Knowledge, attitudes, beliefs and practices of schoolgoing adolescents living in Gauteng in relation to common cancers and cancer risks.

By

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Submitted in partial fulfillment of the requirements for the degree

MASTERS OF SCIENCE
(With specialisation in Community Health)

In the

FACULTY OF MEDICINE

SCHOOL OF HEALTH SYSTEMS AND PUBLIC HEALTH

At the

UNIVERSITY OF PRETORIA

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APRIL 2001

SUMMARY

Aim: The overall aim of the study was to determine the extent of general knowledge, beliefs, attitudes and practices of Gauteng adolescents towards cancer.

Objectives: The specific objectives were to: 1) ascertain cancer-related knowledge, beliefs, attitudes and practices of school-going adolescents; 2) obtain previous information on cancer and reported family history of cancer; 3) investigate the relationships among knowledge, attitudes and behaviour; 4) investigate the effects of gender and of type of schools on cancer knowledge.

Population and Method: This study was a cross-sectional survey of Knowledge, Attitudes, Beliefs and Practices (KABP), personal health behaviours and of demographic and psychological characteristics of a specific group of adolescents in Gauteng.

A questionnaire survey was conducted, and a total of 2278 pupils in Grade 10, from 681 schools in Gauteng, participated.

The questionnaire was designed to obtain information from the pupils on the following: gender, list of known cancers, family cancer history, previously received information on cancer, true and false statements regarding the aetiology, signs and symptoms of skin cancer, breast cancer, cervical cancer, head and neck cancer and lung cancer. It also consisted of 10 statements regarding pupils' attitude towards cancer and questions on practices related to risks of developing cancer (smoking, sunblock use and breast-feeding) to which pupils were asked to respond.

Descriptive statistics were the first step in data analysis. Thereafter, integrated multivariate statistical procedures (e.g. analysis of co-variance and factor analysis) were used to analyse the data further.

Results:

Demographic Information: There were 2278 pupils who completed the questionnaire of those who indicated their gender 1267 (55.6%) were females and 958 (42.1%) males. The pupils' age ranged from 13 to 24 years (average age = 16.5 years, standard deviation (sd) = 1.5). Pupils were from different types of schools formerly known as the Department of Education and Training (DET = 1120); Transvaal Education Department (TED = 663); House of Representatives (HOR = 53); House of Delegates (HOD = 40); and Independent Ordinary (IO = 340). Some pupils had previously received cancer information (48.6%) while others indicated that they had a family related history of cancer (23.6%). Significantly more females reported having received cancer information or having a history of cancer in the family than males ($p < 0.001$). Television (34.8%) and parents (19.2%) appeared to be the main sources of cancer information.

Knowledge About Signs, Symptoms and Aetiology of Cancer: Average knowledge scores among the pupils were low. Females were more knowledgeable than males with regard to breast cancer ($p < 0.001$). Pupils who received cancer information or who reported a family history of cancer were more knowledgeable than those who did not ($p < 0.001$). The knowledge scores were significantly different between different types of schools; Transvaal Education Department (TED), also known today as public schools, tended to have better knowledge of the signs, symptoms and aetiology of the five cancers included in the questionnaire.

Attitudes Towards Cancer Risks: Pupils indicated a favourable attitude towards possible cancer risks, meaning that they would avoid doing things that were seen as possible cancer risk factors. Factor Analysis demonstrated a negative correlation between Factor I (socially acceptable behaviour) and Factor II (socially unacceptable behaviour), meaning that pupils were able to identify the risk factors associated

with cancer development even if they were stated in a positive way in the questionnaire. Pupils separated the attitudes into two groups either socially acceptable behaviour or socially unacceptable behaviour.

Practices: Smoking - More males (26.9%) than females (10.9%) indicated that they smoke ($p < 0.001$). The number of pupils who indicated that smoking was important to them was 27%.

Sunblock – More females (41.7%) used sunblock than males (34%) ($p < 0.001$).

The amount of pupils who used sunblock were 38.2%. Pupils who used sunblock demonstrated higher knowledge scores regarding the signs, symptoms and aetiology of cancer.

Conclusions:

Pupils in grade 10 living in Gauteng are not well informed on the aetiology, signs and symptoms of cancer or cancer risks.

Females are more informed than males with regards to cancer.

Types of schools types differ with regards to cancer knowledge. School from the public sector (TED schools) showed higher knowledge scores than private schools (IO schools).

Pupils who received cancer information previously or who reported a family history of cancer were more knowledgeable than other pupils.

Recommendations: The implementation of Cancer Educational programmes should be considered by the Gauteng Education Department. Future development of educational programmes are needed to include cancer education into the current 'life-skills' training programmes.

OPSOMMING

Doel: Die algehele doel van die studie was om te bepaal wat die algemene kennis, mening, gesindheid en houding is van adolosente wat in Gauteng woon.

Spesifieke doelstellings: 1) om die kennis, mening, gesindheid en houding van skoolgaande adolosente te bepaaal; 2) om te bepaal of hulle enige vorige kennis aangaande kanker ontvang het; 3) om die verhouding te evalueer tussen kennis, mening en houding; 4) evaluasie van die efffek van geslag en tipe skool op kanker kennis.

Populasie en metode: Vraelyste was opgeneem by 'n totaal van 2278 skoolkinders by 681 Graad 10 skole in Gauteng. Die vraelys was ontwerp om inligting te kry aangaande: geslag, bekende kankers, familie geskiedenis van kanker, vorige inligting ontvang, waar en vals bevraagtekens aangaande oorsaake, tekens en simptome van vel kanker, bors kanker, serviks kanker, kop-en-nek kankers en long kanker. Die vraelys het ook 10 vrae bevat wat die leerlinge se houding teenoor kanker bepaal het.

Beskrywende statistiek was die eerste stap van die data analiese. Daarna is geintegreerde multivariansie statistiese prosedures gedoen (bv. faktor analiese).

Resultate:

Demografiese Inligting: Daar was 2278 leerlinge wat die vraelys voltooi het. Daarvan was 1267 (55.6%) vroulik en 958 (42.1%) manlik. Die ouderdomme het gewissel vanaf 13 to 24 jaar (gemiddeld 16.5 jaar, standaard afwyking (sd) = 1.5). Leerlinge was van verskillende skole soos die Departement van Opvoeding en Onderrrig (DOT = 1120); Departement van Onderwys (TOD = 663); Huis van Verteenwoordigers (HOR = 53); Huis van Delegante (HOD = 40); en Privaat skole (IO =

340). Van die leerling het voorheen kanker inligting ontvang (48.6%) terwyl ander aangedui het dat hulle familie verwante kanker geskiedenis het (23.6%). Daar was meer vroulike leerlinge ($p < 0.001$) as manlike leerlinge wat voorheen kanker inligting ontvang het. Televisie (34.8%) en ouers (19.2%) is gesien as die grootste bronne van kanker inligting.

Kennis aangaande Tekens, Simptome en Oorsake van Kanker: Oor die algemeen was die kennis van die leerlinge min. Die vroulike leerlinge het meer kennis getoon met verwysing tot bors kanker ($p < 0.001$). Leerlinge wat voorheen kanker inligting ontvang het, het meer antwoorde korrek geantwoord as leerlinge wat nie voorheen inligting ontvang het nie ($p < 0.001$). The kennis totaal was aansienlik verskillend tussen verskilledne tipes skole, publieke skole het meer kennis getoon as privaat skole aangaande die vyf kankers wat ingesluit was in die vraelys.

Houdings Teenoor Kanker Risiko's: Leerlinge het 'n aanvaarde houding ingeneem teenoor kanker risiko's, bedoelende dat hulle dinge sou vermy was gesien kan word as moontlike kanker risiko's. Faktor analiese het getoon dat daar 'n negatiewe korrelasie bestaan tussen Faktor I (sosiaal aanvaarbare gedrag) en Faktor II (sosiaal onaanvaarbare gedrag), bedoelende dat leerlinge risiko faktore kon identifiseer al was hierdie in 'n positiewe lig gestel in die vraelys. Leerlinge het hulle houdings teenoor kanker in twee groepe verdeel, sosiaal aanvaarbare gedrag en onaanvaarbare gedrag.

Gedrag: Rook – Daar was meer manlike leerlinge (26.9%) as vroulike leerlinge (10.9%) was aangedui het dat hulle rook ($p < 0.001$). Die aantal studente wat aangedui het dat rook vir hulle belangrik was is 27%. Sonbeskerming – Meer vroulike leerlinge (41.7%) gebruik sonskerm as manlike leerlinge (34%) ($p < 0.001$). Die aantal leerlinge was sonbeskerming gebruik was 38.2%. Leerlinge wat sonbeskerming gebruik het meer kennis aangaande kanker gedemonstreer.

Gevolgtrekking: Leerlinge in graad 10 wat in Gauteng woon is nie ingilig oor die oorsake, tekens en simptome van kanker nie. Vroulike leerlinge is meer ingelig as manlike leerlinge aangaande kanker. Verskillende skole het verskillende vlakke van kanker kennis getoon. Leerlinge wat voorheen kanker inligting ontvang het, het 'n better kennis van kanker getoon.

Aanbeveling: Die implementering van 'n kanker onderwys program moet deur die Gauteng Onderwys Departement oorweeg word. Opleidings programme is nodig om kanker opvoeding in te sluit by die huidige lewensvaardige programme.

DECLARATION

I declare that this dissertation is my own, unaided work. It is being submitted for the Degree Masters of Science in Community Health at the University of Pretoria, Pretoria. It has not been submitted before for any degree or examination in any other Technikon or University.

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Adele Botha

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ACKNOWLEDGEMENTS

I would like to acknowledge the following people and institutions that contributed to the completion of this research project:

- My Creator, God Almighty for all the abundant blessings received in my life.
- My parents Hans and Barbara Botha for their unconditional love and continuous support in my academic career.
- The pupils and schools who participated in the survey.
- My family and friends for their endless encouragement.
- My supervisor Prof. CB IJsselmuiden, for his guidance and assistance received within the School of Health Systems and Public Health.
- The Gauteng Education Department for allowing me to conduct my study within the different schools in Gauteng.
- The Cancer Association of South Africa (CANSA) for the research grant received.
- The Technikon Witwatersrand Research Committee (TRC) for the funding received.
- Dr. Jonathan Levin for his support in the data analysis of the survey and continuous motivation.
- Dr. BV Girdler-Brown for his assistance in the initial planning of the survey and training of the fieldworkers.
- All fieldworkers involved in the collection of the data and their commitment to the project.

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CHAPTER 1
INTRODUCTION AND LITERATURE REVIEW

1.1 Cancer

CANCER is a disease about which some people are ignorant, whilst others choose to ignore its significance.

In the United States (US) cancer, as a group of diseases, is the second leading cause of death, and will at some period affect one third of the US population.[1]

Cancer is a major cause of mortality in the United Kingdom (UK) and Europe where the maximum incidence of cancer occurs in middle and old age. However, it is less of a health care priority in countries where life expectancy is much shorter, such as most of Africa, as a result of mortality due to infectious diseases and poor nutrition.[2]

In South Africa, 149,815 new cancer cases were reported between 1993 and 1995.[3] The National Cancer Registry (NRC) estimates that about one in four South Africans will develop a cancer in his or her lifetime. Sitas et al[3] explain that cancer is emerging as a major health problem in South Africa and related this problem to ageing of the population, increasing control of communicable diseases, changing lifestyles and the relatively improved outcomes. Although communicable diseases are an important priority, non-communicable diseases such as cancer are emerging health problems that need to be dealt with appropriately to sustain whatever public health advances have already been achieved.[3]

1.2 Benefits of Cancer Knowledge

"Great strides have been made in recent years in the treatment of this disease. None, however, has impacted on survival as much as early detection; this is particularly true in colon and breast cancer. It is generally accepted that cancer education programs should be directed, in large part, towards this early detection. In order to develop such programs, however, one must be cognizant of the state of public knowledge regarding cancer. Only in this way can effective, problem-oriented programs be designed."[1]

The important key to cancer survival is early detection.[1] Early detection can be advanced by increasing people's knowledge of the disease. The extent of the lack of understanding and knowledge of cancer in the general public must be determined before an education or other intervention programme can be developed.[4]

"Behavioral science research has been critical in understanding the human activities related to the early detection of cancer as well as to interventions designed to increase adherence to recommended screening guidelines."[4]

Many of the behaviours recommended to reduce cancer risk require 'healthy decisions' to be made early and repeatedly throughout life.[5] Women's knowledge of breast cancer influences secondary prevention, care seeking behaviour, and participation in treatment decision making.[7]

While there is a body of literature concerning the promotion of dietary changes among individuals in a traditional clinical setting,[5] these studies have limited applicability to community-based interventions.

The participants in clinical intervention programmes have disease-related risk factors or are self-selected because they are concerned with health and diet. These small group or individual interventions are not practical in guiding public health approaches to health education. Therefore, neither the results of these clinical programmes nor their techniques can be directly applied to the design of community interventions.[8]

Community-based surveys among the youth are needed in South Africa to address the importance of implementing early Cancer Education Programmes.

1.3 Research Design

Knowledge, Attitudes, Beliefs and Practices (KABP) surveys are based on the premise that individual knowledge (facts), combined with attitudes and beliefs (positive or negative feelings and opinions) may predict health related behaviour. Measurement of the psychosocial and personal variables improves the understanding of the way in which people act, so that more effective programmes may be developed to reduce the toll of diseases like cancer.[9]

1.4 Cancer Education

In developed countries such as the United Kingdom and United States cancer education is promoted for all age groups.[1,4,5,6,7,8,10,11,16,17,18,23,24,25] Much research has been done to determine what is lacking in cancer education in the formal education systems of these countries. In developing countries, including South Africa, no published research is available on cancer awareness among South African adolescents.[3]

Lack of knowledge, especially regarding signs, symptoms and risk factors have been associated with an increase in mortality rates.[6]
While the availability of diagnostic facilities is essential to provide secondary cancer prevention, it has been unambiguously demonstrated that education on cancer will greatly increase the impact of secondary prevention.[18]

The key to directing behaviour modification lies in a person's understanding of basic tumour and cancer knowledge and such understanding will aid in the designing of effective, problem orientated educational programmes in future.[1]

By targeting the secondary level of education, a great part of the South African population can be reached at a young age.

