypertension. [Online] Available from: http://www.health24.com/medical/Condition_centres/777-792-815-1773,16811.asp. [Accessed: 2006-04-24].

Anon. 2006. The symptoms of hypertension. [Online] Available from: http://www.health24.com/medical/Condition_centres/777-792-815-1773,16804.asp. [Accessed: 2006-04-24].

Anon. 2005. New View of Smoking Risks to Eyes. *Tufts University Health and Nutrition Letter*, June.

Anon. 2003. How to Transform a Wellness Program Into a Retention Tool. *Ioma's Safety Director's Report*, September:10.

Anon. 2006. Wikipedia Encyclopedia. Oral hygiene. [Online] Available from: http://en.wikipedia.org/wiki/Oral_hygiene. [Accessed: 2006-06-13].

Anon. 2006. Description of Hypertension. [Online] Available from: http://www.health24.com/medical/Condition_centres/777-792-815-1773,17146.asp. [Accessed: 2006-04-24].

Arms, K. 1990. *Environmental Science*. New York: Saunders College Publishing.

Armstrong, L.E. 2005. Hydration Assessment Techniques. *Nutrition Reviews*, 63(6):S40-S54.

Arthur, A.R. 2004. Work-related stress, the blind men and the elephant. *British Journal of Guidance and Counseling*, 32(2):157-169.

Audrey, S., Holliday, J. & Campbell, R. 2006. It is good to talk: Adolescent perspectives of an informal, peer-led intervention to reduce smoke. *Social Science and Medicine*, 63:320-334.

Auslander, B.A., Biro, F.M. and Rosenthal, S.L. 2005. Genital Herpes in Adolescents. *Seminars in Pediatric Infectious Diseases*, 16:24-30.

Australian Academy of Science. 2004. Warmer and sicker? Global Warming and Human Health. *Nova Science in the News* [Online] Available from: <http://www.science.org.au/nova/081/081key.htm> [Accessed: 2007-03-16].

Babbie, E. & Mouton, J. 2001. *The Practice of Social Research*. Oxford: Oxford University Press.

Babor, T.F., Sciamanna, C.N. & Pronk, N.P. 2004. Assessing Multiple Risk Behaviors in Primary Care Screening Issues and Related Concepts. *American Journal of Preventive Medicine*, 27(2S):42-53.

Bai, N., Khazaei, M., van Eeden, S.F. & Laher, I. 2007. The pharmacology of particulate matter air pollution-induced cardiovascular dysfunction. *Pharmacology & Therapeutics*, 113:16-29.

Bakewell, R.T. & Volker, D.L. 2005. Sexual Dysfunction Related to the Treatment of Young Women With Breast Cancer. *Clinical Journal of Oncology Nursing*, 9(6):697-702.

Bakker, A.B., Van Der Zee, K.I., Lewig, K.A. & Dollard, M.F. 2006. The Relationship Between the Big Five Personality Factors and Burnout: A Study Among Volunteer Counsellors. *The Journal of Social Psychology*, 146(1):31-50.

Banhegyi, S. 2002. Why value statements don't work. *HR Future*, 2 (6):42-43.

Beery, W.L., Schoenbach, V.J. & Wagner, E.H. 1986. *Health Risk Appraisal: Methods and Programs*. Haytstsville, MD: National Center for Health Services Research and Health Care Technology.

Beltran-Aguilar, E.D. & Beltran-Neira, R.J. 2004. Oral diseases and conditions throughout the lifespan. Diseases and conditions directly associated with tooth loss. *American Gum Disease Journal*, January - February.

Ben-Dov, I.Z., Ben-Arie, L., Mekler, J. & Bursztyn, M. 2006. Normal Ambulatory Blood Pressure: A Clinical-Practice-Based Analysis of Recent American Heart Association Recommendations. *The American Journal of Medicine*, 119:69.E13-E18.

Benefiel, M. 2002. The second half of the journey: Companionship organizations through spiritual transformation. *Academy of Management Proceedings*, MSR:B1-B6.

Bennet, P.D. 1995. *Dictionary of Marketing Terms*. Lincolnwood: NTC Business.

Benson, P.A.S. & Hergenroeder, A.C. 2005. Bacterial Sexually Transmitted Infections in Gay, Lesbian, and Bisexual Adolescents: Medical and Public Health Perspectives. *Seminars in Pediatric Infectious Diseases*, 16:181-191.

Berkel, L.A., Poston, W.S.C., Reeves, R.S. & Foreyt, J.P. 2005. Behavioral Interventions for Obesity. *Supplement to the Journal of the American Dietetic Association*, 105(5):35-43.

Best, J.A. & Milsum, J.H. 1978. HHA and the evaluation of life style change programs: methodological issues. In: *Proceedings of the 13th Meeting of Society of Prospective Medicine*. Bethesda: Society of Prospective Medicine.

Bhattacharya, M. & Wright, P.M. 2005. Managing human assets in an uncertain world: applying real options theory to HRM. *International Journal of Human Resource Management*, 16:929-948.

Bintliff, S. 1997. The 12 Commandments of Wellness. *Family Practice Management*. [Online] Available from: http://www.aafp.org/fpm/970500fm/suite_2.html. [Accessed: 2004-10-03].

Birchfield, R. 2001. Profiling 21st Century Leaders. *New Zealand Management*, 48:37-39.

Birtcher, K.K. & Ballantyne, C.M. 2004. Measurement of Cholesterol: A Patient Perspective. *Circulation, Journal of the American Heart Association*, 110:296-297.

Blair, S.N., Kampert, J.B., Kohl, H.W., Barlow, C.E., Macera, C.A., Paffenbarger, R.S., & Gibbons, L.W. 1996. Influences of cardiorespiratory fitness and other precursors on cardiovascular disease and all-cause mortality in men and women. *Journal of the American Medical Association*, 275:205-210.

Blassingame, K.M. 2003. Workplace wellness participation lowers health risks, reduces premiums. *Employee Benefit News*, March:52-53.

Bloisi, W., Cook, C.W. & Hunsaker, P.L. 2003. *Management and Organisational Behaviour*. Berkshire: McGraw-Hill Education.

Bolan, S. 2000. The wisdom of wellness. *Computing Canada*, December:25-26.

Boonzaier, B., Ficker, B. & Rust, B. 2001. A review of research on the Job Characteristics Model and the attendant job diagnostic survey. *South African Journal of Business Management*, 32(1):11-34.

Booyesen, S. 2003. Designing a questionnaire. In: Rossouw, D.(ed.) *Intellectual Tools: Skills for the human sciences*. Pretoria: Van Schaik Publishers.

Bossingham, M.J., Carnell, N.S. & Campbell, W.W. 2005. Water balance, hydration status, and fat-free mass hydration in younger and older adults. *The American Journal of Clinical Nutrition*, 81:1342-1350.

Bouma, G.D. 1997. *The Research Process*. Oxford: Oxford University Press.

Bowen, R., Baetz, M., Hawkes, J. & Bowen, A. 2006. Mood variability in anxiety disorders. *Journal of Affective Disorders*, in press.

Boyd, B. & Goss, H. 2003. Fitness, Health and Wellness education - aligning teaching approaches to foster self-regulated learning approaches. In: *Proceedings Effective Teaching and Learning*. Brisbane: Griffith University.

Boyer, C.B., Shafer, M.A., Shaffer, R.A., Brodine, S.K., Pollack, L.M., Betsinger, K., Chang, Y.J., Kraft, H.S. & Schachter, J. 2005. Evaluation of a cognitive-behavioral, group, randomized controlled intervention trial to prevent sexually transmitted infections and unintended pregnancies in young women. *Preventive Medicine*, 40:420-431.

Braun, C.A., Bearinger, L.H., Halcón, L.L. & Pettingell, S.L. 2005. Adolescent use of complementary therapies. *Journal of Adolescent Health*, 37:76.E1-E9.

Bray, G.A. 2005. Epidemiology, risks and pathogenesis of obesity. *Meat Science*, 71:2-7.

Breitbart, E.W., Greinert, R. & Volkmer, B. 2006. Effectiveness of information campaigns. *Progress in Biophysics and Molecular Biology*, 92:167-172.

Brewer, E.W. 2001. Vocational Souljorn Paradigm: A Model of Adult Development to express spiritual wellness as... *Counseling and Values*, 45(2):83-94.

British Occupational Health Research Foundation. 2005. *Workplace interventions for people with common health problems: Evidence review and recommendations*. London: British Occupational Health Research Foundation.

Brooker, C. (ed.) 2003. *Churchill Livingstone Pocket Medical Dictionary*. London: Elsevier Limited.

Brookhuis, K.A., de Waard, D. & Samyn, N. 2004. Effects of MDMA (ecstasy), and multiple drugs use on (simulated) driving performance and traffic safety. *Psychopharmacology*, 173:440-445.

Brynard, P.A. & Hanekom, S.X. 1997. *Introduction to Research in Public Administration*. Pretoria: JL van Schaik Academic.

Buffett, E.D. 2002. The wellness myth. Benefits Canada. [Online] Available from: http://web22.epnet:pnnetcom/citation.asp?tb=1&_ug=dbs+0%2CI%2C2%2C6%2C8%2C10%. [Accessed: 2002-10-12].

Burke, R. 2000. Do managerial men benefit from organizational values supporting work-personal life balance? *Women in Management Review*, 15(2):81-89.

Butler, A.B., Grzywacz, J.G., Bass, B.L. & Linney, K.D. 2005. Extending the demands-control model: A daily diary study of job characteristics, work-family conflict and work-family facilitation. *Journal of Occupational and Organizational Psychology*, 78:155-169.

Butters, J.E., Smart, R.G., Mann, R.E. & Asbridge, M. 2005. Illicit drug use, alcohol use and problem drinking among infrequent and frequent road ragers. *Drug and Alcohol Dependence*, 80:169-175.

Byers, E.S. 2005. Relationship Satisfaction and Sexual Satisfaction: A Longitudinal Study of Individuals in Long-Term Relationships. *The Journal of Sex Research*, 42(2):113-118.

Calderon, K.S., Yucan, C.B. & Schaffer, S.D. 2005. Obesity-related Cardiovascular Risk Factors: Intervention Recommendations to Decrease Adolescent Obesity. *Journal of Pediatric Nursing*, 20(1):3-14.

Call, D. 2005. Knowledge Management - not rocket science. *Journal of Knowledge Management*, 9(2):19-30.

Camargo, J.A. & Alonso, Á. 2006. Ecological and toxicological effects of inorganic nitrogen pollution in aquatic ecosystems: A global assessment. *Environmental International*, 32:831-849.

Campbell, C. 2001. Social capital and health: contextualising health promotion within local community networks. In: Baron, S., Field, J. & Schuller, T. (eds.) *Social capital: critical perspectives*. Oxford: Oxford University Press.

Campos-Outcalt, D. 2006. Are you up to date with new immunization recommendations? *The Journal of Family Practice*, 55(3):232-234.

Carmeli, A. & Tishler, A. 2006. The relative importance of the top management team's managerial skills. *International Journal of Manpower*, 27(1):9-36.

Carpenter, J.S. & Neal, J.G. 2005. Other complementary and alternative medicine modalities: acupuncture, magnets, reflexology, and homoeopathy. *The American Journal of Medicine*, 118(12b):109S-117S.

Carpiano, R.M. 2006. Towards a neighborhood resource-based theory of social capital for health: Can Bourdieu and sociology help? *Social Science and Medicine*, 62:165-175.

Cattell, V. 2001. Poor people, poor places, and poor health: the mediating role of social networks and social capital. *Social Sciences and Medicine*, 52:1501-1516.

Centers for Disease Control. 2006. How Vaccines Prevent Disease. [Online] Available from: <http://www.cdc.gov/nip/publications/fs/gen/howvpd.htm>. [Accessed: 2006-04-27].

Centers for Disease Control and Prevention. 2001. Motor-vehicle occupant injury: strategies for increasing use of child safety seats, increasing use of safety belts, and reducing alcohol -impaired driving. A report on recommendations of the Task Force on Community Preventive Services. *Morbidity and Mortality Weekly Report*, 50(7):329-384.

Centers for Disease Control and Prevention, Department of Health and Human Services. 2005. BMI-Body Mass Index: BMI for Adults: Body Mass Index for Adults. [Online] Available from: <http://www.cdc.gov/nccdphp/dnpa/bmi/bmi-adult-formaul.htm> [Accessed: 2005-09-29].

Centers for Disease Control. 2006. Recommended Adult Immunization Schedule - United States, October 2005 - September 2006. *Morbidity and Mortality Weekly Report*, 54(40):Q1-Q4. [Online] Available from: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5440-Immunization1.htm>. [Accessed: 2006-04-27].

Centers for Disease Control and Prevention. 2003. Preventing skin cancer: findings of the Task Force on Community Preventive Services on reducing exposure to ultraviolet light and counseling to prevent skin cancer: recommendations and rationale of the U.S. Preventive Services Task Force. *Morbidity and Mortality Weekly Report*, 52(15)1-17.

