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AN EXPERIMENTAL INVESTIGATION INTO THE EFFICACY OF MULTICOMPONENT TREATMENT PROGRAMMES FOR TEST-ANXIOUS STUDENT NURSES

by

Dorothea W. M. Marais

Thesis submitted in fulfilment of the requirements for the Degree of Master of Arts in Psychology

Department of Psychology
Faculty of Social Science and Humanities
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ABSTRACT

The present investigation was initiated with the aim of assessing the efficacy of multicomponent treatment programmes for test-anxiety in student nurses, in order to develop a programme that could be included in the nursing curricula. The subjects were 103 student nurses currently in their first year of the four-year Diploma in Nursing (General, Community and Psychiatry) and Midwifery at Carinus Nursing College (CNC). They had been randomly allocated to four classes at the College.

The study compared high-test-anxious, low-test-anxious and mid-test-anxious subjects within these four groups, three of which received multicomponent treatment programmes, while the fourth was the control group. Programmes comprised Systematic Desensitisation (SD), Progressive Muscle Relaxation Training and Guided Imagery (PMRT & GI) and Study Skills Training (SST), each of which included a core component of cognitive restructuring. Treatment spanned six weeks.

The following self-report questionnaires were used at pre- and post-intervention: The Anxiety Achievement Test (AAT), the Anticipated Anxiety Rating Scale (AARS) and the Subjective Units of Disturbance (SUD). Academic achievement was also measured at both pre- and post-intervention by means of examination scores. Differences between pre and post scores were analysed by means of One- and Two-Way Multivariate Analysis of Variance.

The only group to differ significantly from the Control group at post-test was the SD group, showing reductions on the Debilitative scale of the AAT ($p < 0.01$), the SUD ($p < 0.01$) and the AARS ($p < 0.05$). However, this group

expressed less satisfaction with the programme than the PMRT & GI group on the Treatment Evaluation Questionnaire.

A subsidiary study compared the CNC student nurses (n = 103) with first-year paramedical students from the following disciplines: logopaedics (n = 12); physiotherapy (n = 24); occupational therapy (n = 18); BSc nursing (n = 12); radiography (n = 27), on the Profile of Mood States (POMS), Health Behaviour Assessment Scale (HBAS) and Matric scores. CNC nurses obtained significantly lower Matric scores than the other students ($p < 0.0001$), and showed significant differences on other variables, indicating higher negative mood states and less healthy lifestyles.

At one-year follow-up, 33 of the original 103 subjects had failed or resigned: sixteen of whom were high-test-anxious, nine low-test-anxious, eight mid-test-anxious. The drop-out rate was consistent across groups, i.e. treatment had had no long-term effect.

Reasons for this are discussed, and the conclusion reached that high levels of test anxiety were realistically felt by student nurses with comparatively low Matric scores when faced with the demands of the four-year Diploma course. Such anxiety which at present tends to be dealt with by somewhat self-destructive behaviours could not be easily alleviated by short-term anxiety management programmes.

Recommendations are made regarding possible alternative nurse training programmes. There would appear to be good reason to offer a programme with emphasis on clinical skills in addition to the heavily academic four-year Diploma course. A prophylactic stress management programme emphasising healthy lifestyles, and commencing at the start of training, was recommended.

PART ONE

TOWARDS AN UNDERSTANDING OF TEST ANXIETY - BACKGROUND TO THE PRESENT PROJECT

CHAPTER ONE

THE CONCEPT OF TEST ANXIETY

1.1 HISTORICAL PERSPECTIVES ON TEST ANXIETY

Since the turn of the century, the emotional reactions and physiological changes experienced by many students during examinations have received increasing attention from physiologists and psychologists (Spielberger, Gonzales, Taylor, Algaze & Anton, 1978).

In the early studies, however, attention was focussed on physiological changes that accompanied emotional arousal in test situations and little interest was shown in individual differences in test anxiety. The first reported non-physiological approach to "underachievement"* dates from 1927 when Lemon delivered a "How to Study" course to a group of first-year American College Students.

A similar trend followed in Europe a few years later when "academic guidance" received much attention and Neumann (1933) published the first book dealing with test anxiety, while other researchers published papers on its aetiology (Redl, 1933; Stengel, 1936) and treatment (Bergler, 1933; Weber, 1934).

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*In the research literature, underachievement is usually defined in terms of a discrepancy between observed and expected academic performance.

In 1938 in the United States, Charles Brown drew attention to the seriousness of the problem of test anxiety, by linking two student suicides to "worry over an approaching exam" (1938, p. 15). Brown's observations were also linked to the concept of underachievement:

> "Students who become excited before exams, tend, on the whole, to do a little poorer in the examination than those students who are calm before the examination" (*ibid.* p. 15).

Although this may appear to be a somewhat simplistic view of test anxiety as we know it today, it provided a platform for continued research in this area (Spielberger *et al.*, 1978). Not only was time spent researching test anxiety, but cognisance was taken of the need for developing effective methods for its treatment.

More and more colleges in the United States began to offer some kind of study skills course and by 1955, such courses were available to selected groups of students in over 90% of colleges, while 10% of the colleges prescribed such courses for all first year college students (Entwisle, 1960).

Even though Brown's contributions pre-dated the research of George Mandler and Seymour Sarason (Mandler & Sarason, 1952; Sarason & Mandler, 1952) by more than a decade, they are generally credited with having conducted the rudimentary work on test anxiety. Their main contribution was to embed their research findings within a theoretical framework and to offer an

explanation of how anxiety in examination situations influences performance.

Mandler and Sarason (1952) contend that examination situations can be associated with two types of learned drives (from Hullian drive theory) - task drives, and anxiety drives. Task drives are reduced by completion of the task while anxiety drives can evoke either task-facilitating or task-interfering responses, before and during the task. While performance of low-anxious individuals was facilitated by anxiety or arousal in the evaluative context, that of high anxious individuals was affected detrimentally by task-irrelevant responses in such situations (Mandler & Sarason, 1952; Sarason, Mandler & Craighill, 1952).

According to Allen (1980) in the absence of drive activation, no performance differences would exist, and thus the use of counter-conditioning and other strategies for emotional control in early treatment efforts was justified because of the role physiological activation played in the high-test-anxious students.

In 1958 Irwin Sarason proposed the first revision of the learned-drive framework when he included cognitive disruptions in the detrimental effects of test anxiety and suggested that high-test-anxious persons respond to evaluative threat with self-oriented personalised responses.

Spielberger (1966) extended this theory when he postulated that a distinction be drawn between two meanings of the term test-

anxiety, namely anxiety as a state, and anxiety as a trait. Spielberger (1972) suggested that State Anxiety (A-State) may be considered to be a transitory emotional state or condition that varies in intensity and changes over time.

> "This condition (A-state) is characterized by subjective, consciously perceived feelings of tension and apprehension, and activation of the autonomic nervous system ...." (p. 39)

Furthermore, Spielberger suggests that Trait Anxiety (A-Trait) refers to

> "relatively stable individual differences in anxiety proneness, that is, to differences in the disposition to perceive a wide range of stimulus situations as dangerous or threatening, and in the tendency to respond to such threats with A-state reactions" (p. 39).

The state-trait model indicates in essence that evaluation situations that threaten the self-esteem, such as tests and examinations, evoke higher levels of A-State response in high A-Trait individuals than in those persons low in A-Trait. Because of positive correlations between A-Trait and performance decrement, trait anxiety continues to be a major variable in anxiety research (Spielberger & Diaz-Guerrero, 1983).

In agreement with the above postulations Allen (1970) found that the State-Trait Anxiety Inventory (STAI; Spielberger & Gorsuch, 1966) may be a useful predictor of academic success.

The results of his study indicated that test-anxiety scales

> "typically thought to measure traits are quite robust, since the relative standing of subjects on these scales is not strongly affected by situational demand characteristics, as are state scales".

From the time when Liebert & Morris (1967) provided a more detailed conceptual scheme and proposed that two major components, emotionality and worry, were involved in test anxiety, other researchers have adopted this framework. According to Liebert & Morris (1967), *emotionality* referred to the perception of unpleasant autonomic arousal in response to stressful testing situations while *worry* described the more evaluative concerns; the lack of confidence and the consequences of failure. Further studies (Morris & Liebert, 1969; 1970; Doctor & Altman; 1969) indicated that the worry component has greater temporal stability than emotionality which exhibited state-like fluctuations in relation to impending examinations.

In reviewing the previous test-anxiety literature Jeri Wine (1971) offered an interpretation based on cognitive attention. She proposed the Direction of Attention Hypothesis, suggesting that

> "the highly test anxious person responds to evaluative testing conditions with ruminative, self-evaluative worry and thus, cannot direct adequate attention to task-relevant variables" (p. 99).

This was a major theoretical development which was in contrast to the previous dominant focus on emotional reactivity.

Wine (1980) has further empirically shown that high-test-anxious persons are more self-focussed than low-test-anxious persons, and that this self-preoccupation disrupts their coping abilities.

These observations are in some respects similar to the findings of Meichenbaum and Butler (1980) who described the high-anxious person's internal dialogue as "self-oriented rather than task-oriented", and negative in nature rather than positive, which has the effect of "escalating rather than controlling" anxiety (p. 190).

In the model proposed by Meichenbaum & Butler (1980) the test anxious person possesses stereotypic beliefs which centre on helplessness and inadequacy. Wine (1980) has proposed a bi-directional model of cognitive attention which suggests that persons with *low-anxiety* are characterised by cognitions that are behaviourally focussed, situationally specific and problem oriented and they tend to interpret emotional arousal as energising; whereas their *high-anxious* counterparts usually interpret emotional arousal as distressing, and they are characterised by their self-oriented focus which tends to make them task-avoidant observers and not task-oriented actors. Both the models discussed serve to elucidate and emphasize the multi-faceted connections between behaviour and the test anxiety situation. Both of these models were instrumental in providing the theoretical foundation for the use of a comprehensive multicomponent test anxiety management package (Allen, 1980).

More recent research has tended to further refine the variables in question in test anxiety by considering the actual experience of anxiety and the cognitions and behaviours of anxious students in evaluative situations. Recent studies (Baddeley, 1982; 1984; 1988; Guttman, 1987) have directly assessed possible causes of or contributory factors to test anxiety.

In her earlier work, Baddeley (1982; 1984) found that highly anxious children achieved lower IQ scores than low anxious children regardless of the type of IQ measure employed. She suggests that highly anxious children have, over the early school years, developed a sensitivity to social-evaluative cues and that there is a negative correlation between test anxiety and self-concept. Baddeley's findings give confirmatory evidence, in the South African context, to the work done by Sarason (1975) and Many & Many (1975).

Guttman's (1987) study which assessed the anxiety and performance of adolescent children of divorced parents highlighted the importance of distinguishing between test and general anxiety. Unfortunately, the majority of test anxiety scales do not consider this distinction. These studies, considering the possible aetiology of test anxiety i.e. low IQ and failure experience, and general anxiety, are important in that the treatment of test anxiety could be more effective if intervention could alleviate causative factors. Sarason, Davidson, Lighthall, Waite & Ruebush (1960) believed that the test-anxious response needed to be considered within the realm of parental behaviour;

so the idea of aetiological considerations is not a new one, but certainly one which requires attention in the complex situation of test-anxiety management.

The cognitive-attentional viewpoint (Wine, 1980) has been supported with further evidence from fourth grade-students (Zeidner, Klingman & Papko, 1988). In accordance with previous research (Liebert & Morris, 1967; Morris, Davis & Hutchings, 1981), Zeidner *et al.* (1988) also found that worry scores correlated more strongly with achievement than did emotionality scores.

In order to expand further on the cognitive-attentional theory Naveh-Benjamin, McKeachie & Lin (1987), studied the encoding and retrieval skills of a sample of college students to ascertain whether it is the learning or the attentional processes which are inadequate in highly anxious students. The results of their study indicated that there were, in fact, two types of test anxious students who were differentiated according to the direction of the anxiety-achievement causation. Those anxious students who suffered retrieval failures under anxiety-provoking conditions could be seen to achieve poorly as a result of their high test anxiety, (interfering thoughts) while those with deficits in encoding and organising could be considered to be anxious as a result of past failures.

There is obviously a strong association between the two main variables taken into consideration in the anxiety-achievement

research area and the recent findings (Plaas & Hill, 1986; Zatz & Chassin, 1985) are in accordance with previous research (Sarason *et al.*, 1960; Dusek, 1980).

1.2 ANXIETY IN ITS BROADER CONTEXT

In attempting to understand the nature of test anxiety the concept needs to be placed within the broader framework of anxiety. Although there are certain unique aspects regarding test anxiety there is a similar core structure and often the test-anxious person will be anxious in other stressful situations.

According to Rollo May (1950),

> "Anxiety is the apprehension cued off by a threat to some value that the individual holds essential to his existence as a personality" (p. 206).

May continued by noting that the "threat" may be to:

> "physical life (threat of death); psychological existence (loss of freedom, meaninglessness); or to some other value which the individual identifies with his/her existence (such as `success´)" (p. 206).

Although it can be seen that test anxiety is encompassed by this definition, so too are many other forms of anxiety which make up the complex entity known as anxiety.

I.G. Sarason (1978), in his analysis of the concept of anxiety noted that it begins with the objective properties of situations

and the individual's interpretation of them. Regardless of the objective situation, it is this personal interpretation of the situation that leads to the behaviour. Sarason sees anxiety as a type of cognitive response marked by self-doubt, feelings of inadequacy and self-blame.

Within this framework, Sarason sees anxiety as a response to perceived inability to handle a challenge in a satisfactory manner and he cites five characteristics of anxiety responses which become linked to situations (through experience).

> "1. The situation is seen as difficult, challenging and threatening.
> 2. The individual sees himself/herself as ineffective in handling the task at hand.
> 3. The person focuses on undesirable consequences of personal inadequacy.
> 4. Self-deprecatory preoccupations are strong and interfere or compete with task-relevant cognitive activity.
> 5. The individual expects and anticipates failure and loss of regard by others." (Sarason, 1978, p. 196)

Anxiety cannot be avoided, but it can be reduced and maintained at manageable, if not facilitative, levels. If the situation is seen as difficult and challenging and the person can maintain normal levels of anxiety, then this normal anxiety can be used to stimulate one's awareness and vigilance and prepare one to confront the situation constructively.

Kierkegaard and Goldstein (1976) have linked the concept of anxiety as a motivating force to a broad concept of `intelligence' in their research which confirmed that the more

creative and productive the personality, the more anxiety-creating situations he/she confronts.

According to Simpowski (1973), anxiety can either inhibit or facilitate performance, depending on its strength and the individual's creative potential. Highly creative individuals perform cognitive tasks under stress better than those who are less creative.

The general principle, known as the Yerkes-Dodson Law, stating that anxiety facilitates performance up to a point, then as the anxiety level rises and tends to become overwhelming, it becomes debilitating (Collins, 1973), is well established. Just as this principle can be applied to anxiety in general or test anxiety in particular, so it can also be applied (bearing in mind certain characteristics unique to their situation) to nurses whether working in the hospital situation or in a test situation.

1.3 ANXIETY IN STUDENT NURSES

In investigating test-anxiety in student nurses it is important to distinguish between student nurses and college or university students and to determine whether there are any differences between them. In this regard Mancini, Lavecchia & Clegg (1983, p. 330) stated that

> "Nursing students, in comparison with other college students, are more doubtful about their academic performance. A great deal of stress is encountered by the nursing student in the course of adjusting to a rigorous program of theory and clinical practice. The

> reality of nursing education is often far different from a prospective student's image of it".

Caring for ill people is very stressful, and since nurses have the most contact with patients, this experience can be particularly stressful. It is necessary here to acknowledge that stress can be the result of the interaction between the person and the environment and may be associated with psychological, behavioural, and physiological outcomes. This conceptual perspective suggests that stress or anxiety occurs when the environment imposes demands which are perceived as being out of balance with the person's capabilities. The imbalance can occur when the demands of the environment are greater than the person's capabilities or the person's capabilities exceed the environmental demands (Beard, 1988). This discrepancy does indeed occur in nursing and Melia (1982) has reported student nurse difficulties in coping with the learner/worker conflict; the pressure of work; learning what the job is about; and the transient nature of the student nurse experience.

Beard (1988) has discussed the sources of stress relevant to university personnel and these apply equally to hospital personnel and in particular the concepts of role conflict, role ambiguity, role overload, fear of responsibility and unpleasant working conditions can be applied to student nurses. (See Beard, 1988, p. 57 for further details with respect to the suggested causes of these stressors). According to Beard:

> "The ultimate effect of these stressors, if they become excessive, can be harmful physically, emotionally, psychologically and socially. Stress can manifest itself in subjective, behavioural, cognitive, physiological and organizational reactions" (p. 57).

Another factor to consider in relation to the stress associated with nursing is that nurses find themselves near the bottom of the hierarchy in the health professions, where they are poorly paid and often not well respected by other health professionals (Aiken, 1983; Parkes, 1985). The findings of Brown (1987) support those of Huckabay and Ardnt (1976) suggesting that self-esteem and academic achievement are positively correlated. Baddeley (1988) while agreeing with the previous correlation between self-esteem and academic achievement, has however, suggested that treatment for high-test-anxious subjects which reduces test-anxiety does not necessarily yield much success with regard to self-concept - even when specifically directed at this variable (Scheirer & Kraut, 1979). The reason for this is probably due to the entrenched nature of self-esteem, which requires many cues from credible sources prior to significant changes occurring (Braun, 1976).

A major problem encountered by nursing students and their colleges is the students' reactions to evaluation events (Barnes, 1987). The comprehensive integrated nursing course and the examinations involved appear to be a particularly difficult and forebidding experience for certain students. However, there are marked differences in student's reactions and while some students become almost paralysed and appear pre-occupied with self-doubt

and fear of failure and its consequences; other students approach the examinations with self-confidence and high expectations. Sarason (1978) notes that it is important to identify the cognitive events that influence these behaviours and the personal meaning an evaluation event has for a student.

From the literature, it can be seen that not only is the clinical aspect of nursing very stressful and anxiety-provoking, but that this state of anxiety can be transferred into the academic sphere and manifest in certain cognitive difficulties resulting in student nurses being doubtful about their academic performance. Sobol (1978) found that the level of self-actualisation was a significant predictor of the amount of anxiety to be expected in response to the potential stress of clinical performance and examinations.

According to Baird (1974) one of the main functions of a college or university is to prepare its graduates for the roles they will assume. It is therefore important that the nursing colleges take cognisance of the fact that, particularly with the younger student nurses, the process of becoming a nurse is compounded by the process of becoming an adult.

If high stress levels exist as the literature suggests, strategies for coping with stress are vital in the interest of facilitating student learning, and in providing future health professionals with a tool they can use with clients (Mancini, *et al.*, 1983).

CHAPTER TWO

THE MEASUREMENT OF TEST ANXIETY

2.1 MEASURES USED

2.1.1 INTRODUCTION

I. Sarason (1978) observed that in order to use the concept of test anxiety impartially, an index of a variable was needed. This was, however, not an entirely new concept as in 1938 Charles Brown of the University of Chicago developed a questionnaire to identify test anxious students. These self report scales tapped both emotional and cognitive reactions to examinations and were measures of debilitating test anxiety, as the concept of "high" (debilitative) and "low" (facilitative) test anxiety, had not yet been formulated. Allen (1980) conducted a detailed review of the many measuring instruments available to the researcher of test anxiety and advocated that because of the `complex hypothetical construct' (p. 85) of test anxiety, multiple methods of measurement should be employed. He recommended that the assessment methods involved:

> "1. Self-report of subjective experience,
> 2. indices of peripheral autonomic reactivity, and
> 3. direct observation of cognitive or motoric performance" (p. 86).

2.1.2 SELF-REPORT MEASURES

Although Brown produced the first questionnaire in 1938 it was not until 1952, when the Test Anxiety Questionnaire (TAQ),

developed by Mandler and S. Sarason became available, that a test anxiety scale was widely used. The TAQ looked at confidence (or lack of confidence) before and during examinations, avoidance of intelligence testing situations, and accelerated heart rate and increased perspiration (physiological changes) when faced with an examination.