Looking at surveys done elsewhere in the world on the youth's perspective of cancer showed that every country differs with regard to cancer knowledge, and should be taken into account when developing educational programmes.[1, 5,10]
In the United Kingdom, a survey was done among 15-16 year olds to collect information on knowledge and attitudes towards cancer, as well as understanding of health and health-related behaviours. This survey indicated that children and young people possess considerable knowledge about cancer, especially about lung cancer and smoking.[10]
Despite this knowledge, however, many lead a 'less than healthy' lifestyle. Many children and young people do not see health as the most important goal in life: the circumstances in which many children and young people live are not experienced as relevant to their health.
In one study,[10] convenience sampling was used, which limited the study to one specific school, a school which could have received previous

cancer education and explain the reason for high knowledge regarding smoking and lung cancer.

In Calgary, Alberta, in Canada, a similar survey was done in preparation of curriculum materials on cancer prevention and comprehensive health education programmes for the broader public.[5] Students in the survey (n = 246) considered cancer to be a serious disease, not particularly amenable to treatment, and caused by many things. A two-part, open-ended questionnaire was used and it included questions on general knowledge concerning cancer and its consequences, as well as on ways to prevent cancer. The majority of the students (71%) wanted more information about cancer. The results from the survey indicated a need to include cancer prevention education in the school curriculum.

A survey among college undergraduates in the United States contradicted results found in other youth related surveys.[1] The goal of this study was to obtain information that could be used to direct the content and format of future, problem-oriented, cancer education programmes. The results of the pilot study showed that general knowledge about cancer was low. The sample of students represented a spectrum of people from all socio-economic backgrounds, but was limited to a group of adolescents in tertiary education, therefore excluding lower level literacy groups in the population.

Virtually all youth related surveys show that there is a need for cancer information in the school and educational curriculum. The content should include knowledge about cancer risk factors and information that fosters a positive attitude towards cancer prevention. The curriculum should also include skill-building that will allow learners to make informed decisions about health.[1,5,10]

A review of the literature showes that there are relatively few surveys done among adolescents. Attention was focused on other public health related surveys and planning towards information programmes, especially among adults. Some of the results of these studies are, nevertheless, pertinent to this study.

Telephone surveys were used to determine the proportion of American women in various demographic groups who believed, or had heard, that dietary factors played a role in breast cancer prevention and to assess changes between 1991 and 1995.[11] Subjects were asked questions to assess their beliefs about the role of dietary factors in breast cancer prevention. It was concluded that the belief (the positive role of diet in the prevention of breast cancer) is far from universal among American women, although the extent of the awareness of dietary factors increased significantly between 1991 and 1995.

Also in the United States, a survey was conducted to determine a baseline measure of men's health awareness and knowledge of testicular cancer. This study also showed that there was a poor awareness of testicular cancer and highlighted the need for greater public education.

Health institutions in many countries are actively involved in cancer education and promotion of a 'healthy lifestyle'. [1,5,10,11,12] The need for cancer education is demonstrated not only among the youth[1,5,10] but also for the adult population.[11,12] It is clear that a needs assessment should be done before any educational programme is being formulated. This is necessary for two reasons: first to determine the degree of interest in a prevention or detection programme and second, to assess what individuals expect from such a programme.[6,11,12]

In South Africa, limited cancer promotion or research on developing cancer educational programmes has been done. In the past few years it has become clear that comprehensive smoking intervention measures are needed in South Africa.[14] One of the many surveys done with regard to smoking in South Africa used the motivation that in other countries awareness and beliefs about the health risks of smoking have increased, and this has been reflected in the declining smoking rates in many developed countries, but not in developing countries. Surveys have been done to provide baseline data on beliefs of the South African population about smoking.[13,14] Results showed that the overall smoking prevalence was 31% among South African adults. The study also indicated a high level of awareness regarding health hazards of tobacco use, except among the youth, the less educated and the poor. Both these studies stressed the fact that health education should provide skills and facts that will enable people to protect themselves from the harmful effects of tobacco.[13,14]
Emphasis is placed on the importance of education campaigns such as school-based tobacco prevention education that is integrated with comprehensive health education programmes for the broader public.

An increase in awareness of risk factors and symptoms for cancer can have an impact on mortality rates; at least, a lack of knowledge, specially regarding signs, symptoms and risk factors has been associated with an increase in cancer mortality rates.[6,14]

A review of the national education curriculum in South Africa is currently being undertaken. It includes an assessment of 'life-skills' training in primary and secondary schools. The Directorate of Health Promotion, Gauteng Health Services, has been active in schools

providing information about issues such as sex education, smoking and drug abuse.

While the issue of cancer prevention has not been specifically mentioned, the possibility of developing cancer through an 'unhealthy lifestyle' has been included. At present, personnel of the Directorate of Health Promotion are part of the curriculum development campaign for Curriculum 2005, and a component of this curriculum is the promotion of a 'healthy lifestyle' with a view to preventing many diseases of lifestyle, cancer included (personal communication, V. Charleston).

1.5 Sources of Cancer Knowledge

The true extent of the lack of understanding and knowledge must be determined before education or other programmes are started. An important aspect that will influence the results of the study is to determine from where the information or knowledge is obtained.

In a world of rapidly developing technology, most South Africans have access to multiple media. Television is the most common network of the present day and has been successful in the field of medical science research. Targeted television broadcasts are especially productive, and are credited by black viewers in the United States as the dominant avenue for learning about health events, in contrast to whites who listed newspaper announcements as their main source of information.[15]

The importance of the correct information about cancer from the right source is stressed when evaluating the recent survey done in Canada on the use of prostate-specific antigen (PSA) in prostate screening.[16]

The aim of the survey was to determine the level of awareness and knowledge about prostate cancer and screening used to date. Men received more information about PSA from the media than from doctors. This was not due to the fact that they did not visit their

physicians but rather felt that they could not always ask their physicians questions regarding their disease.

Other sources also found television and the printed media to be the most important sources of information.[10] The importance of audiovisual media should not be ignored in cancer directed educational programmes, neither should educational facilities and parents be disregarded. Students rely on a wide variety of sources for health information,[5] 68% of students in the Canadian survey indicated teachers / classroom as their main source of cancer information, but it should be recognised that school only represents one part of their educational experience. Parents were found to have an important role, particularly in the area of diet.[5]

1.6 Age and Gender in Conducting Surveys

In an analysis of cancer attitudes published in popular medical periodicals since the early part of the century, emphasis is placed on how gender has been a key principle in popular cancer discourse.[18] Distinctions are made between knowledge and social attitudes, as well as gender concepts of risk and responsibility. Throughout the last century cancer texts and representations were produced for both gender groups, and through these materials people have learned, not only about cancer, but also about gender norms. History suggests that gender is one of the central identities that compels people to listen to health advice. When promoting education, information should be targeted according to gender, age, and any other identity factors that will gain the attention of specific groups in an attempt to improve their health.[18]

In a survey done to compile a community-based needs assessment on cancer-related knowledge, attitudes and beliefs of the older adult, the

study's participants focused on 'being active' and living a healthy lifestyle.[17] This study was conducted among a large metropolitan community in Canada. Many of the respondents worried about illness interfering with their ability to do what they wanted to do. Many had had exposure to cancer through family members or friends, but still had many unanswered questions about cancer. Age was not considered to be a risk factor for cancer and a range of attitudes existed regarding cancer prevention and early detection. Overall, despite fearing cancer, participants thought older adults needed to know about cancer and suggested a wide range of approaches to disseminate information effectively to them.

In a survey done among college undergraduates, in the United States, it was noted that gender significantly impacted upon the number of correct responses. Females answered significantly more questions correctly than males (88.8% compared to 11.2%). The suggestion was made that educational programmes should be directed in such a way that gender should not preclude exposure to pertinent information.[1] Regan[18] argues that gender has played a key role in medical and popular understanding of cancer. Public health materials created with the intention of improving health through education actually send a multiplicity of messages, not all of them helpful. This essay suggests that public health messages targeted by gender are problematic, although perhaps necessary. The paper also contributes to studies concerned with the question of how people develop their ideas about risk of disease. This study motivates the inclusion of gender into the questionnaires used for assessing cancer-related beliefs and practices.

In South Africa, smoking-related surveys show that the youth underestimate the addictive and adverse effects of smoking and overestimate the prevalence of smoking status in adults.[13] Children are

vulnerable to strategies that promote smoking, and that although the law bans the sale of tobacco to minors, it has failed because of inadequate enforcement of the law.

Understanding the differences between different groups (e.g. age, gender and school type) may assist in designing more successful educational campaigns that are group specific.[1,7,13,18]

1.7 Beliefs, Attitudes and Practices

When a statement is made, a person will respond to this statement either in a positive, negative or neutral manner. If the object of belief (i.e. the statement) is viewed as a '*stimulus*', and if the manner in which the person will respond is seen as a '*response*', a belief statement may be viewed as a *stimulus-response* association.[19]

The manner in which a person responds to a stimulus reflects on a person's attitude towards the issue. In this survey we looked at factors that could lead to the development of cancer, and listed these as statements in the questionnaire. Pupils responded to each statement.

The belief and attitude sections were combined in the questionnaire used in this study. Attitude consists of both a '*cognitive*' and '*action*' component that can be viewed as beliefs about the object,[20] in this case cancer. The *cognitive* component refers to beliefs about the nature of cancer and its relationship to other objects (aetiology, signs and symptoms of cancer) while the *action* component refers to beliefs about what should be done with respect to cancer.

Under certain circumstances, situational factors, such as drug or alcohol use, economic imperatives, environmental factors, peer pressure, and social norms may play a greater role in predicting behaviour than the

individual psychological variables usually included in a KABP survey.[21] Those circumstances and conditions that can influence an adolescent's beliefs and attitudes were included as part of this questionnaire.

The 'Reasoned Action Model'[20] is a well-known model used by researchers when predicting behaviour. Since this model involved multiplication of schools in order to predict behaviour, it was not used, it would have involved 1 pupil from many different schools, increasing the amount of schools that had to be contacted. In this study the aim was not to predict behaviour, but rather to identify knowledge, attitudes, beliefs and practices that can potentially be addressed in an educational programme.

It is believed that an increase in knowledge can influence the attitude of a person especially related to health behaviour.[7] By trying to influence a person's health perceptions in a more positive way we are ultimately trying to direct the population to a more care seeking healthy lifestyle. Before any cancer educational programmes can be implemented or directed towards living a healthier lifestyle it is essential to determine the factors that influence a person's decision to perform or not perform a behaviour.[22]

Cancer related surveys were done in the United States[8, 11,23,24,25] to assess attitudes towards the disease, screening and educational programmes. Attitude influences decision-making. In the older adult, beliefs and attitudes gathered over a lifetime may contribute to a reluctance to attend cancer-screening centres.[17] This leads to a decrease in prevention and early detection behaviours. Reasons for older adults being diagnosed at a later stage of the disease is due to a lack of knowledge concerning the signs and symptoms of cancer,

confusion about normal changes caused by ageing and other pathological changes.

In a study of the level of knowledge on cancer and misconceptions about the disease, patients with cervical cancer and a group of healthy women (no diagnosis of cervical cancer) were asked to answer questions relating to cancer aetiology, treatment and prognosis.[23] The survey was conducted among patients admitted to the gynaecological department of the hospital in Uppsala, Sweden. The response rate and proportion of correct answers of the two groups of women were similar, the lack of knowledge evident, indicating that although diagnosed with cancer, knowledge was still lacking, knowledge that could influence attitudes and a possible change in lifestyle. The survey also indicated that misconceptions about cancer might increase the level of fear in the general population, making coping with the disease more difficult for cancer patients.

Changing a person's attitude is difficult, but improving health information given to the public may help to increase the compliance rate in mass screening programmes.[24,25] To influence or change a person's attitude towards cancer is difficult, but is still of essential value. Suggestions from surveys done indicated the need to evaluate the role of media, and role-model intervention programmes, to determine if these would effect knowledge and attitudes regarding cancer, and whether these changes would lead to increased screening.

Evidence suggests that knowledge and education can lead to a change in attitude and behaviour. In 1990, a survey was conducted in Washington DC, to determine if the population had adopted a more 'healthy lifestyle' after the National Cancer Institute of America published diet and cancer recommendations for the general population

in the 1980s.[8] It was concluded that such interventions do increase the public's beliefs in diet and health associations, and that the communication of dietary recommendations can encourage 'healthy dietary' changes.

In South Africa, no published information regarding attitudes towards cancers among the youth exist. Limited knowledge–related educational programmes are being conducted in South Africa, but no attitude measurements have been done. However, other attitude-related studies regarding smoking and Tuberculosis (TB) have been done.

In a study about Tuberculosis (TB)[26] the reasons for patient delay when visiting the doctor, hospital or clinic were identified predominantly as factors such as a lack of knowledge concerning aetiology as well as a negative attitude towards the disease and health care personnel. Knowledge is necessary to change attitudes, but alone it is insufficient.[27]

Attitudes, values and beliefs including personal perceptions, as well as cultural norms, family, peers and media are all important determinants of whether or not appropriate behaviour is adopted.

CHAPTER 2
AIMS AND RESEARCH OBJECTIVES

The overall aim of the proposed study is to determine the extent of general knowledge, beliefs, attitudes and practices of Gauteng adolescents towards cancer.

The specific objectives are to:

- ascertain cancer-related knowledge, beliefs, attitudes and practices of school-going adolescents;
- obtain previous information on cancer and reported family history of cancer;
- investigate the relationships between knowledge, attitudes and behaviour;
- investigate the effect of gender and of type of schools on cancer knowledge.

CHAPTER 3
POPULATION AND METHODS

3.1 Study Design

This study was a cross-sectional survey of KABP, some personal health behaviours and of demographic and psychological characteristics in adolescents in Gauteng.

3.2 Population, Sampling Frame and Sample

The sampling frame consisted of a list of all secondary schools registered with the Gauteng Department of Education. (N = 681) A two-stage sampling method was used to arrive at the final sample.

Sample size calculations were carried out using TRUE EPISTAT. In order to be able to detect at least a difference of 20% in terms of gender and school type, with $\alpha = 0.05$ and $\beta = 0.2$, a sample size of 150 is required for each stratum. Because of an estimated dropout or non-response of 10%, the actual sample size was increased to 180 in each stratum. The final sample required was calculated as 180 pupils from each region. (North, South and Central)

In the first step, 30 schools were selected randomly from each of the three regions (North, South and Central). (See flow chart and area of schools in Appendix A)

In the second step, one Grade 10 class was chosen within the school. The selection of the grade 10 classes within the schools was not done randomly, but was subject to the time and class made available by the headmaster with regard to a minimum disruption to the school

programme. All pupils in this class were potentially included (subject to informed consent and refusal).

The number of schools that participated in the survey was 76 in total (Table 1 – Appendix D).
The number of pupils who finally participated in the survey was 2278.

3.3 The Questionnaire

A questionnaire, with a consent form (Appendix C), was designed to assess KABP of adolescents concerning cancer and cancer related behaviour (Appendix B).