Centers for Disease Control. 2006. Vaccine-Preventable Diseases. [Online] Available from: <http://www.cdc.gov/nip/diseases/adult-vpd.htm>. [Accessed: 2006-05-08].

Chaharbaghi, K. & Cripps, S. 2006. Intellectual capital: direction, not blind faith. *Journal of Intellectual Capital*, 7(1):29-42.

Champagne, C.M. 2006. Dietary Interventions on Blood Pressure: The Dietary Approaches to Stop Hypertension (DASH trails). *Nutrition Reviews*, 64(2):53-56.

Champion, V.L. 2003. Breast Self-Examination: What Now? *Oncology Nursing Forum*, 30(5):723-724.

Chandler, C.K., Holden, J.M. & Kolander, C.A. 1992. Counseling for Spiritual Wellness: Theory and Practice. *Journal of Counseling and Development*, 71:168-175.

Chang, S.F. 2003. Worksite Health Promotion: The Effects of an Employee Fitness Program. *Journal of Nursing Research*, 11(3):227-229.

Chang, G., Sherritt, L. & Knight, J.R. 2005. Adolescent cigarette smoking and mental health symptoms. *Journal of Adolescent Health*, 36:517-522.

Chappel, T. 1993. *The Soul of a Business*. New York: Bantam Books.

Chaves, M.A., Jennings, S.E., McKinlay S.M. & McKinlay, J.B. 1985. In: *Proceedings of the 20th Meeting of Society of Prospective Medicine*. Bethesda: Society of Prospective Medicine.

Chen, L.H., Baker, S.P. & Li, G. 2005. Drinking history and risk of fatal injury: comparison among specific injury causes. *Accident Analysis and Prevention*, 37:245-251.

Christensen, G.J. 2005. Special oral hygiene and preventive care for special needs. *Journal of American Dental Association*, 136:1141-1143.

Chunda, R.C. & Cooper, C.L. 2002. Does privatization affect corporate culture and employee well-being? *Journal of Managerial Psychology*, 17(3):21-49.

Church, R.L. & Robertson, N. 1999. How state police agencies are addressing the issue of wellness. *An International Journal of Police Strategies and Management*, 22(3):304-304.

Cioffi, J.P. 1979. The effect of health status feedback on health beliefs: An inquiry into the prebehavioral outcomes of a health hazard appraisal. In: *Proceedings of the 15th Meeting of Society of Prospective Medicine*: Bethesda: Society of Prospective Medicine.

Cohen, D.A., Finch, B.K., Bower, A. & Sastry, N. 2005. Collective efficacy and obesity: the potential influence of social factors on health. *Social Science and Medicine*, in press.

Colbert, D. 2002. The Most Important Nutrient for the Body. Better Nutrition, 64(2) [Online] Available from: http://0-web18.epnet.com.innopac.up.ac.za/citation.asp?tb=1&_ug=sid+FC366AFE% [Accessed: 2006-04-21].

Coleman, J.S. 1990. *Foundations of Social Theory*. Cambridge: Belknap Press.

Comeau-Kirschner, C. 2000. Holistic Management. *Management Review*, 88(11):165-174.

Conrad, P. 1988. Health and fitness at work: a participants' perspective. *Social Science and Medicine*, 26(5):545-550.

Cook, C.W. & Hunsaker, P.L. 2001. *Management and Organisational Behavior*. New York: McGraw-Hill.

Creagan, E. T. 2004. A Prescription for life. *American Fitness*, 22(3):20-23.

Crespo, C.J. & Arbesman, J. 2003. Obesity in the United States. *Physician and Sportsmedicine*, 31(11):23-28.

Cullen, M. & Whiteford, H. 2001. *The Interrelations of Social Capital with Health and Mental Health*. Canberra: Published by the Commonwealth of Australia.

Culliford, L. & Powell, A. 2005. Spirituality and mental health.[Online] Available from: <http://0-www.rcpsych.ac.uk.innopac.up.ac.za/info/spirituality.asp> [Accessed: 2006-20-02].

Cummings, T.C. & Worley, C.G. 2001. *Organization Development and Change*. Ohio: South-Western College Publishing.

Curtis, L., Rea, W., Smith-Willis, P., Fenyves, E. & Pan, Y. 2006. Adverse health effects of outdoor air pollutants. *Environment International*, 32:815-830.

Damji, T. & Lee, C.M. 1994. Gender Role Identity and Perceptions of Ismaili Muslim Men and Women. *The Journal of Social Psychology*, 135(2):215-223.

Davey, J., Davies, A., French, N., Williams, C. & Lang, C.P. 2005. Drug Driving from a User's Perspective. *Drugs: education, prevention and policy*, 12(1):61-70.

Davies, J., Davies, R. & Heacock, S. 2003. A Wellness Program for Faculty. *Educational Leadership*, May:68-70

Davis, P. 2006. Beyond Human Resource Management in Co-operatives. *Cross Cultural Management*, 13(1):69-95.

Davis, M.M., Halasyamani, L.K., Sneller, V.P., Bishop, K.R., Clark, S.J. 2005. Provider Response to Different Formats of the Adult Immunization Schedule. *American Journal of Preventive Medicine*, 29(1):34-40.

de Jong, R.D., van der Velde, M.E.G. & Jansen, P.G.W. 2001. Openness to Experience and Growth Need Strength as Moderators between Job Characteristics and Satisfaction. *International Journal of Selection and Assessment*, 9(4):350-356.

De Cieri, H., Holmes, B., Abbott, J. & Pettit, T. 2005. Achievements and challenges for work/life balance strategies in Australian organizations. *The International Journal of Human Resource Management*, 16(1):90-103.

De Jong, N., Simojoki, M., Laatikainen, T., Tapanainen, H., Valsta, L., Lahti-Koski, M., Uutela, A. & Vartianen, E. 2004. The combined use of cholesterol-lowering drugs and cholesterol-lowering bread spreads: health behavior data from Finland. *Preventive Medicine*, 39:849-855.

De Vos, A.S. & Fouche, C.B. 2001. Data analysis and interpretation: Univariate analysis. In: De Vos, A.S. (ed.) *Research at Grass Roots: A primer for the caring professions*. Pretoria: Van Schaik.

Dealtry, R. 2005. Achieving integrated performance management with the corporate university. *The Journal of Workplace Learning*, 17(1/2):65-78.

DeFalco, J. (ed.) 2001. *The Wellness Program Management Yearbook*. Manasquan (USA): American Business Publishing.

Dekker, M. 2001. A study for formulation and implementation of codes of ethics in public service organisations. *International Journal of Public Administration*, 24(5):461-474.

Delpont, C.S.L. 2005. Quantitative data-collection methods. In: de Vos, A.S., Strydom, H., Fouche, C.B. & Delpont, C.L.S. (eds.) *Research at Grass roots for the social sciences and human service professions*. Pretoria: Van Schaik Publishers.

Department of Health and Human Services Centers for Disease Control and Prevention. National Cholesterol Education Month. 2005. *Morbidity and Mortality Weekly Report*, 54(35):1.

DiClemente, R.J., Salazar, L.F., Crosby, R.A. & Rosenthal, S.L. 2005. Prevention and control of sexually transmitted infections among adolescents: the importance of a socio-ecological perspective - a commentary. *Public Health*, 119:825-836.

DiClemente, R.J., Milhausen, R., Sales, J.M., Salazar, L.F. & Crosby, R.A. 2004. A Programmatic and Methodologic Review and Synthesis of Clinic-Based Risk-Reduction Interventions for Sexually Transmitted Infections: Research and Practice Implications. *Seminars in Pediatric Infectious Diseases*, 16:199-218.

DiClemente, R.J., Wingood, G.M. & Crosby, R.A. 2003. A Contextual Perspective for Understanding and Preventing STD/HIV Among Adolescents. In: Romer, D.(ed.) *Reducing Adolescent Risk: Toward an Integrated Approach*. Thousand Oaks, California: Sage Publications, Inc.

Dietary Guidelines for Americans. 2005. *United States Department of Health and Human Services, United States Department of Agriculture*. [Online] Available from: <http://www.healthierus.gov/dietaryguidelines> [Accessed: 2005-04-21].

Digh, P. 1998. The "I" in ethics. *Association Management*, 50(8):105-106.

DiMonda, S. 2005. *A comparison of undergraduate student behaviors in six dimensions of wellness and their grade points*. Unpublished masters thesis, Dowling College, Oakdale, Long Island: United States of America.

Dippenaar, S.C., Mathekenya, W., Mehlwana, M., Nkosi, T. & Simelane, T. 2005. Issues Paper for OECD-South Africa Workshop on International Science and Technology Cooperation for Sustainable Development. Pretoria: CSIR in collaboration with DS.

Dobson, R. & Lepnum, R. 2000. Wellness activities address inequities. *Social Science and Medicine*, 50:107-121.

Downs, J.L., de Bruin, W.B., Murray, P.J. & Fischhoff, B. 2006. Specific STI knowledge may be acquired too late. *Journal of Adolescent Health*, 38:65-67.

Dowshen, S. 2005. How to perform a Testicular Self-Examination. [Online] Available from: http://kidshealth.org/teen/sexual_health/guys/tse.html [Accessed: 2006-04-28].

Drew, E. & Murtagh, E.M. 2005. Work/life balance: senior management champions or laggards? *Women in Management Review*, 20(4):262-278.

Drive Alive. 2006. Alcohol. [Online] Available from: <http://www.drivealive.org.za/DriveAlive/WebSite/Drunk.asp> [Accessed: 2006-07-24].

Drummer, O.H., Gerostamoulos, J., Baziris, H., Chu, M., Caplehorn, J., Robertson, M.D. & Swann, P. 2003. The involvement of drugs in drivers of motor vehicles killed in Australian road traffic crashes. *Accident Analysis and Prevention*, 943:1-10.

Duerr, M. 2004. The contemplative organization. *Journal of Organizational Change*, 17(1):43-61.

Durrheim, K. 2006. In: Terre Blanche, M., Durrheim, K. & Painter, D. (eds.) *Research in Practice: Applied Methods for Social Sciences*. Cape Town: University of Cape Town Press.

Durrheim, K. & Painter, D. 2006. In: Terre Blanche, M., Durrheim, K. & Painter, D. (eds.) *Research in Practice: Applied Methods for Social Sciences*. Cape Town: University of Cape Town Press.

Eddington, D.W., Yen, L. & Braunstein, A. 1999. The reliability and validity of HRAs. In: Hyner, G.C., Peterson, K.W., Travis, J.W., Dewey, J.E., Foerster, J.J. & Framer, E.M. *SPM handbook of health assessment tools*. Pittsburgh: Society of Prospective Medicine and Institute for Health and Productivity Management.

Edlin, G., Golanty, E. & McCormack-Brown, K.M. 1998. *Health and Wellness*. Sudbury Massachusetts: Jones and Bartlett Publishers.

Edwards, W.M. & Coleman, E. 2004. Defining Sexual Health: A Descriptive Overview. *Archives of Sexual Behavior*, 33(3):189-195.

Eichenseher, T. 2003. How Much Water Do We Need, Anyway? *Environmental Magazine*, 14(5):35.

Einwalter, L.A., Ritchie, J.M., Ault, K.A. & Smith, E.M. 2005. Gonorrhea and Chlamydia Infection Among Women Visiting Family Planning Clinics: Racial Variation in Prevalence and Predictors. *Perspectives on Sexual and Reproductive Health*, 37(3):135-140.

Eklund, M. 2004. Satisfaction with Daily Occupations: A Tool for Client Evaluation in Mental Health Care. *Scandinavian Journal of Occupational Therapy*, 11:136-142.

Eli, R. & Fasciano, J.A. 2006. An adjunctive preventive treatment for cancer: Ultraviolet light and ginkgo biloba, together with antioxidants, are a safe and powerful, but largely ignored, treatment option for the prevention of cancer. *Medical Hypothesis*, 66:1152-1156.

Elias, W.S. & Dunton, S. 1981. Effect on reliability on risk factor estimation by a health hazard appraisal. In: *Proceedings of the 16th Meeting of Society of Prospective Medicine*. Bethesda: Society of Prospective Medicine.

Elinson, L., Houck, P., Marcus, S.C. & Pincus, H. 2004. Depression and the Ability to Work. *Psychiatric Services*, 55(1):29-34.

Emma, D. 2006. You are a Human Sponge. *Current Health*, 32(8) [Online] Available from: http://0-web21.epnet.com.innopac.up.ac.za/citation.asp?tb=1&_ug=sid+D3E61695%2 [Accessed: 2006-05-25].

Evans, M.F. & Smith, V.K. 2005. Do new health conditions support mortality-air pollution effects? *Journal of Environmental Economics and Management*, 50:496-518.

