

THE PSYCHOLOGICAL EFFECTS OF DISSECTING HUMAN CADAVERS

by

MADRI STEPHANI JANSEN VAN RENSBURG

submitted in part fulfilment of the requirements
for the degree of

MASTER OF SCIENCE

in the subject

PSYCHOLOGY

at the

UNIVERSITY OF SOUTH AFRICA

SUPERVISOR: DR A C VAN DYK

JOINT SUPERVISOR: MS H L HENDERSON

FEBRUARY 2002



0001943738

In loving memory of my father

**Gert Marthinus Stephanus Johannes
Jansen van Rensburg**

27/10/1933 – 18/09/2000

ACKNOWLEDGEMENTS

I wish to acknowledge many people who aided me in this study.

Dr Alta van Dyk and Ms Louise Henderson, Department of Psychology, University of South Africa, under whose supervision the work was completed. Their encouragement and critical scrutiny were important in bringing this work to fruition.

All the Homoeopathy and Chiropractic students in the Anatomy course, for participating in the project, sharing their feelings and enriching my life.

Mr James Kitching, subject librarian for Psychology, for all his patient assistance.

My mother Clasie, who taught me to never give up. Merten, Bettie, Tersius and Dorel, I greatly appreciate your love, encouragement and support.

Pappa, my studies in Pretoria provided us with the last chance to say goodbye. I know that you are proud of me.

My friends Christel, Ollie and Daniel, whose support and understanding contributed greatly to the completion of this research.

The MA1 class of 2000, Cathy, Kobus, Kgomotso and Barbara, who shared my sorrow but also my happiness.

The Technikon Witwatersrand, Faculty of Health Sciences for the grant that supported this study.

SUMMARY

The aim of the study was to determine the extent of the psychological influence that human cadaver dissection has on Homoeopathy and Chiropractic students. Changes in anxiety levels, appraisals (of the self, the situation and the environment), coping strategies and behavioural changes were investigated during the following four dissection phases: (i) before the dissection started (preparation); (ii) the first dissection period (exposure); (iii) two weeks after dissection started (development of resources) and (iv) three months after dissection started (stabilisation). Anxiety levels were measured using the Taylor Manifest Anxiety Scale and the Templer Death Anxiety Scale. The remaining sections of the self-administrated questionnaire included open and closed ended sections. Anxiety levels were found to be low, possibly due to students being previously exposure to the dissection hall, during peer tutoring sessions. Although active coping strategies were used most often, no clear pattern emerged with regard to which coping strategy was more effective in dealing with dissection anxiety.

Key terms:

Dissection anxiety; Coping strategy; Anatomy dissection; Anxiety; Appraisal; Peer tutoring; Alternative health care students; Cadaver; Taylor Manifest Anxiety Scale; Templer Death Anxiety Scale.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	iii
SUMMARY	iv
CHAPTER 1: GENERAL INTRODUCTION AND AIMS	1
1.1 MOTIVATION	2
1.1.1 Dissection	2
1.1.2 Anxiety associated with human dissection: a pilot study	5
1.2 RESEARCH PROBLEM, AIMS AND RESEARCH QUESTIONS	8
1.3 OVERVIEW OF CHAPTERS	10
CHAPTER 2:OVERVIEW OF DISSECTION AND ANXIETY ASSOCIATED WITH DISSECTION	11
2.1 HISTORY OF DISSECTION	12
2.2 ANXIETY AND DISSECTION	14
2.3 FACTORS INFLUENCING DISSECTION ANXIETY	16
2.3.1 Expectations	17
2.3.2 Sex	17
2.3.3 Age	19
2.3.4 Ethnicity / culture	19
2.3.5 Religion	19
2.3.6 Type of student	20
2.3.7 Body part to be dissected	23

TABLE OF CONTENTS (continue)

	Page
2.4 COPING STRATEGIES	23
2.4.1 Age and coping strategies	25
2.4.2 Sex and coping strategies	25
2.4.3 Specific methods to decrease anxiety	26
2.4.4 Coping and the timing of events	27
2.5 BEHAVIOURAL INFLUENCES OF DISSECTION	28
2.5.1 Performance in related coursework	28
2.5.2 Emotional reactions	29
2.5.3 Social behaviour	29
2.6 ETHICS AND PUBLIC ATTITUDES TOWARDS DISSECTION	30
2.7 DISSECTION AND ANATOMY TEACHING	32
2.7.1 Learning about death and dying	32
2.7.2 Anatomy and education	33
2.7.3 Importance of dissection	33
2.8 SUMMARY OF RESEARCH FINDINGS	35
CHAPTER 3:THEORETICAL BACKGROUND ON ANXIETY AND COPING	36
3.1 ANXIETY AS A COMPONENT OF STRESS	37
3.2 TYPES AND AN OPERATIONAL DEFINITION OF ANXIETY	40
3.3 THEORIES OF STRESS AND ANXIETY ASSOCIATED WITH STRESS	42
3.3.1 Biological/physiological tradition	44
3.3.2 Trait theories	45
3.3.3 Controversies in anxiety theories	46

TABLE OF CONTENTS (continue)

	Page
3.3.4 Transactional theory of Lazarus	48
3.3.4.1 General overview	48
3.3.4.2 The coping process	49
3.3.4.3 Factors that determine appraisal	50
3.3.4.4 Implications of Lazarus' theory	53
3.3.4.5 Concerns about the Transactional Theory of Lazarus	53
3.4 STAGES IN THE DEVELOPMENTAL OF ANXIETY	54
3.4.1 Selye's General Adaptation Syndrome	54
3.4.2 De La Fuente's crises stages	55
3.4.3 Shalev and Nathan's stages in dealing with a stressful event	55
3.5 OTHER IMPORTANT ASPECTS OF ANXIETY	56
3.5.1 Physiology of anxiety	56
3.5.2 Genetics and anxiety	57
3.5.3 Cultural influences on anxiety	58
3.5.4 Effects and clinical manifestations of anxiety	58
3.5.5 Effects of anxiety on academic performance	60
3.6 COPING STRATEGIES	61
3.6.1 Theories of coping	62
3.6.2 Definitions and functions of coping strategies	64
3.6.3 Categories and types of coping strategies	66
3.6.3.1 Active behavioural coping	68
3.6.3.2 Active cognitive coping	69
3.6.3.3 Avoidance behavioural coping	70
3.6.3.4 Avoidance cognitive coping	70
3.6.4 Differences and variations in coping responses	71
3.7 CONCLUSION	74

TABLE OF CONTENTS (continue)

	Page
CHAPTER 4: RESEARCH DESIGN	75
4.1 HYPOTHESES	76
4.1.1 Anxiety levels	76
4.1.2 Coping strategies	77
4.1.3 Behavioural changes	77
4.2 METHOD	78
4.2.1 Research design	78
4.2.2 Subjects	80
4.2.2.1 Biographical data	81
4.2.3 Ethical considerations	83
4.3 MEASURING INSTRUMENTS	84
4.3.1 Biographical data	84
4.3.2 Taylor Manifest Anxiety Scale	85
4.3.2.1 History and development of the Taylor Manifest Anxiety Scale	85
4.3.2.2 Description and interpretation of the Taylor Manifest Anxiety Scale	86
4.3.2.3 Validity and reliability of the Taylor Manifest Anxiety Scale	87
4.3.3 Templer Death Anxiety Scale	88
4.3.3.1 History and development of the Templer Death Anxiety Scale	88
4.3.3.2 Description and interpretation of the Templer Death Anxiety Scale	89
4.3.3.3 Validity and reliability of the Templer Death Anxiety Scale	90
4.3.4 Appraisal measuring instrument	90
4.3.5 Measurement of coping strategies	91
4.3.6 Measurement of behavioural changes	93
4.4 ANALYSIS OF DATA	93
4.5 SUMMARY AND DIAGRAMMATIC REPRESENTATION OF RESEARCH DESIGN	94

TABLE OF CONTENTS (continue)

	Page
CHAPTER 5: RESULTS	99
5.1 DISSECTION ANXIETY	100
5.1.1 Manifest Anxiety scores for “alternative” health care professionals	100
5.1.2 Death Anxiety scores for “alternative” health care professionals	102
5.1.3 Relationship between demographic variables and anxiety	103
5.1.4 Conclusions and additional remarks on anxiety levels	104
5.2 APPRAISALS	105
5.2.1 Expectations of dissection situation	105
5.2.1.1 Positive expectations of dissection	105
5.2.1.2 Negative expectations of dissection	106
5.2.1.3 Conclusions regarding appraisal of the dissection situation	107
5.2.2 Appraisal of own personality	107
5.2.2.1 Appraisals of the self that makes it easier to cope	107
5.2.2.2 Appraisals of the self that makes it more difficult to cope	108
5.2.2.3 Conclusions regarding appraisal of own personalities	109
5.2.3 Appraisal of the environment	109
5.2.3.1 Positive appraisal of the environment	109
5.2.3.2 Negative appraisal of the environment	110
5.2.3.3 Conclusions regarding appraisal of the environment	110
5.3 COPING STRATEGIES	111
5.3.1 Descriptive results of quantitative analysis of coping strategies	111
5.3.1.1 Active behavioural coping	113
5.3.1.2 Active cognitive coping	117
5.3.1.3 Avoidance behavioural coping	119
5.3.1.4 Avoidance cognitive coping	120
5.3.2 Statistical analysis of quantitative analysis of coping strategies	122
5.3.2.1 Correlation between total coping scores and anxiety level	123
5.3.2.2 Correlation between coping strategy and anxiety level	123
5.3.2.3 Changes over time for each coping strategy	125

TABLE OF CONTENTS (continue)

	Page
5.3.2.4 Investigation of dissection stages for differences in coping strategies	126
5.3.3 Qualitative results as obtained from participants' own reports with regard to their coping strategies	127
5.3.3.1 Coping strategies in phase 1	127
5.3.3.2 Coping strategies in phase 2	128
5.3.3.3 Coping strategies in phase 3	129
5.3.3.4 Coping strategies in phase 4	130
5.3.4 General conclusions with regard to coping strategies used	130
5.4 BEHAVIOURAL CHANGES	131
5.5 SUMMARY OF RESULTS	133
CHAPTER 6: DISCUSSION, CONCLUSION AND RECOMMENDATIONS	135
6.1 ANXIETY	136
6.1.1 Anxiety levels	136
6.1.2 Biographical variation in Anxiety levels	140
6.1.3 Summary regarding anxiety levels in this study	143
6.2 APPRAISAL	144
6.2.1 Appraisal of the dissection situation	144
6.2.2 Appraisal of own abilities	145
6.2.3 Appraisal of environmental factors	146
6.2.4 Conclusions regarding appraisal	148
6.3 COPING STRATEGIES	149
6.3.1 Types of strategies used	149
6.3.1.1 Active behavioural strategies	149
6.3.1.2 Active cognitive strategies	151
6.3.1.3 Avoidance behavioural strategies	152

TABLE OF CONTENTS (continue)

	Page
6.3.1.4 Avoidance cognitive strategies	153
6.3.1.5 Summary of types of coping strategies used	154
6.3.2 Coping strategies and anxiety level	154
6.3.3 Coping strategies changes during different phases	155
6.4 BEHAVIOURAL CHANGES	155
6.5 ACHIEVEMENT OF AIMS AND CONCLUSIONS	158
6.6 RECOMMENDATIONS WITH REGARD TO LOWERING DISSECTION ANXIETY LEVELS	159
6.7 SHORTCOMINGS AND SUGGESTIONS FOR IMPROVEMENT	162
REFERENCE LIST	164
APPENDIX A: DEDICATION CEREMONY PROGRAMME	175
APPENDIX B: QUESTIONNAIRE	176
APPENDIX C: SUBJECT INFORMATION SHEETS	184

LIST OF FIGURES

	Page
Fig 1.1 Anatomy dissection hall with cadavers at TWR	3
Fig 2.1 Second year anatomy students dissecting	14
Fig 2.2 Prosections of hands	21
Fig 2.3 Prosections of hearts and lungs	22
Fig 2.4 Prosections of head and neck region	22
Fig 3.1 Coping as a mediator of emotion	66
Fig 4.1 Group photo of 2nd year anatomy students	80
Fig 4.2 Summary of research design and methodology	95
Fig 5.1 Coping strategies as used in each phase	112
Fig 5.2 Active behavioural coping strategies	114
Fig 5.3 Instrumental action as coping strategy	115
Fig 5.4 Religion as coping strategy	115
Fig 5.5 Dedication ceremony as coping strategy	116
Fig 5.6 Active cognitive coping strategies	117
Fig 5.7 Rationalisation as coping strategy	118
Fig 5.8 Humour as coping strategy	119
Fig 5.9 Avoidance behavioural coping strategies	119
Fig 5.10 Substance usage as coping strategy	120
Fig 5.11 Avoidance cognitive coping strategies	121
Fig 5.12 Denial as coping strategy	121
Fig 5.13 Repression as coping strategy	122
Fig 5.14 Four categories of coping strategies for all four stages	126
Fig 6.1 Peer tutoring in the Anatomy museum	139
Fig 6.2 Dissecting human cadavers	144
Fig 6.3 Self study in the anatomy museum	161

LIST OF TABLES

	Page
Table 4.1 Biographical data of subjects	82
Table 5.1 Manifest Anxiety Scale scores for the four dissection phases	101
Table 5.2 Death Anxiety Scale scores for the four dissection phases	102
Table 5.3 ANOVA for Manifest Anxiety Scale scores and demographic variables	103
Table 5.4 ANOVA for Death Anxiety Scale scores and demographic variables	104
Table 5.5 Frequencies of use of four coping categories	112
Table 5.6 Frequencies of use of eight coping strategies	113
Table 5.7 Pearson correlation between Manifest Anxiety level and coping category	124
Table 5.8 Pearson correlation between Death Anxiety level and coping category	124
Table 5.9 Friedman's Chi squared test for changes in the timing of events	125
Table 5.10 Friedman's Chi squared test for difference amongst the different coping categories for each dissection phase	127
Table 5.11 Frequencies of behavioural changes	131

LIST OF BOXES

	Page
Box 4.1 Description of participants who completed only the first phase of the study	81
Box 5.1 Observation of behaviour related to anxiety relief	130
Box 5.2 Individual "stories"	134
Box 6.1 Peer tutoring	138

CHAPTER 1

GENERAL INTRODUCTION AND AIMS

**“How it is necessary
to know
the inner structure of man”**



Leonardo da Vinci

CHAPTER 1

GENERAL INTRODUCTION AND AIMS

Leonardo da Vinci saw the world around him like no one else. His interests varied from painting, sculpture, flight, to architecture and even war machines. But, for me, the most amazing of all his talents was his knowledge of anatomy. He truly believed that “*it is necessary to know the inner structure of man*”. Like Andreas Vesalius, in my mind the other *master* anatomist and artist, Da Vinci believed that dissection was the only way to truly get to know the human form. Dissection, to them both, was a way to discover the real meaning of the art, movement and also disease of the human body.

Even today an in-depth knowledge of the structure of the human body is regarded as essential for any health care professional. This anatomy knowledge can only be obtained by dissecting the human body. But what, if any, are the psychological effects and consequences on students when they dissect human cadavers?

This dissertation focuses on anxiety associated with the dissection of human cadavers during the second year anatomy course for the “alternative” health professions of Homoeopathy and Chiropractic. It investigates dissection anxiety and coping, including behavioural changes related to dissection anxiety. This chapter provides a broad overview of dissection and anxiety associated with dissection. It also describes the necessity of this study, the research problem and aims of the study.

1.1 MOTIVATION

1.1.1 Dissection

Anatomy is a subject that is taught during pre-clinical years for most medical and allied professions. These health professions include allopathic medical professions (e.g.

Medicine, Nursing, Physiotherapy and Occupational therapy) as well as complementary (“alternative”) health professions, such as Homoeopathy and Chiropractic.

Dissection of the human body is an integral part of the study of Anatomy (see Fig. 1.1). Without it the visualising and comprehending of anatomical structures become virtually impossible. In many cases, dissection is the first experience of a student with death and his/her first physical encounter with a dead person. This must have an important effect on the psychological well-being of the student not only in his/her study career, but also afterwards as a professional person dealing with health matters.



Figure 1.1 Anatomy dissection hall with cadavers at the Technikon Witwatersrand

Although dissection for conventional medical studies is widely accepted, anatomy and the consequent dissection for so-called complementary health professions is relatively new in South Africa. Students in Homoeopathy and Chiropractic have been trained at the Technikon Witwatersrand since 1993. Dissection for the subject Anatomy in the second year commenced in 1994.

It would seem that most students experience a phase of anxiety during the first exposure to dissection as well as during the following few weeks. This seems to stabilise and return to normal after a few months (Charlton, Dovey, Jones & Blunt, 1994; Evans & Fitzgibbon, 1992; Hancock, Williams & Taylor, 1998). Not all students experience anxiety and some aspects of dissection seem to have a calming effect on the students. One such aspect is the dedication ceremony that takes place just prior to the first dissection period (see Appendix A for programme of the dedication ceremony). At this occasion a religious leader dedicates the bodies of the deceased persons, and the students are also introduced to the different aspects of and history of dissection. Generally, the students acquire a better understanding of and respect for the cadavers and dissection hall activities. Some students, however, still experience and show a negative reaction to dissection and seem to be emotionally affected to such an extent that it might influence their academic performance and social behaviour.

It might be that students in complementary health professions differ from medical students in their perceptions and experience of dissection. This difference and the concern for the small (but important) number of students who show emotional reactions, that are possibly related to dissection, not only triggered my interest in the topic but also my concern for the well-being of these students.

For most medical students exposure to death and dying in their future profession is a fact of life. This is not so for students of Homoeopathy and Chiropractic as, in their professions, they have a more limited exposure to death and dying. This may influence the way and extent to which dissection of human bodies affects students of Homoeopathy and Chiropractic. The philosophy underlying *Homoeopathy* is that “like cures like”. This means that a patient is treated using a remedy that mimics the effect of the symptoms that the patient experiences. A Homoeopath would, therefore, spend time investigating all the symptoms that a patient experiences in an effort to find the ‘matching’ remedy. *Chiropractors* treat diseases (mostly musculo-skeletal) by adjusting and manipulating the spinal column. Because the nerves that exit the spine can influence the structures and also organs supplied by that specific nerve, correcting the alignment of the spine can help treat

the symptoms of the joints but also organs. Both these professions undergo the same pre-clinical training as their allopathic counterparts (including anatomy and dissection). They also use the same diagnostic methods, such as physical examination and the use of laboratory and radiographic diagnostics. Their mode of treatment is just different and they use a more holistic approach to the patient, that includes the examination of both physical and mental symptoms.

It would seem that medical students begin their study career (and anatomy dissection) with a better preparedness in that they know that they are going to deal with death and dying in their professions. It is expected that dissection anxiety levels will be higher for Homoeopathy and Chiropractic students and that the coping strategies that they use might also differ from those used by medical students. Even between the professions of Homoeopathy and Chiropractic there are different approaches towards patients. Homoeopathy seems to use a more holistic approach to patients with a great deal of emphasis on so called "mental" symptoms, while Chiropractors concentrate less on mental symptoms. Students of the two professions might thus also experience dissection differently and might use different coping strategies to overcome dissection anxiety.

1.1.2 Anxiety associated with human dissection: A pilot study

Due to a general lack of research on the effect of anxiety related to dissection on Homoeopathy and Chiropractic students, a pilot study was conducted during 1998 and 1999 at the Technikon Witwatersrand (Jansen van Rensburg, 1999, 2001). This pilot study was conducted to determine the effect of anxiety associated with human dissection on the anatomy students. The participants included second year Homoeopathy and Chiropractic students in the anatomy course. Questionnaires were distributed to students at different stages of dissection throughout the year, namely:

1. five days before the first dissection period (at the dedication ceremony held at the beginning of the year)
2. during the first dissection period (which included events such as the first sight of the cadaver, the first touch and the first incision)

3. after six months (240 hours) of dissection.

Apart from biographical data (such as age, sex, marital status, previous exposure to death or dying, and expectations about future exposure to death or dying), students' experience of death anxiety, their general mental and physical health, as well as general stressors associated with 2nd year of study were measured. The degree of upset caused by the dissection hall activities, the students' reactions during different dissection stages, and the coping mechanisms they used were also investigated.

The results of the pilot study indicated that dissection of human cadavers could lead to a variety of different physiological and psychological reactions. The physiological and psychological effects experienced by the participants indicated that second year dissecting anatomy students experienced depressive and anxiety symptoms. The students experienced high levels of death anxiety for all stages of dissection. The levels were not based on individual comparisons, but rather on the group average for each phase. Dissection was ranked as the sixth most important stressor experienced by the students. The other five stressors, that were regarded as more stressful than dissection, were all related to work load and financial difficulties. It therefore seemed that dissection played a major role in general stress amongst second year students.

“Alternative” health professional students showed higher anxiety levels (as measured on the Templer Death Anxiety Scale) than their allopathic counterparts (Dickinson, Lancaster, Winfield, Reece & Colthorpe, 1997; Templer, 1970). These levels were lower than the death anxiety levels of persons with clinically diagnosed anxiety disorders. It therefore seems that anxiety is a reaction to dissection, but this anxiety cannot be described as pathological or diagnosed as such.

It was found in the pilot study that students' anxiety levels changed during the different phases of dissection. The anxiety levels were at the highest level in the first dissection period and it declined after three months. As indicated in the pilot study, the first three

months showed the most variation in anxiety levels. Anxiety in the present study is therefore studied at different stages within the first three months of dissection.

The findings of the pilot study have important implications for the present study. Physiological reactions are difficult to measure especially if the method uses the participant's perceptions of aspects such as heart palpitations. The focus of the current study is therefore on a single psychological reaction, namely anxiety. Anxiety is regarded as an emotional response that can be accurately captured by using the participants' own perceptions. Anxiety is also regarded as one aspect or facet of stress. Stress in the present study is regarded as "variations in environmental conditions or circumstances that are characterised by some degree of objective danger" (Gaundry, Spielberger, 1971). Stress can therefore be seen as a broader concept than anxiety which is an emotional reaction evoked in the individual that interprets a stressful situation as personally threatening (Folkman & Lazarus, 1985; Gaundry, Spielberger, 1971; Lazarus, 1991; Monat & Lazarus, 1991).

In an attempt to control for factors that could have influenced the results of the pilot study (such as using only group means), the following changes is made for the present study: anxiety levels for each individual participant is measured and differences in these levels for each dissection phase recorded. Although averages for the group for each dissection phase are investigated, individual anxiety levels provide useful information regarding changes over time. Anxiety levels measured before dissection starts provide for baseline anxiety levels, and also provide for personality or trait anxiety levels.

Coping strategies were examined in the pilot study and it seemed that rationalisation, curiosity, a prior mental preparedness, denial, humour and repression were used most often. Coping strategies are further examined in the present study. Individual responses regarding coping strategies, are examined to determine the most effective strategies used by the students.

Another factor that is crucial when investigating dissection anxiety on an individual basis is the link between baseline (trait) anxiety of the individual and the availability (or the participant's perception of the availability) of resources. Resources include both internal (personal strengths) and external (social support) resources. These resources (both internal and external) were not measured objectively in the pilot study. The interest of the present study is therefore on how each participant appraises his/her personal internal as well as external resources as adequate to cope with the dissection anxiety and also the appraisal of the situation (in this case the dissecting of human cadavers) as anxiety provoking.

From the pilot study it therefore followed that the focus of the present study should be on anxiety (as an emotion or manifestation of stress) as a reaction to the specific stressor, namely the dissection of human cadavers. Anxiety levels in the current study are measured to determine the stage of dissection during which the highest anxiety is experienced.

Coping strategies are examined in relation to the individual anxiety levels, available resources and the usefulness of the coping strategy. Other aspects that are measured include the differences between sexes, religious and cultural groups and differences between different age groups of the dissection participants.

1.2 RESEARCH PROBLEM, AIMS AND RESEARCH QUESTIONS

As far as can be established, the psychological influence of dissection of human cadavers and the coping strategies that Homoeopathy and Chiropractic students use in dealing with dissection anxiety have never been researched in South Africa before. The aim of this study is therefore to determine the extent of the psychological influence (as measured by manifest and death anxiety scales) that human cadaver dissection has on Homoeopathy and Chiropractic students in the second year Anatomy course at the Technikon Witwatersrand. It also aims to describe the changes that occur in the students' behaviour

(e.g. eating and sleeping habits) and the coping strategies that they use to overcome the psychological anxiety associated with dissection. Age, sex, field of study, religion and culture will be examined for possible influence in terms of anxiety, behavioural changes and coping strategies. The effect of appraisal (about the stressor - that is dissection - as well as personal abilities and resources in dealing with the stressor) and expectations (about dissection and the resulting experience of anxiety) will also be examined. These investigations will be done during the four different phases of dissection to establish possible changes and differences over time.

Research questions include the following:

- To what extent do students experience anxiety during dissection? Does this experience of anxiety change after initial exposure, two weeks and three months after dissection started?
- How does behaviour (e.g. diet, exercise, and alcohol use) change in response to dissection anxiety?
- What type of coping strategy is associated with better adaptation to dissection anxiety?
- How do age, sex, field of study (Chiropractic or Homoeopathy), culture and religion influence the development of dissection anxiety, behavioural changes and strategies used to cope with anxiety?
- How do the anxiety, behaviour and the use of coping strategies change during the different stages?
- What is the relationship between appraisal of a situation as stressful, or appraisal of personal factors as inadequate, and the development of psychological anxiety?

The research questions are investigated by using a repeated measures (pretest-posttest) design. The following stages of dissection are investigated for levels of anxiety, appraisals of the situation as well as personal factors, behavioural changes (related to dissection anxiety) and coping strategies used:

Stage 1: Pre-dissection

Stage 2: First dissection period

Stage 3: After two weeks of dissection

Stage 4: After three months of dissection

1.3 OVERVIEW OF CHAPTERS

An overview of dissection, anxiety associated with dissection, behavioural changes and coping strategies is given in Chapter 2. A brief history of dissection is also provided. Chapter 3 discusses the theoretical background of anxiety and coping, and different models and theories are discussed. The research design and methodology used are discussed in Chapter 4. Chapter 5 is concerned with the reporting and integration of the research findings. The results are discussed with regard to previous research findings on dissection anxiety in Chapter 6. In Chapter 6 conclusions regarding all results and useful outcomes are also made. Recommendations are also formulated and a discussion on the limitations of the study is included.

CHAPTER 2

OVERVIEW OF DISSECTION AND ANXIETY ASSOCIATED WITH DISSECTION



Andreas Vesalius

CHAPTER 2

OVERVIEW OF DISSECTION AND ANXIETY ASSOCIATED WITH DISSECTION

The dissection of human cadavers was not always regarded as ethically acceptable, but today the dissection of cadavers features prominently in most medical schools all over the world. The ethical issues related to dissecting corpses seem to have shifted to issues regarding the psychological influence that dissection of human remains can have on students of anatomy. This chapter deals with the history of dissection, factors related to the development of dissection anxiety, methods used in coping with dissection anxiety, and changes in behaviour as a result of dissection. Contributions of dissection in anatomy teaching, training of health care professionals (such as courses on death and dying), and ethical issues are also discussed.

2.1 THE HISTORY OF DISSECTION

The history of dissection shows some radical changes in the way in which people perceived dissection as well as activities in the dissection hall (Richardson & Hurwitz, 1996; Rodning, 1989).

It took a long time before the use of cadavers and corpses become acceptable. The Grecian and Near Eastern Indian civilisations used to cremate their dead without examination. Roman, Chinese and Muslim civilisations all harboured strong taboos regarding dissection. Even Egyptian civilisation did not analyse a corpse, although they preserved corpses and viscera by mummification (Rodning, 1989).

The first well-documented theories of disease were all predictions and extrapolations from animal dissection. The first human post-mortem dissections performed publicly

have been attributed to Herophilus of Chalcedon, considered to be the Father of Anatomy, 335-280 BC (Rodning, 1989).

Various Western artists devoted much of their time to the study of Anatomy. Examples of these masters include Leonardo da Vinci, Raphael, Michelangelo and Titan. They are all believed to have performed human dissection in an attempt to study the human body. Various drawings and paintings were also made of dissection activities (Rodning, 1989; Saunders & O'Malley, 1950).

In 1482 Pope Sixtus IV sanctioned postmortem human dissection for educational purposes. Various individuals can be considered important in the history of human anatomy and human dissection. A Flemish physician Andreas Vesalius (1514-1564) is generally considered to be the "reformer" of human anatomy. In 1628 William Harvey also contributed a monograph that had a great influence on the course of anatomy (Saunders & O'Malley, 1950).

In the eighteenth century dissection was seen as mutilation of the body, but it was understood that human anatomy and dissection was a "necessary inhumanity". Anatomists and dissectors of human cadavers developed mental defence (coping) strategies against both natural fears of corpses and the taboos against the "mutilation of the dead" of the community members. These defence mechanisms included a "disrespectful" attitude and treatment of the dead (Richardson & Hurwitz, 1996).

In the twentieth century it is widely understood and accepted that dissection serves to impart knowledge of bodily structures (the study of anatomy) (see Fig 2.1). Dissection furthermore also plays a role in teaching students about death and dying (Druce & Johnson, 1994; Weeks, Harris & Kinzey, 1995). Today the emphasis is more on the psychological effects that dissecting human cadavers could have on students of anatomy. One of the psychological effects that is investigated is anxiety.

2.2 ANXIETY AND DISSECTION

Different and contradictory results have been reported concerning anxiety associated with dissection. Most studies focused on medical students and have never considered the reactions of Homoeopathy and Chiropractic students to dissection. Studies on medical students were mainly conducted in other countries (such as Saudi Arabia and Israel). The students in these countries differ with regard to culture and socio-economic background, which makes direct comparison to the South African situation difficult.



Figure 2.1 Second year anatomy students dissecting cadavers at the Technikon Witwatersrand

Some studies found no significant increase in stress in first and second year medical students who dissected cadavers. These studies however neither investigated anxiety nor considered dissection as a cause of anxiety. Stress could have been defined as too broad a concept to detect anxiety levels (Mitchell, Matthews, Grandy & Lupo, 1983; Murphy, Nadelson & Notman, 1984).

Various studies found anxiety and anxiety symptoms associated with dissection (Lippert, 1980; Penney, 1983, 1985, 1987; Stern, Norman, & Komm, 1993). These include studies measuring psychological conditions resulting from dissection hall activities. One such condition was death anxiety, that is anxiety about the student's own death (Dickinson *et al.*, 1997; Hancock *et al.*, 1998; Metheny & Sparrow, 1984; Penney, 1985, 1987). Depression as well as depression associated with anxiety in students who participate in dissection were also studied (Stewart, Betson, Lam, Marshall, Lee & Wong, 1997; Stewart, Betson, Marshall, Wong, Lee & Lam, 1995). The anxiety associated with dissection in these studies manifested in physical symptoms such as nausea, fainting, loss of appetite, sleeplessness and nightmares (Gustavson, 1988; Horne, Tiller, Eizenberg, Tashevskaja & Biddle, 1990; Penney, 1983, 1985). Studies conducted on medical students also found elevated levels of anxiety, but this was not necessarily related to dissection (Arnstein, 1986; Lloyd & Gartrell, 1984).

This experience of anxiety associated with dissection does not seem to be a strange phenomenon, since dissection is usually the student's first encounter with a dead body. The cadaver can also be seen as the student's first "patient" of the students (David, 1999; Penney, 1983, 1985). The students are permitted and even encouraged to manipulate and "mutilate" the cadavers from this very first encounter. The great amount of anxiety experienced by the student caused by these events must be mastered (Bourguet, Whittier & Taslitz, 1997; Shalev & Nathan, 1985). Anatomy staff is also in a position to recognise emotional issues at a very early phase.

It was also found that severe anxiety was the emotion experienced with the highest frequency during the first phase of dissection (that is anticipating dissection). This first phase was also the phase at which anxiety levels were the highest.

Many studies, including the pilot study conducted by the author, used a Death Anxiety Scale (Templer, 1970). This scale was used most often to measure anxiety and also to correlate death anxiety to the type of coping strategies used by the students. It is therefore also easier to compare the present study to those in the literature, by using the

same scale. A Manifest Anxiety Scale was also used as the present study involved anxiety measurements encompassing more than just death anxiety.

Research on medical students showed that dissection experiences contribute to the students understanding of and coping with death and dying during later phases of their professional careers (Abu-Hijleh, Hamdi, Moqattash, Harris & Heseltine, 1997; Evans & Fitzgibbon, 1992; Gustavson, 1988; Nnodim, 1996; Penney, 1985). For example, Hull (1991) found that students had little experience of dealing with death and dying before entry into medical school and that there is a great need for a course on death and dying before the start of their clinical training. The beginning of dissection was identified as the best time for this training. Abu-Hijleh *et al.* (1997) also suggested a few methods to introduce students to coping with death and dying, and named the dissection period as the best suited for this intervention. None of the studies actually conducted any such intervention and this might prove to be a worth while outflow of the present study.

It would seem that all students who dissect human cadavers, regardless of their field of study (for example science, medical, and physiotherapy) show the same reactions towards dissection. Although anxiety levels might be similar for all students involved in dissection, the actual experience of anxiety might be different for Chiropractic and Homoeopathy students, due to them being less involved in invasive procedures (e.g. surgery) later in their professional careers.

2.3 FACTORS INFLUENCING DISSECTION ANXIETY

Previous studies have focused on several variables that seem to influence the psychological reactions of students towards dissection. The variables that are examined in the current study include: the students' expectations, differences between males and females, age differences, cultural differences, religion differences and, as previously discussed, possible differences between Chiropractic and Homoeopathy students.

2.3.1 Expectations

Tiberius, Sackin and McLean (1989) indicated that the expectations an individual brings to a situation significantly influence how he/she experiences and copes with that situation. Expectations of students about dissection experiences seem to influence their experience of anxiety (Horne *et al.*, 1990). The students in Horne's study were more anxious about the prospect of *handling* the cadavers than *seeing* the cadavers. Their high anxiety significantly decreased during dissection, which might indicate that the anxiety was more related to their anticipation than to the actual dissection activities. These authors also found that students with previous exposure to death and dying seem to cope better with dissection.

Students' "expectations" about the dissection hall activities and the influence of these activities could be regarded as appraisals as detailed by the Transactional Theory of Lazarus (see Section 3.3.4). The fact that students who have seen or handled corpses previously deal with dissection better could mean that their expectations (appraisals) of the situation are less threatening. They know what to expect and the associated anxiety is therefore lowered. Appraisal of stressors and personality factors should thus be investigated as indicated, in the theory by Lazarus.

2.3.2 Sex

Sanner (1994) found that females are more sensitive towards "operating" on dead bodies than males. Some studies found that female medical students reported more anxiety than male students did (Abu-Hijleh *et al.*, 1997; Dickinson *et al.*, 1997; Finkelstein & Mathers 1990). Females showed higher levels of fear, and reported stronger physical, as well as behavioural reactions. Females were also disturbed more by dissection hall stimuli, such as the smell of formalin in the dissection hall (Abu-Hijleh *et al.*, 1997). Eid, Thayer and Johnsen (1999) measured post-traumatic stress in a Norwegian sample and found that females showed significantly higher values than males for both the first week and four months after dissection started. During my pilot study (involving Homoeopathy and

Chiropractic students at the Technikon Witwatersrand) dissectors of human cadavers were evaluated during three phases (before dissection commenced, at the first dissecting period and after six months). Females showed significantly higher levels of anxiety for all these phases (Jansen van Rensburg, 2001). Other studies, however, found no differences regarding dissection anxiety between males and females (Shalev & Nathan, 1985; Stewart *et al.*, 1995).