3.3.1 Cancers Included in this Study

The following cancers were included in this study. The decision to include these cancers was made on the advice of a group of five specialists in Radiation Oncology who were asked to list the four most important cancers in South Africa. From the returned lists, the four most common cancers were itemised and included in the study. The cancers identified were skin cancer, breast cancer, head and neck cancers and cervical cancer. The decision was also made to include lung cancer and prostate cancer based on the Cancer Registry[3] information, which listed these cancers as preventable common cancers in South Africa.

3.3.2 Knowledge

The knowledge section was designed to include items that are potentially amenable to prevention or early detection.

The items to be included in this section were determined by two separate procedures.

3.3.2.1 Using a Delphi approach,[28] five radiation oncologists were asked to list the five most commonly recognised causes, signs and symptoms of cancer. An average of five causes, and five signs and symptoms for each were listed and sent back to the specialists to then rank these according to importance.

3.3.2.2 Using a Norm method[19]

A second method of ranking items in terms of importance was also used to exclude any possible bias[29] with regard to doctors working in private or government institutions. The second method is referred to as the 'norm' method or 'norm group'. The term 'norm' has often been used to describe the typical behaviour in a group, that is, that which is considered 'normal'.[19]

The norm group consisted of a radiation radiographer, a nurse, a lecturer in Radiation Oncology and a student. The group was selected on the grounds that they work in close contact with the cancer patient on a daily basis. They also have adequate background knowledge with regard to the aetiology and signs and symptoms of cancer, which was covered in their formal training yet they were not part of the group of oncologists who were seen as the specialists in this field. The group represented the 'norm'.

During an afternoon session the researcher acted as facilitator, and the group was asked to rank the items according to what they perceived as important. Although the group is exposed to the same environmental conditions, different feelings of approval or disapproval were voiced in

terms of cancer aetiology, signs and symptoms. The facilitator drew parallel responses until an agreement was formulated which could be included in the questionnaire.[19]

The data from the Delphi method as well as the 'Norm' method was collated and used to compile the knowledge section of the questionnaire; there is a section on aetiology, and signs and symptoms for each cancer.

Both sections contain ten statements each, of which five are true and five are false. Pupils were asked to answer these by selecting the relevant answer Yes (Y), No (N) or Don't Know (DK) (Appendix B).

3.3.3 Attitudes and Beliefs

This section includes ten statements on general beliefs and attitudes. These items were derived from the literature.[2] Pupils responded to these statements by ranking the item according to a scale of very important (VI) to not very important (NVI).

3.3.4 Practices

This section was included to identify harmful or beneficial behaviours (smoking and using sunblock) that need to be addressed in an educational programme.

Validity has to be inferred from the extent to which different methods of measuring the same variables or constructs agree with one another, and the extent to which expected relationships among variables, and in predicting behaviour, are observed.[21]

Other methods used in this study were:

- Repeating questions within the questionnaire – statements in the knowledge section were referred to in the attitude section as well.
- Intensive probing – statements in the attitude section were reversed and asked in a negative or positive manner.
- Interviews with alternative fieldworkers – seven fieldworkers were responsible for data collection.

People are reluctant to supply information on themselves, especially information that is not socially acceptable.[10] In an attempt to overcome this, participants were assured that answers to the questionnaire would be kept confidential.

The final structured questionnaire (Appendix B) was designed to obtain information on:

- personal variables
- cancer knowledge
- schools and schooling.

The first page of the questionnaire contains general information regarding the pupils' age, gender, name of school, highest standard or grade passed, source of cancer knowledge, family related history of cancer, and the number of cancers that they know about.

The rest of the questionnaire is divided into three sections:

- knowledge;
- beliefs and attitudes;
- practices.

3.4 Procedure

3.4.1 Pilot Study

A pilot study was conducted to estimate differences that are highlighted in the main study and to establish whether adolescents understood all questions and statements in the questionnaire.

Three schools were chosen at random, each from a different region: North, South and Central (Appendix A). These schools represented different communities with regard to preferred language and socio-economic status. One Grade 10 class from each school was selected by the headmaster of each school respectively. The questionnaire was administered to 96 pupils in total, after which a debriefing session was conducted.

After completion of the pilot study, analysis of data was done by means of frequency tables using Epi Info Version 6.04b. It was found that Prostate Cancer was almost unknown, and it was decided to exclude this cancer from the questionnaire. The questionnaire was also found to be too lengthy, taking up more time than estimated, leading to difficulties when trying to accommodate the school and to have the questionnaires completed within one period, which was 30 minutes at most schools. During the debriefing session pupils were asked which words they did not understand in the questionnaire. Changes were made to the final questionnaire accordingly to simplify terms or

statements. The final questionnaire was changed to include eight statements for each cancer, five of which were true and three false (Appendix B).

3.4.2 Main Study

There were seven fieldworkers who conducted the main study, four females and three males. The fieldworkers were all involved in the field of Oncology, mostly students in the field of Radiation Therapy, and one qualified radiographer. The fieldworkers were hired for a period of four weeks to collect data at various schools within Gauteng. They were trained at a workshop for a period of three days. Their training included the following topics: introduction and personal skills, completion of the questionnaire, consent forms, role-play, ethical aspects of data collection, transport and claim forms. The fieldworkers were thoroughly guided on how to complete the questionnaires and address any questions that may arise from the pupils. Each fieldworker was supplied with guidelines explaining their responsibilities and a roster system with all relevant contact numbers. Thereafter they spent four weeks collecting data from the various schools indicated within the sample. Data collection took approximately four weeks: May 2000, and the first week of June 2000.

Each day after data collection, the principal investigator and each fieldworker individually checked all the forms and questionnaires to determine if there were any problems. These were then discussed before proceeding with further data collection.

3.5 Data Analysis

Statistical packages STATA and SPSS (Version 10) were used for data analysis. Descriptive statistics and frequency tables were the first step

in the data analysis. Thereafter, Chi-squared tests, t-tests, Pearson correlation coefficients, alpha coefficients, factor analysis, multiple analyses of variance and multiple analyses of co-variance were done to analyse the data further.[30-36]

In accordance with Nunnally's proposal,[30] coefficient alpha was used to ascertain the internal consistency of the attitudinal scale.[31] A reliability coefficient > 0.70 was regarded as satisfactory for research purposes. The attitudinal scale was subjected to factor analysis to determine the underlying dimensions. A direct solution (principal components analysis)[31] was the first step. As items with unique variance > 0.70 tend to be unreliable,[33] only items with communality estimates ≥ 0.30 were taken into consideration.

Orthogonal (VARIMAX) and oblique (OBLIMIN) rotational solutions were used and comparisons made between the two methods to achieve simple structure.[34] In order to ascertain significant loadings at the 1% level, loadings >± 0.50 were examined.[30,33] The Kaiser-Meyer-Olkin measure of item sampling adequacy was used to ascertain whether factor analysis was the correct procedure.[36]

3.6 Limitations

The sample within the study was a true representation of all schoolgoing adolescents in Gauteng. However, other areas were later identified that could impact on the results. Although there was a true representation of North, South and Central schools within Gauteng, the geographic area was not indicated on the completed questionnaire and not used in the data analysis. Distinction was not made between schools in township areas or within the city itself. Differences with

regard to area and also socio-economic status are important when future educational programmes are planned.

3.7 Ethics

Permission to conduct the research was obtained from the Ethics Committee, Faculty of Medicine, University of Pretoria and Pretoria Academic Hospitals and the Gauteng Department of Education. Informed consent forms were handed to the headmaster of each school, the parents, as well as each pupil who participated in the survey (Appendix C).

Confidentiality was explained to all relevant parties, no names were recorded on the questionnaire, but school names were indicated on the questionnaire as a unique identifier. No names were used in the analysis.

CHAPTER 4
RESULTS

4.1 Demographic Information

4.1.1 Age and Gender Distribution of the Sample

The distribution of the age of pupils in Gauteng ranged between 13 and 24 years. The average age of the sample was 16.5 years (standard deviation (sd) = 1.5).
The average age for males was 16.8 years (sd = 1.6) and 16.2 years for females (sd = 1.4).

There were more females (n = 1267) than males (n = 958) in the sample. The other 53 pupils who participated did not indicate their gender on the questionnaire (Table 2 – Appendix D).

4.1.2 Number of Pupils in Different Types of Schools

Schools were classified according to different types. The following types were identified in the sample:

- DET (Department of Education and Training);
- TED (Transvaal Education Department);
- HOR (House of Representatives);
- HOD (House of Delegates); and
- IO (Independent Ordinary).

Different types of schools did not have the same number of pupils who participated in the survey. This was due to the fact that school classification (DET, TED, HOR, HOD and IO) was not known before

the research project started and was only assessed while conducting fieldwork. Schools are not classified in this manner any more, since changes took place in the educational system after the 1994 government elections. The Department of Education was unable to supply this information regarding different school types. Within the sample, DET had the highest number of pupils (1120) and HOD the least (40). Gender distribution and percentages are displayed in Table 3 – Appendix D.

4.1.3 History of Cancer Among Study Subjects

Significantly more females than males ($p < 0.001$) indicated that they had some cancer history in the family or with regard to close friends. All those who answered the question related to family cancer history are shown in Table 4 – Appendix D.

4.1.4 Information on Cancer

Significantly more females than males ($p < 0.001$) indicated that they had received some cancer information previously. All those who answered the question related to cancer information are shown in Table 4 – Appendix D.

4.1.5 Sources of Cancer Information

Television was reported as the major source of cancer information by both males (32%) and females (37%). More than half of the respondents (54%) listed television and parents combined as the greatest source of cancer information. Girls were more likely to cite television ($p = 0.01$); parents ($p < 0.001$); school ($p = 0.03$) and books ($p < 0.001$) as the main sources of cancer information while boys listed

cigarette boxes more than females ($p < 0.001$). The Cancer Association of South Africa (CANSA) (0.4%), cigarette boxes (3.2%) and the Internet (0.7%) scored low as sources of information on cancer (Table 4 – Appendix D).

4.1.6 Different Types of Cancer Listed by the Study Subjects

Breast cancer (67%), lung cancer (61%) and skin cancer (58%) were rated as the most common cancers known to Grade 10 pupils. There were significant differences between males and females regarding the ratings of cancers: breast cancer, ovarian cancer and leukemia ($p < 0.001$); colon cancer, abdominal cancers and prostate cancer ($p < 0.01$); head and neck cancers ($p = 0.03$); lung cancer and central nervous system tumours ($p = 0.02$); and cervical cancer ($p = 0.01$). The top 15 cancers mentioned by respondents are presented in Table 5 – Appendix D.

4.1.7 Smoking and the Use of Sunblock Among Study Subjects

Percentages of males and females that smoke and use sunblock are indicated in Tables 6.1 and 6.2 – Appendix D. The number of pupils who indicated that they smoked was 18%, while 38% indicated that they used sunblock. There was a significant difference between males and females ($p < 0.001$) when comparing the number of cigarettes that they smoked per day (Table 6.2 – Appendix D).

4.2 Knowledge About the Signs and Symptoms and Aetiology of Cancers

The average knowledge scores for the signs, symptoms and aetiology of skin cancer, breast cancer, cervical cancer and head and neck cancer were very low. Pupils were more knowledgeable about signs, symptoms and aetiology of lung cancer than the other cancers. Pupils also indicated better knowledge regarding the aetiology of skin cancer, lung cancer, cervical cancer and head and neck cancer compared to the signs and symptoms of these cancers (Tables 7 and 8 – Appendix D).

4.2.1 Knowledge About the Signs and Symptoms and Aetiology of Cancers by Gender

Females were significantly more knowledgeable than males about the signs and symptoms of breast cancer and cervical cancer, as well as the aetiology of skin cancer, breast cancer, cervical cancer and lung cancer (Tables 9 and 10 – Appendix D).

4.2.2 Knowledge About the Signs and Symptoms and Aetiology of Cancers by Information Received

Pupils who had received cancer information previously showed significantly higher knowledge on the signs and symptoms and aetiology on all cancers listed in the questionnaire: skin cancer, breast cancer, cervical cancer, head and neck cancer and lung cancer (Tables 11 and 12 – Appendix D).

4.2.3 Knowledge About the Signs and Symptoms and Aetiology of Cancers by History of Cancer

Pupils who listed that they had family members with cancer history had higher knowledge with regard to signs and symptoms of skin cancer, breast cancer, cervical cancer and lung cancer. These pupils also had higher knowledge on the aetiology of skin cancer, breast cancer, head and neck cancer and lung cancer (Tables 13 and 14 – Appendix D).

4.2.4 Knowledge About the Signs and Symptoms and Aetiology of Cancers by Different Types of Schools

The results showed highly significant differences between different types of schools on knowledge about the signs and symptoms and aetiology of the five cancers (Tables 15 and 16 – Appendix D). Bonferroni's t test for multiple comparisons showed that: TED schools tended to have better knowledge of the signs, symptoms and aetiology of the five cancers.

4.2.5 Knowledge About the Signs and Symptoms and Aetiology of Cancers by Smoking

Pupils who indicated that they smoked had higher knowledge of the signs, symptoms and aetiology of lung cancer than those who did not smoke. The pupils who smoked also had better knowledge regarding the aetiology of skin cancer (Tables 17 and 18 – Appendix D).

4.2.6 Knowledge About the Signs and Symptoms and Aetiology of Cancers by Sunblock

Pupils who indicated that they used sunblock when going in the sun had a higher knowledge of the signs, symptoms and aetiology of the following cancers: skin cancer, breast cancer and lung cancer (Tables 19 and 20 – Appendix D)

4.2.7 Knowledge About the Signs and Symptoms and Aetiology of Cancers by Age

Results demonstrated that older pupils were less knowledgeable about the signs and symptoms of skin cancer, breast cancer and lung cancer. Older pupils were also more knowledgeable about the aetiology of skin cancer, breast cancer, cervical cancer and lung cancer.

4.2.8 Responses to the Knowledge Statements in the Questionnaire

Overall pupils demonstrated very low knowledge concerning the signs, symptoms and aetiology of cancers included in the questionnaire. This was demonstrated in the low number of correct responses in the knowledge section of the questionnaire (Tables 21 to 30 – Appendix D).

4.2.9 Multiple Analyses of Co-Variance for Knowledge Statements

In the multiple analyses of variance, gender, previously received cancer information and cancer history were identified as important independent variables (Tables 31 to 40 – Appendix D). In order to tease out gender effects on signs, symptoms and aetiology of the five cancers, multiple analyses of co-variance, with Bonferroni t tests,

controlled for sunblock, smoking, cancer history, cancer information, age and school. The adjusted mean scores were significantly higher for females regarding the signs, symptoms and aetiology of breast cancer, as well as the aetiology of cervical cancer (Tables 41 to 44 – Appendix D).