Fabricatore, A.N. & Wadden, T.A. 2004. Psychological Aspects of Obesity. *Clinics in Dermatology*, 22:332-337.

Falkenberg, L.E. 1987. Employee fitness programs: Their impact on the employee and the organization. *Academy of Management Review*, 12(3):511-522.

Farham, B. 2004. How to conduct a breast self-examination. [Online] Available from: http://health.iafrica.com/illness_condition/cancer/breast_cancer/62412.htm [Accessed: 2006-05-18].

Feldman, S. 2006. Soft Water = Increased CVD Risk = Poor Science! *Water Conditioning and Purification*, March.

Fenwick, T.J. 2002. Problem-Based Learning, Group Process and the Mid-career Professional: Implications for Graduate Education. *Higher Education Research and Development*, 21(1):5-21.

Finchilescu, G. 2005. Measurements. In: Tredoux, C. & Durrheim, K. (eds.) *Numbers, Hypotheses and Conclusions: A Course in Statistics for the Social Sciences*. Cape Town: University of Cape Town Press.

Fishbein, D.B., Willis, B.C., Cassidy, W.M., Marioneaux, D., Bachino, C., Waddington, T. & Wortley, P. 2006. Determining indications for adult vaccination: Patient self-assessment medical record, or both? *Vaccine*, 24:803-818.

Fontaine, K.R., Heo, M. & Allison, D.B. 2005. Obesity and prostate cancer screenings in the USA, *Public Health*, 119:694-695.

Frankfort-Nachmias, C. & Nachmias, D. 1996. *Research Methods in the Social Sciences*. New York: St Martin's Press, Inc.

Frankl, V.E. 1984. *Man's search for meaning: Revised and updated*. New York: Washington Square Press.

Frenkel, L.D. & Nielsen, K. 2006. Immunization issues for the 21st Century. [Online] Available from: <http://0-scholar.google.com.innopac.up.ac.za/scholar?hl=en&lr=&q=cache:wAkYvdwN...> [Accessed: 2006-04-27].

FritzGerald, W.A. 2000. Explaining the variety of human sexuality. *Medical Hypotheses*, 55(5):435-439.

Froelicher, V.F. & Myers, J.N. 2000. *Exercise and the Heart*. Philadelphia: W.B. Saunders Co.

Garcia, M., Fernandez, E., Schiaffino, A., Peris, M. & Borràs, J.M. 2005. Smoking reduction in a population-based cohort. *Preventive Medicine*, 40:679-684.

Gardner, B., Rose, J., Mason, O., Tyler, P. & Cushway, D. 2005. Cognitive therapy and behavioral coping in the management of work-related stress: An intervention study. *Work and Stress*, 19(2):137-152.

Gaskie, S. & Nashelsky, J. 2005. Are breast self-exams or clinical exams effective for screening breast cancer? *The Journal of Family Practice*, 54(9):803-804.

Gavin, J.H. & Mason, R.O. 2004. The Virtuous Organization: The Value of Happiness in the Workplace. *Organizational Dynamics*, 33(4):379-392.

Gazmararian, J.A., Foxman, J.A. & Yen, L. 1991. Comparing the predictive accuracy of health risk appraisal: the Centers for Disease Control versus Carter Center Program. *American Journal of Public Health*, 81(10):1296-1301.

Gibson, J.L., Ivancevich, J.M. & Donnelly, J.H. 2000. *Organizations: Behavior, Structure, Processes*. New York: McGraw-Hill.

Gibson, J.L., Ivancevich, J.M., Donnelly, J.H. & Konopaske, R. 2003. *Organizations, Behavior, Structure, Processes*. New York: McGraw-Hill Companies, Inc.

Ginn, G.O. & Henry, J.L. 2003. Wellness Programs in the Context of Strategic Human Resource Management. *Hospital Topics: Research and Perspectives on Healthcare*, 81(1):23-28.

Glanz, K. & Mayer, J.A. 2005. Reducing Ultraviolet Radiation Exposure to Prevent Skin Cancer. *American Journal of Preventive Medicine*, 29(2):131-142.

Goetzel, R. 2002. Making Wellness Work for Your Company. *Compensation and Benefits Report*, 7.

Goldstein, M.G., Whitlock, E.P. & DePue, J. 2004. Multiple Behaviourial Risk Factor Interventions in Primary Care: Summary of Research Evidence. *American Journal of Preventive Medicine*, 27(2S):61-79.

Goodwin, R. 2002. Anxiety disorders and the onset of depression among adults in the community. *Psychological Medicine*, 32:1121-1124.

Gotto, A.M. 2002. Statins: Powerful Drugs for Lowering Cholesterol: Advice for Patients. *Circulation, Journal of the American Heart Association*, 105:1514-1516.

Gozález-Romá, V., Schaufeli, W.B., Bakker, A.B. & Lloret, S. 2006. Burnout and work engagement: Independent factors or opposite poles? *Journal of Vocational Behavior*, 68:165-174.

Grandjean, A. 2004. *Water Requirements, Impinging Factors, and Recommended Intakes*. Geneva, Switzerland: World Health Organization.

Grant, C.B. & Brisbin, R.E. 1992. *Workplace Wellness: The Key to Higher Productivity and Lower Health Costs*. New York: Van Nostrand Reinhold.

Grant, J.M. & Mack, D.A. 2004. Preparing for battle: Healthy Leadership during Organisational Crisis. *Organisational Dynamics*, 33 (4):409-425.

Grant-Vallone, E.J. & Ensher, E.A. 2001. An examination of work and personal life conflict, organizational support, and employee health among international expatriates. *International Journal of Intercultural Relations*, 25:261-278.

Greenblatt, E. 2002. Work/Life Balance: Wisdom or Whining. *Organizational Dynamics*, 31(2):177-193.

Greenhaus, J.H., Collins, K.M. & Shaw, J.D. 2003. The relation between work-family balance and quality of life. *Journal of Vocational Behavior*, 63:510-531.

Griffin, T. 2005. *Wellness: A Journey for Life*. Benefits and Wellness. Central Michigan University: United States of America.

Grzeda. M.M. 2005. In competence we trust? Addressing conceptual ambiguity. *Journal of Management Development*, 24(6):530-545.

Gutknecht, D.B. & Gutknecht, D.M. 1990. *Building Productive Organizations Through Health and Wellness Programs*. Lanham, MD: University Press.

Guttmann, C. 2005. Antioxidants may repel, reverse sun damage. *Dermatology Times*, April:68.

Hackman, J.R. & Oldham, G.R. 1980. *Work redesign*. Reading, MA: Addison-Wesley.

Haddad, P.S., Azar, G.A., Groom, S. & Boivin, M. 2005. Natural Health Products, Modulation of Immune Function and Prevention of Chronic Diseases. *Advance Access Publication*, 20 October.

Haddock, C.K., Lando, H., Klesges, R.C. & Peterson, A.L. 2004. Modified Tobacco Use and Lifestyle Change in Risk-Reducing Beliefs About Smoking. *American Journal of Preventive Medicine*, 27(1):35-41.

Haines, A., Kovats, R.S., Campbell-Lendrum, D. & Corvalan, C. 2006. Climate change and human health: Impacts, vulnerability and public health. *Public Health*, 120:585-596.

Hakkarainen, R., Partonen, T., Haukka, J., Virtamo, J., Albanes, D. & Lönngqvist, J. 2004. Food and nutrient intake in relation to mental well-being. *Nutrition Journal*, 3(14):1-5.

Hall, W.D. 2005. The prospects for tobacco harm reduction. *International Journal of Drug Policy*, 16:139-142.

Halpern-Felsher, B.L., Biehl, M., Kropp, R.Y., & Rubinstein, M.L. 2004. Perceived risks and benefits of smoking: differences amongst adolescents with different smoking experiences and intentions. *Preventive Medicine*, 39:559-567.

Harpaz, I. 2002. Expressing a wish to continue or stop working as related to the meaning of work. *European Journal of Work and Organizational Psychology*, 11(2):177-198.

Harpaz, I. & Fu, X. 2002. The structure of the meaning of work: A relative stability amidst change. *Human Relations*, 55(6):639-667.

Harrison, E.L.R. & Fillmore, M.T. 2005. Are bad drivers more impaired by alcohol? Sober driving precision predicts impairment from alcohol in a simulated driving task. *Accident Analysis and Prevention*, 37:882-889.

Hart, J. 2004. Dental care: Adult. [Online] Available from: <http://www.nlm.nih.gov/medlineplus/ency/article/001957.htm>. [Accessed: 2006-06-13].

Harvey, D.F. & Brown, D.R. 2001. *Experiential Approach to Organization Development*. (5th ed.) New Jersey: Prentice-Hall.

Haslam, C., Atkinson, S., Brown, S.S. & Haslam, R.A. 2004. Patients' experiences of medication for anxiety and depression: effects on working life. *Family Practice*, 21(2):204-212.

Haslam, C., Atkinson, S., Brown, S.S. & Haslam, R.A. 2005. Anxiety and depression in the workplace: Effects on the individual and organisation (a focus group investigation). *Journal of Affective Disorders*, 88:209-215.

Hatfield, T. & Hatfield, S.R. 1992. As if Your Life Depended on it: Promoting Cognitive Development to Promote Wellness. *Journal of Counseling and Development*, 71:164-167.

Hattie, J.A., Myers, J.E. & Sweeney, J. 2004. A Factor Structure of Wellness: Theory, Assessment, Analysis, and Practice. *Journal of Counseling and Development*, 82:354-364.

Hattingh, S.P. 2006. Environmental health. In: Acutt, J. & Hattingh, S.P. (eds.) *Occupational Health: Management and practice for health practitioners*. Lansdowne: Juta & Co, Ltd.

Hausken, A.M., Skurtveit, S. & Christophersen, A.S. 2005. Mortality among subjects previously apprehended for driving under the influence of traffic-hazardous medicinal drugs. *Drug and Alcohol Dependence*, 79:423-429.

Hawe, P. & Shiell, A. 2000. Social capital and health promotion: a review. *Social Science and Medicine*, 51:871-885.

Health24.com. Breast self-examination. [Online] Available from: http://www.health24.com/Woman/Common_conditions/711-712,17667.asp [Accessed: 2006-05-18].

Health24.com. 2006. Water and your body. [Online] Available from: http://www.health24.com/dietnfood/Water_centre/15-167-166,19731.asp [Accessed:2006-04-20].

Health24.com. 2006. Testicular self-examination. [Online] Available from: http://www.health24.com/Man/Great_man_guides/748-3270-3333,3507.asp [Accessed: 2006-04-28].

Heaton, D.P., Schmidt-Wilk, J. & Travis, F. 2004. Constructs, methods, and measures for researching spirituality in organisations. *Journal of Organizational Change*, 17(1):62-82.

Helliwell, J.F. & Putman, R.D. 2004. The social context of well-being. *The Royal Society*, 359:1435-1446.

Herholdt, J. 2004. The ABSA case study: *Energy Investment in Human Capital Programme*. Paper presented at the 2nd South African Wellness Conference, North-West University, Potchefstroom, 24-26 March.

Hettler, B. 2005. Think Peace Act Peace. [Online] Available from: <http://www.hettler.com>. [Accessed: 2005-23-04].

Hettler, B.1980. Wellness promotion on a university campus. *Family and Community Health*, 3(1):77-95.

Heyward, V.H. 2002. Advanced fitness assessment and exercise prescription. 4th ed. Champaign, IL: Human Kinetics.

Hill, J. 2004. Physical activity and obesity. *The Lancet*, 363:182.

Hill, J.B. 2005. Pelvic Inflammatory Disease. [Online] Available from: <http://www.emedicine.com/med/topic1774.htm> [Accessed: 2006-03-20].

Hines, M., Brook, C. & Conway, G.S. 2004. Androgen and Psychosexual Development: Core Gender Identity, Sexual Orientation, and Recalled Childhood Gender Role Behavior in Women and Men with Congenital Adrenal Hyperplasia (CAH). *The Journal of Sex Research*, 41(1):75-81.

Hiom, S. 2006. Public awareness regarding UV risks and vitamin D - The challenges for UK skin cancer prevention campaigns. *Progress in Biophysics and Molecular Biology*, 92:161-167.

Ho, J.T.S. 1997. Corporate Wellness Programmes in Singapore: effect on stress, satisfaction and absenteeism. *Journal of Managerial Psychology*, 12(3):177-189.

Hoffman, R.M., Borders, L.D. & Hattie, J.A. 2000. Reconceptualizing Femininity and Masculinity: From Gender roles to Gender Self-Confidence. *Journal of Social Behavior and Personality*, 15(4):475-503.

Holdgate, M.W. 1979. *A Perspective of Environmental Pollution*. Cambridge: Cambridge University Press.

Holick, M.F. 2006. Vitamin D: Its role in cancer prevention and treatment. *Progress in Biophysics and Molecular Biology*, 92:49-59.