One explanation for these seemingly contradicting findings with regard to sex differences can be the socialisation of the professions. In some countries such as the Arabic nations, females (even when they study medicine) still have very feminine roles (Abu-Hijleh *et al.*, 1997). They only deal with other females and are never exposed to a “masculine” way of dealing with their chosen occupations. The sex differences are then true gender (social role) differences. In other countries, females studying and working in fields such as medicine and engineering take on a more masculine role in their occupation. The absence of sex differences in anxiety levels can, therefore, possibly be explained with regard to the absence of “gender” (social role with regard to occupation). These female students are “expected to” and actually react in a way that is more consistent with male behaviour. This would explain the situation in a country such as Israel, investigated by Shalev and Nathan (1985), where females that study “male / masculine” occupations are expected to act in a male / masculine way. In comparison to Israel this could also to some extent still be the case in South Africa, especially with regard to occupations such as mining, engineering and possibly medicine. Yet another possible scenario would be the countries where occupations are not linked to any gender. These would include countries such as Norway where a female would act in a feminine way whether she is an engineer, medical doctor, nurse or kindergarten teacher. Females in these professions would then have a feminine role regardless of the occupation that they fulfil. Sex differences would then be prominent because females are “allowed to react in a “feminine” way.

2.3.3 Age

Shalev and Nathan (1985) found that older students experienced less anxiety regarding dissection of human cadavers. This lower anxiety level was especially prominent for those with prior experience with death (for example previous exposure to corpses due to occupation, such as nurses).

2.3.4 Ethnicity/culture

Charlton and co-workers (1994) found that ethnicity had no influence on the attitudes of medical students towards dissection. In the study by Shalev and Nathan (1985), who studied Israeli and American students at the Tel Aviv University, some differences between cultural groups existed, but the authors attributed it to differences in age and sex of the groups. It would be interesting to know if there are any differences between black and white students in South Africa with regard to dissection anxiety, especially with the cultural taboos regarding handling of corpses. The current study will investigate the differences between cultural groups, but because of the very limited number of black students studying in the Homoeopathy and Chiropractic fields, it will probably not explain differences between these cultures. Cultures that are expected to be represented in the sample are Portuguese, Chinese, Afrikaans and English speaking South Africans.

2.3.5 Religion

The study by Shalev and Nathan (1985) is the only study (involving students that dissect) that investigated religious orientation. They found that Jewish and non-Jewish medical students did not differ significantly in the amount of anxiety experienced due to dissection.

Templer (1972) found that amongst 267 Protestants that completed the Death Anxiety Scale as well as a religious inventory, participants who were more religious had lower death anxiety scores. The participants with lower death anxiety scores had a stronger

attachment to their religious belief system and attended religious functions more often. Aday (1984) also found that Christians who attended church more often had lower death anxiety scores. It could be that death and the anxiety associated with dying is lower in people who participate more often in religious activities, since their lives are more focussed on a spiritual level.

The current study investigates both religious orientation and how religiosity (that is the strictness of adhering to a particular religion) affect anxiety and coping.

2.3.6 Type of student

It is important to consider whether students from different health care professions experience dissection differently. This is especially true for the “alternative”/complementary health care professionals, such as students of Homoeopathy and Chiropractic. At the Technikon Witwatersrand the students of Homoeopathy and Chiropractic are taught and also dissect together as one group. If they experience dissection differently it is important to consider different ways to deal with these students and not to treat them as one student group.

As far as can be established, no study has been undertaken in South Africa to establish the effects of dissection on Homoeopathy and Chiropractic students, and differences between them have not been established. Studies in other countries have focussed on allopathic health care students which includes the “traditional” medical students. One study did consider the psychological impact of cadavers and prosections (ready dissected specimens of specific regions) on the paramedical professions of physiotherapy and occupational therapy (Hancock *et al.*, 1998). (See figures 2.2 to 2.4 for examples of prosections.) Although these professions (physiotherapy and occupational therapy) are regarded as allopathic health care providers they do not always have the same exposure to dissection as medical students. Hancock and co-workers found that thirty percent of students exhibited a post traumatic stress reaction as measured by the Impact of Events Scale. Seven percent still exhibited symptoms after eight months. These symptoms

included intrusion symptoms (as measured by items such as “pictures about it popped into my mind” and “other things kept making me think about it”) and avoidance symptoms (which included items such as “tried to remove it from memory” and “stayed away from reminders of it”).

My study will investigate the differences in dissection anxiety between Homoeopathy and Chiropractic students. Although allopathic students will not participate in the study it will be interesting to look at differences between allopathic and “alternative”/complementary students of anatomy on a theoretical level.



Figure 2.2 Prosections of hands in the anatomy museum at the Technikon Witwatersrand

No study could be found in the literature that examined the effects of dissection on the psychological well being of complementary health care professionals or students of these professions, or amongst different sub-groups of “alternative” health care professions. It seems important to investigate the influence of the different variables on and between subgroups of the complementary health students in the South African context.



Figure 2.3 Prosections of hearts and lungs in the anatomy museum at the Technikon Witwatersrand



Figure 2.4 Prosections of the head and neck region in the anatomy museum at the Technikon Witwatersrand

2.3.7 Body part to be dissected

It seems that certain body areas provoke different emotions and different levels of anxiety amongst dissectors.

Shalev and Nathan (1985) described two important issues that concern the body region or specific area that is dissected and its relation to anxiety. Firstly, some areas seem to be emotionally more difficult to dissect. These include the brain, face, eyes and hands. Secondly, anxiety about particular parts and their dissection seem to be related to the personality of the dissector. For example, some dissectors see the brain as the center of the person's being, others reacts more to the facial region. Some dissectors might react negatively to the dissection of the sex organs, in response to their own feelings towards sex.

2.4 COPING STRATEGIES

A few studies have focussed specifically on the coping strategies that medical students use to overcome the negative influences of dissecting human cadavers. Anxiety was found to be the most common of these negative influences of dissection (Shalev & Nathan, 1985).

Shalev and Nathan (1985) looked at the broad development of coping strategies to lower anxiety throughout the dissection experience. They found that stressful situations (such as dissection) are initially coped with by the use of previously available defence mechanisms, such as those students used previously in their lives. The students later developed new internal and/or external resources to modify their way of coping. A failure to develop new coping strategies might result in the chronic use of the same rigid defences.

Some studies focussed more on the specific strategies used and the influence of using these strategies on anxiety levels. Strategies that produced a decrease in anxiety were mostly related to active behaviour. The dominant coping strategies used by students in a study by Stern *et al.* (1993) were problem solving and seeking social support (both active, problem-orientated strategies) and accepting responsibility (an emotion based coping strategy). Active coping and positive reinterpretation resulted in decreased anxiety in the study by Stewart *et al.* (1997). Stewart *et al.* (1995) also found that optimism protected against the development of distress. They found that active coping styles and positive reinterpretation as coping strategy correlated negatively with distress caused by the dissection hall activities. Arabic medical students were found to use rationalisation as an effective coping mechanism (Abu-Hijleh *et. al.*, 1997).

Avoidance strategies seem not to be effective in decreasing anxiety levels. The strategies used least often in the study by Stern *et al.* (1993) were escape or avoidance strategies. Stewart *et al.* (1997) also found that avoidance strategies resulted in increased anxiety. Stewart *et al.* (1995) found that wishful thinking and avoiding the subject of dissection correlated positively with distress.

Very specific strategies are developed for use in the dissection hall. These coping strategies include cadaver stories and giving cadavers fictitious names, personalities or life stories. I find the telling of cadaver stories of particular interest. These are narratives by the students (or dissectors) about the cadavers and about jokes played by dissectors involving cadavers. Not only do students tell stories (very often not true) but they also frequently physically manipulate body parts for the dual purpose of shocking onlookers and deriving humour. This emotional experience of forming a type of “bond” with the cadaver can be regarded as a type of coping mechanism, but it can also aid in internalising anatomical knowledge (Richardson & Hurwitz, 1996). This “bond” with the cadaver, and the story telling about dissection, thus indirectly also serve as a teaching tool in that it aids in internalising anatomical knowledge. It can also be seen as a manipulation of the situation in an attempt to cope with dissection (Hafferty, 1988).

2.4.1 Age and coping strategies

With regard to age, Kay and Blythe (1984) and Shalev and Nathan (1985) found that older students coped with dissection by using more mature ways of adaptation while younger, more inexperienced student used more rigid ways to cope. Younger students displayed aggression and denied emotional involvement in the process.

With regard to coping with other stressors associated with medical school training and not necessarily dissection, the following were found: Older students experienced different stresses (including family and financial responsibilities) than their younger classmates. This influenced their experience in the academic area, especially since they might feel that they have to tend to financial obligations. Older students also coped with their problems and the professionalisation process differently. They focussed more on interpersonal issues where as the younger students focussed more on identity issues (Kay & Blythe, 1984).

2.4.2 Sex and coping strategies

Most studies that examined the differences between males and females found no differences in terms of coping with dissection (Evans & Fitzgibbon, 1992; Shalev & Nathan, 1985; Stern *et al.*, 1993). Abu-Hijleh *et al.* (1997), however, did find a difference in coping mechanisms used between males and females. They found that females have the need to discuss the dissection issues amongst themselves as a type of coping strategy. They also used humour, denial, praying and reading the Holy Qur'an as methods to cope.

The contrasting results obtained from studies regarding differences between males and females with regard to anxiety and coping mechanisms could be due to social issues. It could be that in some countries, where female students experience greater difficulty being accepted into medicine, sex differences are either not present or overemphasised. Cultural background and social pressures in Arabic countries could account for the differences found in the study by Abu-Hijleh *et al.* (1997).

2.4.3 Specific methods to decrease anxiety

Anatomy departments employ various methods and strategies that focus on different aspects of the dissection experience in an attempt to assist students with adjusting to and coping with dissection.

A *memorial/dedication ceremony* in which students participate and during which the aspects, importance and history of dissection are explained, can be held at the beginning, end, or both beginning and end of the dissection experience. The dedication ceremony also reinforces values, enhances bonds among students and encourages their appreciation of various religious and cultural beliefs (Bourguet *et al.*, 1997). Bourguet *et al.* (1997) found that 58% of all anatomy departments in the USA and Canada have memorial activities to acknowledge the contribution of donors. This also is seen by most staff as an education opportunity to help students adapt to the new environment. A similar dedication ceremony is held at the beginning of each year at the Technikon Witwatersrand (see Appendix A).

Providing students with the actual *name, age, history and cause of death of the cadaver* is another method suggested by Weeks *et al.* (1995) to alleviate dissection anxiety. At the Technikon Witwatersrand this information is provided to students, with the exception of the person's name. The information is however only supplied after a few weeks of dissection and only on the request of the students themselves.

In addition to the courses on death and dying that were advocated by many authors, another type of course was suggested by Blackwell, Rodin, Nagy and Reece (1979). They used a *student-cadaver correlation session* with four main aims. The first aim was to give a historical overview of the use of cadavers, the second aim was to create an awareness of feelings (student's own as well as others), the third was to create an awareness of social norms concerning the handling of bodies after death and the fourth was to instruct the students with regard to the conduct code and the relating of attitudes towards the cadaver to future experiences with patients. The correlation session involves

the interaction of staff from both anatomy and behavioural sciences and it usually takes place during the initial exposure of the student to the cadaver. Related to this, Weeks and co-workers (1995) suggested that students should also be encouraged to *discuss topics and explore feelings* stimulated by the intense experience of human dissection.

Educating students about coping with the *workload and time management* can also indirectly decrease anxiety levels during dissection (Holtzworth-Munroe, Munroe & Smith, 1985; Stewart *et al.*, 1997). Senior students can act as *mentors* with the primary benefit and goal of helping junior students with acquiring anatomy knowledge but it could have the added benefit of helping junior students (dissectors) in their encounter with death in the dissection hall. The studies by Hendelman and Boss (1986) and Slockers, Van De Ven, Steentjes and Moll (1981) found that the use of student mentors worked well. Both the studies found that senior students helped new students with the transition from secondary education to medical school, and thus with dissection and the anxiety associated with it. Associated with this approach was the education of students about the benefits of well-spent leisure time as a stress management strategy (Folse, DaRosa & Folse, 1985).

All of the above strategies will not only be of benefit to the student while dissecting and in coping with dissection anxiety, but can be useful in dealing with future experiences of death and dying. It could add new coping strategies to the person's coping repertoire.

2.4.4 Coping and the timing of events

The type of coping strategy used by an individual to deal with dissection anxiety, is not necessarily directly related to the specific personality trait/s of that individual, but can also be related to changes in the stressful situation (dissection). For this reason the timing of events (such as the phase of dissection) play a crucial part in the selection of a relevant coping strategy (Lazarus, 1976).

Shalev and Nathan (1985) studied students' coping mechanisms during different phases of dissection. They found that during the first phase (preparation for dissection) students used *projection* and *withdrawal* as coping mechanisms. During the second phase (first exposure to the dissection hall activities) the defences became overloaded. *Denial* and *detaching* themselves (as used in the first phase) from the cadaver were insufficient and they needed new strategies to cope with this new phase of the dissection experience. New strategies included very active responses, such as *identifying* with new social groups and with the cadaver (as in shaking hands and inquiring about the identity of the cadaver). *Displacement, projection* and *reaction formation* were prominent during the third phase (active dissecting). The fourth phase (stabilisation) showed the use of coping strategies such as *denial, omnipotence, intellectualisation* and *mastery* (maturation) (Shalev & Nathan, 1985).

2.5 BEHAVIOURAL INFLUENCES OF DISSECTION

The impact of dissection could also have an influence on other aspects of the students' life. These include the influence on academic performance in anatomy, as well as other subjects. It could also influence the students' social behaviour, such as the use of alcohol.

2.5.1 Performance in related coursework

The dissection of human cadavers and the consequent anxiety experienced because of this exposure could have an important effect on performance in the anatomy course or other related courses in the students' study career.

Nwoha (1992) found that performance in practical anatomy dissection had significant positive correlations with performance in second year anatomy examinations. The significant finding of this study was that practical dissection affected the student's performance in anatomy. Those with less interest in the dissection hall activities were more likely to fail the examination. If a student experiences anxiety about dissection and

does not participate actively in the dissection hall, it can have a more detrimental effect than having low matriculation or first year marks.

The relation between anxiety and academic performance was well described by Martin (1976) who found that anxiety about issues other than the academic subject being studied can lead to an increased anxiety about the academic subjects. Students may therefore experience anxiety in situations other than the one provoking the initial anxiety. If Martin's proposition is true then in the case of dissection, anxiety about dissection may not only lead to increased anxiety about anatomy, but also lead to an increase in anxiety about other second year subjects. Little research has been conducted on dissection anxiety and academic performance, but from the research findings on anxiety levels experienced by dissectors, it seems important to investigate these issues.

2.5.2 Emotional reactions

Anxiety and depression were the most common emotional reactions to dissection. Shalev and Nathan (1985) found that the type of emotion was specific to the phase of dissection in which the person found him/herself. During the first phase (preparation to dissection) *anxiety* was the most prominent, while *confusion* was prominent during the second phase (initial exposure). *Dissatisfaction* was prominent during the third (active dissection) and *apathy* during the last phase (stabilisation).

2.5.3 Social behaviour

Shalev and Nathan (1985) found that students' social behaviour changed according to the specific phase of dissection that was experienced. The students mostly experienced social isolation during the first phase. The social isolation manifested in withdrawal in an attempt to hide their distress as they rarely shared their feelings about the dissection hall. Students who were unable to get external support were also ashamed of being anxious. During the second phase (the first exposure to human cadavers) social attachment and the forming of groups were prominent. Ritual identification in the form of shaking hands,

and naming the cadaver, and even imagining the life of the cadaver, were also typical of the second phase. Some students also showed hyperactivity by turning to action and immediately beginning to work. Flight, compulsive dissection, black humour (macabre jokes and laughter that is typical of the dissection hall) or excessive concern were experienced during the third phase. In the final phase, behaviour crystallised into routines. The end result of the crystallisation process was experienced differently by the students. Some students still denied having had any emotional experience while others had mastered the anxiety. They felt satisfied, thankful towards the “old people that gave up their corpses” and had matured.

The use of alcohol and illicit drugs by medical students was investigated by various researchers (Clark, 1983; Guthrie, Black, Shaw, Hamilton, Creed & Tomenson, 1995; Ind & Rees, 1989). In general, they found that many medical students reported using alcohol and illicit drugs. Physicians in training are therefore at an increased risk of a drug abuse disorder. Alcohol and drug abuse could, however, not necessarily be attributed to dissection anxiety alone, but to a variety of other variables such as stressors related to the workload, adaptation to medical school, or over-estimation in reporting experimentation with certain drugs (e.g. marijuana).

2.6 ETHICS AND PUBLIC ATTITUDES TOWARDS DISSECTION

The uniform Anatomical Gift Act governs the donation and utilisation of donated bodies world wide, with the Human Tissue Act dealing with the use and handling of human tissue in South Africa. Not only is the Human Tissue Act an ethical issue to consider, but it also provides for some relief from anxiety when ground rules are established and known to all parties concerned (Dalley, Driscoll & Settles, 1993). The Human Tissue Act (Act 65 of 1983, as amended) consists of 5 chapters. The act deals with issues regarding the donation of human bodies or tissues from dead bodies. It includes issues such as the bequest of bodies by the person him/herself or the family. It also states that only hospitals, universities and technikons are authorised to receive donations of this kind. The

handling of bodies by authorised institutions as well as the actions of the inspector of anatomy are delineated and safety measures described (Pretorius & Brune, 1992).

In a study conducted to evaluate the public's attitudes towards dissection and body organ donation, Sanner (1994) found that 15% of the participants (general public) were prepared to donate their whole bodies for dissection. This figure is quite low if compared to the 80% of participants who were willing to accept autopsy and 62% who were willing to donate organs. Strenge (1999), who evaluated medical students' acceptance of autopsy, anatomical dissection and organ donation found similar results. Balic and Rumboldt (1995) and Fennell and Jones (1992) found that the participants in their study felt indifferent as to whether donation of their own bodies would be towards body organ donations or dissection donation.

An interesting aspect of this same topic is the change in cadaver donations in South Africa. Less than ten years ago most of the cadavers were unclaimed and pauper bodies. Lately most of the bodies (more than ninety percent) are donations, mostly from terminally ill people who wish to contribute something to medical sciences (some very specifically donate their bodies for studies in Homoeopathy). This also led to a change in the cadaver population from mostly young "Black African" to older "White" cadavers. The cadavers are thus presently fatter and older (not lean and muscular black men, usually mine workers or migrant workers) than before. The sex ratio is also more equal lately, where the cadaver population used to be mostly males with only one to two percent females. Some medical schools (such as the University of the Free State) which have a wider catchment area, still maintain the cadaver population characteristics as they were in the past. In conclusion, it can be said that, in general people in South Africa are aware of and willing to donate their bodies (or those of family members) to be used as cadavers.

2.7 DISSECTION AND ANATOMY TEACHING

Dissection is an important part of the study of the structure of the human body. It makes theoretical knowledge “real” and practical. But the dissection experience could also have other benefits, or the experience could be used to train other skills.

2.7.1 Learning about death and dying

Some of the indirect “benefits” of dissection are that it contributes to learning about death and dying, and it is also of value in the future patient-doctor relationship (Bertman & Marks, 1989, 1985; Bourguet *et al.*, 1997; Marks, Bertman & Penney, 1997; Rodning, 1989). The cadaver can be seen as the student’s “first patient”. Compassion and an emphasis on humanising the patient-doctor relationship can be part of the education process in the dissection hall. This can be achieved by both formal (lectures) or informal ways.

Shalev and Nathan (1985) described the relevance of dissection and the student’s future capacity to deal with death and dying. They concluded that, if a course on death and dying were to be offered it should be offered concurrent with dissection. The issue of death in the chosen profession appears for the first time during dissection. It would also be the ideal time to broach the subject, since defence strategies have not yet crystallised into routines, and better strategies can therefore be taught.

With regard to the doctor-patient relationship, Stefenelli and his co-workers undertook a study to investigate the influence of prior exposure to corpses in dealing with living patients. Of the doctors working in general hospitals in Austria, 44% reported that repeated dealings with corpses of patients that they treated did not lead to habituation (Stefenelli, Kugi, Wintersperger, Prokop, Steininger & Walch, 1993). Exposure to corpses had a positive effect on students’ and doctors’ dealings with living patients, in the sense that it made them more caring and patient. This effect was also achieved because the doctors and students became more aware of their own mortality. Since cadavers are

embalmed corpses, and handling cadavers gives one experience in dealing with other types of corpses (such as “fresh”, non-embalmed corpses), it would seem that the dissection activities could be used indirectly to help students achieve this caring attitude.

2.7.2 Anatomy and education

Anatomy is usually taught either by dissection of the human body or by using prosections. The usefulness of each of these methods is currently being debated by academics. Some faculties want to move away from dissection and rather use computerised and generated models. Living models are also used to teach living/clinical/applied anatomy. Dissecting human cadavers can provide opportunities in which to stress ethical issues and also relate psychological issues about the cadaver (such as handling death and dying), which would be difficult in the case of living anatomy (Stillman, Ruggill, & Sabers, 1978).

2.7.3 Importance of dissection

The one question that comes to mind is whether dissection is worth the effort if we consider all the possible negative influences that it might have on the student (Champney, McCord & Sampson, 1995; Jones, 1997). There are various arguments in favour of the use of dissection. First, it seems that only a limited number of studies found pathological reactions to dissection. Secondly, when pathological reactions were found, it was more the exception than the rule. Thirdly, the benefits of dissection were greater than the negative effects. Fourthly, the negative effects of dissection anxiety could be alleviated by addressing the whole process, including useful coping strategies. The development of coping strategies will also be of additional benefit for the individual involved.

Yeager (1996) conducted a study that compared students that dissected to non-dissectors. Dissectors scored better in 13 out of the 16 sets of multiple choice questions testing their anatomy knowledge. Yeager concluded that although the overall advantage was small,

dissecting was a satisfactory method of study since the students scored above the national average. Dissection would seem to aid in retaining anatomy knowledge.

Ager (1979) compared occupational therapy students who dissected to fellow students who did not. In this study, students had a choice as to whether to dissect or not and it seemed that when given a choice no significant differences in grades resulted. In this case dissection was "voluntary", thus possibly excluding students who could be emotionally affected.

When actually asking students about the relevance and use of anatomy they seemed to experience it very positively, as can be seen from the following investigations. Pabst (1993) found that senior students, who were asked to evaluate the relevance of anatomy, expressed the wish to repeat some sections of the anatomy curriculum or have additional short dissection courses. Students also preferred the introduction of larger numbers of human experiments as opposed to animal experiments in physiology (Padmavathi, Maruthy, Borghona & Vaz, 1998). It therefore seems that human experimentation and human dissection are not viewed as major stressors. Dissection was also rated, by first year students at Harvard Medical School, as the most valuable method for giving students the opportunity to visualise the human body (Percac & McArdle, 1997).

Some studies however found the opposite to be true. In a study by Nnodim (1990) it was found that Nigerian students using prosections rather than dissection used less time to study the course content and did significantly better in their examinations than students who dissected. Nigerian students also indicated that they found reading or private study, formal lectures and informal discussions with their peers more useful than practical work (Nnodim, 1988).

The debate about the usefulness of dissection also encompasses the unavailability of cadavers in some poor countries where alternatives have to be found. It is therefore not an either or situation but more a search for useful approaches in poor countries. One such

country is Mozambique where dissection is performed only occasionally and then on “fresh” corpses, a situation that is horrifying considering the threat that AIDS presents.

2.8 SUMMARY OF RESEARCH FINDINGS

The following is a summary of the research findings about anxiety related to dissection and coping strategies employed to combat this anxiety:

- As far as could be established, no study has yet examined the effect of dissection on so-called “alternative” or complementary health students.
- The studies that involve medical students seem to find raised anxiety levels during the first dissection phases. Males seem to have lower anxiety levels and they use more effective coping strategies than do females.
- Older medical students seem to have lower anxiety levels and seem to cope using more mature strategies.
- No conclusive results were obtained from any study concerning aspects such as ethnicity or culture.
- Many authors advocate strategies to deal with dissection anxiety and to aid in the student’s future experience in death and dying.
- It seems that the debate concerning the use of dissection in teaching anatomy is far from over. It will probably receive a lot more attention in future, as anatomy departments will need more funding to afford the use of cadavers.

In Chapter 3 the theories underlying the development of anxiety and the use of coping strategies to overcome this anxiety will be described.

CHAPTER 3

THEORETICAL BACKGROUND ON ANXIETY AND COPING



Andreas Vesalius

CHAPTER 3

THEORETICAL BACKGROUND ON ANXIETY AND COPING

This chapter will focus on the theory underlying anxiety and coping. Anxiety is seen as an emotional response to a stressful event. This dissertation focuses on dissection as a stressor and anxiety as an important emotional reaction to this stressful situation. The reaction (anxiety) and the coping mechanisms that are employed in an attempt to overcome this anxiety forms part of one continuous and complex coping process.

Different models and theories will be described, but the main focus will be on the Transactional Theory of Lazarus. This theory (as some of the other models that will be described) sees the stress (anxiety) process and the coping process as a single, interactive and circular process. The following description will cover anxiety and coping separately for the sake of easier interpretation.

3.1 ANXIETY AS A COMPONENT OF STRESS

Stress will be dealt with first in an attempt to remove confusion about the use of the terms and concepts of stress and anxiety. Variations in the terminology of stress exist and the terminology used in descriptions of stress is also inconsistent amongst theorists. Other important concepts will also be defined.

The definition of the concept of stress has changed throughout the years. This is mostly due to a constant shift in the focus of research on stress and the different disciplines involved in the study of stress. Hans Selye first used the concept in the life sciences. It was borrowed from the natural sciences and engineering (Monat & Lazarus, 1991). The engineers and physicists used the term stress to refer to the ratio of internal force brought into play when a substance is distorted. Stress was therefore used to refer to a stimulus (external force), a response (resistance or physiological function), or an interaction between the two (external force and resistance).

A lot of confusion exists around the definition of stress, due to the fact that different disciplines use the same term to describe a variety of concepts. In psychology three groups, with different orientations towards stress, exist. Of the three groups, one is stimulus orientated, another is response orientated, and yet another is depth/psychodynamic orientated. The *stimulus orientated* group focuses on the characteristics and influence of the stressor or the stimulus. The *response-orientated* theorists are interested in biological or physiological aspects of the stress response. The *psychodynamic* approach believes that stress is produced by interpersonal or intrapsychic factors. Anxiety can be a result of stress as described by any of these three groups (Lazarus, 1993; Pestonjee, 1992).

For the purpose of the current study, stress is considered to be the broad, overriding term that refers to a wide range of phenomenon important in adaptation to physical and psychological stressors. It encompasses social, physical and psychological stress and it is a collective term for all these areas of study.

Monat and Lazarus (1991, p. 3) defined *stress* as “any event in which environmental demands, internal demands or both, tax or exceed the adaptive resources of an individual, social system, or tissue system”. It is therefore a collective term including the stimulus, response and also the individual’s characteristic personality traits. In the present study a comprehensive image of stress is the one that incorporates the whole process from stimulation to reaction, and not only the stressor or the reaction as separate entities (Lazarus, 1976, 1993).

In the current study only a part of stress is studied, namely the manifestation of anxiety. Anxiety is therefore an emotion associated with one aspect of stress (Folkman & Lazarus, 1985; Gaundry & Spielberger, 1971; Lazarus, 1991; Monat & Lazarus, 1991).

Lazarus defines *anxiety* as a stress emotion, one that is experienced when harm is anticipated or as an intervening variable or a signal (Lazarus, 1966, 1976, 1993). Anxiety as a measure of appraisal of danger can serve as a drive or motivator to escape or cope

with the perceived threat or harm. Anxiety can thus be interpreted as the experience of a dysphoric affective state and thus a response to a stressor. Anxiety in the present study can be examined and measured by introspective reports by the person experiencing the anxiety. Anxiety is an indicator of psychological stress, as are other conditions such as depression, anger and shame (Lazarus, 1966, 1993). Anxiety can be seen as a trait or a state but most commonly it is seen as a complex combination of both (Spielberger, 1966).

Other concepts related to stress and anxiety which are used in describing the coping process need to be clarified. These include demands, harm, threat, challenge, coping and adjustment.

Demands refer to special challenges to a person, and can be internal or external. Internal demands are made from the biological makeup of the person and external demands (and also resources) from the physical or social environment (Lazarus, 1976).

Harm refers to injury or damage that has already occurred, as in loss of a limb or a friendship (Folkman, 1984; Lazarus & Launier, 1978).

Threat is the state in which an individual anticipates confrontation with a harmful condition. This represents loss or harm that has not yet happened, but is anticipated (Freeman, 1953; Lazarus & Launier, 1978).

Challenge refers to an opportunity to grow, master a taxing situation or gain new skills or competencies (Folkman, 1984).

Coping is the process of mastering the situation, and is therefore a type of adjustment. Coping must be optimal to fulfil its function. If coping occurs, but is not adequate to overcome the stress, it will not improve the effects of the stressful encounter. In a study such as the present one, it is not sufficient to just classify the type of coping used by the participant. A complete "picture" of all the aspects including effects such as behavioural

changes should be considered if the outcome of coping is to be investigated / measured (Matthews & Wells, 2000).

Another concept closely related to coping is *adjustment*. According to Sowa and May (1997) adjustment is also part of the cognitive appraisal paradigm. Adjustment involves constantly changing cognitive and behavioural efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person.

The Transactional Theory of Lazarus, on which the current study is based, describes the development of anxiety as a manifestation of stress. This Transactional Theory can not only be viewed as a theory of stress/anxiety, but also as a theory of coping. This is because, in this theory, continuous appraisal of the individual's coping resources and strategies are intimately linked to the process of appraisal of the threat or stressor.

3.2 TYPES AND AN OPERATIONAL DEFINITION OF ANXIETY

Anxiety can be understood and is described by different authors as a variety of concepts. These include anxiety described and studied as an emotion, a personality trait, or a clinical condition. The focus in this study will be on anxiety as an emotional state (Lazarus, 1991). Anxiety as an emotional state will also involve aspects of anxiety as a personality trait. A personality trait is an underlying characteristic of a person that can be used to explain some consistency in behaviour. This personality trait will also have implications for anxiety as an emotion as well as anxiety as a coping mechanism. Anxiety will therefore be measured as an emotional state that can form part of the individual traits (measurable as the base line anxiety) but most importantly it will be measured as an indication of the emotional stress level that an individual is experiencing after exposure to a stressor.

Anxiety as part of a personality trait will have the implication that two different people will experience and cope with the same stressful situation in different ways. It will also

have the implication that the same individual may experience and treat different situations in the same manner. Since the current study only focuses on one specific situation or event (dissection) the second assumption will not be considered here, although its important implications still hold.

The models that the present study is based on describe anxiety and coping as cognitive concepts where a transaction between the situation/stressor/event and the individual's characteristics and appraisals exists. Little emphasis is placed on models that describe anxiety as a pathological condition in my study. The concept of anxiety as a pathological condition will only be described briefly so as to indicate the orientation of those theorists that view anxiety as a disorder. This view of anxiety will by no means be disregarded in the study (the emphasis is just not on that specific view), since all views of anxiety encompass some truth about the complex phenomenon called anxiety.

Anxiety was one of 15 emotions identified by Lazarus as connected with adaptation struggles (Lazarus, 1997). He also advises the use of a particular emotion when studying stress. He argues that the attention should be turned away from stress to the emotions associated with it, which will offer a far richer and more useful description and analytic focus than a broad study of stress (Lazarus, 1993). The interest of the current study lies in anxiety as the emotional state experienced by the participants. Anxiety furthermore is not studied as a pathological phenomenon as described by the DSM-IV (American Psychiatric Association, 1994), but comprises the full spectrum of emotion that offers a less restrictive view.

Anxiety, in this study, is therefore defined as a psychological (rather than physical or physiological) reaction. It entails a specific variable and is measured at the level of the individual. The perspective is that of a thinking, feeling person continuously appraising his/her relationship with the surrounding environment. Anxiety is the result of a judgement that a disturbance has occurred in the person-environment relationship. The person might perceive threat or harm (in this study dissection of human bodies), judge his/her own abilities and resources to deal with the situation as inadequate and consider

the outcome of this as important to him/herself. The experience of anxiety lies in the individual appraising the disturbance as such and not merely in the environment or physiological response to the disturbance (Folkman & Lazarus, 1985; Klein, 1981; Lazarus, 1966; Monat & Lazarus, 1991; Nemiah, 1981) For example, a friend of mine owns pet snakes. Whenever I visit her I feel stressed when confronted with a snake. It is my own fear (a personal characteristic I am aware of) of snakes that makes me anxious, even though I experience the environment (her house) as friendly. It is the appraisal of my own fear of snakes that provokes the anxiety and not the environment or the physiological response (an increased heart rate) that I feel. My friend also experiences the increased heart rate but in her case it is due to excitement, similar to, other people experience of their pets.

3.3 THEORIES OF STRESS AND ANXIETY ASSOCIATED WITH STRESS

The different theories that describe stress (and anxiety associated with stress) can be broadly divided into three main categories. These categories include those theories that describe stress as related to the *individual* or the person, those that describe stress in relation to the *situation*, and stress that involves the interaction (or transaction) between the *person and situation* (Fleming, Baum, & Singer, 1984; Sue, Sue, & Sue, 1994).

Theories that focus on the individual and on the psychological and physiological aspects within the person during stressful situations include the General Adaptation Model as described by Hans Selye (Selye 1976, 1982). Indices of this and similar models are usually based on physiologically measurable aspects such as blood pressure, electrical skin conduction and secretion of specific stress hormones.

The so-called engineering models focus on the situation that causes the stress. In these models anxiety and stress is a reaction to an external factor or stimulus. A situation can act as a stressor with regard to intensity, frequency and extent. The Life Change Model (and also the life change units) is an example of models that emphasise the situation. In

this model even small events can lead to stress (Holmes & Holmes, 1970; Wylers, Masuda & Holmes, 1971). These small events can also have a cumulative effect in producing stress.

The Transactional Theory of Lazarus is an example of theories that involve both the person and the situation (Fleming *et al.*, 1984; Lazarus, 1966, 1976, 1991; Lazarus & Launier, 1978). Lazarus noted that stress couldn't be related to only the person or the situation alone, but that a transaction between the two exists. According to Lazarus there is a transaction between the subjective appraisal by the person of the situation and the amount of stress experienced. People are seen as being in dynamic interaction with situations and the person's interpretation of the meaning of the stimulus provokes the stress reaction. A situation or stressor therefore only contains stressor characteristics in so far as the person is experiencing and appraising it as such. The person's appraisal could therefore be a source of stress in itself.

Appraisal can be defined as the meaning an individual gives to a particular event or situation (Chang, 1998; Chang & Strunk, 1999; Dewe, 1991). Appraisal forms an integral part of all models that focus on the psychosocial (transactional) aspects of stress. Appraisal not only plays an important part in the development of stress and emotional reactions, but it is also important in coping, since it is involved in the selection of responses by evaluating possible outcomes (Fleming *et al.*, 1984). Appraisal can be irrelevant, benign-positive or harmful. Irrelevant means the person does not consider it as having implications for his/her well being. Benign-positive indicates that he/she regards the event as signifying a positive state of affairs. Stressful appraisals can be appraisals regarding possible harm, loss or challenge to the person him/herself or to others (Lazarus & Launier, 1978).

Some models will be described briefly, after which the transactional model of Lazarus will be emphasised as the model on which the theory underlying the current study is based.

3.3.1 Biological/physiological tradition

Selye's General Adaptation Syndrome is popular with biological theorists (Lazarus, 1976, 1991; Monat & Lazarus, 1991; Selye 1976, 1982). It is described in more detail under the heading: "Stages in the development of anxiety" (See section 3.4). Here, only a brief note on the basic assumptions, underlying this model will be given.

