

**The psychological implications of creative activities: an
investigation into how painting affects stress levels.**

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TABLE OF CONTENTS

LIST OF TABLES	6
LIST OF FIGURES	7
SUMMARY	8
CHAPTER 1: INTRODUCTION	9
CHAPTER 2: LITERATURE REVIEW	12
2.1 STRESS	12
2.1.1 Defining stress	12
2.1.2 Theories and models of stress	13
2.1.2.1 The origin of the stress concept	14
2.1.2.2 Cannon's flight or fight response	15
2.1.2.3 Hans Selye's General Adaptation Model	15
2.1.2.4 Lazarus' cognitive appraisal model	18
2.1.3 The relationship between Stress and Anxiety	20
2.1.4 A comparison of different views of stress	20
2.1.5 Patients and stress in hospitals	21
2.1.6 Objective and subjective stress	23
2.2 CREATIVITY	23
2.2.1 Creativity and self-actualization	24
2.2.2 Creativity and cognitive psychology	24
2.3 ART THERAPY	26
2.3.1 The origins of Art therapy	27
2.3.2 Jung and other theorists promote art therapy	28
2.3.3 The scientific status of art therapy	28
2.3.4 The possible benefits of creative activities and reasons thereof	32
2.3.5 Finding flow: creativity as the means of achieving optimal human functioning	33
2.3.6 Possible negative effects of artistic creation	38
2.4 CONCEPTUALISATION	38
2.5 CONCLUSION	39
CHAPTER 3: MEASUREMENT INSTRUMENT	40

3.1 INTRODUCTION TO THE USE OF SELF-REPORT INSTRUMENTS	40
3.1.1 Reasons for using self-report instruments for this study	40
3.1.2 Potential problems with self-report instruments	40
3.2 THE SYMPTOM CHECKLIST (SCL-90-R)	42
3.2.1 Introduction to the SCL-90-R	42
3.2.2 Sub-scales of the SCL-90-R	44
3.2.3 Validity and reliability of SCL-90-R	48
3.2.4 Administration of the SCL-90-R	49
3.3 THE MINI-MENTAL STATUS EXAM	50
3.3.1 Introduction to the MMSE	50
3.3.2 Validity and reliability of the MMSE	51
3.3.3 Administration of the MMSE	51
3.4 CONCLUSION	54
CHAPTER 4: METHODOLOGY	55
4.1 INTRODUCTION TO METHODOLOGY	55
4.2 HYPOTHESIS	55
4.3 QUASI-EXPERIMENTAL DESIGN	56
4.3.1 Introduction to the quasi-experimental design	56
4.3.2 Type of quasi-experimental design used in this study	58
4.3.3 Validity issues	60
4.3.4 Conclusion	62
4.4 PARTICIPANTS AND DATA COLLECTION	62
4.4.1 Procedure/data collection	63
4.4.2 Small sample studies	62
4.5 DATA ANALYSIS	65
4.6 THE IMPLEMENTATION OF THE CREATIVITY RESEARCH DESIGN AND THREATS TO VALIDITY	66
4.6.1 Practical aspects of the data gathering	66
4.6.2 Evaluation of the study's validity	67
4.7 CONCLUSION	70
CHAPTER 5: RESULTS	71
5.1 SAMLE: EXPERIMENTAL SAMPLE	71
5.1.1 Mini-Mental Status Exam: descriptive statistics of the	



experimental sample	71
5.1.2 SCL-90-R: descriptive statistics of the experimental sample	77
5.2 SAMPLE: CONTROL GROUP	84
5.2.1 Mini-Mental Status Exam: descriptive statistics of the control sample	84
5.2.2 SCL-90-R: descriptive statistics of the control sample	90
5.3 INTERVENTION	91
5.4 CONCLUSION	93
CHAPTER 6: DISCUSSION OF RESULTS	94
6.1 MMSE RESULTS DISCUSSION	94
6.2 SCL-90-R RESULTS DISCUSSION	94
6.3 IMPROVING THE METHODOLOGY	95
6.4 LACK OF STATISTICAL SIGNIFICANCE	96
6.5 THE PATIENTS' EXPERIENCE OF THE CREATIVITY	97
6.6 CONCLUSION	99
REFERENCES	100
ANNEXURES	109

LIST OF TABLES

Table 1:	A brief comparison of the three main stress models	21
Table 2:	Summary of potential problems with self-report measures	41
Table 3:	Norm scores of the MMSE	53
Table 4:	A comparison between true experiments, quasi-experiments and non-experimental methods	58
Table 5:	A diagram of testing procedures:	59
Table 6:	Evaluation of the external validity of creativity and stress study	67
Table 7:	Evaluation of the internal validity of creativity and stress study	68
Table 8:	Evaluation of the overall validity of creativity and stress study	69
Table 9:	Subscale scores for the MMSE: total group before choice of experimental group	76
Table 10:	MMSE totals for experimental group	77
Table 11:	Statistics for scales of SCL-90-R: first score experimental group	83
Table 12:	Statistics for scales of SCL-90-R: second score experimental group	83
Table 13:	Total Statistics for scales of SCL-90-R: experimental group	84
Table 14:	Subscale scores for the MMSE: Control group	88
Table 15:	MMSE totals for control group	89
Table 16:	Statistics for scales of SCL-90-R: control group	90
Table 17:	Statistics for experimental group: paired samples statistics	92
Table 18:	Statistics for experimental group: paired samples statistics, first and second score	92
Table 19:	Statistics for experimental group: paired samples test	92
Table 20:	Statistics for comparing experimental group and control group: independent samples statistics	93

LIST OF FIGURES

Figure 1:	A comparison between stress in physics and stress in psychology	14
Figure 2:	Hans Selye's General Adaptation Syndrome	17
Figure 3:	A Representation of how appraisal may function	19
Figure 4:	Elements required for creative functioning	25
Figure 5:	A representation of when flow is achieved	36
Figure 6:	An illustration of the proposed concepts	39
Figure 7:	A summary of studies on the SCL-90-R's validity	48
Figure 8:	Picture to be copied by patient during administration of MMSE	53
Figure 9:	A diagram of decision making when analysing data	65
Figure 10:	MMSE scores of patients	71
Figure 11:	The period of time of hospitalized: total group	72
Figure 12:	Type of injury: Total group before selection for experimental group	73
Figure 13:	Level of education: total group	73
Figure 14:	Age categories: total group	74
Figure 15:	Racial distribution: total group	75
Figure 16:	Gender distribution: total group	75
Figure 17:	Mean scores for the MMSE subscales: total group	76
Figure 18:	Time hospitalized for experimental group	78
Figure 19:	Level of education: experimental group	79
Figure 20:	Age categories: experimental group	79
Figure 21:	Racial distribution: experimental group	80
Figure 22:	Gender distribution: experimental group	80
Figure 23:	Period of time hospitalized: experimental group	81
Figure 24:	Type of injury: experimental group	81
Figure 25:	SCL-90-R scores for experimental group	82
Figure 26:	Level of education: control group	85
Figure 27:	Age categories: control group	85
Figure 28:	Racial distribution: control group	86
Figure 29:	Gender distribution: control group	86
Figure 30:	Type of injury: control group	87
Figure 31:	Period of time hospitalized: control group	87
Figure 32:	MMSE scales for control group	89
Figure 33:	SCL-90-R scores for control group	90
Figure 34:	A patient unable to use her hands painting with a caste	98
Figure 35:	Patient with limited muscular control painting	98
Figure 36:	Some of the art produced by the patients	99

SUMMARY

The research aimed to investigate the effects of creative activity on stress and anxiety levels. The reasons for this proposed direction of study was to investigate the reasons for reported success in art therapy (thus strengthening its standing in the scientific psychological community), to examine whether creative activities could be used to benefit the mental well-being of people in general and to study the link between creativity and mental well-being. This was accomplished through the following means: Patients from MuelMed hospital's rehabilitation centre took part in a creative intervention. Patients took the SCL-90-R before painting for about an hour and then filled in the SCL-90-R again. A control group was also selected who also filled in the SCL-90-R to ascertain their stress levels. The mean score's of the two groups was compared as well as the before and after scores of the experimental group. The MMSE (Mini Mental Status Exam) was used to screen patients, so that only those patients cognitively capable of participating in the study took part in the experiment. For the most part the MMSE was a useful tool to screen patients. In the experimental group, there was no statistically significant difference between the before and after scores on the SCL-90-R. Because the experimental group showed no difference, only one measure of the control group was taken, which also did not differ significantly from the scores of the experimental group. Reasons for the lack of statistical significance is discussed, and may be due to a lack of reported initial stress levels. Despite the lack of a statistically significant findings, it is suggested that further studies be conducted to establish the role creativity plays in mental well-being.

CHAPTER 1

INTRODUCTION

Stress and anxiety are widely researched topics as are the potential ways to alleviate them (see Edworthy, 2000; Kaplan & Saccuzzo, 2005; Rice, 1998; Sanderson, 2004). Yet the possibility of utilising creativity as a way to relax and alleviate the psychological and physiological repercussions of stress and anxiety remain uninvestigated. Such investigations would be both theoretically enlightening and would go some way towards aiding our understanding of the role creativity plays in mental health. Whether this role is constructive or negative remains vague and various theorists often use their own biases to make such decisions, not relying on empirical evidence (Stanovich, 1997). The research conducted in this study is a small-scale investigation of the role that creativity plays in the experience of stress and anxiety in a hospital setting.

Life in modern day South Africa is both demanding and stressful (McGregor, 2003; Reid & Vogel, 2006; Venage, 2004). Stressors to be faced include climate stressors (many of which are related to Global warming, such as floods), HIV/AIDS, competitive work environments, high crime rates and political instability (Reid & Vogel, 2006).

Finding ways to cope and relax in this environment is pivotal to not only to our survival but also to our growth as individuals. With many therapies offered to the modern South African consumer, the question of art therapy's efficacy and reasons thereof remains poorly examined. If it is indeed a powerful therapeutic tool, discovering its scientific properties would help establish its legitimacy and encourage its use. It is important to investigate the scientific validity of any form of therapy to protect the scientific status of psychology and prevent the use of ineffectual methods (Stanovich, 1997). It is also important to consider the context of art therapy in South Africa as socio-cultural factors may affect its applicability. The main objective of this research was to investigate the correlation between art therapy and lowering of stress and anxiety levels.

The patients at MuelMed rehabilitation centre receive physiotherapy to facilitate recovery from injuries (sustained through accident or otherwise) or debilitating nerve illnesses. Having sustained injuries of such magnitude or suffering from debilitating illnesses is not only severely stressful in of itself, but the hospital environment can also be very stressful to patients (Forshaw, 2002; Kent & Dalglish, 1996). On the Social Readjustment Rating Scale, personal injury or illness is ranked number 6, just below death of a close family member (Baron, Byrne & Branscombe, 2006; Kent & Dalglish, 1996). The artificial nature of the environment, the loneliness of being cut-off from family for the majority of the duration of the stay, the painful and often extended period of

recovery and having to deal with altered body image all contribute to the stressful experience of being hospitalized (Kent & Dalgleish, 1996). Other factors that may make being hospitalized stressful include the change in routine experienced by patients (for example eating at different times), having to sleep in a room with other people, the loss of independence and the unfamiliarity of the hospital environment (Kent & Dalgleish, 1996). Considering the negative effect of stress on health it is especially important for patients to find ways to deal with their stress levels (Baron, Byrne & Branscombe, 2006). The art intervention will aim to relieve some of the immediate stress experienced in the institutional environment.

Investigating the effects of creative activity has more practical applicability than just acting as a way to evaluate art therapy. It also serves a dual purpose of enlightening the researcher and the fields of positive psychology (the two main fields involved in the study of creativity) as to the effects of such actions on the mental well-being of the individual. Perhaps creative activities, such as art, can be taught as a way to reduce stress and anxiety. For this reason more empirical investigations into the nature and effects of creative activity is needed.

Fukui, Toyoshima, Kuda, Fukumitsu and Wakita (2007) note that very few studies have been conducted on the effects of creative art activities in terms of how this psychologically impacts on the individual. Fukui et al. (2007) are one of the few researchers who have done a study similar to this one. Fukui et al. (2007) investigated the effects of creative art activities (piano performance, calligraphy, clay moulding) on human stress. Their sample utilized 30 college students (15 male and 15 female) and 10 students (5 male and 5 female) participated in each 30-min session of one of creative activities (playing the piano, moulding a piece of art using clay, writing using a brush and ink and remaining silent, the control group). Fukui et al. (2007) measured the stress levels of the students by assessing their cortisol (C) levels and administering the State-trait anxiety inventory (STAI-I). Their study showed a significant reduction in post-session C levels for calligraphy, clay moulding, and music groups, indicating a reduction in stress due to participation in sessions of creative activity (Fukui et al., 2007). The same trend was observed in the STAI scores, which decreased significantly in all groups, indicating a reduction in anxiety induced by engaging in creative activities. Interestingly the study showed no differences in C and STAI results among sessions (Fukui et al., 2007). This study indicated the psychological and physiological stress reduction effects of creative activities.

The aim of this study was to demonstrate the same reduction in stress levels following a creative intervention in a South African hospital patient population. The hypothesis stated that if it was found that the experimental group has significantly lower stress and anxiety levels after the art production it will be deduced that there is a potential correlation between art therapy and stress

and anxiety reduction. This would then be a starting point from which this correlation can be investigated and its causal relationship studied to possibly determine the direction and reason for this correlation. In fact if art as a creative process is therapeutic in of itself it could be utilized as a relaxation technique, which would not require the presence of a therapist. The possibility of creativity workshops to bring about relaxation and stimulate creative processes could be used in organizations, hospitals, educational settings and even be offered to the general public. The null hypothesis that no such a reduction would be observed may point to the possibility that other factors, such as discussion with the therapist during a session, may be the origins of reported success using art therapy. In such a case the scientific value of art therapy in psychotherapy would seem suspect as an independent originator of relaxation and other positive mental health effects. Rather, it would then appear that art therapy is more of a facilitator of communication in therapy. In this case studying how art (and its properties) facilitates conversation would aid in improving its quality as a therapeutic tool.

This study was done utilising very small samples and should be seen as a pilot study. An overview of creativity and stress research is given in Chapter 2, with particular focus on the development of the constructs. The literature also reveals the challenges associated with studying creative activities and illuminates some of the reasons as to why this is not a more commonly employed method of relaxation. The psychometric instruments used in the study are discussed in detail in Chapter 3 and illuminate both the shortcomings of self-report measures as well as the benefits of investigating the personal experience of stress. The chosen methodology and practical application thereof is discussed in Chapter 4. The study explores ways in which to investigate the psychological effects of creativity and the results are interpreted in terms of the limitations of the methodology and potential of the study in Chapter 5. Conclusions and recommendations are discussed in Chapter 6, where careful interpretations of the results are presented.

CHAPTER 2

LITERATURE REVIEW

2.1 STRESS

This literature review encompasses a variety of views on stress, as well as discussing the relationship between stress and creativity. An in-depth view is offered of the development of art therapy as well as the variety of theories underlying the use of this therapy and its terminology. Stress is both a positive and negative factor, with the correct amount of stress acting as motivating factor, too little stress leading to boredom and too much stress causing psychological and physiological problems (Edworthy, 2000). The focus of this research is on excessive amounts of stress; therefore the other forms will not be investigated.

2.1.1 Defining stress

An excessive amount of stress is a major cause of illness and mental health problems in modern day life (Edworthy, 2000; Sanderson, 2004). Stress is defined as any factor in the environment viewed by the individual as threatening (Rice, 1998). This definition views stress as an external agent which endangers the individual's survival or well-being in some way and according to this view one can only try to survive the threat as well as possible (Rice, 1998).

Clearly this view of stress remains imbedded in the original theory of Cannon's flight or fight response, to be discussed later (Sanderson, 2004). The second way of viewing stress is to see it as a psychological phenomenon in which the individual plays a key role in determining whether an event is indeed stressful (Lazarus, 1984; Rice, 1998). This view has its origins in the theory of Lazarus and Folkman (1984) who proposed that an event or stimuli is only stressful if the individual perceives it as such. Kaplan and Saccuzzo (2005, p.493) define stress as "a response to situations that involve demands, constraints, or opportunities". Stress is both adaptive and harmful; it remains adaptive when the individual is able to deal with it effectively, thus being motivated by it to achieve (Kaplan & Saccuzzo, 2005). However, stress becomes maladaptive when the individual is unable to handle the environmental demands and feel significantly anxious as a result (Kaplan & Saccuzzo, 2005).

The last definition of stress is that of a medical approach which views stress from its physiological aspect, namely the response of the body to stress (Rice, 1998). Stress for purposes of this literature review is defined as a physiological and behavioural response to stimuli, either internal

or external, that is perceived as threatening or harmful to the individual in some way and provoking anxiety. This definition is used because it involves both the physical and resultant behaviour that results in stress while also acknowledging the role cognition plays in the origins and maintenance of stress and anxiety.

2.1.2 Theories and models of stress

Schlebusch (2000) notes that the idea of stress is now so popular and widely used that it would seem as though everyone knows what stress is, but no one can clearly define it. As research scientists, we can clarify the idea of stress and how it should be investigated by looking at different paradigms and models of stress that have developed through scientific thought. Interestingly enough Schlebusch (2000) compares psychological stress with that of the idea of stress in physics. This analogy is very useful as the psychological stress mirrors that of the stress concept in physics. In this analogy a psychological stressor (life event, annoyances and so forth) can be compared to pressure or force being exercised in the physical world (for example a door's handle has become rusty but instead of oiling it you just apply more pressure every time you open it). The next step is the stress that the person feels due to the stressor (the door handle is also under stress every time you force it open). Anxiety is the next step for the individual as stress begins to take its toll, the door handle strains. Next the individual begins to experience symptoms due to the stress and the door handle begins to undergo molecular and structural changes. In the last step, the individual develops psychological and/or physiological disorders as a result of the stress, and the door handle either bends or breaks. The following table demonstrates this stress analogy (Schlebusch, 2000, p.4):

Figure 1: A comparison between stress in physics and stress in psychology

Three main models of stress are reviewed here (the groundbreaking theories of Cannon, Lazarus as well as Folkman and Selye) and looking at these models help to clarify not only what stress is but also how it can be studied.

2.1.2.1 The origin of the stress concept

Lovallo (2005) notes that stress is often defined in terms of a disruption in the *internal equilibrium* for which humans and other organisms strive, whether that disruption is physical in nature (cold weather disrupts your equilibrium and you deal with it by trying to find heat) or psychological in nature (you think about an up coming test and try to deal with it by studying). This concept rests on the idea that we have an internal world, an idea that became popular during the early 19th century as a result of a school of thought called *vitalism* (the idea that living things are driven by a non-physical force that does not obey physiochemical laws) (Lovallo, 2005). While this school of thought may be questionable, it did make scientists more aware of our internal world.

Claude Bernard (1813-1878) took an opposing view to vitalism and argued against a mysterious force that motivates us. Bernard conducted fascinating research to prove his point, first doing experiments on one-celled creatures and proving that these creatures depend wholly on the environment for survival (Lovallo, 2005). Bernard went on to describe how more developed creatures, such as mammals, have an internal regulatory system that mirrors that of the external system used by one-celled creatures. But instead of relying so extensively on the external

environment mammals are able to regulate their response to the outside world by regulating their internal system (Lovallo, 2005). With their ability to regulate their temperatures, heart-rates, metabolic functions and so forth, it became clear that we are not driven by a mysterious internal force but rather by a physiological system designed to help us adapt to our environment (Lovallo, 2005). Bernard's main idea was that challenges to the integrity of an organism results in responses from the organism to counteract those threats, an idea that formed the groundwork for the concept of stress to evolve (Lovallo, 2005).

2.1.2.2. Cannon's flight or fight response

Walter Cannon was fascinated by Bernard's idea that an internal world needs to be maintained and protected and began research into the mechanisms needed for the responses to the external world (Lovallo, 2005). Walter Cannon was the first to describe the flight or fight response in the early 1900's (Lovallo, 2005). Cannon was a physiologist at Harvard Medical School who proposed that people are normally in a state of *homeostasis* (Cannon, 1932). This internal physiological equilibrium alters when an individual is threatened, thus activating the flight or fight response (Sanderson, 2004). The individual's sympathetic nervous system and endocrine system are activated, releasing adrenaline into the blood stream (Sanderson, 2004). Despite the fact that Cannon was a physiologist, he anticipated the idea of psychological stress and noted that when under great stress dysregulation may occur in an organism's internal system resulting in poor psychological and socio-cultural functioning (Lovallo, 2005). In his book, *the Wisdom of the Body*, Cannon (1932) discusses a wide range of physiological systems that need to maintain homeostasis and how this is achieved (the fluid matrix, how thirst and hunger aid maintenance, homeostasis of blood sugar, blood fat, blood calcium, constancy of body temperature and so forth). Cannon (1932) then ends his book with a chapter on the *Relations of Biological and social homeostasis* in which he compares the biological need for homeostasis with that of our social need for homeostasis. This link between the biological and the social as Cannon (1932) saw it was but the beginning of this area of study which later branched out into various fields both medical and psychological.

2.1.2.3. Hans Selye's General Adaptation Model

Hans Selye, an endocrinologist, expanded the theory of Cannon by describing the stages an individual's body goes through when responding to the external world (Sanderson, 2004). In fact, Selye was the first researcher to use the word stress in 1935 (Selye, 1952). In his fascinating book, *the Story of the Adaptation Syndrome*, Selye (1952) recounts how he made this remarkable discovery that there is a general physiological response to threats. While working as a medical

researcher on the physiology of maternal placenta, Selye (1952) noticed that damaging a pregnant rat lead to a wide variety of abnormalities and were what the medical community referred to as 'non-specific responses'. As medical research ignored any non-specific responses as being useless to study, Selye thus also managed to do so at first (Selye, 1952). Reporting these experiments, Selye used the word 'stress' to explain the abnormalities (i.e. the stress induced by the researcher caused the abnormalities observed in the rat) (Selye, 1952). Still, not much came of this at first and when Selye (1952) noticed further lesions on the dissected rat he at first thought that he had discovered a new hormone, sending him into a short lived euphoria which ended in depression when he realized he had discovered nothing of the kind, merely a non-specific reaction once again. But then he realized that what was needed was a new way of looking at the problem: non-specific damage to the body following 'stress' may be worth studying for its own sake!