Holland, J., Ramazanoglu, C., Sharpe, S. & Thomson, R. 1999. *Feminist Methodology and Young Peoples Sexuality*. In: Parker, R. & Aggleton, P. (eds.) *Culture, Society and Sexuality: A Reader*. London: UCL Press.

Houlton, S. 2003. WHO identifies Top Ten Health Risks. *Pharmaceutical Executive*, February: 30. [Online] Available from: http://web22.epnet:pnetcom/citation.asp?tb=l&_ug=dbs+0%2CI%2C2%2C6%2C8%2C10%. [Accessed: 2005-10-12].

Howat, P., Sleet, D., Elder, R. & Maycock, B. 2004. Preventing Alcohol-Related Traffic Injury: A Health Promotion Approach. *Traffic Injury Prevention*, 5:208-219.

Hudson, M. 2006. Hypertension in South-Africa. [Online] Available from: http://www.health24.com/medical/Condition_centres/777-792-815-1778,16793.asp [Accessed: 2006-04-24].

Hunnicut, D. 2001. In: Jenkins (ed.) *Building Blocks for a Successful Workplace Wellness Program: Proven Planning and Management Strategies from Wellness Program Management Advisor*. Manasquan (USA): American Business Publishing.

Hurley J. S. & Schlaadt, R. G. 1992. *The Wellness Life Style*. Guildford: The Dushkin Publishing Group, Incorporated.

Hurst, J. & Baker, S. 2005. Work-life balance: evidence from across the UK. *European Industrial Relations Review*, 380:27-30.

Hyman, J. & Summers, J. 2003. Lacking balance? Work-life employment practices in the modern economy. *Personnel Review*, 33(4):418-429.

Ingersoll, R.E. & Bauer, A.L. 2004. An Integral Approach to Spiritual Wellness in School Counseling. *Professional School Counseling*, 7(3):301-309.

Ishikawa-Takata, K., Ohta, T. & Tanaka, H. 2003. How much exercise is required to reduce blood pressure in essential hypertensives: A dose-response study. *American Journal of Hypertension*, 16(8):629-633.

Ivancevich, J.M. & Matteson, M.T. 2002. *Organizational Behavior and Management*. New York: McGraw-Hill Companies, Inc.

Jacobson, M.I., Yenney, S.L. & Bisgard, J.C. 1993. An organizational perspective on worksite health promotion. In: Scofield, M.E. (ed.) *Worksite health promotion*. New York. Hanley and Belfus.

Jamali, D. 2004. Changing management paradigms: implications for educational institutions. *Journal of Management Development*, 24(2):104-115.

Jeffreys, M. & Mills, D. 1990. *Freshwater Ecology*. London: Belhaven Press.

Jelinski, S.E., Maxwell, C.J., Onysko, J. & Bancej, C.M. 2005. The Influence of Breast Self-Examination on Subsequent Mammography Participation. *American Journal of Public Health*, 95(3):505-511.

Jenkins, D. 2001. Diagnosing human papillomaviruses: recent advances. *Current Opinion in Infectious Diseases*, 14:53-62.

Jenkins, R. 2001. *Building Blocks for a successful Workplace Wellness Program: Proven Planning and Management Strategies from Wellness Program Management Advisor*. Manasquan (USA): American Business Publishing.

Jernigan, I.E., Beggs, J.M. & Kohut, G.F. 2002. Dimensions of work satisfaction as predictors of commitment type. *Journal of Managerial Psychology*, 17(7):564-579.

Jerome-Forget, M. 1992. Changing the Corporate Culture. *Business Quarterly*, 56(3):107-111.

Johnson, R.E. & Johnson, M.D. 2003. Are health promotion programs for you? *Strategic Finance*, December:1-6.

Johnson, S., Cooper, C., Cartwright, S., Donald, I., Taylor, P. & Millet, C. 2005. The experience of work-related stress across occupations. *Journal of Managerial Psychology*, 20(2):178-187.

Jones, L. & Frazier, S.E. 1994. Assessment of self-esteem and wellness in health promotion professionals. *Psychological Reports*, 75:833-844.

Judge, T.A., Erez, A., Bono, J.E. & Thoresen, C.J. 2003. The Core Self-evaluation Scale: Development of a Measure. *Personnel Psychology*, 56(2):303-331.

Judge, T.A., Higgins, C.A., Thoresen, C.J. & Barrick, M.R. 1999. The Big Five Personality Traits, General Mental Ability, and Career Success across the Life Span. *Personnel Psychology*, 52:621-652.

Jurkovic, D. & Walker G.A. 2006. Examining Masculine Gender-Role Conflict and Stress in Relation to Religious Orientation and Spiritual Well-Being in Australian Men. *The Journal of Men's Studies*, 14(1):27-46.

Kacena, J.F. 2002. New Leadership Directions. *The Journal of Business Strategy*. March/April.

Kalichman, S.C., Simbayi, L.C., Cain, D., Jooste, S., Skinner, D. & Cherry, C. 2006. Generalizing a model of health behaviour change and AIDS stigma for use with sexually transmitted infection clinic patients in Cape Town, South Africa. *AIDS Care*, 18(3):178:182.

Kan, K. & Tsai, W.D. 2004. Obesity and risk Knowledge. *Journal of Health Economics*, 23:907-934.

Kaplan, N.M. & Opie, L.H. 2006. Controversies in hypertension. *Lancet*, 367:168-176.

Kapp, J. & Sharp, P. 2003. A Well Workplace: Why a worksite-wellness program makes dollars and sense. *Indiana Business Magazine*, January:40-46.

Karnath, B. 2002. Smoking Cessation. *The American Journal of Medicine*, 112:399-405.

Karp, H.B. & Abramms B. 1992. Doing the right thing. *Training and Development*, 46(8):36-42.

Karras, D.J., Ufberg, J.W., Harrigan, R.A., Wald, D.A., Botros, M.S. & McNamara, R.M. 2005. Lack of relationship between hypertension-associated symptoms and blood pressure in hypertensive ED patients. *American Journal of Emergency Medicine*, 23:106-110.

Kelley, G.A. & Kelley, K.S. 2000. Progressive resistance exercise and resting blood pressure: a meta-analysis of randomized controlled trials. *Hypertension*, 35:43.

Kelly, E., Darke, S. & Ross, J. 2004. A review of drug use and driving: epidemiology, impairment, risk factors and risk perceptions. *Drug and Alcohol Review*, 23:319-344.

Kendler, B.S. 2002. Your Body's many Cries for Water. In: Batmanghelidj, F. (Book review). *Nutrition*, 18(7/8):697-701.

Kenney, W.L. 2004. Dietary water and sodium requirements for active adults. *Sports Science Exchange*, 17(1):92-97.

Ketelhut, R.G., Franz, I.W. & Scholze, J. 2004. Regular exercise as an effective approach in antihypertensive therapy. *Medicine and Science in Sports and Exercise*, 36(1):4-8.

Keys, C.L.M. 1998. Social Well-Being. *Social Psychology Quarterly*, 61(2):121-140.

Khurana, S., Batra, V., Patkar., A.A. & Leone, F.T. 2003. Twenty-first century tobacco use: it is not just a risk factor anymore. *Respiratory Medicine*, 97:295-301.

Kidd, M. 1997. *Environmental Law: A South African Guide*. Kenwyn: Juta & Co, Ltd.

Kim, D., Subramanian, S.V. & Kawachi, I. 2006. Bonding versus bridging social capital and their associations with self rated health: a multilevel analysis of 40 US communities. *Journal of Epidemiology and Community Health*, 60:116-122.

King, J.E. & Crowther, M.R. 2004. The measurement of religiosity and spirituality: Examples and issues from psychology. *Journal of Organizational Change*, 17(1):83-101.

King, J. 2006. Anxiety symptoms - Anxiety and Panic. [Online] Available from: <http://be-healthy.net/articles/health-and-fitness/anxiety-symptoms-anxiety-panic.htm>. [Accessed: 2006-02-27].

Kinjerski, V.M & Skrypnek, B.J. 2004. Defining spirit at work: finding common ground. *Journal of Organizational Change Management*, 17(1):26-42.

Kinman, G. & Jones, F. 2005. Lay representations of workplace stress: What do people really mean when they say they are stressed? *Work and Stress*, 19(2):101-120.

Kirkwood, G., Rampes, H., Tuffrey, V., Richardson, J. & Pilkington, K. 2005. Yoga for anxiety: a systematic review of the research evidence. *British Journal of Sports Medicine*, 39:884-891.

Kleiner, S.M. 2004. The art and science of hydration. *Acta Paediatrica*, 93(12):1557-1558.

Koenig, H.G. 2004. Spirituality, wellness, and quality of life. *Sexuality, Reproduction and Menopause*, 2(2):76-82.

Koh, H.K. & Geller, A.C. 2004. Skin Cancer Prevention Comes of Age. *American Journal of Preventive Medicine*, 27(5):484-485.

Kompier, M.A.J. 2004. *Organisational Stress Interventions*. Paper presented at the 2nd South African Wellness Conference, North-West University, Potchefstroom, 24-26 March.

Kovats, R.S., Campbell-Lendrum, D. & Matthies, F. 2005. Climate Change and Human Health: Estimating Avoidable Deaths and Disease. *Risks Analyses*, 25(6):1409-1418.

Kreitner, R. & Kinicki, A. 1998. *Organizational Behavior*. 4th ed. New York: McGraw Hill.

Krishnakumar, S. & Neck, C.P. 2002. The “what”, “why” and “how” of spirituality in the workplace. *Journal of Managerial Psychology*, 17(3):156-159.

Kritsotakis, G. & Gamarnikow, E. 2004. What is social capital and how does it relate to health? *International Journal of Nursing Studies*, 41:43-50.

Kromhout, D., Menotti, A., Kesteloot, H. & Sans, S. 2002. Prevention of Coronary Heart Disease by Diet and Lifestyle. *Circulation*, 105:893-901.

Kuypers, K.P.C., Samyn, N. & Ramaekers, J.G. 2006. MDMA and alcohol effects, combined and alone, on objective and subjective measures of actual driving performance and psychomotor function. *Psychopharmacology*, in press.

Lachenicht, L. 2005. Correlation In: Tredoux, C. & Durrheim, K. (eds.) *Numbers, Hypotheses and Conclusions: Course in Statistics for the Social Sciences*. Cape Town: University of Cape Town Press.

Lang, A. & Froelicher, E.S. 2006. Management of overweight and obesity in adults: Behavioral intervention for long-term weight loss and maintenance. *European Journal of Cardiovascular Nursing*, 5:102-114.

Langelaan, S., Bakker, A.B., van Dooren, L.J.P. & Schaufeli, W.B. 2006: Burnout and work engagement: Do individual differences make a difference? *Personality and Individual Differences*, 40:521-532.

Lauder, W., Mummery, K. & Sharkey, S. 2006. Social capital, age and religiosity in people who are lonely. *Journal of Clinical Nursing*, 15:334-340.

Lauzon, R.R.J. 1978. HHA and the evaluation of life style change programs: methodological issues. In: *Proceedings of the 13th Meeting of Society of Prospective Medicine*. Bethesda: Society of Prospective Medicine.

Lawrence, V.J. & Kopelman, P.G. 2004. Medical consequences of obesity. *Clinics in Dermatology*, 22:296-301.

Leafgren, F. & Elsenrath, D. E. 1986. The role of campus recreation programs in institutions of higher education. In: Leafgren, F. (ed.) *Developing campus recreation and wellness programs*. San Francisco: Jossey-Bass.

Lee, C.O. 2005. Herbs and Cytotoxic Drugs: Recognizing and Communicating Potentially Relevant Interactions. *Clinical Journal of Oncology Nursing*, 9(4):481-487.

Lee, C.H. & Bruvold, N.T. 2003. Creating value for employees: investment in employee development. *International Journal of Human Resource Management*, 14(6):981-1000.

Leedy, P.D. & Ormrod, J.E. 2005. *Practical Research: Planning and Design*. Upper Saddle River, New Jersey: Pearson Merrill Prentice Hall.

Leedy, P.D. 1993. *Practical Research: Planning and Design*. New York: Macmillan.

Lesch, K.A. 2006. Stay safe in the sun. *Natural Health*, 36(6):47-52.

Lewicki, R.J., Tomlinson, E.C. & Gillespie, N. 2006. Models for Interpersonal Trust Development: Theoretical Approaches, Empirical Evidence, and Future Directions. *Journal of Management*, 32(6):991-1022.

Lewis, R.W., Fugl-Meyer, K.S., Bosch, R., Fugl-Meyer, A.R., Laumann, E.O., Lizza, E. & Martin-Morales, A. 2004. Epidemiology/Risk factors of Sexual Dysfunction. *Journal of Sexual Medicine*, 1(1):35-39.