In 1958, I. Sarason developed the Test Anxiety Scale (TAS), (which he revised in 1972) which also looked at both the cognitive and emotional aspects of test anxiety focussing on the debilitative consequences of these concerns.

Alpert & Haber (1960) developed the Achievement Anxiety Test (AAT)* which at present is still the only instrument available to measure both the facilitative (motivating) and debilitative (inhibiting) aspects of test anxiety. It is thus the only test that takes cognisance of the fact that individuals interpret their arousal differently. Numerous researchers have successfully employed the AAT in experimental investigations (Desiderato & Koskinen, 1969; Kostka & Galassi, 1974; Huck & Jacko, 1974).

More recently, Kirkland & Hollandsworth (1980) report using the AAT successfully as a screening device to discriminate between high-test-anxious and low-test-anxious persons. In this respect a difference score was computed by calculating the debilitative

*A copy of the Achievement Anxiety Test (AAT) appears in a modified form Appendix E.

minus the facilitative score and then subjects scoring in the upper 28% of the distribution (high debilitative/low facilitative test anxiety) were classified as highly test-anxious and used in their research.

The AAT of Alpert & Haber (1960) which revealed an implicitly cognitive theoretical base (Wine, 1980), was followed by further test anxiety instruments which considered both the cognitive and emotionality factors: the Worry-Emotionality Questionnaire (WEQ) of Liebert & Morris (1967 - see Chapter 1 page 3 for details); and the Suinn Test Anxiety Behavioural Scale (STABS) (Suinn, 1969) which measured emotional arousal in academic evaluation. One of the more recently constructed questionnaires which is aimed at distinguishing between worry and emotionality is the Test Anxiety Inventory (TAI) devised by Spielberger *et al.*, (1978).

A measuring device based on items from many of the earlier test anxiety questionnaires (notably the STABS), is the Subjective Units of Disturbance (SUD) Scale, developed by Wolpe in 1969. This scale was used by Wolpe to enable anxious clients to attribute specific scores to their feeling-state of anxiety, a necessary preliminary to determining the extent to which progress had been made in reducing feelings of stress. The scale serves as a numerical index of felt anxiety, based on a scale of 0 - 100. This scale is widely employed in the form of a questionnaire which the subject completes by him/herself (Kostka & Galassi, 1974).

For self-report measures, reliabilities range from r = ,80 in the case of the TAS; r = ,87 and ,76 respectively for the facilitating and debilitating subscales of the AAT, to r = ,82 on the TAI (Allen, 1980).

Self-report anxiety questionnaires provide the most direct access to subjective experience and it is possible to make standardised comparisons across independent investigations since there are adequate normative data for most self-report instruments (Allen, 1980). However cognisance must be taken of the fact that test anxiety scales vary considerably, both in the cognitive/ emotionality dimension and in the nature and specificity of the situations in which the subjects are required to report any feelings of anxiety (Badddeley, 1988). Self-report questionnaires do also have the drawback of transparency i.e. they are subject to the influence of response biases (Allen, 1970; 1980). Although there is a discrepancy in the literature as to the importance of this response bias (Allen, 1980) it is important to recognise the possibility of its existence.

Another area of concern is in the reporting of results in test anxiety research, where a number of researchers (Suinn, 1969; Tasto & Suinn, 1972) have reported substantial anxiety reduction in re-testing untreated respondents. While Allen, Elias & Zlotlow (1980) observed that untreated control subjects rarely show improvement in therapeutic outcomes.

Most of the research in the area of test-anxiety has been carried out with high-anxious individuals and Wine (1980) suggests that existing measures are subject to several limitations, one of which is the absence of information regarding low-test-anxious individuals.

2.1.3 PHYSIOLOGICAL MEASURES

There is a paucity of data relating to measures of physiological activation in the literature on treatment for test-anxiety. A possible reason for this is that technically it may be difficult to obtain the necessary data in real-life examination situations as a high level of expertise is required by the researcher in the area of psychophysiology in order to obtain accurate measurements and interpretations of the data. Assessment may thus be neither cost efficient nor practical. A further consideration is that there is evidence indicating that both high- and low-test-anxious individuals show substantial increments in levels of physiological arousal in test situations, but that the interpretation of this arousal differs in these two distinct groups of individuals (Holroyd & Appel, 1980). In a well-known study by Morris & Liebert (1970), no consistent relationship was observed between pulse rate and self-reported anxiety. Since pulse rate was also not correlated with test performance, Morris & Liebert (1970) suggested that physiological arousal (autonomic activity) is an independent dimension of test anxiety to self-report or performance measures. These findings were replicated by Holroyd, Westbrook, Wolf & Badhorn (1978).

Allen (1980) recommends that some method of testing physiological arousal be utilised and suggests that pulse rate and finger sweat print measures can be obtained, in actual examination situations, as these can be obtained cheaply and with minimal disruption (Cornish & Dilley, 1973; Horne & Matson, 1977). However, Kirkland & Hollandsworth (1980), observed that subjects receiving skills-acquisition training can obtain a significant gain in performance without there being a change in the physiological variable. This in their opinion confirmed the "relative unimportance of somatic reactivity as a factor in ineffective test taking" (p. 438). Physiological measures may thus not be suitable to differentiate between those who suffer from debilitating levels of test anxiety and those who do not (Craske & Craig, 1984; Holroyd *et al.*, 1978; Morris & Liebert, 1970).

2.1.4 OBSERVABLE PERFORMANCE MEASURES

The majority of observable performance measures used assess a wide range of cognitive and academic skills, with semester grade-point averages, course grades, and examination scores being most frequently utilised (Allen *et al.*, 1980). Observable performance measures are designed to provide data about types of cognitive disruptions that test-anxious individuals experience in evaluative situations (Allen, 1980). Improvement in the examination score (which according to Steven-Richards, 1975, is a good outcome measure because of its objectivity, unobtrusiveness and importance), may be influenced by simple re-testing and other non-cognitive factors.

2.1.5 MULTIPLE METHODS OF MEASUREMENT

Although self-report measures on their own are often used in experimental approaches to test anxiety, Allen (1980) does not consider them to be adequate to assess treatment effects in respect of the complex hypothetical construct of test anxiety.

Many researchers (Paul, 1966; Long, 1968; Allen, 1980) advocate the "triangulation" of measures from the three domains previously outlined. Because the limitations which apply to the different domains are unique to each, more potent therapies can be distinguished from those which are less influential. Thus, for example, a treatment manipulation that lowers subjective distress and improves cognitive performance is likely to be considered as more powerful than an intervention that produces change in one area only.

The use of multiple methods helps to include different domains and to reduce the limitations which are unique to each method; and thus provide more compelling support for the efficacy of a therapeutic intervention. The majority of test-anxiety management programmes utilise both self-report and performance measures, while only a few studies include the use of physiological measures.

CHAPTER THREE

THE MANAGEMENT OF TEST ANXIETY

3.1 INTRODUCTION

The concept of test anxiety was not generally recognised in the United States and Europe until after the Second World War when there was a dramatic increase in the number of students attending colleges and universities. The development of this concept coincided with the rise of behaviourism in American psychology. It is thus not surprising that test anxiety was seen as a behavioural problem and therefore behavioural methods of anxiety management were the treatment approaches most often used.

Several comprehensive reviews of test anxiety studies have been conducted in the last decade (Allen *et al.*, 1980; Denney, 1980; Morris *et al.*, 1981). These indicate the persistence of behavioural methods of anxiety management although more recently a multi-component "package" has been utilised (Meichenbaum & Butler, 1980). More recent studies (Dendato & Diener, 1986; Wilson & Rotter, 1986; Zeidner *et al.*, 1988) although placing more emphasis on the cognitive component in treatment, are still advocating a multi-component package which includes some form of desensitisation or relaxation, a cognitive component as well as study skills training. These multi-component treatment packages are proving to have greater success than single-component

procedures, although improvement in performance measures continues to remain lower than expected.

Kirkland & Hollandsworth (1980) suggested that "test anxiety" was incorrect terminology, and that ineffective or inadequate test performance should be seen as an attention-focusing skills deficit. To enhance gains in performance, subjects would thus need to receive skills-acquisition training which would encompass effective test-taking strategies, attentional control skills, and adaptive self-instructional statements. In this broadly based conception of skills-acquisition training, particularly in respect of the development of adaptive self-instructional statements, arousal, instead of being seen as something to be removed, is utilised to enhance test performance.

3.2 TREATMENT APPROACHES

Some of the more popular techniques for the management of test anxiety will be considered. It is, however, not intended to provide a comprehensive review of all treatment programmes available for test anxiety, but rather to concentrate on the treatment approaches intended for use in this experimental investigation (presented in PART TWO of this report).

3.2.1 SYSTEMATIC DESENSITISATION

The most popular behavioural treatment was systematic desensitisation, developed as a formal treatment by Wolpe (1958).

This method can be seen to fall into the category of emotional conditioning of a counter-conditioning nature in which the unpleasant emotional arousal produced by stressful examination situations is reduced and replaced by new, and more adaptive conditioned responses.

Paul (1969) has succinctly described the process of systematic desensitisation as follows: "Systematic desensitisation is essentially characterised by relaxation training, construction of hierarchies of anxiety-eliciting stimuli, and the graduated pairing of anxiety-eliciting stimuli via imagery with relaxation" (Allen, 1977, p. 44). The subject is thus given the opportunity of confronting the anxiety-eliciting stimuli without feeling anxiety, thus allowing the anxiety to subside.

The relaxation training to which Paul (1969) refers is based on the deep-muscle relaxation technique first described by Jacobson (1938) and later adopted by Wolpe as part of his `psychotherapy by reciprocal inhibition' (1958). The systematic desensitisation procedure consisted of verbally presenting carefully graded situations, which are increasingly anxiety provoking, to a deeply-relaxed client, until he or she is able to visualise the most stressful scenes on the list, without experiencing any anxiety. This graded scale of items is called "anxiety hierarchy". Through repeated pairing of threatening situations on the one hand, with deep relaxation on the other, the bond between these situations and the anxiety response, is weakened (Zenmore, 1975).

The rationale according to Cohen (1969) for beginning with a slightly anxiety-arousing situation and gradually introducing more intense items, is that the relaxation response must be stronger than the anxiety response in order to "reciprocally inhibit anxiety" (a concept first introduced by Wolpe, 1969). If the anxiety elicited is too strong, relaxation cannot successfully inhibit the anxiety.

Systematic desensitisation was commonly used in the control of test anxiety on an individually-oriented basis. However Paul & Shannon's (1966) claim that it was as effective in the treatment of test anxiety when administered in group settings, enhanced its usefulness and it thus became an increasingly popular approach to utilise in groups.

The most obvious reason for doing desensitisation with groups rather than individuals, is an economic one, with savings in both staffing and time. Cohen (1969) notes an additional benefit to the participating students: that of hearing of the progress of others involved in the training programme.

On the other hand an important problem in group administration of systematic desensitisation, that of the construction of anxiety hierarchies, has been emphasised by a number of authors (Cohen, 1969; Donner & Guerney, 1969; Taylor, 1971). Various methods of construction and presentation of anxiety hierarchies have been suggested (Cohen, 1969; Donner & Guerney, 1969; Paul & Shannon, 1966) which consisted of a selection made by the researcher based

on scores from a test-anxiety questionnaire. In 1971 Taylor introduced a modified form of systematic desensitisation in which each individuals had their own hierarchical items and in 1974 the concept of a *group-constructed* hierarchy was introduced into desensitisation of test anxiety by Robinson.

Allen (1972) reported that desensitisation was effective in reducing self-reported test anxiety in nine out of the ten studies he reviewed, while the effects on academic performance were more complex and only appeared to lead to performance increments when combined with study skills. Cornish & Dilley (1973) observed that in the research, systematic desensitisation was shown to be more effective than other methods, particularly when included in a combined therapeutic package.

Despite these and other positive statements concerning the efficacy of systematic desensitisation a number of researchers have put forward strong criticism of what is still the most widely used of all single-component therapy programmes (Allen, 1980). For example, Adams & Unikel (1973) have complained that quite frequently anxious subjects cannot relax (as required by the desensitisation programme). In their research experience, subjects often held a fear of losing control of the situation. Adams & Unikel also propose that cognitive distress may still be problematic even in the presence of muscular relaxation.

Kirkland & Hollandsworth (1980) criticise systematic desensitisation and other anxiety-reduction techniques on the

basis of a lack of evidence of improvement in test performance, in their opinion, the ultimate criterion. Furthermore, several investigators have questioned whether high levels of physiological arousal are in fact related to less effective test-taking behaviour (Allen, 1980; Deffenbacher, 1978).

3.2.2 RELAXATION AND GUIDED IMAGERY (VISUALISATION)

Relaxation training can be considered to be a self-control approach to the treatment of test anxiety, and the current emphasis on self-control approaches stems from the work of Cautela (1966, 1969) and Goldfried (1971). Cautela introduced an imagery-based aversion procedure and his paper was the first to offer the view of relaxation training as a self-control procedure. Due to his concern about the lack of generalisation in the treatment effects of systematic desensitisation, and the failure of the behaviour therapists to enable their clients to learn skills that would assist them to avoid future fears, he suggested that clients should learn to use relaxation on their own.

While Cautela endeavoured to preserve systematic desensitisation intact as a self-control procedure, Goldfried (1971) reinterpreted systematic desensitisation as an active process in which "the client is taught to become sensitive to his proprioceptive cues for tension and to react to these cues with his newly acquired skills in muscular relaxation" (p. 228). This he saw as the learning of a skill to actively cope with anxiety,

rather than a replacement for it. Goldfried recommended that greater attention be paid to relaxation training, that diverse themes be included in hierarchies and that clients be taught to relax away their anxiety. Thus they were taught to recognise tension cues as signals to relax, and given practice in doing so in imagined scenes presented by the therapist.

According to Denney (1980), procedures that are classified as applied relaxation techniques constitute the simplest examples of self-control techniques for the reduction of test anxiety and share three common features. Firstly, a self-control rationale similar to that advocated by Goldfried (1971) is used in the introduction of these procedures. Secondly, training in a variant of relaxation, which might range from progressive muscle relaxation (adapted from Jacobson, 1938) to breathing exercises (Meichenbaum, 1972), autogenic training (Reed & Meyer, 1974), imagery exercises (Samuels & Samuels, 1975) and biofeedback-assisted relaxation (Romano & Cabianca, 1978). The last feature to consider is the application of the relaxation technique within stressful real-life situations, and the clients should be informed that although they may indeed still feel somewhat anxious, they should be able to keep their anxiety under better control and thus prevent it from interfering with their performance.

Studies in which subjects received training in progressive relaxation only, vary from being completely ineffective (Aponte & Aponte, 1971), reducing subjects fears relative to untreated

controls (Denney, 1974), being as good as systematic desensitisation (Denney, 1974), to being significantly better than no treatment (Allen, 1973).

Applied relaxation training as used by Chang-Liang & Denney (1976) however, which gave an active, self-control rationale and explicit instructions concerning the application of relaxation in real-life settings, proved more successful than systematic desensitisation, relaxation alone, and no-treatment controls in reducing test and general anxiety and in improving their test performance.

Because of the conflicting evidence on the benefits of relaxation procedures, the clinical status of relaxation training is unclear. In the literature, there are reports in which relaxation was used as the main treatment procedure (Snider & Oetting, 1966) while others employed it as an attention-placebo control (Trexler & Karst, 1972). Although there is still some uncertainty as to exactly how relaxation training lowers anxiety, there is little doubt that it works. In addition to subjective reports of anxiety-free states from individuals following a relaxation training session, physiological studies have shown that muscular relaxation has definite physiological effects, including decrease in pulse rate, blood pressure, and skin conductance (Jacobson, 1938; Paul, 1969).

In Goldfried & Trier's study (1974), relaxation training was presented in two ways. In the first group, subjects were told

that the relaxation exercises, modelled on Paul (1966), would more or less automatically reduce their anxiety level. The second group had their relaxation presented within a self-control context, in which subjects were told that they were learning an active coping skill. Both groups (as well as the discussion attention-placebo group) met for one hour at weekly intervals for five sessions. The relaxation groups were supplied with tape-recorded instructions which they were required to practice twice a week between sessions. From the second session on, however, subjects in the self-control relaxation group were encouraged to apply the relaxation skills in vivo whenever they felt themselves becoming tense. The results indicated that improvement consistently occurred within the self-control relaxation condition, and the overall ratings of satisfaction at the follow-up assessment were greater in this group than the standard relaxation group.

More recently, a study was conducted by Schandler & Dana (1983) which utilised guided cognitive imagery relaxation, frontalis muscle feedback relaxation and a self-rest control procedure. They found that the imagery procedure was associated with moderate reductions in physiological tension and significant reductions in state anxiety and three tension-related personality dimensions; while the biofeedback subjects showed the largest reductions in physiological tension, they displayed only small and variable changes in state anxiety and personality dimensions. The self-rest persons displayed little physiological change and small reductions in general tension.

These results, according to Schandler & Dana

> "raise continued questions about the application of physiologically based operant relaxation procedures and support the use of cognitive mediated protocols for the treatment of specific of general anxiety behaviours" (p. 672).

Guided cognitive imagery represents a relaxation procedure that incorporated the development of mediational processes along with attention to bodily states. Bandura (1969) proposed that effective human coping skills require the formation of complex, cognitively mediated processes that involve direct, vicarious, and self-stimulatory experience. Singer (1974) discussed the facilitative properties of imagery, and suggested a strong, direct relationship between imagery and relaxation. He proposed that relaxation may not only be conducive to imagery and control of thought processes, but that it may also enhance alertness to ongoing feedback from autonomic and muscular systems.

3.2.3 STUDY SKILLS TRAINING

Programmes for training in study skills are derived from the literature on educational counselling (Robinson, 1961, 1970; Beneke & Harris, 1972) and involve coaching test-anxious students on how to improve their study habits. The underlying rationale is that it is the inferior academic preparation which results in the debilitating effect on academic performance, and thus training strategies are aimed at improving cognitive performance without focusing on the disruptive influence of emotional arousal.

Osterhouse (1972) has observed that empirical evidence suggests that highly test-anxious students have poorer techniques of study than do less anxious students (see also Desiderato & Koskinen, 1969; Sassenrath, 1977). In assessing study skills counselling programmes, Carter (1948, 1958) suggests that the most important variables to consider are: morale or self-confidence; scholarly drive and values; study mechanics; and a tendency to plan for getting working done. It was later established that study mechanics or the actual method of studying was more important than it was originally considered to be (Carter 1958; Robinson, 1970). Robinson, (1970) has observed that study mechanics form the basis of most study counselling in the United States.

Allen (1980) has noted that early investigations (Katahn, Strenger & Cherry, 1966; Paul & Shannon, 1966) "provided informal study counselling as an adjunct to emotional conditioning rather than as a therapeutic intervention in its own right" (p. 94). Subsequently, more organised programmes to enhance study consisted of group formats for direct counselling (e.g. Allen, 1971; Mitchell & Ng, 1972). Beneke & Harris (1972) note in their analyses of study habits that the major problem in improving students' study habits is not the development of a set of well-defined principles for effective study, but rather transmitting this information to students and persuading them to use it.

Marston & Feldman (1971) have suggested that the success of a self-control programme depends on two factors:

"a) the strength of the commitment act (or covert decision to change one's behaviour) and
b) the effectiveness of the self-controlling responses which are the particular techniques used by the individual to change his own behaviour". (Cited in Beneke & Harris, 1972, p. 35).

Beneke & Harris (1972) add that the major problem with implementation of a study skills programme is that of inducing the subjects to participate and keeping them motivated to do so.

3.2.4 COGNITIVE MODIFICATION

Cognitive modification, which embraces both relaxation and cognitive restructuring, is a more recent concept in test anxiety which can be traced to the work of Albert Ellis (1962). Ellis's contribution lay in assisting us to appreciate the therapeutic significance of the fact that the way in which individuals construe situations that they confront, has a substantial effect upon the emotional reactions that follow. The use of cognitive restructuring as a coping skill in the treatment of test anxiety was pioneered largely by Wine (1971, 1973, 1974), who developed attentional training based on her "Direction-of-Attention" hypothesis (See 1.1 p. 4). The aim was to train test-anxious students to substitute their negative, task-irrelevant thoughts with positive self-statements which redirect their attention to the test.