The General Adaptation Syndrome model describes a common triad of physiological effects. (The triad involves shrinkage of the thymus, enlargement of the adrenal gland and gastric ulceration). Laboratory animals were injected with hormones or exposed to irritants and their responses studied. This not only led to the three-stage model of the General Adaptation Syndrome, but also indicated that the syndrome was non-specific (Selye 1976, 1982). In other words, the body can react to different stimuli in different ways and the response is not the same (specific) for different stimuli. Another important implication of Selye's research was that the effects of stress are cumulative. If a person's ability to cope is overwhelmed, serious pathology can result. The model also considers stress to be addictive. Some people might actually enjoy and seek exposure to stress.

One shortcoming of the General Adaptation Syndrome model is that it is based on non-human subjects. The model also depends on non-specific physiological responses (some responses are very specific and were not included in this model). Intrapsychic and social factors that are important in humans were not addressed. Responses are also not so easily measured in humans as in non-humans, sometimes for very obvious ethical reasons (Pestonjee, 1992).

Cannon's work on emotional stress laid the foundation for medical interest in stress (Cannon, 1936). He considered stress to be an emergency response. This response prepared the individual to cope with danger. Danger is recognised and sympathetic arousal and adrenal gland activity stimulated. Sympathetic arousal included increased heart rate, increased respiration and reduced blood flow to the skin and organs. The "fight

or flight” reaction was therefore activated. Stress was viewed by this model as a response to threat and was directly related to survival and adaptation (Fleming *et al.*, 1984).

Mason (1975a, 1975b) also contributed to the description of the physiological aspects of stress. This is a more non-specific model of stress, with different patterns of response to different threats. All the responses are integrated by the central nervous system and therefore mediated to some extent (Fleming *et al.*, 1984).

3.3.2 Trait theories

The trait theory of H.J. Eysenck and Gray involves two major assumptions. The first assumption is that individual differences in the personality dimension of trait anxiety are mostly due to genetic factors. Both these authors attribute more than half of the variance in anxiety to genetic factors. The second assumption is that this hereditary influence occurs via the physiological system. The authors believe that individual differences depend on the so-called “visceral brain”. This “visceral brain” consists of anatomical structures such as the hippocampus, amygdala, cingulum, septum and hypothalamus. H. J. Eysenck and Gray’s genetic (or trait) approach to anxiety seems over-simplified and does not consider environmental influences (Eysenck, 1997).

Cognitive approaches include the theory of M.W. Eysenck and the theory of Williams and co-workers. This is a cognitive theory of trait anxiety. Its most important assumption is that anxiety has as a function the early detection of impending danger in potentially threatening environments. The hypervigilance part of the theory implies that individuals high in trait anxiety possess a range of cognitive biases, which are applied to ambiguous or threat related stimuli. This theory also tried to link normal and clinical anxiety. For example, individuals with Generalised Anxiety Disorder can be considered to be normal individuals with high trait anxiety. This theory is consistent with the theory of Lazarus, in that it also puts great emphasis on cognitive appraisal of situations or personal factors. A limitation of the theory is that it does not account for the dynamic interrelationship

between the three response systems (that is the emotional, physiological and action tendencies) (Eysenck, 1997).

Weinberger's Repressor theory takes into account that so called "repressors" (that is people that use repression as a type of coping strategy), are likely to use various strategies to avoid awareness of affect and impulses that are incompatible with their self-images (Weinberger, 1990). This theory would explain why it seems that the different response systems involved in anxiety do not function in harmony. These "failures to work as a unity" are due to the various coping strategies used by "repressors" (Eysenck, 1997).

3.3.3 Controversies in anxiety theories

Two directly opposing viewpoints concerning the relationship between physiological activity and emotional experience will be considered here. One viewpoint is that physiological activity and arousal have a causal role in determining emotional experience. For example, an increase in the sympathetic nervous system activity will lead to a feeling of anxiety). The other, opposing, viewpoint sees no causal role of physiological activity and arousal in the development of anxiety (Eysenck, 1997). Physiological arousal and emotional experience do not have an impact on each other (they appear to happen simultaneously) or physiological activity follows the emotional experience (and is not a cause thereof). In the latter case an emotional experience (such as a fright) will cause physiological activity (e.g. increased heart rate).

The *James-Lange theory* of emotion is the best known approach that considers physiological arousal as causing anxiety or the emotional response. Two major concerns with this theory is that it stipulates that an emotional stimulus produces a series of bodily changes, but very little is said about the process. Another important consideration is that people also seem to experience emotion before bodily changes occur. The theory, furthermore, assumes that every emotional state has a specific pattern of bodily changes.

Schachter and Singer's theory is an extension of the James-Lange theory. According to this theory emotional experience depends on three factors. First, the situation must be interpreted as being an emotional one. Secondly, there must be a state of physiological arousal. Third, the emotional situation must be perceived as the cause of the physiological arousal. In everyday life these factors are difficult to disentangle (Eysenck, 1997; Schachter & Singer, 1963).

Four factor theories try to incorporate the appraisal and feedback theories. Here the emotional experience of anxiety is seen as influenced by four different sources of information. The most important determinant is *the cognitive appraisal of the situation*. The *level of physiological activity* is influenced by the cognitive appraisal of the situation. Another source of information is the *cognitions based on information stored in long-term memory*. An example of the cognitions based on information found in the long-term memory, is "worries". Worries can be regarded as cognitions about anxiety (as based on the long-term memory). The other source of information is based on *the individual's own action tendencies and behaviour*. Other assumptions of this model include that the effects of these four sources of information depend on attentional and interpretative biases normally below the conscious level. These cognitive biases also increase as state anxiety increases. The cognitive biases are also influenced by knowledge stored in long-term memory. It seems that the four factor theory accounts for physiological arousal on emotion (Eysenck, 1997).

The "New Theory" (of M.W. Eysenck) is based on the theory of Lazarus and the theory of Schachter and Singer and is also a trait theory. This "new theory" is more applicable to anxiety. It is designed to apply to four groups of individuals. The groups are the same as those proposed by Weinberger's theory, namely repressors, low-anxious, high-anxious and defensive high-anxious groups. The theory contains the aspects of cognitive biases, environmental threat, behavioural anxiety, long-term memory and physiological anxiety as described in the other theories. This model is not useful in the current study since participant are not divided into the four groups as suggested here (Eysenck, 1997).

3.3.4 Transactional Theory of Lazarus

3.3.4.1 General overview

The Transactional Theory of Lazarus includes the whole process of anxiety (stress) development and coping as a dynamic process with different stages. Lazarus emphasises that the process is not linear and that the outcome of one process may reinvoke a preceding process. The full process of development and coping will be described here and briefly revisited in the next section that deals with coping. Anxiety and coping should be seen as one process and an attempt is made here to describe it both as one process and also to indicate important issues in the coping process as a separate section.

According to the Transactional Theory of Lazarus, the development of anxiety and the development of coping strategies can be attributed to both the situation (or stressor) and the person (Folkman & Lazarus, 1985; Lazarus 1966, 1976, 1991, 1993; Perrez & Reicherts, 1992). The person's perception (or appraisal) of both the stressor and his/her personal factors (such as education, intellectual resources and general strengths) influences how he will cope with the stressor. A stressor will only be stressful if the individual defines (and appraises) it as such. Both threat and appraisal are therefore important not only for the development of anxiety, but as a crucial part of the coping process. Appraisal of the stressor as harmful or not harmful is regarded as an important step in the coping process as well as the continuous appraisal of personal factors (such as the ability to cope) (Flemming *et al.*, 1984).

It can therefore be seen that the Transactional Theory of Lazarus describes a stressor as a potential threat in the environment (Monat & Lazarus, 1991). The *appraisal* of a stimulus makes it a stressor. In the current study the dissection hall activities can be appraised as stressful. This appraisal of dissection as stressful can be due to the environment (e.g. the dissection hall or the lack of social support) or due to characteristics of the individual experiencing the anxiety.

3.3.4.2 The coping process

It is important to remember that coping is a dynamic process, and although different processes can be described they should be seen as complex, ever changing and interactive (Oakland & Ostell, 1996). This cognitive theory of Lazarus can be described as a process oriented theory, where the emphasis is placed on the process (as compared to theories that define stress as a stimulus or a product of intrapsychic conflict). In the cognitive theory of stress the term "process" (as in process orientated) has two meanings. First, the person and the environment are in a dynamic relationship that is constantly changing. And secondly, this relationship is bi-directional, with the person and the environment each acting on the other (Folkman, 1984).

Four processes are identified. They cover the development of anxiety (as a component of stress) and include the coping process. The four processes are primary appraisal, secondary appraisal, reappraisal and coping. These processes are all interactive and the outcome of one may reinvoke the preceding process. It should therefore be seen as a circular process and not a linear one (Carver, Scheier & Weintraub, 1989; Folkman, Lazarus, Dunkel-Schetter, DeLongis & Gruen, 1986; Folkman, Lazarus, Gruen & DeLongis, 1986; Lazarus, 1993).

Primary appraisal is the process of perceiving a threat to the self. It was found by Oakland and Ostell (1996) that primary appraisal influences the choice of coping strategies. They found that confrontive coping was used more when the threat to self-esteem was high.

Secondary appraisal is the process of bringing to mind a potential response to the threat. Attention is focussed not on evaluating the stressor, but on appropriate responses. Secondary appraisal also affects primary appraisal since secondary appraisal provides feedback, which influences primary appraisal. Oakland and Ostell (1996) found that avoidance behaviour was high when individuals appraised situations as "uncontrollable".

Reappraisal is activated when actions have been initiated and are starting to affect the threatening situation. Reappraisal is an attempt to ascertain whether the actions taken have any effect and whether the actions should be changed to new more effective actions.

Coping is the process of initiating the response actions in reaction to the stressor. It also refers to the efforts aimed at managing environmental and internal demands (Dewe, 1991; Fleming *et al.*, 1984).

External resources do not only influence primary and secondary appraisal, but also shape coping (Oakland & Ostell, 1996).

3.3.4.3 Factors that determine appraisal

Factors that determine primary and secondary appraisal of stressors will be considered for each of these (the primary and secondary appraisals) factors in both the situation and the psychological structure of the individual (Lazarus, 1966).

The factors that determine the appraisal of threat (*primary appraisal*) in the *situation* include:

- Balance of power between harm producing stimulus and counterharm resources. An increase in harm producing stimuli would increase the threat.
- Imminence of anticipated confrontation with harm. The temporal nearness of confrontation with harm increases the threat.
- Ambiguity of stimulus cues. The appraisal of harm depends on other cues or the context. Personality characteristics also play a role, for example the sense of control that a person has.

Factors in the *personality* that determines the appraisal of threat (*primary appraisal*) are:

- The motivational characteristics of the individual. This will also reflect cultural differences.
- The belief systems concerning transactions with the environment.

- Intellectual resources, education and sophistication. It can be said that a lack of intellectual resources will increase wrong interpretations and evaluations of the situation.

The factors that determine *secondary appraisal* (the potential response to the threat) in the *situation* include:

- Location of the agent of harm. Without identification of the harm or threat, no action can be planned or executed (for example fight or flight).
- Viability of alternative actions to prevent the harm. The best option will be chosen to overcome the danger.
- Situational constraints. This acts indirectly in the sense that it inhibits or encourages coping action to be expressed.

Factors in the *personality* that determine *secondary appraisal* are:

- Motivational strengths and patterns which include the desire for approval.
- Ego resources. Ego strengths and impulse control play a direct role in the coping process and not via appraisal.
- Coping dispositions include tendencies to aggression or anxiety and the trait of defensiveness.
- General beliefs about the environment and one's resources. These beliefs include beliefs about what is morally right and wrong, what will be effective or ineffective and how the environment will respond.

The *appraisal of control* can also be considered as secondary appraisal (Arambasic, 1996). The relationship between personal control on the one hand and stress, coping and adaptational outcomes on the other hand are complex. Believing that an event is controllable does not always lead to a reduction in stress or a positive outcome. Believing that an event is uncontrollable does not always lead to an increase in stress (Folkman, 1984). Two forms of control exist, generalised beliefs about control and situational appraisals of control.

The *generalised belief of control* of an individual is the personal belief of the individual about whether he/she can control the outcome of an important situation, and also to what extent this personal control is possible. This would include the concepts of internal locus of control (the conviction that events are contingent upon one's own behaviour) versus external locus of control (the conviction that events are not dependent on one's actions but upon luck, chance, fate, or powerful others) (Folkman, 1984).

Situational appraisal is the appraisal of the possibilities for control in a specific stressful encounter. These are difficult to evaluate especially in real life situations. Appraisals of control can also shift as an event unfolds. These changes in appraisal of control can be a result of new information from the environment and/or as a result of the coping efforts (Folkman, 1984).

Appraisal of coping is closely linked to the coping process and coping type used by different individuals. People using an internal locus of control reported more problem-focused coping and more use of self-control and positive reappraisal strategies. It was also found that people with external locus of control make more use of suppression and direct coping (Charlton & Thompson, 1996).

The *relation between primary and secondary appraisal* cannot necessarily be regarded as sequential. There is often an overlap in time, because features of the stimulus that are relevant to secondary appraisal may be noted even before the threat is appraised. Without threat, secondary appraisal has no modifying value and it remains purely intellectual.

Primary appraisal is therefore an appraisal of how much danger there is in a situation while secondary appraisal is an estimate of how much danger there is from what the individual is doing about the situation (it is a consequence of coping). The two influence one another, but they depend on different aspects of the problem and are based on different information (Lazarus, 1966).

3.3.4.4 Implications of Lazarus' theory

Lazarus stressed the important fact that the focus of studies should be on individual differences in coping skills, goals, beliefs, expectations and adaptation transactions. Stress and coping should always be seen as relational concepts. The fit of the characteristics of the individuals and the environmental circumstances determine the way that stress will be experienced and how coping will take place. Another determining factor in the development of stress and the coping strategies used to overcome this stress, is how the characteristics of the individual and the environmental circumstances change between transactions and over time.

3.3.4.5 Concerns about the Transactional Theory of Lazarus

One fundamental limitation of Lazarus' theory is the assumption that cognitive appraisal is of central importance in determining emotional experience, physiological activity and action tendencies and behaviour. According to this theory it can therefore be assumed that the three different response systems (emotional, physiological and behavioural) would be in reasonable concordance. However, in practice, there is generally very little agreement between self-reported measures of anxiety and physiological measures.

Another concern about the theory of Lazarus is that the focus is on appraisal of the person and the situation alone. The biological and physiological aspects of the individual are not taken into account. The physiological reactions that contribute to the individual's experience of the emotion (especially anxiety) are not included or regarded as important in Lazarus's theory. Appraisal of the person is limited to psychological factors such as motivation and beliefs.

These concerns about the theory of Lazarus do not pose a major threat in the present study, since the present study is only concerned with the psychological effect of dissection. Physiological aspects are not measured as such. Only the psychological contributions due to the perceived physiological aspects of emotion are included in the

anxiety measure (Taylor Manifest Anxiety Scale). Anxiety is therefore only measured as perceived symptoms and is never measured as pure physiological reactions (such as heartbeat and blood pressure).

3.4 STAGES IN THE DEVELOPMENT OF ANXIETY

3.4.1 Selye's General Adaptation Syndrome

Selye (1976, 1982) identified three stages in the development of stress as described in the General Adaptation Model. This model emphasises the body's reaction to biological stressors and the three stages include the alarm stage, the stage of resistance, and the stage of exhaustion. Let us use the example of a lady who fractures her femur.

The *alarm stage* consists of an initial shock phase during which the resistance is lowered. In this stage the lady will have an increased heart rate, and lowered blood pressure. Physiologically the autonomic system becomes excitable. There is also a counter-shock phase during which the defence mechanism becomes active. The body will prepare the fracture for the healing process, through, for example, such as an increase in the blood flow to the area.

The *stage of resistance* includes maximum adaptation. The bodily signs disappear and resistance increases to above normal. During this stage the lady will probably be immobile to help with the healing process of the fracture. In not moving about, she is adapting to the fracture in an attempt to speed up her recovery. The pain and other signs such as swelling and temperature increase have also disappeared.

The *stage of exhaustion* shows deterioration of the resistance and also of the organic systems involved in the resistance. Adaptation energy is now exhausted and the alarm phase reappears. Resistance levels decline irreversibly and the organism collapses and

death can result. Due to the lady being immobile she can develop a deep venous thromboses, which in a severe case can form an embolism to her lung causing her death. Although these stages are useful in describing biological aspects associated with anxiety and stress, they would be more appropriate in studies examining stress and physical illness, such as cancer.

3.4.2 De La Fuente's crises stages

De La Fuente (1990) also described stages that seem to parallel Selye's stages. The three stages in crises decompensation include impact, attempted resolution and decompensation (ineffective coping) or growth adjustment (effective coping). In this model both successful and unsuccessful outcomes are considered. Therefore, this is a more feasible model than that of Selye. In the example of the lady with the fractured femur, the coping (being immobile) was ineffective in the sense that, although the fracture healed, the outcome was negative. A positive outcome would be found if she, while having bed rest, also received physiotherapy to prevent the thromboses to form. The therapy would probably also stimulate muscle activity that she did not have before the fracture occurred. In this scenario, the lady obtains additional benefits and the adjustment to her life is also a growth experience.

3.4.3 Shalev and Nathan's stages in dealing with a stressful event

Shalev and Nathan (1985) described four stages when dealing with a stressful event. They based the stages on the same stressful situation as in the present study, that is the dissection experience. The four stages focused on the following:

- preparation
- exposure
- development of resources and
- stabilisation.

Shalev and Nathan (1985) described these stages as successive and also overlapping. The *first stage* takes place before entering the dissection hall. It is a stage where psychological preparation takes place. Students expect a new, unknown and frightening experience. There is no real threat and the anxiety generated is due to the students' imagination and fantasies. The *second stage* is during the first exposure to the cadaver and is usually accompanied by acute reactions such as severe anxiety. The source of the anxiety in this stage is again the imaginary and symbolic importance of the situation, since there is no real threat. The *third stage* is when the students start to dissect actively. The main conflict that leads to anxiety is related to the right to touch or violate the body. *The fourth stage* is the longest stage. During the fourth stage the psychological factors of the previous stages are still present, but defensive solutions are organised so the anxiety can disappear.

The current study will use the same classification and will therefore encompass the following four stages: before dissection starts (preparation), first dissection period (exposure), after two weeks (development of resources, and also behavioural changes) and after three months (stabilisation).

3.5 OTHER IMPORTANT ASPECTS OF ANXIETY

3.5.1 Physiology of anxiety

A brief note should be made about the biological aspects of anxiety. The influence of the neural control of emotion (and anxiety) can not be denied (Lazarus, 1976). It is regarded as a complex process. Both neural (nervous system) as well as hormonal (endocrine system) control is involved.

Various structures of the nervous system play a role in the control of emotions. The cerebral cortex is involved in the cognitive appraisal and evaluation of events and stressors. The reticular formation keeps the organism alert and aroused. It also controls

visceral function and, by increasing the general activity, it plays a role in conceiving of emotions. The limbic system manages the emotional behaviour, which is very important for survival. It also regulates emotional reactions in accordance with feedback from the environment. The hypothalamus acts as a “switchboard” to integrate the various autonomic and somatic reactions that are noted in emotional states. The limbic system and the cortex further refine this function.

The autonomic nervous system with its two subdivisions (sympathetic and parasympathetic systems) causes the visible signs associated with emotional states such as anxiety. These include increased heart rate, respiration rate, increased blood pressure and sweating. All in all it calls the body to mass action to ready itself either to flight or fight.

Biochemical control is important as can be seen in the nervous system with neurotransmitters involvement with impulses. It is also important in hormonal “impulses” or endocrine control. Endocrine glands include the pituitary, thyroid, adrenal glands and the gonads. Specific stress hormones (adrenaline, ACTH) are secreted as part of the “stress” reaction of the body.

Biological or physiological contributions to anxiety theories were also described in Selye’s General Anxiety Syndrome which described the stages and organs involved in anxiety development and the outcome of overload of these systems (Selye, 1976, 1982).

3.5.2 Genetics and anxiety

Genetic factors play a role in anxiety if anxiety is considered to be a trait. Twin and adoption studies are mostly used to determine the effect of hereditary factors (Carey & Gottesman, 1981). Monozygotic twins that are brought up apart are the most useful to consider. It seems that 30% of variance in trait anxiety can be contributed to genetic factors (Carey & Gottesman, 1981; Eysenck, 1997; Gershenfeld & Paul, 1998). Although

this seems to be a large contribution it must be pointed out that individual and environmental factors would be the larger contributors.

3.5.3 Cultural influences on anxiety

The cultural influences on anxiety (development and experience) lie mostly in the motivational patterns and belief systems of the individual. These motivations and beliefs are based on cultural values and social experiences that differ between different cultural groups. Conditions that produce psychological stress and anxiety also differ amongst cultures. In the current study, cultural experience will be investigated (Lazarus, 1966). Another cultural issue that deserves mentioning is masked anxiety. A sample of black males in New York showed masked anxiety, which means that they developed a set of protective behaviours, values and attitudes to mask the chronic anxiety that they experienced (Mayo, 1981). It therefore seems that although cultural issues might be based on the individual or socialisation role, it is an important factor to consider in studying anxiety.

3.5.4 Effects and clinical manifestations of anxiety

The outcome of a person's reaction to anxiety can be complex and varied. Anxiety can be an uneasy or nervous feeling, or it can be "free floating" in the sense that it is not connected to one object or event. Anxiety can also be brief (as in panic) or more chronic. The clinical conditions of anxiety will only be listed and not described, since they fall outside the scope of this study. It is important though to know that other consequences or extreme conditions exist. These should be considered with theories that see anxiety as a pathological or clinical condition.

According to the DSM-IV there are 12 different anxiety disorders (American Psychiatric Association, 1994). These include:

- Panic disorder without agoraphobia
- Panic disorder with agoraphobia

- Agoraphobia without history of panic disorder
- Specific phobia
- Social phobia
- Obsessive-compulsive disorder
- Post-traumatic stress disorder
- Acute stress disorder
- Generalised anxiety disorder
- Anxiety due to a medical condition
- Substance-induced anxiety disorder
- Anxiety disorder not otherwise specified.

Beck's schema theory (Beck, 1976) attempts to provide a coherent theoretical account of the anxiety disorders. The focus of Beck's theory is schemas. Schemas are "functional structures or relatively enduring representations of prior knowledge and experience". Schemas can sometimes be negative and is then regarded as unreasonable attitudes and unrealistic goals that can predispose anxiety disorders. According to Beck's theory, the major feature of the anxiety disorders is that the cognitive system is actively involved. The person might not consciously appraise a situation in a negative way, but the person's predisposing negative schemas can function in an "automatic" manner that can cause anxiety. Other predisposing factors include hereditary factors, physical disease and developmental trauma. Some individuals therefore possess a cognitive vulnerability for developing anxiety.

Since the current study did not focus on clinical anxiety, most of these disorders are excluded due to their aetiology or symptoms (such as agoraphobia or social phobia). There might be a possibility that some of them could be present due to the overwhelming nature of the stressor (that is dissection) on some predisposing individuals. These disorders would include Generalised Anxiety Disorder (GAD), Post-traumatic stress disorder, Panic disorder and Specific phobia (Hoehn-Saric, 1981).

Wells (1999) proposed a cognitive model of Generalised Anxiety Disorder. This disorder is usually chronic and can develop relatively early. Worry seems to play an important role in the development of this disorder. Worry can be defined as an intrusive ideational process that can be differentiated from other types of intrusive thought. It is regarded as a chain of thoughts and images with a negative affect and it is relatively uncontrollable. Worry can even be a problem-solving activity and therefore be seen as a coping strategy.

The Generalised Anxiety Disorder model has a few similarities to the cognitive theory of Lazarus. Worry is divided into two types: Type 1 worry and Type 2 worry. Type 1 worry is worry about external events (events in the environment) and internal events (events as perceived by the person). Type 1 worry is therefore similar to primary appraisal. Type 2 worry is worry about one's own thinking (similar to secondary appraisal). Beliefs (both positive and negative) also play a role in the development of worry. As with the theory of Lazarus, the model of Generalised Anxiety Disorder also includes continued appraisal and coping. In the GAD model coping strategies such as behavioural strategies (e.g. avoidance strategies) are intended to prevent worry but sometimes only aggravate it (Wells, 1999).

3.5.5 Effects of anxiety on academic performance

Although academic performance will not be considered as a variable or measurement of anxiety in the current study it forms the most important part in the rationale and usefulness of this study. The ultimate aim of the research is to help students manage the anxiety they perceive and experience in the dissection of human cadavers. A favourable outcome of this would be the increase in anatomical knowledge and confidence leading to higher grades and pass rates.

3.6 COPING STRATEGIES

Coping strategies involve the processes by which people cope with stressful events. The study of these processes had different focuses throughout the history of psychology. In 1894, psychoanalytic formulations described stress and coping (defence) as intrapsychic conflicts and processes. Coping was also thought to be a largely unconscious process. During the 1960's the focus turned to stress instead of coping. Extensive literature on effects of stressful life events on physical and psychological health exists for the period after 1960. Researchers focused on variables that might moderate the stress-illness relationship. Current theories focus on responses to external stressors, conscious strategies and transactions between the situation and the individual (McCrae, 1984).

In light of the current trend in stress research, the current study will focus on a specific event or external stressor (dissection of human cadavers) and on the related coping mechanisms. In much the same way, Sarason (1960) focused on one specific event and type of coping. Sarason studied the anxiety provoked by a specific event, namely test taking. This provided a powerful analysis of a specific situation and is one way of studying coping. The in-depth analysis of stress in a specific situation is the approach used in the current study, with the specific anxiety provoking event being the dissection of human cadavers (Fleming *et al.*, 1984).

Another important focus in research on stress is the complexity of coping. McCrae (1984) pointed out that coping is not unitary and the meaning of a coping strategy is not always apparent. McCrae deduced this from studies concerning relationships between various appraisals and selective coping styles. The type of coping strategy selected by participants in McCrae's study was related consistently and significantly to the type of stressor that they experienced. For example, when a loss was experienced, faith, fatalism and expression of feelings were used. Coping in the current study is therefore seen as a complex phenomenon encompassing the transaction between the individual, the situation and appraisals of every aspect of dissection.

Most studies on coping would list the coping strategies used by the participants and then report a frequency of use for each of the strategies. Even though it is important to describe the type and frequency of use of specific types of coping strategies, it becomes more and more important to describe strategies in relation to the outcome of their use. The current study therefore focuses on relationships between strategy used and its outcome. It will therefore match a person, his/her anxiety level, appraisal of the person's internal and external resources, with his/her ability to cope. This is in accordance with Oakland and Ostell (1996) who also campaigned for the use of measurements of success of coping strategies, as well as the incorporation of contextual issues, such as the adequacy of external resources. Coping has to be measured in terms of, and in relation to, coping efficacy. Coping efficacy can be defined as the effectiveness of a coping behaviour and is measured as to how well it prevents hardships from resulting in emotional stress (such as anxiety). It can not be measured as a permanent and complete elimination of life-strains (Pearlin & Schooler, 1978).

Another important aspect in the study of coping, is the fact that individual differences exist in coping strategies. These are important, because individuals differ with regard to appraisal and their response to specific events. Moderating factors (such as personal resources) and the appraisal of these moderating factors also differ between individuals (Billings & Moos, 1981; Lazarus, 1993). Pearlin and Schooler (1978) found that the same individual has unequal coping success in different areas, and different individuals have unequal success with the same life-problem. Individual differences and the context therefore are crucial issues when studying coping and will be regarded as such in the current study.

3.6.1 Theories of coping

Numerous theories of how people cope with various aspects of life and stressors exist. Some of the most prominent theories are that of traditional animal experimentation, the psychoanalytic view, and the Transactional Theory of Lazarus (Monat & Lazarus, 1991; Perez & Reicherts, 1992; Pervin & Lewis, 1978).

According to the *traditional model* of animal experimentation an animal (or human) has the ability to predict and to control harmful aspects of the environment (Matthews & Wells, 2000). The animal has the ability to escape or avoid harm. This process depends mostly on the nervous system's ability to make the necessary survival related discriminations. Coping in this model is described as behaviour that controls (or attempts to control) aversive environmental conditions to lower psycho-physiological disturbances. The traditional model seems to be over simplistic and lacks cognitive and emotional aspects that are part of human functioning (Monat & Lazarus, 1991).

The *psychoanalytic model* defines coping as realistic and flexible thoughts and acts that attempt to solve problems in order to reduce stress (Nemiah, 1981). In this model, an emphasis is placed on the ways of perceiving and thinking about the person's relationship with the environment. Behaviour is not disregarded, but treated as less important than cognition (Monat & Lazarus, 1991). Although the psychoanalytic model has been used extensively in coping theory, it places too much emphasis on the cognitive aspects of coping. A more realistic approach would include behaviour, cognitive aspects, as well as interactions between the individual, the environment and the stressor.

Lazarus's Transactional Theory of stress and coping complies with the requirements stated above and will be used in the present study. The Transactional Theory of Lazarus entails the development of stress (anxiety), the coping mechanisms, and the coping process as an interactive process. Although Lazarus' theory can also be described as a cognitive theory, the emphasis in his approach lies in the transaction and interaction between the person and the environment. Another important aspect contained in this theory is the issue of appraisals. The individual's appraisal of the stressor and his/her own abilities to cope plays an important part in Lazarus' Transactional Theory. Because appraisals of the dissection hall and the students' ability to cope with this stressor are important, the Transactional Theory of Lazarus is the most appropriate one to use for this study. The description of this theory can be found in Section 3.3.4 and will therefore not be repeated here.

3.6.2 Definitions and functions of coping strategies

Before coping is defined it is important to consider three concepts, as most of the theory on anxiety and coping is based on these concepts. These concepts are social resources, psychological resources and coping responses. Resources refer to what is available to the individual to assist him/her in coping. *Social resources* are represented in interpersonal networks and present a potential source of support. *Psychological resources* are the personality characteristics that people use to help them withstand threat. *Coping responses* represent the actions themselves (Pearlin & Schooler, 1978).

Some researchers see coping as a relatively stable preference of strategy by the individual, which can be derived from the personality of the individual. In the current study, coping is seen as an individual strategy. A person's coping strategy is dynamic and can be changed and developed, rather than being just a fixed and stable personality trait (Carver *et al.*, 1989). For example, Rowe (1999) showed that coping strategies can be taught to health-care workers and that this training decreased the levels of burnout that they experience. This study by Rowe suggests that the most appropriate approach is one where the research focuses on the individual as possessing a diverse variety of coping strategies that can be selectively adjusted to suite the situation. This would also be true for the current study, where the aim would be to help individual students cope with dissection, and prepare them for their future health-care professions.

Coping strategies consist of a diverse and complex collection of cognitions and behaviours that attempt to moderate the impact of an event on the physical, social, and emotional functioning of a person. This would include responses that attempt to deal with both external as well as internal stressors. It also includes behavioural responses (Billings & Moos, 1981; Fleming *et al.*, 1984; Lazarus, 1966; Pearlin & Schooler, 1978). Coping, behaviour and anxiety should be seen as interactive circular events, instead of linear cause-effect concepts. Usually individuals possess a repertoire of coping skills from which they can select the most appropriate for a specific situation, instead of trying to

solve each problem in the same manner. Different styles can also be combined for a better effect (Fleming *et al.*, 1984).

Some authors describe coping styles as stable tendencies or characteristic ways to handle situations. These are typically assessed with personality tests and are regarded as personality traits. Coping traits are stable characteristics that transcend classes of situations (Pestonjee, 1992). In the present study coping strategies are not seen as personality traits, but rather as dynamic skills in the individual's repertoire that can be changed or learned according to the situation. The different types of coping can be classified into different categories. Lazarus described coping as active or direct (e.g. problem focused, planning, seeking social support) or avoidant (e.g. denial, wishful thinking). Each of these might lead to different outcomes with regard to adjustment (Hughes, Budd & Greenaway, 1999; Lazarus, 1966, 1976; Perrez & Reicherts, 1992).

The process of coping as described by Lazarus forms an integral part of the development of stress reactions such as anxiety and has been described as such in Section 3.3.4 of this chapter. Only a few brief comments on this coping process will therefore be made here (Folkman & Lazarus, 1988). See figure 3.1 for a diagrammatic presentation of coping and emotion.

Figure 3.1 demonstrates the complexity of the coping process. The initial stressor is found in some aspect of the person-environment encounter (e.g. the dissection hall activities). This stressor is then appraised (both primary and secondary) which leads to an emotion, which in the current study is anxiety. This emotion leads to either emotion- or problem- focussed coping. The coping strategy used will lead to either change in the meaning of the situation (in the case of an emotion-focussed coping method), or an altered person-environment relationship (in the case of a problem-focussed coping method). Re-appraisal of the situation and personal characteristics will take place, and the quality and intensity of the emotion will change. The result of this process will be a new approach to the person-environment encounter.

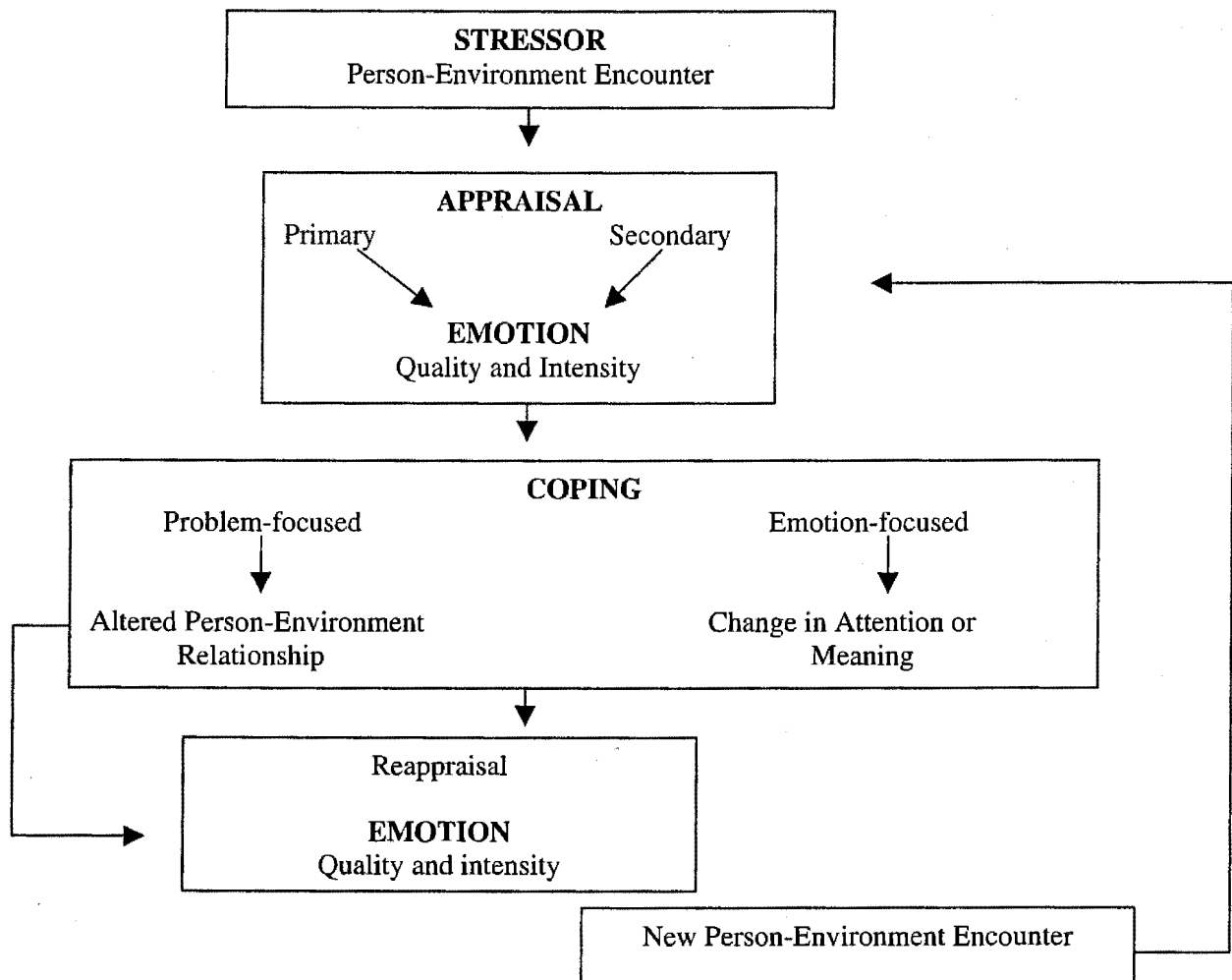


Figure 3.1 Coping as a mediator of emotion (based on Folkman & Lazarus, 1988, p. 467)

3.6.3 Categories and types of coping strategies

Various coping strategies have been described. The current trend is to focus more on the *classification* of these strategies than on specific *types* of coping alone. Coping strategy types are usually coded or factor analysed to obtain fewer and more descriptive and useful divisions. To classify coping strategies, one of the following is usually focussed on: (1) methods employed to modify or eliminate the stressor, (2) cause and effect of the stressor or (3) emotional and behavioural aspects of the coping process.