Lichtman, J.1998. Invoke employee loyalty. *Workforce*, 77(1):121-123.

Lips, P. 2006. Vitamin D physiology. *Progress in Biophysics and Molecular Biology*, 92:4-8.

Litschka, M., Markom, A. & Schunder, S. 2006. Measuring and analysing intellectual assets: an integrative approach. *Journal of Intellectual Capital*, 7(2):160-173.

Little, J.W. 2006. Gonorrhoea update. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology*, 101(2):137-143.

Liukkonen, V., Virtanen, P., Kivimäki, M., Pentti, J. and Vahtera, J. 2004. Social capital in working life and health of employees. *Social Sciences and Medicine*, 59:2447-2458.

Livingston, E.H. & Ko, C.Y. 2005. Effect of diabetes and hypertension on obesity-related mortality. *Surgery*, 137(1):16-25.

Lomas, J. 1998. Social capital and health: implications for public health and epidemiology. *Social Science and Medicine*, 47(9):1181-1188.

Longenecker, C.O. & Fink, L.S. 2006. Closing the management skills gap: a call for action. *Development and Learning Organizations*, 20(1):16-19.

López, S.P., Peón, M.M. & Ordás, C.J.V. 2006. Human Resource Management as a Determining Factor in Organizational Learning. *Management Learning*, 37(2):215-239.

Luszczynska, A. 2004. Change in Breast Self-Examination Behavior: Effects of Intervention on Enhancing Self-Efficacy. *International Journal of Behavioral Medicine*, 11(2):95-103.

Luthans, F. 2002. *Organizational Behavior*. New York: McGraw-Hill Companies, Inc.

Lynch, R., Leo, S. & Downing, K. 2006. Context dependant learning: its value and impact for workplace education. *Education and Training*, 48(1):15-24.

MacGregor, G.A. & He, F.J. 2005. Importance of controlling blood pressure. *Climacteric*, 8(3):13-18.

Madhavan, M., Pandey, R.M., Misra, A., Vikram, N.K., Dhingra, V., Luthra, K. & Wasir, J.S. 2005. Centile values for serum lipids and blood pressure for Asian Indian adolescents. *Lipids in Health Disease*, 4(20):1-9.

Maduka, H.C.C. 2006. Water Pollution and Man's Health. *The Internet Journal of Gastroenterology*, 4(1):1-10.

Mahon, B.E., Temkit, M., Wang, J., Rosenman, M.B. & Katz, B.P. 2005. Pelvic inflammatory disease during the post-partum year. *Infectious Diseases in Obstetrics and Gynecology*, 13(4):191-196.

Makoe, L.N., Seboni, N.M., Molosiwa, K., Moleko, M., Human, S., Sukati, N.A. & Holzemer, W.L. 2005. The symptoms experience of people living with HIV/AIDS in Southern Africa. *Journal of the Association of Nurses in Aids Care*, 16(3):22-32.

Manhart, L.E. & Holmes, K.K. 2005. Randomized Controlled Trials of Individual-Level, Population-Level, and Multilevel Interventions for Preventing Sexually Transmitted Infections: What Has Worked? *The Journal of Infectious Diseases*, 18(Supplement):S7-S24.

Marciniak, M., Lage, M.J., Landbloom, R.P., Dunayevich, E. & Bowman, L. 2004. Medical and Productivity Costs of Anxiety Disorders: Case Control Study. *Depression and Anxiety*, 19:112-120.

Maritz, G.S., Morley, C.J. & Harding, R. 2005. Early developmental origins of impaired lung structure and function. *Early Human Development*, 81:763-771.

Marques J., Dhiman, S. & King, R. 2005. Spirituality in the Workplace: Developing an Integral Model and a Comprehensive Definition. *The Journal of American Academy of Business*, 7(1):81-91.

Martin, M.P. & Carrington, M. 2005. Immunogenetics of viral infections. *Current Opinion in Immunology*, 17:510-516.

Maxwell, G.A. & McDougall, M. 2004. Work-life balance: Exploring the connections between levels of influence in the UK public sector. *Public Management Review*, 6(3):377-393.

Maxwell, G.A. 2005. Checks and balances: the role of managers in work-life balance policies and practices. *Journal of Retailing and Consumer Services*, 12:179-189.

May, D.R., Gilson, R.L. & Harter, L.M. 2004. The psychological conditions of meaningfulness, safety and availability and the engagement of the human spirit at work. *Journal of Occupational and Organizational Psychology*, 77:11-37.

May, T. 1997. *Social Research: Issues, Methods and Processes*. Buckingham: Open University Press.

MayoClinic.com. 2006. Breast self-exams: One way to detect breast cancer. [Online] Available from: <http://www.mayoclinic.com/health/breast-self-exam/WO00026>. [Accessed: 2006-04-28].

McCullagh, J. & Warlow, C. 2005. Promoting awareness and practice of testicular self-examination. *Nursing Standard*, 19(51):41-49.

McElroy, M.W., Jorna, R.J. & van Engelen, J. 2006. Rethinking social capital theory: a knowledge management perspective. *Journal of Knowledge Management*, 10(5):124-136.

McMichael, A., Woodruff, R.E. & Hales, S. 2006. Climate change and human health: present and future risks. *Lancet*, 367:859-869.

Memish, Z.A. & Osoba, A.O. 2006. International travel and sexually transmitted diseases. *Travel Medicine and Infectious Disease*, 4:86-93.

MenWeb - Men's Voices Magazine. 2006. Testicular Self-Examination: High-risk Alert: How to do a self-examination. [Online] Available from: <http://www.menweb.org/testican.htm> [Accessed: 2006-04-28].

Merrick, B. 2002. Skills for future leaders. *Credit Union Magazine*. Madison, February.

Meyer, J.P. & Allen, N.J. 1997. *Commitment in the Workplace: Theory, Research and Application*. Thousand Oaks: Sage Publication.

Middleton, N. 1999: *The Global Casino*. London: Arnold.

Mikkelsen, A., Saksvik, P.Ø., Eriksen, H.R. & Ursin, H. 1999. The impact of learning opportunities and decision authority on occupational health. *Work and Stress*, 13(1):20-31.

Mikkelsen, A., Øgaard, T. & Landsbergis, P. 2005. The effects of new dimensions of psychological job demands and job control on active learning and occupational health. *Work and Stress*, 19(2):153-175.

Miller, G.T. 1996. *Living in the Environment*. California: Wadsworth Publishing Company.

Miller, G.T. 1998. *Living in the Environment*, California: Wadsworth Publishing Company.

Mincey, B.A. & Perez, E.A. 2004. Advances in Screening, Diagnosis, and Treatment of Breast Cancer. *Mayo Clinic Proceedings*, 79:810-816.

Moberg, D.O. 2002. Assessing and Measuring Spirituality: Confronting Dilemmas of Universal and Particular Evaluative Criteria. *Journal for Adult Development*, 9(1):47-60.

Moloney, T. 2005. Dealing with Gum Disease: A Life-Threatening Health Risk. [Online] Available from: <http://www.adha.org/oralhealth/adults.htm> [Accessed: 2006-06-06].

Morantz, C. & Torrey, B. 2004. Obesity and Sedentary Guidelines. *American Family Physician*, 69(10):2479-2480.

Morrison, D., Cordery, J., Girardi, A. & Payne, R. 2005. Job design, opportunities for skills utilization, and intrinsic job satisfaction. *European Journal of Work and Organizational Psychology*, 14(1):59-79.

Mosby's Medical Nursing and Allied Health Dictionary. 1998. St. Louis: Mosby/Elsevier.

Mouton, J. 2001. *How to succeed in your Master's and Doctoral Studies*. Pretoria: JL van Schaik Academic.

Mouton, J. & Marais, H.C. 1988. *Basic concepts in the methodology of the social sciences*. Pretoria: HSRC.

Movig, K.L.L., Mathijssen, M.P.M., Nagel, P.H.A., van Egmond, T., de Gier, J.J., Leufkens, H.G.M. & Egberts, A.C.G. 2004. Psychoactive substance use and the risk for motor vehicle accidents. *Accident Analysis and Prevention*, 36:631-636.

MOW - International Research Team. 1987. *The meaning of working*. London: Academic Press.

Murray, C.J. & Lopez, A.D. 1997. Global mortality, disability, and the contribution of risk factors: Global Burden of Disease Study. *Lancet*, 349:1436-1442.

Myers, J.E., Sweeney, T. & Witmer, J.M. 2000. The wheel of wellness counseling for wellness: A holistic model for treatment planning. *Journal of Counsel Development*, 78:251-266.

Myers, J., Prakash, M., Froelicher, V., Do, D., Partington, S. & Atwood, J.E. 2002. Exercise capacity and mortality among men referred for exercise testing. *New England Journal of Medicine*, 346:793-801.

Nadler, D.A. & Tushman, M.L. 1990. Beyond the charismatic leader: Leadership and organisational change. *California Management Review*, 32(2):77-97.

National Wellness Institute. TestWell: Wellness Inventory - Standard Edition Instructions. [Online] Available from: <http://www.testwell.org>. [Accessed: 2005-04-19].

National Institute on Drug Abuse. 2005. Drugged Driving. [Online] Available from: www.drugabuse.gov [Accessed: 2006-07-24].

National Highway Traffic Safety Administration. 2004. Connecticut Driving Under Influence Screening. *Traffic Safety Digest*, 1:1-2.

National Center for Complementary and Alternative Medicine. 2006. The Use of Complementary and Alternative Medicine in the United States. [Online] Available from: http://nccam.nih.gov/news/camsurvey_fs1.htm [Accessed: 2006-04-28].

National Wellness Institute. 1992. *TestWell, a Wellness Inventory*. Stevens Point, Wisconsin: National Wellness Institute.

National Center for Health Statistics. *Healthy People, 2000*. 1998-1999. Hyattsville, MD: Public Health Service.

National Center for Complementary and Alternative Medicine. 2006. What is Complementary and Alternative Medicine? [Online] Available from: <http://nccam.nih.gov/health/whatiscam/> [Accessed: 2006-04-28].

National Center for Injury Prevention and Control. 2006. Impaired Driving. [Online] Available from: <http://www.cdc.gov/ncipc/factsheets/driving.htm> [Accessed: 2006-07-24].

National Institutes of Health. 2006. High Blood Cholesterol: How is High Blood Cholesterol Treated? [Online] Available from: http://www.nhlbi.nih.gov/health/dci/Diseases/Hbc/HBC_Treatments.html [Accessed: 2006-07-05].

Nel, A. 2005. Air Pollution-Related Illness: Effects of Particles. *Science*, 308:804-806.

Nelson, M.E., Fiatarone, M.A., Morganti, C.M., Trice, I., Greenborg, R.A. & Evans, W.J. 1994. Effects of high intensity strength training on multiple risk factors for osteoporotic fractures. *Journal of American Medical Association*, 272:1909-1914.

Nemec, J. 2004. Sun shines on all, but more harshly on some. *Dermatology Times*, November 56-57.

Nexus Database System [Online] Available from: <http://star.nrf.ac.za/forms/nexuslogin.html> [Accessed: 2005-05-07].

Niggemann, B. & Grüber, C. 2003. Side-effects of complementary and alternative medicine. *Allergy*, 58:707-716.

Nochajski, T.H. & Stasiewicz, P.R. 2006. Relapse to driving under the influence (DUI): A review. *Clinical Psychology Review*, 26:179-195.

Norman, P. & Brain, K. 2005. An application of an extended health belief model to the prediction of breast self-examination among women with a family history of breast cancer. *British Journal of Health Psychology*, 10:1-16.

Nunez, D. 2005. Measurements. In: Tredoux, C. & Durrheim, K. (eds.) *Numbers, Hypotheses and Conclusions: A Course in Statistics for the Social Sciences*. Cape Town: University of Cape Town Press.

Nyklíyek, I. & Pop, V.J. 2005. Past and familial depression predicts current symptoms of professional burnout. *Journal of Affective Disorders*, 88:63-68.

O'Brien, M.S., Burdsal, C.A. & Molgaard, G.A. 2004. Further development of an Australian-based measure of social capital in a US sample. *Social Sciences and Medicine*, 59:1207-1217.

O'Connor, B.P., Rousseau, F.L. & Maki, S.A. 2004. Physical exercise and experienced bodily changes: The emergence of benefits and limits on benefits. *International Journal of Ageing and Human Development*, 59(3):177-203.

O'Donnell, M.P. 2002. *Health Promotion in the Workplace*. 3rd ed. New York: Delmar.

Offman, A. & Matheson, K. 2005. Sexual Compatibility and Sexual Functioning in Intimate Relationships. *The Canadian Journal of Human Sexuality*, 14(1-2):31-39.

Ogden, E.J.D. & Moskowitz, H. 2004. Effects of Alcohol and Other Drugs on Driver Performance. *Traffic Injury Prevention*, 5:185-198.