Multiple analyses of co-variance (MANCOVAs) were used to look at the effects of cancer information on the signs, symptoms and aetiology of all the cancers controlling for sunblock, smoking, cancer history, gender, age and school. The adjusted mean scores were significantly higher for those pupils who had received cancer information regarding the signs, symptoms and aetiology of all cancers included in the questionnaire (Tables 42 and 45 – Appendix D).

Multiple analyses of co-variance (MANCOVAs) were used to look at the effects of cancer history on the signs, symptoms and aetiology of all the cancers controlling for sunblock, smoking, gender, cancer information, age and school. The adjusted mean scores were significantly higher for pupils who had a family history of cancer, regarding the signs, symptoms and aetiology of skin cancer, breast cancer, as well as lung cancer (Tables 43 and 46 – Appendix D)

4.3 Attitudes and Beliefs Towards Cancer Risk Factors

In the analysis 78 pupils were excluded because they had incomplete data. The analysis included 2200 pupils. The following responses were reported for each attitude statement:

Statement 1: Avoid sunlight and tanning,
51% of the pupils indicated that it was very / important while 23% found it not / important.

Statement 2: Going to see the doctor if you have a scar or mole that itches or changes appearance, or does not want to heal,
73% of the pupils indicated that it was very / important while 15% found it not / important.

Statement 3: Following a healthy diet,
63% of the pupils indicated that it was very / important while 20% found it not / important.

Statement 4: Maintaining a standard weight,
57% of the pupils indicated that it was very / important while 21% found it not / important.

Statement 5: Breast-feeding your baby,
57% of the pupils indicated that it was very / important while 25% found it not / important.

Statement 6: Smoking cigarettes
27% of the pupils indicated that it was very / important while 62% found it not / important.

Statement 7: Having sex with only one partner
72% of the pupils indicated that it was very / important while 21% found it not / important.

Statement 8: Having sex at a young age
25% of the pupils indicated that it was very / important while 62% found it not / important.

Statement 9: Drinking alcohol,
25% of the pupils indicated that it was very / important while 60% found it not / important.

Statement 10: Oral hygiene,
55% of the pupils indicated that it was very / important while 22% found it not / important.

Results of response frequencies are summarised in Figures 1 and 2 – Appendix D. Overall the most important attitude statements appear to be related to skin cancer and cervical cancer.

Factor Analysis

Factor analysis was conducted using orthogonal (VARIMAX) and oblique (OBLIMIN) rotational solutions. The correlation matrix was used as the starting point for the direct analysis by the principal component method and two factors, accounting for 55% of the variance, were extracted. The communality estimates for the ten attitude statements ranged between 0.25 and 0.70. Two statements (*Avoid sunlight and tanning* and *Oral hygiene*) had unacceptable communality estimates. These statements were removed and a second factor analysis was conducted. The second factor analysis showed that the communality estimates ranged between 0.37 and 0.72 and were acceptable[34] (Table 1 – Appendix D). Sampling adequacy for the number of items was 0.78, approaching Kaiser's meritorious category, indicating that factor analysis was the correct procedure.[37] The orthogonal and oblique rotational solutions are shown in Tables 49 and 50 –

Appendix D. The oblique (OBLIMIN) rotational solution was selected as it was: more appropriate in meeting the requirements of simple structure; the dominant items in Factor II were negatively related to the factor; and the factors were correlated (r = -0.28).

Factor loadings are described in terms of the most frequent responses (important to unimportant) to the statements. Factor I had 5 items in excess of 0.60. The loadings on Factor I seemed to be related to socially acceptable behaviours. The relevant variables were the importance of visiting a doctor with a scar or mole that itches or does not want to heal (0.70); following a healthy diet (0.74); maintaining a standard weight (0.71); breast-feeding your baby (0.61); and having sex with only one partner (0.62). Factor II had three variables in excess of 0.80. This factor tended to focus on socially unacceptable behaviours, with its emphasis on not smoking cigarettes (-0.80); not having sex at a young age (-0.82) and not drinking alcohol (-0.85) (Table 49 – Appendix D).

Coefficient alpha was 0.74 for the 8-item attitude scale, demonstrating adequate reliability for research purposes.[30]

The average attitude score was 18.0 (sd = 7.0). Females reported that cancer risk factors were more important than males ($p<0.001$). It was also found that older pupils felt that cancer risk factors were less important than younger pupils ($p = 0.01$). Pupils who previously received cancer information had similar attitudes towards cancer risk factors as those who did not receive cancer information. There was a significant difference between pupils who had a family history of cancer and those who did not ($p < 0.001$); pupils who had a family history of cancer felt that cancer risk factors were more important than those pupils who did not have a family history of cancer. There was also significant difference between different types of schools

($p < 0.001$) regarding the attitudes of the pupils towards cancer risks. Pupils who smoked or used sunblock felt that cancer risk factors were more important to them ($p < 0.001$) than those who did not smoke or use sunblock.

CHAPTER 5
DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Discussion

5.1.1 Overall Cancer Knowledge

This study found that cancer knowledge among Grade 10 pupils in Gauteng was poor. Knowledge regarding signs and symptoms of cancer was poor, except for a few items on lung cancer. It was also demonstrated that pupils had slightly more knowledge about the aetiology of the cancers in the questionnaire than the signs and symptoms. This could be attributed to cancer awareness programmes, and tobacco control measures that are currently taking place in South Africa, as these programmes tend to stress the aetiological factors of cancer but little emphasis is placed on signs and symptoms. It is a well known fact that smoking is seen as one of the causes of lung cancer.[10,13,14] The implementation of health warnings with the sale of tobacco products could be a contributing factor, although cigarette boxes were only listed by 3.2% of the pupils as a source of cancer knowledge (Table 4 – Appendix D).

In the multiple analyses of variance three main variables were identified that significantly impacted upon the knowledge scores obtained by the pupils.

Gender

Gender differences were found to be significant, females were more knowledgeable about cancer than males (Tables 9 and 10 – Appendix D). In the multiple analyses of co-variance the significant difference between males and females was reduced to breast cancer (Tables 41 and 44 – Appendix D). Breast cancer is predominantly found among women. Even though breast cancer can occur in men, it is a low percentage, comprising only 1% of all breast cancer.[2] There are currently many educational programmes directed towards women e.g. breast cancer awareness, this could explain the reason for the females being better informed than the males.

From the literature it is clear that gender is a key principle in cancer discourse.[18] Evidence from elsewhere in the world is mixed. Similar results were found in the Philadelphia survey[1] where females answered more questions correctly than males. The survey indicated that gender impacted significantly on the number of correct responses.[1] In the Canadian study, girls were better informed on cancer in limited areas, little differences were found between male and female.[5]

Therefore it is essential to take gender into consideration with the development of educational programmes when addressing certain cancers.[1,7,13,17,18]

Cancer Information

The second variable that impacted significantly on the knowledge scores was cancer information. Pupils who had previously received cancer information were more knowledgeable than those who did not receive any cancer information (Tables 42 and 45 – Appendix D). It is a well-

known fact that information received or education increases knowledge. Therefore it could be said that cancer education programmes increase general knowledge and that this could lead to better decision-making regarding healthier lifestyles.[5,6,7] There is a need for cancer educational programmes within our schools; educating our youth will enable them to make healthier decisions regarding their lifestyle and awareness of any possible signs and symptoms. All this will lead to a decrease in the mortality rate of this disease – Cancer.

Sources of cancer information were linked to cancer information received. Pupils received most of their cancer knowledge from television and their parents (Table 4 – Appendix D). Television and the media were also the most common sources of cancer information listed in other studies, while parents and teachers were seen as the most likely confidants with whom to discuss cancer.[5,8,10,15] The fact that television was indicated as the greatest source of cancer information should be taken into account when planning educational programmes. This survey indicates the possible positive use of this media in communication and education.

In this study, schools were only ranked 5th as the source of cancer information, which is not surprising as there is no general cancer education programme in the Education Department. If the pupils indicated 'school' as their source of cancer knowledge it should be taken into account that this could include all aspects of cancer education at school, even projects or programmes presented by other organisations within the school. This could also be the reason for pupils not indicating CANSA (0.4%) as a source of cancer information. It is a well-known fact that CANSA do visit schools and do supply cancer information.

Cancer History

Cancer history was the third variable indicated by the multiple analyses of co-variance to significantly influence the knowledge scores. Pupils who had a family history of a cancer were more knowledgeable than those who did not have any family history of cancer (Tables 43 and 46 – Appendix D). In this study 22.2% of the study subjects indicated that they had some cancer-related family history. This is in contrast to other studies done among college undergraduate students that showed family history had no significant impact upon the number of correct answers.[1] Yet in a survey done among oncology patients and their 'significant others', there was a significant ($p < 0.01$) difference in knowledge scores between individuals who had no familial or personal history of cancer, and a family member with a history of cancer.

Literature also showed that although people had had exposure to cancer through family members or friends, they still had many unanswered questions about the disease.[17,18,23] This is clearly demonstrated in this study as well. Pupils with a family history of cancer had better knowledge of cancer, yet pupils indicated a poor knowledge of cancer in the survey as a whole.

5.1.2 Attitudes of Schoolgoing Adolescents Towards Cancer Risks

Pupils regarded the attitude statements related to skin cancer and cervical cancer as the most important attitude statements (Figure 1 and 2 – Appendix D). Skin cancer awareness was identified as very important, this could be due to the sale and advertisements of skin care products. While the importance of cervical cancer was demonstrated by the high response of importance for sexual intercourse with only one partner. The

youth of today are exposed to intensive HIV/AIDS related educational programmes at school, as well as through the media; this could be seen as the reason for the high importance in ranking.

Factor analysis demonstrated a negative correlation between Factor I (socially acceptable behaviours) and Factor II (socially unacceptable behaviours) (Tables 48 and 49 – Appendix D). Factor I consisted of important actions to take to avoid cancer and Factor II comprised items associated with risks for developing cancer. Pupils responded to the socially acceptable behaviour as important and to the socially unacceptable behaviour as not important. This indicated that pupils have favourable attitudes towards possible cancer risks.

5.1.3 Practices of Schoolgoing Adolescents in Relation to Cancer Risks

Smoking

In this survey more than half of the study subjects (62%) indicated that smoking was not important to them. More alarming was the number of pupils (27%) who indicated that smoking was important to them. South African based research shows that 95% of regular smokers initiate the habit before the age of 20 years.[13]

The number of pupils who indicated that they smoked was 17.8%. This smoking rate is similar to rates found elsewhere in South Africa in the 18 to 24 year age group by other researchers.[13] There was a significant difference ($p < 0.001$) between the number of males who smoked (26.9%) and the number of females who smoked (10.9%) (Tables 6.1 and 6.2 – Appendix D).

Pupils who smoked had higher knowledge scores on the signs, symptoms and aetiology of all cancers included in the questionnaire (Tables 17 and

18 – Appendix D). In the analysis of variance it was found that pupils who smoked were more knowledgeable about the signs, symptoms and aetiology of lung cancer (Tables 35 and 40 – Appendix D). This could be due to the fact that health related warnings associate lung cancer with smoking.[13,14]

Sunblock Use

Only 38.2% of pupils said that they would use sunblock when in the sun. Pupils who indicated that they used sunblock demonstrated higher cancer knowledge scores (Tables 19 and 20 – Appendix D). In the multiple analyses of variance it was found that pupils who used sunblock were more knowledgeable about the signs, symptoms and aetiology of skin cancer, breast cancer and lung cancer (Tables 31, 32, 35, 36, 37 and 40 – Appendix D). As explained previously, this could be due to product-related advertisements, advertising the prevention of skin cancer. Although pupils were aware of the risks they still lived less healthy lifestyles. The results of this survey are similar to results of a survey done among 15-16 year olds in the UK who had high cancer knowledge scores but continued to live less than healthy lifestyles.[10] Attitudes gathered over a lifetime will eventually influence cancer screening programmes, therefore the promotion of healthier lifestyles is stressed.[15,16,17]

5.2 Conclusion

The youth's perception about cancer aetiology and cancer detection was found to be similar to that found in other studies outside South Africa.[1,5,10]

Grade 10 pupils in Gauteng are seriously ignorant about knowledge about cancer risks and aetiology of cancer. Pupils demonstrated a poor awareness of the aetiology, signs and symptoms of cancer. Their lack of awareness is demonstrated by the high percentage of 'don't know' responses in the results. It appears that they are slightly better informed with regard to skin, breast and lung cancer than other cancers in this study.

Although they regard many of the attitude statements, especially sexual behavioural attitudes in the questionnaire, as important, they still continue to live less healthy lifestyles with regard to smoking and the use of sunblocking agents.

When comparing the knowledge score results from all the cancers in the questionnaire, it is clearly demonstrated that different factors influenced the results. The most prominent factors were identified as cancer information, family cancer history, gender, age and different types of schools.

5.3 Recommendations

5.3.1 Cancer Education

The study has clearly demonstrated the need for formal cancer education programmes. Therefore it is recommended that the Gauteng Department of Education should consider the implementation of cancer prevention and detection programmes within the syllabus, especially within the category of 'life-skills'. By educating schoolgoing adolescents, a large part of the population can be targeted. Studies have shown that the youth underestimated the adverse effects that certain

practices have on their health. By obtaining knowledge at an early age, they can be directed to living a healthier lifestyle.

Cancer education programmes should be gender specific, for example: female-related cancers should feature more prominently within female education programmes and the same for males. School specific programmes should concentrate on information previously received and language specific training. Television is an aspect of the media that should be considered for mass communication among the youth. Educational programmes should also be directed to address any misconceptions with regard to the false statements included in the questionnaire.

5.3.2 Future Studies

Educational programme development

With the development of cancer education programmes, further research is required to determine the content. Questions need to be addressed to the study subjects with regard to what they want to know. Also what type of medium should be used for these educational programmes, and what types of facilities are available within all Gauteng schools.

Inclusion into existing 'life skills' programmes

Within the development of an educational programme it is important to use all resources available to determine the feasibility of such a project. The aim would be to include cancer education into existing life-skills training programmes within the Education Department.