Further research revealed that a non-specific reaction pattern to damage caused by a wide variety of pathogens did indeed exist (and Selye called this non-specific reaction *stress* and the pathogen that causes it became known as the *stressor*) (Selye, 1952). Selye (1952) further describes the difficulties he faced in introducing the idea of stress to the medical community, how his research aided him and the semantic difficulties that also arose from his project¹. Selye then created a model with three stages to explain how the stress syndrome works in organisms (Selye, 1952). In this model Selye divides the stress response into three phases. The first stage is the *alarm stage*, wherein the body becomes mobilized to deal with the threat (the sympathetic nervous system is activated by the hypothalamus and catecholamine is released) (Sanderson, 2004). In an ideal situation the individual would deal with the stressor at this stage. However, if this is not the case, the second stage is the *resistance stage* (Rice, 1998). During this stage the stressor continues and the individual persists in trying to deal with the stressor. This stage requires a lot of energy though, which the body cannot maintain for a long period of time (Rice, 1998). Finally, when the stressor remains for too long, the body can no longer supply such vast amounts of energy and enters the *exhaustion stage* (Sanderson, 2004). Selye is often seen as the father of stress research as he systematically studied the processes the physiological system goes through to regulate responses to threats (Lovallo, 2005).

Because of his findings, Selye believed that all organisms use the same steps for dealing with a stressor, and called his model the *General Adaptation Syndrome* (Lovallo, 2005; Selye, 1952). Selye saw the stress response as adaptive because its main aim is to protect and preserve the

¹ For more information see the above-mentioned book, a worthwhile read of how a remarkable and influential scientific discovery was made.

organism, but he also realized that the stress response requires energy and can drain the organism of resources, perhaps even leading to death should the stress continue for too long (Lovallo, 2005). The quicker a threat is dealt with the better for the organism and if the organism has to deal with minor stressors regularly it may make the organism 'fitter' and better able to deal with more severe stressors at a later stage. The body's need to deal swiftly with stress poses a major problem for modern day living, as often the stressors produced by contemporary life cannot be escaped (for example noise) or fought (heavy traffic). This then leaves the person physiologically prepared for action, but no clear way of reducing the stress and resolving the problem. This has serious ramifications for the health of the individual, as the flight and fight response in the long term leads to damage of health (for example the immune system is suppressed by the sympathetic nervous system during this action) (Rice, 1998). Being in such a state of physiological arousal, which cannot be resolved, may result in the stress changing into anxiety (Rice, 1998). Later, other theorists (Sterling and Eyer) used the term allostasis as the state the individual is in when not in homeostasis and also referred to allostasis load as the cost of trying to achieve homeostasis again (Lovallo, 2005). To illustrate Selye's General Adaptation Syndrome, a model is presented:

Figure 2: Hans Selye's General Adaptation Syndrome

This model shows how the first two stages are critical, alarm being necessary to mobilize the organism to respond to the threat. Should the threat not be neutralized the stress continues. If the stress continues to elevate the organism may reach such a stage of exhaustion that death may be imminent.

2.1.2.4. Lazarus' cognitive appraisal model

"In humans, therefore, and to a lesser extent in other primates and mammals, cognitive appraisal processes of some sort mediate reactions and are essential for adequate psychological understanding". (Lazarus & Folkman, 1984, p.24).

Lazarus and Folkman (1984) proposed a more psychological model of stress in which the individual's perception of the stressful event is also taken into account (Cavanaugh & Fields, 2003). Lazarus and Folkman (1984, p.19) formally define stress as "a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well being". Lazarus and Folkman's (1984) model is of great significance for psychology and research psychology as it provides a clear explanation for the cognitive aspects in stress (c.f. Cavanaugh & Fields, 2003). Lazarus and Folkman (1984) in their book *Stress, Appraisal and Coping* discuss how researchers began the investigation into stress from a very mechanical and biological perspective. While there is nothing wrong with studying the biological aspects of stress in various species, when it comes to humans there is another pivotal aspect involved that cannot be ignored: **cognition**. Lazarus and Folkman (1984) also note that one of the key aspects that drew attention to this difference in human stress is the fact that there are individual differences in response to stress as well as a wide variety of coping mechanisms employed. The subjective meaning that humans attach to situations mediate not only their coping with stressful situations but also the situation is mediated through the actions the individual decides to take (Lazarus & Folkman, 1984).

Key in the theory of Lazarus and Folkman (1984) is the concept of appraisal, which involves judgment, discernment, and choice of activity when the stressful situation is encountered. So even if there is an immediate physiological response, it is quickly followed by a cognitive assessment of the situation and decisions are made about how to act (Lazarus & Folkman, 1984). But stressful events or situations can be continuous when not immediately resolved, and so appraisal is not a once off occurrence but secondary appraisal is also likely to occur (and third, fourth and so forth) (Lazarus & Folkman, 1984). Lazarus and Folkman (1984) note that the terms primary and secondary may be misleading because appraisal is a continuous process and primary appraisal is not as the term might suggest more important than secondary appraisal.

Lazarus and Folkman (1984) also have three main forms of appraisal (though these are not rigid and the individual may have a combination of them): irrelevant (the event holds no danger), benign/positive (the event will lead to pleasing emotions and situations) and harm/loss (the event holds dangers or challenges or both for the individual) (Lazarus & Folkman, 1984). Primary and secondary appraisals may also differ from one another and the different appraisals may interact to give an individual a different conceptualization of the problem faced (Lazarus & Folkman, 1984).

Figure 3: A Representation of how appraisal may function

Above is a demonstration the author has conceptualized from Lazarus and Folkman's (1984) appraisal system and how it influences stress responses. This is a simplistic demonstration and the appraisal process is more complex and interwoven than this. However, for demonstration purposes it may be useful to see how the appraisal process may operate. First a situation or event is encountered and the individual can appraise the potential stressor in one of the three ways mentioned earlier. Should the primary appraisal be that the situation or event is irrelevant, it is ignored. Should the second option be deemed appropriate and it is considered a positive occurrence, a positive emotional response may be given. If the event or situation is seen as posing a threat of harm or loss then coping strategies may be considered and implemented.

Which would also lead to secondary appraisal and one of the three options or combinations may once again be chosen. Of course this model suggests that humans are very rational beings, that they have clear option and implement appropriate strategies. It is a truism to note that this process is hardly this linear nor always this conscious when people find themselves in stressful situations. After all an individual may appraise a situation as **both positive and threatening** and utilize coping mechanisms in a more subconscious manner (for example eating more without realizing the reason for this).

2.1.3 The relationship between Stress and Anxiety

According to Kaplan and Saccuzzo (2005, p.494): “Exposure to stressful situations can cause an observable reaction known as anxiety, an emotional state marked by worry, apprehension, and tension”. In fact, anxiety and stress are so closely related that their physiological symptoms are often identical, for example fast heart-rate, pulse rate goes up and other similar physiological responses (Kaplan & Saccuzzo, 2005).

2.1.4 A comparison of different views of stress

The understanding of the concept of stress began as a purely physiological response to the environment (as can be seen in the Cannon model of stress). But as our knowledge of human behaviour became more complex and we began to see how body and mind interact the view of stress grew more complex (Lovallo, 2005). Lovallo (2005) notes how our understanding of the *informational exchange* that happens when the individual develops stress related responses allows for stress to be viewed in a more interactive way and to adjust treatments accordingly.

Thought processes have significant and lasting effects on the body and well-being. Testing the participants' perception of their stress levels is therefore a valid method of assessing stress because to a large degree beliefs about stress influence stress levels. There are less subjective measures of stress, such as blood pressure, pulse measurements, hormone measurements and so forth. However, for purposes of this study the subjective experience of stress as reported on a self-report measurement will be used as the measurement tool.

While in terms of this investigation stress is seen as a negative phenomenon it is important to remember that stress has positive aspects and make important contributions to everyday life. In effect stress is really a normal part of human function (like for example, pain). Yet like pain it can

be damaging and dangerous should it get out of control and persist for long periods of time (Lovallo, 2005).

As medical science and psychology have progressed so the views of stress have matured and grown more complex. Whereas ideas of stress used to be dominated by biomedical model, the biopsychosocial model has grown more popular as research began to reveal that stress is more complex than mere reaction to threatening environmental stimuli (Lovallo, 2005). Treating stress also needs to take into account all the factors that influence the perception of stress.

Table1: A brief comparison of the three main stress models

Name of stress model	Main focus of model	Originator associated with model
1. Cannon's flight or fight response	The main focus of the model is on the physiological response of the organism to a threat.	Walter Cannon
2. Hans Selye's General Adaptation Model	The main focus of this model is the phases (physiological) through which the organism goes when encountering stressful stimuli.	Hans Selye
3. Lazarus' cognitive appraisal model	This theory looks more at the psychological evaluation of the threat and how this influences the response of the organism.	Lazarus & Folkman

This comparison demonstrates how the view of stress has become more complex to take into account the various facets that influence the experience of stress (which include our cognitive appraisal of the stressful event).

2.1.5 Patients and stress in hospitals

According to Dietrich, Abbott, Gartner-Schmidt, and Rosen (2008) it is a commonly acknowledged fact that the mind and body are integrated and that psychological stress affects health. Such a strong relationship between stress and health are corroborated by a body of health psychology research indicating that stress may affect health via psychobiological, psychoneuroimmunological and behavioral pathways (Dietrich et al., 2008). Further more stress

is the focus of much research because there is evidence that chronic stress appears to be on the rise in modern life (Dietrich et al., 2008). Dietrich et al. (2008) also note that while physiological measures of stress may be more reliable understanding patients' personal experience (whether stressful or not) is key to managing the stress. So and Chan (2004) point out that hospitals add to the stress levels of patients due to factors such as the presence of strange machinery, loud and unfamiliar noises, noxious smells, lights on 24 hours, along with invasive procedures, lack of privacy, separation from the family, and immobility all contributed to a stressful environment. Thus hospitals may in themselves trigger the fight and flight responses. Thus the aim should be to minimize the controllable stressors and promoting adaptive coping strategies to anticipated stressors (So & Chan, 2004).

According to Curtis, Groarke, Coughlan and Gsel (2004), stress in medical contexts has long been an important field of interest as stress can heighten physiological reactivity, depresses the immune system, alter health habits, and influence the recognition and reporting of symptoms and indeed the seeking of medical care. Stress is also associated with failure to comply with medical regimens resulting in disease exacerbation (Curtis et al., 2004). Thus the stress levels in hospitals are important to investigate, especially the perceived stressful nature of events (Curtis et al., 2004). Curtis et al. (2004) also found that while disease status predicted illness related functioning, it did not predict emotional or social adjustment. Rather, perceived stress was a better predictor than disease of concurrent positive and negative emotionality (Curtis et al., 2004).

The patients at MuelMed rehabilitation centre receive physiotherapy to facilitate recovery from injuries (sustained through accident or otherwise) or debilitating nerve illnesses. Having sustained injuries of such magnitude or suffering from debilitating illnesses is not only severely stressful in of itself, but the hospital environment can also be very stressful to patients (Forshaw, 2002; Kent & Dalgleish, 1996). On the Social Readjustment Rating Scale, personal injury or illness is ranked number 6, just below death of a close family member (Baron, Byrne & Branscombe, 2006; Kent & Dalgleish, 1996). The artificial nature of the environment, the loneliness of being cut-off from family for the majority of the duration of the stay, the painful and often extended period of recovery and having to deal with altered body image all contribute to the stressful experience of being hospitalized (Kent & Dalgleish, 1996). Other factors that may make being hospitalized stressful include the change in routine experienced by patients (for example eating at different times), having to sleep in a room with other people, the loss of independence and the unfamiliarity of the hospital environment (Kent & Dalgleish, 1996). Considering the negative effect of stress on health it is especially important for patients to find ways to deal with their stress levels (Baron, Byrne & Branscombe, 2006). The art intervention will aim to relieve some of the immediate stress experienced in the institutional environment.

Each stage of life is seen as having opportunities/possibilities for the individual to grow, and his/her response will determine whether there is “well-being” or “ill-being” (Raeburn & Rootman, 1998, p.55). According to this view each individual has the capacity to make the most of what is being offered, of course this “capacity” is a mixture of personal and environmental factors (Raeburn & Rootman, 1998, p.55). Avoiding disease is not always possible. Yet incidence thereof can be significantly lowered through practicing healthy life-style and finding ways to relax and positively engage (Cavanaugh & Fields, 2002). Engaging with life is also seen as a main way to find happiness and fulfilment (this is linked to *flow*, a concept discussed later in this chapter). Engaging implies interest and purpose, ultimately meaning. Without personal meaning one cannot grow, cannot thrive and ultimately cannot live. This is especially true for rehabilitation patients who may feel their loss of physical capabilities limit them and what they can contribute to their communities. Engaging in creative activities may be one way for them to increase their feelings of efficacy and meaning.

2.1.6 Objective and subjective stress

As mentioned earlier, stress has both physiological (*objective*) and psychological (*subjective*) components and both form an integral part of the stress experience. According to Acharya (2005) stress responses in humans often comprise of strong mental, social and emotional components. The mental component (for example imagining a disaster that could happen to you) has been shown to lead to physiological problems such as hypertension and peptic ulcers (Acharya, 2005). The social component of stress is the disruption in relationships that occur as a result of trying to cope with the stress (and relationships with poor quality may also cause stress) (Acharya, 2005). The emotional component of stress includes symptoms such as depression, anxiety and anger that occur as a result of stress (Acharya, 2005). How an individual *perceives* his or her stress is an important aspect of how they deal with their stress. Thus the cognitive aspect of stress cannot be overlooked. The best way to assess this subjective aspect of stress is by means of a self-report instrument. The focus of this study is on the subjective experience of stress and how creative activities can alter this.

2.2 CREATIVITY

In the realm of science, creativity remains an elusive concept to define. Lauronen et al. (2004) note that there is as yet no universal or psychometrically standardized definition of creativity, despite the wide range of writings on the topic. Lauronen et al. (2004) note that there are three dimensions of creativity that can be found, firstly the creative person themselves, the process of being creative and lastly the product of creativity. Lauronen et al. (2004) and other theorists

(such as Eysenck, 2003; Sternberg & Lubart, 2003) focus on attributes of the so-called creative person, but this research will focus mainly on the process of being creative and its effects on a group of individuals. The over-emphasis of creativity research on the intrinsic attributes of the creative individual has left a vacuum as it pertains to the effects of creative actions on the individual which remains an equally worthwhile aspect of this phenomenon to study, one that will be addressed in this research.

Creativity both in children and in adults is important for many reasons, such as aiding cultural interaction, promoting problem-solving, and fuelling entertainment industries; but perhaps one of the most compelling reasons is the economic one (Goswami, 1999). As noted by Candy (2000, p.7) in Britain: "Culture and Creativity are vital to our national life... But there is another justification for creativity...the creative industries generate revenues approaching £60bn a year. They contribute over 4% to the national economy and employ around one and a half million people. The sector is growing faster than, almost twice as fast as, the economy as a whole".

2.2.1 Creativity and self-actualization

Burleson (2005) notes that in the field of positive psychology creativity is strongly linked to *self-actualization* (as well as *flow*, see 2.3.5). According to Burleson (2005) creativity is associated with self-actualization, self-awareness and intrinsic motivation forming what Burleson calls a **synergistic cycle**. Torrance (in Burleson, 2005) was involved in creativity research for over sixty years and disputed traditional IQ tests as the only indicators of general intelligence. Instead he developed the *Torrance Tests of Creative Thinking* and showed that creativity levels can be scaled and personal creativity increased through practice. Torrance also saw creativity as a means for attaining self-actualization and believed that lack of original achievement in person's life may lead to feelings of futility (Burleson, 2005).

2.2.2 Creativity and cognitive psychology

"Creativity in any of its forms, either visual, musical, literary or performing arts, may be conceived as a cognitive capability..." (Fornazzari, 2005, 219).

The relationship between positive affect and creativity is complex, with positive affect generally leading to higher levels of creativity, but sometimes positive affect can have the opposite effect and lead to lower levels of creativity. Positive affect has been found to lead to categorizing more broadly, giving more unique or unusual responses on listing tasks creatively (Filipowicz, 2006).

Filipowicz (2006) discusses how various researchers have found contradicting findings with some researchers finding that creativity increases with positive affect and others finding it decreases with positive affect and increases with negative affect. Filipowicz's study (2006) found that gender has a significant effect on whether a creative activity is affected by positive affect with men's performance increasing following positive affect and women remaining unaffected.

Matlin (1998) discusses Sternburg and Lubart's **investment theory of creativity**, in which creativity depends on a combination of elements such as intelligence, knowledge, motivation, appropriate thinking styles, personality and an encouraging environment. In order to function creatively all these elements would need to be present.

Figure 4: Elements required for creative functioning:

Yet as Matlin (1998) points out, many individual's who have had great creative achievements in their lives did not necessarily have all these elements. Would all these elements be necessary for individual to use creativity as a method of relaxation? The answer is unclear but it would seem that at least some of the elements would have to be present. The **investment theory of creativity** is appealing because it takes into account some of the complex elements required in creativity but more research is needed to understand how these elements combine to support and promote creativity (Matlin, 1998).

Certainly it seems that an individual's environment can have a significant effect on their creativity, especially their social environment (Matlin, 1998). For example people may be less creative when they know someone is evaluating their work (Matlin, 1998). Evaluation seems to have a negative effect on creativity, which may be due to performance anxiety and also to a desire to make the product as acceptable as possible thus losing some of the spontaneity, and creativity.

A study by Amabile (1983) demonstrates this effect of evaluation on creativity. In this study Amabile (1983) asked college students to compose a poem. Half the students were told the researcher is interested only in their handwriting and the other half were told that the research is interested in the poem's content and that poetry judges would write a report on their poems and that they would receive a copy of this evaluation (Amabile, 1983). Each poem of both groups was judged according to the consensual assessment technique, using judges who were poets. The group who did not expect to be evaluated, was judged to be more creative than those who did

expect to be evaluated (whether the students worked together or alone did not seem to have an impact) (Amabile, 1983).

2.3 ART THERAPY

Art therapy has joined with the many forms of therapy currently available to the public and mental health sector. Yet like many of these therapies, the therapist must investigate its scientific validity before investing in it as a tool with which to aid clients and patients. As art-therapy's popularity continues to grow, it is being utilized in ever increasing amounts around the world. In Japan for example, more than 500 hospitals and clinics use art-therapy as a way to aid mentally disturbed patients (Naito, 1997). According to Naito (1997) being creative acts as an emotional outlet for the patients and the physical action of painting itself has a cathartic effect.

Guttman and Regev (2004) define art therapy as the blend of creative work, such as painting, with therapy. Problems in investigating the effectiveness of art therapy lies in its diverse nature, with art therapists themselves not agreeing on its nature and content (Guttman & Regev, 2004). Is the creative process in itself therapeutic, as proposed by Kramer (in Guttman & Regev, 2004) or is it only a means for facilitating the verbal therapeutic process? Both approaches imply that art therapy can be a facilitating component in the therapeutic process (Guttman & Regev, 2004).

Siddiqi and Ahmed (2006) for example report that in the aftermath of a devastating earthquake in Kashmir and Pakistan's North West Frontier Province, the use of art therapy played a pivotal role in the counseling of affected children. The art seemed to have a calming effect on the children and facilitated the healing process (Siddiqi & Ahmed, 2006). Siddiqi and Ahmed (2006) are of opinion that both the product (for example the picture that was produced) and the process (the act of creating the art) are important to the method of the intervention. It is the process that is under consideration in this study; the interpretation of the product remains a subjective practice for the art therapist to ensue and does not easily lend itself to investigation (Broom, 2000; Lejsted & Nielsen, 2006). Lejsted and Nielsen (2006) report that in the psychiatric setting it has been noted that many patients who are given the opportunity to be creative, for example painting, require less drug treatment, a good indication of the mental health benefits of creativity. Furthermore many patients describe how the painting, sculpting or writing not only helps them express themselves but also helps them organize their thoughts (Lejsted & Nielsen, 2006).

So the question remains: is doing art an intrinsically healing or even a relaxing process? If art therapy is indeed as healing as it claims to be perhaps it can also aid the lowering of stress and anxiety levels.

2.3.1 The origins of Art therapy

Art therapy is not as new concept as one may suppose. In fact, W.A.R. Brown (Superintendent of Crichton Royal Hospital in Scotland) suggested in 1841 that doing art contributes to physical and mental health and brings about tranquillity (Guttman & Regev, 2004). Art therapy is seen as healing primarily for its expressive qualities, a way to “voice” what we can perhaps not say. Art therapy progressed slowly, with Jung viewed as its theoretical godfather (Guttman & Regev, 2004). The slow progress of art therapy is in part due to Freud’s negative evaluation of the artist as “not far removed from neurosis” (Guttman & Regev, 2004). This escape into fantasy was viewed by Freud as the oppression of powerful instinctual needs (Eisdell, 2005).

2.3.2 Jung and other theorists promote art therapy

However, Jung following his theoretical and personal break with Freud embraced art therapy as a means of expressing the sacred and mysterious, an important part of the individuation process (Eisdell, 2005). Jung himself used painting as a way to understand the dramatic psychological crises he experienced in his later years (Guttman & Regev, 2004). Out of Jung’s work flowed the idea that artwork may help express unconscious elements so that one becomes conscious of these hidden phenomena. Later Anna Freud and Melanie Klein incorporated art therapy into their respective psychoanalytical techniques to aid their work with children who experience this type of expression as more accessible (Eisdell, 2005). Since then, the mental health care profession has used art therapy as a way to assess, measure functioning, explore concerns and conflicts, gain access to traumatic experiences and memories in varying settings (Eisdell, 2005). Yet tests of its therapeutic effects remain limited and flawed with many methodological problems.

According to Naumburg (in Eisdell, 2005) uncovering this unconscious material is the primary rationale for using art therapy. Other theorists postulate that once one can give an independent existence to the symbolic self it bridges the gap between private-self and public-self (Oppenheim, Gericot & Hartman, 2002). The lack of operational terminology in art therapy is one of the many problems for which it is criticised (Guttman & Regev, 2004). The reason for this difficulty lies in the abstract aspects that compose this elusive therapy (Guttman & Regev, 2004). Guttman and Regev, (2004) tried to resolve this problem by analysing the practice of art therapy and identifying its goals, stages of the session, the role of the therapist, its emphasis and the material to be used. However, before trying to find out how art therapy works, perhaps the focus should be as to whether it works in the first place. After all, art therapy is most often facilitated through verbal means, which may be the origins of the successful therapeutic process or at the very least a confounding variable (Eisdell, 2005).