In the case of the test anxious individual, the use of cognitive modification strategies is based on the rationale that people who

are highly test anxious have "unrealistically high expectations for their own performance" (Allen, 1980, p. 95). This heightens their emotional arousal and causes the students' attention to be diverted from task-relevant cues. Goldfried, Linehan & Smith (1978) have delineated three steps normally included in a cognitive modification therapeutic programme, these are:

> "1. Convincing clients that maladaptive beliefs can indeed foster uncomfortable emotional arousal and disrupt cognitive abilities;
> 2. Teaching clients to identify the maladaptive self-statements they make in stressful situations;
> 3. Using guided rehearsal to facilitate verbalization of more adaptive self-statements" (p. 33).

Meichenbaum (1972) devised a treatment package comparing cognitive modification with a modified self-control type of desensitisation in the treatment of test anxiety. Subjects in the cognitive modification group scored higher on a measure of facilitating anxiety, and performance both at post-test and one-month follow up.

Subsequent to Meichenbaum's (1972) study, several outcome studies were conducted to asses the relative efficacy of cognitive modification. Holroyd (1976) found that cognitive restructuring was more important than relaxation training in the cognitive modification procedure and that cognitive modification was more effective than systematic desensitisation in improving performance scores, but that attentional training alone, in addition to improving performance, also significantly lowered reported levels of anxiety prior to a test. These findings of Holroyd (1976) were similar to those of Wine (1971), but in

contrast Hahnloser (1974) found the cognitive modification procedure to be significantly more effective than relaxation training alone, in terms of reducing debilitating test anxiety and increasing facilitating test anxiety. Hahnloser's results differed from those of Wine's & Holroyd's again in that he found no significant differences on performance measures.

By 1980, cognitive therapy approaches for controlling test anxiety had established themselves as falling amongst the most effective, reliable and hence respected therapeutic approaches (Cooley & Spiegler, 1980). There is still, however, a certain amount of discrepancy regarding the efficacy of cognitive modification in improving performance. This is evidenced in the findings observed by D'Alelio & Murray (1981) who commented:

> "... the present results are consistent with the literature in demonstrating that cognitive therapy is effective in reducing self-reported test anxiety but has little effect on performance." (p. 306).

3.2.5 MULTICOMPONENT TREATMENT PROGRAMMES

The idea of multicomponent treatment packages, also referred to as combinative programmes or treatment clusters, is not entirely new. In Wine's (1971) review of test anxiety literature, she demonstrated that treatment clusters proved more efficacious than behavioural manipulations in isolation. One of the earliest and most enduring combinative treatments is that of systematic desensitisation with study skills counselling (Allen, 1971; Katahn *et al.*, 1966; Paul & Shannon, 1966). In a 1971

investigation of this combination, Allen found that a combination of desensitisation and study skills was more effective in reducing physiological activation due to exam stress and in improving academic performance, than either type of treatment used by itself. This was consistent with the earlier findings of Doctor, Aponte, Burry & Welch (1970), Katahn *et al.*, (1966) and Paul (1966) and was later to be supported by McMillan & Osterhouse (1972) and Lent & Russell (1978), who found improvements both on self-reported anxiety and academic improvement.

Rosenthal (1980) suggested that more comprehensive techniques were needed to treat the complex intermingling of affective and cognitive elements involved in test anxiety. Meichenbaum & Butler (1980) also argued for a multifaceted treatment approach while Allen (1980) claimed that only treatment clusters had been found to yield significant improvement in performance, as measured by self-report, physiological and academic performance measures.

Positive findings of the efficacy of multicomponent treatment programmes have been reported (Allen, 1980; Richardson, 1976; Sarason, 1975). Researchers are cautioned however by Sarason (1975) and others, against 'overloading' test anxiety programmes with too many components; while Richardson (1976) warns against a programme being extended over too long a period.

There has been an increasing tendency to devise packages which combine study skills training derived from the work of Robinson (1970) or Beneke & Harris (1972), with some form of cognitive-behaviour modification or stress-inoculation training as devised by Meichenbaum (1977) and Meichenbaum & Genest (1977). A rationale for the inclusion of study skills training is provided by Kirkland & Hollandsworth (1980), who suggest that test anxiety should not be viewed as an anxiety-related disorder, but rather as an attention-focussing skills deficit. They conclude that the goal of therapy should thus be the acquisition of effective test-taking behaviours, and that the physiological arousal perceived by the subject should be utilised to enhance test performances. Brown & Nelson (1983) approached the situation differently and investigated the differences between high and low achieving test-anxious students and found that they differed not only in their study skills but also in the degree of facilitating and debilitating anxiety as well as in the number of positive and negative cognitions that they experienced. Brown & Nelson recommended that cognisance be taken of these differences when planning a treatment programme.

The present argument in test-anxiety research is not about whether multi-component programmes or packages are the most efficacious method of treatment, but about which components ought to be included in the package (Baddeley, 1988). In the past decade most published studies in this field have included a cognitive component in some form: 1) in comparison to , or in combination with, emotionality-based treatment (Cooley &

Spiegler, 1980; Kirkland & Hollandsworth, 1980); 2) as part of multicomponent packages e.g. combined cognitive/relaxation therapy with study skills training (Dendato & Diener, 1986); cognitive therapy, systematic desensitisation and study skills training (McCordick, Kaplan, Fin & Smith, 1981). The more recent focus on cognitive therapy has indicated that on its own the ability of cognitive therapy to improve performance is doubtful (Arnkoff, 1986; D'Alelio & Murray, 1981), whereas its inclusion in a multicomponent package, along with study skills training, appears to be essential.

Multicomponent treatment packages which now appear to be universally accepted, have the ability to reduce self-reported anxiety, but without the inclusion of a study skills training or effective test-taking the improvement in academic performance will remain minimal.

CHAPTER FOUR

TREATMENT OF TEST ANXIOUS STUDENT NURSES

4.1 INTRODUCTION

There is a paucity of research on nursing students as it relates to stress or anxiety. According to Sobol (1978), the considerable stress involved in nursing education has not captured the interest of investigators. In the literature, the dominant theme for nursing students is their report of the stress involved in their clinical experiences (Davitz, 1972; Fox, Diamond & Walsh, 1963; Lee, 1987; Parkes, 1982). In the study by Fox *et al.*, (1963) and other studies (Garrett, Manuel & Vincent, 1976; Davis & Fricke, 1977) however, the largest number of responses described examinations, assignments and homework as stressful experiences.

Although nursing colleges are aware of the stress associated with nursing education, there is limited evidence of research directed towards assisting students to develop strategies to cope with the complex experiences associated with studying nursing (Mancini, Lavecchia, & Clegg, 1983). A number of methods of stress reduction in nursing students have since been utilised with reasonable success (Lachman, 1983; Manderino & Yonkman, 1985). Mancini *et al.*, (1983) used the Transactional Model of Stress proposed by Cox (1978), in which stress is viewed as an imbalance

between the individual's perception of the demands of the environment and the perception of her capability to meet these demands. The stress management programme of Mancini *et al.*, (1983) consisted of relaxation, imagery, diaphragmatic breathing and reduced caffeine intake, which resulted in positive effects on stress response and coping in the experimental group.

The Transactional Model of Stress proposed by Cox (1978) is a refinement and expansion of the interactional concept of stress proposed by Lazarus (1966; 1976). While the interactional concept of stress proposes that the stress response results from an imbalance between individuals and their environment, Cox's transactional model proposes the following stages, the first four of which usually occur in sequence.

1. Sources of demand relating to individuals and their environment;
2. The realisation of the actual demand of the situation through cognitive appraisal;
3. The imbalance between the individual's perceived capabilities and the demand of the situation which produces the stress response, resulting in physiological and psychological efforts to cope with the situation;
4. The consequence of coping in response to the stressful situation; and
5. The feedback which may occur during any of the preceding stages, thus making the model cyclical rather than linear.

This Transactional Model of Stress was also utilised by Strauss & Hutton (1983) as a framework for conceptualising nursing students' responses to stress inherent in the learning environment. They suggest that this model should enable nursing educators to:

> "1) appreciate the complexity of students' responses to stress;
> 2) identify patterns of students' coping strategies;
> 3) develop a better understanding of the importance of timing of intervention to facilitate optimal adaptation to stressful situations;
> 4) identify areas which need to be addressed in future research" (p. 370).

Further studies attempting to reduce stress by increasing the support given during clinical learning by preceptorship (Turkoski, 1987), as well as in the academic field (Brown, 1987) indicate that intervention of various types can have beneficial effects and improve the outcome for the student nurse. Although these studies and others (Abraham, 1982; Cobb, 1976; Hilbert & Allen, 1985) indicate that stress management programmes can be successful in the management of anxiety in student nurses, few nursing education programmes offer such a course as part of the curriculum. Less than 2% require such a course for undergraduates (Manderino, Ganong & Darnell, 1988, p. 323). This number is surprisingly low, given the fact that nursing is a career prone to high levels of stress.

Birch (1979) measured the anxiety levels of nursing students in the first two years of hospital experience. He felt that anxiety arises because of a combination of experiences in the clinical

situation and the academic curriculum (in block periods of study) planned by the tutorial staff. He used the IPAT anxiety scale and a questionnaire testing expressed anxiety at eight-monthly intervals and his results suggested that the students were inadequately prepared and instructed during their block periods of study and demonstrated high levels of anxiety.

The few reported studies on test-anxiety in student nurses indicate the existence of inverse relationships between the interfering effect of anxiety and cognitive outcomes (Barnes, 1987; Carter & Mills, 1982). In a sample of nursing students Hilbert & Allen (1985) in the course of an investigation into the relationship of social support to educational outcomes found a significant inverse correlation between test anxiety and examination results.

In the study by Barnes (1987) it was found that the students' general test anxiety and their pre-test anxiety correlated positively with cognitive interferences about evaluative outcome of the examination. While suggesting that these findings have direct implications for nursing education and research, Barnes recommends that nursing colleges can assist students to understand why test anxiety develops as well as assist them in learning to utilise appropriate coping strategies. She also proposes that further research

> "... will facilitate the development of curricular strategies for preventing - or at least reducing - such anxiety, rather than instituting treatment modalities for students who subsequently appear unable to cope" (p. 17).

Gordy (1984) recommends that students' test-anxiety can be reduced through physical and mental relaxation techniques, biofeedback and therapeutic touch; and that by using these techniques, professionally prepared nursing educators can assist students in interrupting non-productive anxiety-coping patterns and discovering more beneficial alternatives. The implication in these studies is that anxiety-reduction techniques ought to be included in the nursing curriculum and that the nurse educators need to be proficient in teaching these techniques (Phillips, 1988).

4.2 THE SOUTH AFRICAN CONTEXT

There appears to be minimal research into the concept of Test Anxious student nurses in the South African context. This lack of research and information is understandable when viewed in the light of the paucity of research into student anxiety in general i.e. students in a Tertiary Education establishment.

Norton (1983) researched the effects of behavioural methods for the control of test anxiety on students at Rhodes University and Bodibe (1986) did similar research on black students at the Mamelodi Campus of Vista University. Norton (1983) conducted a mail survey of all the residential universities in Southern Africa in order to establish the availability of assistance for test-anxious students. He found that in most universities test-anxiety is dealt with within the rubric of more general counselling (i.e. often viewing test-anxiety as a symptom of a

wider and more complex disturbance). The Counselling and Careers Unit (CCU) of the University of the Witwatersrand, was the only South African campus counselling service to offer group counselling to test-anxious students. Individual counselling on campuses, specifically designed for these students was at that stage available only at the universities of the Witwatersrand (through CCU), Natal (in Durban, through the Student Advisory Service) and Cape Town (through the Students' Health Service and informally through members of the Academic Support Staff).

In July 1989 members of the Students' Health Service (SHS), the Academic Support Programme (ASP) and the Students' Representative Council (SRC) were in the process of forming a sub-committee to investigate methods of reducing the anxiety levels (particularly pertaining to examinations) of students at UCT. One of the psychologists at the Students' Health Service said that they saw this as a complex matter that required further investigation and clarification prior to the implementation of an anxiety-management programme on a group basis for students at the university (ASP staff members and SHS Psychologist, personal communication).

The areas that have been researched in South Africa within nursing, in relation to anxiety appear to pertain more to anxiety and stress within the clinical aspect of nursing than in the educational field. For example the study of Lewis (1987) into the management of stress in nurses which looks at Registered

Nurses in the ward situation. The complex syndrome of "Burnout" and the management of this by methods of anxiety reduction or stress management have also received attention (Greef, 1986; Lewis, 1988). Curriculum planning and development for the future generation of nurses (Thompson, 1986; Uys, 1982) and the development of evaluation tools and techniques (Kollmitz & MacKenzie, 1986), have also received attention, but neither of these included a component of anxiety management for the student nurse.

In a study into "*The accompaniment of students by nurse teachers*", Goodchild-Brown (1986) takes cognisance of the psychological needs of the student nurse involved in the Comprehensive Nursing Diploma Course. This research commenced in the first year of the four year course and thus, as the author mentioned "many unknown variables were operant, tension and stress was high prior to commencing. Support mechanisms were essential." She mentions anxiety reduction techniques employed by the nurse teachers, further commenting on the fact that the students felt more secure, reassured, confident, and competent in the presence of the nurse teacher who was easily approachable and calmed their emotional feelings.

It thus appears that neither Goodchild-Brown (1986) nor the other studies included an anxiety management component within the teaching models utilised for the student nurses.

Due to the paucity of literature initially found on the topic of the treatment of test-anxious student nurses, for the present study, the researcher carried out an International Literature Search through Medical Information Dissemination System (MIDS) using the `Medline´ and `Psycinfo´ databases. A literature search was also conducted through the Human Sciences Research Council (HSRC), the Dissertation Abstracts of South African Universities as well as the National Nursing Register co-ordinated by the South African Nursing Association. These literature searches were largely unsuccessful (except for MIDS) as there has been very little research in this area carried out in South Africa.

No treatment programme for student nurses in South Africa to date appears to have been multicomponent in nature, addressing both the cognitive and emotional arousal components of test-anxiety, and incorporating study-skills training. Nor have the situational factors which might be eliciting, maintaining and increasing such anxiety been addressed.

PART TWO

THE PRESENT PROJECT

CHAPTER FIVE

INTRODUCTION

5.1 RATIONALE

From the discussion already given in Part One it will be clear that a constellation of factors, which are of concern to educators in general and nurse educators in particular, is involved in the concept of test anxiety. This constellation of behaviours which has been found to have a debilitating effect on academic performance consists of subjective distress, physiological activation, cognitive disruption and at times behavioural avoidance.

Student nurses experience test anxiety not only with regard to academic performance, but also in the clinical situation where they are assessed on measures of intellectual ability as well as on practical skills. The present study was concerned mainly with academic performance, but the debilitating effects of anxiety will affect the student in other anxiety-provoking situations such as clinical assessment.

The present researcher, having been involved in the education of student nurses for many years, was concerned with the number of students who were manifesting the previously mentioned constellation of behaviours. As the ongoing education of nurses to higher levels continues, it becomes essential for the student nurse to reduce evaluation-related anxiety to manageable levels

to avoid placing subsequent educational and career opportunities in jeopardy. It is not unreasonable to assume that the student nurses who lack the necessary skills to reduce test anxiety to manageable levels, (i.e. high test-anxious students) will experience the stressors of their work with ill people more than the low-anxious students.

Selye (1980) suggests that "diseases of adaptation" or "stress diseases" are due to insufficient, excessive or faulty reactions to stressors, while Strumpfer (1983) reviews the consequences of such "dystress" and relates certain physical and emotional conditions, such as exhaustion, hypertension, duodenal ulcers, coronary heart disease, substance abuse and burnout, to the dystress experienced. It thus becomes essential to reduce the high-stress level of student nurses as early in their training as possible in the hope that the skills learnt will be of benefit in the clinical environment as well as academically. In this manner the students would be assisted in understanding and incorporating effective coping skills into their lifestyle and would thus be more able to cope with the stress of nursing in this totality, and consequently would be affected less by the "stress diseases" mentioned by Selye.

This experimental investigation sought to develop a group-run programme, specifically tailored to meet the needs of the First Year Student Nurses in the recently implemented Four Year Diploma in Nursing (General, Community and Psychiatry) and Midwifery at Carinus Nursing College in Cape Town.

5.2 CHOICE OF TREATMENT APPROACH

In reviewing the literature, multicomponent treatment programmes consistently emerged as being more beneficial than specific behavioural methods in isolation (Wine, 1971; Allen, 1980). It was thus decided to use multicomponent therapeutic programmes, which incorporated aspects of emotionality reduction, study skills techniques and cognitive restructuring in this research.

Cognitive Restructuring is considered to be an important aspect of anxiety management and it was thus included in all three treatment groups. Following the procedure developed by Meichenbaum and Genest (1977), the subjects were alerted to the role of anxiety-provoking thoughts in the initiation and maintenance of test anxiety and they were assisted in substituting positive, coping self-evaluation statements (Hollandsworth, Glazeski, Kirkland, Jones, & van Norman, 1979).

In attempting to reduce the emotionality aspect of test anxiety, two of the groups were offered different methods of control; namely, relaxation and systematic desensitisation and relaxation and guided imagery (visualisation). The third group, the study skills group were informed of the value of relaxation but were not instructed in any relaxation method.

In the Systematic Desensitisation group the subjects were assisted in constructing a group hierarchy using the technique of brainstorming, and an item-delineated procedure based on the

principles of the phenomenological research praxis described by Stones (1979).

The relaxation technique for both of the emotionality- reduction groups followed a similar pattern and was based on the deep-muscle relaxation principle of Jacobson (1938) as modified by Bernstein and Borkovec (1973).

The third component was study skills. While the Study Skills Training group had more in-depth study counselling, based on the techniques of Francis Robinson (1970) (which centered around effective study and test-taking strategies), the previous two groups were given study skills technique information during informal discussions within their own programme.

To assist in the possible future implementation and wider application of findings, should this research prove useful, all treatments were designed to be cost effective with regard to equipment, setting, professional supervision and time expenditure.

Group treatment of all the first year student nurses, and not just test-anxious students, was chosen both for economic reasons and because it was felt that the improved understanding that might develop between high test-anxious and low test-anxious students would be beneficial to all students concerned. This became particularly evident when real-life anxiety provoking situations were included in the discussions during the programme.

5.3 INFORMAL STATEMENT OF THE RESEARCH HYPOTHESES

It is evident that each of the three multicomponent treatment programmes featured behavioural components which are potentially highly effective. The question thus arises: Which treatment programme will prove to be the most effective in reducing experiences of debilitative test anxiety in student nurses? A second aspect which needs to be addressed is one that considers whether, in fact, students with a particular level of anxiety improve more in a particular treatment programme, than students with similar levels in the other treatment programmes.

To investigate the relative efficacy of the programmes a number of methods of assessment were utilised (See Section 6.2, p. 57) and for the purposes of analysing the data the subjects in each treatment group were further divided into high-anxiety, mid-anxiety and low-anxiety sub-groups.

It was hypothesised that the greatest improvement in terms of the self-report measures would occur in the Systematic Desensitisation (SD) treatment group and the Progressive Muscle Relaxation Training (PMRT) and Guided Imagery (GI) group as both of these techniques should assist in decreasing physiological arousal and allow for a certain amount of improvement in performance. The Study Skills Technique (SST) group were expected to improve to a lesser degree on the self-report measures. Although they were intensively instructed in effective study and exam methods, they were not assisted in removing the

physiological arousal component; they were, however, expected to make the greatest gains in academic achievement as this was the main area of concern in their programme.

The SD group were expected to make less academic gains than the SST group, but possibly more than the PMRT and GI group as the emotionality reduction component in the SD group was related directly to the test situation while the Guided Imagery consisted only of visualising pleasant relaxing scenes.