Oncken, C., McKee, S., Krishnan-Sarin, S., O'Malley, S. & Mazure, C.M. 2005. Knowledge and perceived risks of smoking-related conditions: a survey of cigarette smokers. *Preventive Medicine*, 40:779-784.

Ong, M.K. & Glantz, S.A. 2004. Cardiovascular Health and Economic Effects of Smoke-Free Workplaces. *The American Journal of Medicine*, 117:32-38.

Orenstein, W.A., Douglas, R.G., Rodewald, L.E. & Hinman, A.R. 2005. Immunizations in the United States: Success, Structure, and Stress. *Health Affairs*, 24(3): 599-610.

Ostrom E. & Ahn, T.K. 2003. In: Ostrom, E. & Ahn, T.K. (eds.) *Foundations of Social Capital*. Cheltenham: Edward Elgar Publishing.

Owen, T.R. 1999. The Reliability and Validity of a Wellness Inventory. *American Journal of Health Promotion*, 13(3):180-182.

Ozminkowski, R.J., Goetzel, R.Z., Santoro, J., Saenz, B.J., Eley, C. & Gorsky, B. 2004. Estimating Risk Reduction Required to Break Even in a Health Promotion Program. *American Journal of Health Promotion*, 18(4):316-325.

Paavola, S. & Hakkarainen, K. 2005. The Knowledge Creation Metaphor - An Emergent Epistemological Approach to Learning. *Science and Education*, 14:535-557.

Palombi, B.J. 1992. Psychometric Properties of Wellness Instruments. *Journal of Counseling and Development*, 71:221-225.

Panagiotakos, D.B. 2005. More evidence that a healthy lifestyle matters: Converting epidemiology to policy. *Evidence-based Healthcare and Public Health*, 9(2):108-110.

Panday, S., Reddy, S.P. & Bergström, E. 2003. A qualitative study on the determinants of smoking behaviour among adolescents in South Africa. *Scandinavian Journal of Public Health*, 31:204-210.

Papafotiou, K., Carter, J.D. & Stough, C. 2005. The relationship between performance on the standardised field sobriety tests, driving performance and the level of Δ 9-tetrahydrocannabinol (THC) in blood. *Forensic Science International*, 155:172-178.

Patz, J.A., Campbell-Lendrum, D., Holloway, T. & Foley, J.A. 2005: Impact of Regional Climate Change on Health. *Nature*, 438:310-317.

Paul, R.J. 2003. Managing Employee Depression in the Workplace. *Review of Business*, Winter:31-37.

Pelletier, K. R. 1979. *Holistic medicine: From stress to optimum health*. San Francisco: Delta/Seymour Lawrence.

Perkins, A.M. 2004. Trichomoniasis. [Online] Available from: <http://www.emedicine.com/med/topic2308.htm> [Accessed: 2006-03-21].

Petersen, P.E. & Kwan, S. 2004. Evaluation of community-based oral health promotion and oral disease prevention - WHO recommendations for improved evidence in public health practice. *Community Dental Health*, 21:319-329.

Petersen, P.E. 2005. The burden of oral disease: challenges to improving oral health in the 21st century. *Bulletin of the World Health Organization*, 83(1):3.

Peterson, J.L. & Bakeman, R. 2006. Impact of beliefs about HIV treatment and peer condom norms on risky sexual behavior among gay and bisexual men. *Journal of Community Psychology*, 34(1):37-46.

Pfeffer, J. 2005. Producing sustainable competitive advantage through the effective management of people. *Academy of Management Executives*, 19(4):95-108.

Pihlstrom, B.L., Michalowicz, B.S. & Johnson, N.W. 2005. Periodontal diseases. *The Lancet*, 366:1809-1820.

Polychronopoulos, E., Panagiotakos, D.B. & Polystipiotti, A. 2005. Diet, lifestyle factors and hypercholesterolemia in elderly men and women from Cyprus. *Lipids in Health and Disease*, 4:1-7.

Poortinga, W. 2006. Social capital: An individual or collective resource for health? *Social Science and Medicine*, 62:292-302.

Porter, S.R. & Whitcomb, M.E. 2005. Non-response in student surveys: The Role of Demographics, Engagement and Personality. *Research in Higher Education*, 46(2):127-152.

Postgraduate Medicine Online. 1999. [Online] Available from: http://www.postgradmed.com/issues/1999/04_99/pn_test.htm. [Accessed: 2006-04-28].

Preventive Services Task Force. 2003. Screening for High Blood pressure: Recommendations and Rationale. *American Journal of Preventive Medicine*, 25(2):159-164.

Prochaska, J.J., Sorensen, J.L., Hall, S.M., Rossi, J.S., Redding, C.A., Rosen, A.B., Eisendrath, S.J. & Meisner, M.R. 2005. Predictors of health functioning in two high-risk groups of smokers. *Drug and Alcohol Dependence*, 78:169-175.

Pronk, N.P., Tan, A.W.H. & O'Connor, P. 1999. Obesity, fitness, willingness to communicate and health care costs. *Medical Science and Sports Exercise*, 31:1535-1543.

Proper, K.I., Hildebrandt, V.H., Van der Beek, A.J., Twisk, J.W.R. & Van Mechelen, W. 2003. Effect of Individual counseling on Physical Activity Fitness and Health: A Randomized Controlled Trial in a Workplace Setting. *American Journal of Preventive Medicine*, 24(3):218-226.

Puoane, T., Steyn, K., Bradshaw, D., Laubscher, R. Fourie, J., Lambert, V. & Mbananga, N. 2002. Obesity in South Africa: The South African Demographic and Health Survey. *Obesity Research*, 10(1):1038-1048.

Putman, R. 2000. *Bowling Alone: The Collapse and Revival of American Community*. New York: Simon and Schuster.

Quick, J.D., Henley, A.B. & Quick, J.C. 2004. The Balancing Act - At Work and At Home. *Organizational Dynamics*, 33(4):426-438.

Radonjic, I.V., Dzamic, A.M., Mirovic, S.M., Arsenijevic, S.A., Popadic, D.M. & Kranjic Zec, I.F. 2005. Diagnosis of *Trichomonas vaginalis* infection: The sensitivities and specificities of microscopy, culture and PCR assay. *European Journal of Obstetrics and Gynecology and Reproductive Biology*, in press.

Ramaekers, J.G., Berghaus, G., van Laar, M. & Drummer, O.H. 2004. Dose related risk of motor vehicle crashes after cannabis use. *Drug and Alcohol Dependence*, 73:109-119.

Ratten, V. & Suseno, Y. 2006. Knowledge development, social capital and alliance learning. *International Journal of Educational Management*, 20(1):60-72.

Rau, R. 2006. Learning opportunities at work predictor for recovery and health. *European Journal of Work and Organizational Psychology*, 15(2):158-180.

Reid, C.M. & Thrift, G. 2005. Hypertension 2020: Confronting Tomorrow's Problem Today. *Clinical and Experimental Pharmacology and Physiology*, 32:374-376.

Rew, L., McDougall, G., Riesch, L. & Parker, C. 2005. Development of the self-efficacy for testicular self-examination scale. *The Journal of Men's Health and Gender*, 2(1):59-63.

Rikli, R.E. 2005. Movement and Mobility Influence Successful Ageing: Addressing the Issue of Low Physical Activity. *Quest*, 57:46-66.

Risser, W.L., Bortot, A.T., Bejamins, L.J., Feldmann, J.M., Barratt, M.S., Eissa, M.A. & Risser, J.M.H. 2005. The Epidemiology of Sexually Transmitted Infections in Adolescents. *Seminars in Pediatric Infectious Diseases*, 16:160-167.

Road Traffic Management Corporation. 2006. Road Traffic Report on Number of Registered, Un-Roadworthy and Un-Licensed Vehicles, Driving Licences, PRDPs, Fuel Sales, Distance Travelled and Fatal Crashes and Fatalities. [Online] Available from: <http://www.arrivealive.co.za/documents/stats/2006Part1A & Part2B.pdf> [Downloaded: 2006-07-28].

Roberts, W.C. 2005. Managing Patients With High Blood Pressure before the Introduction of Antihypertensive Drugs. *The American Journal of Cardiology*, 96(10):1465-1466.

Robin, L., Dittus, P., Whitaker, D., Crosby, R., Ethier, K., Ches, J.M., Miller, K. & Pappas-Deluca, K. 2004. Behavioral Interventions to Reduce Incidence of HIV, STD, and Pregnancy Among Adolescents: A Decade in Review. *Journal of Adolescent Health*, 43(1):3-26.

Robin, R. 2003. Healthy, Wealthy and Wise. *Canadian Business*, 76(23):129-134.

Robinson, J.D., Silk, K.J., Parrott, R.L., Steiner, C., Morris, S.M. & Honeycutt, C. 2004. Healthcare providers' sun-protection promotion and at-risk clients' skin-cancer-prevention outcomes. *Preventive Medicine*, 38:251-257.

- Rosenberg, M.L., McIntyre, M.H. & Sloan, R. 2004. Global road safety. *Injury Control and Safety Promotion*, 11(2):141-143.
- Rosner, B. 2001. Is there room for the soul at work? *Workforce*, 80(2):82-83.
- Rössner, S. 2002. Obesity: the disease of the twenty-first century. *International Journal of Obesity*, 26:S2-S4.
- Ruhling, R.O. 2004. Why not exercise? *Quest*, 56:208-225.
- Ruth, D. 2006. Frameworks of managerial competence: limits, problems and suggestions. *Journal of European Industrial Training*, 30(3):206-226.
- Ruttkamp, E. & Ally, M. 2000. *Philosophy of Science*. Pretoria: University of South Africa.
- Sacks, J.J., Krushat, M.W. & Newman, J. 1980. Reliability of the health hazard appraisal. *American Journal of Public Health*, 70:730-732.
- Saher, M. & Lindeman, M. 2005. Alternative medicine: A psychological perspective. *Personality and Individual Differences*, 39:1169-1178.
- Salmela-Aro, K., Näätänen, P. & Nurmi, J.E. 2004. The role of work-related personal projects during two burnout interventions: a longitudinal study. *Work and Stress*, 18(3):208-230.
- Sandfort, T.G.M. & Ehrhardt, A.A. 2004. Sexual Health: a Useful Public Paradigm or a Moral Imperative. *Archives of Sexual Behavior*, 33(3):181-187.
- Sandström, A., Rhodin, I.N., Lundberg, M., Olsson, T. & Nyberg, L. 2005. Impaired cognitive performance in patients with chronic burnout syndrome. *Biological Psychology*, 69:271-279.
- Sapp, A. 2004. *Promoting Wellness in Employees*. [Online] Available from: <http://www.bsu/web/amsapp/employeeewellness.htm> [Accessed: 2004-5-15].
- Sawka, M.N., Cheuvront, S.N. & Carter, R. 2005. Human Water Needs. *Nutrition Reviews*, 63(6):S30-S39.
- Schaufeli, W.B. & Buunk, B.P. 2005. *Burnout: An Overview of 25-years of Research and Theorizing*. In: Schabracq, M.J., Cooper, C.L. & Winnubst, J.A.M. (eds.) *Handbook of Work and Health Psychology*. Chichester: John Wiley & Sons.
- Schaufeli, W.B. & Bakker, A.B. 2004. Job Demands, job resources, and their relationship with burnout and engagement: a multi-sample study. *Journal of Organizational Behavior*, 25:1-23.

Schaufeli, W.B. & Kompier, M.A.J. 2001. Managing job stress in the Netherlands. *Journal of Stress Management*, 8:15-34.

Schoenbach, V.J. 1987. Appraising health risk appraisal. *American Journal of Public Health*, 77(4):409-411.

Schoever, E., Fréchin, V., Fritsch, S., Freitag, R., Fuchs, A., Gut, J.P. & Stoll-Keller, F. 2006. Atypical symptoms in patients with herpesvirus DNA detected by PCR in cerebrospinal fluid. *Journal of Clinical Virology*, 35:458-462.

Scientific Research on Transcendental Meditation and (TM) Sidhi Programs. [Online] Available from: <http://www.tm.org/research/home.html> [Accessed: 2005-09-22].

Scott, E. 1999. New Model Explored for Population Health Assessment, Improvement. Employee Benefit News. [Online] Available from: http://0-web5.epnet.com.innopac.up.ac.za/citation.asp?tb=l&_ug=sid+246155B8%2DCE8. [Accessed: 2004-08-19].

Seaberg, J.R. 1988. *Utilizing sampling procedures*. In: Grinnell, R.M. (ed.) Social research and evaluation. 3rd ed. Itasca, IL: Peacock.

Sebitloane, M.H. 2005. HIV and gynaecological infections. *Best Practice and Research Clinical Obstetrics and Gynaecology*, 19(2):231-241.

Secginli, S. & Nahcivan, N.O. 2006. Breast self examination remains an important component of breast health: A response to Tarrant. *International Journal of Nursing Studies*, 43:521-523.