2.3.3 The scientific status of art therapy

In his definitive book on the status of art therapy (*Art, Science and Art therapy*), Kaplan (2000) discusses the degree to which art therapy is scientific. Kaplan (2000) notes that in his long career as an art therapist, he has often seen art therapy as a scientific practice. But when carefully considering the theory behind art therapy he has come to realize that art therapy draws its theoretical roots from psychoanalysis, a theory with dubious scientific validity. Kaplan (2000, p.105) further adds that unless art therapy becomes more scientific “art therapies canvas will be muddied by pseudoscience and its beauty will not be fully available to provide inspiration and solace to those who need it most”. Perhaps the most challenging aspect of creating a more scientific art therapy lies in the relationship between art and science. Kaplan (2000) notes that both art and science share certain aspects through which they relate to one another. Both art and science have aspects of the objective and subjective and both lie on this continuum to different degrees. Uniting art and science is not, according to Kaplan (2000), destructive to either but rather the mержence of knowledge in a new and exciting way. Both art and science require a certain amount of creativity, implying similar cognitive thought processes involved in both. This further links to the idea that art can be scientifically studied and the process scientifically documented. From this view point it would seem that even though art therapy does not have the scientific status it requires it does have the potential to acquire this. From Kaplan’s (2000) view point all that is needed for this to be accomplished are two things: for art therapists to see the importance of scientifically investigating art therapy, and research. In a manner of speaking, science is research. For science is the investigation of the world, accomplished through the objective and precise methods of investigation that is lacking in art therapy.

Art therapists also tend to view their form of therapy as intuitive, separate from the cold hard facts offered by science. As noted by Kaplan (2000) this is a view typical of art therapists, yet without science there is no way to test the truth of any ideas held, and the door is wide open for false beliefs to enter. McNiff (1998) takes an opposing view and instead advocates studying the creative process of art in a qualitative manner using mainly introspection to accomplish this. McNiff (1998) views the creative process as too subjective and particular to the artist to be studied quantitatively (to some degree this is understandable as creativity is a very individualistic process). Yet McNiff (1998) fails to take into account the usefulness of understanding how populations at large are affected by creative activity and how knowing this could lead to future benefits such as stress relief workshops. McNiff’s (1998) point of view is also limiting to the progress of the scientific investigation of creativity, for introspection is a method of inquiry with low scientific validity. Without scientific research the scientific status of all psychological disciplines would be null and void and their potential for positively influencing the course of

mental well-being in the human race unpredictable and negligible: or worse yet, harm instead of help may result (Nelson & Prilleltensky, 2005; Stanovich, 1997).

Art therapists owe it to their clients to investigate the validity of their pre-conceived ideas about art and therapy. Without research bad practice may ensue. There are other reasons for attempting to establish the scientific validity of art therapy, such as gaining understanding of the mechanisms that facilitate healing in art therapy. Kaplan (2000) notes that it is typical of human nature to be enthralled by mystery, to cling to it and to not wish for the veil of mystery to lift. This may be one of the reasons for art therapy's neglect of scientific investigation. But if this veil is not lifted superstition and pseudoscience thrives and ultimately humanity loses out. Understanding not only art as a therapeutic process, but also creativity, is an endeavor that requires a wide variety of investigators across the board. Neuroscientists, evolutionary psychologists, chemists and a host of other scientists need to be involved in the process. Art therapists have much to contribute towards this investigation, an investigation that could help elucidate not only creativity but also other neurological functioning. According to Kaplan (2000) the three most important contributions science can make to art are:

- 1) Proof of worth
- 2) Revealing secrets of the art process
- 3) Developing a true theory of art therapy (rather than relying on psychotherapy).

What is meant by science in the context of this investigation?

According to Kaplan (2000) there are three ways of looking at science:

- 1) Science as a method of investigation.
- 2) Science as a body of knowledge
- 3) Science as theory of the world

For purposes of this investigation science is seen in light of the first definition, that of a method of investigation. It is here that research is most important, for without research science cannot exist. The type of research that is common in art therapy is that of case studies. While case studies can make wonderful contributions to any field, they tend to be low in scientific validity and not very generalizable. Often qualitative research is viewed as being more compatible with the aims of art therapy and therefore advocated as the best manner in which to study the therapy. As Kaplan (2000) so rightly points out, no field can afford to ignore either qualitative or quantitative methods of investigation. The objections raised to using quantitative methods with which to study the artistic process can often be traced back to the suspicion of art therapists that the quantitative

investigation will violate their cherished beliefs. Scientific investigation is reality checking and, truth seeking.

Some art therapist have begun to see the importance of investigating art therapy in more scientifically valid ways and Payne states that: "as a therapist I understand research to be concerned with the systematic checking out whether in fact the varies and benefits I aim to generate through my practice are more than simply wishful thinking" (Payne, 1993 p.17). Cathy Malchiodi expressed the lack of adequate investigation into art therapy most eloquently when she said in a paper on the scientific status of art therapy: "Why has the field of art therapy spent most of its energy conducting research on the meaning of images rather than understanding the *process* it takes to make them?" (1999, p.82). She emphasizes that it is imperative to the growth of the field of art therapy that not only should the product of art is studied but also the process. According to Malchiodi one of the key questions that need answering is: "Is art therapy inherently therapeutic?" To answer the second question, perhaps we should ask another question: what happens when non-scientific methods are used in a discipline? The answer, according to Ruscio (2006) is pseudoscience. Pseudoscience is the most undesirable state for any discipline as it is characterized by poor methodology, untrue conclusions, the promotion of ineffective treatments, the sustaining of false beliefs and bad decision making (Ruscio, 2006). So it is vital for research psychologists to work from a scientific paradigm so that results are as close to reality as possible, so that findings are replicatable and usable and so that a factual and accurate contribution is made to humanity's store of knowledge. Considering that research findings are the basis for many decisions, we want those findings to be precise and trustworthy so that decisions and policies are not put into place that will be harmful or ineffective and cause more damage to society and nature.

To a large extent the need for new research in the field of art therapy is due to the decline of confidence in psychoanalysis. In recent years psychoanalysis has received harsh criticism from the scientific community. The main criticisms leveled at psychoanalysis include the following:

- 1) There is little scientific data supporting psychoanalysis and the only reason it persists is because offers seemingly satisfying explanations for inexplicable behaviour. For example, if the Oedipus complex is as universal as originally claimed by Freud there should surely be a high incidence of parricide. Yet crime statistics show the incidence for this to be particularly low. Despite this evidence to the contrary the belief in the Oedipus complex persists and art therapists may interpret artwork in this light.
- 2) Many of Freud's theories can be traced back to twentieth century biology (much of which has now been disproved). For example a concept popular during the 1800's is the concept of

'biogenetic law', which states that a developing individual repeats the evolutionary history of the species. This would explain Freud's theory that infants pass through various stages of sexual development (also known as recapitulation theory).

- 3) Popper's (Mouton, 1997) criticism that Freud's theories fail the test of falsifiability is probably one of the most damning to psychoanalysis. When art therapists rely on psychoanalysis they often postulate theories that also fail the test of falsifiability. Popper was especially critical of Freud and implied that Freud relies on self-fulfilling prophecies and that this means psychoanalysis is both un-testable and untenable.

For many art therapists this criticism of psychoanalysis seems pointless as they view their form of therapy as a hermeneutic process concerned with interpretation and meaning creation. The fact that this interpretation and meaning making is based on the flawed and questionable theories of Freud is in itself problematic. All of this is largely problematic as art therapists largely rely on psychodynamic theory even though this does offer a satisfactory explanation as to why art therapy is successful. The psychodynamic model employed in art therapy rests on the assumption (it remains an assumption due to its un-testable nature) that through the process of art the client projects internal processes, transforms ideas and internalizes certain beliefs.

Scientific research conducted on the creative processes in humans reveal that being creative is an inherent aspect of being human (Kaplan, 2000). Kaplan (2000) suggests that instead of relying on the outdated and flawed model of psychoanalysis for guiding principles in art therapy, what is instead needed is a biological and evolutionary theory to support this therapy. In this regard some research has already been done which suggests that esthetical value placed on visual stimuli is an evolutionary gift from our distant ancestors who may have used art making as an educative tool. Artistic expression may also have been a part of ritualistic processes for ancient people, these processes being used to enforce a group's identity and loyalty to the clan. Thus part of the therapeutic process may be the partaking in a ritual, which binds you to a culture (this could be linked to the art therapist who facilitates the ritual providing grounding for the feeling of belonging).

According to Kaplan (2000) one of the reasons that art therapists are unable to explain the process of art therapy is that the process is often reduced to common-sense psychology. Instead of doing research and basing theories on that, the therapists tend to make assumptions, such as that the process of being creative is therapeutic. As far as creativity is concerned, neurologists are starting to realize that creativity requires both sides of the brain. While some research has been done on the benefits of creative activities such as art production, they tend to be limited. One of the interesting findings is research done on art production and self-esteem. Sylvester

(1997) found that while artistic accomplishment naturally boosts self-esteem there is also a biological reason why this is the case. Sylvester (1997) points out that art is associated with small movements, action that could be linked to increased serotonin levels. Appreciation of aesthetics tends to be associated with pleasant feelings and other research reveals that we may be biologically predisposed to feeling pleasure when confronted with aesthetically pleasing stimuli (Sylvester, 1997). According to Kaplan (2000) neuroscience has an important role to play in the understanding of creative processes and how visual stimulation affects us. The reports of how artistic processes have improved quality of life for various people has a tendency to be limited to anecdotal evidence or case studies (Kaplan, 2000). What is needed is more quantitative studies that investigate how large groups are influenced by the process of being creative.

2.3.4 The possible benefits of creative activities

As previously stated, Kaplan (2000) mentions our inherited tendency towards creativity as possible reason as to why being creative may be beneficial. Kaplan (2000) also notes two theories as to why artistic appreciation formed a part of our evolution as suggested by anthropologists:

- 1) It formed a part of our communication development, an important social skill that aided our survival.
- 2) Eased pattern recognition (faces, meanings and so forth).
- 3) It formed part of the social rituals that were part of our tribes (face painting, dwelling decoration and so forth).

In terms of the purposes that modern day artistic creation serves, Kaplan (2000) has the following suggestion:

- 1) Being artistically creative has cognitive advantages, especially for children as they may gain developmentally.
- 2) Being artistic may help us achieve optimal functioning in terms of flow (see 2.3.5).
- 3) Participating in an artistic endeavour in a group may solidify communal structures and encourage interpersonal bonds.
- 4) Exercising visual intelligence can be a source of sensual pleasure and provide a source of constructive gratification for our aesthetic desires.
- 5) Visual art expression facilitates problem solving and encourages other forms of creativity.

So art is a form of cognition, forms a part of normal childhood development, can be used to order and interpret experience, be used to communicate ideas, facilitate problem solving and to

promote group bonding (Kaplan, 2000). Kaplan (2000) notes that while therapists may be focused on interpreting an artistic creation, the meaning may be in the process not the product.

Kao (2006) reports interesting research in terms of Chinese calligraphy and its psychological benefits. In Kao's (2006) study measures were taken of the writer's physiological changes associated with the brush-writing act, and the results showed that the practitioner experiences relaxation and emotional calmness evident in decelerated respiration, slower heart-rate, decreased blood pressure, and reduced muscular tension (Kao, 2006). Kao (2006) also found that there were cognitive benefits of Chinese calligraphy and that the practitioner showed quickened response time and improved performance in discrimination and figure identification, as well as enhanced visual spatial abilities, spatial relations, abstract reasoning, and aspects of memory and attention. Based on this research done by Kao (2006) intervention programs were implemented for individuals with autism, Attention Deficit Disorder (ADD), and Attention Deficit Hyperactivity Disorder (ADHD). These interventions were successful and the participants showed improvements of cognitive reasoning, judgment, and cognitive facilitation as well as enhanced memory, concentration, spatial orientation, and motor coordination in Alzheimer's patients (Kao, 2006). Kao (2006) also reports other successful interventions with patients with psychosomatic diseases of hypertension and diabetes, as well as mental diseases of schizophrenia, depression, and neurosis in terms of the patients' emotions, concentration, and hospital behaviours. Thus this writing behaviour is both creative and relaxing for patients and has psychological benefits. This is just one example of creative activities can benefit individuals in terms of psychological health, although it should be noted that the participants first had to learn the art of Chinese calligraphy before they could begin to reap the benefits.

2.3.5 Finding flow: creativity as the means of achieving optimal human functioning

"What constitutes a good life? Few questions are of more fundamental importance to a positive psychology. Flow research has yielded one answer, providing an understanding of experiences during which individuals are fully involved in the present moment. Viewed through the experiential point of view of flow, a good life is one that is characterized by complete absorption in what one does" (Nakamura & Csikzentmihalyi, 2002, p.89).

As Nakamura and Csikzentmihalyi (2002) note in the above quotation, how to live the "good life" is indeed a question that has plagued humanity for millennia. Flow is one attempt to answer that question. But would doing art offer a way to experience flow and add meaning? While it is entirely possible that doing a creative activity such as painting and drawing will be relaxing and have various other benefits, it is as Kaplan (2000) notes, not an instantaneous form of relaxation.

Instead it requires engagement with the activity, effort on the part of the participant and the investment of concentration and time. Mihaly Csikszentmihalyi's (1997) concept of *flow* is most useful for understanding why the benefits of art making can help humans achieve optimal functioning. Csikszentmihalyi studied the creative process during the 1960s and was impressed by the way artists are single-mindedly involved in the artistic process, ignoring hunger and fatigue until the artistic creation has been completed (Nakamura & Csikzentmihalyi, 2002).

Csikszentmihalyi (1997) defines flow as being involved in an activity that requires a maximum of **concentration, involvement and commitment**. When people are in a state of flow, they are so focused on the activity at hand that they do not even notice the passage of time. For Csikszentmihalyi (1997) this is optimal human functioning, wherein the individual is neither anxious nor bored but in an ideal state of concentration and involvement in that moment. Aspects of flow are as follows:

- 1) When in flow a person's skills are fully engaged.
- 2) A flow activity has a clear set of goals that require appropriate responses.
- 3) Flow activities provide immediate feedback.
- 4) Attention is ordered and fully invested.
- 5) There is a harmonious balance between physical and psychic energy.

Csikszentmihalyi (1997) uses the term *psychic energy* to describe our mental and emotional energy, our most precious resource. When we use our psychic energy for flow purposes, we should feel most fulfilled and happy (psychic negentropy) but when we waste our psychic energy (what Csikszentmihalyi calls psychic entropy) on meaningless activities that do not contribute to our lives we should feel most unhappy and unfulfilled (Csikszentmihalyi, 1997). Flow is often linked to creative activities (for example the piano player experiences flow when playing a particularly challenging piece of music). Although of course flow can be found in any activity to which we give our utmost attention and commitment. Yet flow is linked to creativity because being creative is so engaging and challenging, demanding much attention. Creative activities also build and necessitate a high amount skill, a key aspect of flow.

When in a state of flow, the individual is intensely focused on what he or she is doing at the present moment (Nakamura & Csikzentmihalyi, 2002). There is also a merging of action and awareness and a loss of reflective self-consciousness (the awareness of the self as a social actor fades into the background or is completely lost to the individual in a state of flow). The individual in a state of flow also has a unique sense of control because he/she can deal with and knows what is going to happen next (Nakamura & Csikzentmihalyi, 2002). During flow time may seem

to pass faster than normal and the process of the activity is more important than the end product (Nakamura & Csikzentmihalyi, 2002). So when in flow the individual is functioning at full capacity, achieving a delicate balance between perceived action capabilities and perceived action opportunities. A slight shift in focus could ruin this delicate balance, for example if the individual began to feel uncertain of his or her abilities (Nakamura & Csikzentmihalyi, 2002).

The concept of flow is also strongly linked to the view of the individual as pro-active, self-regulating organism. Because flow is shaped by both the individual and the environment, Nakamura and Csikzentmihalyi (2002, p.91) refer to this interaction "emergent motivation in an open system". Nakamura and Csikzentmihalyi (2002) also emphasize the subjective nature of flow, while a person can find flow in almost any activity (washing dishes, playing golf ect) it all depends on the person's prior experiences with the activity and their attitude towards it. So while almost any activity can be a flow activity, any activity can be boring or provoke anxiety as well, depending on the circumstances of the individual (Nakamura & Csikzentmihalyi, 2002). The concept of attention is very important in understanding flow and Nakamura and Csikzentmihalyi (2002) agree with William James that our decisions as to what to pay attention to determine to a great extent the content of our consciousness. What is paid attention to will limit the amount and type of information that will be processed. Entering flow is to a large extent the product of what the individual can and will pay attention to at any given time. Remaining in a state of flow also requires that attention be maintained and held by the stimulus field in which the flow is being found (Nakamura & Csikzentmihalyi, 2002).

Figure 5: A representation of when flow is achieved

The figure above is the authors' visual conceptualization of flow (Csikszentmihalyi has his own, see page 31 in *Finding Flow*, 1997). Figure 3 has mental states on the y-axis and emotional states on the x-axis. Of course neither the mental nor the emotional states are mentioned exhaustively and a simplification of how flow is achieved is represented with only five mental states and five emotional states. On the side of mental states we see that some mental states are predetermined when the environment or task requires a low level of skills to be utilized while other mental states are associated with a demand for a high level of skill utilization. On the emotional scale we see that some emotional states are associated with a low level of challenge and others are associated with a high level.

Starting on the right hand side, we see that when we are in a mental state of boredom and an emotional state of apathy, we are the farthest away from flow because skills used are low (i.e. low concentration and little mental engagement) and the challenge we face tends to be minimal. This

state has a high degree of psychic entropy, as we are neither emotionally nor mentally engaged. When we are emotionally and mentally relaxed we are neither very challenged nor using our skills intensely but tend to be at a restful point. Being in a mental state of arousal and an emotional state of interest means that we are beginning to engage with a task or our environment though we are not focused enough to experience flow as yet. When we start to control our mental faculties so that we can engage in a more challenging task and use our skills we approach flow, but if we are not fully focused on the task we may be distracted by emotions such as anxiety (the task is challenging or there is external pressure) so that we are still not fully concentrating on the task. The final point in this representation is that point at which we are entirely emotionally involved and mentally concentrating to our utmost ability. This is the point where flow is achieved. Of course figure 3 is very linear and simplistic in its representation of flow and emotional and mental states (after all, you could for example be bored and anxious and so forth). The human experience tends to be very complex, we being able to feel several different emotions at once. But one thing remains certain, we can only be in a state of flow if mentally we are concentrating and emotionally we are only involved in the task before us.

Csikszentmihalyi (1997) notes that during flow the individual is not feeling happiness as such, but rather after the period of flow has ended a feeling of happiness is likely to flood the individual at what was achieved during flow.

But flow, though it may relax and invigorate the individual, is not easily achieved. It is much easier to do an activity that requires little attention (for example watching television) to relax than to do an activity that would require attention and commitment and as Csikszentmihalyi (1997) notes, flow activities may also involve a certain amount of risk. After all if you decide to learn a new skill such as sculpting, it may require a considerable amount of practice and time before it becomes a flow activity. You may also feel anxious about not succeeding at first, which is a further risk to consider. So to achieve optimal human functioning is necessarily a choice, a commitment and a risk that needs to be taken before flow can be reached. This may explain why many people do not engage in challenging activities as a way to relax, it is easier for them to choose an easy option with no risk involved to meet their needs. Yet when they decide to choose a job or leisure activity with little challenge they also run the risk of boredom, which leads to psychic entropy and lower life satisfaction. Flow provides the individual with the opportunity to achieve optimal human functioning, a risk worth taking.

2.3.6 Possible negative effects of artistic creation

According to Kaplan (2000) there are also potential negative effects that can stem from being artistically creative (as mentioned above it requires concentration and a certain amount of risk). The possible drawbacks to being artistically creative include:

- 1) For some time theorists believed that artistic creativity could lead to madness (Kaplan, 2000). But through scientific investigation into this possibility expanded it became clear that there is no causal link between being artistically creative and mental illness although an individual may inherit traits that predispose them to both a mental illness and to expressing themselves artistically. It makes more sense that disturbed individuals pursue artistic endeavors as a means of expressing their inner frustration rather than that being creative causes mental illness.
- 2) The process of being creative may be stressful in itself as it requires a great deal of concentration and performance (does the work of art please the artists?). Vick (1998, p.9) exhorts his fellow art therapists to “work harder to understand what is clearly a more subtle relationship between creativity and health” as it seems that sometimes people find art relaxing and at other times stressful.

2.4 CONCEPTUALISATION

Many different concepts are discussed in this chapter and the relationships among these theoretical concepts are of key importance to understanding how these issues will be investigated. The concepts of stress, creativity and art therapy all interact and are investigated in this research.

Figure 6: An illustration of the proposed concepts:

As can be seen in the above model, creativity is what underlies the artistic process. The artistic process of art therapy in turn interacts with the individual's stress levels (according to the art therapist in a way that relieves stress). It is then through measurement that these aspects can be evaluated in terms of how effective the artistic process is in relieving stress. So that by extracting the process of being creative in terms of drawing and painting we assess how this factor influences mental states (i.e. a reductionist approach is taken). Perhaps reductionism has lost some of its popularity in light of systems theory and the acknowledgment of how complex the world is, yet it is still a useful method for studying aspects of phenomena that cannot be studied in the system without causing interference with the variable. Investigating art therapy in its total framework may yield results that show it does reduce stress, but it would not reveal if it were the artistic process that is responsible for this.

2.5 CONCLUSION

It is important to note that doing art in a group as opposed to doing it alone as an individual may also influence the mental experience of the creative process (Case & Dalley, 1992). We are, after all, social beings and it is possible that doing a creative activity in a social setting may also facilitate the creative process. To clarify how doing creative activities collectively will influence mental states as opposed to doing it in a group setting; it would be advisable to do separate studies. However, this research only investigates a creative intervention offered at a group level.

CHAPTER 3

MEASUREMENT INSTRUMENTS

3.1 INTRODUCTION TO THE USE OF SELF-REPORT INSTRUMENTS

Stress has both physiological (objective) and psychological (subjective) components and both form an integral part of the stress experience. However, for purposes of this study, only the subjective aspect of the stress experience will be investigated through a self-report instrument.