Strategies can be categorised as problem-focused or emotion-focused (Billings & Moos, 1981; Carver *et al.*, 1989). *Problem-focused* strategies include attempts to modify or eliminate the sources of stress through behaviour. *Emotion-focused* strategies include both behavioural and cognitive responses with the primary function to manage the emotional consequences of stressors and to maintain emotional equilibrium. Matthews and Wells (2000) added a third type of coping to this list and that is *avoidance*. In this strategy the problem is avoided or ignored.

Another classification approach is based on whether the coping strategy is directed at the effect of the stressor or the intrapsychic cause (as described by Freud). Strategies *directed at the symptoms* include the use of drugs, alcohol, or muscle relaxant training as an aid to feel better or function effectively. Examples of *intrapsychic defence mechanisms* include identification, displacement, repression, denial, projection, and intellectualisation.

Yet another way to classify coping strategies is into direct action or palliation (Lazarus, 1976). *Direct action coping* includes strategies such as preparing against harm, aggression, avoidance and inaction (apathy). *Palliative modes* of coping are devoted to moderating distress (as expressed in bodily, motor and affective features) rather than changing the situation.

Since a lot of overlap is present between and within each of these classification systems all these different types of classifications can, for the sake of the present study, be integrated in the system as described by Blalock and Joiner (2000). The usefulness of this model in the present study also lies in the fact that most types and classifications used in the literature can be divided into one of the coping styles described in this model. The four categories are:

1. Active behavioural coping (seeking guidance and support).
2. Active cognitive coping (logical analysis, positive reappraisal and mental rehearsal of alternatives and consequences).

3. Avoidance behavioural coping (seeking alternative rewards, venting emotions and engaging in tension reducing behaviours).
4. Avoidance cognitive coping (aimed at denying or minimising the seriousness of the event and its consequences).

It is important to understand that, for the purpose of this study, strategies will not be classified as healthy or pathological. Some strategies might be healthy to one individual and not to others, or healthy in one situation and not in another. Successful strategies will be those that are associated with less anxiety.

3.6.3.1 Active behavioural coping

Active behavioural coping refers to overt behavioural attempts to deal directly with the stressful event or its effects in an attempt to resolve it (Billings & Moos, 1981; Folkman & Lazarus, 1980; Lazarus, 1966).

The following are types of active behavioural coping strategies: *Aggression* involves an attack on the agent or the stressor. *Social support* involves efforts made to mobilise advice, information and emotional support to help with the problem or the distress experienced. This usually involves family and friends. *Displacement* occurs when human needs can not be expressed. This could be because of physical or social conditions. One way of coping with the frustration is to direct the motivational force into new channels that permit gratification in different and acceptable forms. *Seeking meaning* is an attempt to discover new faith or turning to religion. This is true for people who are normally considered religious, as well as for those that use the strategy on an ad-hoc basis. *Instrumental action* is a type of coping strategy where efforts are made towards managing the problem. Drawing up a time schedule and prioritising can be seen as examples of this type of coping.

The types of coping strategies detailed in the active behavioural coping category are usually associated with better outcomes where the threat is very prominent or clearly

defined. Specific actions can be taken to overcome the stressor. It is anticipated that anatomy students in the dissection hall will use these types of coping frequently. They can physically perform actions that will lower their anxiety, such as partake in religious activities or seek the support of their family and friends. Some of the types of coping strategies e.g. aggression are not considered “healthy”, but may be used in indirect ways towards the cadaver, such as telling violent cadavers stories (Shalev & Nathan, 1985; Stern *et al.*, 1993). This aggression towards the cadavers and even towards the students themselves might become apparent in their behaviour outside the dissection hall, for example in their participation in sport.

3.6.3.2 Active cognitive coping

Active cognitive coping includes cognitive attempts to manage the personal appraisal of the situation as stressful (Billings & Moos, 1981; Folkman & Lazarus, 1980; Lazarus, 1966).

Examples of coping strategies in the active cognitive category include humour, minimisation and rationalisation. *Humour* and joking about the dissection situation, or personal factors regarding the cadaver or the dissectors, seems to be a coping strategy that is often employed. This is usually not used in high threat situations, but is more an attempt to deal with reactions to situations that caused public and mass trauma. *Minimisation* involves coping efforts in which the person refuses to dwell on the problem. The problem or stressor is not regarded as significant. *Rationalisation* or intellectualisation takes place when a person gains detachment from a threatening event in order to remain untouched by it emotionally. It therefore represents an analytic type of coping. The person will study a situation and will be curious about it rather than emotionally involved.

The coping strategies in this group are also expected to be used frequently. Students usually tend to tell cadaver stories and jokes around the dissection table (Hafferty, 1988; Richardson & Hurwitz, 1996). Most students also actively remind themselves during

dissection that the cadaver is a tool for obtaining the necessary knowledge to practice one day as a Homoeopath or Chiropractor.

3.6.3.3 Avoidance behavioural coping

Avoidance behavioural coping attempts to avoid actively confronting a problem or to indirectly reduce emotional tension (Billings & Moos, 1981; Folkman & Lazarus, 1980; Lazarus, 1966). This can be achieved by behaviour such as increased eating or smoking. Fuller and Conner (1990) found that these methods are only effective if used as a short-term coping strategy.

Avoidance behavioural coping is also evident in the use of substances. *Escapism* is also often used and involves emotion-focused factors related to wishful thinking, fantasising or excessive indulgence in drugs, sex or alcohol.

These types of strategies, especially the use of alcohol, is sometimes attributed to the dissection anxiety experienced by students. Whether this is a coping strategy used frequently by the students, and whether the use thereof is associated with dissection will be investigated in this study.

3.6.3.4 Avoidance cognitive coping

Avoidance cognitive coping strategies aim to avoid confronting the stressor by reasoning about the reality or importance of the stressor (Billings & Moos, 1981; Folkman & Lazarus, 1980; Lazarus, 1966).

Coping strategies that can be classified as avoidance cognitive includes the following types: projection, instrumental action and denial. *Projection* is where the impulse is attributed to someone or something else, instead of the individual self. This type of coping strategy is often seen in students and scholars who fail a subject. The teachers or lecturers are at fault and the student, who never prepares, is a victim. *Denial* is a coping

strategy directed at external dangers or threats, in contrast to repression that is directed towards internal impulses, that is impulses arising from within the person. The person would deny that it exists. Threats are regarded as non-existing or as to be non-threatening. This strategy can be conscious or not conscious. *Repression* is a strategy where the urge or impulse is blocked from expression, so that the experience is not conscious or not expressed in behaviour. It is usually involved with negative affect and also eliminates specific memories or experiences (Niaura, Herbert, McMahon, & Sommerville, 1992). Sometimes it is associated with individuals who have a need to appear socially desirable. They then play down their state of anxiety (Furnham & Traynar, 1999). *Suppression* is similar to repression, but this type of coping is conscious (Lazarus, 1976).

It is expected that avoidance coping strategies do not play a significant role in the coping process of dissectors. If any of the above mentioned strategies are used it would most probably be denial and repression. These strategies would be used in the situations where students feel so overwhelmed by dissection that they prefer to block the whole experience from their minds. They might also deny the existence of the cadaver as a previously living person. These types of strategies might not have a beneficial effect, especially if used for a long period such as the whole second year of study.

3.6.4 Differences and variations in coping responses

People differ in their reaction towards stressors and also in the coping strategies that they use to overcome the anxiety associated with the stressful situation. Research has found that differences in coping exist between males and females. The resources available to people might also influence the anxiety level and type of coping response. Another important consideration is the type and severity of the event that caused the stress or anxiety.

With regard to the possible differences between how *males and females* cope with a stressful event, it seems that men are more likely to use more effective types of coping

than women (Billings & Moos, 1981; Pearlin & Schooler, 1978; Weidner & Collins, 1993). Men use more avoidance strategies, especially in handling everyday short-term stress. Women tend to use more attention strategies when encountering short-term stressors (which could be a waste of emotional energy on events beyond their control). When attention strategies are used for physical threats it tends to be more adaptive. This implies that women seem to handle and adapt to physical threat better when they give attention to the threat and its real meaning. For example, women would handle work-related stress by identifying the cause of the stress and then acting upon that specific stressor by, for example, prioritising and drawing up timetables. With regard to long-term stressors, sex differences were not reported (Weidner & Collins, 1993). It also seems that females use more emotion-focussed strategies while men use problem-focussed coping strategies (Billings & Moos, 1981). Blalock and Joiner (2000) also found that females use more cognitive avoidance strategies and that the use of these strategies only seemed to increase symptoms of anxiety.

It seems that men utilise behavioural active and cognitive active strategies while females use behavioural active strategies in seeking social support (Carver *et al.*, 1989; Weidner & Collins, 1993). Both men and women use behavioural avoidance strategies. Women are more likely to use emotional venting, self-care and relaxation, while men are more likely to use alcohol and drugs (Carver *et al.*, 1989). The research findings for the use of cognitive avoidance strategies differ between studies. Some studies found that women tend to use cognitive avoidance more than men do (Pearlin & Schooler, 1978). Other studies found that men use denial and fantasy to a greater extent than women do. Blalock and Joiner (2000) found no difference between males and females in the use of cognitive avoidance strategies.

It seems that sex differences in coping are more related to the social roles occupied by men or women (Weidner & Collins, 1993). In the current study men and women, tend to have the same social roles, because both sexes have the same occupation as a Homoeopath or Chiropractor. Both these professions are (as with medical physicians and engineers) seen as traditionally masculine professions. The results of the study, with

regard to the differences in coping strategies used by men and women, may therefore provide a better interpretation of general sex differences in coping strategies than pure “gender” (social role) differences.

How is it possible that two people can react differently and suffer different levels of anxiety when experiencing the same stressor? Part of the answer lies in their environments. If family and friends surround you, then the outcome of your experience might be more positive than for someone who is isolated and far away from support. *Resources*, including the availability of social support, seem to play an important role in the coping process. Low levels of social support have been associated with psychological stress and anxiety (Billings & Moos, 1981). Not only is the quantity of the social support important, but also the quality of the support, and the person’s appraisal of the availability and quality of the support (Billings & Moos, 1981). In the dissection hall every student is surrounded by fellow students and lecturers, but not all of them experience these people in the same way. Some students will still feel isolated mostly due to their own appraisals of the unavailability of the support from friends and also lecturers, and also due to their appraisals of the support as being inadequate to fulfil their needs.

The *severity and the type of event* leading to the experience of anxiety also seems to be important in coping with the stressor. We all experience some stressors as more significant than others. Some people also seem to cope with a variety of stressful issues at the same time. Do stressors have an accumulative effect? The Life Change Model (and also the life change units) as proposed by Holmes and Holmes (1970) are used to determine the combined effect of various stressors on a person and it would seem that stressors do have a cumulative effect. The type of coping strategy used for each of these events might also be different and adapted to suit the stressor. But this change in coping strategy seems to be an individualised matter. It seems that there is not a specific strategy “assigned” to more stressful events and others to less stressful events. This relationship was investigated by Billings and Moos (1981) who found no significant correlation between type of strategy used and the severity of the event.

3.7 CONCLUSION

This chapter focussed on the theory underlying anxiety and coping and it appeared that the best theory to base the present study on was the Transactional Theory of Lazarus. According to this theory anxiety develops as an emotion associated with the stress process. The experience of this anxiety, and also the coping strategies that might be selected to deal with the situation, depend on the appraisals of the person. The appraisals include aspects of the person, the environment as well as the stressor. Another important issue in the coping process is the timing of events. It seems that the stage of exposure to the stressor might be the stage with the highest anxiety levels. The coping process seems to be specific to the individual and might not be related to aspects such as age, sex or culture.

In Chapter 4 the sample will be described as well as the methods used to investigate dissection anxiety, coping and behavioural changes related to anxiety.

CHAPTER 4

RESEARCH DESIGN



Leonardo da Vinci

CHAPTER 4

RESEARCH DESIGN

The purpose of this study was to describe the psychological influence of human cadaver dissection on Homoeopathy and Chiropractic students. It involved a repeated measures (pretest-posttest) design investigating four stages of dissection for levels of anxiety, appraisals of the situation as well as personal factors, behavioural changes (related to dissection anxiety) and coping strategies used.

4.1 HYPOTHESES

To fulfil the aims of this study the following hypotheses were tested regarding anxiety, coping strategies and behaviour changes in the context of cadaver dissection:

4.1.1 Anxiety levels

The following hypotheses with regard to anxiety levels were tested:

- H 1: Dissectors of human cadavers will show high levels of Manifest anxiety.
- H 2: Dissection anxiety as measured by the Manifest Anxiety Scale will decrease from phase 1 to phase 4 of dissection.
- H 3: Dissectors of human cadavers will show high levels of Death anxiety.
- H 4: Dissection anxiety as measured by the Death Anxiety Scale will decrease from phase 1 to phase 4 of dissection.
- H 5: Older students will experience lower anxiety levels than younger students on both the Manifest and Death Anxiety scales.
- H 6: Female students will experience higher levels of anxiety than male students on both the Manifest and Death Anxiety scales.
- H 7: Chiropractic students will experience higher levels of anxiety than Homoeopathy students on both the Manifest and Death Anxiety scales.

- H 8: There will be no difference in the experience of anxiety between members of different cultural groups.
- H 9: There will be no difference in experience of anxiety between members of different religious groups.
- H 10: Participants who report participating in religious activities more frequently will experience lower anxiety levels.

4.1.2 Coping strategies

The following hypotheses with regard to coping strategies were tested:

- H 11: Students with high anxiety levels will make more use of coping strategies than students with low anxiety levels.
- H 12: Students with high anxiety levels will use active coping strategies more often than avoidance strategies.
- H 13: The use of coping strategies will decrease over time between phases 1 and 4 of dissection.
- H 14: Students will use different coping strategies in the different phases of dissection.

4.1.3 Behavioural changes

The following hypotheses with regard to behavioural changes were tested:

- H 15: There is a positive correlation between anxiety level and behavioural changes due to dissection.
- H 16: Behavioural changes due to dissection decrease from dissection phase 1 to dissection phase 4.

4.2 METHOD

4.2.1 Research design

The current study was a repeated measure design. A questionnaire was used to study the anxiety levels and coping strategies of anatomy students who were enrolled for Homoeopathy and Chiropractic at the Technikon Witwatersrand.

A repeated measures design tests the effect of a variable, or variables, as it changes over time (also called a pre-experimental, one group pretest-posttest design). In the present study anxiety levels of students, the coping mechanisms they employ and their behavioural changes were investigated using a self-administered type of questionnaire completed by the participants during four different stages. These four stages were described and used by Shalev and Nathan (1985). It also compared well to those used by Penney (1985) in the research investigating dissection reactions. The study comprised all the different stages of dealing with a stressful situation and developing an anxiety reaction and included the following:

- Before dissection starts (preparation).
- First dissection period (exposure).
- Two weeks after dissection started (development of resources).
- Three months after dissection started (stabilisation).

Stage 1 – The preparation phase: The preparation stage took place before dissection started while participants were in anticipation of dissection. The questionnaires were posted (on 12 December 2000) to all students with their invitations to the dedication ceremony that took place during the week before the first dissection period. Baseline anxiety levels were measured as an indication of trait anxiety.

Stage 2 – The exposure phase: The exposure stage took place during the first dissection period (29 January 2001). This was the stage when students “met” their cadavers, touched them for the first time and also made the first incision.

Stage 3 – The resources development phase: The resources development stage took place after two weeks of dissection (14 February 2001). In this stage the participants were developing strategies to cope with the dissection situation.

Stage 4 – The stabilisation phase: The stabilisation stage occurred place three months after dissection commenced (23 April 2001). During this phase anxiety has stabilised and resources developed to keep participants at a baseline anxiety level.

The questionnaire was self administered by the participants. They were requested to complete the questionnaire and return it on the same day. The questionnaire was distributed and completed during the four stages.

At each stage the questionnaire was introduced by a short introduction addressed to the participant (see Appendix B). The format and function of this introduction was to help set the stage for the participant. It aimed to briefly describe the specific stage to the participant, in an attempt to get the participant to focus on his/her present experience of dissection. It also aimed to “desensitise” the participant to the format of the questionnaire, since the questions in each section remained the same throughout the study, and the participants should for each phase approach the questionnaire as if for the first time.

The following variables were included in this study: anxiety and coping strategies (dependent variables) and sex, age, field of study, culture, religion and appraisal (independent variables). Appraisals about of the nature of the stressor (dissection) or personal factors (e.g. own resources in dealing with the stressor) were investigated in an attempt to determine whether appraisal can cause or influence the development of anxiety. Behavioural changes, possibly resulting from dissection anxiety, were also studied.

4.2.2 Subjects

The sample included all students in the second year in 2001 that were busy with dissection for the course Anatomy for Homoeopathy and Chiropractic. The group consisted of 47 students. All students repeating the course (13 students) were excluded from the study, therefore leaving a sample of 34 students. Of these, 22 students completed questionnaires during all four phases (a response rate of 64.7%).

The full anatomy course is conducted over two years. During the first year the students are offered courses in Histology (the study of cells and tissues) and Osteology (the study of the human skeleton). The first year involves practical work in the histology laboratory (with microscope slides to be studied) and osteology laboratory (with human skeletons to be studied). In the second year students are examined on osteology (each dissection group receives a complete human skeleton, which they keep at home). The course material deals with embryology (developmental anatomy) and gross anatomy (macroscopic anatomy). Dissection only forms part of the second year course.



Figure 4.1 Group photo of 2nd year Anatomy students in the dissection hall

Students who participated in the study were previously (in their first year in 2000) exposed to the dissection hall. A mentor from the second year anatomy group tutored

them. Although they were allowed into the dissection hall, they were not allowed to handle any human tissue. They were always under supervision and some students opted not to visit the dissection hall or to only do it on occasion to see muscles on the cadaver to help them study muscle attachments.

No sampling or control group was used since the group size was small and all anatomy students (for these courses) participated in dissection.

A description of the participants that only completed the first phase without responding to the other phases is given in Box 4.1.

Box 4.1 Description of participants who completed only the first phase of the study

In an attempt to clarify whether participants that did not complete more than the first phase of the study differed from participants that completed all the phases, a statistical analysis of the difference in anxiety levels was performed. This aimed to establish whether the participants that did comply to all four dissection phases were more anxious and therefore felt a greater need to participate.

The student's t-test did not show any statistically significant difference between the combined group of participants that responded in the first phase and the selected group that completed all four phases. This was true for Manifest anxiety scores ($t=0.262$, $p=0.795$) and Death Anxiety scores ($t=0.192$, $p=0.849$). We can therefore assume that the participants that responded to all the phases did not differ with respect to anxiety level.

The participants that left the study were either students that left the course due to supplementary results that were only published after the first phase, or students who voluntarily decided not to participate further in the study.

4.2.2.1 Biographical data

The characteristics of the sample that were investigated are given in Table 4.1 and include the following: sex, age, marital status, field of study, culture, language, religion and religiosity.

Table 4.1 Biographical data of subjects

Variable	N	Percentage
Sex		
Male	7	31.8%
Female	15	68.2%
Age		
18 – 20 years	15	68.2%
21 – 23 years	4	18.2%
24 – 26 years	2	9.1%
27 – 29 years	1	4.5%
Marital status		
Single	21	95.5%
Married	1	4.5%
Field of study		
Homoeopathy	11	50%
Chiropractic	11	50%
Home language		
English	13	59.1%
Afrikaans	6	27.3%
Portuguese	2	9.1%
Croatian	1	4.5%
Cultural group		
White	16	72.8%
Asian	1	4.5%
Croatian	1	4.5%
Chinese	1	4.5%
Missing values	3	13.7%
Religion		
Christians	14	63.7%
Catholic	4	18.2%
Jewish	2	9.1%
Hindu	1	4.5%
Missing values	1	4.5%
Religiosity		
Strict	10	45.5%
Some extent	12	54.5%
Unconcerned	0	0%

The participants represented both sexes. Of the sample 7 were male and 15 female. The participants were between 18 and 27 years of age, with a mean age of 20.6 years (SD=2.27). Most participants were 20 years old. The majority (95.5%) of the sample was single, with no participants being divorced and 4.5% being married. This seems to be a

normal distribution for these fields of study. Fifty percent of the participants were students of Chiropractic while the other 50% were students of Homoeopathy.

Most of the participants were English speaking (59.1%). Afrikaans speaking participants made up 27.3% of the sample. The other language groups included Portugese (9.1%) and Croatian (4.5%) speaking participants (see Table 4.1). Participants classified themselves into the following cultural groups: White, Asian, Croatian and Chinese. Three participants did not answer this question.

The sample represented four different religious groups (see Table 4.1). These included Christians (63.6%), Catholic (18.2%), Jews (9.1%), Hindus (4.5%) and 1 participant did not answer the question. 45.5% of students regarded themselves as very religious, and 54.5% regarded themselves as religious to some extent.

4.2.3 Ethical considerations

Since human subjects were used in this study, ethical clearance was obtained from the Ethics Committee of the Technikon Witwatersrand. The ethical clearance number is EC27/2000/152.

Written informed consent was obtained from each participant before the study commenced. They were informed that their participation was voluntary and that they could withdraw from the study at any time. Their treatment as students in anatomy was never compromised due to participation or non-participation.

All information was treated confidentially. An independent person assigned a unique reference number to each individual participant. The participants used these numbers for all the phases throughout the study. This was done to enable the researcher to follow the development of a single participant and to keep participation anonymous. The participants' identities remained anonymous throughout the study.

4.3 MEASURING INSTRUMENTS

The selection of the measuring instruments was guided by the literature survey. Various measuring instruments were considered with regard to their applicability to the relevant model and theory of the research (that of transactional theory of Lazarus), and particular emphasis was placed on the validity and reliability of the various instruments.

Anxiety was measured with the Taylor Manifest Anxiety Scale as well as the Templer Death Anxiety Scale. Open-ended as well as close-ended questions were asked to assess appraisal (of the situation, personal factors and support systems), behavioural changes, and coping strategies. These were content analysed and classified using the models as described in Chapter 2 and 3 (see Appendix B).

The questionnaire consisted of the following five sections :

Section A: Biographical data

Section B: Taylor Manifest Anxiety Scale and Templer Death Anxiety Scale

Section C: Appraisal measurement

Section D: Coping strategies

Section E: Behavioural changes

4.3.1 Biographical data

All the questions in this section were structured questions. Answers were completed by selecting a choice from a list provided or by completing information (one word, e.g. to state home language). The section on biographical data included an investigation of the following aspects (see Appendix B, Section A).

- Sex
- Age
- Marital status
- Field of study (Homoeopathy or Chiropractic)
- Home language

- Cultural or Ethnic group
- Religion (type and extent of religiosity)

4.3.2 Taylor Manifest Anxiety Scale

The Revised Taylor Manifest Anxiety Scale (TMAS) was adapted for the measurement of dissection anxiety (See Appendix B, Section B, part 1). The TMAS will be discussed with reference to its history and development (including notes on the rationale for its inclusion in the present study). A brief description of the scale and notes on its interpretation, validity and reliability will also be given.

4.3.2.1 History and development of the Taylor Manifest Anxiety Scale

The Taylor Manifest Anxiety Scale was constructed by clinical psychologists from what they considered as typical characteristics of anxiety. The items were selected from items of the MMPI (Minnesota Multiphasic Personality Inventory) (King & Campbell, 1986). An adapted version of the Revised Manifest Anxiety Scale was used in the present study (Lazarus, 1966; Taylor, 1953, 1956). The original Revised Version contained twenty-eight items and the adapted version twenty-seven items, changed to suit the dissection environment. For example, item 1 in the adapted form of the TMAS “I feel sick to my stomach when thinking of dissection” appeared in the original Revised form of the Manifest Anxiety Scale as: “I am often sick to my stomach”.

The Taylor Manifest Anxiety Scale is frequently used in experimental stress and anxiety research (Deese, Lazarus & Keenan, 1953; Price & Blackwell, 1980; Simpson, Parker & Harrison, 1995; Suetsugi *et al.*, 2000). The scale was also used in other psychological and medical research, such as studies on brain mapping of cancer patients (Tashiro *et al.*, 2000), and myofascial pain (Esenyel, Caglar, & Aldemir, 2000). The Taylor Manifest Anxiety Scale was also used in research on coping (King, Taylor, Albright & Haskell, 1990; Niaura *et al.*, 1992).

According to Lazarus (1966) the anxiety levels in an individual can reflect a variety of factors. These include trait anxiety, state anxiety, anxiety as a reaction to a stimulus, or anxiety as a coping mechanism. Taylor described anxiety as a manifestation of a drive and this scale therefore measures anxiety as a drive or motivator of performance (Taylor, 1953). These uses of the scale render it as particularly useful to measure anxiety related to dissecting human cadavers.

The Taylor Manifest Anxiety Scale was also used in cross-cultural research in South Africa (Moerdyk & Spinks, 1979), which adds to the reliability of the scale and makes it an appropriate scale to use in the South African context.

4.3.2.2 Description and interpretation of the Taylor Manifest Anxiety Scale

The Taylor Manifest Anxiety Scale is a closed format scale. The Adapted Version of the Taylor Manifest Anxiety Scale constitutes 27 items.

Although some items involved physical symptoms experienced by the respondent it should not be confused with scales measuring physiological conditions of anxiety. These items included item 4 (“I often have diarrhoea”), item 7 (“I do not often notice my heart pounding and I am seldom short of breath”) and item 8 (My bowels don’t move for several days at a time”). It might seem that the items could measure actual physiological conditions and should therefore be excluded from the present study because the study did not investigate physiological symptoms or anxiety. These items were however included since they refer to perceived physical signs and are not testing physiological symptoms.

Different interpretations of the Taylor Manifest Anxiety Scales exist. The interpretation usually depends on the type of study and the research question addressed by each study. For the purpose of the current study the scores were broadly categorised into two groups (high and low anxiety) by taking the median (that is a score of 14) as the cut off point. This was also the method used by Fuller and Conner (1990) and by Werhun and Cox (1999).

The participants selected between a true or false option for each statement. Scoring of the scale was manual. Each of the twenty-seven items reserved a score out of one, thus either 1 if true or 0 if false. Four items (items 2, 7, 19 and 27) were reversed and the scores therefore reversed before the scores were calculated. Scores were added to get a total out of 27 (Meites, Lovallo & Pishkin, 1980). A maximum score of 27 (high anxiety) and a minimum score of 0 (low anxiety) was theoretically possible. The higher the score of the participant, the higher the manifest anxiety experienced by the individual.

The calculated scores were used to compare scores for each individual throughout the different stages of the research. Each individual's scores were related to his/her scores for other phases.

4.3.2.3 Validity and reliability of the Taylor Manifest Anxiety Scale

According to Breakwell, Hammond and Fife-Schaw (1995), a measure is valid when it really measures what it claims to measure. It is reliable if it consistently gives the same effect. Reliability can be tested by replication, either on the same sample at different times, or by using different samples.

Content validity of the Taylor Manifest Anxiety Scale seems to be high (Deese *et al.*, 1953; Esenyel *et al.*, 2000; King *et al.*, 1990; Niaura *et al.*, 1992; Price & Blackwell, 1980; Simpson *et al.*, 1995; Suetsugi, *et al.*, 2000; Tashiro, *et al.*, 2000).

Studies also reported high correlations between the Taylor Manifest Anxiety Scale and clinical evaluations by trained clinicians (Lazarus, 1966; Taylor, 1956). There is therefore a good criterion (predictive) validity in agreement between clinical judgements and Manifest Anxiety Scale scores (Gilbert, 1967; Kamin, Bindra, Clark & Waksberg, 1955; Lazarus, 1966; Meites *et al.*, 1980). Wilkins and Krauss (1978) found a 0.78 correlation between the Taylor Manifest Anxiety Scale and overt anxiety, which suggests concurrent validity. Blackbill and Little (1954) also found a high correlation between the Taylor

Manifest Anxiety Scale and the MMPI (Minnesota Multiphasic Personality Inventory) ($r=0.92$).

The reliability of the Taylor Manifest Anxiety Scale was high. The results of re-testing 58 students after a lapse of three weeks yielded a Pearson product-moment coefficient of 0.89. A second test-retest study (involving 163 students tested after 5 and other students tested after 9 months) yielded a test-retest coefficient of 0.82 over 5 months and 0.81 after 9 months (Taylor, 1953).

4.3.3 Templer Death Anxiety Scale

Death and the rituals associated with death have always been considered important in humanity and religious life. For students dissecting human cadavers, this awareness of their own mortality could possibly increase death anxiety and pose problems (Bromberg & Schilder, 1933). The Templer Death Anxiety Scale (TDAS) was included in the present study to measure the experience of the participants towards their own mortality (see Appendix B, Section B, part 2). The TDAS will be discussed with reference to its history and development (including notes on the rationale for its inclusion in the present study) a brief description of the scale will be given and notes on its interpretation, validity and reliability.

4.3.3.1 History and development of the Templer Death Anxiety Scale

The Templer Death Anxiety Scale was developed by Donald Templer to reflect a wide range of life experiences. Forty items were originally devised. Seven judges rated the face validity of the items. Item analyses retained 15 items for the final scale (Lonetto, Mercer, Fleming, Bunting & Clare, 1980; Templer, 1970).

The Templer Death Anxiety Scale was developed to cover more than just the anxiety associated with the act of dying, the finality of death and experiences with corpses. It

included a wider range of experiences in terms of peoples' feelings towards their own mortality, and can as such be used in the current study (Templer, 1970).

The Templer Death anxiety scale was considered to be a good option to use in the current study because it was used in research on the specific topic of dissection anxiety in other studies (Dickinson *et al.*, 1997; Lonetto *et al.*, 1980; Templer, 1970). It would therefore make comparison to other studies that used the same measuring instruments easier. The Templer death anxiety scale has shown good validity and reliability and is appropriate for studies concerned with death anxiety.

4.3.3.2 Description and interpretation of the Templer Death Anxiety Scale

The Templer Death Anxiety Scale was used in its original format in this study. It consists of 15 items. For each item the respondent selected whether the statement was true or false. Of these, 6 items were false and 9 items were true. In the current study the participants were asked to keep the dissection situation in mind when answering the questions (Lonetto *et al.*, 1980; Templer, 1970).

Manual scoring of the scale took place. For this study each of the fifteen items reserved a score out of one, thus either 1 if true or 0 if false. The scores of six items (items 2, 3, 5, 6, 7, and 15) were reversed before the scores were calculated. Scores were summed to get a total out of 15 (Lonetto *et al.*, 1980; Templer, 1970). A maximum score of 15 (high anxiety) and a minimum score of 0 (low anxiety) was theoretically possible.

The "raw" scores were used as such to compare the differences in scores throughout the different stages of the research. Each individual's score was related to his/her scores for the other phases.

4.3.3.3 Validity and reliability of the Templer Death Anxiety Scale

The validity of the Templer Death Anxiety Scale was confirmed by the following two studies. Psychiatric patients were found to have significantly higher scores on death anxiety than control patients (Templer, 1970). Secondly, Death Anxiety Scores correlated significantly with Boyar's Fear of Death Scale (FODS) ($r = 0.74$), as well as with a sequential word association task ($r = 0.41$) (Lonetto *et al.*, 1980, Templer, 1970).

The reliability of the Templer Death Anxiety scale seems to be high, as concluded from previous test-retest results. In the development of the scale, 31 of the college subjects in Templer's (1970) study completed the Templer Death Anxiety Scale a second time, three weeks after the first administration. The product-moment correlation coefficient of 0.83 between the two sets of scores provided high test-retest reliability. A coefficient of 0.76 demonstrates reasonable internal consistency with these 31 subjects (Templer, 1970).

4.3.4 Appraisal measurement instrument

The appraisal of the dissection experience was investigated by open-ended questions (see Appendix B, Section C). This format was selected, rather than close-ended or structured questions, because forced type (or close-ended questionnaires) do not always reflect the appraisal by the participant, but sometimes offers choices of which the respondents seem to choose the "correct" one. Asking participants to describe their appraisals could be a more realistic reflection of their appraisals (Abu-Hijleh *et al.*, 1997; Evans & Fitzgibbon, 1992; Farhall & Gehrke, 1997; Nnodim, 1996).

Appraisal of dissection was measured on the following three aspects:

1. The dissection situation, e.g. "How do you experience dissection at this stage?"
2. Personal factors related to the experience of anxiety and the coping process, e.g. "Which aspects of yourself make it easier or more difficult for you to cope with dissection and the emotions associated with it?"

3. Environmental aspects (especially with regard to social support), e.g. “Which aspects in your environment make it easier or more difficult for you to cope with the emotional aspects of dissection?”

4.3.5 Measurement of coping strategies

Section D (see Appendix B, Section D) consisted of one open-ended question and one closed-ended set of questions. The open-ended question was concerned with the coping strategy/ies that the participant used to help with anxiety associated with dissection. The open-ended question was content analysed by the researcher and common themes extracted.

The second subsection consisted of 16 items where respondents had to indicate on a 4-point Likert scale how often they use a specific coping strategy (from “never” to “always”). The closed-ended question was designed by the researcher adjusting items from the literature to fit using dissection hall examples.

The close-ended scale was used to identify the following eight coping strategies (the items in brackets indicate the items used for each strategy identification):

- Religion as a coping mechanism (Items 2, 9, 16. E.g. “I pray about my fear for dissection”).
- Denial (Items 10, 14. E.g. “I look at the cadaver as if it wasn’t real”)
- Rationalisation (Item 3. E.g. “I consider the cadaver as a tool for gaining the knowledge I need to become a Homoeopath or Chiropractor”)
- Repression (Items 4, 7. E.g. “I think about other things to keep out thoughts of dissection”)
- Instrumental action (Items 1, 8. E.g. “I take an active part as much as possible”)
- Substance use (Items 5, 11, 13. E.g. “I use substances to help me cope”)
- Humour (Items 6, 12. E.g. “We tell a lot of jokes around the dissection table”)
- Dedication ceremony (Item 15. E.g. “The dedication ceremony helped me understand the need for dissection”)

The eight coping strategies as discussed above were classified into four coping categories. The categories of coping strategies are those described by Blalock and Joiner (2000) who based their categories on the model of Lazarus. The four categories are:

- Active cognitive strategies (Rationalisation, Humour)
- Active behavioural strategies (Instrumental action, Religion, Dedication ceremony)
- Avoidance cognitive strategies (Repression, Denial)
- Avoidance behavioural strategies (Substance use)

The coding of each of the 16 *items* involved a score with a minimum of 0 and a maximum of 3. Items marked as “Never” were allocated a score of 0, a score of 1 was allocated for items marked “Occasionally”, a score of 2 for items marked “Often” and a score of 3 for items marked “Always”. These scores were used to calculate a combined score for each participant, for each phase of dissection, with a minimum of 0 and a maximum of 48.

Each item was identified as one of *eight coping strategies* for each participant for each dissection phase. The scores for each of the strategies were calculated by adding the item scores and standardising the coping strategy to a maximum score of 3 (and minimum of 0). The coping strategy type identification was done by the researcher and by an independent person.