It was further hypothesised that all three treatment groups would achieve improved self-report measures and academic results at the post-test level and would achieve greater improvements than the no-treatment control group, who would be expected to make the smallest improvement of all. Due to the Hawthorne effect it was possible that there could be certain minimal changes in the control group; more probably in performance or academic achievement than in the self-report measures.

CHAPTER SIX

METHOD

6.1. SUBJECTS

6.1.1 SUBJECT POOLS

The subjects in this study were the First Year student nurses at Carinus Nursing College. The programme was compulsory for all the students as one of the aims of this research was to assess whether a test-anxiety management programme would be beneficial to test anxious students if the programme was administered in the classroom setting for the whole class. The students therefore did not volunteer to be on the programme because they considered themselves to be highly test anxious, but were there because the programme was included as part of their syllabus.

This research therefore differs from most other research as test anxiety management programmes usually involve only test anxious students, and not whole classes of students which obviously include students ranging from one end of the test anxiety continuum to the other. As the group of students was not merely a "high-test-anxious" group, it provided an opportunity to observe what differences existed between high-test-anxious and low-test-anxious students as scored on the Achievement Anxiety Test (AAT), developed by Alpert & Haber (1960).

6.1.2 SUBJECT SELECTION

As the programme was compulsory there was no initial subject selection. There were, however, 120 students who completed the initial forms, but as some of these students either: 1) did not complete all the forms; or 2) were absent from more than one session; or 3) resigned before the end of the year examinations; they were excluded from the data and thus in the final analysis only 103 student nurses were included.

6.1.3 SUBJECT ALLOCATION TO GROUPS

When the subjects commenced their student nurse training in January 1988 they were randomly assigned to one of the four groups used in the study. The students remained in College for January and February and in March they went to work in their hospitals. On their return to College in June they were allocated to the same groups and had the same tutor so that by this time the students should have been well acquainted with their fellow classmates, their tutor and the College system.*

*Allen (1972) proposes that first year students be excluded from participation in test anxiety management programmes as such students may view the non-specific stresses inherent in their new environment as indicative of test anxiety.

6.1.4. DETAILS CONCERNING THE SUBJECTS AND THE GROUPS

At the commencement of the programme there were 30 students in each of the four groups, but as various students dropped out of the programme the number in each group altered until groups comprised the following number of subjects: Group 1 - 25; Group 2 - 28; Group 3 - 24; and Group 4 - 26 subjects.

Because of the large number of students in each of the groups - these groups were divided into two different sub-groups so that the numbers, although still fairly high, were manageable and more consistent with those used in the work of Kirkland & Hollandsworth (1980).

These sub-groups again, did not necessarily have equal numbers in them due to people randomly dropping out. The breakdown across the various groups was as follows:

GROUP 1 SYSTEMATIC DESENSITISATION
GROUP 1A (n = 13)
GROUP 1B (n = 12) TOTAL : n = 25

GROUP 2 PROGRESSIVE MUSCLE RELAXATION AND GUIDED IMAGERY
GROUP 2A (n = 13)
GROUP 2B (n = 15) TOTAL : n = 28

GROUP 3 CONTROL
TOTAL : n = 24

GROUP 4 STUDY SKILLS TRAINING
GROUP 4A (n = 14)
GROUP 4B (n = 12) TOTAL : n = 26

The method of applying the programme or package was similar in both the A and the B subsections of the group. To ensure that no additional variables needed to be accounted for when assessing the data, the sub-groups alternated in attending the programme first or last. The students were taken out of the classroom situation and while the one half of the class was involved in the programme the other half was involved in self-study in the classroom. After the hour allocated to the programme the two sub-groups exchanged places.

6.1.5 PERSONAL DATA GATHERED FROM SUBJECTS

The following information pertaining to the subjects was gathered:

1. The mean age of the participating subjects was 20.95 years with the following breakdown
   a) range 18 - 37 years
   b) percentages in the different age groups:
      18 years = 49%, 19 years = 22%, 20 years = 6%,
      21 years = 8%, 22 years = 4%, 23 years = 2%,
      24 years = 2%, 25 years = 2%, over 25 years = 5%
   c) the mean age in the 4 groups was:
      Group 1 = 19.60; Group 2 = 19.89; Group 3 = 18.52;
      Group 4 = 20.40 years.
2. The calculation of matric "scores" (the UCT Medical School Scoring System) resulted in the following:

a) range 9 - 43 points

b) the mean score in the 4 groups was:

Group 1 = 22.57; Group 2 = 24.46; Group 3 = 25.67;

Group 4 = 23.96 points.

3. The student nurses involved in the study came from three different hospitals and they could choose to live in or out of residence. The breakdown across the various hospitals was:

Groote Schuur Hospital	:	living in - 59%
	:	living out - 11.5%
Victoria Hospital	:	living in - 11.5%
	:	living out - 4%
Somerset Hospital	:	living in - 9%
	:	living out - 5%

As Groote Schuur Hospital is by far the largest training school hospital the majority of the first year student nurses were employed in this hospital.

4. There was only one male nurse within the group and the data from this subject was not included in the final analysis.

6.2 GENERAL PROCEDURE

6.2.1 INTRODUCTION

Three multicomponent treatment programmes and a no-treatment control were utilised in this investigation. The three programmes encompassed a distinctly different emphasis or core although they did however share certain components with the other

programmes. Each treatment programme was represented by two groups of subjects. (See Section 6.1.4 for numerical breakdown).

6.2.2 SETTING

The initial introductory talks and time spent on the completion of questionnaires took place in the students' classroom. The remaining sessions in the smaller groups were carried out in a room with a carpeted floor and cushions from the chairs were used as pillows when the subjects lay down for the relaxation part of the programme. The first room used did not provide optimum conditions for treatment as it was the students lounge, which smelled of stale smoke and was certainly not sound proof; the subjects could hear their fellow students going home in the afternoon as they walked past the room. (The programme was usually held between 13h30 and 15h30 and as College ended at 15h30 the second group of subjects was often still busy when the remaining College students left the building, particularly if they were allowed to leave before 15h30).

In the course of the programme a change was made to a second room and although on a quieter side of the building, it was, however, equipped with a communications system which could not be disconnected. Although the staff on duty were repeatedly asked not to transmit any messages before 15h30, they did on occasions forget this request. While this room was more comfortable, it too, did not provide optimum conditions for treatment.

6.2.3 DURATION OF TREATMENT PROGRAMMES

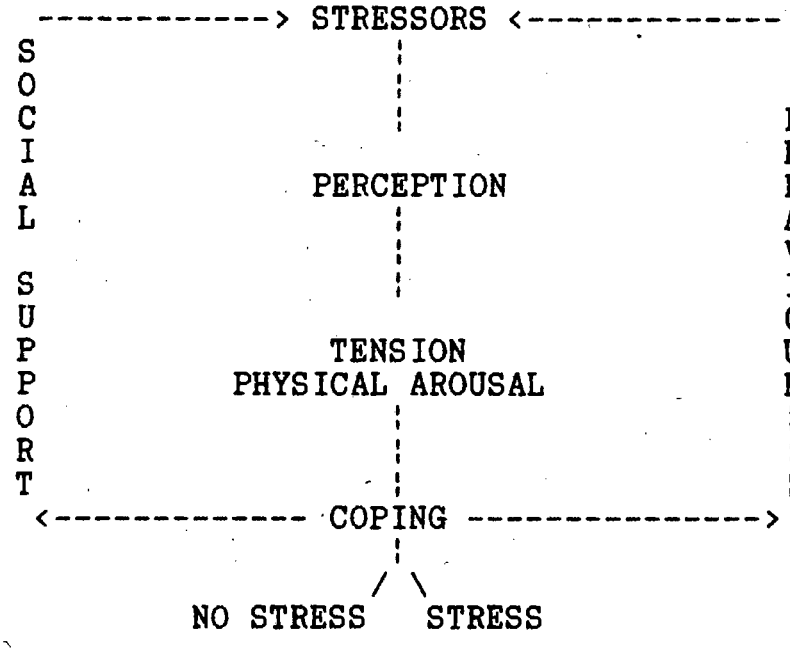
An initial meeting of two hours was followed by a one hour long weekly meeting over five weeks. The sessions were slotted in to the first year student nurses timetable at a time that was convenient for the College staff. A further half-hour was allocated at the end of the programme to complete forms etc. and give a brief explanation to subjects. Therefore a total of 7 $^{1}/_{2}$ hours was used for the entire programme for each of the six groups (i.e. 2 sub-groups in each of the three multicomponent treatment groups) and 3 hours was spent with the control group.

6.2.4 THE INITIAL INTRODUCTORY SESSION

This initial session was the same for each of the four groups. The group was initially seen as a whole and a brief introductory talk was given to the subjects by the researcher. The topic of this talk was "Understanding Stress" which was explained by means of FIGURE 6.1.

FIGURE 6.1

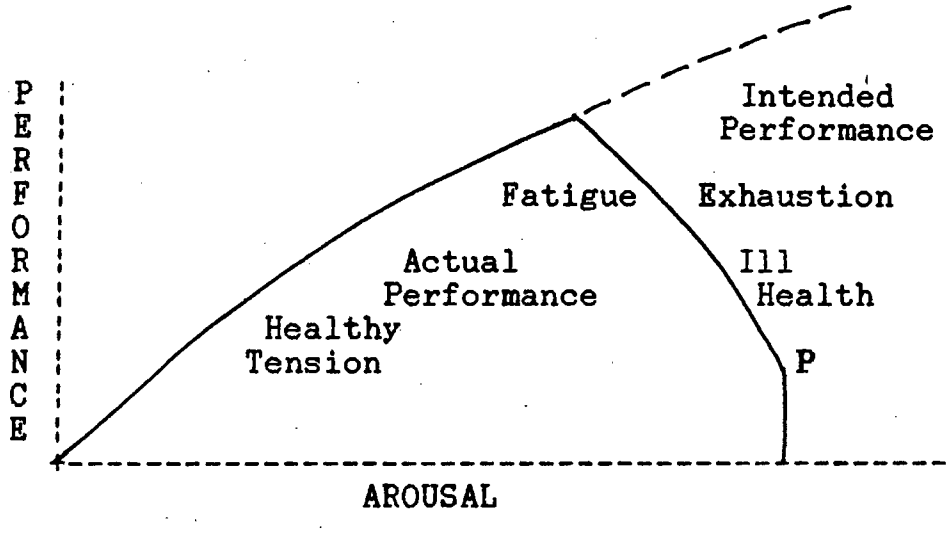
UNDERSTANDING STRESS



Once the concept of stress had been discussed the talk continued with a discussion on the Human Function Curve with the intention of indicating to the subjects the rationale behind the need for reducing stress or arousal. The Human Function Curve devised by Dr P. Nixon, Consultant Cardiologist at London's Charing Cross Hospital was used to demonstrate the Yerkes-Dodson Law: indicating how performance initially increases with arousal, but declines as the person continues to push themselves after fatigue has set in (see FIGURE 6.2).

FIGURE 6.2

THE HUMAN FUNCTION CURVE



P = The point at which minimal arousal may precipitate breakdown.

The need for a certain measure of stress management and the place of test anxiety among the stressors experienced by the student nurse was discussed. A method of reducing test anxiety was suggested and the subjects were encouraged to discuss this and other matters relating to the stressors that they perceived when contemplating writing examinations.

At this stage neither the researcher nor any of the class Tutors had any idea which group would receive which treatment programme so each group received an identical introductory session. After this introduction all the students were asked to complete a number of questionnaires.

6.2.5 SELECTION OF SUB-GROUPS

In each of the different programme groups, at the commencement of the second session, the students were randomly divided into two groups. The one group stayed in the classroom and were allowed to utilise the time for self-study while the other group attended the 'programme'. After an hour these groups changed places. Although the sessions involved only half of the group at a time, the sessions were identical and thus the sub-groups received the same information throughout the programme.

6.3 THE CONTROL GROUP

At the beginning of the second session Group 3 became the Control Group. Allocation of time, for self-study, was organised between the class Tutor and the researcher and the subjects were not informed of the fact that they were the Control Group.

6.3.1 CONTROL/PLACEBO 'PROGRAMME'

The Control group could perhaps be better described as a "placebo" group. They received the initial introductory discussion which would certainly have made them more aware of the problem as it related to them and their examinations. Although the need for stress management or anxiety reduction was discussed they were not given any particular method to assist them. O'Leary & Borkovec (1978) suggest that for ethical reasons clients should not be offered theoretically totally inert

treatments and thus in this programme the students were involved in the programme to a minor degree.

This programme was unlikely to be "totally useless" and certainly not "damaging" to the students involved. The students were encouraged to talk about their problems with other students a procedure which Katahn *et* al., (1966) and I. Sarason, Pederson & Nyman (1968) considered to serve as a powerful behaviour-influencing cue. This procedure was, however, limited to the first and a short period of the second sessions.

The Control/Placebo group had no further sessions until they completed the second set of questionnaires when the other groups had completed their 6 week programme.

The Control/Placebo group did not receive a programme *per se*, but as they received a certain amount of attention from a researcher, the possibility of the "Hawthorne Effect" must be taken into consideration in the final analysis. Because of this attention, students were expected to achieve minor improvements in their scores on the self-report research measures with the possibility of slight improvement on the academic performance measure.

6.4 THE SYSTEMATIC DESENSITISATION PROGRAMME (SD)

(Session by session details of the Systematic Desensitisation Programme will be found in Appendix A1)

6.4.1 COMPONENTS OF THE PROGRAMME

This programme consisted of certain core components which included:

A. progressive muscle relaxation training (PMRT) (after Jacobson, 1938; Wolpe, 1958 and revised by Bernstein & Borkovec 1973).

B. group-constructed anxiety hierarchies;

C. a group-based method of working through the hierarchical scenarios;

Certain secondary programme features were also included, consisting of:

a) Cognitive restructuring; and

b) informal study counselling and a discussion of examination technique.

6.4.2 METHOD UTILISED

The rationale behind the systematic desensitisation technique was explained to the subjects who were told:

> "... an important part of the method involves teaching you to relax as completely as possible. You may think you don't have to be taught how to relax, but the fact is that most people are frequently unaware of their tensions". (after Garlington & Cotler, 1968, p. 249).

A discussion of the concept of desensitisation as a counter conditioning procedure was given prior to the explanation of the need to construct an hierarchy.

Subjects were then introduced to the progressive muscle relaxation technique developed by Jacobson (1938) modified by Wolpe (1958) and further modified by Bernstein & Borkovec (1973). The students worked through this technique under the instruction and supervision of the researcher. The "live" training was favoured over audiotaped training, following recommendations by Carey & Burish (1987) who when providing relaxation training to cancer patients receiving chemotherapy found that "live" PMRT & Guided Imagery (GI) reduced emotional distress and physiological arousal in their patients. They found the live administration to be superior to audiotaped administered training which did, in fact, not reduce symptoms more than the standard treatment for their patients.

The students were then asked to `brainstorm´ and offer suggestions for the construction of an anxiety hierarchy, which was intended to feature a ranked list of exam-related situations or scenarios which the students considered to be anxiety provoking. An hierarchy of 14 items was constructed by the group, the most anxious scenario ranked as number one, with the least anxiety provoking at the bottom of the list (see Appendix A2).

Cognitive restructuring (see Appendix A3) was also introduced at the beginning of this programme and the students were encouraged to ensure that their cognitions were of a positive, motivating nature at all times and particularly, in relation to studying for and writing examinations. The students were asked to identify which situational cues triggered negative cognitions and to replace them with more constructive positive cognitions that directed attention to the task on hand (Meichenbaum & Genest, 1977). Subjects were encouraged to practice relaxation technique at least once a day during quiet, anxiety-free times when the exercises could produce the deep relaxation needed (after Denney & Rupert, 1977, p. 274). A relaxation tape (made by the researcher following the method used by Bernstein & Borkovec, 1973), was offered to each subject after the second session to assist them in practising the relaxation technique between sessions.

The relaxation technique was then practised by all students, followed by the introduction of the scenarios from their hierarchy, i.e. pairing relaxation with imagined scenes from the hierarchy was undertaken. Goldfried's (1971) procedural modification was utilised, whereby the scene was not terminated when they experienced a disruption in their state of relaxation, instead they were encouraged to employ coping skills to regain the state of relaxation.

Because the systematic desensitisation programme emphasised the emotional (or physiological) aspects of test anxiety, students

were expected to benefit notably on the self-report measures, with a modest gain in academic performance.

6.5 PROGRESSIVE MUSCLE RELAXATION TECHNIQUE (PMRT) AND GUIDED IMAGERY (GI)

(Session by session details of the PMRT and GI programmes will be found in Appendix B1).

6.5.1 COMPONENTS OF THE PROGRAMME

This programme consisted of certain core components which included:

A. Progressive muscle relaxation technique (PMRT) (After Jacobson, 1938; Wolpe, 1958 and revised by Berstein & Borkovec, 1973); and

B. Guided Imagery (GI) or visualisation.

The secondary programme features included were the same as those included in the systematic desensitisation, viz:

a) Cognitive Restructuring; and

b) informal study counselling and a discussion of examination technique.

6.5.2 METHOD UTILISED

The rationale behind the PMRT and GI technique was explained to the students, using the same introductory statements that were used in the systematic desensitisation programme.

The Bernstein & Borkovec (1973) adapted version of Jacobson's (1938) progressive muscle relaxation technique was supervised by the researcher (see Appendix B2) and this was followed by a brief introduction to guided imagery. An audiotape of a similar relaxation and guided imagery/visualisation was given to each subject so that they could practice the technique daily in between the 'live' weekly sessions.

The imagery used during these relaxation sessions was of a relaxing nature i.e. peaceful scenes were visualised to assist the students to become more relaxed. No connection was made, however, between the feeling of relaxation achieved and the writing of exams or the successful improvement of exam results. Behavioural rehearsal can be paired with visualisation, but as this procedure is similar to systematic desensitisation it was not utilised in this programme. Visualisation can be utilised in ego building techniques which develop positive self-images and promote self-confidence (Hartland, 1966). These techniques have certain similarities to cognitive restructuring and were therefore not used during the visualisation procedure. The sessions were used purely to increase relaxation and instil a feeling of calm and relaxation in the students, and examinations were not mentioned.

As in the systematic desensitisation programme, cognitive restructuring was introduced and the implementation of constructive positive cognitions (see Appendix A3) as a replacement for negative cognitions was discussed.

Because the PMRT and GI programme emphasised the physiological and emotional aspects, the students were expected to improve noticeably on the self-report measures, and modestly in academic performance.

6.6 STUDY SKILLS TECHNIQUE (SST)

(Session by session details of SST will be found in Appendix C1).

6.6.1 COMPONENTS OF THE PROGRAMME

This programme consisted of certain core components which included:

A. Aspects of study skills training (after Robinson, 1970)
   - study habits
   - examination management.

The secondary programme features included:

a) Cognitive Restructuring; and

b) discussion on the benefits of relaxation.

6.6.2 METHOD UTILISED

Cognitive Restructuring (i.e. that used with the students on the previous two programmes - see Appendix A3) was used with these students. Subjects were instructed in the importance of developing a motivating attitude towards examinations (and thus improving performance) and in conjunction with this, positive self-talk and positive thought processes were examined.

In study skills technique, training was based on Francis Robinson's (1970) study counselling methods and the subjects were asked to identify factors which might be interfering with effective studying and to instigate changes.

Because this programme was one of introducing subjects to methods of improving their technique of studying and their exam skill, substantial improvements on the measure of academic evaluation as well as improvement on self-report measures were anticipated.

6.7 SUBDIVISION OF GROUPS

To ensure that there were no significant differences between the four treatment groups at pre-test a one-way ANOVA was performed on all the initial data. It would be too cumbersome to include all the data here as there were 52 initial variables and an additional 14 variables were computed and therefore only significant data will be presented. There were no significant differences or even trends on any of the anxiety related variables. There was, however, a significant difference on the first examination scores. See TABLE 6.1 for raw scores for each of the groups and TABLE 6.2 for the analysis of variance results for the first examination percentages.