3.1.1 Reasons for using self-report instruments for this study

According to Schmitz, Hartkamp, Kiusel, Franke, Reisterl and Tress (2000), self-report symptom inventories are commonly used by both clinicians and researchers to gather information about patients' mental states. This form of data gathering is preferable to clinician-based rating scales as the information comes directly from the patients reflecting on their perceptions of distress (Schmitz et al., 2000). In mental health services and research using self-report questionnaires can be very helpful in monitoring the quality of medical/psychological interventions and as screening devices to identify symptoms of psychopathology (Schmitz et al., 2000).

3.1.2 Potential problems with self-report instruments

According to Razavi (2001) reliance on self-report for the measurement of both dependent and independent variables leads to concerns about the validity of causal conclusions because of systematic response distortions, method variance and the psychometric properties (reliability and validity) of questionnaire scales. The context in which self-report measures are used, in terms of the design of studies, as well as the statistical treatment of questionnaire data at the analysis stage can also lead to potential problems (Razavi, 2001). Of course self-report instruments remain the best way to measure constructs that are by definition perceptual in nature, for example values, attitudes and affective responses to the work environment (Razavi, 2001).

Razavi (2001) points out that it is especially important to understand systematic biases associated with self-report measures, especially when a self-report measure is used to assess *all* variables in a study.

Table 2: Summary of potential problems with self-report measures:

<u>Potential Problem</u>	<u>Description</u>
1. Response styles	Response styles refer to a bias in a particular direction regardless of the content of the test items, and include acquiescence, extreme and central tendency responding, and negative affectivity bias (discussed below).
2. Response distortion	This distortion is related to content and reflects a conscious or unconscious attempt on the part of the respondent to create a certain impression; the most frequently studied is socially desirable responding.

The first response style to be discussed is acquiescence, which refers to the tendency to respond positively to a question, regardless of the content of the question, and is particularly problematic for attitude survey research. A way to counter this tendency is to balance positively- and negatively-keyed items, such that the bias could be detected through inconsistent responses. But when items with mixed positive and negative wording are factor or cluster analyzed, there is a danger that negatively-keyed items will define a single factor, due to the careless responding of even 5% of participants (Razavi, 2001). In measures with rating scales extreme and moderacy response styles operate and reflect the tendency for subjects to respond consistently using particular sections of the scale (Razavi, 2001). Factors such as sex, age, education and culture have also been shown to relate to moderacy versus extreme response bias (Marin, Gamba & Marin, 1992). Many authors suggest controlling for extreme responding by altering the response format.

Negative affectivity has been shown to account for some of the variance in self-report measures of many variables, including measures of job stress and strain, somatic symptoms, health complaints and life events (Razavi, 2001). Brief et al. (1988) argue that negative affectivity markedly inflates correlations between stressor and outcome variables, and on this basis call into question the extent to which relationships detected through self-report research are valid. They suggest that negative affectivity measures in self-report research control statistically for this response bias in analyses of self-report data.

Social desirability bias refers to the tendency to answer self-report instruments in such a way as to deliberately or unconsciously represent oneself in a flattering light (Razavi, 2001). The motivation for such behaviour varies, for example some respondents may believe the more socially desirable answer is preferred to the truthful answer because of the beliefs of respondents about the purpose of the research (Razavi, 2001). Deliberate misrepresentation may take the form of “faking good” (making a positive presentation of oneself), or making things look worse than they are when it is believed that such a pattern of answers may produce a desirable outcome, for example patients in mental institutes who wish to receive long term care may fake bad to prolong their stay (Razavi, 2001). Some evidence suggests that deliberate faking is increased under conditions of high face validity. It is also important to remember that socially desirable responding is not necessarily a deliberate behaviour; it may also reflect an unconscious inclination to create a positive impression, to avoid criticism or gain positive approval or may betray self-deceptive tendencies of the respondent (Razavi, 2001). Like other response biases, social desirability is problematic because of its potentially contaminating influence on the relationships between variables, including masking and spurious associations (Razavi, 2001). The advantages of self-report measures are to a large extent dependent on the psychometric properties of the instruments used in research, in particular their reliability and validity (Razavi, 2001).

3.2 THE SYMPTOM CHECKLIST (SCL-90-R)

3.2.1 Introduction to the SCL-90-R

The chosen instrument for the measurement of overall stress level and associated symptoms of stress is the Symptom Checklist (SCL-90-R) devised by Leonard R. Derogatis (Spahn, Wiek, Burger & Hansen, 2003). The SCL-90-R is a self-report instrument that measures psychological distress and provides an overview of the patient’s symptoms and their intensity (Smith, 1996). The SCL-90-R is primarily used by psychologists, psychiatrists, physicians and counselling professionals in mental health, medical and education setting as well as for research purposes (Smith, 1996).

The SCL-90-R measures stress symptoms associated with psychoticism, depression, hostility, interpersonal sensitivity, somatization, phobic-anxiety, anxiety, paranoid ideation and obsessive-compulsive disorder (Spahn et al., 2003). The SCL-90-R also has a Global Severity Index (GSI) which measures the person’s basic mental stress (Nickel, Cangoez, Bachler, Muehlbacher, Lojewski, Mueller-Rabe, Mitterlehner, Egger, Leiberich, Rother, Buschmann, Kettler, Gil, Lahmann, Fartacek, Rother, Loew & Nickel, 2006). This can be recorded on a 5-tiered Likert

Scale between ranging from right now I experience the symptom: “not at all”, “A little bit”, “Moderately”, “Quite a bit” and “extremely”. Transformation of the raw values to T values, which take sociodemographic factors into consideration, also permits classification of individual cases. T values of 60 or more are regarded as mildly increased, 70 or more as greatly, and 75 or more as severe (Nickel et al., 2006).

The SCL-90-R has the following advantages: it is an objective method for stress symptom assessment, it measures patient progress during and after treatment to monitor change and it can be used to help measure the changes in symptoms such as depression and anxiety. The SCL-90-R takes approximately 12-15 minutes to administer and consists of 90 items rated on a 5-point scale (Chen, Yang, Yen & Wu, 2005). The instrument was normed using a standard sample of 1006 “normal” people and more than a thousand studies have been done on the validity, reliability and utility of the SCL-90-R (Spahn et al., 2003). The transformation into T values takes the demographic variables of sex and degree of education into account (Spahn et al., 2003). The SCL-90-R provides a total stress score as well as sub-scores on pathologies associated with high degrees of distress. The scales and alpha coefficients for the SCL-90-R are as follows: somatization = .88, obsessive-compulsive = .82, interpersonal sensitivity = .84, depression = .88, anxiety = .88, hostility = .81, phobic anxiety = .87, paranoid ideation = .73, psychoticism = .86, additional items = .78, and total score = .98 (Derogatis & Cleary, 1977). Internal consistency scores range from .77 to .90 with test-retest reliability ranging from .80 to .90 with a one-week interval between tests (Smith, 1996). The SCL-90-R has the advantage of being multi-dimensional and brief making it a good way to assess psychological stress and distress and also to re-evaluate a patient after treatment.

According to Zare´, Galanko, Behrns, Koruda, Farley, Evans, Meyer, Sheldon and Farrell (2004) the GSI is a very good indicator of the global level of psychological distress, which is the most sensitive single numeric indicator of a respondent’s overall distress. The GSI score takes into account the intensity of distress and the number of symptoms (Zare´ et al., 2004). The nine primary symptom dimensions clarify the specific stress experienced by the individual. Somatization is indicated by symptoms such as headache or upset stomach (Zare´ et al., 2004). Somatization symptoms typically have a high prevalence in disorders of functional etiology. Depression is determined by a broad range of questions related to dysphoric mood and affect and cognitive and somatic correlates of depression (Zare´ et al., 2004). Anxiety is measured by symptoms such as nervousness, tension, and apprehension (Zare´ et al., 2004). Interpersonal sensitivity is measured with items measuring feelings of personal inadequacy, as manifested by self-deprecation or discomfort during interpersonal interactions. Hostility is demonstrated by negative thoughts, feelings, or actions stemming from anger (Zare´ et al., 2004). Obsessive-

compulsive symptoms are measured with items focusing on patterns of thought or behaviors that are irresistible and unwanted in nature (Zare' et al., 2004). Phobic anxiety is indicated by irrational responses to situations or persons, leading to avoidance of those circumstances (Zare' et al., 2004). Paranoid ideation is measured by symptoms of suspiciousness and loss of autonomy. The Psychoticism dimension is aimed at recognition of a spectrum of clinical entities ranging from withdrawn schizoid lifestyle to overt psychosis.

3.2.2 Sub-scales of the SCL-90-R

Psychoticism

According to the SCL-90-R manual psychoticism is a construct designed to be measured on a continuous dimension of human experience (Spahn et al., 2003). The items indicate a withdrawal from society. Isolation and a schizoid lifestyle are also key characteristics of psychoticism. Thus the items include problems such as hallucinations and thought control problems. The psychoticism dimension provides a graduated continuum from mild interpersonal alienation to severe psychosis. The SCL-90-R has 10 items measuring psychoticism.

Depression

The SCL-90-R reflects a range of clinical depression symptoms. The symptoms include dysphoric mood and affect which are represented by a lack of interest, motivation and a loss of energy (Spahn et al., 2003). This is accompanied by thoughts of hopelessness, suicide, and other cognitive and somatic symptoms of depression.

The DSM-IV criteria for a mild depressive episode are as follows (Saddock & Saddock, 2003):

- a) The person experiences a depressed mood for most of the day which is largely uninfluenced by circumstances.
- b) There is a marked loss of interest in pleasure or pleasurable activities.
- c) Decreased energy or increased fatigue.
- d) Additional symptoms include a loss of confidence or self-esteem, unreasonable feelings of self-reproach or excessive or inappropriate guilt.

The SCL-90-R has 13 items measuring the above-mentioned DSM-IV criteria.

Hostility

Hostility in terms of the SCL-90-R is defined as thinking patterns related to negative thoughts, feelings or actions that are characteristic of negative affect and anger. The SCL-90-R has 6 items that measure aggression, irritability, rage and resentment.

Interpersonal sensitivity

The interpersonal sensitivity items of the SCL-90-R measure feelings of inferiority, particularly when the person compares him or herself with others. The SCL-90-R measures self-deprecation, self-doubt and discomfort during interpersonal interactions. There are 9 items that measure interpersonal sensitivity.

Somatization

Somatization items measure the distress arising from perceptions of bodily dysfunction such as cardiovascular complaints, gastrointestinal, respiratory and other autonomic mediation problems. Somatization disorder is characterized by physical complaints that cannot be fully explained by a physician (Barlow & Durand, 2005). The individual does not intentionally feign the symptoms but rather the symptoms are linked to psychological origins (Barlow & Durand, 2005). Such an individual may need many days of sick leave and become anxious when away from home. The physiological symptoms may be manifestations of psychological illnesses.

The DSM-IV criteria for somatization disorder are as follows (Barlow & Durand, 2005):

- a) A history of physical complaints beginning before age 30 that resulted in treatment being sought or significant impairment in social, occupational or important areas of functioning.
- b) At least four pain symptoms and a history of pain sites or functions.
- c) Two gastrointestinal symptoms (for example nausea).
- d) One sexual symptom not involving pain (for example erectile dysfunction).
- e) One pseudoneurological symptom (for example amnesia).
- f) These symptoms cannot be explained by medical science.
- g) When related to physical disorder the symptoms are exaggerated

The SCL-90-R measures these symptoms with 12 items focused on unexplained illnesses related to poor psychological functioning.

Phobic-anxiety

Phobic anxiety is viewed in terms of a persistent fear response, either in terms of being afraid of a specific person, place, object, or situation that is irrational and a more than normal fear response to the stimulus. This leads to the person wanting to escape or displaying avoidance behaviour. Phobic anxiety usually involves the following symptoms (Saddock & Saddock, 2003):

- a) Palpitations or pounding heart
- b) Sweating
- c) Trembling or shaking
- d) Dry mouth not due to dehydration or medication.

The SCL-90-R measures phobic-anxiety with 7 items focused on the above-mentioned symptoms, for example questions as to whether the person experiences trembling.

Anxiety

The SCL-90-R defines anxiety as a general feeling of nervousness, tension, and trembling. Feelings of terror, apprehension and dread are part of the definition of anxiety as defined by the SCL-90-R. According to Saddock and Saddock (2003), anxiety has two components: an awareness of the physiological sensations and feelings of being nervous or frightened. Psychological distress is often accompanied by feelings of anxiety and as mentioned in chapter two stress and anxiety are closely linked. Unlike phobic anxiety, general anxiety is less specified but the vague feelings of nervous tension is distressful to the individual none-the-less (Saddock & Saddock, 2003). The SCL-90-R measures anxiety with 10 items focused on the symptoms of dread and nervousness.

Paranoid ideation

Paranoid behaviour is generally seen as a disordered mode of thinking. The main characteristics of paranoid ideation measured by the SCL-90-R include projective thoughts, hostility, lusciousness, grandiosity, centrality, fear of loss of autonomy, and delusions that primarily reflect this mode of thinking. Paranoid ideation is thus characterized by a pervasive and unwarranted mistrust of others (Barlow & Durand, 2005; Bernstein, Useda & Siever, 1995). This hypervigilance and sensitivity to criticism hinders the individual's opportunities for healthy relationships with others. The DSM-IV criteria for paranoid personality disorder are as follows (Barlow & Durand, 2005; Bernstein, Useda & Siever, 1995):

- a) Suspects others without sufficient basis, believes others are deceiving, exploiting, harming or deceiving him or her.
- b) Is pre-occupied with unjustified doubts about the loyalty or the trustworthiness of friends, acquaintances or spouse.
- c) Is reluctant to confide in others because of unwarranted fear that information will be used against him or her.
- d) Reads hidden meanings into benign remarks or events.
- e) Persistently holds grudge and is unforgiving of insults, injuries or slights.
- f) Perceives attacks on his or her character and is quick to react angrily or to counter attack.
- g) Have recurrent suspicions that spouse or partners' fidelity is questionable.

The SCL-90-R measures paranoid ideation with 6 items focused on the above-mentioned symptoms, for example questions relating to trusting others or feelings that others cannot be trusted.

Obsessive-compulsive disorder

The OCD items in the SCL-90-R measures those symptoms typically described in the DSM-IV. The measurement instrument focuses on thoughts, impulses, and actions that are experienced unremittingly and are irresistible to the individual in question. Obsessive-compulsive personality disorder is primarily characterized by indexing, classifying, compiling lists, obsession with cleanliness, and a tendency to hoard (Barlow & Durand, 2005; Bernstein, Useda & Siever, 1995).

The DSM-IV criteria for OCD personality disorder are as follows (Bernstein, Useda & Siever, 1995):

- a) A pervasive pattern of preoccupation with orderliness, perfectionism, and mental and interpersonal control at the expense of flexibility, openness and efficiency.
- b) The person is preoccupied with details, rules, lists, order, organization or schedules to the degree that the major point of the project is lost.
- c) Shows perfectionism that interferes with job completion.
- d) Is excessively devoted to work and productivity to the exclusion of leisure activities and friendships.
- e) Is over conscientious, scrupulous, and inflexible about matters of morality, ethics or values.

- f) Is unable to discard worn-out or worthless objects even when they have no sentimental value.
- g) Is reluctant to delegate tasks or to work with others unless they submit to the exact requirements of the OCD individual.
- h) Adopts a miserly spending style toward both self and others. Money is viewed as something to hoard for future disasters.

Symptoms of obsessive compulsive disorder may be an expression of the individual's psychological distress or the high amount of stress they are currently experiencing (Saddock & Saddock, 2003). Some individual's may express their psychological distress by displaying obsessive-compulsive characteristics. The SCL-90-R measures OCD with 10 items focused on the above-mentioned symptoms.

3.2.3 Validity and reliability of SCL-90-R

Schmitz et al. (2000) report that despite the frequent use of SCL-90-R as a measure of psychopathology and general distress, the validity of the instrument is controversial. Schmitz et al. (2000) note that the results of studies investigating the factor structure of the instrument have been inconsistent. For example Hoffman and Overall (1978) identified five factors, as opposed to the nine factors, that were significant in a psychiatric outpatient sample.

Figure 7: A summary of studies on the SCL-90-R's validity.

<u>Main findings of study on SCL-90-R</u>	<u>Reference</u>
1. A study that identified five factors, as opposed to the nine factors, that was significant in a psychiatric outpatient sample.	Hoffman N.G., & Overall P.B. (1978). Factor structure of the SCL-90 in a psychiatric population. <i>Journal of Consulting Clinical Psychology</i> , 46, 1187-1191.
2. A study that obtained nine factors that were somewhat different from those obtained by Derogatis et al.	Holcomb, W.R., Adams, N.A., Ponder, H.M. (1983). Factor structure of the Symptom Checklist-90 with acute psychiatric inpatients. <i>Journal of Consulting Clinical Psychology</i> , 51, 535-538.
3. Hafkenscheid (1993) found four clinically	Hafkenscheid, A. (1993). Psychometric

interpretable factors in a psychiatric inpatient population	evaluation of the Symptom Checklist (SCL-90) in psychiatric inpatients. <i>Personality Individual Differences</i> , 14, 751-756.
4. Bonyge (1993) could only derive one large factor accounting for nearly 70% of the variance of the instrument in a community mental health crisis intervention unit.	Bonyge, E.R. (1993). Uni-dimensionality of SCL-90-R scales in adult and adolescent crisis sample. <i>Journal of Clinical Psychology</i> , 49, 212-215.

Of course the above-mentioned studies are but a small sample of studies done on the SCL-90-R and literally hundreds of similar studies have been done with varying results. It does seem that the SCL-90-R has different variability depending on the patient population (Schmitz et al., 2000). Yet despite this variability of validity scores there is evidence for the utility of the global scores and several sub-scales in the identification of mental disorders (Schmitz et al., 2000). For example, some studies showed that the power of the SCL-90-R to discriminate between patients and the community is good (Bonicatto, Dew, Soria & Seghezso, 1997; Holi, 1998). The SCL depression and anxiety scales for example have shown good convergent and divergent validity (Koeter, 1992).

The SCL-90-R has been validated against the Minnesota Multiphasic Personality Inventory, the Middlesex Hospital Questionnaire, the Center for Epidemiologic Studies Depression Scale, the Hamilton Depression Rating Scale, the Social Adjustment Scale and the General Health Questionnaire (Schmitz et al., 2000). The instrument has been evaluated in psychiatric patients and in patients with most major medical conditions (Schmitz et al., 2000). It has also been used in surgical studies evaluating patients with breast cancer and patients with fractures of the distal radius (Schmitz et al., 2000). The SCL-90-R was chosen for this study based on its ease of application and on the considerable data supporting it.

3.2.4 Administration of the SCL-90-R

To calculate the GSI, the nine primary symptom dimensions' summed total score is divided by the number of items. Within each symptom, scores are averaged across the respective items in that dimension. The raw score obtained is then referred to gender-appropriate norms, derived from a normal adult population of 960 individuals, for conversion to standard t-score, which may alternatively be expressed as a percentile score (Zare' et al., 2004).

A t-score of 63 for example would represent the 90th percentile of the normative sample (regardless of symptom) (Zare´ et al., 2004). Thus based on studies of large numbers of normal individuals and psychiatric patients, t-scores equal to or greater than 63 (90th percentile) for GSI alone can be reason for concern. This does not mean however that the SCL-90-R should be used as a method of assigning psychiatric diagnoses, but rather to provide an indication of overall distress (Zare´ et al., 2004).

3.3 THE MINI-MENTAL STATUS EXAM

3.3.1 Introduction to the MMSE

The mini-mental state examination (MMSE) is the chosen screening device and is a brief examination consisting of eleven questions, which are used to evaluate an adult patient's level of cognitive functioning (Cavanaugh & Blanchard-Fields, 2003; Folstein, Folstein & McHugh, 1975). The MMSE was used to identify patients cognitively capable of participating in the study. The Mini-Mental State Examination is a brief, quantitative measure of cognitive status in adults. It can be used to screen for cognitive impairment at a given point in time, to follow the course of cognitive changes in an individual over time, and to document an individual's response to treatment (Mystakidou, Tsilika, Parpa, Galanos & Vlahos, 2007).

The MMSE is also used in epidemiological studies for disorders that affect cognition (Kurlowic & Wallace, 1999). The MMSE is used to evaluate six areas of cognitive functioning, which are as follows (Srivastava, Rapoport, Leach, Phillips, Shammi & Feinstein, 2006):

- Orientation
- Attention
- Immediate recall
- Short-term recall
- Language
- The ability to follow simple verbal and written commands.

Through this process the examiner is able to place the patient on a scale of cognitive function. The MMSE has a median score of 29 for individuals 18–24 years of age; the median score is 25 for those who are 80 or older (Mast, Fitzgerald, Steinberg, McNeill, & Lichtenberg, 2001). The median score is 22 for individuals with a grade four education or less; 26 for those who completed primary school and 29 for those who completed matric (Mast et al., 2001). The maximum total score that can be obtained on the MMSE is 30 (Mast et al., 2001). If an individual scores 20 or

lower this could indicate delirium, dementia, schizophrenia, poor cognitive functioning or a mood disorder. Individuals with none of the above mentioned problems and those with a primary diagnosis of personality disorder score close to the median for their age and education level (Kurlowic & Wallace, 1999).

Folstein, Folstein and Mchugh (1975) explain the reasoning behind the MMSE. While there are many tests to assess mental abilities most of them require long periods of concentration for testing which patients with neurological problems may be unable to sustain. This makes the MMSE much more user friendly, as it is quick to administer but gives a good indication of the patient's mental capabilities.

3.3.2 Validity and reliability of the MMSE

The MMSE has demonstrated validity and reliability in psychiatric, neurologic and other medical populations (Mystakidou et al., 2007). Mystakidou et al. (2007) found that the MMSE meets the recommendation that Cronbach's coefficient should be at least 0.60 for a self-report instrument to be reliable, their study on the MMSE showed a Cronbach's alpha value of 0.890.

Research conducted by Commenges, Gagnon, Letenneur, Dartigues, Barberger-Gateau and Salamon (1992) showed that two sub-scores, "orientation to time" and "recall three objects," improved the discrimination between demented and non-demented individuals. Educational level was also found to be correlated to the Mini-Mental State Examination score, which aids in the interpretation of the score (Commenges et al., 1992). Their study also revealed Benton's Visual Retention Test had a major discriminating ability and that a high specificity (0.90) was obtained when both tests were used (Commenges et al., 1992). Commenges et al., (1992) suggested that it seems worthwhile to construct a screening procedure based on the Mini-Mental State Examination and on psychometric tests that specifically assess visual memory and verbal fluency, two cognitive functions that are not explored at length in the Mini- Mental State Examination.