The scores for each of the *four classification* types for each of the 4 dissection phases were calculated by adding the scores of the different coping strategies that belong to the type of classification. The scores for each classification type were standardised to a score with a minimum value of 0 and a maximum value of 300. This increase in the standardisation scale was necessary to detect small differences. The researcher classified the coping strategy into categories that were independently verified by another person.

4.3.6 Measurement of behavioural changes

Behavioural changes were investigated in Section E (see Appendix B, Section E). For each question the participant had to indicate whether the question was relevant to him/her. (For example: “Did dissection anxiety cause any changes in your eating habits or diet?” Yes or No.) The second sub-question in each question was an open-ended question, which prompted an explanation of the behavioural change that the participant considered relevant. (For example: If yes, please explain in which way it changed your eating habits.)

The questions measured changes in the following aspects.

- Eating habits or diet.
- Physical exercise.
- Alcohol consumption or drug (substance) usage.
- Sleep patterns.
- Dreams.
- Other social activities.

Frequencies were calculated for the first part (Yes/No) of each question with a minimum score of 3 and a maximum score of 6 for each phase for each participant. The explanations of the open-ended sections were content analysed.

4.4 ANALYSIS OF DATA

The quantitative data was analysed using the Statistical Package for Social Sciences (SPSS). Qualitative data was content analysed.

The following analyses were done: (1) *Pearson’s correlation coefficient* to establish the relationship between several variables, (2) *Analysis of Variance* to investigate differences between the groups for the various variables, (3) *Friedman’s chi square test*

to establish differences between different phases (for Manifest Anxiety and Death Anxiety).

All open-ended questions were content analysed and coded to determine the “category” that each appraisal, coping strategy or behavioural change belonged to. It was also analysed to determine the efficiency or extent of each of these variables.

4.5 SUMMARY AND DIAGRAMMATIC REPRESENTATION OF RESEARCH DESIGN

This chapter discussed the first steps of the empirical investigation. The research design, sample description, the choice, administration and scoring of the measuring instruments and the statistical processing of the data were outlined.

Figure 4.1 gives a summary of the research design and methodology used in the study, including a diagrammatic representation of the development of the research problem into a research question, listing of variables, descriptions of the sample, measurement instruments, the different phases of the study and statistical analysis.

The results of the study will be reported in Chapter 5

THE PSYCHOLOGICAL EFFECT OF DISSECTING HUMAN CADAVERS

Research problem

Dissecting human cadavers could have an effect on the psychological wellbeing of Homoeopathy and Chiropractic anatomy students. Changes in their behaviour, and the coping strategies that they use, are of interest in this study. Age, sex, religion, culture and the field of study (that is Homoeopathy or Chiropractic) might also have an effect.

Theoretical Framework

Lazarus Theory of Psychological Stress
 Transactional (person AND situation)
 Threat AND appraisal (stimulus and personal factors)
 Coping process

Variables		
Dependant	Independent	Nuisance
Anxiety Coping	Age Sex Field of study (Homoeopathy + Chiropractic) Culture Religion	Repeat students Personality (trait)

Figure 4.2 Summary of research design and methodology

Research design
This is a repeated measure design
(Pre-experimental, one group pretest-posttest design)

- Research Aims**
- Measure effect of dissection anxiety (compare variables: sex, age, religion, culture, field of study)
 - Describe (and measure) behavioural changes (content analysis)
 - Describe (and measure) coping strategies
 - Examine relationship between expectations (appraisal) and anxiety
 - Describe coping mechanisms that high-anxious and low-anxious individuals use
 - To determine all of the above for changes over the four dissection periods

Sample
Second Year Homoeopathy and Chiropractic students at TWR - 2001
(n=22, first time dissectors, male and female, all age groups)

Measurement Instruments	
Close ended questionnaire/s	Anxiety measure + symptoms
Open ended questionnaire	Appraisals (about dissection situation, own abilities, environment) Behavioural changes: dreams, diet, exercise, alcohol consumption Coping strategies

Figure 4.2 Summary of research design and methodology (continue)

Phase	Date	Student activity	Measure	Measurement Instrument	Variable/s Measured
1	Jan 2001 (early)	Pre-dissection (Preparation)	Anxiety Expectations	Questionnaire (posted) (Open and close-ended questions)	Baseline anxiety Expectations
2	Jan 2001 (end)	1 st dissection period (Exposure)	Anxiety Appraisal Behaviour Changes Coping strategies	Questionnaire (Open and close-ended questions)	Anxiety level Time to develop anxiety, behavioural changes and coping strategies
3	Feb 2001	After 2 weeks of dissection (Resources development)	Anxiety Appraisal Behaviour Changes Coping strategies	Questionnaire (Open and close-ended questions)	Anxiety level Time to develop anxiety, behavioural changes and coping strategies
4	April 2001 (end)	After three months of dissection (Stabilisation)	Anxiety Appraisal Behaviour Changes Coping strategies	Questionnaire (Open and close-ended questions)	Anxiety level Time (recover) Influence of sex, age, field of study, religion, culture Coping strategies Influence of expectation on development + Adaptation

Figure 4.2 Summary of research design and methodology (continue)

Data Analysis	
Statistical analysis (SPSS for MS windows package)	
Relationships between variables:	Pearson's correlation coefficient
Differences between groups:	Analysis of Variance
Differences between different phases:	Friedman's chi square
Content analysis	

Figure 4.2 Summary of research design and methodology (continue)

CHAPTER 5

RESULTS



Leonardo da Vinci

CHAPTER 5

RESULTS

The current study investigates the psychological effects of dissection on Homoeopathy and Chiropractic students. It considers their anxiety levels, both as a conscious experience and as an emotion towards their own death and mortality. The study also investigates the coping strategies that the students employ in dealing with anxiety and how this anxiety influences their behaviour. In this chapter the results of the study will be reported. The hypotheses relevant to each section will be presented in a block, for the sake of easy reading.

5.1 DISSECTION ANXIETY

Two anxiety scales were used to determine anxiety levels. The Taylor Manifest anxiety scale was used to determine manifest anxiety (that is anxiety that is displayed and admitted). The Templer Death Anxiety Scale was used to determine specific anxiety related to fear of death. These measurements were done during the four phases of the dissection experience, namely before dissection starts (preparation), first dissection period (exposure), two weeks after dissection started (development of resources), and three months after dissection started (stabilisation).

5.1.1 Manifest anxiety scores for “alternative” health care professionals

The following hypotheses regarding Manifest anxiety were tested:

- | |
|--|
| <p>H 1: Dissectors of human cadavers will show high levels of Manifest anxiety.
H 2: Dissection anxiety as measured by the Manifest Anxiety Scale will decrease from phase 1 to phase 4 of dissection.</p> |
|--|

The mean score for the group on manifest anxiety was 5.93 (SD=3.67). The highest average score for a phase was 6.55 and the lowest average score was 5.59. It seems that the students did not experience high levels of manifest anxiety due to dissection.

As can be seen in Table 5.1, manifest anxiety decreased with time, with the highest scores during the first phase and the lowest scores during the last phase. The average manifest anxiety score for phase 1 was 6.55 (SD=4.18). During phase 2 the average score was 5.82 (SD=4.28), during phase 3 it was 5.77 (SD=3.96) and for phase 4 it was 5.59 (SD=3.55). The highest possible score was 27 and the lowest 0. It would therefore seem that the average scores were at a low level of manifest anxiety and there was no significant difference for the scores during the four phases of dissection measured by a Friedman's Chi squared test ($\chi^2=2.157$, $p=0.541$). It was also found that 3 of the participants showed high Manifest anxiety levels that remained high throughout the four phases of dissection. This finding could indicate high trait anxiety levels for these individuals.

Table 5.1 Manifest Anxiety Scale scores for the four dissection phases.

	Phase 1	Phase 2	Phase 3	Phase 4
Average score	6.55	5.82	5.77	5.59
Range	1-17	1-16	1-14	1-13
SD	4.18	4.28	3.96	3.55
Sum	144	128	127	123

It can be concluded that students who participated in this study did not suffer high levels of Manifest anxiety, and although there was a decrease in anxiety levels over the four dissection phases, this decrease was not statistically significant. Hypotheses 1 and 2 can therefore not be accepted for Chiropractic and Homoeopathy students at the Technikon Witwatersrand.

5.1.2 Death anxiety scores for “alternative” health care professionals

The following hypotheses regarding Death anxiety were tested:

- H 3: Dissectors of human cadavers will show high levels of Death anxiety.
H 4: Dissection anxiety as measured by the Death Anxiety Scale will decrease from phase 1 to phase 4 of dissection.

The mean score for the group on death anxiety was 5.14 (SD=2.87). The highest average score for all the phases was 5.86 and the lowest average score was 4.68. It seems that the students did not experience high levels of death anxiety due to dissection.

As can be seen in Table 5.2, death anxiety decreased with time, with the highest scores during the first phase and the lowest scores during the last phase. The average death anxiety score for phase 1 was 5.86 (SD=3.25). During phase 2 the average score was 5.23 (SD=3.23), during phase 3 it was 4.77 (SD=3.23) and for phase 4 it was 4.68 (SD=2.95). The highest possible score was 15 and the lowest 0. It would therefore seem that the average scores were at a low level of death anxiety through all the stages of dissection, and there was no significant difference for the scores during the four phases measured by a Friedman's Chi squared test ($\chi^2=3.367$, $p=0.338$).

Table 5.2 Death Anxiety Scale scores for the four dissection phases.

	Phase 1	Phase 2	Phase 3	Phase 4
Average score	5.86	5.23	4.77	4.68
Range	0-10	0-11	0-10	0-11
SD	3.25	3.23	3.23	2.95
Sum	129	115	105	103

It can be concluded that students who participated in this study did not suffer high levels of Death anxiety, and although there was a decrease in anxiety levels over the four dissection phases, this decrease was not statistically significant. Hypotheses 3 and 4 can therefore not be accepted for Chiropractic and Homoeopathy students at the Technikon Witwatersrand.

5.1.3 Relationship between demographic variables and anxiety

The following hypotheses regarding demographic variables and anxiety were tested:

- H5: Older students will experience lower anxiety levels than younger students on both the Manifest and Death Anxiety scales.
 H6: Female students will experience higher levels of anxiety than male students on both the Manifest and Death Anxiety scales.
 H7: Chiropractic students will experience higher levels of anxiety than Homoeopathy students on both the Manifest and Death Anxiety scales.
 H8: There will be no difference in the experience of anxiety between members of different cultural groups.
 H9: There will be no difference in experience of anxiety between members of different religious groups.
 H10: Participants who report participating in religious activities more frequently will experience lower anxiety levels.

The results of the analysis of variance for Manifest anxiety and demographic variables are presented in Table 5.3, while the results of the analysis of variance for Death anxiety and demographic variables are presented in Table 5.4.

Table 5.3 ANOVA for Manifest Anxiety Scale scores and demographic variables

Manifest Anxiety Variable	Phase 1		Phase 2		Phase 3		Phase 4	
	F value	p value	F value	p value	F value	p value	F value	p value
Age	2.856	0.045 *	2.432	0.74	1.594	0.217	0.733	0.648
Sex	3.328	0.083	2.284	0.146	1.478	0.238	2.171	0.156
Field of study	0.010	0.922	0.991	0.331	1.573	0.224	0.423	0.523
Cultural group	2.764	0.078	1.068	0.392	0.441	0.727	1.196	0.345
Language group	0.815	0.502	1.942	0.159	0.568	0.643	0.212	0.887
Religion	2.139	0.133	0.915	0.455	0.190	0.902	0.941	0.443
Extent of religious activity	0.756	0.395	0.000	0.986	1.520	0.232	0.948	.0342

* significant at level of $p < 0.05$

Table 5.4 ANOVA for Death Anxiety Scale scores and demographic variables

Death Anxiety Variable	Phase 1		Phase 2		Phase 3		Phase 4	
	F value	p value	F value	p value	F value	p value	F value	p value
Age	2.899	0.043 *	1.507	0.243	2.160	0.104	2.290	0.089
Sex	0.021	0.887	0.864	0.364	0.378	0.546	0.536	0.472
Field of study	0.037	0.850	0.976	0.335	0.724	0.405	0.125	0.727
Cultural group	0.242	0.865	0.900	0.464	0.862	0.482	0.241	0.866
Language group	0.367	0.778	1.774	0.188	0.950	0.437	0.901	0.460
Religion	0.579	0.636	1.514	0.247	0.474	0.704	0.436	0.730
Extent of religious activity	0.753	0.396	2.370	0.139	2.123	0.161	0.297	0.592

* significant at level of $p < 0.05$

There was a significant difference in anxiety level between participants of different ages for phase 1. This difference was found for both Manifest Anxiety ($F=2.856$, $p=0.045$), as well as Death anxiety ($F=2.899$, $p=0.043$) (see Table 5.3 and 5.4). This indicates that younger students experienced higher anxiety levels than older students during the preparation phase, i.e. before dissection started.

No statistically significant difference was found for any of the phases for either Manifest Anxiety or Death Anxiety with regard to sex, field of study, culture, language and religion. Only Hypothesis 5 can, therefore, partly be accepted.

5.1.4 Conclusions and additional remarks on Anxiety levels

It is clear from the results that students did not experience high levels of anxiety during dissection. The only statistically significant difference was that younger students experienced more anxiety than older students during the first phase.

An additional result that was not stated as a hypothesis, but seemed to be an interesting issue was the influence of anxiety on the academic performance of students. This is important to consider, since students often use dissection anxiety as an excuse or reason for not achieving good marks or for failing the subject anatomy. It was found that there

was no significant difference in the anatomy test results for students with low or high anxiety levels, as measured by both the Manifest Anxiety and Death Anxiety Scales.

5.2 APPRAISALS

Appraisals can shape the experience of anxiety. The following appraisals were investigated to determine their effect during the different phases of the dissection experience: appraisal of the *dissection situation*, appraisal of the *self* as being able to cope, and appraisal of the *environment* as being supportive.

5.2.1 Expectations of the dissection situation

Expectations or appraisals of the dissection situation were analysed by dividing responses into those that were positive and those that were negative. Positive appraisals were those that the participants experienced as contributing to a better outcome. The negative appraisals included those aspects that were regarded as associated with more anxiety.

5.2.1.1 Positive expectations of dissection

Phase 1 consisted of emotions and expectations about the dissection hall activities that the students had not yet experienced. Most of these emotions involved excitement, amazement and interest. Most students were eager, but some did not know what to expect or were uncertain.

During phase 2 participants were more confident. Most of them did not foresee any problems and were still excited and interested. Some also commented on the ease of coping with the dissection situation.

The most frequent comment during phase 3 was “interesting”. Other frequent comments included “comfortable”, “a lot easier” and “appreciating the privilege”. Participants were more relaxed and reported that they felt no anxiety.

The fourth phase yielded the same comments as for phase 3. Respondents did not report any discomfort, but were “enjoying it”, “at ease” and “more relaxed”. It was now a part of life.

5.2.1.2 Negative expectations of dissection

The most common negative response that was made during all the phases, was about the workload. It seems that the respondents judged the workload, more important than the dissection situation in provoking anxiety.

During the first phase, other responses including “feeling strange” and “not too keen on participating in dissection” were prominent. A number of respondents commented on reservations about being able to cut and touch the cadaver. They also expressed sadness that the cadaver had lost its’ life.

The second phase elicited many responses. The participants seemed to be disturbed and some respondents regarded dissection as unethical. Some of the experiences that they regarded as very negative were the smell in the dissection hall, and the first sight and incision of the cadaver. Some body parts (e.g. the hands and face) were found to be very personal and upsetting.

During phase 3 participants became tired and they commented on the long hours. Participants were anxious about the lecturers questioning them and started to doubt their abilities to dissect. The cadavers’ hands bothered many of them.

The feeling of being rundown, tired and drained continued during phase 4. The respondents found the perineum offensive, complex and difficult to dissect. The smell still affected them.

5.2.1.3 Conclusions regarding appraisal of the dissection situation

It would seem that the appraisal of the dissection hall activities changed with time. The appraisals changed from eager anticipation before dissection started, to apprehension at the first touch of the cadaver, and to a realistic concern about the workload after three months. It would therefore seem that there is a change in appraisal of the situation.

5.2.2 Appraisal of the self as being able to cope

Appraisal of the participants' own personality included those aspects of themselves that they consider as part of their normal way of dealing with stressful situations (positive) or hindering them in dealing with stressful matters (negative). Some aspects of the appraisal of the "self" were thus classified as positive and other aspects as negative. The positive aspects that helped the respondents cope were reported to a much greater extent than the negative aspects.

5.2.2.1 Appraisal of self that makes it easier to cope

The positive appraisals differed extensively between the phases. Some common themes among the participants and for *all the phases* were the participants' sense of humour and them being "outgoing" people. They also considered themselves to be "determined" and "hardworking". The respondents felt during all the phases that their "respectful attitude" towards the cadavers would help them cope.

During the *first phase* a lot of the respondents felt that aspects such as their religious beliefs would help them cope. They felt confident and knew their own strengths and weaknesses. Their determination to succeed and enthusiasm about their studies all

seemed to be important to the participants. Some reported more on their emotional strengths, such as not being afraid, not effected by emotions and being easily detached. Most of the participants felt that they would cope more easily because of their personality type (including being considerate, outgoing, hardworking, and determined to pass).

During the *second phase* religion and personal beliefs played a bigger role. Most participants still felt that they would cope because they could remain calm and detached. They were also keen to learn and had an interest (and curiosity) in anatomy.

In the *third phase* emphasis was placed on the fact that the respondents saw themselves as determined. Emotionally they could detach themselves and control their emotions. The cadaver is seen as a “tool” to be used “while they can”.

The most important aspect in the *fourth phase* was that respondents believed their sense of humour was their strongest means of coping. They were keen to learn new things, purposeful and determined to succeed. At this stage they saw themselves as hard working.

5.2.2.2 Appraisal of self that makes it more difficult to cope

The one aspect that was present during *all four phases* was that participants felt that they were emotionally sensitive and that this aspect of their personality would make it difficult for them to cope. Compassion, sympathy and being emotionally involved with the work at hand were also associated with this aspect.

Fear of the unknown was prominent during the *first phase* as well as the fear of failing and making mistakes. Some participants did not look forward to working in a group.

During the *second phase* participants were more concerned with issues such as being easily irritated, distracted and tired. Thoughts about the cadavers being in pain before they died were also prominent.

During *phase three* most of the respondents became very despondent and this also influenced the rest of the class. Most of the participants were self-absorbed and wished to work alone.

Phase four also dealt with problems associated with the long hours spent in the dissection hall. Participants were scared of becoming tired and bored and therefore procrastinated.

5.2.2.3 Conclusions regarding appraisal of own personalities

As with the appraisal of the dissection hall activities the appraisal of the participants regarding their own personal strengths and weaknesses changed over time. The appraisals changed from feeling confident and determined before dissection started, to a realisation of the long hours that dissection involved. It would therefore seem that there is a change in their personal appraisals.

5.2.3 Appraisal of the environment

Some aspects of the environment made it easier to cope with, while others made it more difficult. These two aspects will be discussed separately.

5.2.3.1 Positive appraisal of the environment

The following responses about aspects in the environment (especially social support) were shared by most of the respondents. During all four phases the support of family and friends (conversations and encouragement) was important. The support of peers, the rest of the dissection group and lecturers was also regarded as very important. An additional comment in phase 2, included personal beliefs and the belief in God. Peers in the same situation (dissection) received more attention in phase 4 than before.

5.2.3.2 Negative appraisal of the environment

Very few comments were made with regard to the negative aspects in the environment. These comments were also isolated ones made by individuals, not shared experiences. Insensitive lecturers, parental pressure and non-understanding friends were regarded as negative in all four phases. In phase 2 the atmosphere and smell of the dissection hall were also experienced as negative.

5.2.3.3 Conclusions regarding appraisal of the environment

It was apparent that the appraisals of the environment changed over time. The expectations that the participants had before dissection started changing as they changed their social environment. Some of these changes were realistic changes that were expected when the high workload is taken into consideration. Examples of this, are the change expressed by most of the participants with regard to losing friendships with friends that are not part of the dissection experience. There is just not enough time to socialise with friends. The “outside” friends also are unable (or are perceived as such) to understand the activities and related emotions of the dissection hall. Other changes involved the manner in which they relied on lecturers as well as family members during the first phases, and less in later phases.

Another very important consideration, and probably the most important, is the appraisal of the peer tutoring that they received in their first year. This includes two important aspects. Firstly, the availability of a fellow student with whom to venture into the dissection hall in a non-threatening manner. This provided the students with an opportunity to gradually get used to the dissection hall in their own time. The use of fellow students on a one-to-one basis also provided them with a “confidant” that they could confide in more readily than with lecturers (from whom they still expected help during the first phase). This sharing with a peer who had gone through the same situation only a year before was commented on as being the most important aspect in helping them deal with the dissection situation.

5.3 COPING STRATEGIES

Coping strategies used by the participants were obtained and described in a quantitative as well as a qualitative way by using both a close-ended scale and an open-ended question.

The results regarding coping will be dealt with in three sections. The first will deal with descriptive results pertaining to the *four coping categories* into which the coping strategies were classified. Included in this section will be discussions on the relevant coping strategies contained in the specific classification. The second section will deal with *statistical analysis* of aspects regarding the relationship between coping strategy used and anxiety level. The third section will report on the *qualitative data* as obtained from the open-ended question.

5.3.1 Descriptive results of quantitative analysis of coping strategies

Coping strategies can be classified into the following four coping categories: Active behavioural, active cognitive, avoidance behavioural and avoidance cognitive. Active strategies include strategies that are active or confrontational in dealing with the situation. Avoidance strategies involve trying to avoid the situation either by behavioural or cognitive means.

It is clear from the results of this study that *active strategies* are most often used throughout all four phases of dissection. As can be seen in Table 5.5 and Figure 5.1, active behavioural strategies and active cognitive strategies were mostly used, with a frequency of between 165 and 209 (out of a possible 300 score). Avoidance behavioural strategies were very seldom used (with an average usage of between 1.5 and 9.1 on a 300-point scale). Avoidance cognitive strategies were used to a greater extent than avoidance behavioural strategies, but less than the active coping strategies.

Table 5.5 Frequencies of use of four coping categories

Coping category	Phase 1		Phase 2		Phase 3		Phase 4	
	mean	SD	mean	SD	mean	SD	mean	SD
Active behavioural	199.6	32.75	205.2	43.89	184.1	38.31	165.2	48.22
Active cognitive	205.0	45.84	193.9	39.35	209.1	37.34	202.3	43.42
Avoidance behavioural	9.1	25.57	4.5	15.58	3.0	14.21	1.5	7.10
Avoidance cognitive	97.6	75.78	101.1	69.21	102.3	62.63	104.5	65.75

In Table 5.6 the frequencies of eight coping strategies used by the students during the four phases of dissection are given. These coping strategies include religion, denial, rationalisation, repression, instrumental action, substance usage, humour and the dedication ceremony.

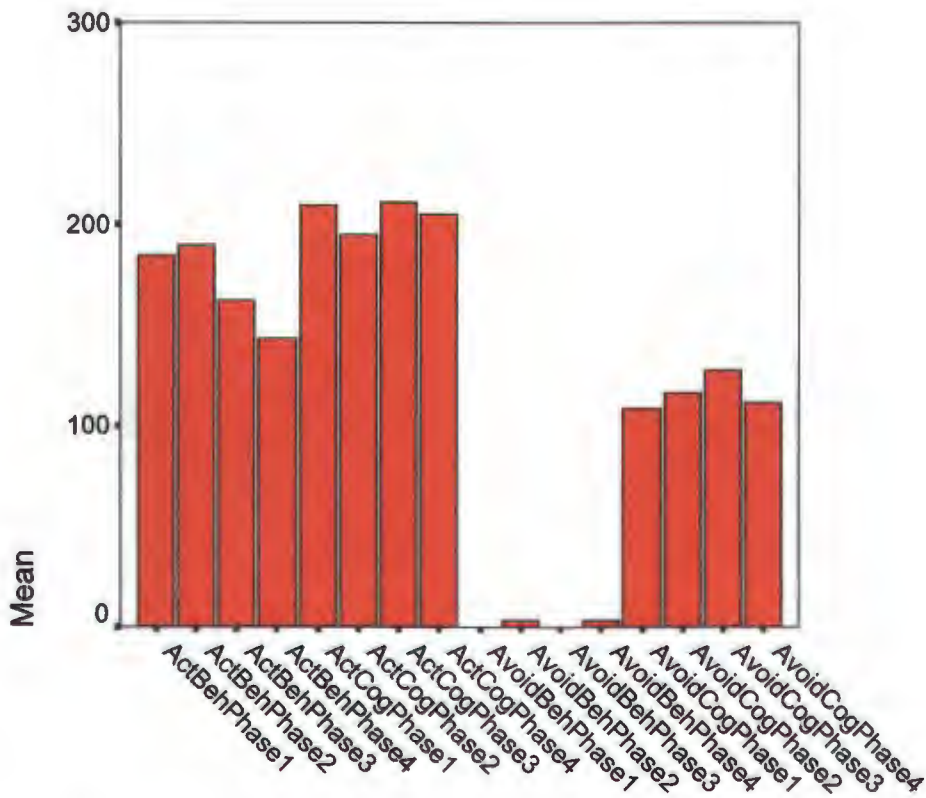


Figure 5.1 Coping strategies as used in each dissection phase

Table 5.6 Frequencies of use of eight coping strategies

	Phase 1	Phase 2	Phase 3	Phase 4
Coping strategy	frequency	frequency	frequency	frequency
Religion	1.7	1.8	1.5	1.3
Denial	1.2	1.1	1.1	1.2
Rationalisation	2.8	2.8	2.8	2.7
Repression	0.7	0.9	0.9	0.9
Instrumental action	2.2	2.2	2.2	1.9
Substance use	< 0.1	< 0.1	< 0.1	< 0.1
Humour	1.1	1.2	1.4	1.5
Dedication ceremony	2.3	1.8	2.1	1.8

As can be seen from Table 5.6 *rationalisation* was the coping strategy used most often throughout all the phases (mean value of more than 2.7 on a 3-point scale). Substance usage was the coping strategy used least (less than 0.1). The use of the eight coping strategies – as classified into the four coping categories – will be discussed in more detail in Section 5.3.1.1. to 5.3.1.4.

5.3.1.1 Active behavioural coping

Active behavioural coping strategies are mostly used during the first and second phases (with a peak during the second phase) (see Fig. 5.1). Active behavioural strategies include those strategies that are directly aimed at dealing with dissection, such as instrumental action, religion and the dedication ceremony. The use of active behavioural strategies then declines after phase 2 (see Fig. 5.2 and Table 5.5). Active behavioural strategies were used with a frequency of 199.6 during phase 1; 205.2 during phase 2; 184.1 during phase 3 and 165.2 during phase 4. This represents moderate to high levels if taken into account that the scale ranges from 0 to 300.

Table 5.5 Frequencies of use of four coping categories

Coping category	Phase 1		Phase 2		Phase 3		Phase 4	
	mean	SD	mean	SD	mean	SD	mean	SD
Active behavioural	199.6	32.75	205.2	43.89	184.1	38.31	165.2	48.22
Active cognitive	205.0	45.84	193.9	39.35	209.1	37.34	202.3	43.42
Avoidance behavioural	9.1	25.57	4.5	15.58	3.0	14.21	1.5	7.10
Avoidance cognitive	97.6	75.78	101.1	69.21	102.3	62.63	104.5	65.75

In Table 5.6 the frequencies of eight coping strategies used by the students during the four phases of dissection are given. These coping strategies include religion, denial, rationalisation, repression, instrumental action, substance usage, humour and the dedication ceremony.

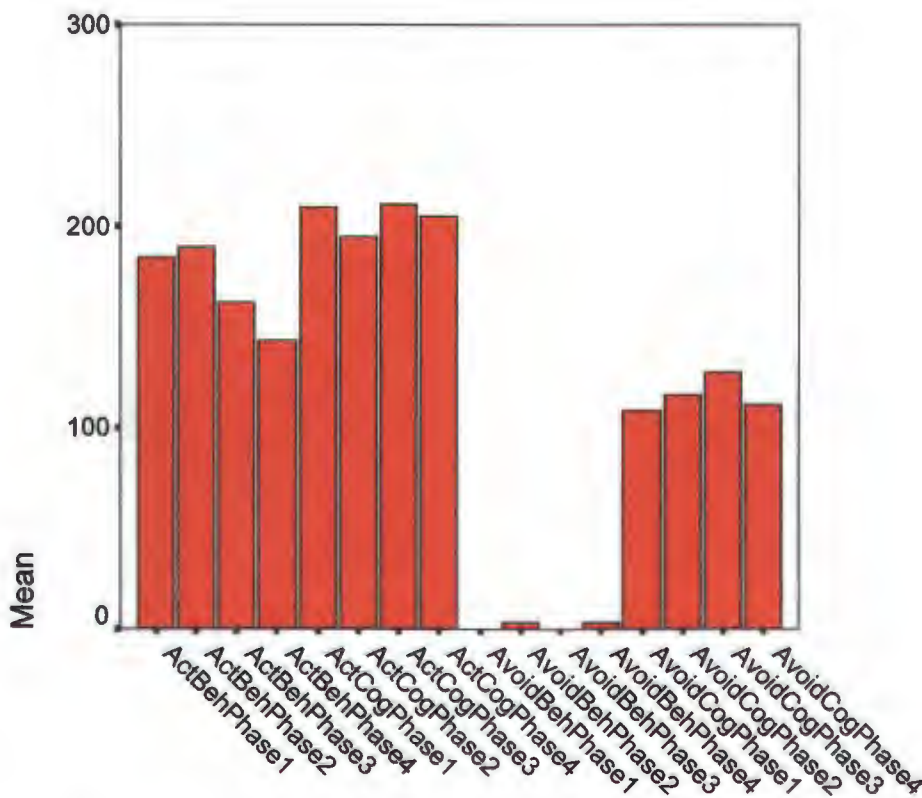


Figure 5.1 Coping strategies as used in each dissection phase

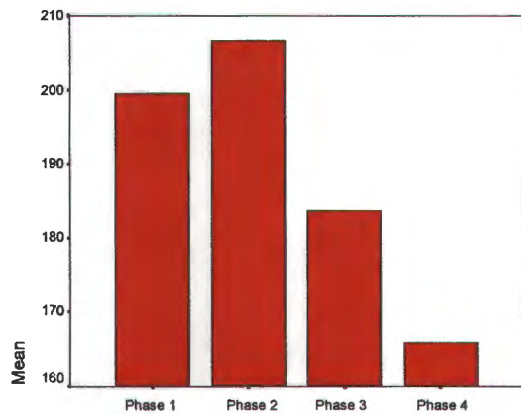


Figure 5.2 Active behavioural coping strategies

The following is a description of the different coping strategies in the active behavioural category, namely the use of instrumental action, religion and religious activities, and the attendance of the dedication ceremony.

(a) Instrumental action

Instrumental action was used often during the first three phases, with a slight decline in usage during these three phases, and a rapid decline during the last phase (see Fig. 5.3 and Table 5.6). The mean usage of instrumental action was high. During phase 1, 2 and 3 the average score was 2.2 and during phase 4 it was 2.0. Instrumental action is characterised by actions to overcome the anxiety, such as more frequent visits to the dissection hall or taking an active part in dissecting.

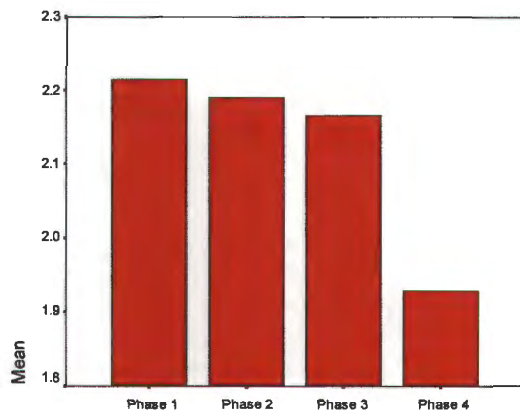


Figure 5.3 Instrumental action as coping strategy

(b) Religion

Religion was often used, as a coping mechanism, during phase 2 (exposure) and phase 1 (preparation) of this study. It's use then declined during the following phases (see Fig. 5.4 and Table 5.6). The mean usage of religion as a coping mechanism was 1.7 during phase 1; 1.8 during phase 2; and 1.5 and 1.3 during phases three and four respectively. These do not represent very high levels if taken into account that the scale only ranges between 0 and 3.

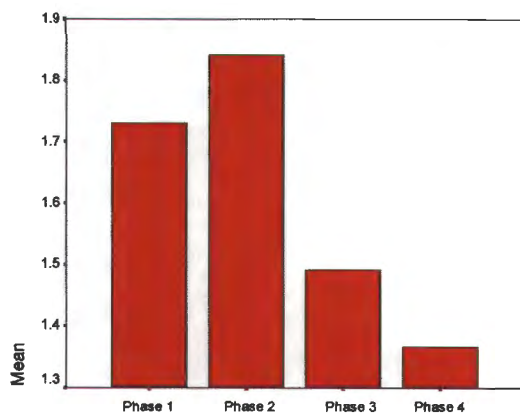


Figure 5.4 Religion as coping strategy

(c) Dedication ceremony

The dedication ceremony acts as a coping mechanism in that attendance of the ceremony places the students in the reality of the dissection process for the first time (see Appendix A). The action of attending the dedication ceremony can be seen as a religious activity, since most of the students see the religious activities (dedication and prayers for the deceased) as the most important part of the ceremony. The attendance of the dedication ceremony is also an intellectual activity in that a person (such as Prof. J C Allan) will explain to the students the significance of the commitment that people make in donating their bodies for dissection and science. He also explains the history of dissection and the importance thereof.

In this study the dedication ceremony seems to be a coping mechanism before dissection is participated in (phase 1). During phase 2 (which is just after the dedication ceremony) the participants seem to not use the dedication ceremony as a way to cope. The usage of the ceremony then increases slightly during phases three and four (see Fig. 5.5 and Table 5.6). The mean usage of the dedication ceremony as a coping mechanism was 2.3 during phase 1; 1.8 during phase 2; and 2.1 and 1.8 during phases three and four respectively. These represent relative high levels if taken into account that the scale only ranges from 0 to 3.

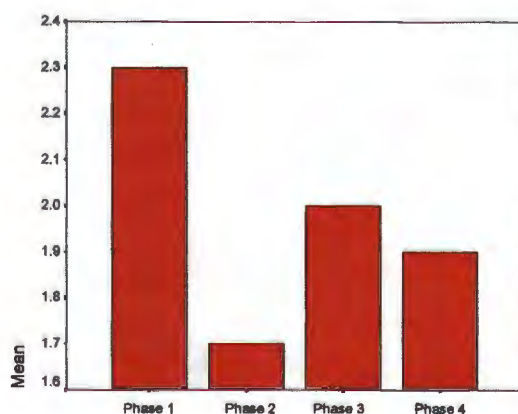


Figure 5.5 Dedication ceremony as coping strategy

5.3.1.2 Active cognitive coping

Active cognitive strategies are used during all the phases (see Fig. 5.6 and Table 5.5), but with a low frequency during the first dissection period (phase 2). Active cognitive strategies included all the strategies aimed at reasoning about dissection and the use of the cadavers and trying to establish a reason or positive outcome/gain for its presence. The types of coping in this category include rationalisation and humour. Active cognitive strategies were used with more or less the same frequency as active behavioural strategies. Average frequencies of 205 during phase 1; 193.9 during phase 2; 209 during phase 3 and 202.3 during phase 4 were reported. These represent moderate to high levels if taken into account that the scale ranges between 0 and 300.