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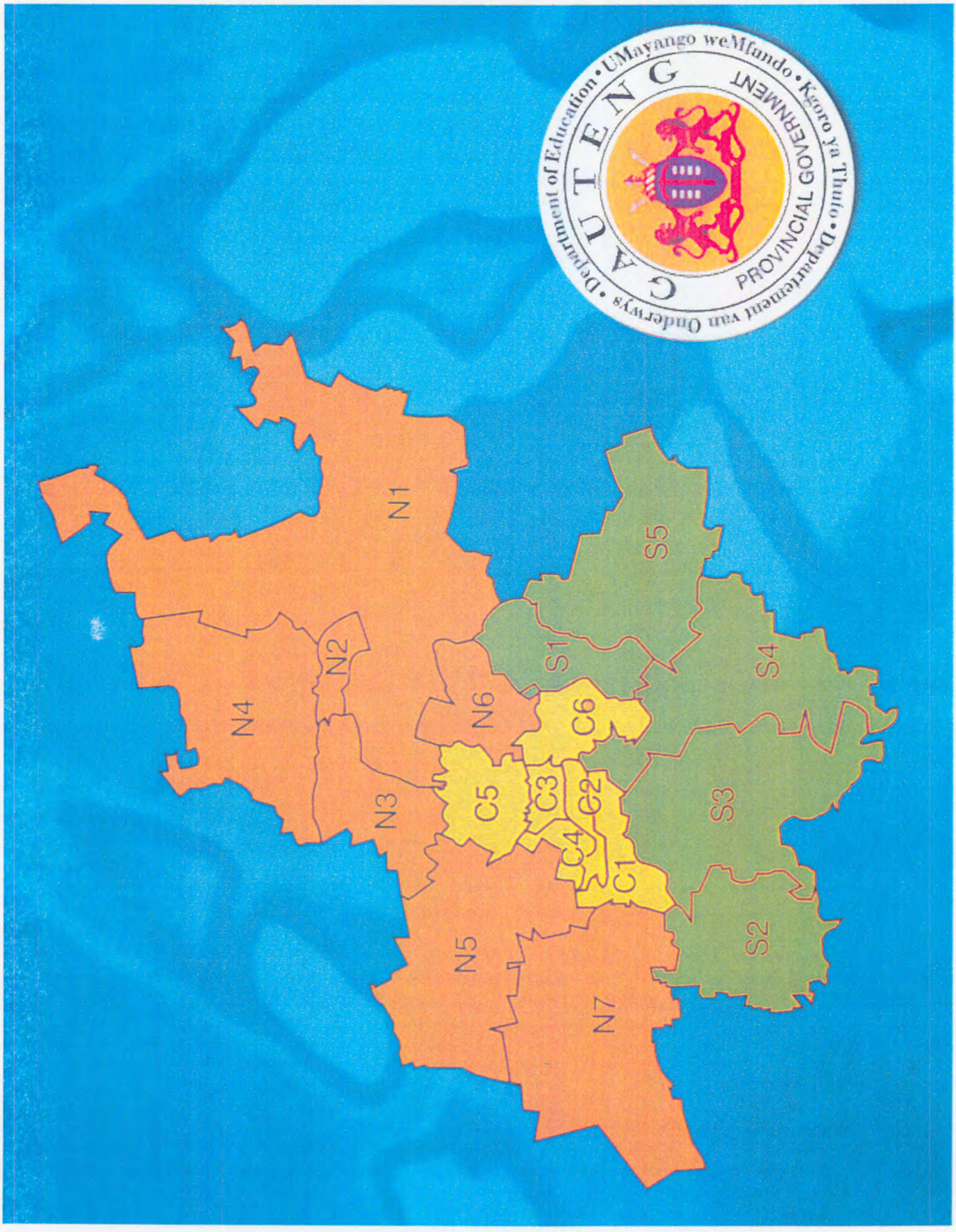
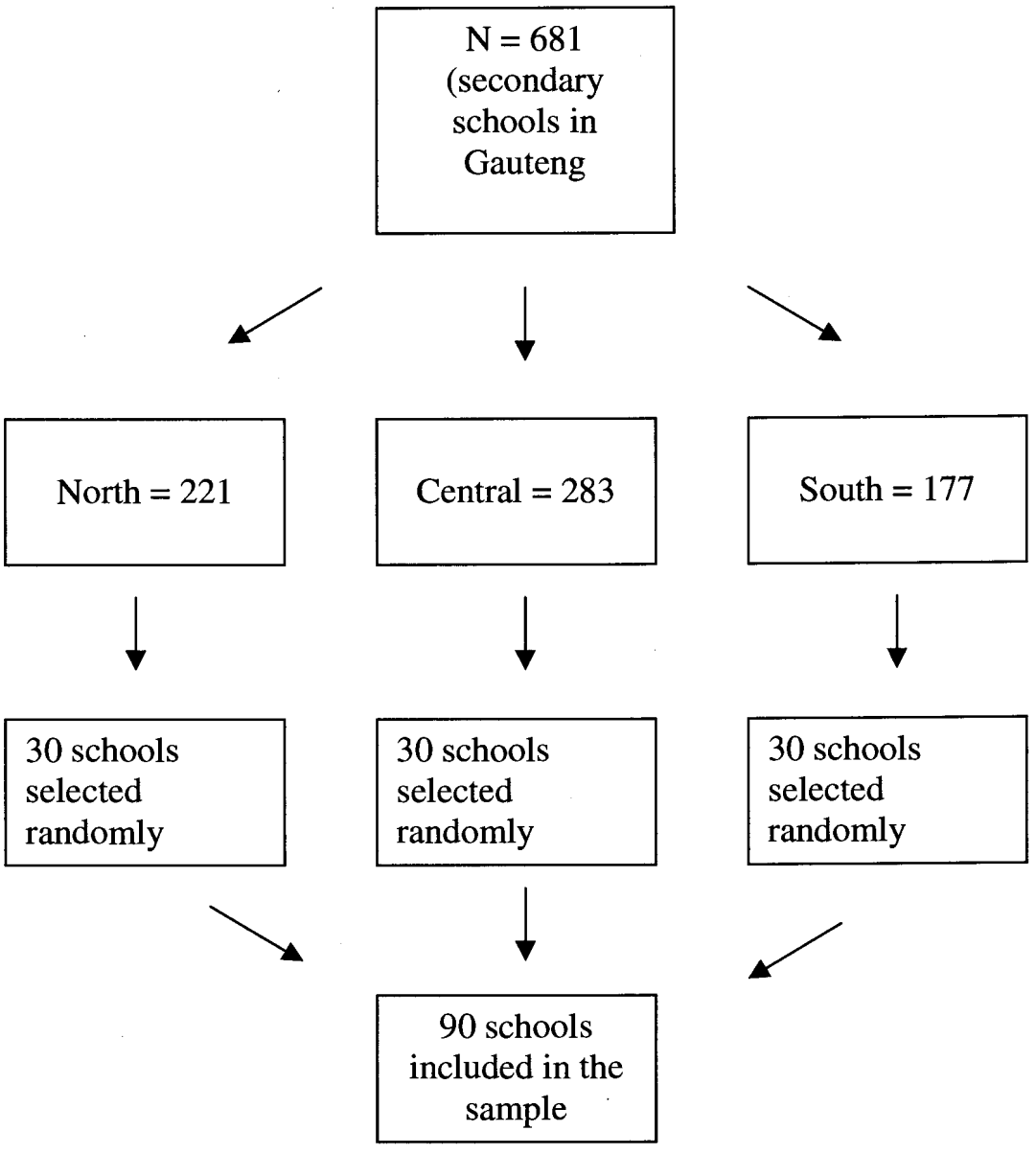
APPENDIX A

REGIONAL MAP OF SCHOOL DISTRIBUTION IN GAUTENG AND FLOW CHART OF SAMPLE SELECTION



FLOW CHART FOR SELECTION OF SCHOOLS



APPENDIX B

QUESTIONNAIRE

QUESTIONNAIRE:

INTERVIEWER:_____

NAME OF SCHOOL:_____

GENDER (MALE/FEMALE)_____

AGE:_____

WHAT GRADE/STANDARD ARE YOU IN?:_____

HAVE YOU RECEIVED ANY INFORMATION ON CANCER? **Y /N**

DO YOU HAVE ANY FAMILY HISTORY OF CANCER? **Y /N**

WHAT KIND OF CANCERS DO YOU KNOW ABOUT?

_____

_____

_____

_____

_____

_____

_____

_____

_____

WHERE DID YOU OBTAIN YOUR KNOWLEDGE OF CANCER FROM?

_____

_____

_____

PLEASE PUT A CIRCLE AROUND YOUR RESPONSE EITHER YES (Y), NO (N) OR DON'T KNOW (DK)

The signs and symptoms of skin cancer are:

		Y	N	DK
a	Nodular mass (rounded lump on skin)	1	2	3
b	Unexpected hair growth	1	2	3
c	Change in colour of scar or mole	1	2	3
d	Persistent itching	1	2	3
e	Change in size or shape of scar or mole	1	2	3
f	Ulceration of the skin (open sore on the skin)	1	2	3
g	A wound that won't stop bleeding when injured	1	2	3
h	No feeling on the skin (numb skin)	1	2	3

The signs and symptoms of breast cancer are:

		Y	N	DK
a	Hard knob in one or both breasts	1	2	3
b	No feeling in the breast	1	2	3
c	Little red spots on the breast	1	2	3
d	More than one knob in breast	1	2	3
e	Pain in breast	1	2	3
f	Discharge from nipple (leaking nipple)	1	2	3
g	The one breast being slightly larger than the other	1	2	3
h	Skin dimpling over breast area (like orange peel)	1	2	3

The signs and symptoms of cervix cancer are:

		Y	N	DK
a	Irregular bleeding	1	2	3
b	Blood stained discharge (fluid flowing from cervix)	1	2	3
c	Itching of skin	1	2	3
d	Pain in the groin	1	2	3
e	Irregular menstrual cycle	1	2	3
f	Continuous infection (regular disease)	1	2	3
g	Urinary frequency and pain (wanting to go to the toilet often)	1	2	3
h	Hair loss over the groin area	1	2	3

The signs and symptoms of head and neck cancer are:

		Y	N	DK
a	Swelling or ulcer(open sore) that fails to heal in the mouth	1	2	3
b	Memory loss	1	2	3
c	Local pain in head and neck area	1	2	3
d	Difficulty in swallowing	1	2	3
e	Loss of taste	1	2	3
f	Persistent hoarseness (rough, husky voice)	1	2	3
g	Bloody discharge from nose (fluid flowing from nose)	1	2	3
h	Not being able to keep your head up	1	2	3

The signs and symptoms of lung cancer are:

		Y	N	DK
a	Persistent cough	1	2	3
b	Shortness of breath	1	2	3
c	Chest pain after cardio-vascular exercise	1	2	3
d	Red patches on the skin over your chest area	1	2	3
e	Chest infection that fails to cure after using antibiotics	1	2	3
f	Pain in your shoulder and arm	1	2	3
g	Hoarse voice or no voice	1	2	3
h	Not being able to hold your breath for very long	1	2	3

Skin cancer can be caused by:

		Y	N	DK
a	Exposure to sunlight	1	2	3
b	Use of excessive tanning oil	1	2	3
c	Swimming in public swimming pools	1	2	3
d	Scar tissue that changes	1	2	3
e	Use of steroids	1	2	3
f	Inheritance form your parents	1	2	3
g	Exposure to x-rays	1	2	3
h	Not washing with soap	1	2	3

Breast cancer can be caused by:

		Y	N	DK
a	Family history of breast cancer (mother, sister grandmother)	1	2	3
b	Early menstruation	1	2	3
c	Having your first baby after the age of 30 or having no children	1	2	3
d	By breast feeding your baby	1	2	3
e	Having small breasts	1	2	3
f	Having plastic surgery to enlarge your breasts	1	2	3
g	Continuous use of high doses of hormone treatments	1	2	3
h	By being overweight	1	2	3

Cervix cancer can be caused by:

		Y	N	DK
a	Wearing nylon underwear	1	2	3
b	Multiple sexual partners	1	2	3
c	Sexual intercourse from a young age	1	2	3
d	Having any sexually transmitted diseases	1	2	3
e	Smoking	1	2	3
f	Using tampax instead of pads during menstruation	1	2	3
g	Multiple pregnancies (more than three)	1	2	3
h	Not having any children	1	2	3

Head and Neck cancer can be caused by:

		Y	N	DK
a	Not looking after your teeth e.g. regular brushing	1	2	3
b	Excessive use of tooth paste	1	2	3
c	Using "snuff"	1	2	3
d	Smoking	1	2	3
e	Excessive use of alcohol	1	2	3
f	Eating a lot of sweets	1	2	3
g	Inhaling of wooddust	1	2	3
h	Having flu more than twice a year	1	2	3

Lung cancer can be caused by:

		Y	N	DK
a	Not wearing protective clothing after exercise	1	2	3
b	Smoking	1	2	3
c	Environmental factors such as mining asbestos, nickel and chrome	1	2	3
d	Holding your breath for very long times	1	2	3
e	Not doing cardio-vascular exercise 3 times a week	1	2	3
f	Drinking alcohol	1	2	3
g	Family history of lung cancer (Genetic factors)	1	2	3
h	Not following a healthy diet	1	2	3

PLEASE INDICATE HOW IMPORTANT THESE FOLLOWING STATEMENTS ARE TO YOU BY SELECTING THE BLOCK OF YOUR CHOICE EITHER VERY IMPORTANT (VI) TO NOT IMPORTANT (NI)

How important is this to you?
VERY IMPORTANT (VI) **NOT IMPORTANT (NI)**

a) Avoid sunlight and tanning

1	2	3	4	5

b) Go and see the doctor if you have a scar or mole that itches or changes in appearance, or does not want to heal

1	2	3	4	5

c) Follow a healthy diet

1	2	3	4	5

d) Maintain a standard weight

1	2	3	4	5

e) Breast feeding your baby

1	2	3	4	5

f) Yourself smoking cigarettes

1	2	3	4	5

g) Having sex with only one partner

1	2	3	4	5

h) Having sex at a very young age

1	2	3	4	5

i) Using alcohol

1	2	3	4	5

j) Oral hygiene

1	2	3	4	5

PLEASE ANSWER THE FOLLOWING QUESTIONS TRUTHFULLY.

1) Do you smoke

Y	N

How many cigarettes do you smoke every day?

_____

2) If you go in the sun do you use sunblock?

Y	N

3) If you are a female, do you think you would breast-feed your baby?
If you are a male do you think your partner would breast-feed your baby?

Y	N	DK

APPENDIX C

CONSENT FORMS

CANCER EDUCATION

Consent form

Research Study

I_____-willingly agree to let my child _____ participate in the completion of a research questionnaire.
This research is being conducted by the Department of Community Health, University of Pretoria.

Purpose of the study

The overall aim of the study is to determine the extent of general knowledge, beliefs, attitudes and practices of schoolgoing adolescents in Gauteng towards cancer.
The specific outcomes are to ascertain knowledge, beliefs, attitudes and practices of adolescents, to determine the sources of cancer knowledge, to determine if the educational system is adequate in providing information, and to investigate the influences on adolescents life-styles.