3.3.3 Administration of the MMSE

The first task is to establish the patient's awareness of the current world, i.e. the *Orientation Test (10 points)*². This is done by asking the patient for the date, season, location and so forth. One

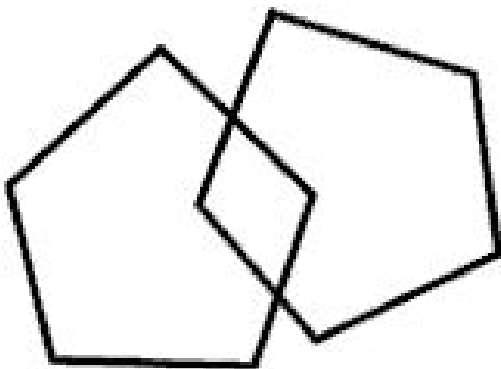
² Instruction on how to administer the MMSE based on NHCQF's MMSE interpretation:
medicine.uiowa.edu/igec/tools/cognitive/MMSE.pdf

point is given for each correct answer. *The Registration Test (3 points)* assesses the patient's ability to learn and memorize three unrelated objects. After having named the objects, the patient is asked to repeat them. The number of objects the patient names correctly upon the first repetition determines the score (0-3). If the patient does not repeat all three objects the first time, continue saying the names until the patient is able to remember all three items, with up to six trials. The number of trials it takes for the patient to memorize the words should also be recorded. Should the patient not be able to learn all three objects, recall cannot be meaningfully tested. *The Attention and Calculation Test (5 points)* begins by asking the patient to begin with 100 and count backward by sevens, this is stopped after five subtractions (93, 86, 79, 72, 65). The total number of correct answers is scored. If the patient is unable to do the subtraction task, the patient is asked to spell the word "world" backwards. The score is determined by the number of letters in the correct order (e.g., dlrow=5, dlrow=3).

The next step is to do the *Recall Test (3 points)*, which is done by asking the patient if he or she can recall the three words you previously asked him or her to remember, then score the total number of correct answers (0-3). *The Language and Praxis Test (9 points)* is done by asking the patient to name two objects (for example show the patient a watch). One point is given for each correct naming (0-2). Next the patient is asked to repeat the sentence "No ifs, ands, or buts." Only one trial (score 0 or 1) is allowed. Then the patient is given a piece of blank paper and told: "Take this paper in your right hand, fold it in half, and put it on the floor." One point is given for each part of the command correctly performed. This is then followed by writing the sentence, "Close your eyes," in letters large enough for the patient to see clearly. Then the patient is told to read the sentence and do what it says. A score of one point only is given if the patient actually closes his or her eyes. As this is not a test of memory, the patient may be prompted to perform the task (say to the patient "do what it says" after the patient reads the sentence).

To test ability to write, the patient is given a blank piece of paper and asked to write a sentence for you (it is important to not dictate a sentence; it should be written spontaneously). The sentence must contain a subject and a verb and make sense (there is no subtraction for incorrect grammar and punctuation). Copying is tested by showing the patient the picture of two intersecting pentagons and asking the patient to copy the figure exactly as it is. For a full score all ten angles must be present and two must intersect to score one point (ignore tremor and rotation). See the figure on the next page.

Figure 8: Picture to be copied by patient during administration of MMSE (intersecting pentagrams):



The figures aid in the testing of the patient's mental abilities and is used to assess their cognitive functioning in terms of form recognition and the ability to successfully duplicate a figure.

Table 3: Norm scores of the MMSE³

<u>Method</u>	<u>Score</u>	<u>Interpretation</u>
Single Cutoff	<24	Abnormal
Range	<21	Increased odds of dementia
	>25	Decreased odds of dementia
Education	21	Abnormal for 8th grade education
	<23	Abnormal for high school education
	<24	Abnormal for college education
Severity	24-30	No cognitive impairment
	18-23	Mild cognitive impairment

³ Taken from Crum, Anthony, Bassett and Folstein (1993).

	0-17	Severe cognitive impairment
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As can be seen in the table above, the MMSE has norm scores for different educational levels and also indicators of severity. Mystakidou et al. (2007) note that cognitive problems are an unfortunately consequence of many severe illnesses and injuries. According to the Diagnostic and statistical Manual of Mental Disorders (4th ed) cognitive disorders can be divided into the following subscales of:

- (1) Delirium, dementia, amnesic, and other cognitive disorders
- (2) Mental disorders due to general medical condition (including mood disorder, anxiety disorder, and personality change due to general medical condition);
- (3) Substance-related disorders.

The MMSE helps to identify cognitive impairment and may point to any of the above-mentioned impairments. By using the MMSE the clinician can identify potential cognitive problems patients are experiencing and make recommendations

3.4 CONCLUSION

Both the MMSE and the SCL-90-R showed acceptable reliability and validity coefficients and served a useful purpose in this study. The MMSE helped identify patients who were cognitively capable of participating in the study and the SCL-90-R was used to assess stress levels in patients to assess whether the intervention helped to reduce the stress levels. Of course the SCL-90-R is a self-report instrument and interpretation of results should be done with care but it is none-the-less a useful way of assessing perceived stress levels.

CHAPTER 4

METHODOLOGY

4.1 INTRODUCTION TO METHODOLOGY

Methodology is the defining aspect of research, it can produce reliable and valid results if the method is appropriate, or produce unusable research should the method be poorly chosen or applied (Babbie & Mouton, 2002).

4.2 HYPOTHESIS

The hypotheses on which this research will be based include the variables of stress levels and art production and the aim is to investigate their possible relationship. The research hypothesis mainly entails the expectation that there will be a significant change in reported stress levels after painting for half an hour.

To operationalize these variables in more quantitative terms they are presented as follows: Dependent Variable (DV): Stress levels are operationalised as the score a person obtains on the SCL-90-R (a self-report measure) and the scores obtained on the subscales of the SCL-90-R are also analysed (see chapter 5).

Independent Variable (IV): Art therapy will be operationalised as half an hour of painting. Other factors that groups will be compared on include age, race, nature of injury, time in rehabilitation and education level.

To test the research hypothesis by means of T-tests, the following statistical hypotheses can be stated:

H₀ (Null Hypothesis): No statistically significant correlation exists between the lowering/ increase of stress levels after participating in a creative activity such as art production in the form of painting, thus, where groups are compared $\mu_1 = \mu_2$.

H_A (Alternative Hypothesis): A statistically significant correlation exists between the lowering/ increase of stress levels after participating in a creative activity such as art production in the form of painting, thus, where groups are compared $\mu_1 > \mu_2$, or $\mu_1 \neq \mu_2$ or $\mu_1 < \mu_2$.

4.3 QUASI-EXPERIMENTAL DESIGN

4.3.1 Introduction to the quasi-experimental design

According to Garcon, research designs falls into two broad classes: quasi-experimental and experimental (Garcon, 2007). A quasi-experimental design, as the name suggests, is similar to that of a usual experimental design but fails to meet all the requirements that would classify it as an experimental design (Gravetter & Forzano, 2003). The quasi-experimental design owes its prominence in the field of social experimentation to the influential chapter of Campbell and Stanely in Gage's *Handbook of Research on Teaching* (Robson, 2002).

Like an experimental design, the quasi-experimental design attempts to limit threats to internal validity and produce cause-and-effect conclusions but lacks a critical component that an experiment would have had, such as manipulation or control. Usually a quasi-experimental design compares pre-existing groups or defines the condition with a time variable (Gravetter & Forzano, 2003). Because a quasi-experimental design does not have the level of control that an experiment has, this research design cannot draw an unambiguous cause-and-effect conclusion (Gravetter & Forzano, 2003). The non-manipulated variable in the quasi-experimental design is usually a participant variable (male participants versus female participants) or time variable (such as before versus after treatment) (Gravetter & Forzano, 2003). To control for confounding variables, quasi-experimental designs make use of statistical techniques (Garcon, 2007).

The research design chosen for the study is a quasi-experimental design which attempts to limit threats to internal validity and produce cause-and-effect conclusions but lacks a critical component that an experiment would have had, in this case randomisation.

Experimental designs are most often done in laboratories or other contrived settings, whereas quasi-experimental designs tend to be done in more natural settings (Gravetter & Forzano, 2003). This study is a good example of this as the study was conducted with the patients in the hospital and not in an artificial environment such as a laboratory. Experimental studies rely on randomization, dividing subjects randomly into treatment and control groups and thereby controlling to some extent the extraneous variables (Garcon, 2007). According to Gravetter & Forzano (2003), for a study to be classified as an experiment it needs the following components: **manipulation**: did the researchers manipulate one variable to create a set of two or more treatment conditions? The next criteria is **measurement**: Was a second variable measured so as to obtain a set of scores in each treatment condition? Then **comparison**: Were the scores in one treatment condition compared with scores in another treatment condition? Finally **control**: Were

other variables controlled to make sure they do not influence the relationship between the two variables being examined? In a quasi-experimental design, one or more of these pre-requisites are not met and thus the experiment cannot be classified as an experimental design (Gravetter & Forzano, 2003). Another aspect of experiments is that they are always prospective (Thomson & Panacek, 2006). **Prospective studies** are studies wherein the events of interest have not yet occurred when the study begins (data is then more accurate because the researcher can control the event/intervention and variables that may interfere with results) (Thomson & Panacek, 2006). So for example, if a new drug is administered to a patient the study is prospective because the researcher is studying an event (in this case an intervention) that has not occurred before. This study is prospective because an intervention is given and the results are studied and thus the event of interest has not yet occurred before the study begins.

Retrospective studies are those in which the events of interest all occurred before the onset of the study (i.e. the researcher is studying an already existing phenomenon or event) (Thomson & Panacek, 2006). For example if the researcher wishes to investigate the success of a health intervention, the study is retrospective because the event has already happened. Control is not possible in retrospective studies because the event/intervention has already occurred and therefore retrospective studies cannot be considered experimental. Quasi-experiments are most often prospective but can also be retrospective (Thomson & Panacek, 2006).

The word quasi is in fact misleading, giving the impression that this design is a sub-standard form of an experimental design. Quite the contrary, a quasi-experimental design is a separate research design from an experimental design, and when applied correctly serves a valid method for investigating variables that cannot be manipulated or controlled (Gravetter & Forzano, 2003). Some theorists do maintain that experimental designs are better than quasi-experimental designs, but Cook and Campbell (1979) prefer to stress the advantages and disadvantages of both types of designs and recommend considering all the options and choosing the most appropriate design for the study. Thomson and Panacek (2006) concur with the aforementioned assertion and state that it is a common misconception that for every research project there is one single best design to answer that research question. Instead Thomson and Panacek (2006) point out that there are usually multiple research designs that can be used to approach a given research question. Thomson and Panacek (2006, p.242) state that “decisions regarding selection of a research design for a given project represent a compromise between the goal of rigorous scientific integrity versus limited resources and research reality”. A common misconception is that only research that is prospective, randomized, blinded and truly experimental can fulfill the purposes of useful and appropriate research and meet scientific standards (Thomson & Panacek, 2006). While studies that do fulfill these criteria are very useful and encouraged they are limiting

in the sense that sometimes the variables under investigation cannot be studied in this manner. Thomson and Panacek (2006) offer a comparison of experimental, quasi-experimental and non-experimental designs:

Table 4: A comparison between true experiments, quasi-experiments and non-experimental methods.

<u>True experimental</u>	<u>Quasi-experimental</u>	<u>Non-experimental</u>
1) Have all of the experimental characteristics: control, randomization, comparison and manipulation	1) Only have one or two the experimental characteristics (manipulation or control).	1) Have one or none of the core experimental characteristics
2) Are always prospective	2) Generally lack randomization	2) Lack manipulation and randomization, may also lack control
3) Have high scientific validity	3) Are generally prospective in nature	3) Generally retrospective
	4) Moderate in scientific validity	4) Have the lowest scientific validity

As can be seen in the table above, true experiments have the highest scientific validity. Yet it is not always possible to have a truly randomised sample. It is for this purpose that a quasi-experimental design yields useful results even if the design is not as rigorous as that of a true experiment and is also the reason that this design was chosen for this study.

4.3.2 Type of quasi-experimental design used in this study

Pre-test Post-test non-equivalent control group design is a much stronger form of non-equivalent design, with the two groups being measured twice. The treatment group is measured before the treatment and after the treatment, whereas the other group is measured the same two

times but does not receive any treatment⁴. The main problem with this design is that the researcher cannot say for sure if an effect found is due to the treatment or due to some other characteristic that differentiates the two groups (Robson, 2002). As the experimental group showed no difference between the pre-test and the post-test and the control group was only measured some months later, it was deemed unnecessary to test the control group twice. Analysis of the experimental group showed no difference so there was no treatment effect, and therefore a post-test for the control group would not have proved anything and was unnecessary. A pre-test was conducted with the control group to show that the control and experimental groups do not differ initially, which ensures group equivalence on the dependent variable. The post test is necessary for the experimental group to ascertain whether the treatment had an influence on the experimental group.

In this study the patients were not randomly divided, but rather one group was be measured in one month (experimental group), and 2 months later a new group was measured (control group). Because a quasi-experimental design does not have the level of control that an experiment has, this research design cannot draw an unambiguous cause-and-effect conclusion (Gravetter & Forzano, 2003). However, the design will still look for a potential relationship between stress levels and a creative intervention. This study serves as a pilot study of a potential way in which to investigate the relationship between stress levels and creativity. The results should thus be interpreted cautiously and the methodology should be evaluated for flaws so that improved studies can be conducted in the future.

Table 5: A diagram of testing procedures:

<u>Group</u>	<u>Time of Selection</u>	<u>Screening</u>	<u>Pre test</u>	<u>Treatment</u>	<u>Post test</u>
Experimental	Selected in first month	Screened the day before/or an hour before the intervention	O	X	O
Control	Selected 2 months later	Screened on the same day	O		

⁴ Due to practical reasons the control group could not take the SCL-90-R twice so there is only one score to compare. However the experimental group did take the SCL-90-R twice and these two scores could be compared to each other and to the control group's score.

The experimental group received the intervention during the first month and are pre and post tested. Two months later the control group was selected and tested but they did not receive the intervention. As there was no significant change between the first score of the experimental group and the second score it was deemed unnecessary to test the control group twice.

4.3.3 Validity issues

The internal validity of a quasi-experiment study is concerned factors within the research that raise doubts about the results and their interpretation (Gravetter & Forzano, 2003). Researchers wish to draw a single conclusion/explanation for their findings and factors that may have caused the results. Validity in research design refers to the *truth* of the design in terms of how sound and legitimate the methodology and design as a whole is (Cook & Campbell, 1979; Seale, 1999). As Cook and Campbell note (1979), research is an attempt to approximate *truth* and validity is the measure of how accurately this is accomplished. One may argue that to reflect the truth of reality is marred by the philosophical problems of the degree to which we may know the real world objectively. Yet science rests on the assumption that a world separate from us not only exists but is knowable if not fully then at least partially (Seale, 1999). Without this assumption research in itself seems pointless. So validity is a corner stone of scientific research.

When variables other than the manipulated variables can explain the obtained results then the internal validity of the study becomes suspect (Gravetter & Forzano, 2003). A study can achieve internal validity if there is *only one* explanation for the results (Gravetter & Forzano, 2003; Meltzoff, 1998; Holosko, 2006). Finding a relationship between two variables in quantitative research depends on statistically significant data obtained from testing the two variables (or more). However, even if there is a statistically significant relationship between the two variables it is not certain that A caused B or that B caused A or that neither influenced each other but that a third variable C (or D) actually caused the apparent relationship between A and B (Gravetter & Forzano, 2003; Johnson, 1997; Seale, 1999). This problem of causality is what lies at the heart of internal validity and is known as the problem of *spurious causation* (Seale, 1999).

The external validity of a study is concerned with the degree to which the result obtained can be generalized to different setting, populations and times (Cook & Campbell, 1979; Gravetter & Forzano, 2003). So to once again link validity to the search for truth, the external validity is centered on how *true* the result are for anyone not a part of the study or for the participants in the study in a different environment (Cook & Campbell, 1979). For this reason it is easy to see why external validity is often considered synonymous generalizability.

Specific threats are usually related to specific research designs so the following list of general threats will differ according to the research design. **Assignment bias** occurs when the participants are divided into group but the groups are not homogenous and the two groups differ significantly in characteristics from one another making comparison unpractical (Gravetter & Forzano, 2003; Holosko, 2006). **Environmental variables** could also influence the responses of participants, for example the amount of light in a room, temperature, time of day or season and so forth (Gravetter & Forzano, 2003; Holosko, 2006). Another potential threat to the internal validity of a study is what is known as the **history effect** (Gravetter & Forzano, 2003). The history effect means that participants come from different backgrounds and have had different learning experiences and may have gained different values. For example doing a teen-pregnancy prevention program in rural and urban schools may yield different results because the two groups may have had different experiences. Other threats include **fatigue** (participants may become tired if the study takes too long) and **practice effects** (administering the same test more than once could mean participants have had opportunity to learn how to answer the questions, a real threat for this study).

Ecological validity requires the researcher to use participants and settings as closely representative of the real world as possible (Meltzoff, 1998). This will strengthen external validity considerably as it would make the findings far more generalizable than strictly controlled laboratory experiments (Meltzoff, 1998). To increase ecological validity researchers attempt one of two strategies: make the testing/intervention circumstances as natural as possible or conduct experiments in natural settings (Gravetter & Forzano, 2003; Meltzoff, 1998).

Without validity the research would be unscientific and ultimately, useless. Achieving both internal and external validity is the goal of research, i.e. the researcher wants to know that the results are an accurate explanation of the two variables (or more) and that the findings extend to other groups and situations (Gravetter & Forzano, 2003). However, achieving both simultaneously is easier said than done. Often increasing one type of validity decreases the other (Gravetter & Forzano, 2003). For example to increase internal validity the researcher may conduct the study in a carefully controlled environment but this would affect the external validity negatively as such an artificial environment may produce results that are not easily generalizable to other, more natural situations (i.e. low ecological validity) (Gravetter & Forzano, 2003; Meltzoff, 1998). Finding the balance between external and internal validity is matter of trade-offs and depends on the type of research design and the aims of the study. The balance is difficult to achieve and often a study may be externally valid but lose internal validity and vice versa (Gravetter & Forzano, 2003).

4.3.4 Conclusion

Quasi-experimental designs are important in psychological research, as there are phenomena that cannot be studied in a true experimental fashion. Quasi designs are also more flexible and give the researcher the opportunity to increase the external validity of the research. In this study a quasi-experimental design was necessary as it was not possible to assign the participants randomly.

4.4 PARTICIPANTS AND DATA COLLECTION

The participants were selected from MuelMed Hospital's Rehabilitation division in Pretoria. The patients were not randomly selected but rather a group of pre-existing patients were utilized. The creative intervention took place during the recreation therapy session, which is scheduled twice a week for an hour. The patients range in ages from as young as 18 up to 85 and include people from varied backgrounds and different races. Reasons for being in the rehabilitation centre include injuries and debilitating illnesses. The MuelMed Rehabilitation centre aims to help patients regain their independence.

4.4.1 Procedure/data collection

The variables involved in the study are as follows: a dependent variable (the stress and anxiety levels), an independent variable (the art production), pre-testing (to assess the initial stress and anxiety levels) and the post-test (to assess whether the intervention made a difference). The same variables were be used for both the experimental group and the control group except in the case of the control group where the independent variable of art production was not used. The independent variable (art production) has no level in this case and remains a nominal variable.

The day before the intervention, the researcher administered the Mini Mental Status Exam to establish which patients were cognitively capable of participating in the research. According to Cavanaugh and Blanchard-Fields (2003) screening devices such as the Mini Mental Status Exam are "especially useful as quick screening measures of mental competence that are used to screen for cognitive impairment" (p.112).

The experimental group filled in the stress questionnaire, received 30-90 minute art intervention and filled in the stress questionnaire again. The control group filled in the stress questionnaire once but received no intervention. The participants in the experimental group were given the

instruction to express themselves through the use of paint on paper in an encouraging way. This was to prevent psychological apprehension of artistic skills, which may also lead to anxiety and stress (Katz, 2003). "Both real and implied evaluation by others leads to apprehension that is likely to inhibit creativity" (Katz, 2003, p.209). It was clearly stated that these works of art will in no way be evaluated for artistic ability, but that participants should merely enjoy themselves and express themselves through generation of artistic ideas.

4.4.2 Small sample studies

Lunsford and Lunsford (1995) note that the two most important questions a researcher must ask before conducting a study are: "How many subjects will I need to complete my study?" and "How will I select them?" Naturally if one could gain access to an entire population this would be ideal but this is rarely possible. Instead the researcher may be constrained by limited access and funds, thus necessitating the use of a small sample. In the case of this study, the researcher had access to rehabilitation patients at a hospital but only those cognitively capable could participate in the study and this led to the utilization of very small samples. Lunsford and Lunsford (1995) add that an effective intervention could be discarded if the sample size is reduced to such a degree that changes in pre and posttests are difficult to detect. According to Lunsford and Lunsford (1995), when studying relationships (correlation), data for at least 30 subjects should be gathered, while in experimental studies involving the comparison of groups, data for a minimum of 15 subjects is desirable. In this study 2 groups of 11 patients in each group was used. This is less than the recommended group and thus the study should be seen as a pilot study only and the results interpreted cautiously.

When the sample size is not carefully considered the study may lack the power or ability to detect intervention effects of fairly substantial magnitude and importance (Lunsford & Lunsford, 1995; Trochim, 2001). Mainly the researcher is trying to avoid two errors, the type I (reject the hypothesis [H_0] when it is true) and type II (accept the H_0 when it is false) (Lunsford & Lunsford, 1995; Trochim, 2001). The chance of making a type 1 error is denoted by *alpha*, and the probability of a type II error is called *beta* (Lunsford & Lunsford, 1995). Alpha is also referred to as the *level of significance* of the test (Lunsford & Lunsford, 1995; Trochim, 2001). Whereas the quantity $(1 - \beta)$ is called the *power of the test* (Lunsford & Lunsford, 1995; Trochim, 2001). Clearly any researcher does not wish to make a type 1 or type 2 error so ideally both *alpha* and *beta* should be small. To determine sample size, at the very least an estimate of the variance is needed. Should the variance be unknown, a small sample needs to be drawn to determine the variance (variance being defined as the measure of spread of the data) (Lunsford & Lunsford, 1995; Trochim, 2001). Determining the effect size (the measure of the magnitude of differences between the sample means) is another important aspect of calculating sample size (Lunsford &

Lunsford, 1995). According to Lunsford and Lunsford (1995), the effect size can be classified as follows:

- *Large effect size* ($\epsilon = .80$) implies there is a large degree of separation and therefore very little potential overlap between groups. These differences should be obvious by scrutiny, and statistics should be applied only to legitimately document them.
- *Medium effect size* ($\epsilon = .50$) implies an observable difference may be noted by the trained observer. Testing is necessary to verify the differences.
- *Small effect size* ($\epsilon = .20$) implies the differences, if any, are so small as to be invisible to the observer, and testing is necessary to identify differences in performance and/or behaviors.