TABLE 6.1

EXAMINATION SCORES FOR ALL GROUPS PRIOR TO THE PROGRAMME

	MEAN n=103	GROUP1 n=25	GROUP2 n=28	GROUP3 n=24	GROUP4 n=26
EXAMINATION SCORE	57.77	52.79	54.89	58.71	64.69

TABLE 6.2

ANOVA SUMMARY FOR THE EXAMINATION DATA

SOURCE	SS	DF	MS	F
Examination	2535.91	3, 99	845.30	8.49**

As is evident from the tables there is a significant difference between the treatment groups on the examination scores. When contrasting each treatment group with the Control Group (Group 3) this difference is less significant and there is only a difference ($p < .05$) between Group 1 and the Control and Group 4 and the Control, while the greatest difference was evidenced between Group 1 and Group 4.

There were no significant differences on any of the other variables when comparing the different groups, and thus the four groups were separated into three levels of anxiety depending on their scores obtained on the AAT questionnaire (see 7.1.3 p.74). Although the students were initially randomly assigned to the four different treatment groups and in the final analysis the four groups were comparably represented i.e. 25, 28, 24, 26; the

representation within the three levels of anxiety was not equal within each treatment group. TABLE 6.3 indicates the number of students within each treatment group and the different anxiety levels.

TABLE 6.3

DISTRIBUTION OF ANXIETY LEVELS WITHIN THE TREATMENT GROUPS

GROUP	HI-ANX	LO-ANX	MID-ANX	TOTAL
1 SD	13	3	9	25
2 PMRT & GI	8	11	9	28
3 CONTROL	8	9	7	24
4 SST	5	11	10	26
TOTAL:	34	34	35	103

$x^2 = 9.385$ df = 6 p = 0.153

To check for original compatibility of the four treatment groups, a Chi-square test was carried out on the above figures and indicated that there was no significant difference as regards anxiety levels within the three treatment and one control group; i.e. there was no evidence of violation of randomness.

CHAPTER SEVEN

INSTRUMENTATION AND DESIGN OF THE STUDY

7.1 INSTRUMENTATION

7.1.1 INTRODUCTION

Initially a number of descriptive/informational schedules were administered to the subjects to obtain information relating to the characteristics of the first year student nurses. Various self-report measures of test anxiety were utilised in this experimental investigation, to cover different aspects of assessment; as well as measures of academic performance.

7.1.2 DESCRIPTIVE/INFORMATIONAL QUESTIONNAIRES

(See Appendix D for a copy of the Management of Examination Anxiety - Descriptive Schedule Questionnaire)

The elucidation of anxiety in general, and test anxiety in particular, especially the first noticed onset of disabling exam tension and methods used to counteract this tension is the main aim of this schedule. Findings recorded on this schedule are presented in Section 9.1.1.

7.1.3 ACHIEVEMENT ANXIETY TEST (DEBILITATIVE/FACILITATIVE)

(See Appendix E for a copy of the Modified Achievement Anxiety Test)

A modified version of Alpert & Haber's Achievement Anxiety Test (AAT), developed in 1960, was used, (after Norton, 1983). The AAT is the only instrument to measure facilitating and debilitating test anxiety separately, recognising that individuals interpret their arousal differently.

The AAT consists of two independent scales:

A. A FACILITATING SCALE of 9 items; and

B. A DEBILITATING SCALE of 10 items.

The modifications to the AAT consisted of utilising all 19 items in one continuous list of items and excluding the buffer items (Desiderato & Koskinen, 1969; Kostka & Galassi, 1974; and Beaty & Barling, 1982).

Several authors have recommended the use of this instrument in screening for test anxiety (Huck & Jacko, 1974; Kirkland & Hollandsworth, 1980). The AAT can thus be utilised as a device to distinguish between high- and low-test anxious students as well as a means of measuring progress made by subjects in test-anxiety treatment programmes. It was used in this dual role in this research, but additional instruments were also used to measure changes in anxiety levels over time, as detailed below (see sections 7.1.4 and 7.1.5).

A five point rating scale was used for scoring responses on the scale (see Appendix E). Score ranges for the two subscales are therefore:

a) 9 - 45 (9 items) for the facilitative score, and

b) 10 - 50 (10 items) for the debilitative score.

An overall difference score can be obtained by computing the debilitative score minus the facilitative score (-AAT) - (+AAT). Kirkland and Hollandsworth, (1980) using this formula invited subjects scoring in the upper 28% of the distribution (high debilitative/low facilitative test anxiety) to participate in their research.

In view of the fact that the present research included High-, Low- and Mid-Anxious students, the author separated the subjects into three groups in the following manner:

1. if (-AAT) - (+AAT) was greater than or equal to 5 then the subject was placed in the High-Anxious Group,
2. if (-AAT) - (+AAT) was less than or equal to -5 then the subject was placed in the Low-Anxious Group, and
3. if (-AAT) - (+AAT) was less than 5 AND greater than -5 then the subject was placed in the Mid-Anxious Group.

Desiderato & Koskinen (1969) reported substantial coefficients of temporal stability for the modified AAT for ten-week and eight-month intervals (r = ,83 and ,75) respectively. The AAT is also said to have good construct validity (Desiderato & Koskinen, 1969).

7.1.4 THE ANTICIPATED ANXIETY RATING SCALE (AARS)

(See Appendix F for a copy of this schedule).

Incorporating exam-related items used by Paul & Erikson (1964), Collins (1973) and Scissons & Njaa (1973), the eight items in this scale were scored along a 10-point continuum; a total score of more than 48 (on a range of 8 - 80) was considered to be indicative of "debilitative - tending" anxiety (Collins, 1973).

Test-re-test reliability for this scale is between r = ,68 and ,72 (Collins, 1973). This Anticipated Anxiety Rating Scale was administered at the pre-treatment and the post-treatment intervals.

7.1.5 THE SUBJECTIVE UNITS OF DISTURBANCE (SUD) SCALE

(See Appendix G for a copy of this Schedule).

This scale features 16 exam-related events as itemised entries; items being based primarily on the SUD-scale developed by Wolpe in 1969 (see in Kostka & Galassi, 1974, Pps 464 ff.). Items were also extracted from Suinn (1969) and Allen (1980) utilising similar situational examination menus.

This scale serves as a numerical index of felt anxiety, based on a range of 1 - 100. After an explanation the subjects were able to give their state of anxiety a numerical approximation.

Tasto & Suinn (1972) have reported test-re-test reliability coefficients of between *r* = ,77 and ,80 for the SUD-scale; these figures based on the proviso that subjects are adequately trained in understanding the meaning of the "felt anxiety" index.

7.1.6 THE TREATMENT EVALUATION QUESTIONNAIRE

(See Appendix H for a copy of this questionnaire).

This questionnaire featured six items scored along a 7-point continuum, with 1 representing unfavourable or negative features, while the most favourable description of the programme was coded as 7.

This questionnaire was completed by the subjects in all the groups except the control group as they did not undergo any form of treatment. To ensure that the subjects completed these questionnaires honestly, every possible effort was made to maintain the students' anonymity. These questionnaires were not completed immediately after the treatment programme, but four weeks later on the day before the students wrote their third examination.

The questionnaire was used as an index of the students' confidence in the treatment programme. A mean score of 4 (or more) for each question i.e. a total of 24 (or more) suggested that the student:

1. Found the treatment skills easy to acquire;
2. Felt the programme was run competently;

3. Enjoyed the treatment sessions;
4. Felt that her time was being employed usefully;
5. Experienced a generalisation effect - reduced feeling of irritability on other levels;
6. Found the research programme valuable in terms of its potential durability as a training procedure.

7.2 SUMMARY OF MEASURES FOR ANALYSIS

Descriptive/Informational questionnaires (See Section 7.1.2) were issued at the commencement of the programme, while other self-report measures were issued both before and after the intervention:

1. The Management of Exam Anxiety Schedule (See Section 7.1.3)
2. The Anticipated Anxiety Rating Scale (See Section 7.1.4)
3. The Subjective Units of Disturbance Scale (See Section 7.1.5)

Academic Performance was assessed both before and after the programme.

The Treatment Evaluation Questionnaire (Confidence Index) (See Section 7.1.6) was issued four weeks after completion of the programme.

7.3 DESIGN OF THE STUDY

7.3.1 DESIGN CONSIDERATIONS

The research design used in this study was the pretest-posttest control group design (Kazdin, 1980). The essential feature of this design is that all students, including the control group, are tested before and after intervention, and the effect of the intervention is reflected in the amount of change from pre- to post-intervention.

Kazdin (1980) notes that by pre-testing and post-testing the various groups used at the same time, the usual threats to internal validity such as history, maturation, repeated testing and instrumentation, can be controlled.

The students had been previously randomly assigned to groups which ensured that group differences were not a function of selection bias.

The disadvantage of using the pretest-posttest design is that the possibility of the pretest having a sensitising effect and rendering the treatment effective because of this must be considered. The timing of the pretest and posttest is also significant. If the time between the two tests is too short then the chances are increased that sensitisation will occur. If they are too far apart, the possibility of maturation or of intervening events significantly affecting the outcome exists.

7.3.2 STATISTICAL CONSIDERATIONS - EXPERIMENT-WISE ERROR

When many comparisons are made between several sample groups on one or more variables, it is common practice to adopt a single level of significance explicitly for all such comparisons. The implications of the level of significance need to be properly understood. A 5% level implies that there is less than .05 probability that the results occurred because of random error. The significance level chosen (usually .05 or .01) merely specifies the probability of a Type I error if the null hypothesis is rejected. If one examines 100 hypothesis tests then one is accepting that there will be on average 5 rejections of the null hypothesis arising from misleading samples. A probability of obtaining *at least one* statistically significant statistic is much higher than 5% and, in fact, increases as the number of hypothesis tests increases. The significance level chosen is usually dependent on the consequences of making a Type I versus a Type II error. A Type I error is made when we reject the null hypothesis but the null hypothesis is actually true; while a Type II error occurs when the null hypothesis is accepted although in the population the research hypothesis is true (Cozby, 1981).

The term experiment-wise error is used to convey the probability of *one or more* falsely rejected null hypotheses. In this study the experiment-wise error will vary through several analyses, all

of which are reported for convenience in terms of a nominal 5% level of significance. The reader will be alerted to analyses where the number of significant statistics is large enough to suggest real underlying sets of effects or associations, rather than just a small number attributable to the notion of chance (Dunne, personal communication, September 1989).

All statistical tests and analyses were performed, by the researcher, using statistical alternatives available through BMDP programmes, run on the VAX mainframe computer at UCT

7.4 RESEARCH HYPOTHESES

The aim of this study was to test the effects of three different multi-component treatment programmes on test-anxiety in first year student nurses.

It was hypothesised that significant reductions in test anxiety and gains in achievement would occur only in treated students and not in students in the Control Group.

Furthermore, it was hypothesised that because of the emphasis on deep muscle relaxation training in Groups 1 and 2, students within these groups would develop the ability to control the emotional or physiological component of test anxiety, and would thus show the greatest gains on post-intervention self-report measures. The Study Skills group (who were introduced to the relaxation concept, but received no training in it) were expected to make the next best gains, followed by the Control Group (who were not expected to make any gains at all on these measures).

The core therapeutic emphasis in the Study Skills group, involved the learning of improved study and examination techniques and the expectation here was that these students would make the greatest gains on the measure of academic performance. The Systematic Desensitisation group and then the PMRT & GI group were expected to realise the next best improvement, since lowered physiological stress levels should assist the student in feeling more

given informal study counselling and hints on examination technique .

The Control Group were not expected to achieve any gains on the academic performance measure.

CHAPTER EIGHT

SUBSIDIARY STUDY

8.1 INTRODUCTION

During the introductory session with the student nurses from Carinus Nursing College (CNC), the researcher became aware that the nurses were experiencing severe tension. It was not clear whether this was purely examination-related or whether some other situation-specific factor could be responsible for these apparently high stress levels.

8.1.1. RATIONALE

In discussing this observation with the Head and Senior Principals of CNC it was evident that the staff were also of the opinion that the student nurses doing the 4-year Integrated Nursing Diploma appeared to be experiencing considerable stress. In order to determine whether they differed in mood states from other paramedical 1st year students, a comparative analysis was conducted. A Lifestyle questionnaire was included to provide insight into the coping mechanisms used by all the groups, and to assess how these related to mood states.

8.1.2 THE SUBJECTS

The 103 CNC student nurses in the Integrated Course were compared with the first year students in the following disciplines:

B.Sc nurses	- 12 students
Physiotherapists	- 24 students
Logopaedic Students	- 12 students
Occupational Therapists	- 18 students
Radiographers	- 27 students
TOTAL 1ST YEAR STUDENTS	-196 students

The BSc nurses were included as a separate category because although they too are student nurses, their course and academic input more closely resemble those of the other paramedical students; and in their first year they spend a greater percentage of their time at university attending lectures, and correspondingly shorter periods of time in the hospital than the CNC student nurses.

8.2 INSTRUMENTATION

Two self-report measures were used in this study - the Profile of Moods States and the Health Behaviour Assessment Scale.

8.2.1 PROFILE OF MOOD STATES (POMS)

No copy of the POMS is included as it is protected by copyright. A copy of the POMS Profile Sheet College Norms may be found in Appendix I. The Profile Sheet indicates the conversion of raw scores to T-scores. T-scores only will be presented in the analyses.

The Profile of Mood States (POMS) comprises 65 five-alternative choice items (words that describe feelings people experience). The POMS provides a rapid and economical method of identifying and assessing transient, fluctuating affective mood states, namely: Tension-Anxiety; Depression-Dejection; Anger-Hostility; Vigour-Activity; Fatigue-Inertia; and Confusion-Bewilderment.

The POMS questionnaire is relatively easy to administer, score and interpret. It has normative standards and a POMS Profile Scoring Sheet for College students, which is based on data from a sample of 340 men and 516 women college students.

A Total Mood Disturbance (TMD) score may be obtained by summing the scores across all six factors, weighting Vigour negatively. This results in a single global estimate of affective state; the lower the TMD score the more stable the profile. The six POMS factors have high validity and reliability coefficients, while norms and validity standards are not available for TMD scores.

8.2.2 HEALTH BEHAVIOUR ASSESSMENT SCALE (HBAS)

(See Appendix J for a copy of this scale).

This assessment scale looks at the different aspects of a subject's lifestyle by asking questions pertaining to Smoking, Eating, Drugs & Alcohol, Exercise, Safety and Stress Control. There are 24 questions and the method of scoring the questionnaire gives a maximum possible score of 60 (10 points for each of the six factors), the higher the score, the more healthy the life style. The Smoking, Eating, Drugs & Alcohol, and Exercise questions are straight forward; while the Safety variable includes questions such as:

I wear a seat belt while riding in a car; and

I am careful when using potentially harmful products or substances;

and the Stress Control variable includes questions such as:

I participate in group activities or hobbies that I enjoy; and

I recognize early, and prepare for, events or situations likely to be stressful for me.

An additional factor, that of Self-Assessment is also included in which the person rates, on a scale of 1 to 10, how healthy they think they are.

8.3 METHODOLOGY

The researcher saw each group of students and requested their co-operation in this study. After an explanation of the research, the questionnaires were distributed to the students, and completed in the classroom setting.

The various groups of students all completed the forms at approximately the same time point in their curriculum, i.e. about ten weeks before their final examinations.

8.4 RESULTS

8.4.1 PROFILE OF MOOD SCORES

The mean scores and standard deviations of the first year CNC student nurses and the paramedical students are shown in TABLE 8.1. In the POMS variables, a high score in Vigour, but low scores in all the other variables is desirable.

TABLE 8.1

MEANS AND STANDARD DEVIATIONS OF THE PROFILE OF MOOD SCORES

	CNC NURS		BSC NURS		PHYSIOS		LOGOS		OT		RADIOG	
VAR	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
Ten	49.0	9.8	50.6	6.4	42.9	8.0	46.8	9.5	51.3	10.5	50.6	9.5
Dep	49.3	9.8	51.3	8.8	45.3	7.5	47.6	12.0	53.5	10.0	49.4	9.7
Ang	51.6	10.2	53.9	8.9	45.2	5.7	43.8	5.3	51.3	9.6	49.7	8.0
Vig	49.6	10.3	51.1	11.7	54.0	9.1	52.0	11.5	49.5	8.6	49.9	8.9
Fat	50.9	9.8	58.5	9.8	48.6	9.4	51.1	11.8	53.3	9.2	50.4	9.1
Con	46.6	9.5	47.5	5.3	45.0	7.5	47.4	11.0	49.6	7.8	47.4	8.4
TMD	197.8	45.6	210.7	38.4	173.0	37.2	184.7	49.4	209.5	41.3	197.6	38.7

A series of one-way ANOVAS was conducted comparing each occupational group with the CNC Nurses. Each of the POMS factors was used, yielding a number of significant F values. Only these significant results will be presented in TABLE 8.2.

TABLE 8.2

ANOVA SUMMARY TABLE FOR POMS SCORES COMPARING THE CNC NURSES WITH THE DIFFERENT OCCUPATIONAL GROUPS

	SOURCE	SS	DF	MS	F
CNC-BSc					
	Fatigue	601.06	1, 185	601.06	6.43 *
CNC-Physio					
	Tension	720.26	1, 185	720.26	7.96 **
	Anger	800.66	1, 185	800.66	10.74 **
	Vigour	396.75	1, 185	396.75	4.17 *
CNC-Logo					
	Anger	646.15	1, 185	646.15	8.66 **

* = $p < .05$
** = $p < .01$

When each occupational group of students was compared with the first year CNC students it became apparent that:

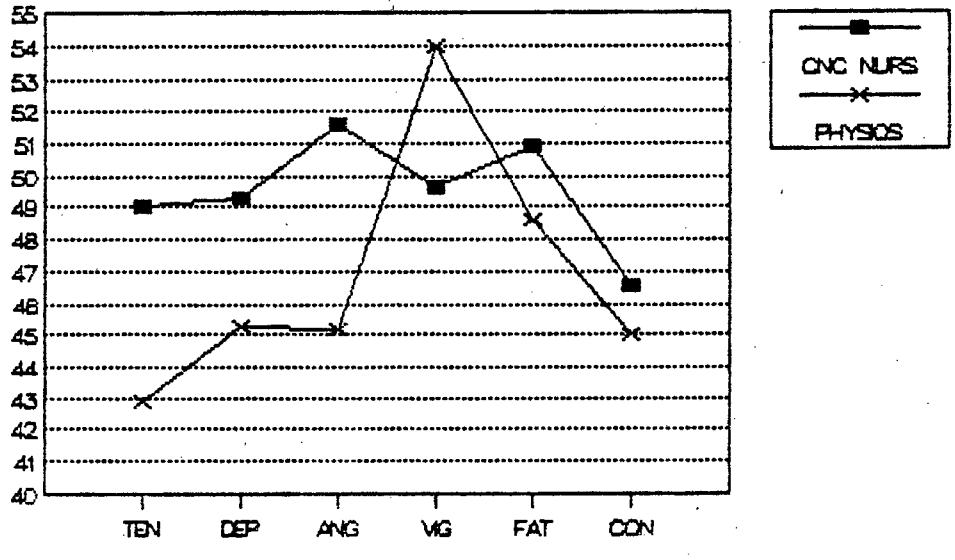
1. the main differences were between the CNC students and the Physiotherapy students, in that the latter had significantly lower levels of Tension ($p < .01$) and Anger ($p < .01$), and higher levels of Vigour ($p < .05$); see FIGURE 8.1 for a graphical representation of these comparisons.
2. the Logopaedic students had significantly lower levels of Anger ($p < .01$);
3. the BSc nurses evidenced higher Fatigue levels than the CNC nurses ($p < .05$); while

4. there were no significant differences between the CNC nurses and the first year Radiography- and Occupational Therapy students.

With 5 of 30 comparisons significant at a nominal 5% level (or better) we may conclude that there are real group differences suggested by the data.

FIGURE 8.1.

GRAPHICAL REPRESENTATION OF THE COMPARISON OF THE POMS SCORES BETWEEN THE CNC NURSES AND THE PHYSIOTHERAPISTS



As can be seen on FIGURE 8.1 the Physiotherapy students reported far lower levels of the negative Mood States and higher levels of Vigour than the CNC student nurses.