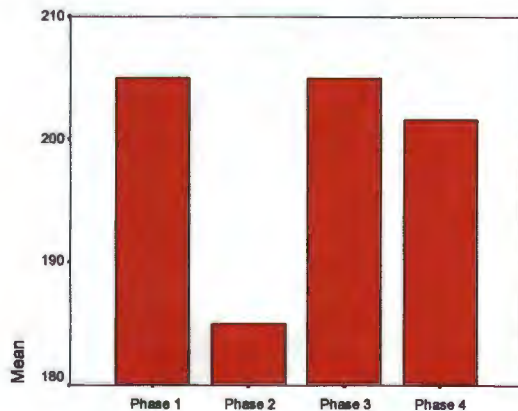


Figure 5.6 Active cognitive coping strategies

Active cognitive strategies included coping strategies such as rationalisation and the use of humour. These will be discussed next.

(a) Rationalisation

Rationalisation was used during the middle phases of the study, and to a lesser extent during the first and last phases (see Fig. 5.7 and Table 5.6). The mean usage of rationalisation as a coping mechanism was higher than religion or denial. During phase 1 and 2 the average score was 2.8; and during phases three and four 2.8 and 2.7 respectively. These represent high levels if taken into account that the scale only ranges

between 0 and 3. Rationalisation includes a conscious reasoning as to why the cadaver is important and the situation necessary to achieve a “higher” goal, which is entering a future profession.

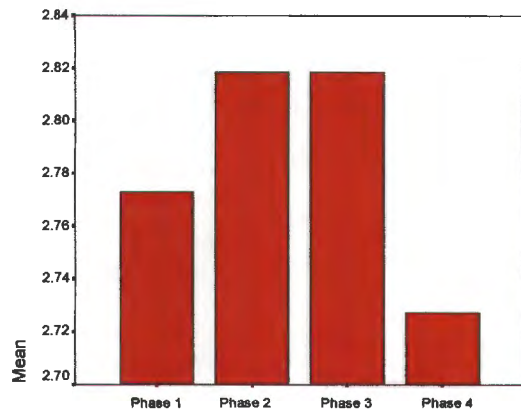


Figure 5.7 Rationalisation as coping strategy

(b) Humour

Humour was not used during the first phase of the study. The participants increased the use of humour to cope during the four phases, and it was used often during the last phase (see Fig. 5.8 and Table 5.6). The mean usage of humour as a coping mechanism was 1.1 during phase 1 (preparation, before dissection starts); 1.2 during phase 2 (first dissection period); and 1.4 and 1.5 during phases 3 (after two weeks) and 4 (after three months respectively). These do not represent extremely high levels if taken into account that the scale ranges between 0 and 3. Humour mostly involved the telling of jokes at the dissection table, both about the cadaver and also other jokes not involving the dissection experience.

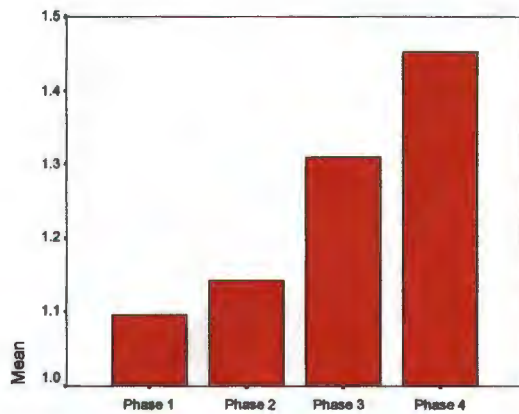


Figure 5.8 Humour as coping strategy

5.3.1.3 Avoidance behavioural coping

Avoidance behavioural strategies are used during the first phase (see Fig. 5.9 and Table 5.5) and the usage thereof then declines during the actual dissection phases (phases two to four). Avoidance behavioural strategies are aimed at avoiding the dissection hall or its activities. Avoidance behavioural strategies (for example the use of substances) were used with an extremely low frequency if considered on a 300-point scale (see Fig. 5.1). Frequencies of 9.1 during phase 1; 4.5 during phase 2; 3.0 during phase 3 and 1.5 during phase 4 were reported.

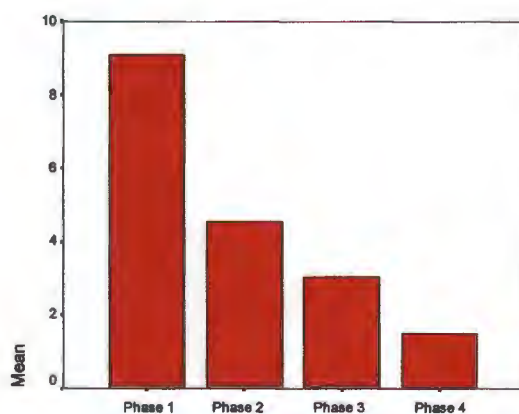


Figure 5.9 Avoidance behavioural coping strategies

Substance usage was the only type of coping strategy in this category that was used by dissectors.

(a) Substance usage

Substance usage occurred often and to a large extent during the first phase; the usage of substances declined rapidly after the first phase (see Fig. 5.10 and Table 5.6). The substances used included prescribed tranquillisers and alcohol. The results should be interpreted with caution since the substance usage was extremely low. All the values in the graph for all the phases were below 0.1.

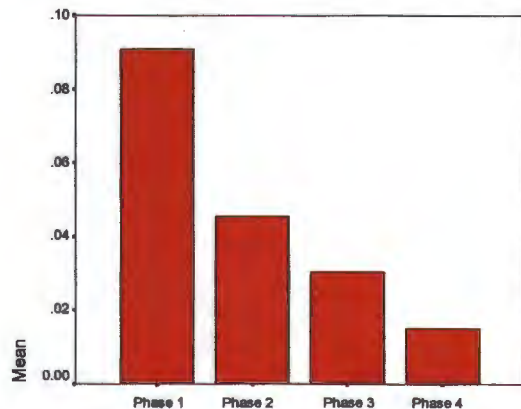


Figure 5.10 Substance usage as coping strategy

5.3.1.4 Avoidance cognitive coping

With a decline in avoidance behavioural strategies an increase in avoidance cognitive strategies is observed (see Fig. 5.11 and Table 5.5). Avoidance cognitive strategies include those that emotionally and cognitively aim to avoid the feelings associated with the dissection hall activities. Repression and denial are the strategies included in this type of coping. Avoidance cognitive strategies show low frequencies, although not as low as that of avoidance behavioural strategies. Frequencies of 97.6 during phase 1; 101.1 during phase 2; 102.3 during phase 3 and 104.5 during phase 4 were reported. These represent moderate to low levels if taken into account that the scale ranges between 0 and 300 (Fig. 5.1).

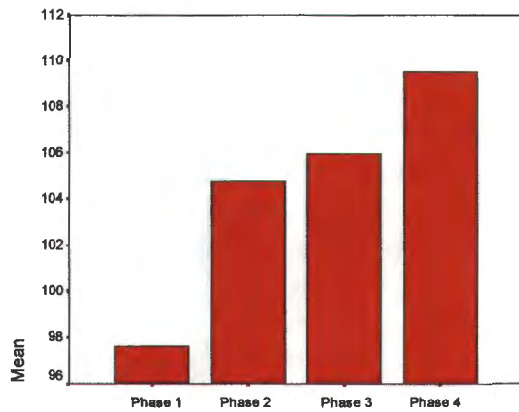


Figure 5.11 Avoidance cognitive coping strategies

Repression and denial was two coping strategies included in the avoidance cognitive category. A description of these two types of strategies will follow.

(a) Denial

Denial included perceptions by the students that the cadaver was not a “real” person and was used during the first and the last phase of the study (see Fig. 5.12 and Table 5.6). The mean usage of denial as a coping mechanism was 1.2 during phase 1 (preparation phase); 1.1 during phase 2 (exposure); 1.1 during phases 3 (two weeks after dissection started); and 1.2 during phase 4 (after 3 months). These averages are also relatively low if the 3-point scale is taken into account.

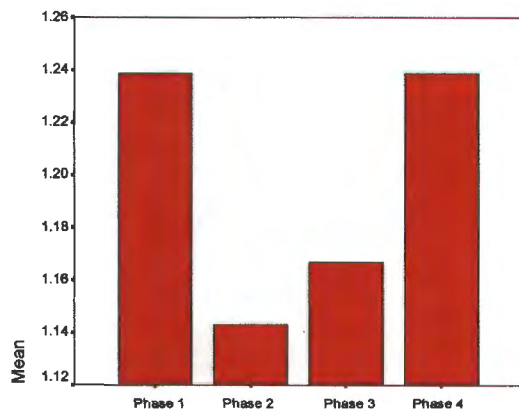


Figure 5.12 Denial as coping strategy

(b) Repression

Repression was not used much during the first phase of dissection, but increased to be used to an equal extent during the last three phases (see Fig. 5.13 and Table 5.6). The mean usage of repression as a coping mechanism was 0.7 during phase 1 (preparation, before dissection starts) and 0.9 during the other three phases. These represent low levels on a 3-point scale with the highest value being 0.9.

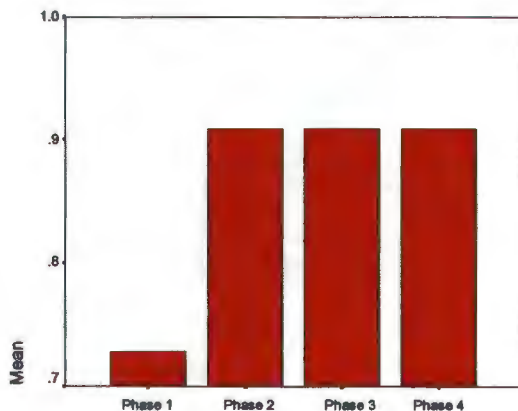


Figure 5.13 Repression as coping strategy

5.3.2 Statistical analysis results of quantitative analysis of coping strategies

The following hypotheses regarding coping strategies were tested:

- H 11: Students with high anxiety levels will make more use of coping strategies than students with low anxiety levels.
- H 12: Students with high anxiety levels will use active coping strategies more often than avoidance strategies.
- H 13: The use of coping strategies will decrease over time between phases 1 and 4 of dissection.
- H 14: Students will use different coping strategies in the different phases of dissection.

5.3.2.1 Correlation between total coping scores and anxiety level

The correlation between the total coping scores in the four phases of dissection and anxiety levels were investigated. The average total coping score for the students was 18.59 (SD=5.50) for phase 1; 20.72 (SD=4.95) for phase 2; 20.68 (SD=3.27) for phase 3 and 19.68 (SD=4.40) for phase 4. No correlation was found between the total coping score and the anxiety level experienced during any of the dissection phases. Hypothesis 11 can therefore not be accepted.

5.3.2.2. Correlation between coping category and anxiety level

The correlation between anxiety levels and students' use of coping strategies was investigated. No clear pattern of correlation was evident between specific coping categories and anxiety levels. Only two isolated correlations within a specific phase were noted. When the four broad categories were correlated with the *Manifest Anxiety scores* a statistically significant correlation was found with avoidance behavioural strategies during phase 3 ($r=0.464$, $p=0.03$) (see Table 5.7). Categories were correlated with the *Death Anxiety scores* and a statistically significant correlation was only found with avoidance behavioural strategies during phase 4 ($r=0.478$, $p=0.024$) (see Table 5.8). This means that the frequency of use of avoidance behavioural coping strategies (such as substance usage) increased with an increase in anxiety level for the specific phase. Since these statistically significant correlations only exist for these two phases, (for different measurements and without any pattern) it is clear from the results that no correlation exists between type of coping strategy used and anxiety level. Hypothesis 12 can therefore not be accepted.

Table 5.7 Pearson correlation between Manifest Anxiety level and coping category

	Phase 1		Phase 2		Phase 3		Phase 4	
	r	P	r	p	r	p	r	p
Active behavioural phase 1	-0.01	0.945						
Active behavioural phase 2			-0.05	0.831				
Active behavioural phase 3					-0.36	0.095		
Active behavioural phase 4							-0.08	0.707
Active cognitive phase 1	-0.60	0.062						
Active cognitive phase 2			-0.17	0.445				
Active cognitive phase 3					0.03	0.873		
Active cognitive phase 4							0.00	0.978
Avoidance behavioural phase 1	0.12	0.566						
Avoidance behavioural phase 2			0.39	0.070				
Avoidance behavioural phase 3					0.464	0.030*		
Avoidance behavioural phase 4							-0.22	0.313
Avoidance cognitive phase 1	0.15	0.508						
Avoidance cognitive phase 2			0.23	0.295				
Avoidance cognitive phase 3					0.14	0.517		
Avoidance cognitive phase 4							0.05	0.811

* significant at level $p < 0.05$

Table 5.8 Pearson correlation between Death Anxiety level and coping category

	Phase 1		Phase 2		Phase 3		Phase 4	
	r	p	r	p	r	p	r	p
Active behavioural phase 1	-0.10	0.655						
Active behavioural phase 2			-0.82	0.723				
Active behavioural phase 3					-0.21	0.341		
Active behavioural phase 4							-0.31	0.156
Active cognitive phase 1	0.06	0.869						
Active cognitive phase 2			-0.40	0.065				
Active cognitive phase 3					-0.04	0.833		
Active cognitive phase 4							0.30	0.170
Avoidance behavioural phase 1	0.09	0.684						
Avoidance behavioural phase 2			0.29	0.185				
Avoidance behavioural phase 3					0.08	0.708		
Avoidance behavioural phase 4							0.47	0.024*
Avoidance cognitive phase 1	0.30	0.177						
Avoidance cognitive phase 2			0.11	0.608				
Avoidance cognitive phase 3					0.01	0.949		
Avoidance cognitive phase 4							0.34	0.115

* significant at level $p < 0.05$

5.3.2.3 Changes over time for each coping strategy

Each coping strategy was investigated for changes over time. As can be seen from Table 5.9 there is a significant difference in the active behavioural coping category during the four phases as measured by Friedman's Chi squared test ($\chi^2=20.936$, $p=0.000$). It would seem that the use of an active behavioural strategy decreases from the first two phases (anticipating dissection and the first dissection experience) to the last phase (after three months of dissection). It is clear from the results that there is a significant difference between the different phases for the use of active behavioural coping. No statistically significant difference was found for any of the other coping categories, indicating that the use of these strategies did not change over time. The frequency of the use of these three types of coping strategies seemed to stay the same over the four dissection stages. Hypothesis 13 could therefore only be accepted for the use of active behavioural strategies.

Table 5.9 Friedman's Chi squared test for changes in the timing of events

Coping category	χ^2 squared test		Ranks			
	χ^2	p	Phase 1	Phase 2	Phase 3	Phase 4
Active behavioural	20.936	0.000 *	3.03	3.05	2.45	1.48
Active cognitive	5.435	0.143	2.85	1.75	2.65	2.75
Avoidance behavioural	2.538	0.468	2.61	2.52	2.43	2.43
Avoidance cognitive	2.928	0.403	2.14	2.71	2.55	2.60

* significant at level $p < 0.05$

It is also interesting to see that behavioural and cognitive strategies (in both active and avoidance strategies) are mirror images of each other, that is if the behavioural strategy increase then the cognitive strategies decrease and vice versa (see Fig. 5.14).

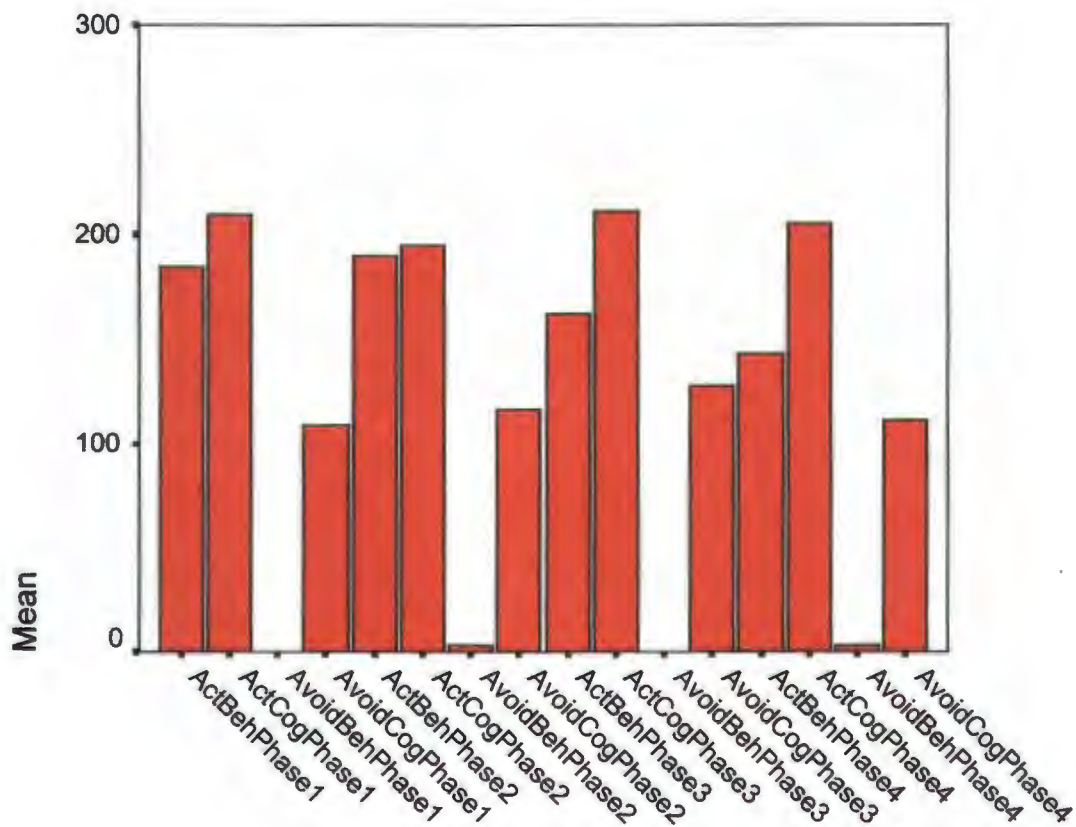


Figure 5.14 Four categories of coping strategies for all four stages

5.3.2.4 Investigation of dissection stages for differences in coping strategies

Table 5.10 (and Fig. 5.14) report on the results obtained when the different dissection phases were investigated to ascertain whether one type of coping strategy is more dominant in a particular phase of dissection. There is a significant difference between the different coping categories for each one of the four phases of dissection. For phase 1 (anticipating dissection) a Friedman's Chi squared test revealed a significant difference between the four coping categories ($\chi^2=25.701$, $p=0.000$). Significant differences were also found for phase 2 (first dissection practical) $\chi^2=49.165$, $p=0.000$; for phase 3 (after two weeks), $\chi^2=54.486$, $p=0.000$ and for phase 4 (after three months) $\chi^2=53.542$, $p=0.000$. This result indicates that the four categories of coping strategies were not used with the same frequency, but that one type of coping strategy was more prominent than

the other types. For each of the four phases active behavioural and cognitive coping categories ranked higher than avoidance coping categories. It can therefore be concluded that active types of coping strategies are used more frequently than avoidance strategies during all the dissection phases. Hypothesis 14 can therefore be accepted for more frequent use of active coping strategies.

Table 5.10 Friedman’s Chi squared test for differences amongst the different coping categories for each dissection phase

Timing	χ^2 squared test		Ranks			
	χ^2	p	Active/Beh	Active/Cog	Avoid/Beh	Avoid/Cog
Phase 1	25.701	0.000 *	3.30	3.60	1.05	2.05
Phase 2	49.165	0.000 *	3.45	3.36	1.07	2.12
Phase 3	54.486	0.000 *	3.20	3.64	1.05	2.11
Phase 4	53.542	0.000 *	3.09	3.70	1.07	2.14

* significant at level $p < 0.05$

5.3.3 Qualitative results as obtained from participants’ own reports with regard to their coping strategies

The following were common themes as extracted from the open-ended part of the questionnaire that dealt with coping strategies.

5.3.3.1 Coping strategies in phase 1

Most of the aspects that students described as helping them cope with the forthcoming dissection included seeing or *visualising the cadaver in a very physical manner*. Statements such as “the cadaver is not human”, “the study will focus on a physical level” and the cadaver was used to “gain knowledge” were repeated by more than ten students. The body was also seen as less important than the soul or spiritual being. A theme that was linked to this and that was very prominent was that the body was seen as a tool to *gain scientific information* and to further their careers.

Some participants *detached themselves from the situation*. This theme is linked to the first theme of seeing the cadaver in a physical way. Participants wanted to learn and not overanalyse the situation. Another way of doing this was to be convinced that being a cadaver was a choice that “the owner of the body made” before death. This led to feelings of thankfulness (towards the soul of the body but also to God). Respect for this body/cadaver was also expressed often.

Some participants wanted to achieve a *mental preparedness* and tried to reason that this was an important part of their career. Some participants felt that if other students had coped before them, they needed to do the same, especially since this was an important part of their study career. Every career has positive and negative aspects and, after all, this was their own choice.

Physical strategies include getting more exercise, participating in sport, and trying to live a balanced life.

Social relationships, including friends (both those involved in dissection and those not taking part in dissection) and family, played an important role in this phase. Participants also anticipated that the lecturers would help them cope, as well as the repeat students in the class who had previously been exposed to the situation.

5.3.3.2 Coping strategies in phase 2

In the second phase of dissection (the first dissection period) the cadaver is still viewed as only a “*physical entity*”. The cadaver is a “tool to gain knowledge”, and not real.

Physical solutions during this phase are expressed as actions in the dissection hall. Participants cover the faces and hands of cadavers and isolate the body region that they are dissecting.

The *social relationships* that were deemed important by the respondents now changed from family and friends in general, to family and friends that shared the dissection experience (either by previous exposure or by being fellow students). It is noticeable that the students' anticipation of social support from friends (who are not in same study situation) and lecturers seemed to have changed. The "us" group dissect together and the "them" group (consisting of outside friends) do not understand or have sympathy for the dissection anxiety that dissectors experience.

Some students are *focussing on the work*. "I want to keep up to date", "I take part as much as possible" and "I am here to learn".

5.3.3.3 Coping strategies in phase 3

During the third phase (after two weeks of dissection) the emphasis has shifted from viewing the cadaver in a very physical manner to a strong urge to *gain knowledge*. Most responses dealt with the aspect of constant hard work, trying to keep up to date, studying hard and even preparing for the next sessions.

Social interventions include participating in sport and socialising with friends. Peers are also play a more important role. Study groups form and close relationships (such as a "wife") are mentioned for the first time.

For the first time *humour* was reported as a coping strategy. The seriousness has given way to a more relaxed manner, both inside and outside the dissection hall.

All the responses for this phase dealt more with *realities* (such as the work load) than with philosophical comments on the spiritual aspects of the cadaver.

5.3.3.4 Coping strategies in phase 4

It seems that the coping strategies in the fourth phase were more focussed on dealing with the *realities of life*. The themes for this phase were the same as that for the third phase. The cadaver was still seen as *a tool to gain knowledge*. The participants felt more *interested and amazed* by the human body and form. They still deal with the work and try to keep up. They also use active strategies such as *confront their fears* by more frequent visits to the dissection hall. They also try to relax when outside the dissection hall. *Humour* and “laughing” plays a more important part in this phase.

5.3.4 General conclusions with regard to coping strategies used

From both the qualitative and quantitative results it seems that no clear pattern emerged with regard to a “better” type of coping, that is to say a coping strategy that is positively correlated with lower levels of anxiety. Where a correlation was found it was only for one phase. It seems that the type of coping strategy is not related to the anxiety level, but rather to the timing of the events or the phase of the experience.

Some interesting student behaviour was observed. This could be part of the coping strategies that they use, or just rituals that they developed in dealing with dissection (see Box 5.1 for examples)

Box 5.1 Observation of behaviour related to anxiety:

The following are a few observations, by Anatomy staff members involved with teaching in the dissection hall, of actions taken by students to relieve anxiety related to dissection. The observations stated here are all physical ways for students to deal with aspects of the dissection that could be disturbing to them.

- Most students covered the faces of the cadavers with a cloth.
- Some students also deliberately covered other body parts that they found sensitive, e.g. the hands.

Students frequently stated that they felt upset by looking at specific features of the cadaver that they considered to be very personal, especially the face, hands and genitals (perineum). Covering these parts formed a very physical barrier between them and certain aspects of the cadaver that they found difficult to handle. This habit was continued in some cases even after the specific region had been dissected.

5.4 BEHAVIOURAL CHANGES

The following hypothesis were tested:

H 15: There is a positive correlation between anxiety level and behavioural changes due to dissection.
H 16: Behavioural changes due to dissection decrease from dissection phase 1 to dissection phase 4.

Very few participants reported changes in their behaviour. The average frequency of behavioural changes did not differ between the four phases of dissection (see Table 5.11). These frequencies are very low if considered that the minimum score was 0 and the maximum score 6. Few respondents reported any changes in behaviour due to dissection. No correlation was found between anxiety level and behavioural changes for any of the phases. Hypotheses 15 and 16 can therefore not be accepted.

Table 5.11 Frequencies of behavioural changes

	Phase 1	Phase 2	Phase 3	Phase 4
Average	0.27	0.36	0.36	0.36
Range	0-2	0-2	0-3	0-3
SD	0.63	0.72	0.84	0.78

The following qualitative report is based on very limited responses. With regard to the question on changes in *eating habits* for phase 1 (before dissection started) only one respondent reported a change in eating habits. This person reported not being able to eat chicken. For phase 2, five participants reported changes in eating habits. They were not able to eat scrambled eggs, butter, oil or fat. Some reported eating more and others to eating less or more healthily. For phase 3, two participants responded. They reported eating less and more healthily and both avoided fat. Two participants reported not eating sweet corn or scrambled eggs during phase 4. A healthier lifestyle was also mentioned here.

Three respondents gave an answer to the question on *physical exercise*. During all the phases these respondents reported an increase in physical exercise, as a method to relax.

No respondent reported an increased intake of *alcohol* during any of the phases. Since anonymity was ensured, it would seem that this was an honest answer given.

Only one respondent reported changes in *sleep patterns* and this was only for the first (before the first dissection period) and last phases. During the first phase the respondent reported that it was difficult to fall asleep because of excitement. During the last phase the workload led to sleeplessness.

Not many *dreams* were reported on. Only during phase 3 and phase 4 did one respondent indicate experiencing dreams related to dissection. In phase 3 the dream was about a question involving the arterial supply to the forearm. This dream was distressing because the answer was wrong. The dream during phase 4 involved a family member transporting a cadaver in order to “swop” it for a less smelly one.

In phase 1, two participants reported changes in their *social activities*. They reported that their non-dissecting friends felt “weird” to them because they did not understand the dissection situation and the emotions caused by it. During phase 2, one respondent reported that less time was spent with friends. This was due to the fact that less time was available and because the friends did not understand the dissection issues. The respondent felt that the friends also did not understand that life now had a different meaning. During phase 3, two respondents felt that they had no more time for friends, since the workload was too heavy. This was also the case for phase 4.

It is clear from these results that very little change had occurred in the behaviour of these students. Apart from a few individual changes, there was no major change in their eating habits, physical exercise, alcohol usage, sleep patterns or dreams. Changes in social activities were mostly related to the heavy workload and not directly to dissection activities.

5.5 SUMMARY OF RESULTS

The results of the present study showed that levels of anxiety (as measured by manifest and death anxiety scales) were low for “alternative” health care students. The phase with the highest anxiety level was the first phase (anticipation about dissection). The anxiety levels then decreased consistently during the subsequent phases. Coping strategies were not related to the anxiety level, but rather to the phase of dissection that was relevant to the specific time. Active behavioural coping strategies were more prominent during the initial phases of dissection. Avoidance behavioural strategies were prominent during the first phase and then steadily decreased, while avoidance cognitive strategies were found to increase from the first to the last phase.

As with coping strategies, the results suggest that appraisal did not differ amongst individuals with different anxiety levels, but rather changed as the situation (dissection) changed. This was especially true for the appraisal of social support. These appraisals changed from perceiving support to come from friends outside the dissection experience, to relying closely on friends within the dissection hall and those sharing the dissection experience.

An important aspect for the participants was the peer tutoring system. The guidance they received from students who had already experienced dissection the previous year (2000) proved to be invaluable.

It was also found that few participants reported any behavioural changes that they could relate directly to the dissection hall activities. Only a few reported avoiding food that physically resembled fat (such as scrambled eggs) or having dreams about the dissection hall.

As an interesting ending to this chapter a few anecdotes on individual reactions are presented. The following Box 5.2 contains short narratives about two specific students

and their experiences. The students did not form part of the study, but their “stories” do have interesting aspects relevant to the current study.

Chapter 6 will provide a discussion of all the results pertaining to dissection anxiety. It includes aspects that were found to be in contrast to previously reported studies (such as the differences between people of different ages and sex) and contains interesting discussions as to the causes of these apparent discrepancies.

Box 5.2 Individual “stories”

Anna:

Anna wrote a highly emotional letter before leaving the Anatomy course after just two weeks of dissection. The letter referred to aspects of dissection that she perceived to be very distasteful. She, for example, mentioned that dissecting the female breast was very upsetting to her, especially since it made her feel that they were disrespectful towards and actually mutilating the body. She was seen leaving the dissection hall frequently, smoking and crying outside. It must be stressed that this student left the course due to failing the first year supplementary exam. She also admitted during a personal interview to having previously suffered from anorexia and other psychological disorders. The letter therefore could not be seen as a true reflection of the effects of the dissection situation. Rather it was used in an attempt to blame the dissection situation to justify her exclusion from the course. This trend is also seen with other students who are excluded from the course due to non-performance.

Brenda:

Brenda dissected for the first time during 2000 and lost her father during the latter part of the year. He died of a heart attack with her being a witness to the whole process. For most of the year she was unable to enter the dissection hall. She studied in the anatomy museum, as she was able to accept the presence of dissected specimens (which were expected by staff members to be more disturbing to students than “whole” cadavers). She reported that the sight of “whole” cadavers was so upsetting that she could not stand it. She had a very good social support network in the form of her family and her boyfriend, who was a final year chiropractic student. She failed the year, despite attempts to allow her to write the supplementary exam. She had also failed all earlier tests in 2000 before her father passed away. She thought that repeating the second year Anatomy course would benefit her most. Concerns about her ability to master dissectional requirements were proved to be unfounded. She repeated the year and obtained distinctions for all tests and exams during 2001.

CHAPTER 6

DISCUSSION, CONCLUSION AND RECOMMENDATIONS



Andreas Vesalius

CHAPTER 6

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

The main aims of this study were to determine the extent of the psychological influence that human cadaver dissection has on Homoeopathic and Chiropractic students and to describe the changes that occurred in their behaviour and the coping strategies that they used to overcome the psychological anxiety associated with dissection. Changes in anxiety levels, behavioural changes and coping strategies over time were also investigated. It was found that the students of Homoeopathy and Chiropractic at the Technikon Witwatersrand generally experience low levels of anxiety.

6.1 ANXIETY

6.1.1 Anxiety levels

The anxiety levels of the students of Homoeopathy and Chiropractic seem to be very low on both the Manifest Anxiety Scale and the Death Anxiety Scale. Death Anxiety is more prominent and its actual scores higher than those for Manifest anxiety. This could indicate that students actually have higher levels of fear for death than they have for a specific stressor - in this case dissection. Their manifestation of anxiety about dissection is lower than their direct anxiety about death.

The anxiety levels did not stay constant throughout the dissection phases, but decreased from phase 1 to phase 4. The highest levels of anxiety were found during the anticipation phase of dissection (before the dissection started) and not during the first dissection period as would be expected. Most other studies found that the phase with the highest levels of anxiety was the first dissection period, which involves the first sight and first incision of the cadaver (Abu-Hijleh *et al.*, 1997; Evans & Fitzgibbon, 1992; Nnodim, 1996; Shalev & Nathan, 1985; Stewart *et al.*, 1997). Hancock *et al.*, (1998) found high levels of anxiety for occupational and physiotherapy students even after eighteen months,

i.e. at later stages of dissection. As was found in the present study, Penney (1983) reported that students had higher levels of anxiety in anticipating dissection. She did not use an anxiety scale, but instead used attitudes towards dissection and different emotional feelings. She suggested that if students were mentally prepared for the dissection it would decrease their anxiety levels. This could explain the finding (that students present with high levels of dissection anxiety before they start dissecting) of the present study. Another possible explanation would be that the questionnaires used in this study indirectly also contributed to the progressive decrease in anxiety levels. The questionnaire, consent form and cover letters (see Appendix C) could have made students feel that the cause of their anxiety was addressed and that help would be available to them.

Another very important aspect, which might have impacted on the finding of low anxiety in the present study, is the peer tutoring that these students underwent during their first year Anatomy course (see Box 6.1 and Fig. 6.1). The second year students introduced the first years to a different level of understanding, not only regarding the course content and the relevance thereof for their second year Anatomy course, but also of the relevance of the first year course to other subjects and their future careers.

A second important aspect of using the peer tutors was that the students were allowed from the second block (after April) to visit the anatomy dissection hall when accompanied by the second year students. They were allowed to view muscles and other relevant aspects of the cadavers. In this respect the first year students were well aware of what was to happen in the dissection hall in their second year. This exposure to the cadaver in a relatively non-threatening situation can result in lower anxiety when actual dissection starts (Horne *et al.*, 1990; Penney, 1985). They achieved this knowledge about the dissection hall activities not from lecturers (who at the first year phase are still regarded as distant and uninvolved) but from their peers.

Box 6.1 Peer Tutoring

The peer tutoring system was developed and implemented at the Witwatersrand Technikon during 2000. This was the year when the participants of the present study was in their first year of study and thus being tutored. It was mainly aimed at helping second year students revise their Osteology knowledge. Each second year student was assigned a first year student for whom they took responsibility.

Second year students were allowed, later in the year (after the second semester started) to accompany their first year peers into the dissection hall. This was aimed to help the first year students identify the tissue and organs that they were studying in Histology. An attempt was thus made to help students visualise structures that they only see using a microscope and slides of human tissue.

A second, indirect, goal was that it provided first year students with an "informal" opportunity to visit the dissection hall before they begin their second year of study and start to dissect. It seemed that students felt more at ease entering the dissection hall (voluntarily) in the presence of a "peer tutor".

The students that participated in the present study were tutored in their first year, that is during 2000. At the time of the present study, the participants of the study did not yet act as tutors themselves (being in second year in 2001) but only started the peer tutoring later in the year. This slight delay is an attempt to help second years adjust to the dissection hall and the workload of the second year, before taking on the added responsibility of tutoring first years.

The use of the peer tutoring system was received well by students, both first and second year students. Second year students felt proud and valued the confidence expressed towards them by both lecturers and their junior fellow students. The first year students appreciate the opportunity to discover aspects of anatomy in a non-threatening situation with peers that is perceived as more sympathetic than lecturers or more senior students that have "forgotten" the stresses associated with studying Homoeopathy and Chiropractic.

All these experiences (viewing the cadaver in advance, talking about their feelings and apprehensions to second year students in situations that were not threatening could explain the lower anxiety levels. It must also be mentioned that the participation in dissection hall activities was completely voluntary for first year students. Second year students attended a lecture on behaviour, respect towards cadavers and peer tutoring skills prior to allowing them to mentor/tutor first year students. The first tutoring session was also not conducted early in the year when the second years themselves still felt

anxious. A few second years referred first year students to lecturers if they felt that the students were too anxious. None of the students (first or second year) reacted in a negative or disrespectful manner towards the cadavers. Informal investigation into why the anxiety levels were lower than for previous years (as found in the pilot study) revealed that most participants felt that seeing the cadaver during their first year helped them adjust faster. This mentoring system was also employed by a medical faculty in the Netherlands, but with the main aim being to help first year students adapt to medical school (Slockers *et al.*, 1981). They also achieved very good results. Hendelman and Boss (1986) also promoted the use of peer tutors. They reasoned that students learn more easily from their peers and also learn to become independent self-learners for life-long learning.