In order to determine power, the level of significance for testing, i.e., .05, .01, needs to be decided (Trochim, 2001). Then the decision should be taken as to whether the hypothesis infers direction or is non-directional. What power is desired needs to be established next. Tables or programs designed to determine power can be used to help with the calculation. As noted by Lunsford and Lunsford (1995), when power is low a large sample is needed to establish significance and the same applies when the means are very close and the ratio of the means/standard deviation is small. The importance of sample size on the power of a test is critical, larger samples offer greater statistical power when combined with well-planned research design and correct sampling techniques (Lunsford & Lunsford, 1995; Trochim, 2001). Unfortunately, smaller samples are less likely to be good representations of population characteristics, therefore, true differences between groups are less likely to be detected. But specifying a level of significance and a desired power in the planning stages of a study, a researcher can better estimate how many subjects are needed to detect a significant difference for an expected effect size (Lunsford & Lunsford, 1995; Trochim, 2001).

Decision making when deciding whether a result is significant or not needs to take many factors into account. Using the diagram below we see that when the decision is made in terms of significance the research either accepts or rejects the Null hypothesis. Accepting the Null hypothesis implies that there is no real effect whereas rejecting the Null hypothesis implies that there is indeed a real effect. However, underlining this choice is reality and in 'reality' the Null hypothesis may be either true or false. This in turn is affected by the power of the test, the probability of making a type I or type II error and the confidence level. Thus the decision made as to whether the result is significant or not needs to be carefully analysed and it should be kept in mind that many factors such as those represented in the diagram need to be taken into account.

Figure 9: A diagram of decision making when analysing data and factors impacting the decision:

4.5 DATA ANALYSIS

The differences between the experimental and control groups' responses to the SCL-90-R were analysed using dependent t-test and independent t-test (see Chapter 5). The main effect of the art intervention was measured to see whether there is any significant effect between two groups (Carter, 1997). Further data analysis was done on the sub-scales of the SCL-90-R.

4.6 THE IMPLEMENTATION OF THE CREATIVITY RESEARCH DESIGN AND THREATS TO VALIDITY.

The implementation of a research design is perhaps the defining point of the study as practical issues that arise during the data gathering impacts greatly on the validity of the study. This section therefore includes practical aspects of the data gathering as well as an evaluation of the internal, external and overall validity of the study.

4.6.1 Practical aspects of the data gathering

The experimental group was gathered at three intervals with the intervention groups being help with 3-5 patients at a time. Most of the patients expressed the opinion that they enjoyed doing the art as a welcome break from their usual hospital routine. However, patients' claimed to not feel very stressed before the intervention. This may be due to a variety of reasons, such as the following:

- MuelMed offers excellent counseling and other rehabilitation interventions that may aid patients' considerably in dealing with their trauma.
- The patients' who were cognitively capable of participating in the study had been at MuelMed for some time and began to recover and deal with the stressful event (mostly accidents) that placed them in the rehabilitation centre.
- Some of the patients were not able to write and the researcher had to help them fill in the SCL-90-R questionnaires. This may have led to greater social desirability responding as the patient may have been uncomfortable with answering such personal questions directly.

Other note worthy happenings during the experimental groups' data gathering include the fact that two patients who scored very poorly on the MMSE were allowed to participate in the study as the researcher later learned that there had been a language barrier. The patients who could not speak English performed poorly on the MMSE for this reason and when a translator was utilized to conduct the SCL-90-R the patients had no difficulty answering the questions. Even patients' who have difficulty using their hands participated in the study and special arrangements such as splits were made to aid them. They expressed great joy at the sense of accomplishment this gave them.

When the data for the control group was gathered, the MMSE was once again administered beforehand to determine patients' ability to partake in the study. Once this had been established the SCL-90-R was administered to assess their stress levels.

4.6.2 Evaluation of the study's validity

"The validity of a research study is determined by the quality of the research process and the accuracy of the results"

(Gravetter & Forzano, 2003, p.136).

All researchers need to critically evaluate their own studies as they are the most likely to know where there are flaws in their studies. The tables that follow offer such critical examinations of the internal, external and overall validity of this study.

Table 6: Evaluation of the external validity of creativity and stress study.

<u>External Validity Criteria</u>	<u>Definition</u>	<u>Research Evaluation</u>
Randomisation	Participants randomly chosen and assigned to groups	As this was a quasi-experimental design the participants were not randomly assigned. Also it was not practically possible to randomly assign the participants. This does however lower the external validity of the study.
Generalizing across participants	Participants representative of population under investigation	The samples are too small to be representative although to a certain degree the samples were representative of rehabilitation patients.
Generalizing across features of a study	The research process is a novel experience for the participants and	The novelty effect may have a possible impact on the patients although they do participate in recreation workshops every week. Reactivity is unlikely to have been a problem because patients would not have been able to alter the art intervention with their behaviour. Demand



	may affect their contributions	characteristics may have played a role if the participants answered the SCL-90-R differently. Multiple treatments would not be a problem here because only one intervention was given.
Generalizing across features of the measures	The tests used to assess the variables offer the same validity as other similar tests	Pre and posttest were given so assessment sensitization is a possibility especially considering the short amount of time that elapsed between the first and second test.
Generalizing across experimenters	Demographic and personality characteristics of experimenters may influence the participants	The researcher is unsure of how personal characteristics may have influenced the study.
Ecological Validity	How closely the research resembles real world scenarios.	The study has ecological validity in the sense that the study was done in the natural setting of rehabilitation patients, i.e. the hospital.

Table 7: Evaluation of the internal validity of creativity and stress study.

<u>Internal Validity</u> <u>Criteria</u>	<u>Definition</u>	<u>Research Evaluation</u>
Confounding variables	Variables that are not being measured but are present and may interfere with the results of the research	Participants were carefully screened with the MMSE to make sure they are cognitively capable of participating in the study. But other factors such as social desirability may still have interfered with the study and lowered the internal validity.



Assignment bias	The groups are too heterogeneous to be compared because of incorrect group assignment	Assignment bias is a possibility as the participants were not randomly chosen but on basis of their cognitive ability to participate in the study. Yet the patients were very diverse in terms of age, race and gender.
Environmental variables	Environmental variables such as time of day, lighting and temperature may negatively impact results	Unlikely to have influenced the participants as the study was conducted in the hospital under very similar circumstance for each group and the environment was comfortable.
History effect	The backgrounds of the participants may influence their answers	History effect may influence participants in terms of how much they enjoyed the art. Different patients may have had different experiences of art and this may have impacted the relaxing effect of the intervention.
Fatigue	Long testing procedures may tire out participants and responses may become poorer due to tiredness and not the variable under investigation	This may indeed have influenced the participants. After having answered the SCL-90-R once (some patients took very long to answer the questionnaire) and having participated in an hour's art intervention most patients were tired and reluctant to fill in the SCL-90-R again, especially as they felt their answers would not have altered in one hours time.

Table 8: Evaluation of the overall validity of creativity and stress study.

<u>Types of Validity</u>	<u>Articles evaluation</u>

Overall Research Design Validity	The quasi-experimental research design was the most practical design for this population group. But considering how difficult it was to implement and how small the samples it may have been advisable to find a different sample and change the research design somewhat.
External Validity	The external validity of this study was acceptable in that the design was done in a natural setting.
Internal Validity	The internal validity is somewhat questionable as there were many extraneous variables, which could not be controlled.

4.7 CONCLUSION

Validity in research design is not just an imperative aspect of research, it is a corner stone without which the research becomes unfounded, in essence useless and may just as well not have been conducted. But this is specific to type of research design and the aims of the research. The aim of this study was to serve as a pilot study for the investigation of a possible relationship between creative activities and stress levels. No absolute conclusions can be drawn and the study is rather seen as an experiment for the methodology. The research methodology is very valid for the chosen topic. However, small groups were used (impacting of statistical validity) and it was not possible to control all the extraneous variables. The study is none-the-less still useful in terms of guiding future research and for making suggestions as to how this phenomenon may be studied in the future.

CHAPTER 5

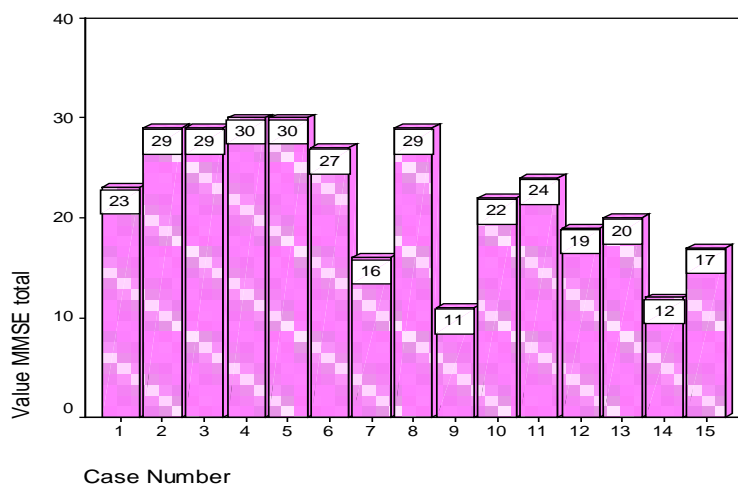
RESULTS

5.1 SAMLE: EXPERIMENTAL SAMPLE

To select the participants for the experimental group, the MMSE was administered to 15 patients, of whom 11 were capable of participating in the intervention (MMSE scores higher than 24). Sometimes patients who scored lower than 24 were allowed to participate in the study if it was clear that their MMSE scores were low because of a physical disability (for example being unable to fold a paper in half because they were not able to use their hands). Some patients did not speak English well as it was their third, fourth or fifth language. In such cases a translator was usually recruited from hospital staff able to translate. The next section first describes the MMSE data for the 15 patients from whom the 11 patients were chosen to participate in the study. This includes descriptives of the patients. In the control group section only 11 patients are described as the MMSE was only given to these 11 patients. This was done because administering MMSEs to patients not capable of participating in the study was time consuming and so the occupational therapist nominated patients she believed capable of participating in the study and if they passed the MMSE they were included.

5.1.1 Mini-Mental Status Exam: descriptive statistics of the experimental sample

Figure 10: MMSE scores of patients



Patients with scores lower than 24 were not cognitively capable of participating in the study. The exception to this was case number 7 and 8, who were cognitively capable but performed poorly on the MMSE due to a language barrier (they spoke only Zulu and a translator was obtained for the administration of the SCL-90-R). Case 10 is also an exception; she was unable to do the physical tasks of the MMSE because she is a tetraplegic.

Figure 11: The period of time of hospitalized: Total group

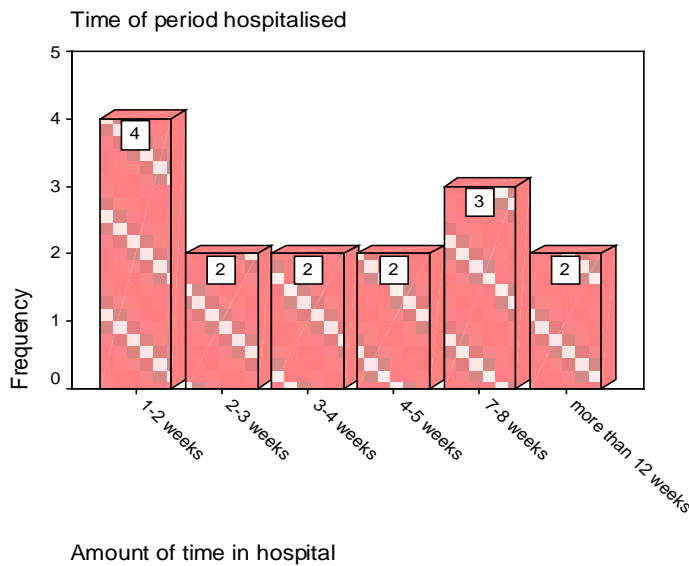


Figure 11 shows the period of time the 15 patients interviewed with the MMSE were hospitalized. There is an even spread for the amount of time the patients had been at MuelMed rehabilitation centre (this of course is influenced by the type of injury and the rehabilitation required).

Figure 12: Type of injury: Total group before selection for experimental group

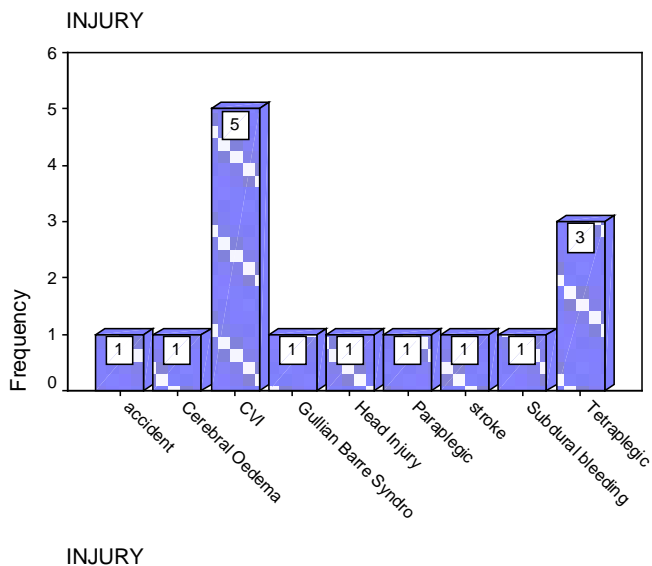


Figure 12 shows that the majority of the 15 patients had a CVI injury, followed by tetraplegics with the other patients evenly distributed among illnesses and accidents.

Figure 13: Level of education: total group

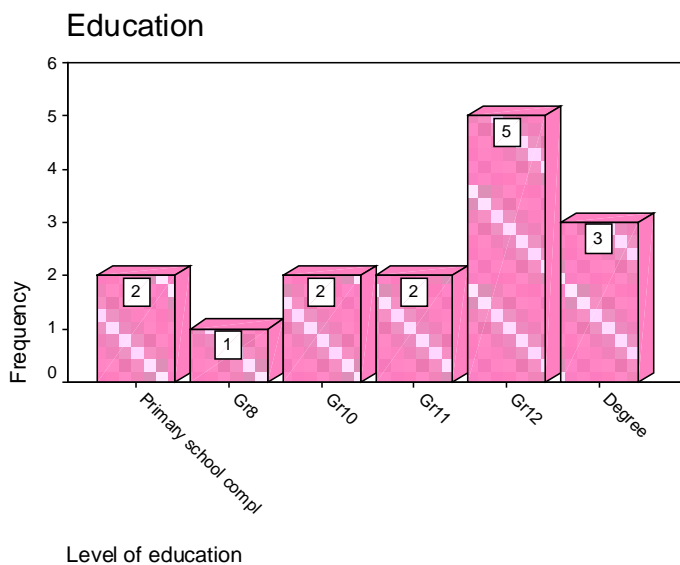


Figure 13 shows the distribution of the education levels, with 53,3% of the 15 patients having completed Grade 12 or have even higher education levels. Whereas 33,3% of the sample have completed a grade in high school. Of the 15 patients 13,3% had only completed primary school. Thus this sample had fairly high levels of education.

Figure 14: Age categories: total group.

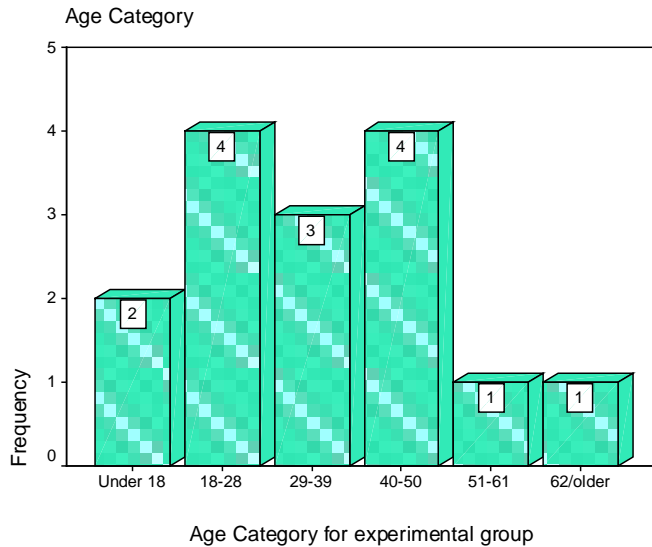


Figure 14 shows the distribution of the age categories into which the patients fall before the selection of the experimental group. Here can be seen that only 2 participants are under the age of 18 (13,3%) and 26,7% of the patients fall into the 18-28 age category. In the 29-39 age category there are 3 patients which accounts for 20% of the 15 patients. In the 40-50 age category there are 4 people (26,7% of sample) and the older participants (51 years and older) make up 13,3% of the sample. Thus the ages of the patients range mostly from 18-50 years.

Figure 15: Racial distribution: total group.

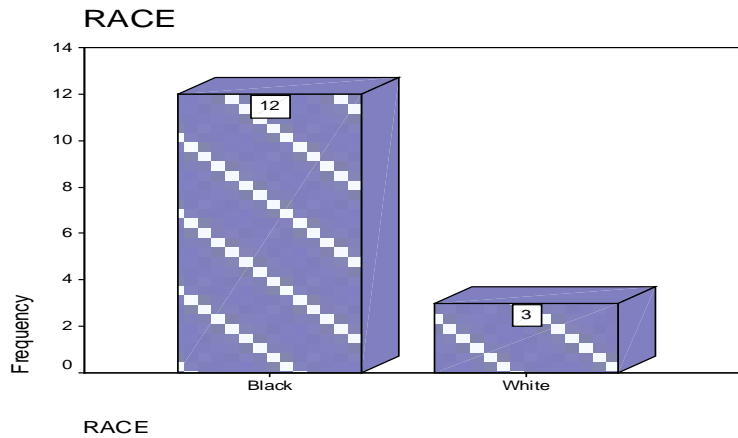
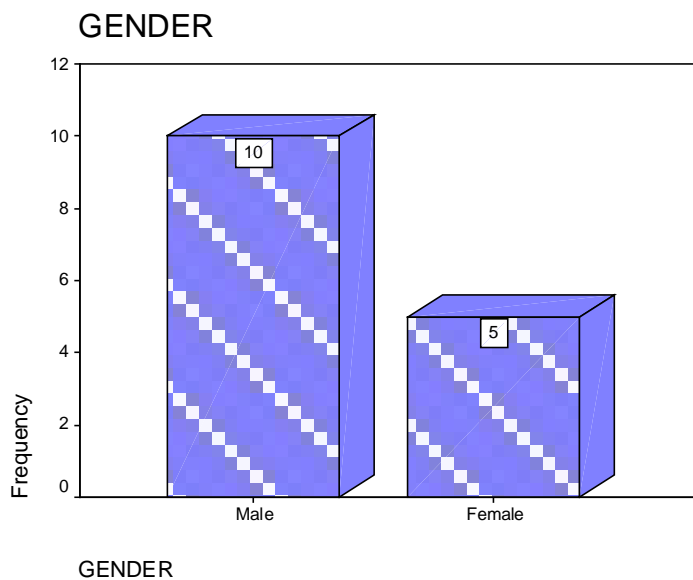


Figure 15 shows that the majority of the participants were Black (80%) with 20% White participants in the sample.

Figure 16: Gender distribution: total group.



There were 2/3's more men than women in the sample, with men making up 66,7% of the sample and women 33,3% of the sample.

Table 9: Subscale scores for the MMSE: total group before choice of experimental group

		Statistics					
		MMSE_TOT	ORIENTAT	REGISTRA	ATTCALCU	RECALL	LANGPRAX
N	Valid	15	15	15	15	15	15
	Missing	0	0	0	0	0	0
Mean		22.53	8.20	2.80	3.67	1.93	6.07
Median		23.00	10.00	3.00	4.00	2.00	6.00
Mode		29	10	3	5	3	9
Std. Deviation		6.523	2.783	.775	1.676	1.280	2.344
Variance		42.552	7.743	.600	2.810	1.638	5.495
Minimum		11	1	0	0	0	2
Maximum		30	10	3	5	3	9

Table 9 represents the total score for the MMSE as well as the mean scores for the subscales. The mean score for the total MMSE score is 22,53%, understandably so as extremely low scores (outliers) would have lowered the mean score. The mean score for orientation is 8,2 (out of a maximum score of 10), which is high and shows that most patients were at least aware of their surroundings. The mean score for registration 2,8 (out of a maximum of 3) and for attention and calculation it is 3,67% (out of a maximum of 5). Attention and calculation may be more challenging for patients, as it requires more concentration. The mean score for recall was 2 (out of a maximum of 3). The mean score for language praxis was 6,07 (out of a maximum of 9). This score is understandably lower as some patients have difficulty talking and expressing themselves. Figure 14 below offers a visual description of the mean scores.