Seedat, S. 2006. The links between anxiety and depression. [Online] Available from: <http://www.health24.com/mind/Anxiety/1284-1295,23552.asp>. [Accessed: 2006-02-27].

Seefeldt, V., Malina, R.M. & Clark, M.A. 2002. Factors Affecting Levels of Physical Activity in Adults. *Sports Medicine*, 32(3):143-168.

Seguin, R. & Nelson, M.E. 2003. The benefits of strength training in older adults. *American Journal of Preventive Medicine*, 25(3):141-149.

Serfontein, W. 2003. *Leef Lank en Gesond: Voorkom en oorkom die grootste gesondheidsgevaar*. Kaapstad: Tafelberg uitgewers.

Sgan-Cohen, H.D. 2005. Oral hygiene: past history and future recommendations. *International Journal of Dental Hygiene*, 3:54-58.

Sharpley, C.F., Reynolds, R., Acosta, A. & Dua, J.K. 1996. The presence, nature and effects of job stress on physical and psychological health at a large Australian university. *Journal of Educational Administration*, 34(4):73-86.

Shawn, E.R., Campbell, L., Mnguni, M.B., Defilippi, K.M. & Williams, A.B. 2005. The spectrum of symptoms among rural South Africans with HIV infection. *Journal of the Association of Nurses in Aids Care*, 16(6):12-23.

Shefy, E. & Sadler-Smith, E. 2006. Applying holistic principles in management development. *Journal of Management Development*, 25(4):368-385.

Shekelle, P., Tucker, J., Maglione, M., Morton, S.C., Roth, E.A., Chao, B., Rhodes, S., Wu, S.Y., Newberry, S., Gruman, J. & Rubenstein, L. 2004. Evidence Report and Evidence-based Recommendations: Health Risk Appraisal and Medicare. [Online]. Available from: <http://www.cms.gov/healthyaging/2c1.pdf>. [Downloaded: 2004-11-25].

Shephard, R.J. 2000. Worksite health promotion and the older worker. *International Journal of Industrial Ergonomics*, 25:465-475.

Sherman, M.T. 1990. *Wellness in the Workplace: How to Plan, Implement, and Evaluate a Wellness Program*. Los Altos, California: Crisp Publications, Inc.

Sherman, A.W. & Bohlander, G.W. 1992. *Managing Human Resources*. Cincinnati, OH: South-Western Publishers.

Shmueli, A. & Shuval, J. 2005. Complementary and alternative medicine: Beyond users and nonusers. *Complementary Therapies in Medicine*, in press.

Shortell, S. M. & Kaluzny, A.D. 2000. *Health care management: Organization design and behavior*. 4th ed. Albany, New York: Delmar.

Siegel, A.F. & Morgan, C.J. 1996. *Statistics and Data Analysis: An Introduction*. New York: John Wiley & Sons, Inc.

Sierra Club. 2005a. *Global Warming and Energy: Health Effects -Conclusions*. [Online] Available from: <http://www.sierraclub.org/globalwarming/health/conclusions.asp#top> [Accessed: 2007-03-19].

Sierra Club. 2005b. *Ten Things You can do to Curb Global Warming*. [Online] Available from: <http://www.sierraclub.org/globalwarming/tenthings/> [Accessed: 2007-03-28].

Simões-Barbosa, A., Lobo, T.T., Xavier, J., Carvalho, S.E. & Leornadecz, E. 2005. *Trichomonas vaginalis*: intrastrain polymorphisms within the ribosomal intergenic spacer do not correlate with clinical presentation. *Experimental Parasitology*, 110:108-113.

Simpson, H.M., Beirness, D.J., Robertson, R.D. , Mayhew, D.R. & Hedlund, J.H. 2004. Hard Core Drinking Drivers, *Traffic Injury Prevention*, 5:261-269.

Sinclair, K.A., Woods, C.R., Kirse, D.J. & Sinal, S.H. 2005. Anogenital and Respiratory Tract Human Papillomavirus Infections Among Children: Age, Gender, and Potential Transmission Through Sexual Abuse. *Pediatrics*, 116(4):815-825.

Sinclair, G. 2006. Risks and benefits of sun exposure: Implications for public health practice based on the Australian experience. *Progress in Biophysics and Molecular Biology*, 92:173-178.

Sloman, L., Farvolden, P., Gilbert, P. & Price, J. 2006. The interactive functioning of anxiety and depression in agonistic encounters and reconciliation. *Journal of Affective Disorders*, 90:93-99.

Smink, B.E., Ruiter, B., Lusthof, K.J., de Gier, J.J., Uges, D.R.A. & Egberts, A.C.G. 2005. Drug use and the severity of traffic a accident. *Accident Analysis and Prevention*, 37:427-433.

Smith, K.M., Lawson, A.P. & Tuteja, S. 2006. Effect of internal reporting criteria on suspected adverse drug reactions submitted to MedWatch. *American Journal of Health-System Pharmacy*, 63:949-952.

Smith, K.W., Sonja, M.A., McKinlay, M. & McKinlay J.B. 1989. The Reliability of Health Risk Appraisals: A Field Trail of Four Instruments. *American Journal of Public Health*, 79(2):1603-1607.

Smith, E.A. 2005. Communities of Competence: new resources in the workplace. *The Journal of Workplace Learning*, 17(1/2):7-23.

Soeda, S., Terao, T., Iwata, N., Abe, H., Uchida, K. & Nakamura, J. 2006. Mental effect of cholesterol in males: Protective effect. *Journal of Affective Disorders*, 91:139-144.

Sonnetag, S. 2003. Recovery, Work Engagement, and Proactive Behaviour: A New Look at the Interface Between Nonwork and Work. *Journal of Applied Psychology*, 88(3):518-528.

Sørensen, J.M. 2002. Herb-Drug, Food-Drug, Nutrient-Drug, and Drug-Drug Interactions: Mechanisms Involved and their Medical Implications. *The Journal of Alternative and Complementary Medicine*, 8(3):293-308.

Steadman, L. & Quine, L. 2004. Encouraging young males to perform testicular self-examination: A simple, but effective, implementation intentions intervention. *British Journal of Health Psychology*, 9:479-487.

Stewart, J.L., Rowe, D.A. & LaLance, R.E. 2000. Reliability and Validity Evidence for the Testwell: Wellness Inventory - High School Edition (TWI [HS]) *Measurement in Physical Education and Exercise Science*, 4(3):1157-1173.

Steyn, A.G.W., Smit, C.F., Du Toit, S.H.C. & Strasheim, C. 1994. *Modern Statistics in Practice*. Pretoria: JL van Schaik Publishers.

Stinchcomb, J.B. 2004. Searching for Stress in All Wrong Places: Combating Chronic Organizational Stressors in Policing. *Police Practice and Research*, 5(3):259-277.

Stockwell, T. 2006. Alcohol supply, demand and harm reduction: What is the strongest cocktail? *International Journal of Drug Policy*, 17:269-277.

Stoner, C.R., Robin, J. & Russel-Chapin, L. 2005. On the edge: Perceptions and responses to life imbalance. *Business Horizons*, 48:337-346.

Strümpfer, D.J.W. 2003. Resilience and burnout: A stitch that could save nine. *South African Journal of Psychology*, 33(2):69-79.

Sturges, J. & Guest, D.H. 2004. Working to live or living to work? Work/life balance early in the career. *Human Resource Management Journal*, 14(4):5-20.

Swearingen, S.G. & Klausner, B.A.J.D. 2005. Sildenafil use, sexual risk behavior, and risk for sexually transmitted diseases, including HIV infection. *The American Journal of Medicine*, 118(6):571-577.

Sweedler, B.M., Biecheler, M.B., Laurell, H., Kroj, G., Lerner, M., Mathijssen, M.P.M., Mayhew, D. & Tunbridge, R.J. 2004. Worldwide Trends in Alcohol and Drug Impaired Driving. *Traffic Injury Prevention*, 5:175-184.

Szilagyi, P.G., Shone, L.P., Barth, R., Kouides, R.W., Long, C., Humiston, S.G., Jennings, J. & Bennett, N.M. 2005. Physician practices and attitudes regarding adult immunizations. *Preventive Medicine*, 40:152-161.

Szymanski, L., Pate, R.R. & Dowda, M. 1991. A comparison of questionnaire and physiological data in predicting future chronic disease risk factor status in an employee population. *American Journal of Health Promotion*, 5:298-304.

Taris, T.W., Kompier, M.A.J., De Lange, A.H., Schaufeli, W.B. & Schreurs, P.J.G. 2003. Learning new behaviour patterns: a longitudinal test of Karasek's active learning hypothesis among Dutch teachers. *Work and Stress*, 17(1):1-20.

Tattelman, E. 2005. Health Effects of Garlic. *American Family Physician*, 72(1):103-106.

Templeton, G.F., Morris, S.A., Snyder, C.A. & Lewis, B.R. 2004. Methodological and Thematic Prescriptions for Defining and Measuring the Organizational Learning Concept. *Information Systems Frontiers*, 6(3):263-276.

Temte, J.L. 2005. The 2006 Adult Immunization Schedule: Improving Immunization Rates. *American Family Physician*, 72(12):2545-2548.

Terrion, J.L. 2005. The impact of a management training program for university administrators. *Journal of Management Development*, 25(2):183-194.

The American Cancer Society. 2005. Testicular Self-Examination. [Online] Available from: <http://health.rutgers.edu/factsheets/testicular.htm> [Accessed: 2006-04-28].

The Testicular Cancer Resource Center. 2004. How to do a Testicular Self Examination. [Online] Available from: <http://tcrc.acor.org/tcexam.html> [Accessed: 2006-004-28].

Third Report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III). 2001. U.S. Department of Health and Human Services. *Journal of American Medical Association*, 285:2486-2497.

Thivierge, B. 2002. Oral hygiene. *Gale Encyclopedia of Medicine* [Online] Available from: http://www.healthatoz.com/healthatoz/Atoz/ency/orla_hygiene.jsp [Accessed: 2006-06-13].

Thomas, L. O. 1978. On Magic in Medicine. *New England Journal of Medicine*, August, 31.

Thompson, B.L., Nelson, D.E., Caldwell, B. & Harris, J.R. 1998. Assessment of Health Risks Behaviors: A Tool to Inform Consumers, Providers, Health Care Organizations and Purchasers. *American Journal of Preventive Medicine*, 16(1):48-59.

Thyer, B.A. 1993. Single-system research designs. In: Grinnell, R.M., *Social work research and evaluation*, (4th ed.) Itasca: Peacock.

Toth, P.P. 2005. The “Good Cholesterol”: High-Density Lipoprotein. *Circulation, Journal of the American Heart Association*, 111:89-91.

Travis, J.W. & Ryan, R.S. 1988. *The Wellness Workbook*. [Online] Available from: <http://www.nau.edu/~eaw/eaw.htm> [Accessed: 2003-08-03].

Tredoux, C. & Smith, M. 2006. Evaluating research design. In: Terre Blanche, M., Durrheim, K. & Painter, D. (eds.) *Research in Practice: Applied Methods for Social Sciences*. Cape Town: University of Cape Town Press.

Tribus, M. 1989. Changing the corporate culture: A roadmap for the change agent. *Human Systems Management*, 8(1):11-22.

Triola, M.F. 1998. *Elementary Statistics*. New York: Addison Wesley Longman, Inc.

Tsai, J.C., Yang, H.Y., Wang, W.H., Hsieh, M.H., Chen, P.T., Kao, C.C., Kao, P.F., Wang, C.H. & Chan, P. 2004. The beneficial effect of regular endurance exercise training on blood pressure and quality of life in patients with hypertension. *Clinical and Experimental Hypertension*, 26(3):255-266.

Tsao, J.C.I. & Zelzer, L.K. 2005. Complementary and Alternative Medicine Approaches for Pediatric Pain: A Review of the State-of-the-science. *Advances Access Publication*, 2(2):149-159.

Turner, L.R & Mermelstein, R.J. 2005. Psychosocial Characteristics Associated with Sun Protection Practices Among Parents of Young Children. *Journal of Behavioral Medicine*, 28(1):77-90.

Turner, J., Mavin, S. & Minocha, S. 2006. We will teach you the steps but you will never learn to dance. *The Learning Organization*, 13(4):398-412.

U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Heart, Lung, and Blood Institute. 2005. High Blood Cholesterol: What you need to know. [Online] Available from: <http://www.nhlbi.nih.gov/hbp> [Accessed: 2006-07-05].

U.S. PIRG: *Global Warming Solutions* [Online] Available from: <http://www.uspirg.org/issues/global-warming-solutions> [Accessed: 2007-03-30].

U.S. Preventive Services Task Force. 2002. Screening for Breast Cancer: Recommendations and Rationale. *Annals of Internal Medicine*, 137(5):344-346.