8.4.2 HEALTH BEHAVIOUR ASSESSMENT SCALE (HBAS)

The group means and standard deviations of the first year CNC student nurses and the paramedical students are in TABLE 8.3.

TABLE 8.3

MEANS AND STANDARD DEVIATIONS OF THE HBAS

	CNC NURS		BSC NURS		PHYSIOS		LOGOS		OT		RADIOG	
VAR	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
Smok	5.9	4.2	8.0	3.6	9.3	2.4	9.5	1.7	8.2	3.5	7.2	4.2
Eat	5.8	2.6	6.3	3.1	7.1	3.1	7.2	2.5	6.4	2.2	6.1	2.7
Drugs	8.6	1.8	9.2	1.2	9.3	1.2	8.4	3.1	9.0	1.5	9.6	0.9
Exer	4.1	2.3	5.6	2.2	6.8	2.5	6.3	2.4	4.7	2.5	5.5	2.4
Stress	6.5	1.7	6.3	1.7	7.0	1.8	7.3	1.7	6.4	2.3	6.6	1.3
Safe	7.9	2.3	8.0	2.3	9.0	1.4	9.4	0.8	8.3	1.9	8.5	1.1
Total	38.8	8.9	43.4	9.4	48.5	8.2	48.1	5.2	43.0	8.9	43.5	6.2
Self-A	6.3	1.5	6.8	1.6	7.2	1.5	6.8	1.5	6.4	1.3	6.0	1.5

NOTE: The maximum (best) score possible in each variable is 10 (Total 60)

TABLE 8.4

ANOVA SUMMARY TABLE FOR HBAS

SOURCE	SS	DF	MS	F
Smoking	356.28	8, 185	44.53	3.02 **
Eating	62.05	8, 185	7.76	1.08
Drugs and Alcohol	51.56	8, 185	6.45	2.31 *
Exercise	223.54	8, 185	27.94	4.85 **
Stress Management	21.34	8, 185	2.67	0.87
Safety	46.26	8, 185	5.78	1.48
Self-Assessment	31.69	8, 185	3.96	1.72 *

* = $p < .05$
** = $p < .01$

From TABLE 8.4 it is apparent that there were significant differences on the Smoking ($p < .01$), and Exercise variables

($p < .01$); and the Drugs and Alcohol ($p < .05$) and Self-Assessment variables ($p < .05$).

A series of one-way ANOVAS was conducted comparing each occupational group with the CNC Nurses. Each of the HBAS factors was used, yielding a number of significant F values. Only these significant results will be presented in TABLE 8.5.

TABLE 8.5

ANOVA SUMMARY TABLE FOR HBAS COMPARING THE CNC NURSES WITH THE DIFFERENT OCCUPATIONAL GROUPS

	SOURCE	SS	DF	MS	F
CNC-BSc					
	Exercise	25.83	1, 185	25.83	4.48 *
CNC-Physio					
	Smoking	215.03	1, 185	215.03	14.56 ***
	Eating	33.94	1, 185	33.94	4.73 *
	Drugs & A	12.63	1, 185	12.63	4.53 *
	Exercise	151.95	1, 185	151.95	26.35 ***
	Safety	24.96	1, 185	24.96	6.40 *
	Self-A	15.82	1, 185	15.82	6.87 **
CNC-Logo					
	Smoking	134.41	1, 185	134.41	9.10 **
	Exercise	56.80	1, 185	56.80	9.85 **
	Safety	24.46	1, 185	24.46	6.27 *
CNC-OT					
	Smoking	78.20	1, 185	78.20	5.30 *
CNC-Radiog					
	Drugs & A	24.41	1, 185	24.41	8.76 **
	Exercise	44.73	1, 185	44.73	7.76 **

* = $p < .05$
** = $p < .01$
*** = $p < .001$

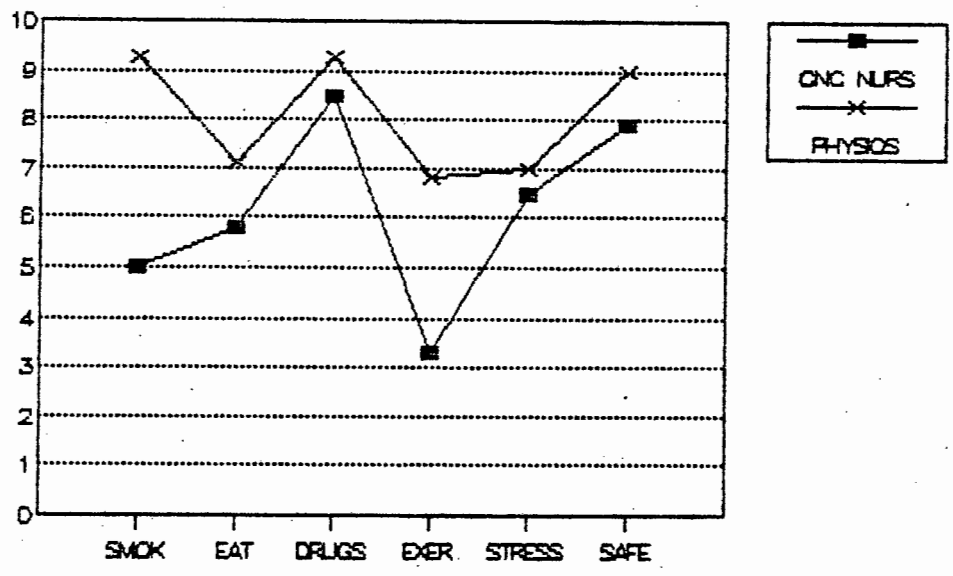
When each group of students was compared with the CNC nurses it became apparent that:

1. the main differences were again between the CNC nurses and the Physiotherapy students, with the latter achieving significantly better scores on the following variables: Smoking ($p < .001$), Exercise ($p < .001$); Self-Assessment ($p < .01$); and Eating ($p < .05$), Drugs & Alcohol ($p < .05$), Safety ($p < .05$); see FIGURE 8.2. for a graphical representation of these comparisons.
2. the Logopaedic students smoked significantly less ($p < .01$) and had significantly better scores on the Exercise ($p < .01$) and the Safety variables ($p < .05$);
3. the Radiography students had significantly better scores on the Exercise ($p < .01$), and Drugs & Alcohol variables ($p < .01$);
4. there was a significant difference between the BSc- and the CNC nurses on the Exercise variable ($p < .05$), with the BSc nurses reporting a higher score;
5. there were no significant differences between the CNC nurses and the Occupational Therapy students.

Again, with 13 of 30 comparisons significant at a nominal 5% level (or better), we may reasonably conclude that group differences are evidenced by the data.

FIGURE 8.2.

GRAPHICAL REPRESENTATION OF THE COMPARISON OF THE HBAS SCORE BETWEEN THE CNC NURSES AND THE PHYSIOTHERAPISTS



A high score on all of the variables on the HBAS questionnaire indicates a healthy lifestyle. From FIGURE 8.2 it is evident that the Physiotherapy students appeared to have a far healthier lifestyle than the CNC student nurses.

The two variables that were the most significant were Smoking ($p < .01$) and Exercise ($p < .01$); and a comparison of the Group means and standard deviations for these two variables, can be found in TABLE 8.3.

On analysing the Smoking variable, the following percentages of students smoked:

48.75% of the CNC nursing students

33.33% of the Radiography students

25.00% of the BSc nursing students

22.22% of the Occupational Therapy students

8.33% of the Physiotherapy students

7.69% of the Logopaedic students.

It is interesting to note the high rate of smoking in the CNC student nurses in light of their Descriptive Analysis Schedules (see 10.1.1), where 28 students said that in an attempt to alleviate the stress associated with studying for examinations they increased their smoking.

8.4.3 INTERDEPENDENCE BETWEEN MOOD STATES (POMS) AND LIFESTYLE (HBAS)

On the POMS and HBAS variables the CNC nurses differed the most from the Physiotherapy students and thus these two groups of students will be compared in an attempt to isolate the differences in their mood states and lifestyle. For the nurses only the variables that had significant correlations (r crit 0.01 = 0.2301) with other variables can be seen in TABLE 8.6. (see Appendix K for all the significant correlations and their values for all the groups of students).

TABLE 8.6

SIGNIFICANTLY CORRELATED VARIABLES FOR THE CNC NURSES

NEGATIVE CORRELATIONS		
LOW HBAS	HIGH POMS	*r* VALUE
Safety	Anger	-0.7014
Drugs & Alcohol	Depression	-0.4677
Safety	Depression	-0.4492
Stress Control	Confusion	-0.3349
Drugs & Alcohol	Tension	-0.3066
Drugs & Alcohol	Anger	-0.2905
Stress Control	Fatigue	-0.2702
Drugs & Alcohol	Fatigue	-0.2334
Stress Control	Tension	-0.2334

NOTE: A high score in the HBAS variables; Smoking, Eating, Drugs & Alcohol, Exercise, Stress Control, and Safety indicates a healthy lifestyle. In the POMS variables, a high score in Vigour but low scores in all the others, is desirable.

TABLE 8.6 indicates that for the CNC nurses there were only negative correlations between the POMS and the HBAS variables. These correlations imply that as CNC Nurses' levels of negative mood states (from the POMS) increased, so they were more likely to become less Safety conscious (less likely to take proper precautions), less able to control the stress, and more likely to abuse Drugs & Alcohol. Here 9 of 36 pairs of variables showing significant correlation at a 1% level suggests more than chance association.

When analysing the correlations for the Physiotherapy students a different picture emerged - TABLE 8.7 depicts the variables that were significantly correlated (r crit 0.01 = 0.4622).

TABLE 8.7

SIGNIFICANTLY CORRELATED VARIABLES FOR PHYSIOTHERAPY STUDENTS

NEGATIVE CORRELATION		
HIGH HBAS	LOW POMS	*r* VALUE
Smoking	Fatigue	-0.6361
Stress Control	Depression	-0.5865
Exercise	Depression	-0.5514
Stress Control	Confusion	-0.5489
Eating	Anger	-0.5259
Exercise	Anger	-0.5232
Safety	Fatigue	-0.5074
Self-Assessment	Tension	-0.4950
Stress Control	Tension	-0.4862
Self-Assessment	Anger	-0.4736
Exercise	Confusion	-0.4686
Exercise	Tension	-0.4666

NOTE: A high score in the HBAS variables, Smoking, Eating, Drugs & Alcohol, Exercise, Stress Control, and Safety indicates a healthy lifestyle. In the POMS variables, a high score in Vigour, but low scores in all the other variables is desirable.

Taking cognisance of the raw data and the levels of the variables for the Physiotherapy students these correlations all indicate a far more healthy approach to stressful situations.

From the above it appears that when the nurses' negative mood states (Tension, Depression, Anger and Fatigue) are increased they do not have healthy means of coping with the situation, whereas the Physiotherapy students have lower levels of the negative mood states and higher levels of Vigour and appear to have integrated a more healthy approach to improving their Lifestyle and Mood States. The fact that 12 of 36 correlations are significant ($p < .01$) implies that real associations rather than chance effects operate within the Physiotherapy group.

8.5 OTHER DIFFERENCES

In assessing whether other factors could have been responsible for the significant differences between the CNC nurses and the Physiotherapy, the factors of age and place of residence (i.e. "living in" or "living out" of residence) were compared (see TABLE 8.8).

TABLE 8.8

COMPARISON OF AGE AND RESIDENCE FOR THE CNC STUDENTS AND THE PHYSIOTHERAPY STUDENTS

	CNC STUDENT NURSES	PHYSIOTHERAPY STUDENTS
MEAN AGE	20.95 yrs	19 yrs
LIVING IN	79.3%	50%
LIVING OUT	20.7%	50%

There was only a small non-significant difference in mean age of the students, but there was a substantial difference in whether the students lived in residence or not ($p < .01$), with a greater percentage (79.3%) of the student nurses living in a Nurses' Residence while only 50% of the Physiotherapy students lived in a University Residence. This difference may have some bearing on the lifestyle of the students, but was not investigated in this exploratory subsidiary study.

Finally, on further investigation of the literature, IQ is emerging as a more important aspect of the perception of stress and of the ability to deal with it, than was previously thought. The researcher therefore obtained the Matric scores (as a surrogate for IQ) for all the paramedical students, so that comparisons could be made in order to shed some light on the significant differences between the Physiotherapy students and the CNC nursing students (for the UCT Medical School's Matric Scoring system see Appendix L).

The Physiotherapy, Logopaedic, Occupational Therapy and BSc Nursing Students all attend lectures at UCT, and for the Faculty of Medicine the entrance requirement is a Full Matric Exemption with a minimum of a `C' aggregate and 50% in Mathematics and Science. The Radiography Students, like the CNC nurses, complete a Diploma course, and the entrance requirements for student Radiographers are that the student will have passed matriculation or its equivalent with Mathematics and Science on the higher grade (a Matric exemption is preferred).

The mean Matric scores and relevant data for the different disciplines can be seen in TABLE 8.9.

TABLE 8.9

MEANS AND STANDARD DEVIATIONS FOR ALL DISCIPLINES ON MATRIC SCORE

	MEAN	SD	RANGE
CNC Nurses	24.85	6.24	9 - 43
BSc Nurses	33.50	2.24	29 - 37
Physiotherapists	38.88	3.04	32 - 44
Logopaedic students	38.54	2.88	33 - 43
Occupational therapists	34.17	2.43	29 - 36
Radiographers	29.59	3.94	22 - 38

The Matric scores and the ranges for the Physiotherapy, Logopaedic, Occupational Therapy and BSc Nursing Students are all slightly skewed (on the low side) because in each of these Departments, 3 students had been accepted with Matric scores that would not normally be accepted by Medical School. These students had, however, already obtained credit for certain undergraduate courses, and were accepted on these grounds. If these "transferring undergraduate" students were not included in the calculations, the Physiotherapy students, for example, would have a mean Matric score of 39.72 and the range for the Matric scores would be 37 - 44 (only 4 CNC student nurses would have fallen within this range, and one of those has left to follow a nursing degree).

The Faculty Officer at the Dean's Office at Medical School (UCT) reports that the Medical School was most oversubscribed by students wanting to become Physiotherapists, with approximately 8-10 applications for every available position; the second most popular paramedical course was Logopaedics with the number of applicants far exceeding the available posts. Occupational

Therapy followed in popularity - with Faculty still being able to choose the most suitable students; but the Faculty struggled to find sufficient suitable candidates for the BSc Nursing Degree (personal communication).

In the light of this information it is understandable that the Matric aggregates for the students in the different Departments varied - as seen in TABLE 8.10.

TABLE 8.10

MATRIC AGGREGATES FOR STUDENTS IN DIFFERENT DISCIPLINES

STUDENTS	A	B	C
BSc Nurses	0	5	7
Physiotherapy Students	6	15	3
Logopaedic Students	2	8	2
Occupational Therapy	0	8	10

As a number of the Radiography students, and many of the CNC nurses, did not have a Matriculation exemption (which is not a criterion for acceptance), it was not possible to include them in the above table. However, from the Matric scores in those groups it is obvious that far more students have C, D, and E aggregates. There was one CNC nurse but no Radiography student with an A aggregate.

A univariate one-way ANOVA was performed on the Matric scores, and the results are presented in TABLE 8.11.

TABLE 8.11

UNIVARIATE ONE-WAY ANOVA SUMMARY TABLE FOR MATRIC SCORES

SOURCE		SS	DF	MS	F	
Treatgroup		6206.38	8, 187	775.80	32.66	***
Contrast	CNC - BSc	790.70	1, 187	790.70	33.29	***
	CNC - Physio	3782.46	1, 187	3782.46	159.25	***
	CNC - Logo	2138.55	1, 187	2138.55	90.04	***
	CNC - OT	1308.33	1, 187	1308.33	55.08	***
	CNC - Radiog	466.39	1, 187	466.39	19.64	***

*** = $p < .001$

It is evident that the CNC nurses were significantly different, (i.e. had significantly lower Matric scores) from every group of students with whom they were compared.

On contrasting each of the groups with one another:

1. The BSc Nurses had significantly lower scores than the Physiotherapy and Logopaedic students ($p < .01$) and significantly higher scores than the Radiography students ($p < .05$).
2. The Physiotherapy students and the Logopaedic students were not significantly different from each other, while the Physiotherapy students had significantly higher Matric scores than the Occupational Therapy students and student Radiographers ($p < .01$).
3. The Logopaedic students had significantly higher Matric scores than the Radiography students ($p < .01$).

It thus appears that the Physiotherapy and Logopaedic students achieved significantly higher mean Matric scores than any of the other students. There is a clear indication that the CNC student

nurses had by far the lowest mean Matric scores, with 5 out of 5 significant contrasts ($p < .001$).

Relationships with the POMS and Lifestyle Questionnaires are presented in TABLE 8.12, where the groups have been ranked according to the mean scores they achieved on Matric, POMS, and Lifestyle (HBAS) Questionnaires.

TABLE 8.12

RANKING OF MATRIC, POMS AND HBAS SCORES

STUDENT GROUP	MATRIC RANKING	POMS RANKING	HBAS RANKING
Physiotherapy students	1	1	1
Logopaedic students	2	2	2
Occupational therapy	3	5	5
BSc Nurses	4	6	4
Radiographers	5	3	3
CNC Nurses	6	4	6

From these rankings it can be seen that the Physiotherapy and the Logopaedic students ranked 1 and 2 on all the variables while the CNC students ranked 6th on 2 of the 3 variables and the BSc nurses ranked 6th on the Total Mood Disturbance (TMD) of the POMS, with their fatigue levels being significantly higher (worse) than the CNC nurses ($p < .05$).

8.6 SUMMARY

There were significant differences on Matric scores and the POMS and the HBAS questionnaires between the first year student nurses and the paramedical students. In all of the variables on the

HBAS on which there were significant differences between the CNC nurses and another group of first year students, the CNC nurses had the lowest (less healthy) score in every instance.

There are therefore significant differences between the CNC nurses and the other paramedical students, and these differences lie mainly between the nurses and the Physiotherapy- and Logopaedic students. The differences suggest the possibility that the higher levels of Tension and Anger, and lower levels of Vigour (from the POMS questionnaire) and the apparently less-healthy lifestyle (from the HBAS questionnaire) of the CNC student nurses, might be associated with their lower Matric scores and the added stress that lower academic ability induces in trying to cope with the Academic aspect of their four year Integrated Nursing Diploma Course.

The findings of this study confirm the fact that the CNC nursing students do have higher levels of negative mood states (as scored on the POMS questionnaires), and that their lifestyles (on the HBAS) are less healthy than those of the other first year paramedical students with whom they were compared. Furthermore, the presumption that the CNC nurses are experiencing considerable stress in relation to examinations is realistic when taken in context of their academic ability (as measured by their Matric Scores). It is those students with comparatively low Matric Scores who find the expectations and stresses placed upon them too much to cope with, and become particularly anxious under test and examination conditions.

CHAPTER NINE

RESULTS

9.1 METHODOLOGICAL CONSIDERATIONS FOR ANALYSES

9.1.1 GROUP CHARACTERISTICS

In order to analyse the data the groups were sub-divided into anxiety level sub-groups, as described in Chapter 6.7. TABLE 9.1 indicates the number of students within each treatment group and anxiety level sub-group.

TABLE 9.1

DISTRIBUTION OF ANXIETY LEVELS WITHIN THE TREATMENT GROUPS

GROUP	HI-ANX	LO-ANX	MID-ANX	TOTAL
1 SD	13	3	9	25
2 PMRT & GI	8	11	9	28
3 CONTROL	8	9	7	24
4 SST	5	11	10	26
TOTAL:	34	34	35	103

9.1.2 ANXIETY AND EXAMINATION SCORES

Since the pre-test Achievement Anxiety Test (AAT) Facilitative (+AAT) and Debilitative (-AAT) Anxiety scores were used to differentiate the students into High-Anxious (Hi-Anx), Low-Anxious (Lo-Anx) and those in-between (Mid-Anx), when assessing the change from pre-test to post-test the pre-post difference scores for each individual were used rather than the actual pre- and post-test scores. (The actual scores will be found in

Appendix M1 for the High-Anxious Group, M2 for the Low-Anxious Group, and M3 for the Mid-Anxious Group). The difference scores were calculated by subtracting the one score from the other so that in all cases, an improvement (decrease in anxiety) resulted in a positive difference score.