Figure 6.1 Peer tutoring in the Anatomy museum

A difference between the current study and the pilot study with regard to anxiety levels was evident. Anxiety levels were higher in the pilot study. Both studies involved the same (Homoeopathy and Chiropractic) environment and more or less the same sample

characteristics (with regard to age, sex, previous experience with death and dying). Peer tutoring could explain the difference in anxiety levels of students in the two studies. The students who participated in the pilot study did not participate in peer tutoring in their first year. Another possible explanation is that the pilot study was a retrospective study where participants were only asked to comment and complete the scales in September. They were therefore unaware of the study during the phase before the dedication ceremony. These were the only differences between the two studies, with the peer tutoring system being the most important new aspect.

6.1.2 Biographical variation in Anxiety Levels

In the present study it was found that although women scored higher on the Death anxiety scale than men, this difference was not statistically significant. Evans and Fitzgibbon (1992), Shalev and Nathan (1985) and Stewart *et al.* (1995) also found no difference between males and females with regard to anxiety in the dissection hall.

The findings of Abu-Hijleh *et al.* (1997), Charlton *et al.* (1994), Dickinson *et al.* (1997) and Guthrie *et al.* (1995) that females had significantly higher Death anxiety levels for all stages, were confirmed by findings from the pilot study, that preceded the current study.

One possible explanation for the absence of sex differences in the current study is that males and females in this group have the same social role. They are entering a profession that previously was seen as a male domain. Perhaps females are “expected” to act in a more masculine manner. Or possibly there are no perceived masculine and feminine roles in these professions and the students do not act differently according to their sex.

As with sex, no age differences were found. Evans and Fitzgibbon (1992) found that more mature students were less stressed, but could not find statistically significant differences in level of upset about dissection hall activities. Shalev and Nathan (1985) found that older students seem to cope easier. Some studies found no difference between age groups (Dickinson *et al.*, 1997). The age differences or spread in the present study

group were not that prominent and maybe contributed to this finding. The most mature student was 27 years of age, 9 years older than the youngest participant. Perhaps this age difference was not large enough to show the real differences that were expected from more mature students.

Individual observations and interviews with more mature students during the pilot study and also on other occasions (involving students of 40-50 years of age) gave a different impression. These mature students felt frustrated at being in a class with juniors who wanted to have fun and were not as dedicated to their work. Interestingly, these more "mature" students were also the ones taking the lead in requesting "spoon feeding" (root learning) type of teaching. Dealing with dissection was not necessarily easier for them.

Of the 22 participants only one was married and any conclusions regarding the role of marital status would therefore be invalid. Dickinson *et al.* (1997) found no difference between married and single participants with regard to Death Anxiety in the dissection hall situation.

An informal observation was that the married participant frequently discussed the role of the marriage partner, as a social support structure in coping with dissection. This will be further discussed in the coping strategy section.

"Alternative" health care students (such as Homoeopathy and Chiropractic) presumably have higher anxiety levels than medical students and other allopathic health care students. The assumption is made due to the fact that Homoeopaths and Chiropractors, unlike allopathic medical practitioners, are not allowed to perform any invasive diagnostics or therapy. It was therefore hypothesised that these students would show higher anxiety levels in dealing with cadavers, since they do not see this phase of their training as a preparation for surgery or for patients dying (in e.g. trauma units) where they will be working. It was found during the pilot study, that 50% of the "alternative" students expected to be confronted by death and dying one day in their practices. On investigation of this the relevant students replied that they expected most of their patients to be either

terminally ill or suffering from illnesses that could not be treated by allopathic treatments. They therefore expected that more of their patients would die. "Alternative" health care students felt they treated in an holistic manner and become involved in both physical and mental aspects of their patients and that they would be affected more when a patient dies. This lead to the belief or hypothesis in the present study that the students of Homoeopathy and Chiropractic might have higher Death Anxiety and Manifest Anxiety levels than their allopathic counterparts. Although this was true for the pilot study (during 1999), it was not true for the present study.

The participants in the present study showed lower death anxiety than medical students (Dickinson *et al.*,1997) and also lower levels than those of Homoeopathy and Chiropractic students in the pilot study. This could be explained by the peer tutoring that exposed the students to the dissection hall and could have aided these students in coping with anxiety in the present study.

One would expect Chiropractic student to experience higher levels of anxiety than Homoeopathy students since they do not anticipate losing patients as often as Homoeopathy students. Chiropractic students tend to be different in behaviour and personality (more extroverted) as compared to Homoeopathy students who are more introverted and less physically inclined. Homoeopaths are more focussed on mental symptoms and signs than Chiropractors, who almost exclusively deal with physical signs and symptoms. This expected higher level of anxiety was not evident from the results of the present study. There was also no significant difference found between Homoeopathy and Chiropractic students with regard to their anxiety levels. This could possible be explained by the fact that the students of Homoeopathy and Chiropractic are treated the same in the dissection hall. No distinction is ever made between the students, and staff deals with the students as one Anatomy class. Both groups also underwent the same peer tutoring system, possibly with the same effect on both groups.

With regard to cultural differences in anxiety levels no differences were found, most probably due to the small sample size for some of the cultural groups. Charlton *et al.* (1994) also found no difference between ethnic groups for dissection anxiety.

Religion also did not seem to play a part in the anxiety levels in the present study. No significant difference for the extent to which the participants regarded themselves as religious was found either. This is in contrast to Lonetto and Templer (1986) who found that frequent visits to religious gatherings lowered anxiety. Other authors, however, found that the frequency of visits and the type of religion did not significantly decrease Death Anxiety (Dickinson *et al.*, 1997; Shalev & Nathan, 1985). The results of the present study should, however, not be seen as conclusive as to the influence of religion on anxiety or its moderating effect, as the questionnaire did not involve an indepth examination of this particular aspect and the sample size was small for some groups. In the section on coping students did mention that they prayed frequently, that they relied on God, and that their religion helped them to cope. Thus religion is important with regard to coping strategies and could therefore have helped participants in this study in dealing with anxiety.

6.1.3 Summary/conclusion regarding anxiety levels of Chiropractic and Homoeopathy students

It can be concluded that participants in the present study experienced low Death as well as Manifest Anxiety levels. These low levels can be partially explained by the peer tutoring system, in which these students were the first to participate in. This system could have desensitised them to the dissection hall and it's activities. They also had sufficient and individual opportunities to discuss their apprehensions and concerns with peers.



Figure 6.2 Dissecting human cadavers

6.2 APPRAISALS

It seems that the appraisal of situations did not only affect the amount of anxiety experienced, but also the type of strategy employed by the participant. The anxiety level during the first phase was relatively higher than for the other phases, perhaps due to the fact that the threat of dissection was not physical but more an apprehension about the “unknown” situation. The coping strategies were also selected (probably not consciously) to fit with the type of appraisal given to the situation, personal strengths and environmental support.

6.2.1 Appraisal of the dissection situation

The dissection hall was viewed in both a positive and negative way. Positive appraisal included amazement and interest. The appraisals did change a bit in the sense that the interest expressed during the first phase was still present during the following phases, but in addition to this participants expressed surprise at the ease with which they adjusted and

coped with the situation. Tiberius *et al.* (1989) also reported that the students' expectations that they would find it difficult to cope with dissection, was not met. Later the responses changed to more relaxed and appreciative emotions.

On the negative side the dissection was appraised during first phase as something that had to be done, and reservations were expressed as to how they would be able to do what was asked from them. During the first dissection period (phase 2) most respondents reported feelings of disgust and feeling guilty about violation a body. From the third phase the workload seem to over shadow any feelings towards the dissection. The apprehension about the dissection was replaced by apprehension about their abilities to deal with subject content. In a sense this can be seen as a step forward. One situation was dealt with and the attention now moved on to the next stressful situation (an apprehension about the workload). This apprehension about the workload was also found by Evans & Fitzgibbon (1992) and Metheny and Sparrow (1984). They also found that students adapted fairly quickly, but that workload anxiety was high.

6.2.2 Appraisal of own abilities (strengths and weaknesses)

Respondents were very positive about their own abilities. They felt that they were determined enough to succeed. Other personality traits that they identified in themselves and felt would be to their advantage were: that they were enthusiastic, unafraid, and not affected by their emotions. They also commented on aspects that they felt they could use to cope such as a sense of humour, being respectful, and religion. These findings are consistent with that of Horne *et al.* (1990) and Evans and Fitzgibbon (1992) who found that students usually felt adequately prepared for dissection. They however found that this was more technical than emotional preparedness. They did not find that students see humour as an important aspect in coping with dissection.

During the second phase the students' appraisals of themselves were more focussed on their ability to learn, which changed during the following phases where they were more concerned about their abilities to cope with the workload. Emotional aspects and abilities

seem to be much less important during the last phases, while determination played a much more important role.

Aspects of the students' personalities that they felt were important to them in their careers, but could be a hindrance in their coping with dissection included emotional aspect such as being sensitive, compassionate, sympathetic and emotionally involved in their work.

During the first phase of dissection fear was prominent, especially fear of the unknown (including fear of the situation and also fear of not being able to cope with the situation). The students commented that they were apprehensive about working in groups and later also expressed that they would much rather work alone. These comments are not that uncommon and are experienced each year. It could be related to the time aspect, with the students spending a lot of time together in the dissection hall, working closely together and sharing emotions and personal details of their lives. This is also an important aspect in the relationship between lecturers and students. Because of the situation, the space shared and the time spend together, some students may feel threatened by sharing such an intimacy. These comments are consistent with the view of Horne *et al.* (1990) that students are usually very realistic about their expectations about the dissection experience and their own abilities to cope.

6.2.3 Appraisal of environmental factors

The environmental aspect reported by the respondents mostly concerned relationships and social support. The type of social support changed during the different phases. During the first phase participants felt that they would be supported by lecturers, something that was not present in later phases. It would seem that lecturers did not meet this expectation. Evans and Fitzgibbon (1992) also found that students regard the attitudes and involvement of staff as a way of coping with dissection. This would be an important aspect to improve on. It might be that lecturers and other staff in anatomy get so used to the dissection situation, and so unperturbed that they do not always appreciate

the anxiety that the students experience. Training in this and in how to recognise when students need more help would be a strong recommendation. The “alternative” health care students trained by the Technikon Witwatersrand are lucky in the sense that the class is small and more individual attention is given to students. Yet, making staff more sensitive to student’s anxiety would definitely help.

Another relationship that was anticipated by most students to contribute to their coping with anxiety was the relationship of friends that did not participate in dissection. Friends were defined in the beginning of the study as social relationships both in and outside the dissection hall. Students expected that they would have support from both these groups and no distinction was made between these “two groups of friends”. During the second to last phases students felt a differentiation between “them” and “us” groups. Friends that did not share the dissection experience were not supportive and did not understand what happened in the dissection hall.

Support was perceived as being received during all the phases by friends in the dissection hall, dissection group members as well as from students that were repeating the second year. The last mentioned relationship seemed to be very important to these students. This reliance on people that have had previous experience or exposure was also found to be important to people handling bodies after violent death (McCarroll, Ursano, Wright & Fuller, 1993). Group members with some dissection experience could relate on a more personal and equal way to the students dissecting for the first time. The repeat students also explained to the new students what to expect, how to go about dissection hall activities and also trained them in dissection skills such as removal of the skin, etc. This relationship merits further investigation.

The social relationship with the family also did not seem to have lived up to the expectations of the students. Close family, such as a wife and brother or sister seemed to have a positive influence, especially when the relevant person also dealt or had dealt with dissection or even handling dead bodies before. Parental pressure was perceived in a very negative way. This was not only related to the fact that parents expected their children to

cope with their anxiety but also pressure because of financial constraints. Financially the burden on these students can be quite substantial. The theoretic (pre-clinical and clinical) part of the course runs over 5 years, after which a research project has to be completed. This financial cost implication as well as the high failure rate of students sometimes render parents less supportive and they consequently apply much pressure on the students. This has a very negative effect on the students.

The only physical aspect that bothered the participants was the strong preservative formalin odor in the dissection hall. This does not seem to be a major issue, since a sound air conditioning system can remedy this and help students cope better.

6.2.4 Conclusions regarding appraisal

Student's initial expectations of dissection, as a negative experience was not really fulfilled during the second phase, when they started dissecting human cadavers. This could be due to the fact that they were mentally prepared and regarded themselves as well enough equipped to cope with the situation. The peer tutoring and social relationship, especially with repeat students and group members also contributed to them coping well. Their appraisal of the first phase (before dissection started) could explain why they experienced the highest anxiety levels during this phase.

Therefore, how participants appraised different situations, themselves as well as other environmental aspects seems to be very important. These appraisals were important in their experience of anxiety as well as the use of specific coping strategies.

6.3 COPING STRATEGIES

6.3.1 Types of strategies used

The coping strategies used by participants in this study were classified as one of the following four: active behavioural, active cognitive, avoidance behavioural and avoidance cognitive categories. Although some patterns did emerge from the classifications, the timing of events (that is the four phases of dissection) seemed to be more important.

6.3.1.1 Active behavioural strategies

Active strategies include strategies that are active or confronting in dealing with the situation. Active behavioural strategies include those where a behaviour is directed at the source of the stress or anxiety. Active behavioural strategies were mostly used during the first two phases, that is the anticipation to dissection and the first actual dissection practical. The first dissection practical was the phase with the highest frequency of usage of active behavioural strategies. This could be due to the physical nature of the threat. An active behavioural approach seems to help students cope better with the immediate situation. Some physical activities were employed by students in an attempt to deal with the anxiety caused by very specific aspects of dissection. For example by covering the faces of cadavers, students try to cope with the dissection by active means. Shalev & Nathan (1985) also found that students were upset by certain body part such as the face and sexual organs. Active behavioural strategies were much more effective than for instance the avoidance strategies, such as giving in to emotions and avoiding contact or confrontation with the cadaver and dissection hall. These avoidance strategies include leaving the dissection hall and crying outside.

Instrumental action was one of the most frequently used strategies. It was mostly used during the first phases of dissection and less frequent during the last phase. This indicates that instrumental action did not form an important part of coping once students had

settled in the dissection hall. It is likely that they reported using this coping strategy less and focussed on the task since it became part of their daily routine. Their confidence had been established and to take an active part in dissection is no longer seen as a specific type of coping strategy. In the first phases the students frequently visited the dissection hall in an attempt to get used to the situation. This could be seen as a more deliberate step on the part of the student. One that decreased as the student did not feel the need for coping with his/her anxiety (since the anxiety level had decreased).

Religion did not featured prominently as a type of coping strategy. Yet many participants reported to pray about their feelings. They also felt that a “higher being” was present during the dissection hall activities. It also seemed that students took comfort in the fact that the spirit of the deceased (that donated their body) was now in another level of existence. This type of strategy was also more prominent during the first phases of the study probably related to the dedication ceremony where a religious leader would dedicate these bodies to a “higher being”. Thus although religion was not featuring prominently in the results it might have been a “matter of fact” to the students, since they started their dissection “career” in this spirit.

It is no surprise that the *dedication ceremony* was more prominently used as a coping strategy during the first phase, that is before dissection started. This was (with rationalisation and instrumental action) one of the most frequently used strategies. The theme of respect can also be linked to this coping strategy. Part of the dedication ceremony is focussed on installing respect for the cadavers. Rules are laid down and also a history of dissection given as to place the students in the right frame of mind as to how important dissection was in the past and still is. Usually the students also feel very privileged at this stage to be afforded the opportunity to dissect a human cadaver (Weeks *et al.*, 1995). As the reality of dissection settles in and the students become used to the dissection hall and the activities therein, they tend to reduce the distance (and the respect and privileged feelings) that they felt towards the cadavers. They even feel comfortable enough to break some of the rules that seemed so natural (and realistic) during the dedication ceremony (e.g. to eat in the dissection hall, although it is prohibited).

Although this is strictly forbidden it does somehow indicate that the students have moved on to a different level of acceptance of the situation.

6.3.1.2 Active cognitive strategies

When using active cognitive strategies the person tries to deal with the situation by reasoning about it and trying to establish a reason or positive outcome for the stressors presence. Active cognitive strategies were used to a large extent but not during the second phase (this phase showed more active behavioural strategies. The second phase included the first time the students saw, touched and incised the cadaver where they used more behavioural coping strategies. During phases where the threat was not as real and the anticipation higher, the strategies were more cognitive in nature allowing cognitive reasoning to lower anxiety levels.

Rationalisation was the most frequent used strategy. This was also found by Abu-Hijleh *et al.* (1997) for Arab medical students. Although it was the most frequently used strategy for all the phases, but was especially high during the middle two phases of the study after the students started dissection. It would seem that students try and rationally convince themselves of the importance of dissection and also about issues such as that the cadavers when alive donated themselves, therefore condoning the dissection action. This was an important type of strategy to use during the phases where the anticipation was not very high but the reality of dissection very prominent. This reality is prominent during the phase when dissection started, since this was the first time that the students saw and incised the cadavers and they were still very new at dissection. The repetitive theme of respect towards the cadaver, can also be seen as a type of rationalisation. Other themes that were also very prominent was “visualising the cadaver in a very physical way” and “the cadaver is not human and real”. The body is used to gain knowledge, and is not something to be anxious about.

Descriptions of the use of *humour* to overcome anxiety related to dissection are found in the literature. Evans and Fitzgibbon (1992) found that humour was used even from the

first dissection period. Hafferty (1988) also described the use of cadaver stories told by dissectors in an attempt to alleviate anxiety. This seems to be related to the use of humour since these stories are often told to provoke either humour or shock. In the present study the students did not tell as many jokes or used humour as a coping strategy as was expected from the literature. This might be due to under reporting, since it would seem disrespectful towards the cadavers. Informal observations in the dissection hall tends to disagree with the research findings in that it seems that students do use humour and also cadavers stories to relieve tension. This is especially true for phases where they are a little more used to the cadaver and the dissection hall activities.

6.3.1.3 Avoidance behavioural strategies

When using avoidance strategies the person tries to avoid the situation either by behavioural or cognitive means. Avoidance behavioural strategies include those actions taken to try and avoid the dissection hall, such as leaving it or being absent. This did not occur often with students who participated in the current study. If students left the dissection hall it was for a few minutes and they would return afterwards. (See Box 5.2 for an example). It is important to understand that lecturers should take care to help these students with activities that they feel comfortable with and not to exclude them from dissection completely. The empathetic handling of students can help them deal with the dissection anxiety and also with dealing with death and dying in a personal and professional way (Bergum, 1994; Bertman & Marks, 1989; Charlton, 1993; Druce & Johnson, 1994; Hull, 1991; Marks *et al.*, 1997; Nnodim, 1996; Penney, 1987). It is therefore concluded that avoidance behavioural strategies are not often used in the average and day to day coping with dissection but it could be very important to specific situations and individuals.

The coping strategy that was reported least often was the *use of substances*. Although substance use was very low some changes over time was evident. The use of substances was reported to be higher during the first phase and this usage decreased in the following

phases. The use can probably be related to a “quick fix” type of strategy to deal with the initial anticipation anxiety, or uncertain phase of the dissection experience.

6.3.1.4 Avoidance cognitive strategies

Avoidance cognitive strategies include those coping mechanisms that are employed as to repress the effect and emotions associated with the stressor. Avoidance cognitive strategies were more prominent during the phases where reality has settled in and the student has to cope with a continuous situation. It seems that *active* strategies are more useful than *avoidance* strategies and avoidance behavioural strategies more useful than avoidance cognitive strategies. (See Box 5.2 for an example of the use of an avoidance cognitive strategy, which did not lead to the resolution of the student’s problem.)

Repression was used with rather a low frequency. It was not used often during the first phase but used more during the last three phases. Students during the last phases try not to think about the cadaver once outside the dissection hall. This was maybe not used as frequently as expected due to the very prominent presence of the cadaver and dissection in their lives. They spend 12 ½ hours per week in the dissection hall and to try and repress the situation and its mental consequences would be very difficult, and maybe not a very effective way to deal with the situation. Themes on this type of coping strategy were not found in the qualitative aspects of the questionnaire. Some students that did leave the dissection hall to cry, or tried to repress their feelings were reported by students that left the course after the first phase.

Denial was used often, with a very high frequency during phase 1 and 4 (the phases with the highest and lowest average anxiety levels). During some phases, coping strategies are directed towards trying to deal with realistic anxiety provoking aspects of the dissection situation, such as visualisation of the cadaver. When the novelty of dissection is over and having to cope with the workload is prominent, denial rather than rationalisation is used. It seems that it is better and more effective to deal with the situation in a way that removes you from the situation. The qualitative data also revealed that the participants

detached themselves from the situation. They do not over emphasise or analyse the situation but try to distance themselves. Denial was in the same way also a common strategy used by personnel that had to handle bodies after violent death (McCarroll, Ursano, Wright & Fullerton, 1993).

6.3.1.5 Summary of types of coping strategies used

The strategies used most often were those involving active intervention. The students seem to be actively involved in preparing themselves mentally for the dissection. They also used denial and instrumental action as methods to cope. The active behavioural strategies (that were mostly present during the phases that involved direct confrontation with the cadaver) included strategies such as physically covering the faces of the cadavers and rationalising the situation. Avoidance strategies were not used that often. Avoidance behavioural strategies were more prominent during the first phase of anticipating dissection and the cognitive strategies more prominent during the last phases where coping with the “boring” aspects of continuous dissection.

6.3.2 Coping strategies and Anxiety level

It seemed that the level of anxiety (both Manifest and Death Anxiety) was not dependent on the type of coping strategy used by the participant. It would therefore seem that it is not a specific type of coping strategy that is related to a better outcome (lower anxiety). It was noted that specific strategies were employed at specific phases that dealt with different types of situations. The type of threat in the dissection situation during phase 1 was that of anticipation and during phase 2 it was more a physical threat. During phase 3 and 4 the workload and continued intensive labour was the most important aspects of the situation. As these aspects changed during the phases so did the coping strategies used by the participants. It can therefore be concluded that the type of strategy is not related to the anxiety level (outcome) but to the type of threat/phase of dissection (Stern *et al.*, 1993).

6.3.3 Coping strategies changes during the different phases

The following strategies were used most often and were prominent during all the phases: rationalisation, instrumental action and the dedication ceremony. A more simplistic way to describe the coping strategy changes over time is to look at the four different categories that were used. During the phases where the anticipation about dissection was high more active cognitive strategies were employed. This includes the use of substances (although very low frequency), the dedication ceremony and religion, all which featured more prominently during the first phase. Instrumental action was prominent during the first phase and also the following two phases. During phases where a physical threat (the first sight and first incision) was more important more active behavioural strategies were used. Avoidance strategies were not used that often, but when used it was more as a coping mechanism used by isolated individual cases. Repression and the use of humour increased in the last phases. Rationalisation was prominent during the middle phases while denial was prominent during the last and first phases. The use of a specific type of coping strategy was also not associated with a better or worst outcome, but rather dependent on the situation, support and the personality of the individual. Strategies can also be taught to students and are not stable over time or situation (Rowe, 1999)

6.4 BEHAVIOURAL CHANGES

Participants reported few behavioural changes. Even the observed behaviour in and outside the dissection hall was not significant. Students did not really socialise as much as before, but this was due to the constant hard work and long hours involved in coping with the heavy workload. The dissection experience also did not seem to interfere with their academic achievement. This was in contrast to the findings of Marks and Bertman (1980), who found a decrease in test marks with an increase in anxiety level. It would seem that the students in this study achieved better results than students from previous years, but this is purely speculative since other nuisance variables were not controlled for. The students though did show low Manifest Anxiety levels, which could indicate a low

personality trait anxiety. Low Manifest Anxiety levels were found to be associated with higher intellectual abilities and better academic achievement (Gaundry & Spielberger, 1971; Krohne & Laux, 1982). Studies found that academic achievement decreases with an increase in anxiety (drop out rates also increased). These studies also stated that general anxiety scales are not good predictors of academic success. Groups of students also differ to a large extent from year to year with respect to academic abilities.

It was expected that the participants would report various changes in *eating habits*, such as loss of appetite (Abu-Hijleh *et al.*, 1997). This was not the case, with only a few people reporting not eating fat, or other food resembling the cadaver's fat, such as scrambled eggs. Some participants tried to eat and live more healthily. Since most of the cadavers are donated or bequeathed by themselves while they were still alive, the cadaver population is mostly older persons that suffered long-term terminal diseases, such as cancer. All the cadavers were white and most were fat. The fat makes the anatomical structures difficult to dissect and is quite unpleasant, especially during the first week, when most of the time is spent removing the skin and subcutaneous tissue. These facts would certainly explain the aversion to fat experienced by the participants.

An increase in *physical exercise* was not very prominent. It could be envisaged that more of the respondents would like to exercise more for relaxation, but the time constraints also seem to have an important influence here. Even if students want to participate in sport or exercise, time constraints do not really allow that in their second year of study.

Although expected, no increase in *alcohol usage* in the participant's responses was noted. This was also true for informal observations during social events. The result was probably not due to underreporting, since the student felt very comfortable with the confidentiality of the questionnaire. Guthrie *et al.* (1995) found an increase in alcohol usage by medical students, especially males. In contrast to this Ind and Rees (1989) found that alcohol usage by medical students was on the decrease. The results of the present study could possibly be explained by the fact that the students were very dedicated to their studies or to a profession where they have a specific outlook on life. Because the

students are from so called alternative health care professions they tend to have a different attitude towards life. Most of them believe that good health lies in a healthy and positive live. Most of them do not even use antibiotics or other allopathic medicines, that most of us consider as healthy and part of life.

It was expected that the respondents would report sleeplessness during the first phases (Finkelstein & Mathers, 1990). With the exception of one respondent it seems that their *sleeping patterns* were not affected by dissection. Furthermore, the respondents did not report any disturbing *dreams* about or related to dissection. No conclusions can be drawn from the two isolated cases that did in fact report dreams, and the dreams were not distressing to the students involved. Finkelstein and Mathers (1990) found that many students in their study reported sleeplessness or nightmares.

The *social* support issue was also raised by the appraisal of the environment. It was discussed in detail in Section 6.2.3. To recap, social activities changed in frequency, in that visits to friends were limited. This was mostly due to the fact that there was very limited time available to socialise. Some participants also remarked that their friends did not understand that they felt positive and excited about dissection. Their involvement with these “outsider” friends decreased and they formed new friendships with the “in” group that could relate to these feelings. With nearly the same trend, an issue was raised that the “outside” group did not understand that the dissectors now had a different view on life and living. It is actually important to educate these students about the benefits of leisure activities since these activities might help them relieve some of the stress that they experience due to the heavy workload (Folse *et al.*, 1985; Stewart *et al.*, 1995).

Behavioural changes, due to or related to dissection, were very limited in this study. Perhaps if this study revealed higher anxiety levels, behavioural changes would be more evident.

6.5 ACHIEVEMENT OF AIMS AND CONCLUSIONS

The main conclusion from this study was that dissection is not necessarily associated with high levels of anxiety. This was true for both Manifest Anxiety as well as Death Anxiety. This could be concluded due to the fact that the scores obtained by students of Anatomy, exposed to dissecting human cadavers, were lower than those reported by other studies involving medical students and patients with anxiety disorders. The changes in the anxiety levels were not statistically significant during the different phases of dissection. One explanation for this phenomenon could be the peer tutoring that these students underwent during their first year anatomy course.

Involvement of the participants in their first year of study (the year preceding this study) in the peer tutoring system, influenced the anxiety scores recorded in the present study in that it alleviated potential high levels of anxiety. Students also became active participants in the study, in the sense that they were informally asked to comment on the results of the study, especially after the results revealed that their anxiety levels were lower than expected. Since the students felt that they shared in the ownership of the study and were not merely respondents, they would probably be actively involved in improving the peer tutoring system when they in turn act as tutors later in their second year.

The findings of the study furthermore have far reaching implications for the dissection hall activities and for preparing students for dissection activities. It implies that it is not dissecting human cadavers per se that provokes anxiety but how the situation is anticipated and appraised and how the participants view their own and their environmental situation.

Departments that have decreased anatomy and dissection hours and content can not use dissection anxiety as a valid reason for decreasing hours spent in active dissection. This would imply that not only do they not invest enough energy and time in preparing students for dissection, but students could also be deprived of a valuable opportunity to learn to deal with difficult situations such as death and dying (Bertman & Mark, 1985).

Dealing with these situations seems to form part of all health professions, regardless of whether they are allopathic (and involve surgery) or involve an alternative perspective and treatment regime (Finkelstein & Mathers, 1990). Students in health care professions should not only learn to deal with theoretic knowledge but the application (practical aspects) thereof as well as dealing with their own and other peoples' emotional and physical well-being.

Students deal with dissection in a manner that provokes as little as possible anxiety. They adjust their coping strategies in a manner that fits the particular situation and resources available to them. This finding is a valuable contribution of this study, because it indicates that no rigid coping strategies should be recommended to people in situations provoking anxiety. Rather, a full spectrum of suggestions on how to analyse the particular situation (appraise), themselves and their environmental support should be employed. The focus should be on training people to be flexible in using different coping strategies in different situations.

6.6 RECOMMENDATIONS WITH REGARD TO LOWERING DISSECTION ANXIETY LEVELS

After studying the results of this study the following recommendations can be made regarding alleviating anxiety due to dissecting human cadavers.

- A brochure can be developed and mailed to students with their letter of invitation to the dedication ceremony. This brochure could possibly give a few "tips" on what to expect in the dissection hall and it's activities, how to handle the situation, and contact details on where to get help.
- It seems that the peer tutoring system is working well. Although this system was not implemented with this specific aim, it is apparent that it has a definite benefit to students with regard to helping them adapt to the second year situation. The peer

tutoring programme can therefore be improved by specifically training the tutors (second year students) in dealing with this specific situation. The positive effects of peer tutoring were previously also advocated by Blackwell *et al.* (1979) and Bourguet *et al.* (1997).

- The students reported that they were also “guided” by their second year friends who repeated the second year. These students can be encouraged and trained to offer even better social support. This is important since these students are regarded as part of “in group” and therefore accepted by their peers. They (the repeat students) are already given responsibility in training students in basic dissection skills such as removal of the skin. They hold this responsibility in high regard and it gives the repeat students some importance in the dissection hall. The guidance of students with regard to anxiety is a secondary aspect that was once again not deliberately aimed for. The “new” students, in gaining these basic skills, increase their self-confidence and were not anxious about their ability to cope anymore.
- Increasing the lecturer’s sensitivity towards the student’s anxiety is another recommendation. This does not include counselling skills, but more an awareness of the student’s struggle to cope and a willingness to provide support.
- Some physical changes in the dissection environment can also help. The dissection complex at this stage contains no air conditioners, and only fans. Replacing these with air conditioning systems that will replace the air (and with it the formalin smell) will make the environment more user-friendly. The smell would probably still affect students to some extent as found by Fleisher (1987).
- The issue of re-curriculation is a very sensitive subject in Anatomy departments countrywide. The current trend is to decrease the practical hours (used to dissect) of Anatomy in an attempt to relieve the work load stress experienced by anatomy students. Although this is true for all the Anatomy departments in South Africa it is an especially important issue at the Technikon Witwatersrand. Most students at

medical schools study three subjects (Anatomy, Physiology and Biochemistry) in their second year. Homoeopathy and Chiropractic students currently do eight subjects in their second year. These subjects include major subjects such as Microbiology, Pathology and Physiology and students therefore suffer a lot of strain due to the heavy workload. The pressure to decrease Anatomy hours is therefore a more pressing issue than at medical schools. Decreasing anatomy dissection time however does not seem to be a feasible solution. A better solution would be to move some of the other subject to the third year of study. Outcome based education will also determine which of these subjects can be integrated. The anatomy course already includes various assignments to comply with outcome based education and to train students in cognitive skills rather than rote learning. The peer tutoring system is also part of life long learning and independent self-study (Hendelman & Boss, 1986) (see Fig 6.3). Re-curriculation should focus more on the use of outcome base education (such as self-study and the peer tutoring system) than on decreasing anatomy dissection hours.



Figure 6.3 Self-study in the Anatomy museum

- A final recommendation is that parents should be more involved in their children's study careers. This might increase the parents' awareness as to what their children have to deal with and might decrease the parental pressure that the students experience. This exposure could be during the dedication ceremony at the beginning of the year or perhaps during a parental open day, which could in turn then also involve other subjects.

6.7 SHORTCOMINGS AND SUGGESTIONS FOR IMPROVEMENT

The following shortcomings of the current study were identified, and suggestions for improvement made:

- A follow up study to examine the exact contribution of the peer tutoring system will add valuable information to this study. It was possible to compare the results of the present study to previous studies involving the same students, since data from the pilot study was available. But a longitudinal study involving more years of study will contribute even more.
- Students in other, contrasting situations such as medical students at the University of the Free State, who do not dissect the human cadaver at all, should be included to compare anxiety levels as influenced by the amount of dissection that takes place.
- An attempt can be made to increase the sample size by encouraging more students to participate. Although a higher response rate was attempted in the current study, completing four questionnaires over three months seemed to be difficult to achieve.
- It would also be interesting to evaluate the effect that dissection hall activities have on anatomy staff. This would include academic staff and technical staff (whose duty it is to cut, saw and slice the cadavers to provide the prosections). It would also be interesting to see how the reactions and psychological effects change over time.

This study not only indicated that dissecting human cadavers is not as anxiety provoking as expected, but also indicated why this is true for the participating students. The recommendations of this study will hopefully lead to improving the service to Homoeopathy and Chiropractic students, and also, indirectly, their patients.

REFERENCE LIST

- Abu-Hijleh, M.F., Hamdi, N.A., Moqattash, S.T., Harris, P.F., & Heseltine, G.F.D. (1997). Attitudes and reactions of Arab medical students to the dissecting room. *Clinical Anatomy*, 10, 272-278.
- Aday, R.H. (1984). Belief in afterlife and death anxiety: correlates and comparisons. *Omega*, 15, 67-75.
- Ager, C.L. (1979). Effects of the human dissection experience on subsequent related course work. *The American Journal of Occupational Therapy*, 33, 776-778.
- American Psychiatric Association. (1994). *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.). Washington: American Psychiatric Association.
- Arambasic, L. (1996). Appraisal of control and coping with air-raids. *Journal of Traumatic Stress*, 9, 325-333.
- Arnstein, R.L. (1986). Emotional problems of medical students. *American Journal of Psychiatry*, 143, 1422-1423.
- Balic, V., & Rumboldt, Z. (1995). Public attitudes towards autopsy, organ donation and dissection. *Journal of the American Medical Association*, 273, 1907.
- Beck, A.T. (1976). *Cognitive therapy and the emotional disorders*. New York: International Universities Press.
- Bergum, V. (1994). Knowledge for ethical care. *Nursing Ethics*, 1, 71-79.
- Bertman, S.L., & Marks, S.C. (1985). Humanities in medical education: rationale and resources for the dissection laboratory. *Medical Education*, 19, 374-81.
- Bertman, S.L., & Marks, S.C. (1989). The dissection experience as a laboratory for self-discovery about death and dying: another side of clinical anatomy. *Clinical Anatomy*, 2, 103-113.
- Billings, A.G., & Moos, R.H. (1981). The role of coping responses and social resources in attenuating the stress of life events. *Journal of Behavioral Medicine*, 4, 139-157.
- Blackbill, G., & Little, K.B. (1954). MMPI correlates of the Taylor scale of manifest anxiety.
- Blackwell, B., Rodin, A.E., Nagy, F., & Reece, R.D. (1979). Humanizing the student-cadaver encounter. *General Hospital Psychiatry*, 315-321.
- Blalock, J.A., & Joiner, T.E. (2000). Interaction of cognitive avoidance coping and stress in predicting depression / anxiety. *Cognitive Therapy and Research*, 24, 47-65.