Description of Procedure

Research will be conducted by means of a questionnaire. The six most common cancers in South Africa were used for questioning in this study. It will also determine the influence of different types of schools and gender on the knowledge, beliefs, attitudes and practices of adolescents.

Confidentiality

Pupils are asked not to write their names on the questionnaire. Any information obtained will be kept strictly confidential; no names or even school names will be used in the reporting of the data.

Your child's participation in this research project is voluntary and he/she is allowed to withdraw at any time. Your child will also be asked to sign a similar consent form.

Refusal to participate will have no negative consequences for your child in any way. However, we request you to consider that a better understanding of what teenagers know about cancer and its prevention will assist I the development of better educational programmes.

****

I have read all of the above and willingly give my consent for my child to participate in the study. Upon signing this form, I will receive a copy.

_____ _____

Parent / Guardian Date

_____ _____

Witness Date

_____ _____

Witness Date

If you have any further queries, do not hesitate to contact me, the main researcher, or the Department of Community Health at the University of Pretoria.

1) Main Researcher: Ms A Botha
Address: School of Radiography
Department Health and
Biotechnology
PO Box 17011
Doornfontein

Tel: 011-4062451(w)
011-4068457(fax)
0832729754 (cell)

Email: abotha@twrinet.twr.ac.za

2) Department of
Community Health: Head: Prof. CB Ijsselmuiden

Tel: 012-3398618(w)

CANCER EDUCATION

Consent form

Research Study

I_____- as headmaster of the school _____(name of school) willingly agree to let the grade 10 pupils participate in the completion of the research questionnaire.
This research is being conducted by the Department of Community Health, University of Pretoria.

Purpose of the study

The overall aim of the study is to determine the extent of general knowledge, beliefs, attitudes and practices of schoolgoing adolescents in Gauteng towards cancer.
The specific outcomes are to ascertain knowledge, beliefs, attitudes and practices of adolescents, to determine the sources of cancer knowledge, to determine if the educational system is adequate in providing information, and to investigate the influences on adolescents life-styles.

Description of Procedure

Research will be conducted by means of a questionnaire. The six most common cancers in South Africa were used for questioning in this study. It will also determine the influence of different types of schools and gender on the knowledge, beliefs, attitudes and practices of adolescents.

Confidentiality

Pupils are asked not to write their names on the questionnaire. Any information obtained will be kept strictly confidential; no names or even school names will be used for the analysing of the data.

Subject's participation in the research project is voluntary and they are allowed to withdraw at any time.

Refusal to participate will have no negative consequences for the pupils in any way. However, we request you to consider that a better understanding of what teenagers know about cancer and its prevention will assist us to develop better educational programmes.

****

I have read all of the above and willingly give my consent for the pupils in grade 10 to participate in the study. Upon signing this form, I will receive a copy.

_____ _____

Headmaster Date

CANCER EDUCATION

Consent form

Research Study

I_____-willingly agree to participate in the filling in of the research questionnaire.
This research is being conducted by the Department of Community Health, University of Pretoria.

Purpose of the study

The overall aim of the study is to determine the extent of general knowledge, beliefs, attitudes and practices of schoolgoing adolescents in Gauteng towards cancer.

Confidentiality

No pupil is allowed to write his or her name on the questionnaire. Any information obtained will be kept strictly confidential; no names or even school names will be used in the reporting of the data.

Your participation in the research project is voluntary and you are allowed to withdraw at any time.

Refusal to participate will have no negative consequences for you in any way. However, we request you to consider that a better understanding of what teenagers know about cancer and its prevention will assist us to develop better educational programmes.

****

I have read all of the above and willingly give my consent to participate in the study.
Upon signing this form, I will receive a copy.

_____ _____

Name of pupil Date

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

GAUTENG Department of Education • UMnyango wemFundo • Kgoro ya Thuto
PROVINCIAL GOVERNMENT

P.O. BOX 7710
JOHANNESBURG
2000

111 COMMISSIONER STREET.
JOHANNESBURG
2000

Tel: (011) 355 - 0555

Fax: (011) 355 - 0670

Researchers Particulars:

Botha A.

Institution: University of Pretoria

Student No: 9521741

Date: 9 March 2000

Dear A. Botha.

Request to conduct a study

Topic: KNOWLEDGE, BELIEFS, ATTITUDES AND PRACTICES OF SCHOOL-GOING ADOLESCENTS IN GAUTENG IN RELATION CANCER.

Approval is hereby granted that you may conduct a study / administer a questionnaire to Gauteng schools. Approval is with effect from 7 February 2000

District(s) where the study shall be conducted: throughout the province.

Permission is subject to the following conditions:

1. The District Director concerned is to be informed that you have received permission from the Gauteng Department of Education to conduct your research in the specified GDE school/ district / region.
2. Please show this letter to the school principal and the chairperson of the School Governing Body (SGB) as proof that you have received the Department's consent to carry out the research.
3. A letter / document which sets out a brief summary of your intended research should please be made available to the principal of the school concerned.
4. Please obtain the goodwill and co-operation of the principal, chairperson of the SGB, learners and educators involved. Persons who offer their co-operation will receive no special benefit from the Department, while those who prefer not to participate will not be penalised in any way.
5. You must conduct your research after school, and the normal school programme should be interrupted as little as possible. The principal must be consulted as to the times when you may carry out your research.

6. The names of the school, learners and educators may not appear in your dissertation without their consent.
7. Please supply the Department via the Research Unit with a bound copy of the report. You may also be requested to give a short presentation on your findings
8. Please supply the Director in whose district the school (s) is/are located with a brief summary of your findings.
9. You must obtain the consent of parents to involve their children in your research. This is the researchers responsibility.

The Department wishes you well with this project and looks forward to hearing from you in due course.

Regards

Lekhotla Mafisa
Research Unit.

GAUTENG DEPT. OF EDUCATION
HEAD OFFICE
2000 -03- 0 9
PRIVATE BAG 7710
JOHANNESBURG 2000
GAUTENG DEPT. VAN ONDERWYS

GAUTENG PROVINCIAL GOVERNMENT

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

'T DEPARTEMENT
'F VAN
HEALTH GESONDHEID

Tel: (012) 354 1560

Fax/Faks: (012) 354 1631

Ref/Verw: Ethics Committee

Enquiries/Navrae: Dr R Sommers
Ward 4 Room 19

Date : 20/10/1999

Number : S 148/99

Title : Knowledge, Beliefs, Attitudes and Practices of Schoolgoing Adolescents in Gauteng in Relation to Cancer.

Investigator : Adele Botha; Department of Community Health (Prof C B IJsselmuiden) Pretoria Academic Hospital; Pretoria.

This Protocol and Informed Consent has been considered by the Ethics Committee,Faculty of Medicine,Univ.of Pretoria and Pretoria Academic Hospitals on 20/10/1999 and found to be acceptable.

Dr J.E.Davel	(female) MBChB:Hospital Superintendent
Prof G.I. Falkson	(female)MBChB;M.Med(Int);MD;Med. Oncologist
Prof G. Falkson	CHAIRPERSON; MBChB;M.Med(Int);MD;OSG: Medical Oncologist
Mrs C Gerber	(female)BA(FineArts)(U.P)(Unisa);Architectural Draughting (Bostom House College Pta)
Prof S.V. Grey	(female)BSc(Hons)(Stell);MSc(PU vir CHO)DSc(Pret):Deputy Dean
Dr V.C.L. Karusseit	MBChB;MFGP(SA);M.Med(Chir); FCS (SA): Surgeon
Dr S.Khan	(female)MB.BCh.(Rand); Med.Adviser (Gauteng Dept.of Health).
Ms B.C F.Magardie	(female) BCur:Matron/Senior Nursing-Sister
Snr Sr J. Moerane	(female) BCur(Et.Al)Senior Nursing-Sister
Dr P.Z Nlongwe	(female)MBChB(Natal);D.P.H;DTMtH; DOH (WITS)F.F.C.H(CM) S.A.Chief Med.Super of Pretoria Academic Hospital.
Prof H.W. Pretorius	MBChB;M.Med (Psych) MD: Psychiatrist
Prof P. Rheeder	MBChB;MMed(int);LKI(SA);MSc (KLIN.EPI):Specialist Physician
Prof J.R. Snyman	MBChB,M.Pharm.Med: MD:Pharmacologist
Prof De K.Sommers	BChB; HDD; MBChB; MD: Pharmacologist
Dr R.Sommers	SECRETARIAT (female)MBChB; M.med (Int);MPhar.Med;
Prof FFW van Oosten	BA; LLB(Potch); LLD (Pret);LLD (Unisa):Head of Department of Public Law and Prof in Criminal Law and Medical Law

PROF G FALKSON MBChB; M.Med (Int);MD;CHAIRPERSON

PROF P Rheeder MBChB:MMed(Int);LKI(SA);MSc (KLIN.EPI):Specialist Physician
CHAIRPERSON of the Student Ethics Committee at P.A. H.

APPENDIX D

RESULTS

Table 1: Sample Results

Number of Schools in Sample and Response Rates

Schools	Number	Percent
Participation	76	84
No – participation		
• Refusal	9	10
• Not found	5	6
Total	90	100

Table 1 shows the response rates for the number of schools who participated in the survey, as well as the reasons for non-participation. A total of 90 schools were selected for the sample, of which 76 participated in the completion of the questionnaire. Non-response was mostly due to refusal (10%) where failure to find certain schools accounted for 6%. Two of the schools listed among the refusal group had no Grade 10s enlisted at the time that the fieldwork was being conducted.

Table 2: Description of the Sample: Number of Pupils and Age Distribution

Age	Male		Female	
	N	Percent	N	Percent
13	0	0	2	0.16
14	13	1.4	38	3.0
15	187	19.5	389	30.7
16	303	31.6	446	35.2
17	190	19.8	171	13.5
18	123	12.8	121	9.6
19	63	6.6	62	4.9
20	55	5.7	21	1.7
21	15	1.6	10	0.8
22	8	0.8	4	0.3
23	0	0	3	0.2
24	1	0.1	0	0
Total	958	100	1267	100

Table 3: **Number of Pupils in Different Types of Schools Who Participated in the Survey**

Types of Schools	Male		Female		Total
	N	Percent	N	Percent	
DET	505	22.7	616	27.8	1120
TED	293	13.2	370	16.7	663
HOR	18	0.8	35	1.6	53
HOD	21	0.9	19	0.9	40
IO	116	5.2	225	10.1	340
Total	**953**	**43.0**	**1265**	**57.0**	**2218**

Table 4: Number and Percent of Pupils Who Have Received Cancer Knowledge and Have a Family History of Cancer

	Males			Female			Total		
	N	%	Rank	N	%	Rank	N	%of the total sample	Chi-square
CANCER HISTORY	179	19.4		327	26.8		506	23.6	16.0***
CANCER INFORMATION	403	43.7		638	52.3		1041	48.6	15.3***
Television	310	32.4	1	470	37.1	1	780	34.8	6.04*
Parents	153	15.9	2	279	22.0	2	432	19.2	13.4***
Magazines	89	9.3	6	198	15.7	3	287	12.8	20.1***
Other family	102	10.6	3	168	13.3	4	270	12.0	3.8
School	97	10.1	5	166	13.1	5	263	11.7	4.9*^
Hospital or doctor	98	10.2	4	145	11.5	6	243	10.8	0.9
Radio	82	8.6	7	129	10.2	7	211	9.4	1.8
Other	71	7.4	9	104	8.2	9	175	7.8	0.5
Books	51	5.3	11	123	9.7	8	174	7.8	15.0***
Newspapers	78	8.1	8	85	6.7	10	163	7.2	1.5
Friends	63	6.6	10	79	6.2	11	142	6.3	0.08
Cigarette box	48	5.0	12	26	2.1	12	74	3.3	14.5***
Internet	8	0.8	13	7	0.6	13	15	0.7	0.6
CANSA	3	0.3	14	6	0.8	14	9	0.4	0.9

*p = 0.01
*^p = 0.03
**p < 0.01
***p < 0.001

Table 5: **Different Types of Cancer Listed Among Grade 10 Pupils**
The following table was compiled in response to the question: What type of cancers do you know about? (See Appendix B for questionnaire)

Cancer Type	Male		Female		Chi-square
	N	Percent	N	Percent	
Breast	541	55.8	977	76.5	108.1***
Lung	571	58.9	812	63.6	5.2^^
Skin	555	57.2	747	58.4	0.4
Head and neck	192	19.8	301	23.6	4.6*^
Other					
Leukemia	81	8.4	197	15.4	25.5***
Cervix	97	9.9	175	13.7	8.8*
Central Nervous System	98	10.1	169	13.2	5.2^^
Abdominal (e.g. kidneys liver pancreas)	85	8.8	156	12.2	6.9**
Prostate	73	7.5	69	5.4	4.2^^*
Bone	26	2.7	35	2.7	1.3
Colon	14	1.4	27	2.1	1.4^^
Ovarian	1	0.1	22	1.7	14.2***
Lymphatic	5	0.5	17	1.3	3.7
Esophagus	4	0.4	7	0.5	1.5
Metastases	2	0.2	5	0.4	2.7

*p = 0.01
^^p = 0.02
*^p = 0.03
**p < 0.01
***p < 0.001

Table 6 1: Practices of Pupils Regarding Smoking and Use of Sunblock

	Male				Female				Response Rate		Chi-square
	Yes		No		Yes		No				
	N	%	N	%	N	%	N	%	N	%	
Smoking	253	26.9	689	73.1	136	10.9	1102	89.0	2180	95.7	91.9***
Sunblock	313	34.0	608	66.0	506	41.7	706	58.3	2133	93.6	13.3***

***p < 0.001

Table 6.2: Number of Cigarettes Smoked by Pupils

Number smoked per day	Male		Female		Total	
	N	%	N	%	N	%
None	691	72.1	1093	86.2	1784	78.2
1 – 5	95	9.9	75	5.9	170	7.5
6 – 12	97	10.1	32	2.5	129	5.7
13 – 25	35	3.7	13	1.0	48	2.1
26 and up	6	0.6	3	0.2	9	0.4

Table 7: **Average Scores and Standard Deviations for the Signs and Symptoms of Cancers**

Type of Cancer	m	sd
Skin	2.7	1.7
Breast	2.9	1.6
Cervix	2.2	1.7
Head and Neck	2.6	1.7
Lung	3.0	1.4

Table 8: **Average Scores and Standard Deviations for the Aetiology of Cancers**

Type of Cancer	m	sd
Skin	3.1	1.7
Breast	2.6	1.5
Cervix	3.1	1.8
Head and Neck	3.3	1.8
Lung	4.0	1.9