U.S. Department of Health and Human Services. 2000. *Healthy people 2010: Understanding and improving health*. Washington, DC: U.S. Department of Health and Human Services, Government Printing Office.

U.S. Department of Health and Human Services. 1996. *Physical Activity and Health: A Report of the Surgeon General*. Washington, DC: U.S. Department of Health and Human Services, Government Printing Office.

U.S. Preventive Services Task Force. 2005. Screening for HIV: Recommendation Statement. *American Family Physician*, 72(11):2287-2292.

U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Heart, Lung, and Blood Institute. 2006. High Blood Cholesterol: What is Cholesterol? [Online] Available from: http://www.nhlbi.nih.gov/health/dci/Diseases/Hbc/HBC_WhatIs.html [Accessed: 2006-07-05].

United States Department of Health and Human Services and United States Department of Agriculture. 2005. Dietary Guidelines for Americans. [Online] Available from: www.healthierus.gov/dietaryguidelines [Accessed 2005-23-07].

Upcroft, J.A., Delgadillo-Correa, M.G., Dunne, R.L., Sturm, A.W., Johnson, P.J. & Upcroft, P. 2006. Genotyping *Trichomonas vaginalis*. *International Journal of Parasitology*, in press.

van der Watt, I. 2004. *Employee Wellness Program*. Paper presented at the 2nd South African Wellness Conference, North-West University, Potchefstroom, 24-26 March.

Van Selm, M. & Jankowski, N.W. 2006. Conducting Online Surveys. *Quality and Quantity*, 40:435-456.

van Daalen, D. & Odendaal, A. 2001. In: Robbins, SP., Odendaal, A. & Roodt, G. (eds.) *Organisational Behaviour: Global and South African Perspectives*. Pinelands: Pearson Education.

van der Hulst, M., van Veldhoven, M. & Beckers, D. 2006. Overtime and Need for Recovery in Relation to Job Demands and Job Control. *Journal of Occupational Health*, 48:11-19.

Van Haselen, R. 2006. Complementary or alternative medicine: Towards establishing 'value for money'. *Complementary Therapies in Medicine*, 14:1-2.

Van der Sluis, L.E.C. 2004. Designing the workplace for learning and innovation: Organizational factors affecting learning and innovation. *Development and Learning in Organizations*, 18(5):10-13.

Van Heerden, I.V. 2006. Are you drinking too much water? [Online] Available from: http://www.health24.com/dietnfood/DietDocs_articles/15-1871,18525.asp [Accessed: 2006-05-27].

Van der Klink, J.J.L., Blonk, R.W.B., Schene, A.H. & van Dijk, F.J.H. 2001. The benefits of Interventions for Work-Related Stress. *American Journal of Public Health*, 91(2):270-276.

Vanlaar, W. & Yannis, G. 2006. Perception of road accident causes. *Accident Analysis and Prevention*, 38:155-161.

Veenstra, G., Luginaah, I., Wakefield, S., Birch, S., Eyles, J. & Elliott, S. 2005. Who do you know, where you live: social capital, neighbourhood and health. *Social Science and Medicine*, 60:2799-2818.

Veenstra, G. 2005. Location, location, location: contextual and compositional health effects of social capital in British Columbia, Canada. *Social Science and Medicine*, 60:2059-2071.

Vemuri, A.W. & Costanza, R. 2006. The role of human, social, built, and natural capital in explaining life satisfaction at the country levels: Toward a National Well-Being Index (NWI). *Ecological Economics*, 58:119-133.

Verhoef, M.J., Lewith, G., Ritenbaugh, C., Boon, H., Fleishman, S. & Leis, A. 2005. Complementary and alternative medicine whole systems research: Beyond identification of inadequacies of the RCT. *Complementary Therapies in Medicine*, 13:206-212.

Viberga, I., Odland, V., Lazdane, G., Kroica, J., Berglund, L. & Olofsson, S. 2005. Microbiology profile in women with pelvic inflammatory disease in relation to IUD use. *Infectious Diseases in Obstetrics and Gynecology*, 13(4):183-190.

Viitala, R. 2005. Perceived development needs of managers compared to an integrated management competency model. *Journal of Workplace Learning*, 17(7):436-451.

Violette, J.A. 1990. Employee wellness is good business. *The CPA Journal Online*. [Online] Available from: <http://www.luca.com/cpajournal/old/09709005.htm> [Accessed: 2003-08-10].

Visser, I. 2006. Periodontitis. [Online] Available from: www.health24.com/medical/Condition_centres/777-792-3000-3003,35815.asp [Accessed: 2006-06-13].

Voit, S. 2001. Work-site health and fitness programs: Impact on the employee and employer. *Work*, 16(3):273-286.

Volpe, M., Alderman, M.H., Furberg, C.D., Jackson, R., Kostis, J.B., Laragh, J.H., Psaty, B.M. & Ruilope, L.M. 2004. Beyond Hypertension: Towards Guidelines for Cardiovascular Reduction. *American Journal of Hypertension*, 17:1068-1074.

Wakefield, S.E.L. & Poland, B. 2005. Family, friend or foe? Critical reflections on the relevance and role of social capital and health promotion and community development. *Social Science and Medicine*, 60:2819-2832.

Wakley, G. 2005. Sexual Dysfunction. *Current Obstetrics and Gynaecology*, 15:38-45.

Wallis, C. & Mirinda, C.A. 2005. Get Moving. *Time*, 6 June:23.

Walsh, J. 2002. Water, The Rodney Dangerfield of Nutrients: It Gets No Respect. *Environmental Nutrition*, 25(6):5-6.

Walsh, J.M., Flegel, R., Atkins, R., Cangianelli, L.A., Cooper, C., Welsh, C. & Kerns, T.J. 2005. Drug and alcohol use among drivers admitted to a Level-1 trauma center. *Accident Analysis and Prevention*, 37:894-901.

Walsh, J.M., Flegel, R., Cangianelli, L.A., Atkins, R., Soderstrom, C.A. & Kerns, T.J. 2004. Epidemiology of Alcohol and Other Drug Use Among Motor Vehicle Crash Victims Admitted to a Trauma Center. *Traffic Injury Prevention*, 5:254-260.

Wang, P.S., Beck, A.L., Berglund, P., McKenas, D.K., Pronk, N.P., Simon, G.E. & Kessler, R.C. 2004. Effects of Major Depression on Moment-in-Time Work Performance. *American Journal of Psychiatry*, 161:1885-1891.

Ward, K.D., Vander Weg, M.W., Read, M.C., Sell, M.A. & Beech, B.M. 2005. Testicular cancer awareness and self-examination among adolescent males in a community-based youth organization. *Preventive Medicine*, 41:386-398.

Warnakulasuriya, S., Sutherland, G. & Scully, C. 2005. Tobacco, oral cancer, and treatment of dependence. *Oral Oncology*, 41:244-260.

Watson, D. & Clark, L.A. 1997. Extroversion and its positive emotional core. In: Hogan, R. Johnson, J. & Briggs, S. (eds.) *Handbook of personality psychology*. San Diego: Academic Press.

WebMD Health Centers. 2005. Breast Self-Examination. [Online] Available from: http://www.webmd.com/hw/healthy_women/hw [Accessed: 2006-04-28].

Weisser, B., Mengden, T., Düsing, R., Vetter, H. & Vetter, W. 2000. Normal Values of Blood Pressure Self-Measurement in View of the 1999 World Health Organization-International Society of Hypertension Guidelines. *American Journal of Hypertension*, 13:940-943.

Wellness Councils of America. 2001. 101 Ways to Wellness. [Online] Available from: http://www.welcoa.org/101_tips/101_Wellness_Ideas.pdf. [Downloaded: 2004-05-30].

Welman, J.C. & Kruger, S.J. 2001. *Research Methodology for the Business and Administrative Sciences*. Cape Town: Oxford University Press Southern Africa.

Weston, S. 2003. In an Ideal World. [Online] Available from: www.nzbusiness.co.nz. [Accessed: 2004-06-23].

Whelton, P.K., Beevers, D.G. & Sonkodi, S. 2004. Strategies for improvement of awareness, treatment and control of hypertension: results of a panel discussion. *Journal of Human Hypertension*, 18:563-565.

White, J. 2000. Soul at work. *Benefits Canada*, 24(1):17.

White, J. & Weathersby, R. 2006. Can universities become true learning organizations? *The Learning Organization*, 12(3):292-298.

Whitelaw, A. 2006. Fact sheets on STI's: Syphilis. [Online] Available from: <http://www.health24.com/sex/STIs/1253-1258-2448,17901.asp> [Accessed: 2006-04-18].

Whitworth, J.A. & Chalmers, J. 2004. World Health Organization - International Society of Hypertension (WHO/ISH) Hypertension Guidelines. *Clinical and Experimental Hypertension*, 26(7 & 8):747-752.

Wiley, J.A. 1981. Predictive risk factors to predict life events. In: *Proceedings of the 16th Annual Meeting of Society of Prospective Medicine*. Bethesda: Society of Prospective Medicine.

Wilkinson, R.G., Kawachi, I. & Kennedy, B. 1998. Mortality, the social environment, crime and violence. *Sociology of Health and Illness*, 20:578-597.

Wilson, R.P., Freeman, A., Kazda, M.J., Andrews, T.C., Berry, L., Vaeth, P.A.C. & Victor, R.G. 2002. Lay Beliefs about High Blood Pressure in a Low-to Middle-Income Urban African-American Community: An Opportunity for Improving Hypertension Control. *The American Journal of Medicine*, 112:26-30.

Wilson, B.R.A. & Wagner, D.I. 1997. Developing Organisational Health at the Worksite. *American Journal of Health Studies*, 13(2):105-109.

Witmer, J.M. & Sweeney, T.J. 1992. A Holistic Model for Wellness and Prevention Over the Life Span. *Journal of Counseling and Development*, 71:140-148.

Wolfe, R.A. & Parker, D.F. 1994. Employee health management: challenges and opportunities. *Academy of Management Executive*, 8(2):22-31.

Wolpowitz, D. & Gilchrest, B.A. 2006. The vitamin D question: How much do you need and how should you get it? *Journal of the American Academy of Dermatology*, 54(2):301-317.

Worda, C., Huber, A., Hudelist, G., Schatten, C., Leipold, H., Czerwenka, K. & Eppel, W. 2005. Prevalence of Cervical and Intrauterine Human Papillomavirus Infection in the Third Trimester in Asymptomatic Women. *Journal of Society for Gynecologic Investigation*, 12(6):440-444.

Worksite Wellness for Tompkins County. [Online] Available from: <http://www.co.tompkins.ny.us/wellness/worksite> [Accessed: 2004-05-15].

World Health Organization. 1947. *Constitution of the World Health Organization*. Geneva: Switzerland.

World Health Organization. 1993. Community Action for Health. New Dehli: Report and Documentation of the Technical Discussions of the 46th Session of the WHO Regional Committee for South-East Asia.

World Health Organisation. 2002. Global Solar UV Index: A Practical Guide. [Online] Available from: <http://www.who.int/uv/> [Accessed: 2006-07-13].

Wright, T.A. & Cropanzano, R. 2004. The Role of Psychological Well-being in Job Performance: A Fresh Look at an Age-Old Quest. *Organizational Dynamics*, 33(4):338-351.

Wright, W. (admin@nationalwellness.org) 2006. TestWell's questionnaire. [E-mail to:] Botha, P.A. (Bothapa@tut.ac.za) 15 October 2006.

Wright, K.B. 2006. Researching Internet-based Populations: Advantages and Disadvantages of Online Survey Research, Online Questionnaire Authoring Software Packages, and Web Survey Services. [Online] Available from: <http://0-jcmc.indiana.edu.innopac.up.ac.za/vol10/issue3/wright.html> [Accessed:2006-08-31].

Yang, B.C., Wu, P.G. & Yang, M.H. 2006. On establishing the core competency identifying model: A value-activity and process oriented approach. *Industrial Management and Data Systems*, 106(1):60-80.

Yarhouse, M. & Tan, E.S. 2005. Sexual Identity and Being a Christian. *Journal of Psychology*, 24(1):60-64.

Yen, L., Eddington, D.W. & Witting, P. 1991. Associations between health-related measures and prospective medical costs in a manufacturing company. *American Journal of Health Promotion*, 6:46-54.

Yu, J., Evans, P.C. & Clark, L.P. 2006. Alcohol addiction and perceived sanction risks: Deterring drinking drivers. *Journal of Criminal Justice*, 34:165-174.

Zhang, M., Song, Y. & Cai, X. 2007. A Health-based assessment of particulate air pollution in urban areas of Beijing in 2000-2004. *Science of the Total Environment*, 376:100-108.

Zimmerman, R.K., Middleton, D.B., Burns, I.T., Clover, R.D. & Kimmel, S.R. 2005. Routine vaccines across the life span, 2005. *The Journal of Family Practice*, 54(1):S9-S26.