- Bourguet, C.C., Whittier, W.L., & Taslitz, N. (1997). Survey of the educational roles of the faculty of anatomy departments. *Clinical Anatomy*, 10, 264-271.
- Breakwell, G.M., Hammond, S., & Fife-Schaw, C. (1995). *Research Methods in Psychology*. London: Sage.
- Bromberg, W., & Schilder, P. (1933). Death and dying: a comparative study of the attitudes and mental reactions towards death and dying. *Psychoanalytic Review*, 20, 133-185.
- Cannon, W.B. (1936). *Bodily changes in pain, hunger, fear and rage* (2nd ed.). New York: Appelton-Century.
- Carey, G., & Gottesman, I.I. (1981). Twin and family studies of anxiety, phobic, and obsessive disorders. In D.F. Klein and J. Rabkin (Eds.), *Anxiety: New Research and Changing Concepts* (pp. 301-309). New York: Raven Press.
- Carver, C.S., Scheier, M.F., & Weintraub, J.K. (1989). Assessing coping strategies: a theoretically based approach. *Journal of Personality and Social Psychology*, 56, 267-283.
- Champney, T.H., McCord, G.C., Sampson, H.W. (1995). Rotation of dissecting groups among different cadavers provides students of anatomy with increased opportunity to observe human variation. *Clinical Anatomy*, 8, 412-413.
- Chang, E.C. (1998). Dispositional optimism and primary and secondary appraisal of a stressor: controlling for confounding influences and relations to coping and psychological and physical adjustment. *Journal of Personality and Social Psychology*, 74, 1109-1120.
- Chang, E.C., & Strunk, D.R. (1999). Dysphoria: relations to appraisals, coping, and adjustment. *Journal of Counselling Psychology*, 46, 99-108.
- Charlton, P.F.C., & Thompson, J.A. (1996). Ways of coping with psychological distress after trauma. *British Journal of Clinical Psychology*, 35, 517-530.
- Charlton, R. (1993). Education about death and dying at Otago University medical school. *New Zealand Medical Journal*, 106, 447-449.
- Charlton, R., Dovey, S.M., Jones, D.G., & Blunt, A. (1994). Effects of cadaver dissection on the attitudes of medical students. *Medical Education*, 28, 290-295.
- Clark, D.C. (1983). Prevalence of psychiatric risk factors among first year medical students. *Proceedings of the Annual Conference on Research in Medical Education*, 22, 226-231.
- Dalley, A.F., Driscoll, R.E., & Settles, H.E. (1993). The uniform anatomical gift act: what every clinical anatomist should know. *Clinical Anatomy*, 6, 247-254.

- David, E.M. (1999). On being a doctor. Thoughts from gross anatomy. *Annals of Internal Medicine*, 131, 974-975.
- Deese, J., Lazarus, R.S., & Keenan, J. (1953). Anxiety, anxiety reduction, and stress in learning. *Journal of Experimental Psychology*, 46, 55-60.
- De La Fuente, R. (1990). The mental health consequences of the 1985 earthquakes in Mexico. *International Journal of Mental Health*, 19, 21-29.
- Dewe, P. (1991). Primary appraisal, secondary appraisal and coping: their role in stressful work encounters. *Journal of Occupational Psychology*, 64, 331-351.
- Dickinson, G.E., Lancaster, C.J., Winfield, C.I., Reece, E.F., & Colthorpe, C.A. (1997). Detached concern and death anxiety of first-year medical students: before and after the gross anatomy course. *Clinical Anatomy*, 10, 201-207.
- Druce, M., & Johnson, M.H. (1994). Human dissection and attitudes of preclinical students to death and bereavement. *Clinical Anatomy*, 7, 42-49.
- Eid, J., Thayer, J.F., & Johnsen, B.H. (1999). Measuring post-traumatic stress: a psychometric evaluation of symptom- and coping questionnaires based on a Norwegian sample. *Scandinavian Journal of Psychology*, 40, 101-108.
- Esenyel, M., Caglar, N., & Aldemir, T. (2000). Treatment of myofacial pain. *American Journal of Physical Medicine Rehabilitation*, 79, 48-52.
- Evans, E.J., & Fitzgibbon, G.H. (1992). The dissecting room: reactions of first year medical students. *Clinical Anatomy*, 5, 311-320.
- Eysenck, M.W. (1997). *Anxiety and Cognition: A Unified Theory*. London: Psychology Press.
- Farhall, J., & Gehrke, M. (1997). Coping with hallucinations: exploring stress and coping framework. *British Journal of Clinical Psychology*, 36, 259-261.
- Fennel, S., & Jones, D.G. (1992). The bequest of human bodies for dissection: a case study in the Otago Medical School. *New Zealand Medical Journal*, 105, 472-474.
- Finkelstein, P., & Mathers, L. (1990). Post-traumatic stress among medical students in the anatomy dissection laboratory. *Clinical Anatomy*, 3, 219-226.
- Fleisher, J.M. (1987). Medical students' exposure to formaldehyde in gross anatomy laboratories. *New York State Journal of Medicine*, 87, 385-388.
- Fleming, R., Baum, A., & Singer, J.E. (1984). Toward an integrative approach to the study of stress. *Journal of Personality and Social Psychology*, 46, 939-949.
- Folkman, S. (1984). Personal control and stress and coping processes: a theoretical analysis. *Journal of Personality and Social Psychology*, 46, 839-852.

- Folkman, S., & Lazarus, R.S. (1980). An analysis of coping in a middle-aged community sample. *Journal of Health and Social Behaviour*, 21, 219-239.
- Folkman, S., & Lazarus, R.S. (1985). If it changes it must be a process: study of emotion and coping during three stages of a college examination. *Journal of Personality and Social Psychology*, 48, 150-170.
- Folkman, S., & Lazarus, R.S. (1988). Coping as a mediator of emotion. *Journal of Personality and Social Psychology*, 54, 466-475.
- Folkman, S., Lazarus, R.S., Dunkel-Schetter, C., DeLongis, A., & Gruen, R.J. (1986). Dynamics of a stressful encounter: cognitive appraisal, coping, and encounter outcomes. *Journal of Personality and Social Psychology*, 50, 992-1003.
- Folkman, S., Lazarus, R.S., Gruen, R.J., & DeLongis, A. (1986). Appraisal, coping, health status, and psychological symptoms. *Journal of Personality and Social Psychology*, 50, 571-579.
- Folse, M.L., DaRosa, D.A., & Folse, R. (1985). The relationship between stress and attitudes toward leisure among first-year medical students. *Journal of Medical Education*, 60, 610-617.
- Freeman, M.J. (1953). The development of a test for the measurement of anxiety: a study of its reliability and validity. *Psychological Monographs*, 67, 353.
- Fuller, B.F., & Conner, D.A. (1990). Selection of vigilant and avoidant coping strategies among repressors, highly anxious and truly low anxious subjects. *Psychological Reports*, 66, 103-110.
- Furnham, A., & Traynar, J. (1999). Repression and effective coping styles. *European Journal of Psychology*, 13, 465-492.
- Gaundry, E., & Spielberger, C.D. (1971). *Anxiety and Educational Achievement*. Sydney: John Wiley and Sons.
- Gershenfeld, H.K., & Paul, S.M. (1998). Towards a genetics of anxious temperament: from mice to men. *Acta Psychiatrica Scandinavica Supplement*, 393, 56-65.
- Gilbert, A.R. (1967). Increased diagnostic value of the Taylor Manifest Anxiety scale by use of response latency. *Psychological Reports*, 20, 63-67.
- Gustavson, N. (1988). The effect of human dissection on first-year students and implications for the doctor-patient relationship. *Journal of Medical Education*, 63, 62-64.
- Guthrie, E.A., Black, D., Shaw, C.M., Hamilton, J., Creed, F.H., & Tomenson, B. (1995). Embarking upon a medical career: psychological morbidity in first year medical students. *Medical Education*, 29, 337-341.

- Hafferty, F.W. (1988). Cadaver stories and the emotional socialization of medical students. *Journal of Health and Social Behavior*, 29, 344-356.
- Hancock, D., Williams, M., & Taylor, A. (1998). Psychological impact of cadavers and prosections on physiotherapy and occupational therapy students. *Australian Journal of Physiotherapy*, 44, 247-255.
- Hendelman, W.J., & Boss, M. (1986). Reciprocal peer teaching by medical students in the gross anatomy laboratory. *Journal of Medical Education*, 61, 674-680.
- Hoehn-Saric, R. (1981). Characteristics of chronic anxiety patients. In D.F. Klein and J. Rabkin (Eds.), *Anxiety: New Research and Changing Concepts* (pp. 301-309). New York: Raven Press.
- Holmes, T.S., & Holmes T.H. (1970). Short-term intrusion into the life style routine. *Journal of Psychosomatic Research*, 14, 121-132.
- Holtzworth-Munroe, A., Munroe, M.S., & Smith, R.E. (1985). Effects of a stress-management training program on first-and second-year medical students. *Journal of Medical Education*, 60, 417-419.
- Horne, D.J., Tiller, J.W.G., Eizenberg, N., Tashevskaa., & Biddle, N. (1990). Reactions of first-year medical students to their initial encounter with a cadaver in the dissection room. *Academic Medicine*, 65, 645-646.
- Hughes, I., Budd, R., & Greenaway, S. (1999). Coping with anxiety and panic: a factor analytic study. *British Journal of Clinical Psychology*, 38, 295-304.
- Hull, F.M. (1991). Death, dying and the medical student. *Medical Education*, 25, 491-496.
- Ind, T., & Rees, P. (1989). Drinking among medical students. *British Medical Journal*, 299, 321.
- Jansen van Rensburg, M.S. (1999, April). *The Psychological Influence of Dissection on Students of Homoeopathy and Chiropractic*. Paper presented at the twenty-ninth Annual Conference of the Anatomical Society of Southern Africa, Sun City.
- Jansen van Rensburg, M.S. (2001, February). *The psychological Influence of Dissecting Human Cadavers: Gender Differences*. Paper presented at the South African Association of Women Graduates, Cape Town.
- Jones, D.G. (1997). Reassessing the importance of dissection: a critique and elaboration. *Clinical Anatomy*, 10, 123-127.
- Kamin, L.J., Bindra, D., Clark, J.W., & Waksberg, H. (1955). The interrelations among some behavioral measures of anxiety. *Canadian Journal of Psychology*, 9, 79-83.

- Kay, J., & Blythe, M. (1984). Professionalization of the older medical student. *Journal of Medical Education*, 59, 559-566.
- King, A.C., Taylor, C.B., Albright, C.A., & Haskell, W.L. (1990). The relationship between repressive and defensive coping styles and blood pressure responses in healthy, middle-aged men and women. *Journal of Psychosomatic Research*, 34, 461-471.
- King, M.G., & Campbell, I.M. (1986). A manifest anxiety scale from the MMPI-168. *Journal of Clinical Psychology*, 42, 748-751.
- Klein, D.F. (1981). Anxiety reconceptualized. In D.F. Klein and J. Rabkin (Eds.), *Anxiety: New Research and Changing Concepts* (pp. 235-263). New York: Raven Press.
- Krohne, H.W., & Laux, L. (1982). *Achievement, Stress, and Anxiety*. Washington: Hemisphere Publication Corporation.
- Lazarus, R.S. (1966). *Psychological Stress and the Coping Process*. New York: McGraw-Hill.
- Lazarus, R.S. (1976). *Patterns of Adjustment*. (3rd ed.). New York: McGraw-Hill.
- Lazarus, R.S. (1991). *Emotion and Adaptation*. New York: Oxford University Press.
- Lazarus, R.S. (1993). From psychological stress to the emotions: a history of changing outlooks. *Annual Review of Psychology*, 44, 1-21.
- Lazarus, R.S. (1997). Acculturation isn't everything. *Applied Psychology*, 46, 39-43.
- Lazarus, R.S., & Launier, R. (1978). Stress-related transactions between person and environment. In L.A. Pervin and M. Lewis (Eds.), *Perspectives in Interactional Psychology* (pp. 287-327). New York: Plenum Press.
- Lippert, H. (1980). Die angst des medizinstudenten vor der leiche. *Medizinische Klinik*, 75, 895
- Lloyd, C., & Gartrell, N.K. (1984). Psychiatric symptoms in medical students. *Comprehensive Psychiatry*, 25, 552-565.
- Lonetto, R., Mercer, G.W., Fleming, S., Bunting, B., & Clare, M. (1980). Death anxiety among university students in Northern Ireland and Canada. *The Journal of Psychology*, 104, 75-82.
- Lonetto, R., & Templer, D.I. (1986). *Death Anxiety*. Washington: Hemisphere Publishing corporation.
- Marks, S.C., & Bertman, S.L. (1980). Experiences with learning about death and dying in the undergraduate anatomy curriculum. *Journal of Medical Education*, 55, 48-52.

- Marks, S.C., Bertman, S.L., & Penney, J.C. (1997). Human anatomy: a foundation for education about death and dying in medicine. *Clinical Anatomy*, 10, 118-122.
- Martin, R.F. (1976). *Anxiety and Academic Behaviour: A Review of the Literature Toward Conceptualizing*. University of Maryland: Unpublished Doctoral Thesis.
- Mason, J.W. (1975a). A historical view of the stress field. *Journal of Human Stress*, 1(2), 22-36.
- Mason, J.W. (1975b). A historical view of the stress field (Part II). *Journal of Human Stress*, 1(3), 22-36.
- Matthews, G., & Wells, A. (2000). Attention, automaticity, and affective disorder. *Behavior Modification*, 24, 69-93.
- Mayo, J.A. (1981). The concept of masked anxiety in young adult black males. In D.F. Klein and J. Rabkin (Eds.), *Anxiety: New Research and Changing Concepts* (pp. 381-398). New York: Raven Press.
- McCarroll, J.E., Ursano, R.J., Wright, K.M., & Fullerton, C.S. (1993). Handling bodies after violent death: strategies for coping. *American Journal of Orthopsychiatry*, 63, 209-214.
- McCrae, R.R. (1984). Situational Determinants of coping responses: loss, threat, and challenge. *Journal of Personality and Social Psychology*, 46, 919-928.
- Meites, K., Lovallo, W., & Pishkin, V. (1980). A comparison of four scales for anxiety, depression, and neuroticism. *Journal of Clinical Psychology*, 36, 427-432.
- Metheny, W.P., & Sparrow, A.W. (1984). Assessing medical student stress levels and psycho-physiological stress reactions. *Proceedings of the Annual Conference on Research in Medical Education*, 23, 257-262.
- Mitchell, R.E., Matthews, J.R., Grandy, T.G., & Lupo, J.V. (1983). The question of stress amongst first-year medical students. *Journal of Medical Education*, 58, 367-372.
- Moerdyk, A.P., & Spinks, P.M. (1979). Preliminary cross-cultural validity study of Taylor Manifest Anxiety scale. *Psychological Reports*, 45, 663-664.
- Monat, A., & Lazarus, R.S. (1991). *Stress and Coping an Anthology*. (3rd ed.). New York: Columbia.
- Murphy, J.M., Nadelson, C.C., & Notman, M.T. (1984). Factors influencing first-year medical students' perceptions of stress. *Journal of Human Stress*, 10, 165-173.

- Nemiah, J.C. (1981). The psychoanalytic view of anxiety. In D.F. Klein and J. Rabkin (Eds.), *Anxiety: New Research and Changing Concepts* (pp. 291-300). New York: Raven Press.
- Niaura, R., Herbert, P.N., McMahon, N., & Sommerville, L. (1992). Repressive coping and blood lipids in men and women. *Psychosomatic Medicine*, 54, 698-706.
- Nnodim, J.O. (1988). Learning human anatomy: student preferences of methods in a Nigerian medical school. *Medical Education*, 22, 412-417.
- Nnodim, J.O. (1990). Learning human anatomy: by dissection or from prosections? *Medical Education*, 24, 389-395.
- Nnodim, J.O. (1996). Preclinical student reactions to dissection, death, and dying. *Clinical Anatomy*, 9, 175-182.
- Nwoha, P.U. (1992). Student's attitude and predictor of performance in anatomy. *African Journal Med Med Science*, 21, 41-45.
- Oakland, S., & Ostell, A. (1996). Measuring coping: a review and critique. *Human Relations*, 49, 133-155.
- Pabst, R. (1993). Gross anatomy: an outdated subject or an essential part of a modern medical curriculum? *The Anatomical Record*, 237, 431-433.
- Padmavathi, R., Maruthy, K.N., Borghona, S., & Vaz, M. (1998). The perceptions of first-year medical students on animal and human experiments in physiology. *Indian Journal of Physiological Pharmacology*, 42, 127-130.
- Pearlin, L.I., & Schooler, C. (1978). The structure of coping. *Journal of Health and Social Behavior*, 19, 2-21.
- Penney, J.C. (1983). Reactions to human dissection: a report, and proposal for modification. *Proceedings of the Annual Conference of Research in Medical Education*, 22, 220-225.
- Penney, J.C. (1985). Reactions of medical students to dissection. *Journal of Medical Education*, 60, 58-60.
- Penney, J.C. (1987). The evolution of a medical school curriculum in death and dying. *Journal of Palliative Care*, 3, 14-18.
- Percac, S., & McArdle, P.J. (1997). Anatomy teaching: students' perceptions. *Surgical Radiologic Anatomy*, 19, 315-317.
- Perrez, M., & Reicherts, M. (1992). *Stress, Coping, and Health: A Situation-Behavior Approach Theory, Methods, Applications*. Seattle: Hogrefe & Huber.

- Pervin, L.A., & Lewis, M. (1978). *Perspectives in Interactional Psychology*. New York: Plenum Press.
- Pestonjee, D.M. (1992). *Stress and Coping: The Indian Experience*. New Delhi: Sage.
- Pretorius, W.F., & Brune, E.O. (1992). *Introduction to Anatomical Techniques*. Pretoria: University of Pretoria.
- Price, K.P., & Blackwell, S. (1980). Trait levels of anxiety and psychological responses to stress in migraineurs and normal controls. *Journal of Clinical Psychology*, 36, 658-660.
- Richardson, R., & Hurwitz, B. (1996). Celebrating New Year in Bart's dissecting room. *Clinical Anatomy*, 9, 408-413.
- Rodning, C.B. (1989). "O Death. where Is thy sting?" Historical perspectives on the relationship of human postmortem anatomical dissection to medical education and care. *Clinical Anatomy*, 2, 277-292.
- Rowe, M.M. (1999). Teaching health-care providers coping: results of a two-year study. *Journal of Behavioral Medicine*, 22, 511-527.
- Sanner, M. (1994). A comparison of public attitudes toward autopsy, organ donation, and anatomic dissection. *Journal of the American Medical Association*, 271, 284-288.
- Sarason, I.G. (1960). Empirical findings and theoretical problems in the use of anxiety scales. *Psychological Bulletin*, 57, 403- 415.
- Saunders, J.B.de C.M., & O'Malley, C.D. (1950). *The illustrations from the works of Andreas Vesalius of Brussels*. New York: Dover Publications.
- Schachter, S., & Singer, J.E. (1963). Cognitive, social, and physiological determinants of emotional state. *Psychological Review*, 69, 379-99.
- Selye, H. (1976). *The stress of life*. New York: McGraw-Hill.
- Selye, H. (1982). Stress: Eustress, distress, and human perspectives. In S. B. Day (Ed.), *Life stress* (p3-13). New York: Van Nostrand Reinhold.
- Shalev, A., & Nathan, H. (1985). Medical students' stress reactions to dissections. *Israel Journal of Psychiatry and Related Sciences*, 22, 121-133.
- Simpson, M.L., Parker, P.W., & Harrison, A.W. (1995). Differential performance on Taylor's Manifest Anxiety Scale by black private college freshmen, a partial report. *Perceptual and Motor Skills*, 80, 699-702.

- Slockers, M.T., Van De Ven, P., Steentjes, M., & Moll, H. (1981). Introducing first-year students to medical school: Experiences at the Faculty of Medicine of Erasmus University, Rotterdam, The Netherlands. *Medical Education*, 15, 294-297.
- Sowa, C.J., & May, K.M. (1997). Expanding Lazarus and Folkman's paradigm to the Social and emotional adjustment of gifted children and adolescents (SEAM). *Gifted Child Quarterly*, 41, 36-43.
- Spielberger, C.D. (1966). *Anxiety and Behaviour*. New York: Academic Press.
- Stefenelli, N., Kugi, A., Wintersperger, U., Prokop, E., Steininger, P., & Walch, E. (1993). Auswirkungen der begebnun von medizinstudenten und krankenhauesarzten mit dem menschlichen leichnam. *Der Pathologe*, 14, 341-345.
- Stern, M., Norman, S., & Komm, C. (1993). Medical students' differential use of coping strategies as a function of stressor type, year of training, and gender. *Behavioral Medicine*, 18, 173-180.
- Stewart, S.M., Betson, C., Lam, T.H., Marshall, I.B., Lee, P.W.H., & Wong, C.M. (1997). Predicting stress in first-year medical students: a longitudinal study. *Medical Education*, 31, 163-168.
- Stewart, S.M., Betson, C., Marshall, J., Wong, C.M., Lee, P.W.H., & Lam, T.H. (1995). Stress and vulnerability in medical students. *Medical Education*, 29, 119-127.
- Stillman, P.L., Ruggill, J.S., & Sabers, D.L. (1978). The use of live models in the teaching of gross anatomy. *Medical Education*, 12, 114-116.
- Streng, H. (1999). Todesfurcht und bereitschaft zur organspende bei medizinstudenten. *Psychother. Psychosom. Med. Psychol.*, 49, 23-28.
- Sue, D., Sue, D., & Sue, S. (1994). *Understanding Abnormal Behavior* (4th ed.). Boston: Houghton Mifflin.
- Suetsugi, M., Mizuki, Y., Ushijima, I., Kobayashi, T., Tsuchiya, K., Aoki, T., & Watanabe, Y. (2000). Appearance of frontal midline theta activity in patients with generalized anxiety disorder. *Neuropsychobiology*, 41, 108-112.
- Tashiro, M., Juengling, F.D., Reinhardt, M.J., Brink, I., Hoegerle, S., Mix, M., Kubota, K., Yamaguchi, K., Itoh, M., Sasaki, H., Moser, E., & Nitzsche, E.U. (2000). Reproducibility of PET brain mapping of cancer patients. *Psychooncology*, 9, 157-163.
- Taylor, J.A. (1953). A personality scale of manifest anxiety. *The Journal of Abnormal and Social Psychology*, 48, 285-290.

- Taylor, J.A. (1956). Drive theory and manifest anxiety. *Psychological Bulletin*, 53, 303-319.
- Templer, D.I. (1970). The construction and validation of a death anxiety scale. *The Journal of General Psychology*, 82, 165-177.
- Templer, D.I. (1972). Death anxiety in religiously involved persons. *Psychological Reports*, 31, 361-362.
- Tiberius, R.G., Sackin, H.D., & McLean, A. (1989). Medical students' early expectations and later opinions of aspects of their first-year. *Academic Medicine*, 64, 538-542.
- Weeks, S.E., Harris, E.E., & Kinzey, W.G. (1995). Human gross anatomy: a crucial time to encourage respect and compassion in students. *Clinical Anatomy*, 8, 69-79.
- Weidner, G., & Collins, R.L. (1993). Gender, coping and health. In Krohne, H.W. (Ed.), *Attention and Avoidance: Strategies in Coping with Aversiveness*. Seattle: Hogrefe & Huber Publishers.
- Weinberger, D.A. (1990). The construct validity of the repressive coping style. In J.L. Singer (Ed.), *Repression and Association: Defense Mechanisms and Personality Style*. Chicago: University of Chicago Press.
- Wells, A. (1999). A cognitive model of generalized anxiety disorder. *Behavioral Modification*, 23, 526-555.
- Werhun, C.D., & Cox, B.J. (1999). Levels of anxiety sensitivity in relation to repressive and self-deceptive coping styles. *Journal of Anxiety Disorders*, 13, 601-609.
- Wilkins, W.E., & Krauss, H.H. (1978). Anxiety and actualization: further research. *Journal of Clinical Psychology*, 34, 958-960.
- Wyler, A.R., Masuda, M., & Holmes, T.H. (1971). Magnitude of the life events and seriousness of illness. *Journal of Psychosomatic Medicine*, 33, 115-122.
- Yeager, V.L. (1996). Learning gross anatomy: dissection and prosection. *Clinical Anatomy*, 9, 57-59.

PROGRAMME

**NOTE: ALL PARTICIPANTS TO RISE AS THE
ACADEMIC PROCESSION ENTERS
AND LEAVES THE DISSECTION HALL**

1. Mr A. van den Berg, Head of the School of Bio-Sciences will open the ceremony and welcome the guests.
2. Professor J. C. Allan, Emeritus Professor, Department of Anatomical Sciences, University of the Witwatersrand will deliver an address.
3. The Dedication Ceremony will be conducted by the Reverend R. Cruickshank.
4. Mr van den Berg will administer the Modified Hippocratic Oath.
5. Mr van den Berg will close the ceremony.
6. Visitors and staff will retire for tea and refreshments in Room 2304a, John Orr Building, Doornfontein Campus.
7. Students to return to the dissection hall at 10h30 to sign the Anatomy register, and be allocated to dissection tables.

MODIFIED HIPPOCRATIC OATH

175

“As a student in the Faculty of Health Sciences of the
Technikon Witwatersrand, I do solemnly declare:

That I will not improperly divulge anything I learn in my
capacity as an anatomy student.

That in my relations with patients, colleagues and academics,
I will conduct myself as becomes a student of an
honourable profession.

And I further declare that I will be loyal to the Technikon,
and endeavour to promote its welfare and maintain its
reputation.”



ANATOMY DEDICATION CEREMONY

16 JANUARY 2002



FACULTY OF HEALTH SCIENCES

APPENDIX B: QUESTIONNAIRE

Ref. No:

Section A: BIOGRAPHICAL DATA

Please answer the following questions by writing an answer in the space provided or by selecting the most appropriate answer (mark with a X) where indicated.

1. Please state your age in years Years

2. Please indicate your gender

Male

Female

3. Please state your home language

4. Please indicate your marital status

Single

Married

Divorced

5. Please indicate your field of study

Chiropractic

Homoeopathy

6. Please state the religion that you belong to?

7. How religious do you see yourself, that is to what extent does your religion dictate your life, lifestyle and the way you cope?

Nothing to very little

To some extent

It determines most to everything I do

8. Please give the cultural or ethnic group that you consider yourself to be part of.

Section B

2. MANIFEST ANXIETY SCALE

For each of the following statements please indicate whether you experience the following at the moment. Remember although you will comment on a general feeling it is important to keep in mind the effect that dissection has on you.

	True	False
1. I feel sick to my stomach when thinking of dissection.		
2. I feel as nervous as my co-students.		
3. I work under a great deal of strain.		
4. I often have diarrhoea ("the runs").		
5. I worry quite a bit over the dissection I am about to do.		
6. When thinking of dissection, I often break out in a sweat.		
7. I do not often notice my heart pounding and I am seldom short of breath.		
8. My bowels don't move for several days at a time.		
9. At times I worry so much I can't sleep.		
10. My sleep is restless and disturbed.		
11. I often dream about things I don't like to tell other people.		
12. My feelings are hurt easier than most people's.		
13. I often find myself worrying about something.		
14. I wish I could be as happy as others.		
15. I feel anxious about something or someone almost all the time.		
16. At times I am so restless that I cannot sit in a chair for very long.		
17. I have often felt that I faced so many difficulties I could not overcome them.		
18. At times I have been worried beyond reason about something that really did not matter.		
19. I do not have as many fears as my co-students.		
20. I am more self-conscious than most other students in the dissection hall.		
21. I am the kind of person who takes things hard.		
22. I am a very nervous person.		
23. Dissection is often a strain for me.		
24. I am not at all confident of myself.		
25. At times I feel that I am going to crack up.		
26. I don't like to face a difficulty or make an important decision.		
27. I am very confident of myself.		

Section B

1. DEATH ANXIETY SCALE

For each of the following statements please indicate whether you experience the following at the moment. Remember although you will comment on a general feeling it is important to keep in mind the effect that dissection has on you.

	True	False
e.g. I enjoy golf.		
1. I am very much afraid to die.		
2. The thought of death seldom enters my mind.		
3. It doesn't make me nervous when people talk about death.		
4. I dread to think about having to have an Operation.		
5. I am not at all afraid to die.		
6. I am not particularly afraid of getting cancer.		
7. The thought of death never bothers me.		
8. I am often distressed by the way time flies so fast.		
9. I fear dying a painful death.		
10. The subject of life after death troubles me greatly.		
11. I am really scared of having a heart attack.		
12. I often think about how short life really is.		
13. I shudder when I hear people talking about World War III.		
14. The sight of a dead body is horrifying to me.		
15. I feel that the future holds nothing for me to fear.		

Section C: EXPECTATIONS/APPRAISAL

1. How do you experience dissection at this stage? Please comment on any aspect of the situation that you feel provokes anxiety for you?

2. Which aspects of yourself (strengths, weaknesses, competencies or personality traits) make it easier for you to cope with dissection and the emotions associated with it?

3. Which aspects of yourself (strengths, weaknesses, competencies or personality traits) make it more difficult for you to cope with dissection and the emotions associated with it?

4. Which aspects in your environment (support systems, social aspects, etc) make it easier or more difficult for you to cope with the emotional aspects of dissection?

2. Please indicate, by ticking the appropriate box, how often you use the following methods to overcome your fear or apprehension in the **DISSECTION ROOM**.

	Never	Occasionally	Often	Always
1. I take an active part as much as possible.				
2. I read holy/ religious books.				
3. I consider the cadaver as a tool for gaining the knowledge I need to become a Homoeopath/ Chiropractitioner.				
4. I make sure not to think about it once outside the dissection hall.				
5. Alcohol seems to help me cope.				
6. We tell a lot of jokes around the dissection table.				
7. I think about other things to keep out thoughts of dissection.				
8. I pay frequent visits to the dissection hall.				
9. I pray about my fear for dissection.				
10. I look at the cadaver as if it wasn't real.				
11. I use tranquillisers to help me cope.				
12. I see the humor in every situation.				
13. I use substances to help me cope.				
14. I try not to think about the cadaver as a human being that once had a family and friends.				
15. The dedication ceremony helped me understand the need for dissection.				
16. My religious convictions help me cope.				

Section E: BEHAVIOURAL CHANGES

Please indicate which of the following changed since you have been exposed to dissection

Please only indicate those that you consider having direct relevance to emotionality associated with dissection.

1. Did dissection anxiety cause any changes in your eating habits or diet?

1.1

Yes

No

1.2 If yes, please explain in what way it changed your eating habits.

2. Did dissection anxiety cause any changes in your physical exercise?

2.1

Yes

No

2.2 If yes, please explain in what way it changed your physical exercise.

3. Did dissection anxiety cause any changes in your alcohol consumption or drug usage?

3.1

Yes

No

3.2 If yes, please explain in what way it changed your consumption of alcohol or drugs.

4. Did dissection anxiety cause any changes in your sleep pattern?

4.1

Yes

No

4.2 If yes, please explain in what way it changed your sleep pattern.

5. Did dissection anxiety cause any changes in your dreams? Can you directly relate any of your dreams to dissection anxiety?

5.1

Yes

No

5.2 Briefly describe any dream directly related to dissection that causes you anxiety.

6. Did dissection anxiety cause any changes in your other social activities?

6.1

Yes

No

6.2 If yes, please explain in what way it changed your social activities.

APPENDIX C: INFORMATION SHEETS

Stage 1

Dear student,

12 December 2000

You are at the moment getting ready for your first day in the dissection hall as a second year anatomy student. Congratulations on passing the first year. This new experience is probably evoking various emotions in you. These could include excitement, apprehension, fear or anxiety and various others.

At the moment we as researchers are interested in the feelings that you are now experiencing with regard to your anticipation of dissection. Please keep this in mind when answering the questionnaire.

Could you please complete it in the day before the Anatomy Dedication Ceremony and hand it back at this ceremony. Please note that the questionnaire is anonymous and that you do not have to write your name anywhere. For administrative purposes, we do however require you to write your unique reference number on your questionnaire. All your answers will therefor be treated in the strictest confidence, so please tell us exactly how you feel. Also please keep in mind that there are no wrong or right answers, we are only interested in how YOU experience dissection.

Thank you very much for participating in this study. We really appreciate your participation and remember that future students in your position will be helped due to your participation. If you have any questions please feel free to contact me at any time.

Thank you once again.

Madri Jansen van Rensburg

Tel: (011) 406 8041

Office: Room 2304J

John Orr Building

Doornfontein Campus

Technikon Witwatersrand.

Stage 2

Dear student,

29 January 2001

Today was an important day for you in your study career as well as in your professional life as a Homoeopath or Chiropractor. You had your first experience in dissecting a cadaver today. It might also have been your first experience in dealing with a deceased human's body. Your emotional experience of this is quite normal and all the feelings that you are presently experiencing have been shared with you for a long time by other anatomy students.

At the moment we as researchers are interested in the feelings that you are now experiencing with regard to your first day and first experience of dissection. Please keep this in mind when answering the questionnaire.

Could you please complete the questionnaire today and hand it back directly after completion. Please remember to add your unique reference number to your questionnaire, to enable us to compare data and you will not be identified by any person involved in the research. If you have forgotten your reference number please contact the secretary of the School of Biotechnology (Mrs. Michelle Knowles, room 2304B, John Orr Building) who can trace the number for you. Remember that all your answers are treated with confidence, so feel free to report on your true feelings. Also please keep in mind that there are no wrong or right answers, we are only interested in how YOU experience dissection.

Thank you very much for participating in this study. We really appreciate your participation and remember that future students in your position will be helped due to your participation. If you have any questions please feel free to contact me at any time.

Madri Jansen van Rensburg

Tel: (011) 406 8041

Office: Room 2304J (John Orr Building, Doornfontein Campus).

Stage 3

Dear student,

14 February 2001

You probably feel a little bit more at home in the dissection hall by now. Two weeks have passed since your first dissection experience. We (the researchers) are interested in your feelings, two weeks after dissection started.

Could you please complete the questionnaire today and hand it back directly after completion. You might be getting use to the format and questions in the questionnaire. Please remember that we are interested in your feeling as you experience them today. Keep this in mind when answering the questions. It is OK if your feelings are different to those you experienced before. (The ways that the dissection influenced you as well as the strategies that you use to cope could be quite different.)

Please remember to add your unique reference number to your questionnaire. If you have forgotten your reference number please contact the secretary of the School of Biotechnology (Mrs. Michelle Knowles, room 2304B, John Orr Building) who can trace the number for you. Remember that all your answers are treated with confidence, so feel free to report on your true feelings. Also please keep in mind that there are no wrong or right answers, we are only interested in how YOU experience dissection.

Thank you very much for participating in this study and for answering the questionnaire. We really appreciate your participation and time. Remember that you and the future anatomy students will benefit from your participation. If you have any questions please feel free to contact me at any time.

Madri Jansen van Rensburg

Tel: (011) 406 8041

Office: Room 2304J (John Orr Building, Doornfontein Campus).

Stage 4

Dear student,

23 April 2001

It has been some time (three months) since you started dissecting for the first time. You probably feel a bit more relaxed with regard to dissection hall activities. We (the researchers) are interested in your feelings, three months after dissection started, and also particularly in the methods you employ to help you cope.

Could you please complete the questionnaire today and hand it back directly after completion. You probably remember the questionnaire. Please remember that we are interested in your feeling as you experience them today. Keep this in mind when answering the questions. It is acceptable if these feelings might be different to those you experienced before.

Please remember to add your unique reference number to your questionnaire, you will not be identified by any person involved in the research. If you have forgotten your reference number please contact the secretary of the School of Biotechnology (Mrs. Michelle Knowles, room 2304B, John Orr Building) who can trace the number for you. Remember that all your answers are treated with confidence, so feel free to report on your true feelings. Also please keep in mind that there are no wrong or right answers, we are only interested in how YOU experience dissection.

Thank you very much for your patience and continued participating in this study. We really appreciate your participation. Future anatomy students that will benefit from your participation will surely also be grateful for your effort and time. If you have any questions regarding the study or the results please feel free to contact me at any time.

Madri Jansen van Rensburg

Tel: (011) 406 8041