Table 9: Average Knowledge Scores, Standard Deviations and t-tests by Gender for the Signs and Symptoms of Cancer

Signs and Symptoms	Males		Females		T test
	m	sd	m	sd	
Skin cancer	2.6	1.7	2.7	1.7	0.9
Breast cancer	2.5	1.6	3.2	1.5	10.7***
Cervical cancer	2.0	1.7	2.3	1.8	2.9**
Head and Neck cancer	2.7	1.7	2.6	1.6	1.8
Lung cancer	2.9	1.5	3.0	1.4	1.9

Table 10: Average Knowledge Scores, Standard Deviations and t-tests by Gender for the Aetiology of Cancer

Aetiology	Males		Females		T test
	m	sd	m	sd	
Skin cancer	3.0	1.8	3.2	1.7	3.5***
Breast cancer	2.4	1.6	2.8	1.4	7.0***
Cervical cancer	2.9	1.8	3.3	1.8	0.8
Head and Neck cancer	3.3	1.8	3.9	2.0	2.9**
Lung cancer	3.9	2.0	4.1	1.9	3.0**

*p = 0.01
^^p = 0.02
*^p = 0.03
**p < 0.01
***p < 0.001

Table 11: Average Knowledge Scores, Standard Deviations and t-tests by Information for the Signs and Symptoms of Cancer

Signs and Symptoms	Cancer Information Received		No Cancer Information Received		T test
	m	sd	m	sd	
Skin cancer	2.9	1.6	2.4	1.7	6.8***
Breast cancer	3.2	1.6	2.6	1.6	7.7***
Cervical cancer	2.3	1.8	2.0	1.7	4.3***
Head and Neck cancer	2.8	1.6	2.4	1.7	4.6***
Lung cancer	3.1	1.4	2.9	1.4	3.2**

Table 12: Average Knowledge Scores, Standard Deviations and t-tests by Information for the Aetiology of Cancer

Aetiology	Cancer Information Received		No Cancer Information Received		T test
	m	sd	m	sd	
Skin cancer	3.4	1.7	2.9	1.7	6.7***
Breast cancer	2.9	1.5	2.4	1.5	6.5***
Cervical cancer	3.3	1.8	3.0	1.8	2.9**
Head and Neck cancer	3.4	1.7	3.2	1.8	2.5^^
Lung cancer	4.3	1.9	3.7	1.9	6.8***

*p = 0.01
^^p = 0.02
*^p = 0.03
**p < 0.01
***p < 0.001

Table 13: Average Knowledge Scores, Standard Deviations and t-tests by History for the Signs and Symptoms of Cancer

Signs and Symptoms	History of Cancer		No History of Cancer		T test
	m	sd	m	sd	
Skin cancer	3.2	1.6	2.5	1.7	8.2***
Breast cancer	3.4	1.5	2.8	1.6	7.2***
Cervical cancer	2.4	1.8	2.1	1.7	4.0***
Head and Neck cancer	2.7	1.7	2.6	1.7	1.2
Lung cancer	3.3	1.3	2.9	1.4	6.0***

Table 14: Average Knowledge Scores, Standard Deviations and t-tests by History for the Aetiology of Cancer

Aetiology	History of Cancer		No History of Cancer		T test
	m	sd	m	sd	
Skin cancer	3.9	1.6	2.9	1.7	12.7***
Breast cancer	3.0	1.4	2.5	1.5	6.7***
Cervical cancer	3.3	1.8	3.1	1.8	1.6
Head and Neck cancer	3.5	1.7	3.2	1.8	2.8**
Lung cancer	4.8	1.8	3.8	1.9	11.1***

*p = 0.01
^^p = 0.02
*^p = 0.03
**p < 0.01
***p < 0.001

Table 15: Average Knowledge Scores, Standard Deviations and t-tests by Different Types of Schools for the Signs and Symptoms of Cancer

Signs and Symptoms	DET		TED		HOR		HOD		IO		F test
	m	sd	m	sd	m	sd	m	sd	m	sd	
Skin cancer	2.4	1.7	3.1	1.6	2.0	1.5	1.6	1.5	2.7	1.8	19.2***
Breast cancer	2.7	1.5	3.3	1.6	2.5	1.6	1.8	1.7	3.0	1.7	23.3***
Cervical cancer	2.1	1.7	2.3	1.8	2.0	1.7	0.9	1.5	2.1	1.8	5.6***
Head and Neck cancer	2.7	1.6	2.7	1.7	2.4	1.7	2.1	1.6	2.4	1.7	2.9^^
Lung cancer	2.8	1.4	3.2	1.4	2.7	1.3	2.4	1.4	3.0	1.4	9.1***

Table 16: Average Knowledge Scores, Standard Deviations and t-tests by Different Types of Schools for the Aetiology of Cancer

Aetiology	DET		TED		HOR		HOD		IO		F test
	m	sd	m	sd	m	sd	m	sd	m	sd	
Skin cancer	2.6	1.6	3.9	1.6	2.5	1.5	1.5	1.2	3.4	1.7	78.7***
Breast cancer	2.4	1.5	3.0	1.5	2.1	1.5	1.2	1.4	2.7	1.4	25.1***
Cervical cancer	3.1	1.7	3.3	1.8	2.8	1.6	1.6	1.6	3.1	1.9	9.7***
Head and Neck cancer	3.2	1.8	3.4	1.7	3.2	2.0	2.0	1.7	3.4	1.8	10.7***
Lung cancer	3.4	1.7	4.8	1.9	3.9	1.8	2.3	1.5	4.4	1.8	73.3***

*p = 0.01
^^p = 0.02
*^p = 0.03
**p < 0.01
***p < 0.001

Table 17: Average Knowledge Scores, Standard Deviations and t-tests by Smoking for the Signs and Symptoms of Cancer

Signs and Symptoms	Do Smoke		Don't Smoke		T test
	m	sd	m	sd	
Skin cancer	2.8	1.6	2.6	1.7	1.9
Breast cancer	2.9	1.7	2.9	1.6	0.5
Cervical cancer	2.2	1.8	2.1	1.7	0.4
Head and Neck cancer	2.7	1.7	2.6	1.7	1.0
Lung cancer	3.2	1.4	2.9	1.4	4.2

Table 18: Average Knowledge Scores, Standard Deviations and t-tests by Smoking for the Aetiology of Cancer

Aetiology	Do Smoke		Don't Smoke		T test
	m	sd	m	sd	
Skin cancer	3.4	1.7	3.1	1.7	3.0**
Breast cancer	2.7	1.6	2.6	1.5	0.6
Cervical cancer	3.2	1.8	3.1	1.8	0.3
Head and Neck cancer	3.4	1.9	3.3	1.8	0.9
Lung cancer	4.3	1.9	4.0	1.9	3.6***

*p = 0.01
^^p = 0.02
*^p = 0.03
**p < 0.01
***p < 0.001

Table 19: Average Knowledge Scores, Standard Deviations and t-tests by Use of Sunblock for the Signs and Symptoms of Cancer

Signs and Symptoms	Use Sunblock		Don't Use Sunblock		T test
	m	sd	m	sd	
Skin cancer	3.0	1.6	2.4	1.7	7.6***
Breast cancer	3.1	1.5	2.8	1.7	5.0***
Cervical cancer	2.3	1.8	2.1	1.7	2.0^^*
Head and Neck cancer	2.7	1.7	2.6	1.7	1.8
Lung cancer	3.2	1.3	2.8	1.4	5.8***

Table 20: Average Knowledge Scores, Standard Deviations and t-tests by Use of Sunblock for the Aetiology of Cancer

Aetiology	Use Sunblock		Don't Use Sunblock		T test
	m	sd	m	sd	
Skin cancer	3.6	1.6	2.8	1.7	10.0***
Breast cancer	2.9	1.5	2.5	1.5	5.0***
Cervical cancer	3.3	1.8	3.1	1.8	2.7**
Head and Neck cancer	3.4	1.7	3.3	1.8	1.6
Lung cancer	1.4	1.9	3.8	1.9	6.6***

*p = 0.01
^^p = 0.02
*^p = 0.03
**p < 0.01
***p < 0.001

Table 21: Signs and Symptoms of Skin Cancer

	Responded						Response Rate	
	Yes		No		Don't know			
	N	%	N	%	N	%	N	%
True Statements:								
1) Change colour of scar or mole	994	45.4	314	14.3	1162	53.0	2189	96.0
2) Change in size or shape of scar or mole	897	41.2	347	16.0	881	40.2	2175	95.5
3) Nodular mass (rounded lump on the skin)	745	34.0	284	13.0	931	42.8	2191	96.1
4) Ulceration of the skin(open sore on the skin)	707	32.7	489	22.6	966	44.7	2162	94.9
5) Persistent itching	530	24.4	446	20.5	1200	55.1	2176	95.5
False statements:								
1) Unexpected hair growth	477	21.8	816	37.3	896	89	2189	96.1
2) A wound that won't stop bleeding when injured	573	26.3	620	28.5	984	101	2177	95.6
3) No feeling on the skin (numb skin)	561	25.4	536	24.2	1115	66	2212	97.1

Table 22: Signs and Symptoms of Breast Cancer

	Responded						Response Rate	
	Yes		No		Don't know			
	N	%	N	%	N	%	N	%
True statements:								
1) Pain in the breast	1453	65.8	254	11.5	500	22.7	2207	96.9
2) Hard knob in one or both breasts	1416	64.1	219	9.9	573	26.0	2208	97.0
3) More than one knob in the breast	857	39.3	352	16.1	974	44.6	2196	96.4
4) Discharge from nipple (leaking nipple)	552	25.2	367	16.8	1270	58.0	2189	96.1
5) Skin dimpling over breast area (like orange peel)	521	23.6	387	17.6	1297	58.8	2205	96.8
False statements:								
1) No feeling in the breast	550	25	694	31.6	952	43.4	2196	96.4
2) The one breast being slightly larger than the other	837	38.3	529	24.2	822	37.6	2188	96.0
3) Little red spots on the breast	837	38.1	358	16.3	1004	45.7	2199	96.5

Table 23: Signs and Symptoms of Cervical Cancer

	Responded						Response Rate	
	Yes		No		Don't know			
	N	%	N	%	N	%	N	%
True statements:								
1) Pain in the groin area	837	38.2	291	13.3	1065	48.6	2193	96.3
2) Continuous infection (regular disease)	779	35.5	299	13.6	1116	50.9	2194	96.3
3) Irregular bleeding	735	33.4	295	13.4	1173	53.2	2203	96.7
4) Blood stained discharge (fluid flowing from the cervix)	719	32.8	298	13.6	1172	53.5	2189	96.1
5) Irregular menstrual cycle	596	26.0	376	17.2	1246	56.9	2191	96.2
False statements:								
1) Itching of skin	622	28.5	421	19.3	1141	52.2	2184	95.9
2) Urinary frequency and pain (wanting to go to the toilet often)	822	37.4	366	16.7	1007	45.9	2195	96.4
3) Hair loss over the groin area	720	32.6	330	15.0	1156	52.4	2206	96.8

Table 24: Signs and Symptoms of Head and Neck Cancer

	Responded						Response Rate	
	Yes		No		Don't know			
	N	%	N	%	N	%	N	%
True statements:								
1) Local pain in the head and neck area	1285	58.6	287	13.1	619	28.3	2191	96.2
2) Difficulty in swallowing	877	40.1	364	16.7	945	43.2	2186	96.0
3) Persistent hoarseness (rough husky voice)	823	37.7	381	17.5	979	44.8	2183	95.8
4) Swelling or ulcer (open sore) that fails to heal in the mouth	733	33.5	313	14.3	1141	52.2	2187	96.0
5) Bloody discharge from nose	613	28.1	424	19.5	1141	52.4	2178	95.6
False statements:								
1) Memory loss	826	37.6	508	23.2	860	39.2	2194	96.3
2) Not being able to keep your head up	633	28.7	479	21.7	1094	46.4	2206	95.9
3) Loss of taste	704	32.2	467	21.4	1013	49.6	2184	96.8

Table 25: The Signs and Symptoms of Lung Cancer

	Responded						Response Rate	
	Yes		No		Don't know			
	N	%	N	%	N	%	N	%
True statements:								
1) Shortness of breath	1652	74.8	232	10.5	324	14.7	2208	96.9
2) Persistent cough	1488	67.5	201	9.1	515	23.4	2204	96.8
3) Hoarse voice or no voice	964	43.9	435	19.8	798	36.3	2197	96.4
4) Chest infection that fails to cure after using antibiotics	771	35.3	275	12.6	1139	52.1	2185	95.9
5) Pain in your shoulder and arm	561	25.6	615	28.0	1019	46.4	2195	96.4
False statements:								
1) Red patches on the skin over chest area	525	23.9	509	23.2	1161	52.9	2195	96.4
2) Not being able to hold your breath for very long	1331	60.1	287	13.0	595	26.9	2213	97.1
3) Chest pain after cardio-vascular exercise	1281	58.5	262	12.0	646	29.5	2185	96.1

Table 26: Aetiology of Skin Cancer

	Responded						Response Rate	
	Yes		No		Don't know			
	N	%	N	%	N	%	N	%
True statements:								
1) Exposure to sunlight	1584	71.2	244	11.0	396	17.8	2224	97.6
2) Scar tissue that changes	710	32.4	424	19.8	1056	48.2	2190	96.1
3) Inheritance from your parents	681	30.9	645	29.3	877	39.8	2203	96.7
4) Exposure to x-rays	546	24.9	675	30.8	974	44.4	2195	96.4
5) Use of steroids	373	17.0	495	22.5	1328	60.5	2196	96.4
False statements:								
1) Swimming in public swimming pools	549	24.9	1132	51.3	524	23.8	2205	96.8
2) Not washing with soap	377	17.0	1128	50.9	713	32.1	2218	96.1
3) Use of excessive tanning oil	692	31.6	675	30.8	822	37.6	2189	97.4

Table 27: Aetiology of Breast Cancer

	Responded						Response Rate	
	Yes		No		Don't know			
	N	%	N	%	N	%	N	%
True statements:								
1) Family History of breast cancer (mother, sister or grandmother)	1165	52.6	513	23.2	535	24.5	2213	97.1
2) Continuous use of high doses of hormone treatments	600	27.4	351	16.0	1239	56.6	2190	96.1
3) Having your first baby after the age of 30 or having no children at all	440	20.0	766	34.8	995	45.2	2201	96.6
4) By being overweight	338	15.4	967	44.1	890	40.5	2195	96.4
5) Early menstruation	258	11.8	927	42.2	1010	46.6	2195	96.4
False statements:								
1) Having small breasts	192	8.8	1284	58.7	713	32.6	2189	96.1
2) By breast-feeding your baby	355	16.2	1158	52.9	677	30.9	2190	96.1
3) Having plastic surgery to enlarge your breasts	667	30.5	549	25.1	968	44.3	2184	95.9