Figure 17: Mean scores for the MMSE subscales: total group

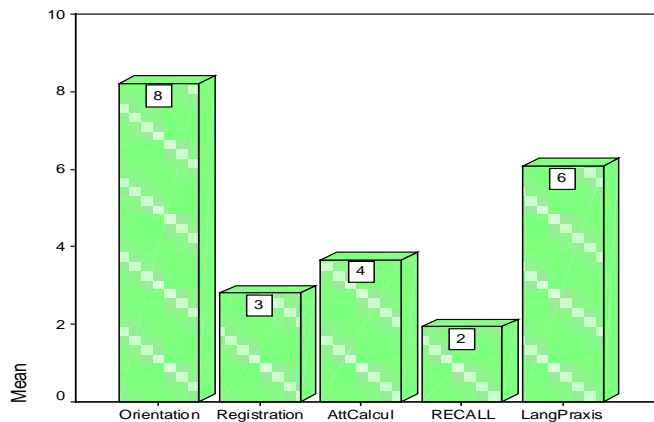


Table 10: MMSE totals for experimental group

Statistics

MMSE_TOT

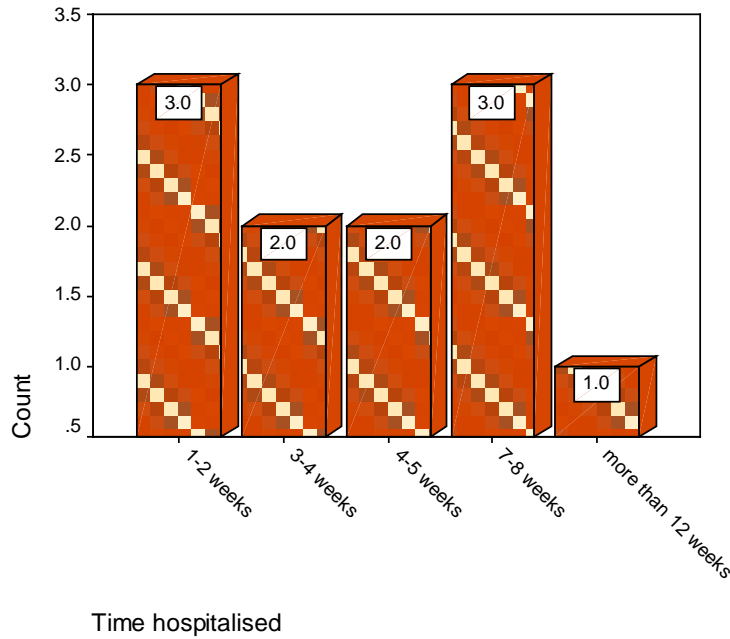
N	Valid	11
	Missing	0
Mean		24.55
Median		27.00
Mode		29
Std. Deviation		6.251
Variance		39.073
Range		19
Minimum		11
Maximum		30

Table 10 shows the statistical averages of the MMSE totals for the 11 patients who participated in the art intervention. Except for the two patients with the language barrier and the patient who had a lower score because of her physical disability, the other patients who were chosen to participate in the study had on average high MMSE scores. The mean for the experimental group was 24,55 out of 30 (the overall cut-off score is 24). It is important to note that the mode is 29, which makes sense, as those patients who took part in the experiment were those who had higher MMSE scores and who were thus chosen because of their cognitive ability to take part in the study.

5.1.2 SCL-90-R: descriptive statistics of the experimental sample

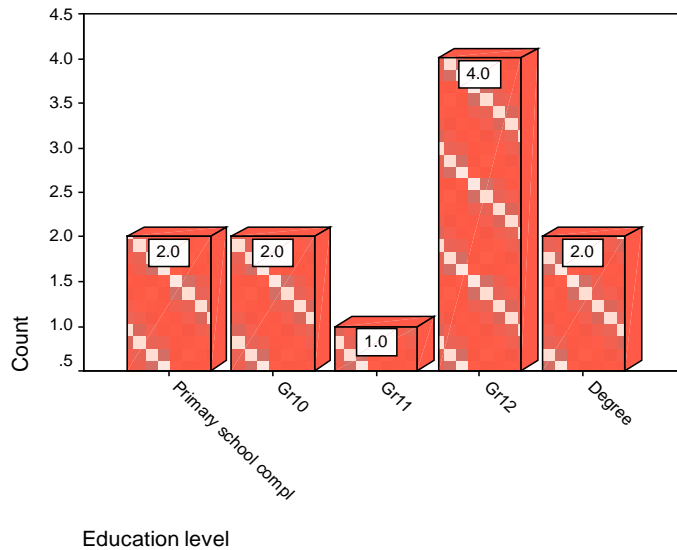
The following descriptive statistics are those of the experimental group of 11 patients who received the art intervention.

Figure 18: Time hospitalized for experimental group.



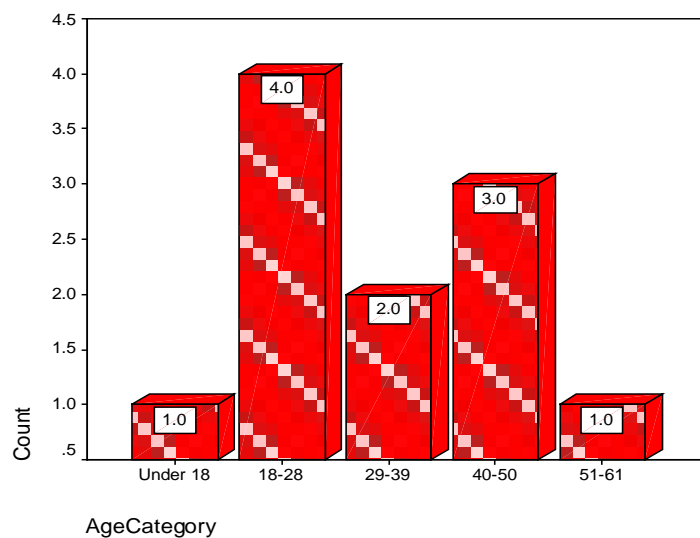
As can be seen in figure 18, there is a relatively even spread of the time period for which patients had been hospitalized once they joined the study. 27,3% of the experimental group had only spent 1-2 weeks in the rehabilitation unit, with 36,4% of the sample having been hospitalized for 3 to 5 weeks. 27,3% had been at MuelMed rehabilitation centre for 7-8 weeks and only one patient had been there for more than 12 weeks.

Figure 19: Level of education: experimental group



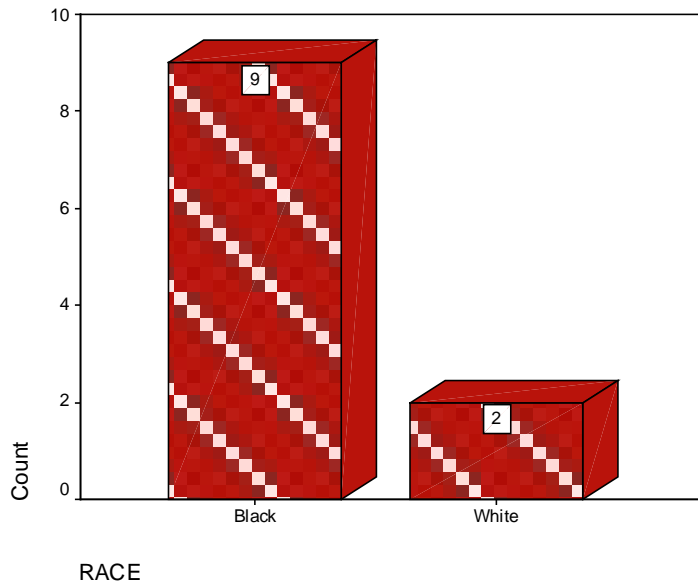
Of the 11 participants, 36,4% had completed matric, and 18,2% had a degree. Whereas 45,5% of the sample had not completed high school. This may impact on their ability to for example, read the SCL-90-R questionnaire. But in such cases the researcher read the questions to them and helped the patient to fill in the SCL-90-R. Unfortunately this does impact social desirability as having to answer such personal questions out-loud to the researcher may lead to a person answering in a more socially desirable manner.

Figure 20: Age categories: experimental group



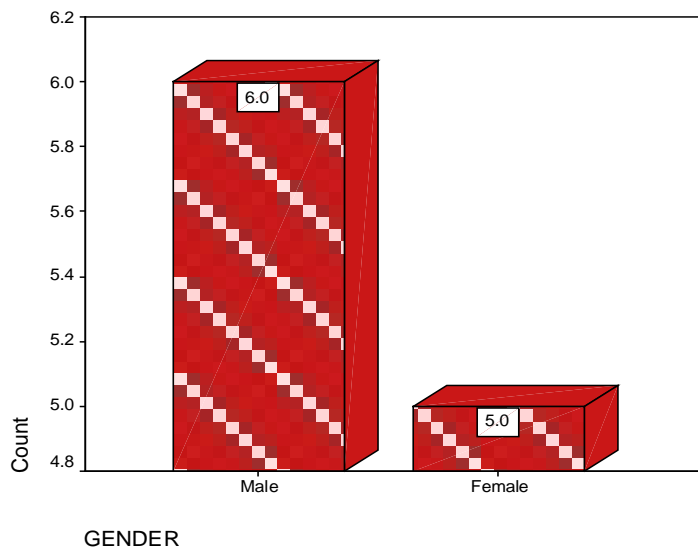
36,4% of the experimental group fell into the 18-28 age category and 45, 3% of the group was between 29 and 50 years old. Only one participant was older than 50.

Figure 21: Racial distribution: experimental group



81,8% of the sample was Black and 18,2% of the population was White.

Figure 22: Gender distribution: experimental group



There were almost equal amounts of women and men in the sample with 54,5% of the sample being male and 45,5% of the sample being female.

Figure 23: Period of time hospitalized: experimental group

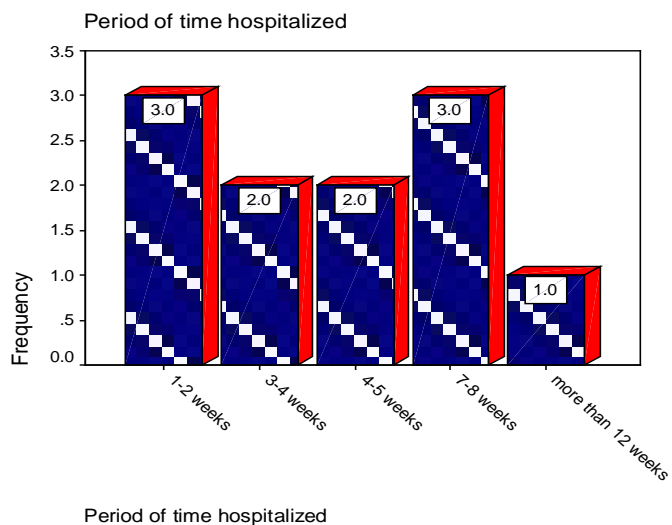


Figure 23 shows that 27,3% of the experimental sample has only been at MuelMed for 1-2 weeks and another 27,3% have been at MuelMed for 7-8 weeks. 36,4% have been at MuelMed between 3 to 5 weeks. Only one patient had been at the rehabilitation unit for more than 12 weeks.

Figure 24: Type of injury: experimental group

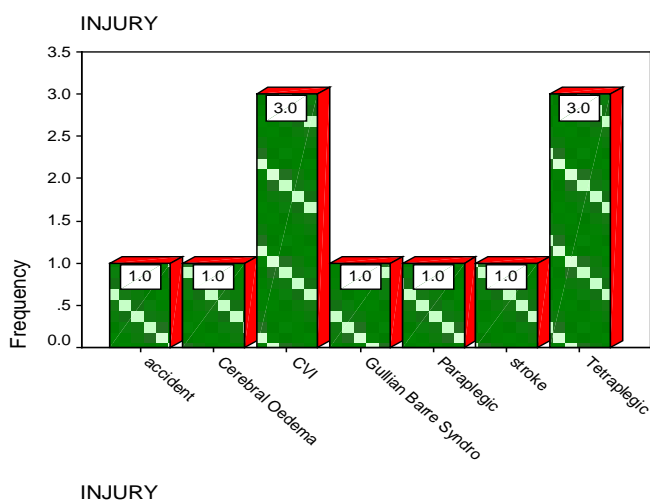


Figure 24 shows that CV injuries and tetraplegics were most common injuries in the experimental group (together they account for 54,6% of the sample's injuries). For the other injuries/illnesses there is one patient per category (9,1%).

Thus a good overall description of the experimental sample is that the sample contained almost equal amounts of males and females, the participants were mainly Black, most had Gr. 12 or higher education, the average participant was aged between 18-50 and injuries were mostly evenly spread. Most patients have been at Muelmed between 1 to 8 weeks and CV injuries and tetraplegics were the most common medical reasons for being at MuelMed.

Figure 25: SCL-90-R scores for experimental group (n= 11)

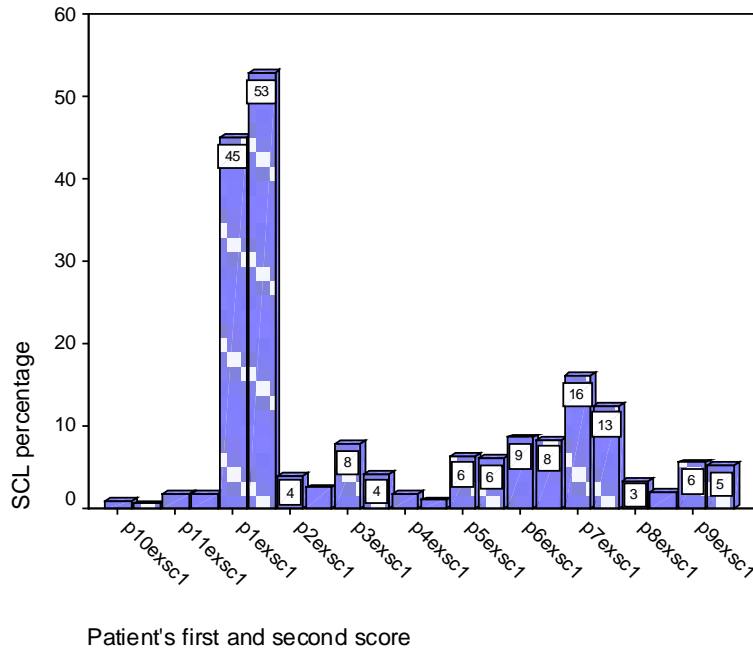


Figure 23 shows the two scores each patient received on the SCL-90-R. The patients have been appointed numbers so as to insure anonymity (for example p10exsc1 means patient 10, experimental group, score 1). As can be seen in this graph, most patients had low stress percentages (SCL-90-R scores have been converted to percentages). Only patient 1 had extremely high stress levels (score 1 = 45% and score 2 = 53%). These low stress scores are discussed in Chapter 6.

Table 11: Statistics for scales of SCL-90-R: first score experimental group

Statistics: first score for experimental group

		Anxiety	Psychoticism	Depression	Hostility	Sensitivity	Somaticism	Phobic anxiety	Paranoid ideation	Obsessive compulsive
N	Valid	11	11	11	11	11	11	11	11	11
	Missing	0	0	0	0	0	0	0	0	0
Mean		5.45	3.64	12.24	2.27	4.80	11.55	13.64	12.12	13.64
Median		.00	.00	5.77	.00	2.78	6.25	7.14	8.33	10.00
Mode		0	0	0 ^a	0	0	0 ^a	0	0	0 ^a
Minimum		0	0	0	0	0	0	0	0	0
Maximum		38	35	60	21	19	40	46	63	70

a. Multiple modes exist. The smallest value is shown

Table 11 shows the total averages for the SCL-90-R scales in terms of percentages for the first score of the SCL-90-R. Most scales patients scored very low percentages (for example for depression there was an average percent of 12,24). None of these percentages as in the case of the overall score show any significant stress levels. It is also important to note that as one patient scored particularly high on the SCL-90-R that patient may be considered an outlier and may inflate the mean. Thus it is better to look at the mode to see which score occurs most often and it is clear that most patients reported 0 on these scales, thus resulting in the low overall SCL-90-R score observed in figure 23.

Table 12: Statistics for scales of SCL-90-R: second score experimental group

Statistics: second score for experimental group

		Anxiety	Psychoticism	Depression	Hostility	Sensitivity	Somaticism	Phobic anxiety	Paranoid ideation	Obsessive compulsive
N	Valid	11	11	11	11	11	11	11	11	11
	Missing	0	0	0	0	0	0	0	0	0
Mean		5.91	5.45	8.04	6.44	6.31	11.74	15.91	8.71	12.05
Median		.00	.00	3.85	.00	2.78	6.25	7.14	8.33	5.00
Mode		0	0	0 ^a	0	0	0	0	0 ^a	0 ^a
Minimum		0	0	0	0	0	0	0	0	0
Maximum		43	53	31	67	36	56	79	46	70

a. Multiple modes exist. The smallest value is shown

Table 12 shows the total averages for the SCL-90-R scales in terms of percentages for the second score of the experimental group. Again on most scales patients scored very low percentages. There are no significant stress levels. It is also important to note that the same patient again scored particularly high on the SCL-90-R (the outlier). When considering the mode to see which score occurs most often it is clear that most patients reported 0 on these scales, thus resulting in the low overall SCL-90-R score observed in figure 23.

Table 13: Total Statistics for scales of SCL-90-R: experimental group

Statistics for sub-scales of SCR-90-R of experimental group

		Anxiety	Psychoticism	Depression	Hostility	Interpersonal sensitivity	Somatization	Phobic anxiety	Paranoid Ideation	Obsessive compulsive
N	Valid	22	22	22	22	22	22	22	22	22
	Missing	0	0	0	0	0	0	0	0	0
Mean		5.68	4.55	10.14	4.36	5.56	11.65	14.77	10.42	12.84
Median		.00	.00	5.77	.00	2.78	6.25	7.14	8.33	8.75
Mode		0	0	0	0	0	0	0	0	0 ^a
Minimum		0	0	0	0	0	0	0	0	0
Maximum		43	53	60	67	36	56	79	63	70

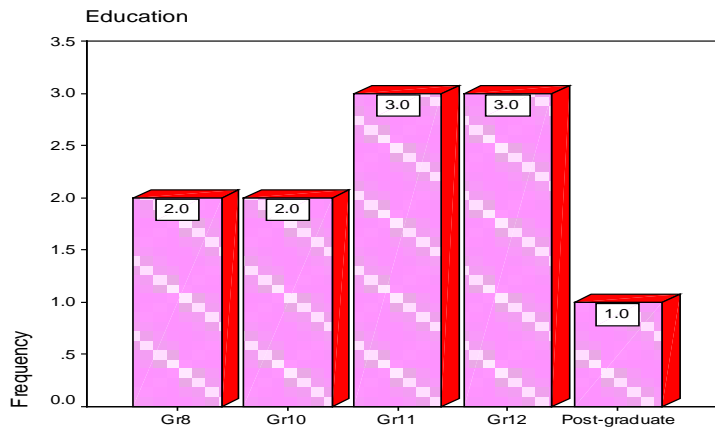
a. Multiple modes exist. The smallest value is shown

Table 13 shows the total averages for the SCL-90-R scales in terms of percentages. As can once again be seen, on most scales patients scored very low percentages (for example for depression there was an average percent of 10,14). None of these percentages as in the case of the overall score show any significant stress levels. The same is true of the mode again, most patients reported 0 on these scales, thus resulting in the low overall SCL-90-R score observed in figure 23.

5.2 SAMPLE: CONTROL GROUP

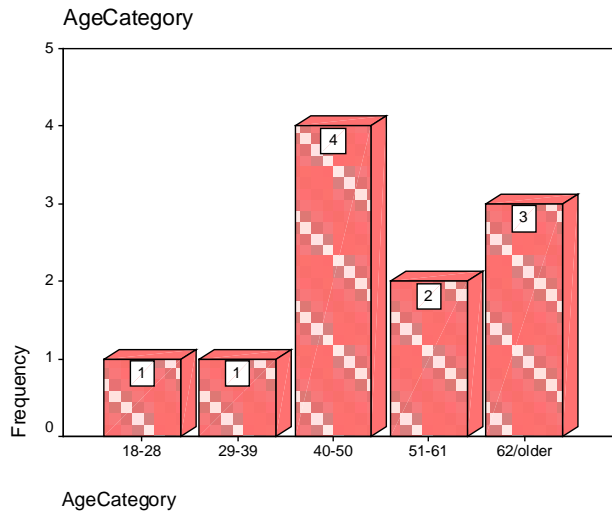
5.2.1 Mini-Mental Status Exam: descriptive statistics of the control sample

Figure 26: Level of education: control group



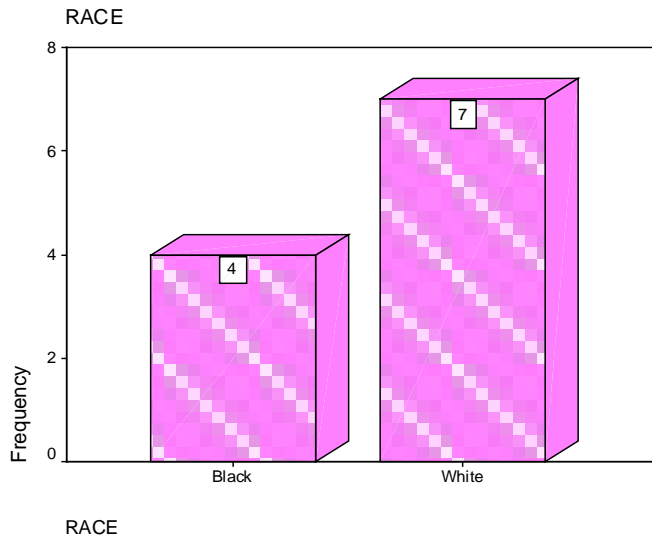
27,3% of the control group completed gr.12, with the same percentage having completed gr.11. 18,2% completed gr.10 and the same percentage completed gr.8. Only one person (9,1%) had received tertiary education.

Figure 27: Age categories: control group



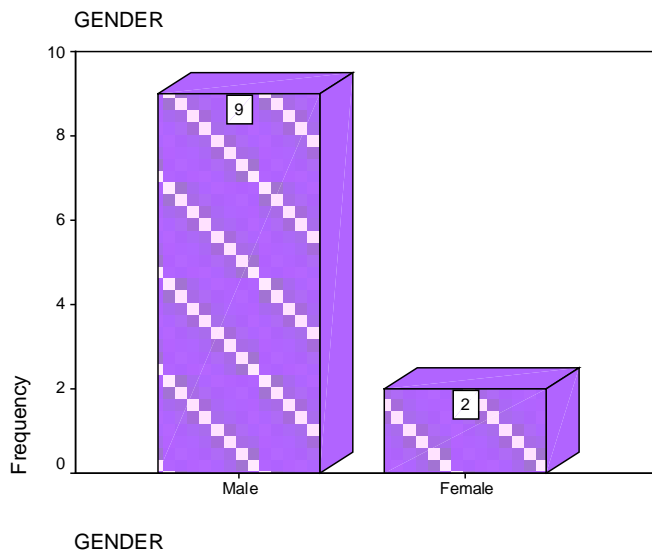
36,4% of the sample fell into the 40-50 age category, with 45,5% being older than 50. Only 18,2 of the sample was younger than 40.

Figure 28: Racial distribution: control group



36,4% of the sample was Black and 63,6% of the sample was White.

Figure 29: Gender distribution: control group



The control group consisted mostly of males (81,8%) with only 18,2% of the control group being female.