The following method of calculating the difference score was used: as it was anticipated that Facilitative Anxiety (+AAT) and Examination results would increase, the difference scores were calculated by subtracting the pre-test scores from the post-test scores i.e. FACILD = FACIL2 - FACIL1 and EXAMD = EXAM2 - EXAM1. The other scores were expected to decrease and therefore the post-scores were subtracted from the pre-scores i.e.
Debilitative Anxiety (-AAT): DEBILD = DEBIL1 - DEBIL2;
Anticipated anxiety (AARS): ANTICD = ANTIC1 - ANTIC2; and
Subjective Units of Disturbance: SUDD = SUD1 - SUD2.
In the first instance, the means of these difference scores and the standard deviations will be given, to indicate the change from pre- to post-intervention. In TABLE 9.2 it can be seen that initially the mean difference scores were calculated for the whole study sample ignoring sub-groupings, and then for the High-Anxious, Low-Anxious and Mid-Anxious sub-groups in each Treatment Group and the Control Group.

TABLE 9.2

THE MEANS AND STANDARD DEVIATIONS OF DIFFERENCE SCORES FOR THE ANXIETY FACTORS AND EXAMINATION SCORES FOR THE GROUPS

GROUP 1 : SYSTEMATIC DESENSITISATION										
	+AAT	SD	-AAT	SD	AARS	SD	SUD	SD	EXAMS	SD
ALL	1.16	4.2	5.12	6.9	4.28	11.2	10.92	11.1	6.19	11.9
HI-ANX	2.39	5.2	8.08	7.1	4.39	13.4	12.00	11.3	7.08	14.0
LO-ANX	-0.33	1.5	-1.67	3.5	3.00	4.0	5.00	11.1	-1.67	6.1
MID-ANX	-0.11	2.6	3.11	4.9	4.56	10.2	11.33	11.1	7.44	10.4
GROUP 2 : PROGRESSIVE MUSCLE RELAXATION TRAINING AND GUIDED IMAGERY										
	+AAT	SD	-AAT	SD	AARS	SD	SUD	SD	EXAMS	SD
ALL	-0.86	4.5	-0.50	6.6	-0.43	8.4	1.75	13.1	9.57	12.3
HI-ANX	1.38	4.3	2.50	9.7	-3.50	11.9	-5.75	13.6	11.88	10.0
LO-ANX	-0.55	4.0	-2.36	4.5	-0.45	5.7	4.09	12.2	9.64	13.4
MID-ANX	-3.22	4.6	-0.89	5.2	2.33	7.3	5.56	12.2	7.44	13.8
GROUP 3 : CONTROL										
	+AAT	SD	-AAT	SD	AARS	SD	SUD	SD	EXAMS	SD
ALL	0.71	4.0	-0.08	4.5	-1.83	7.9	2.00	7.9	5.13	9.5
HI-ANX	2.38	3.2	-0.38	3.2	0.25	5.2	3.50	7.7	4.63	13.2
LO-ANX	1.11	4.9	0.67	5.6	-2.89	9.7	2.89	6.8	6.22	7.9
MID-ANX	-1.71	2.8	-0.71	4.7	-2.86	8.5	0.86	9.7	4.29	7.8
GROUP 4 : STUDY SKILLS TECHNIQUE										
	+AAT	SD	-AAT	SD	AARS	SD	SUD	SD	EXAMS	SD
ALL	2.42	4.4	0.58	6.4	-2.81	9.5	2.73	10.3	1.46	9.2
HI-ANX	5.20	4.8	6.80	2.5	4.00	13.0	-4.20	9.6	-5.80	4.8
LO-ANX	3.09	4.0	-2.64	5.7	-5.18	6.6	2.54	10.1	6.00	8.1
MID-ANX	0.30	4.1	1.00	6.4	-3.60	9.7	6.40	9.9	0.10	9.7

9.2 COMPARISONS BETWEEN THE GROUPS

By means of both one-way and two-way multivariate ANOVAS, the groups and sub-groups were compared and the Treatment Groups were contrasted with the Control Group to establish whether there were any significant differences.

In comparing the results of the treatment groups, initially the analyses were performed with all the students in each Treatment Group being included in the comparisons, then each of the groups was divided into High-Anxious, Low-Anxious and Mid-Anxious sub-groups and further comparisons were made.

9.2.1 TWO-WAY MULTIVARIATE ANALYSIS ON ANXIETY FACTORS AND EXAMINATION DIFFERENCE SCORES FOR THE GROUPS WITHIN THE DIFFERENT LEVELS OF ANXIETY

When both Treatment Group and Anxiety level were used as grouping variables and a two-way multivariate ANOVA was computed, (see TABLE 9.3) there were no significant two-way interactions, indicating that the effects of the one factor (treatment group) did not depend on the levels of the other factor (anxiety). There were significant overall effects and main effects on both the Treatment Group factor and the Anxiety Factor.

Overall there were significant pre-post differences on Examination scores ($p < .01$) and Subjective Units of Disturbance ($p < .05$). There were significant differences (between the Treatment Groups) on Facilitative Anxiety ($p < .05$) and Examination scores ($p < .05$). There were significant differences between anxiety level groups on the Facilitative Anxiety ($p < .01$) and the Debilitative Anxiety ($p < .01$) variables. The number of significant statistics from the multiple comparisons, is sufficient to suggest that some real differences are implied by the data.

TABLE 9.3

TWO-WAY MULTIVARIATE ANOVA SUMMARY TABLE FOR THE ANXIETY FACTORS AND EXAMINATION SCORES FOR THE GROUPS AND THE LEVELS OF ANXIETY

	SOURCE	SS	DF	MS	F	
OVALL	Facilitative	60.69	1, 91	60.69	3.59	
	Debilitative	112.79	1, 91	112.79	3.33	
	Anticipated	0.001	1, 91	0.001	0.00	
	SUD	116.53	1, 91	116.53	9.71	*
	Exam	2024.89	1, 91	2024.89	16.90	**
TRTGRP	Facilitative	169.55	3, 91	56.62	3.35	*
	Debilitative	166.92	3, 91	55.64	1.64	
	Anticipated	412.09	3, 91	137.36	1.55	
	SUD	874.41	3, 91	291.47	2.54	
	Exam	1157.07	3, 91	385.69	3.22	*
ANXIETY	Facilitative	261.05	2, 91	130.52	7.73	**
	Debilitative	479.93	2, 91	239.97	7.09	**
	Anticipated	98.58	2, 91	49.29	0.56	
	SUD	287.29	2, 91	143.65	1.25	
	Exam	5.26	2, 91	2.63	0.02	
INTER-ACTION	Facilitative	24.73	6, 91	4.12	0.24	
	Debilitative	282.09	6, 91	47.02	1.39	
	Anticipated	422.77	6, 91	70.46	0.79	
	SUD	980.59	6, 91	163.43	1.42	
	Exam	751.86	6, 91	125.31	1.05	

* = $p < .05$
** = $p < .01$

9.2.2 ONE-WAY MULTIVARIATE ANALYSIS ON THE ANXIETY FACTORS AND EXAMINATION DIFFERENCE SCORES FOR THE GROUPS

TABLE 9.4 indicates the summary of the ANOVA for the Treatment Groups i.e. before they were divided into High-Anxious, Low-Anxious and Mid-Anxious sub-groups.

TABLE 9.4

ONE-WAY MULTIVARIATE ANOVA SUMMARY TABLE FOR THE ANXIETY FACTORS AND EXAMINATION DIFFERENCE SCORES FOR THE TREATMENT GROUPS

SOURCE	SS	DF	MS	F
Facilitative	148.76	3, 99	49.59	2.69 *
Debilitative	514.59	3, 99	171.53	4.47 **
Anticipated	744.03	3, 99	248.01	2.85 *
SUD	1468.63	3, 99	489.54	4.15 **
Exam	899.80	3, 99	299.93	2.53

* = p < .05
** = p < .01

As these results were statistically significant, comparisons between Treatment Groups were carried out and difference scores of significance are to be found in TABLE 9.5.

TABLE 9.5

ONE-WAY MULTIVARIATE ANOVA SUMMARY TABLE FOR CONTRASTS BETWEEN GROUPS ON ANXIETY FACTORS AND EXAMINATION DIFFERENCE SCORES

SOURCE	SS	DF	MS	F
Group 1 : Control Group				
Debilitative	331.53	1, 99	331.53	8.64 **
Anticipated Anxiety	457.63	1, 99	457.63	5.29 *
SUD	974.28	1, 99	974.28	8.26 **
Group 2 : Group 4				
Facilitative	124.69	1, 99	124.69	4.21 *
Exam	556.98	1, 99	556.98	4.09 *

* = p < .05
** = p < .01

From the contrasts in TABLE 9.5 it was apparent that: Group 1 differed significantly from the Control Group on Debilitative

Anxiety ($p < .01$) and Subjective Units of Disturbance ($p < .01$) and Anticipated Anxiety ($p < .05$). Group 2 differed significantly from Group 4 on Examination difference scores ($p < .05$) and Facilitative Anxiety ($p < .05$). Having 5 out of 30 comparisons significant suggests that real as opposed to chance differences occurred.

9.2.3 ONE-WAY MULTIVARIATE ANALYSIS ON THE ANXIETY FACTORS AND EXAMINATION DIFFERENCE SCORES FOR THE LEVELS OF ANXIETY

After the comparative analyses between the Treatment Groups had been conducted, a multivariate one-way ANOVA was performed using the different levels of anxiety to subdivide the students.

TABLE 9.6

ONE-WAY MULTIVARIATE ANOVA SUMMARY TABLE FOR TREATMENT DIFFERENCES ASSOCIATED WITH THE ANXIETY FACTORS ON SEVERAL SCALES

	SOURCE	SS	DF	MS	F	
HI-ANX	Facilitative	46.76	3, 30	15.59	0.76	
n = 34	Debilitative	414.64	3, 30	138.21	3.04	*
	Anticipated	351.92	3, 30	117.31	0.88	
	SUD	1920.08	3, 30	640.03	5.32	**
	Exam	1000.14	3, 30	333.38	2.29	
LO-ANX	Facilitative	79.54	3, 30	26.51	1.57	
n = 34	Debilitative	64.48	3, 30	21.49	0.81	
	Anticipated	216.19	3, 30	72.06	1.40	
	SUD	23.24	3, 30	7.75	0.07	
	Exam	311.62	3, 30	103.87	1.03	
MID-ANX	Facilitative	71.57	3, 31	23.86	1.80	
n = 35	Debilitative	89.94	3, 31	29.98	1.01	
	Anticipated	421.49	3, 31	140.50	1.72	
	SUD	588.52	3, 31	196.17	1.63	
	Exam	348.37	3, 31	116.12	1.03	

* = $p < .05$
** = $p < .01$
NOTE: Three separate multivariate ANOVAS were performed, one for each level of anxiety.

TABLE 9.7

ONE-WAY MULTIVARIATE ANOVA SUMMARY TABLE FOR CONTRASTS BETWEEN HIGH-ANXIOUS SUB-GROUPS

SOURCE	SS	DF	MS	F
Group 1 : Control Group Debilitative	353.77	1, 30	353.77	7.78 **
Group 4 : Control Group Debilitative	158.41	1, 30	158.41	4.02 *

* = $p < .05$
** = $p < .01$

In the three levels of anxiety (i.e. High-Anxious, Low-Anxious and Mid-Anxious sub-groups) when the Treatment Groups were contrasted with the Control Group by means of one-way ANOVAS the following results were obtained (see TABLE 9.7). In the High-Anxious sub-group there were significant differences on the Debilitative (-AAT) variable between Group 1 and the Control Group ($p < .01$), and between Group 4 and the Control Group ($p < .05$).

Although there was a significant difference evidenced on the Subjective Units of Disturbance (SUD) variable in TABLE 9.6, this was due to the difference between the High-Anxious sub-groups of Group 1 and Group 2 ($p < .05$) and not a difference between a Treatment Group and the Control Group (see Appendix N for mean scores and standard deviations for the different groups on the anxiety and examination variables).

In both the Low-Anxious and the Mid-Anxious sub-groups there were no significant differences between the Control Group and any of the Treatment Groups on any of the variables.

With only 3 of the 45 implicit comparisons yielding significance it is possible that the observed differences may reflect chance effects.

In order to graphically represent these differences in a way that takes cognisance of individual students within each of the sub-groups, histograms will be presented of the actual changes in scores for the individuals in the sub-groups, for each of the variables included in TABLE 9.2.

9.2.4 AAT FACILITATIVE ANXIETY DIFFERENCE

Significant positive differences (improved Facilitative Anxiety scores) were found in the High- and Low-Anxious sub-groups of Group 4 (SST) ($p < .05$), while a negative difference (lower Facilitative Anxiety score) was found for the Mid-Anxious sub-group of Group 2 (PMRT & GI) ($p < .05$). See FIGURE 9.1.

FIGURE 9.1

DIFFERENCE SCORES ON FACILITATIVE ANXIETY

	GROUP 1			GROUP 2			GROUP3			GROUP 4		
	HI	LO	MID	HI	LO	MID	HI	LO	MID	HI	LO	MID
12.0										*		
10.5	*											
9.0												
7.5	*			*			*	**		*	***	*
6.0	*						*					
4.5	****		*	**	**		*	*		N	***	*
3.0	N		*	*	*		M	*	*	**	N	**
1.5	**	*	**	M	**	*	*	M			***	
0		M	N	*	N	***			**	*		M*
-1.5	**	*	****		***		***	*	N		*	**
-3.0	*		*			M*		**	*			*
-4.5				**	**	*			***		*	
-6.0								*				
-7.5					*	*						*
-9.0	*											
-10.5												
-12.0												
-13.5						*						
MEAN	2.4	-0.3	0.1	1.4	-0.5	-3.2	2.4	1.1	-1.7	5.2	3.0	0.3
S.D.	5.2	1.5	2.4	4.3	4.0	4.6	3.2	4.9	2.8	4.8	3.8	4.1
S.E.M.	1.4	0.9	0.7	1.5	1.2	1.5	1.1	1.6	1.0	2.1	1.1	1.3
MAX	11.0	1.0	5.0	8.0	5.0	2.0	7.0	8.0	3.0	12.0	8.0	7.0
MIN	-9.0	-2.0	-2.0	-5.0	-7	0-13.0	-1.0	-6.0	-4.0	0.0	-5.0	-7.0
n	13	3	9	8	11	9	8	9	7	5	11	10

GROUP MEANS ARE DENOTED BY M's IF THEY COINCIDE WITH *'s, OTHERWISE N

For all of the groups the mean difference in the High-Anxious sub-groups were in a positive direction but with the only significant difference (improved Facilitative Anxiety) occurring in Group 4. This may be a purely chance effect.

9.2.5 AAT DEBILITATIVE ANXIETY DIFFERENCE

FIGURE 9.2

DIFFERENCE SCORES ON DEBILITATIVE ANXIETY

	GROUP 1			GROUP 2			GROUP3			GROUP 4		
	HI	LO	MID	HI	LO	MID	HI	LO	MID	HI	LO	MID
25.0												
22.5	*			*								
20.0												
17.5	*											
15.0	*											
12.5	**		*									
10.0			*	*						*		*
7.5	M					**		*		M		**
5.0	***		*		*		*	**	**	***		*
2.5	**	*	N	M	*		*	**			**	
0	*		***	*	****	M	M**	M*	M		****	M*
-2.5	*	M	***	**	M	****	**		**		M*	**
-5.0		*		**	*	*	*		**		**	*
-7.5					**	*		*				
-10.0					*			*				*
-12.5												
-15.0												
-17.5											*	
MEAN	8.1	-1.7	3.3	2.5	-2.4	-0.9	-0.4	0.7	-0.7	6.8	-2.6	1.0
S.D.	7.1	3.5	5.0	9.7	4.5	5.1	3.1	5.6	4.7	2.5	5.5	6.4
S.E.M.	2.0	2.0	1.5	3.4	1.4	1.7	1.1	1.8	1.8	1.1	1.6	2.0
MAX	22.0	2.0	13.0	23.0	4 0	8.0	4.0	7.0	6.0	11.0	2.0	11.0
MIN	-2.0	-5.0	-3.0	-6.0	-10.0	-8.0	-6.0	-9.0	-6.0	5.0	-18.0	-9.0
n	13	3	9	8	11	9	8	9	7	5	11	10

GROUP MEANS ARE DENOTED BY M's IF THEY COINCIDE WITH *'s, OTHERWISE N

There were significant differences (decreased Debilitative Anxiety) in the High-Anxious sub-groups of Group 1 (SD) ($p < .01$) and Group 4 (SST) ($p < .05$): the only significant differences between the Control Group and a Treatment Group, indicating that for the High-Anxious sub-groups Systematic Desensitisation and Study Skills Training possibly had a beneficial effect on Debilitative Anxiety.

Except for the Control Group the changes from pre- to post-test resulted in increased Debilitative Anxiety (higher levels of -AAT) in all the Low-Anxious sub-groups; however, only in Group 4 was this of any significance ($p < .05$) indicating that for the Low-Anxious sub-group Study Skills Training possibly had a detrimental effect on Debilitative Anxiety (see FIGURE 9.2). It is not unlikely that the observed significant differences are merely chance results.

9.2.6 ANTICIPATED ANXIETY RATING SCALE DIFFERENCE

FIGURE 9.3

DIFFERENCE SCORES ON ANTICIPATED ANXIETY

	GROUP 1			GROUP 2			GROUP3			GROUP 4		
	HI	LO	MID	HI	LO	MID	HI	LO	MID	HI	LO	MID
35.0	*											
31.5												
28.0												
24.5			*									
21.0	*											
17.5				*								
14.0										*		
10.5	***		**	*	*	**		***		**	*	
7.0		*	*		*	**	*		**			**
3.5	M	M	M	*	***	M*	***			N	**	*
0	***	*			M		M*		**		*	*
-3.5	*		**	N	***	**		M*	N	*	M***	M***
-7.0				**	*		**	*	*			
-10.5	**		*	*	*	*		**	*		*	
-14.0	*		*	*				*	*	*	*	
-17.5											*	*
-21.0				*								
-24.5												*
MEAN	4.4	3.0	4.6	-3.5	-0.5	2.3	0.3	-2.9	-2.9	4.0	-5.2	-3.6
S.D.	13.4	4.0	11.4	11.9	5.7	7.3	5.2	9.7	3.5	13.0	7.5	9.7
S.E.M.	3.7	2.3	3.6	4.2	1.7	2.4	1.8	3.2	3.2	5.8	2.2	3.1
MAX	35.0	7.0	25.0	16.0	9.0	12.0	6.0	9.0	7.0	15.0	9.0	8.0
MIN	-13.0	-1.0	-15.0	-20.0	-9.0	-12.0	-8.0	-15.0	-15.0	-15.0	-18.0	-23.0
n	13	3	9	8	11	9	8	9	7	5	11	10

GROUP MEANS ARE DENOTED BY M's IF THEY COINCIDE WITH *'s, OTHERWISE N

The differences on the Anticipated Anxiety Rating Scale (see FIGURE 9.3) showed little uniformity in direction and degree of change amongst the sub-groups. The Low-Anxious sub-group of Group 4 (SST) was the only sub-group in which there was a significant difference ($p < .05$). This sub-group reported higher levels of Anticipated Anxiety in the post-intervention measurement, suggesting that a Study Skills Programme possibly

had a detrimental effect on the Low-Anxious sub-group's Anticipated Anxiety. This may be a purely chance effect.