Table 28: Aetiology of Cervical Cancer

	Responded						Response Rate	
	Yes		No		Don't know			
	N	%	N	%	N	%	N	%
True statements:								
1) Having sexually transmitted diseases	1048	47.9	353	16.1	785	35.9	2186	96.0
2) Multiple sexual partners	1009	45.9	403	18.3	785	35.7	2197	96.4
3) Smoking	862	39.4	663	30.3	663	30.3	2188	96.0
4) Sexual intercourse from a young age	763	34.8	523	23.9	905	41.3	2191	96.2
5) Multiple pregnancies	284	13.0	698	31.9	1205	55.1	2187	96.0
False statements:								
1) Wearing nylon underwear	222	10.1	1065	48.4	912	41.5	2199	96.5
2) Not having any children	210	9.5	967	43.9	1028	46.6	2205	96.8
3) Masturbation	308	14.1	872	39.9	1007	46.0	2187	96.0

Table 29: Aetiology of Head and Neck Cancer

	Responded						Response Rate	
	Yes		No		Don't know			
	N	%	N	%	N	%	N	%
True statements:								
1) Smoking	1223	55.8	421	19.2	548	25.0	2192	96.2
2) Using "snuff"	974	44.3	484	22.0	739	33.6	2185	95.9
3) Excessive use of alcohol	889	40.9	474	21.8	811	37.3	2174	95.4
4) Inhaling wooddust	607	27.8	486	22.3	1087	49.9	2180	95.7
5) Not looking after your teeth e.g. regular brushing	375	17.0	1137	51.5	969	31.5	2208	96.9
False statements:								
1) Eating lots of sweets	266	12.1	1183	53.9	745	34.0	2194	96.3
2) Excessive use of toothpaste	329	15.1	1101	50.4	755	34.6	2197	96.4
3) Not blowing your nose regularly	357	16.2	903	41	945	42.9	2205	96.8

Table 30: Aetiology of Lung Cancer

	Responded						Response Rate	
	Yes		No		Don't know			
	N	%	N	%	N	%	N	%
True statements:								
1) Smoking	1960	88.2	153	6.9	108	4.9	2221	97.5
2) Environmental factors such as mining asbestos, nickel and chrome	1059	48.2	237	10.8	901	41.0	2197	96.4
3) Family History of lung cancer (genetic factors)	907	41.3	503	22.9	786	35.8	2196	96.4
4) Drinking alcohol	903	41.2	637	29.0	652	29.7	2193	96.3
False statements:								
1) Holding your breath for very long times	326	14.8	1167	53.1	704	32.0	81	3.6
2) Not wearing protective clothing after exercise	337	15.4	1111	50.9	736	33.7	94	4.1
3) Not doing cardio-vascular exercise 3 times a week	253	11.6	904	41.3	1031	47.1	90	4.0
4) Not following a healthy diet	632	28.6	705	31.9	869	39.4	71	3.1

Table 31: Signs and Symptoms of Skin Cancer – Analysis of Variance

Source	df	MS	F	p-value
Cancer History	1	152.6	54.5	<0.001
Sunblock	2	125.4	45.6	<0.001
Cancer Information	3	109.5	40.5	<0.001
Age	4	90.0	33.5	<0.001

Table 32: Signs and Symptoms of Breast Cancer – Analysis of Variance

Source	df	MS	F	p-value
Gender	1	283.4	114.8	<0.001
Cancer Information	2	206.0	85.9	<0.001
Cancer History	3	158.3	70.0	<0.001
Age	4	122.8	52.1	<0.001
Sunblock	5	100.8	42.9	<0.001

Table 33: Signs and Symptoms of Cervical Cancer – Analysis of Variance

Source	df	MS	F	p-value
Cancer Information	1	71.2	24.2	<0.001
Cancer History	2	52.1	17.8	<0.001
Gender	3	39.2	13.4	<0.001

Table 34: Signs and Symptoms of Head and Neck Cancer – Analysis of Variance

Source	df	MS	F	p-value
Cancer Information	1	56.6	20.5	<0.001
School	2	42.1	15.3	<0.001

Table 35: Signs and Symptoms of Lung Cancer – Analysis of Variance

Source	df	MS	F	p-value
Cancer History	1	66.3	34.8	<0.001
Sunblock	2	49.2	26.1	<0.001
Smoking	3	39.2	20.8	<0.001
Age	4	32.9	17.6	<0.001
Cancer Information	5	28.5	15.3	<0.001

**df* - *degrees of freedom*

MS - *Mean Square*

F - *F-test*

Table 36: Aetiology of Skin Cancer – Analysis of Variance

Source	df	MS	F	p-value
Cancer History	1	358.8	134.2	<0.001
Sunblock	2	253.3	97.7	<0.001
Age	3	200.6	78.9	<0.001
Cancer Information	4	163.1	64.9	<0.001
School	5	138.4	55.5	<0.001
Smoking	6	117.6	47.2	<0.001

Table 37: Aetiology of Breast Cancer – Analysis of Variance

Source	df	MS	F	p-value
Cancer Information	1	112.1	49.8	<0.001
Gender	2	98.2	44.5	<0.001
Cancer History	3	82.4	37.8	<0.001
Age	4	70.2	32.5	<0.001
Sunblock	5	58.6	27.2	<0.001

Table 38: Aetiology of Cervical Cancer – Analysis of Variance

Source	df	MS	F	p-value
Gender	1	79.5	25.2	<0.001
Cancer Information	2	60.2	19.2	<0.001

Table 39: Aetiology of Head and Neck Cancer – Analysis of Variance

Source	df	MS	F	p-value
Cancer Information	1	28.6	9.1	<0.01

Table 40: Aetiology of Lung Cancer – Analysis of Variance

Source	df	MS	F	p-value
Age	1	385.1	112.7	<0.001
Cancer History	2	310.6	94.4	<0.001
Cancer Information	3	239.9	74.1	<0.001
School	4	199.4	62.4	<0.001
Sunblock	5	166.8	52.5	<0.001
Smoking	6	144.6	45.7	<0.001

**df* - *degrees of freedom*

MS - *Mean Square*

F - *F-test*

Table 41: **Adjusted Mean Scores (am), Standard Errors (se) and F Tests for Signs and Symptoms of Skin Cancer, Breast Cancer, Cervical Cancer, Head and Neck Cancer and Lung Cancer by Gender – Multiple Analysis of Co-Variance**

Cancers	Male		Female		
	am	se	am	se	F
Skin	2.7	0.1	2.7	0.1	1.0
Breast	2.6	0.1	3.2	0.1	59.9***
Cervical	2.0	0.1	2.2	0.1	1.6
Head and Neck	2.7	0.1	2.5	0.1	5.9^^
Lung	2.9	0.1	3.0	0.1	0.9

Table 42: **Adjusted Mean Scores (am), Standard Errors (se) and F Tests for Signs and Symptoms of Skin Cancer, Breast Cancer, Cervical Cancer, Head and Neck Cancer and Lung Cancer by Cancer Information – Multiple Analysis of Co-Variance**

Cancers	Cancer Information Received		No Cancer Information Received		
	am	se	am	se	F
Skin	2.9	0.1	2.5	0.1	23.2***
Breast	3.2	0.1	2.7	0.1	35.4***
Cervical	2.3	0.1	1.9	0.1	17.3***
Head and Neck	2.8	0.1	2.4	0.1	14.8***
Lung	3.0	0.1	2.9	0.1	4.2^^*

Table 43: **Adjusted Mean Scores (am), Standard Errors (se) and F Tests for Signs and Symptoms of Skin Cancer, Breast Cancer, Cervical Cancer, Head and Neck Cancer and Lung Cancer by Cancer History – Multiple Analysis of Co-Variance**

Cancers	Cancer History		No Cancer History		
	am	se	am	se	F
Skin	3.0	0.1	2.6	0.1	21.3***
Breast	3.2	0.1	2.9	0.1	13.6***
Cervical	2.4	0.1	2.0	0.1	12.4***
Head and Neck	2.6	0.1	2.6	0.1	0.2
Lung	3.2	0.1	2.9	0.04	17.2***

*p = 0.01
^^p = 0.02
*^p = 0.03
**p < 0.01
***p < 0.001

Table 44: **Adjusted Mean Scores (am), Standard Errors (se) and F Tests for Aetiology of Skin Cancer, Breast Cancer, Cervical Cancer, Head and Neck Cancer and Lung Cancer by Gender – Multiple Analysis of Co-Variance**

Cancers	Male		Female		
	am	se	am	se	F
Skin	3.2	0.1	3.3	0.1	1.3
Breast	2.4	0.1	2.9	0.1	28.3***
Cervical	2.9	0.1	3.3	0.1	11.8*
Head and Neck	3.3	0.1	3.3	0.1	0.1
Lung	4.1	0.1	4.1	0.1	0.1

Table 45: **Adjusted Mean Scores (am), Standard Errors (se) and F Tests for Aetiology of Skin Cancer, Breast Cancer, Cervical Cancer, Head and Neck Cancer and Lung Cancer by Cancer Information – Multiple Analysis of Co-Variance**

Cancers	Cancer Information Received		No Cancer Information Received		
	am	se	am	se	F
Skin	3.4	0.1	3.1	0.1	12.6***
Breast	2.9	0.1	2.5	0.1	17.3***
Cervical	3.3	0.1	3.0	0.1	11.8**
Head and Neck	3.4	0.1	3.2	0.1	4.5*^
Lung	4.3	0.1	3.9	0.1	14.3***

Table 46: **Adjusted Mean Scores (am), Standard Errors (se) and F Tests for Aetiology of Skin Cancer, Breast Cancer, Cervical Cancer, Head and Neck Cancer and Lung Cancer by Cancer History – Multiple Analysis of Co-Variance**

Cancers	Cancer History		No Cancer History		
	am	se	am	se	F
Skin	3.8	0.1	3.0	0.1	63.2***
Breast	2.9	0.1	2.6	0.1	13.8***
Cervical	3.1	0.1	3.1	0.1	0.1
Head and Neck	3.4	0.1	3.3	0.1	3.2
Lung	4.6	0.1	3.9	0.1	43.9***

*p = 0.01
^^p = 0.02
*^p = 0.03
**p < 0.01
***p < 0.001

Table 47: Principle Components Matrix for Attitudes Towards Cancer Risks

Variables	Common Factor Loadings		Commonalties
	I	II	h^2
Going to see the doctor if you have a scar or mole that itches or changes appearance, or does not want to heal.	0.64	0.32	0.52
Following a healthy diet	0.65	0.38	0.57
Maintaining a standard weight	0.54	0.43	0.47
Breast-feeding your baby	0.52	0.33	0.38
Smoking cigarettes	0.59	-0.54	0.64
Having sex with only one partner	0.60	0.27	0.43
Having sex at a young age	0.60	-0.56	0.67
Drinking alcohol	0.63	-0.57	0.72

Table 48: Orthogonal Rotational Solution for Attitudes Towards Cancer Risks

Variables	Factors	
	I	II
Going to see the doctor if you have a scar or mole that itches or changes appearance, or does not want to heal.	0.70	----
Following a healthy diet	0.74	----
Maintaining a standard weight	0.69	----
Breast-feeding your baby	0.61	----
Smoking cigarettes		0.79
Having sex with only one partner	0.64	----
Having sex at a young age	----	0.81
Drinking alcohol	----	0.84

Table 49: Oblique Rotational Solution for Attitudes Towards Cancer Risks

Variables	Factors	
	I	II
Going to see the doctor if you have a scar or mole that itches or changes appearance, or does not want to heal.	0.70	----
Following a healthy diet	0.75	----
Maintaining a standard weight	0.71	----
Breast-feeding your baby	0.62	----
Smoking cigarettes		-0.80
Having sex with only one partner	0.63	----
Having sex at a young age	----	-0.82
Drinking alcohol	----	-0.85

Figure 1

1. Go and see the doctor if you have a scar or mole that itches, changes appearance or does not want to heal
2. Having sex with only one partner
3. Following a healthy diet
4. Maintaining a standard weight
5. Breast-feeding your baby
6. Oral hygiene
7. Avoid sunlight and tanning
8. Smoking cigarettes
9. Having sex at a young age
10. Drinking alcohol

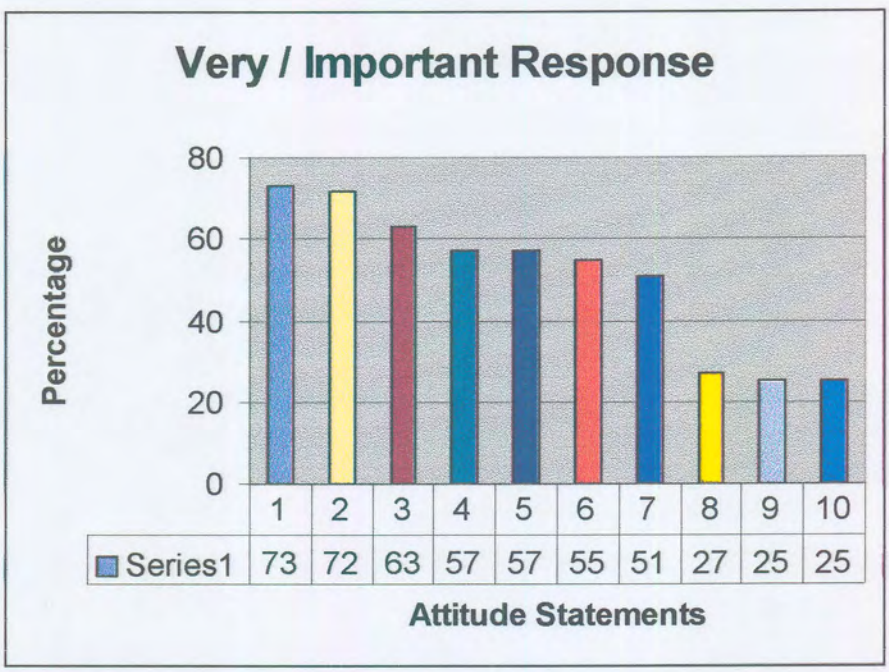


Figure 2

1. Go and see the doctor if you have a scar or mole that itches, changes appearance or does not want to heal
2. Following a healthy diet
3. Having sex with only one partner
4. Maintaining a standard weight
5. Oral hygiene
6. Avoid sunlight and tanning
7. Breast-feeding your baby
8. Having sex at a young age
9. Smoking cigarettes
10. Drinking alcohol