Figure 30: Type of injury: control group

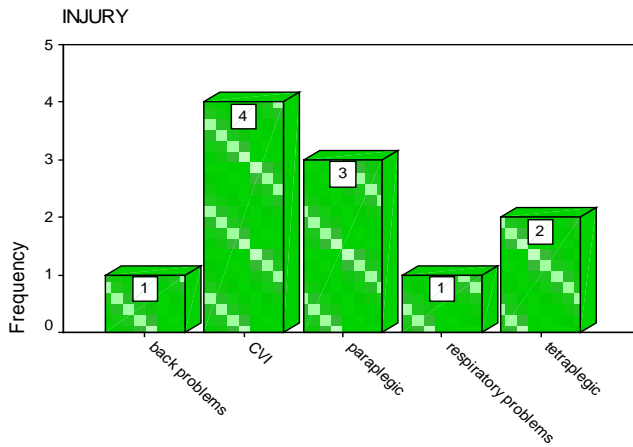


Figure 29 shows that CV injuries (36,4%) were the most common reason for patients being at MuelMed’s rehabilitation unit, with paraplegics being the second most common (27,3%) followed by tetraplegics (18,2%).

Figure 31: Period of time hospitalized: control group

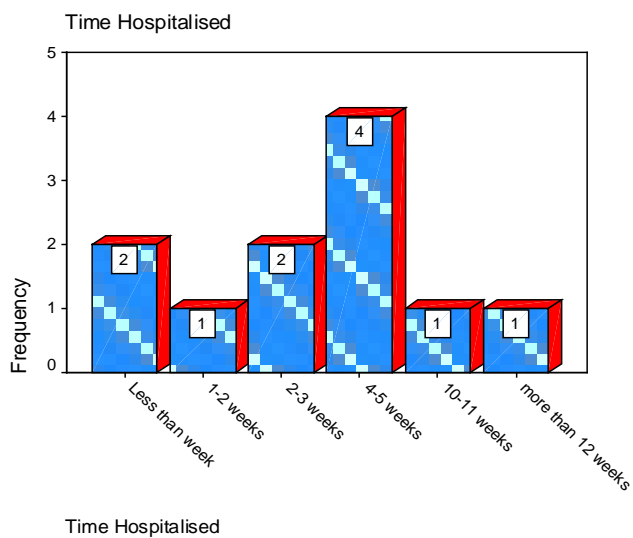


Figure 30 shows that 36,4% of the control group had been at MuelMed for 4-5 weeks. 18,2% of patients had been at MuelMed for 2-3 weeks and the same percentage had been at MeulMed for 2-3 weeks.

Thus a good overall description of the control is that they sample contained mostly males with only 18,2% of the sample being female, there were more White patients than Black patients, most had either Gr. 12, Gr. 11 or Gr.8 qualifications, the average participant was aged 40 and higher and CV injuries were most common. Most patients have been at Muelmed between 1 to 5 weeks.

Table 14: Subscale scores for the MMSE: Control group

Statistics: MMSE for control group

		MMSE total	Orientation	Registration	Attention and calculation	Recall	Language praxis
N	Valid	11	11	11	11	11	11
	Missing	0	0	0	0	0	0
Mean		24.18	8.45	3.00	4.00	2.18	6.45
Median		25.00	9.00	3.00	5.00	3.00	7.00
Mode		27	10	3	5	3	8
Std. Deviation		4.215	1.753	.000	1.673	1.079	2.252
Variance		17.764	3.073	.000	2.800	1.164	5.073
Minimum		17	5	3	0	0	3
Maximum		30	10	3	5	3	9

Table 14 represents the total score for the MMSE as well as the mean scores for the subscales. The mean score for the total MMSE score (for the control group) is 24,18%, understandably so as extremely low scores (outliers) would have lowered the mean score. The mode is 27, showing that most patients who participated in this study scored well enough to participate in the study. The mean score for orientation is 8,45 (out of a maximum score of 10), which is high and shows that most patients were aware of their surroundings. The mean score for registration 3 (out of a maximum of 3) and for attention and calculation it is 4 (out of a maximum of 5). This shows that the patients were functioning well in terms of attention and being able to register their surroundings, showing their capability to participate in the study. The mean score for recall was 2,18 (out of a maximum of 3), so most patients did not have a problem with their memories. The mean score for language praxis was 6,45 (out of a maximum of 9). This score is understandably

lower as some patients have difficulty talking and expressing themselves after accidents and operations. Figure 28 below offers a visual description of the mean scores.

Figure 32: MMSE scales for control group

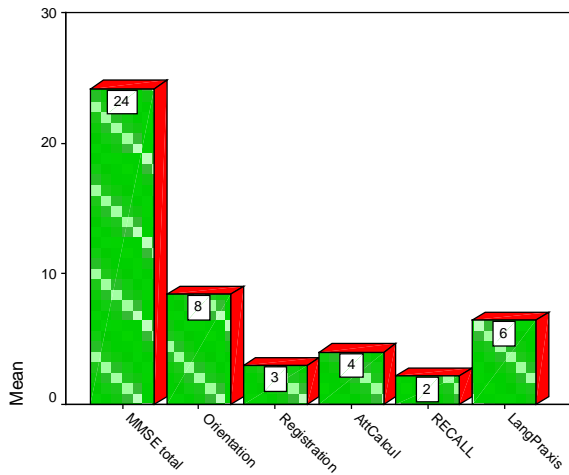


Table 15: MMSE totals for control group

Statistics

MMSE_TOT		
N	Valid	11
	Missing	0
Mean		24.18
Median		25.00
Mode		27
Std. Deviation		4.215
Variance		17.764
Minimum		17
Maximum		30

Table 13 shows the statistical averages of the MMSE totals for the 11 patients who were in the control group. Except for the patients with language barriers and the patients who had lower scores because of physical disability, the other patients who were chosen to participate in the study had on average high MMSE scores. The mean for the experimental group was 24,18 out of 30 (the overall cut-off score is 24). It is important to note that the mode is 27.

5.2.2 SCL-90-R: descriptive statistics of the control sample

Figure 33: SCL-90-R scores for control group

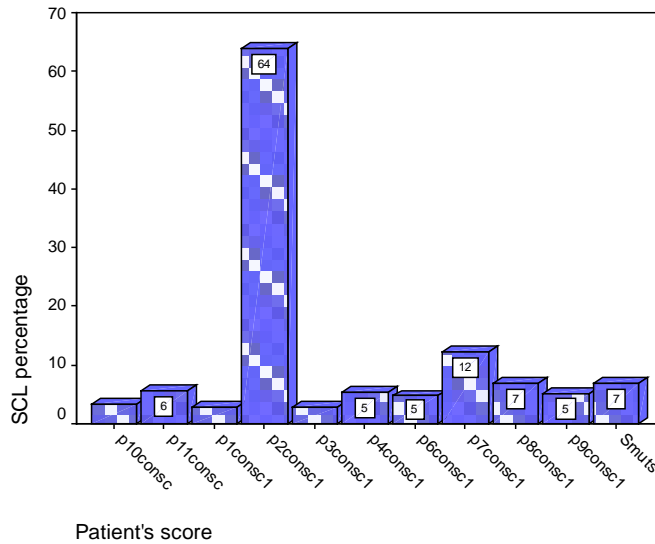


Figure 29 shows the score each patient received on the SCL-90-R. The patients have been appointed numbers so as to insure anonymity (for example p4consc1 means patient 4, control group, score 1). Once again it seems most patients have very low stress levels (SCL-90-R scores have been converted to percentages). Again, only patient 1 had extremely high stress levels (score = 64%). These low stress scores are discussed in Chapter 6.

Table 16: Statistics for scales of SCL-90-R: control group

Statistics for SCL-90-R for control group

	Anxiety	Psychoticism	Depression	Hostility	Interpersonal sensitivity	Somatization	Hostility	Paranoid ideation	Obsessive compulsive
N Valid	11	11	11	11	11	11	11	11	11
Missing	0	0	0	0	0	0	0	0	0
Mean	8.64	7.05	13.11	7.58	4.91	15.34	5.52	8.71	16.36
Minimum	0	0	0	0	0	0	0	0	0
Maximum	70	60	77	58	37	63	39	54	63

Table 14 shows the averages for the SCL-90-R scales in terms of percentages for the control group. As can be seen once again, on most scales patients scored very low percentages (for example for hostility there was an average percent of 4,36). None of these percentages as in the case of the overall score show any significant stress levels. It is also important to note that as one patient scored particularly high on the SCL-90-R that patient may be considered an outlier and may inflate the mean. So again we look at the mode to see which score occurs most often and it is clear that most patients reported 0 on these scales, thus resulting in the low overall SCL-90-R score.

5.3 INTERVENTION

The intervention, as mentioned before, consisted of an art intervention during which the patients painted for between half an hour and an hour. The stress test was administered before and after the intervention to the experimental group and these two scores are compared. The stress test was also administered once to the control group. T-tests were used to determine whether there is a significant difference in scores for the before and after as well as for the control group. According to Nunez (2005) three assumptions have to be met in order to use a t-test, they being:

- a) **The assumption of normality:** This means that the samples that have been drawn from the population have normal distributions. This assumption was tested using the Kolmogorov-Smirnov test of normality and it was found that the experimental and control groups had normal distributions ($Z= 1.564$).
- b) **The assumption of homogeneity of variance:** If the samples have highly different variances it is difficult to get accurate results using a t-test. The homogeneity of the groups was tested using Levene's test of homogeneity (see table 18, $F= 1.72$) and it was found that the groups do have homogeneity of variance.
- c) **The assumption of independence:** Except for repeated measures t-test all other t-tests require the assumption of independence so that the data sets are independent and did not influence one another. For the first set of calculations this is not applicable as a repeated measures t-test was used, for the independent samples t-test the assumption of independence is met as the experimental and control groups' data were gathered at different times and from different patients.

As all three assumptions of the t-tests were met the t-test was then used to analyze the data.

Table 17: Statistics for experimental group: paired samples statistics

Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 SCORE1	9.27	11	12.594	3.797
SCORE2	9.27	11	14.927	4.501

The table above shows the statistics for the paired sample statistics for score 1 and score 2 of the experimental group. The means are the same and the standard deviations are slightly different. This would suggest that the intervention did not lower stress levels (note that they are very low, with the mean stress percentage being 9,27%).

Table 18: Statistics for experimental group: paired samples statistics, first and second score

Paired Samples Correlations

	N	Correlation	Sig.
Pair 1 SCORE1 & SCORE2	11	.991	.000

Table 16 shows the correlation between score 1 and score 2 for the experimental group, which is very high (.991). This also strongly suggests that the intervention made no difference to the patients stress levels as their first and second scores are so highly correlated that they are statistically significant (table 17 confirms this).

Table 19: Statistics for experimental group: paired samples test

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 SCORE1 - SCORE2	.00	3.000	.905	-2.02	2.02	.000	10	1.000

Table 17 shows that the differences between score 1 and score 2 of the experimental group ($t = .000$) is not significant.

Table 20: Statistics for comparing experimental group and control group: independent samples statistics

		Independent Samples Test									
		Levene's Test for Equality of Variances		t-test for Equality of Means						95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper	
SCORE1	Equal variances assumed	.172	.683	-.241	20	.812	-1.59	6.571	-15.292	12.121	
	Equal variances not assumed			-.241	18.014	.812	-1.59	6.571	-15.390	12.218	

Table 18 is the t-test for independent samples in which the experimental group's first score and the control group's score are compared to see whether there is a significant difference. As mentioned before, the Levene's test for equality of variances shows that there is equality of variances. Once again $t (-.241)$ is not significant, showing no statistically significant difference in scores between the control group and the experimental group scores.

5.4 CONCLUSION

Chapter 5 included the descriptive statistics of the experimental group and the control group as well as the results of the statistical tests conducted to see whether the intervention showed any difference. The descriptive statistics revealed that the experimental group consisted mostly of equal amounts of males and females, the participants were mainly Black, most had Gr. 12 or higher education, the average participant was aged between 18-50 and injuries were mostly evenly spread. Most patients in the experimental group had been at Muelmed between 1 to 8 weeks and CV injuries and tetraplegics were the most common medical reasons for being at MuelMed. In terms of the control, it consisted mainly of males with only 18,2% of the sample being female, there were more White patients than Black patients, most had either Gr. 12, Gr. 11 or Gr8 qualifications, the average participant was aged 40 and higher and CV injuries were most common. Most patients have been at Muelmed between 1 to 5 weeks. When considering the results of the t-test, it was noted that score 1 and score 2 of the experimental group did not differ statistically significantly and the experimental and control group did also not show a statistically significant difference.

CHAPTER 6

DISCUSSION OF RESULTS

6.1 MMSE RESULTS DISCUSSION

The MMSE was used to screen patients so that only those patients cognitively capable of participating in the study took part in the experiment. For the most part the MMSE was a useful tool to screen patients. However, some patients scored low on the MMSE not due to poor cognitive ability but due to physical challenges (for example the MMSE asks patients to fold a paper in half, a patient with paralysis on one side of their bodies are not able to complete this task and subsequently score lower). Where language and physical disability lowered a patient's score this was taken into account and if the patient had good functioning on other levels, such as being aware of surroundings, this was taken into account and the patient was included in the study. Mostly patients scored above the 24 cut-off score.

6.2 SCL-90-R RESULTS DISCUSSION

In the experimental group, there was no statistically significant difference between the before and after score on the SCL-90-R. But it should be noted that the initial stress levels reported were very low. This may be due to the following reasons:

- a) MuelMed rehabilitation centre provides excellent services, which include therapy from a clinical psychologist and very supportive staff. This may mean that the patients do not feel stressed in this supportive environment.
- b) Because the SCL-90-R is a self-report measurement, patients may have responded in a socially desirable manner. This may be increased by the fact that many patients are unable to write and that the researcher had to help them fill in the questionnaire.
- c) Many patients told the researcher that after their accident/injury/illness they have found a new gratefulness for life and a new love for being alive. The relief they feel of having survived gives them a psychological boost and makes a positive outlook more likely. This may also lower stress levels and provide a psychological resilience for the trauma they have experienced. According to Thege, Bachner, Kushnir and Kopp (2008), when one has meaning in life this is

accompanied by a sense of clear aims, a sense of achieving life goals, and a feeling that one's experiences and daily activities are worthwhile and meaningful. Without this sense of meaning in life, there is an increased proneness to boredom and an enlarged sensitivity to societal pressures.

Due to the fact that patients do not report high initial stress levels, it is not surprising that the intervention does not have a statistically significant impact. It would be more advisable to conduct the experiment on a group that has high initial stress levels. But as this is a pilot study for a mini-dissertation, it was not possible to have a larger, more appropriate sample.

6.3 IMPROVING THE METHODOLOGY

According to Safety and science monitoring (2008), the pre-test post-test non-randomized design is the most basic of quasi-experimental designs and is the quasi-experimental version of a simple experiment. To improve on this design, Safety and science monitoring (2008), suggest the following strategies:

- 1) **Add a control group:** Adding a control group gives an extra level of comparison strengthens the design of the study. But unlike a true experiment, in this case the groups are not randomly divided. It was for this reason that a control group was added to this study.
- 2) **Take more measurements before and after the intervention:** This would then change from a simple pre-test post-test design to a *time series design*. By taking additional before-and-after measurements a base-line trend is established. So that if the intervention is indeed effective, there would be a difference in the two trends measured. This also helps to control for the maturation threat because a change in trend can be observed. Regression-to-the mean can also be controlled for through this as a general trend is observed and outlier more easily identified and “noise” or interfering factors are also identified.
- 3) **Stagger the introduction of the intervention among groups:** With this strategy all groups eventually receive the treatment but at different times. This helps to eliminate the possibility that something specific happened to the experimental group other than the intervention to cause their results to differ from that of the control group. This also reduces the problem of history effect significantly.
- 4) **Reverse the intervention:** The fourth strategy is to pre-and –post test the group but to also take measurements when the intervention is removed to observe a “reversal” of the

intervention. Then the researcher implements three phases: a baseline phase, an intervention phase and a reversal or withdrawal phase. This strategy helps to reduce maturation effect, history effect, dropout and the Hawthorne effect. When using this strategy and demonstrating the usefulness of the intervention and the results should it be removed, the researcher can make a good case for the importance of maintaining the intervention. However, it may create confusion and stress for the participants if the intervention is given, taken away and then implemented again.

- 5) **Add intervening outcome measures:** This helps so that where the program failed the researcher can identify whether the program was inherently ineffective or the implementation was flawed.

Ensuring the scientific validity of a study is paramount to obtaining useful results. However, practical problems may hamper the researcher from using the best available methodology. In such a case it is advisable that whatever methodology is used, the design be strengthened as much as possible.

6.4 LACK OF STATISTICAL SIGNIFICANCE

The biggest reason for a lack of statistical significance as already mentioned is the small sample utilized. According to Kraemar and Thiemann (1987), there are important facts concerning the statistical significance of the study that must be kept in mind:

- 1) The more stringent you as researcher select your significance level to be, the larger the sample size needs to be (more subjects are needed for 1% than for 5%). The significance level for this study was placed at the 5% level.
- 2) Two-tailed tests necessitate larger samples than one-tailed tests. This is logical as investigating two directions at the same time requires more subjects. Two-tailed t-tests were used for this data analysis, as the researcher cannot be sure if the effect of the creative intervention would be positive or negative.
- 3) Detecting subtle effects require larger samples because the change is more difficult to detect. This may have been the case with this study as the art intervention may have a subtle effect on stress levels at first and relieve them gradually when the participant does creative activities over a long period.

- 4) When using smaller samples the researcher must be willing to take the risk that no statistical significance will be found. This is the case for this research, it was not possible to obtain a larger sample, which is why the study should be viewed as a pilot study.

When taking all of the above into consideration it is understandable why the p -value was not significant. However, the fact that p was not significant does not mean that creative activities have no impact on stress levels. Kawano (2007) points out that the following assumptions about the p -value that are **erroneous assumptions** (c.f. Hubbard & Lindsay, 2008).

1. The p value is an indication of the probability that the differences found between groups can be ascribed to chance.
2. The p value is the probability that the research hypothesis is correct.
3. The p value tells you the probability of finding the same results if a replication of the study was conducted.
4. The p value points out the practical or theoretical importance of the results.

While the p -value is very useful in statistical analysis, it also cannot for certain tell us if a theory is “correct” or “incorrect”. The lack of statistical significance in this study is due mostly to lack of initially high stress levels and to the small sample size. Further studies using larger samples, samples’ with more appropriate base line’s and more interventions staged over longer periods of time is what is needed.

6.5 THE PATIENTS’ EXPERIENCE OF THE CREATIVITY

Most patients who participated in the intervention told the researcher and the occupational therapist that they enjoyed the painting and that it gave them a sense of accomplishment. The positive effect of the intervention was also linked to their being able to see their own progress. Many had to learn to write and use their hands again after the stroke/accident. Being able to do art showed them how far they had come on the road to recovery and they felt very encouraged by this. From these positive responses it does seem that patients benefit from creative activities. This is why further studies meeting the suggestions for improved methodology should be implemented.

Figure 34: A patient unable to use her hands painting with a caste



Figure 35: Patient with limited muscular control painting



Figure 36: Some of the art produced by the patients



6.6 CONCLUSION

Although it cannot be ascertained from this study whether art interventions lower stress levels, the study serves as a useful illustration of how such research may be conducted. Firstly it is important that the sample used have high initial stress levels so that lowering of the stress levels can be tested. It is also important to use larger samples so that robust statistical techniques may be used. It may also be necessary to conduct the study over a longer period of time. It may not be enough to give one art intervention, more sessions over a longer period of time may be necessary to lower stress levels and improve the quality of the measurement. Studying the effects of creativity on stress levels and other psychological dimensions remains important for the scientific advancement of psychology and all of the above should be taken into account.

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APPENDIX A

MINI-MENTALSTATUS EXAM



Mini-Mental State Examination

**Maximum
Score**

Score

ORIENTATION

- 5 () What is the: (year) (season) (date) (day) (month)
- 5 () Where are we: (state) (county) (town) (facility) (floor)

REGISTRATION

- 3 () Name three objects and have person repeat them back. Give one point for each correct answer on the first trial.
1. _____ 2. _____ 3. _____
Then repeat them (up to 6x) until all three are learned.
[Number of trials ____]

ATTENTION AND CALCULATION

- 5 () Serial 7's. Count backwards from 100 by serial 7's. One point for each correct answer. Stop after 5 answers. [93 86 79 72 65]
Alternatively spell "world" backwards. [D - L - R - O - W]

RECALL

- 3 () Ask for the names of the three objects learned above. Give one point for each correct answer.

LANGUAGE

- 9 () Name: a pen (1 point) and a watch (1 point)
Repeat the following: "No ifs, ands, or buts" (1 point)
Follow a three-stage command: "Take this paper in your [non-dominant] hand, fold it in half and put it on the floor". (3 points)
[1 point for each part correctly performed]
Read to self and then do: "Close your eyes" (1 point)
Write a sentence [subject, verb and makes sense] (1 point)
Copy design [5 sided geometric figure; 2 points must intersect] (1 point)

Score: ____/30

CLOSE YOUR EYES

Sentence:



APPENDIX B

INFORMED CONSENT

**UNIVERSITY OF PRETORIA
DEPARTMENT OF PSYCHOLOGY**

LETTER OF CONSENT FOR CREATIVITY STUDY

Principal investigator: C. M. Combrinck
Contact Details: Tel: 076 126 9353
E-mail: celeste.combrinck@gmail.com

The aim of this study is to investigate the creative activity of painting. You as a participant have the opportunity to contribute towards the understanding of creativity and thereby contribute to the scientific status of cognitive and positive psychology. Your input to this study will be highly appreciated.

The study entails the use of a checklist that you are requested to complete and a painting session of 30 minutes. The checklist is easy to complete and takes approximately 10 minutes to complete. Your identity remains the exclusive knowledge of the researcher and will not be captured or disclosed anywhere in the research report. Confidentiality is guaranteed, as all participants will remain anonymous. Please note that your participation in this research is completely voluntary.

Should you feel uncomfortable and/or emotionally disturbed during your participation in this research, you may withdraw at any given time if you so wish without any negative consequences. Should you decide to withdraw from the research the data collected from you will be destroyed. Your data may be held in reserve for future research but will be kept in a secure location.

If you need to contact the researcher for information regarding the research, this can be done by using the details stipulated above.

I, _____, have read and understood this form.

By signing this form, I choose to participate in this research project. I understand that this information may be published.

Participant signature Date Place

Researcher signature Date Place