9.2.7 SUBJECTIVE UNITS OF DISTURBANCE DIFFERENCE

FIGURE 9.4

DIFFERENCE SCORES FOR SUBJECTIVE UNITS OF DISTURBANCE

	GROUP 1			GROUP 2			GROUP3			GROUP 4		
	HI	LO	MID	HI	LO	MID	HI	LO	MID	HI	LO	MID
40.0	*											
36.0												
32.0												
28.0												
24.0	*		**			*						
20.0			**		*						*	*
16.0	***	*		*	*	**	**				*	*
12.0	M*				***	*		*	*			*
8.0	*		N					**	*	*	*	M*
4.0	**	M	**	*	M	M	M	M*	*		M	**
0.0	***		**	*	*		***	**	M		****	*
-4.0		*	*	M	**	**	*	*		M**	*	*
-8.0				**	*	**	*	*	*		*	
-12.0									**			*
-16.0											*	
-20.0				*	*					*		
-24.0												
-28.0				*								
MEAN	12.0	5.0	11.3	-5.8	4.1	5.6	3.5	2.9	-0.9	-4.2	2.6	6.4
S.D.	11.3	11.2	11.6	13.6	12.2	12.2	7.7	6.8	9.7	9.6	10.1	9.9
S.E.M.	3.1	6.4	3.5	4.8	3.7	4.1	2.7	2.3	3.7	4.3	3.0	3.1
MAX	41.0	17.0	26.0	17.0	21.0	23.0	15.0	13.0	12.0	8.0	21.0	21.0
MIN	0.0	-5.0	-4.0	-27.0	-21.0	-8.0	-6.0	-8.0	-13.0	-19.0	-14.0	-13.0
n	13	3	9	8	11	9	8	9	7	5	11	10

GROUP MEANS ARE DENOTED BY M's IF THEY COINCIDE WITH *'s, OTHERWISE N

In assessing the change in the Subjective Units of Disturbance, (see FIG 9.4) it was evident that only the High- and Mid-Anxious sub-groups of Group 1 (SD) showed a significant decline ($p < .01$), suggesting that for these sub-groups the SD programme possibly had a beneficial effect. It is not clear that more than chance is operating in the significant differences.

9.2.8 EXAMINATION SCORES DIFFERENCE

FIGURE 9.5

DIFFERENCE SCORES ON EXAMINATION RESULTS

	GROUP 1			GROUP 2			GROUP3			GROUP 4		
	HI	LO	MID	HI	LO	MID	HI	LO	MID	HI	LO	MID
30.0			*									
27.0	*				*							
24.0	*			**	*	*					*	
21.0	**			*	**							
18.0				*		*	**	*	*			
15.0	*		**		*	*	*	*			*	
12.0	*			N		**	*					***
9.0			N		M			**	*		**	
6.0	M*	*	**	*	*	N	N	M*			N	
3.0			**	**	*	**	*	*	M*	*	***	
0.0			*	*	*		*		*		*	M*
-3.0	**	M	*			*		*	**		*	**
-6.0		*						*		M**	*	*
-9.0	**				*						*	
-12.0					*		*			*		**
-15.0							*					
-18.0	*											
-21.0						*						
MEAN	7.1	-1.7	7.4	11.9	9.6	7.4	4.6	6.2	4.3	-5.8	6.0	0.1
S.D.	14.0	6.1	9.5	10.0	13.4	13.8	13.2	7.9	7.8	4.8	8.8	9.7
S.E.M.	3.9	3.5	3.0	3.5	4.0	4.6	4.7	2.6	2.9	2.1	2.5	3.1
MAX	26.0	5.0	29.0	24.0	28.0	25.0	17.0	18.0	19.0	2.0	24.0	13.0
MIN	-17.0	-7.0	-3.0	1.0	-12.0	-21.0	-16.0	-7.0	-3.0	-11.0	-8.0	-13.0
n	13	3	9	8	11	9	8	9	7	5	11	10

GROUP MEANS ARE DENOTED BY M's IF THEY COINCIDE WITH *'s, OTHERWISE N

It was evident that there was a positive change for all four groups in the mean examination scores, i.e. most of the examination scores improved (see FIGURE 9.5). These positive changes are real, and chance effects may be eliminated as an explanation.

There were significant differences in Group 2; for the High-Anxious and the Low-Anxious sub-groups the differences were at the 1% level ($p < .01$), while for the Mid-Anxious sub-group it was at the 5% level. There were also significant differences in Group 1 for the High-Anxious and Mid-Anxious sub-groups ($p < .05$).

Group 2 thus had the greatest positive change in examination scores. There were two sub-groups that had negative changes (lower examination percentages) - the Low-Anxiety sub-group of Group 1 and the High-Anxiety sub-group of Group 4. Neither of these negative differences were, however, significant.

Cognisance must be taken of the fact that the method of assessing the students was not the same for the pre- and post-intervention examination scores. The pre-intervention examination score was the result of one examination which was based mainly on General Nursing Science. The post-intervention examination score was a mean score of 5 examination marks - General Nursing Science, Anatomy, Medical Biophysics, Physiology and Applied Chemistry. It is probable that the improved examination scores are due to the different method of assessment and not to any of the

treatment interventions. This view is substantiated by the consistent increases in the Control Groups Examination scores from pre- to post-test.

9.2.9 SUMMARY

To summarise, there was no group that was significantly better than the Control Group or any other Treatment Group on both Anxiety related variables *and* Examination scores. The only Treatment *Group* that differed significantly from the Control Group on more than one variable was Group 1 (SD). For that Group there were significant differences on Debilitative Anxiety ($p < .01$), Subjective Units of Disturbance ($p < .01$), and Anticipated Anxiety ($p < .05$). On analysing the *sub-groups* of Group 1, these differences were only statistically significant in the High-Anxious sub-group ($p < .01$), and not at the other anxiety levels.

In comparison to the High-Anxious sub-group of the Control Group, the High-Anxious sub-group of Group 4 achieved a significantly improved score ($p < .05$) on Debilitative Anxiety (lowered -AAT).

In comparing the different Treatment *Groups*, there were differences between Group 2 (PRMT & GI) and Group 4 (SST) which were statistically significant on both Facilitative Anxiety ($p < .01$) and Examination scores ($p < .05$); Group 2 (PRMT & GI) improved their examination score but not their Facilitative Anxiety, while Group 4 (SST) improved their Facilitative Anxiety

but not their Examination scores. When analysing the *sub-groups* (i.e. High-, Low- and Mid-Anxious) it was apparent that only the High-Anxious sub-groups were significantly different on these variables. On their post-intervention self-report measures the High-Anxious sub-group of Group 4 improved their Facilitative Anxiety scores significantly more than Group 2's High-Anxious sub-group ($p < .05$), however, their Examination results were significantly lower than Group 2 ($p < .01$).

In Group 2 the High-Anxious and Low-Anxious sub-groups both had significantly improved Examination scores ($p < .01$), while the Mid-Anxious sub-group had a significantly improved Examination score ($p < .05$), but their Facilitative Anxiety decreased significantly ($p < .05$).

9.3 COMPARISONS BETWEEN THE ANXIETY LEVELS

9.3.1 ACADEMIC PERFORMANCE

Only the Examination scores allow for the elimination of chance as an explanation of the observed differences. From the analyses in the Subsidiary Study (see Chapter 8) it was apparent that Matric scores were significantly related to the Profile of Moods States and Health Behaviour Assessment Scale. It is apparent that they might equally be related to Examination results, which in turn might be related to the students' anxiety levels.

Initial comparisons between the students in the three anxiety levels (irrespective of Treatment Group) on Matric, pre- and

post-intervention examination scores can be seen in TABLE 9.8 where the group means and standard deviations are presented, followed by the ANOVA summaries in tables 9.9, 9.10, and 9.11.

TABLE 9.8

MEANS AND STANDARD DEVIATIONS FOR MATRIC SCORES, PRE- AND POST-INTERVENTION EXAMINATION RESULTS

ANXIETY LEVEL	MATRIC MEAN	MATRIC SD	PRE-INTERVENTION MEAN	PRE-INTERVENTION SD	POST-INTERVENTION MEAN	POST-INTERVENTION SD
High	23.06	6.58	53.26	10.00	59.00	13.14
Low	27.77	5.91	63.06	11.59	69.20	11.59
Mid	23.77	5.60	57.53	9.00	62.53	9.60

TABLE 9.9

ONE-WAY UNIVARIATE ANOVA SUMMARY TABLE FOR MATRIC SCORES

SOURCE	SS	DF	MS	F	P	
All	401.20	2, 93	200.60	5.54	0.0053	**
Contrast Hi-Lo	337.86	1, 93	337.86	9.33	0.0029	**
Contrast Mid-Lo	263.39	1, 93	263.39	7.27	0.0083	**
Contrast Hi-Mid	8.02	1, 93	8.02	0.22	0.6390	

** = p < .01

NOTE: The number of students involved in this analysis was 96 and not 103 as some of the students had foreign Matric results which could not be converted into a `Matric Score´.

The Matric scores, with a mean of 24.87 points (range 9 - 43) indicate that the High-Anxiety Group had the lowest mean Matric score of 23.06; and the Low-Anxiety Group had the highest mean Matric score of 27.77; while the Mid-Anxiety Group had a mean Matric score of 23.77. These mean scores were significantly different ($p < .01$) as is evident in TABLE 9.9. It was also

evident that the contrast between the High- and the Low-Anxious Groups was highly significant ($p < .01$), as was the contrast between the Mid- and the Low-Anxious Groups ($p < .01$) while the difference in mean Matric scores between the High- and the Mid-Anxious Groups was not significant.

The pre-intervention and post-intervention examination results were also significantly different as seen in tables 9.10 and 9.11.

TABLE 9.10

ONE-WAY UNIVARIATE ANOVA SUMMARY TABLE FOR PRE-INTERVENTION EXAMINATION RESULTS

SOURCE	SS	DF	MS	F	P
All	1665.51	2, 100	832.76	7.94	0.0006 **
Contrast Hi-Lo	1653.79	1, 100	1653.79	15.76	0.0001 **
Contrast Mid-Lo	542.58	1, 100	542.58	5.17	0.0251 *
Contrast Hi-Mid	317.78	1, 100	317.78	3.03	0.0848

* = $p < .05$
** = $p < .01$

TABLE 9.11

ONE-WAY UNIVARIATE ANOVA SUMMARY TABLE FOR POST-INTERVENTION EXAMINATION RESULTS

SOURCE	SS	DF	MS	F	P
All	1858.42	2, 100	929.21	7.03	0.0014 **
Contrast Hi-Lo	1794.31	1, 100	1794.31	13.57	0.0004 **
Contrast Mid-Lo	790.05	1, 100	790.05	5.97	0.0162 *
Contrast Hi-Mid	217.61	1, 100	217.61	1.65	0.2025

* = p < .05
** = p < .01

From these tables of the pre-intervention and post-intervention examination scores it was evident that (as with the Matric scores) there was a significant difference between the High-Anxious and the Low-Anxious Groups ($p < .01$), while the significance was at the 5% level between the Mid-Anxious and the Low-Anxious Groups. Once again there was no significant difference between the High-Anxious and the Mid-Anxious Groups.

TABLE 9.12

CORRELATION BETWEEN MATRIC AND PRE-INTERVENTION EXAM SCORES

GROUP	*r* VALUE	*r* CRIT VALUE
High Anxious (n = 34)	0.3041	0.05 = 0.2869*
Low Anxious (n = 34)	0.2674	0.05 = 0.2869
Mid Anxious (n = 35)	0.2339	0.05 = 0.2826

The correlation between Matric scores and Pre-intervention Examination scores was weak, and only reached significance in the High-Anxious group. This may perhaps be explained by the nature of the pre-intervention examination, which was General Nursing

Science, which taps practical experience and problem solving skills rather than purely academic ability. Also, the Examination was relatively low-key, occurring at a time when exclusion from nursing training was not a threat, and the examination was presented as a "class test".

TABLE 9.13

CORRELATION BETWEEN MATRIC SCORES AND POST-INTERVENTION EXAM SCORES

GROUP	*r* VALUE	*r* CRIT VALUE
High Anxious (*n* = 34)	0.6643	0.001 = 0.5113 ***
Low Anxious (*n* = 34)	0.3083	0.05 = 0.2869 *
Mid Anxious (*n* = 35)	0.5967	0.001 = 0.5045 ***

In contrast, there was a significant positive correlation between Matric scores and post-intervention Examination scores in all three groups. This examination bore considerable similarities to Matric in that it was viewed in a serious light by Staff and Students; continuation in nursing training was dependent upon success in the examination; and papers included academic subjects such as Anatomy, Physiology, Medical Biophysics and Applied Chemistry, as well as General Nursing Science.

9.3.2 SELF-REPORT MEASURES

TABLE 9.14

ONE-WAY MULTIVARIATE ANOVA SUMMARY TABLE FOR ANXIETY RELATED VARIABLES COMPARING THE ANXIETY LEVELS

	SOURCE	SS	DF	MS	F
OVALL	Facilitative	236.19	2, 100	118.10	6.81 **
	Debilitative	662.79	2, 100	331.40	9.08 **
High-Low	Debilitative	648.53	1, 100	648.53	17.77 **
Mid-Low	Facilitative	83.66	1, 100	83.66	4.82 *
High-Mid	Facilitative	232.68	1, 100	232.68	13.41 **
	Debilitative	258.82	1, 100	258.82	7.09 **

* = $p < .05$
** = $p < .01$

Means and standard deviations for the anxiety-related variables are to be found in Appendix N. TABLE 9.14 indicates that only the Facilitative Anxiety (+AAT) and Debilitative Anxiety (-AAT) difference scores (from pre- to post-intervention) were significantly different ($p < .01$). When contrasting the different anxiety-level groups it was apparent that:

1. the Facilitative Anxiety was the only variable of significance ($p < .01$) for High- versus Low-Anxious Groups, with the High-Anxious Group improving their Facilitative Anxiety scores significantly more than the Low-Anxious Group; and
2. the Debilitative Anxiety was significant ($p < .05$) for Mid- versus Low-Anxious Group contrast, (with the Mid-Anxious Group reducing their Debilitative Anxiety scores more than the Low-Anxious Group); while

3. both Facilitative Anxiety and Debilitative Anxiety were significant ($p < .01$) for the High- versus Mid-Anxious contrast, (with the High-Anxious Group improving their mean score the most).

None of the difference scores for the other variables proved to be significant, but 4 of 10 comparisons achieved 5% (or better) significance which allows us to conclude that real differences are evidenced in the data.

From the comparisons between the different Anxiety levels it is evident that there are significant differences between these levels (i.e. High, Low and Mid Anxious) on Matric scores, pre-intervention Examination results, post-intervention Examination results as well as the Facilitative and Debilitative Anxiety variables - all of these being significant at the 1% significance level.

One conclusion might therefore be that in this study Anxiety and Academic ability (as represented by the Matric scores) are confounded, and that the treatments intended to improve anxiety conditions fail to show differences because academic ability is not substantially or even relatively improved in any of the groups (Dunne, 1989 - Personal Communication).

9.4 ONE - YEAR FOLLOW UP

Although the (now second-year) students have written a number of tests during 1989 they will be coming into the college to write examinations only towards the end of 1989. It was thus not possible to obtain follow-up academic results or questionnaires from these students in time to analyse them for this research. The one-year follow up data thus consisted of taking the students who were included in the research and then analysing the number of students who had failed or resigned to see if there were any noticeable trends.

TABLE 9.15 indicates the actual number of students who have left each group.

TABLE 9.15

THE NUMBER OF FAILURES AND RESIGNATIONS FROM EACH GROUP

	FAILED	RESIGNED	TOTAL
GROUP 1	8	3	11
GROUP 2	5	3	8
GROUP 3	2	6	8
GROUP 4	2	4	6
TOTAL:	17	16	33

Of the 103 students included in the research, at the one year follow-up only 70 of these students were in second year. There were also totals of 17 failures and 16 resignations meaning that only 67.96% of the original 103 students continued in second

year. There were no significant differences between the Treatment groups, on the number of failures and/or resignations.

There did, however, appear to be a trend when all the students, irrespective of their treatment group, were analysed in terms of the High-Anxiety, Low-Anxiety and Mid-Anxiety sub-groups.

TABLE 9.16

ONE - YEAR FOLLOW UP DATA : FAILURES AND RESIGNATIONS

	1988	FAILED		RESIGNED		FAILED + RESIGNED		1989
	n	n	%	n	%	n	%	n
All	103	17	16.5	16	15.5	33	32.0	70
Hi-Anx	34	9	26.5	7	20.5	16	47.1	18
Lo-Anx	34	4	11.8	5	14.8	9	26.5	25
Mid-Anx	35	4	11.4	4	11.4	8	22.9	27

From TABLE 9.16 it was evident that of the 17 students who failed, 9 (53%) came from the High-Anxious Group and 4 (23.5%) came from each of the Low-Anxious and Mid-Anxious Groups. A similar trend can be seen in the 16 students who resigned with 7 (44%) coming from the High-Anxious Group, 5 (31%) from the Low-Anxious Group and 4 (25%) from the Mid-Anxious Group. TABLE 9.17 indicates the students within the different anxiety levels who remained in nursing at the 1 year follow-up.

TABLE 9.17

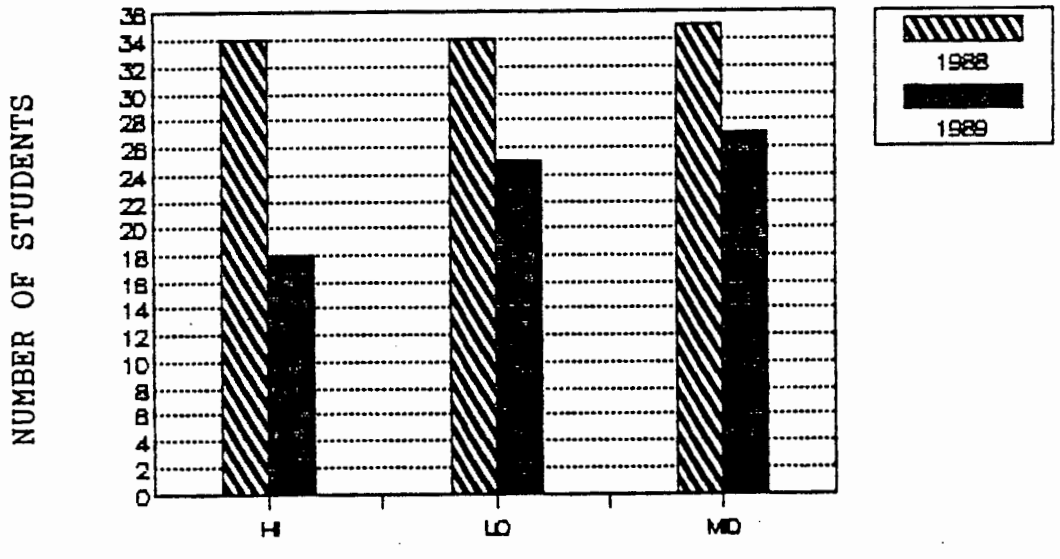
ONE YEAR FOLLOW-UP DATA : REMAINING STUDENTS

GROUP	HI-ANX	LO-ANX	MID-ANX	TOTAL
1 SD	4	2	8	14
2 PMRT & GI	7	7	6	20
3 CONTROL	4	6	6	16
4 SST	3	10	7	20
TOTAL	18	25	27	70

FIGURE 9.6 is a graphical representation of CNC nurses, divided into the 3 anxiety levels, who were included in the study in 1988 and those who remain in 1989.

FIGURE 9.6

CNC NURSES 1988 : 1989



ALL STUDENTS SUBDIVIDED INTO THE THREE ANXIETY LEVELS

Initially the High-Anxious Group had a mean Matric Score of 23.1 points (compared to the Low-Anxious Group's mean Matric Score of 27.8 points). The mean Matric Score of those who failed was 18.5 (range 9 - 25) points and of those who resigned was 22.0 (range 18 - 27) points which results in the fact that the students in the High-Anxious Group who have remained (n = 18) have a mean Matric Score of 26 points which is in fact higher than the initial mean Matric Score for all the students (n = 103) which was 24.87 points.

It seems apparent that by the time the students were in their second year, most of the high-anxious, low-ability students (using the Matric score as an indicator of ability) were no longer in nursing. The majority of the students remaining in the High-Anxious Group were apparently of higher ability i.e. they had higher Matric scores. It appears that the high test anxious students who have higher Matric scores can meet the academic requirements of the Integrated Nursing Diploma whereas those with low Matric scores are not able to cope with the academic demands made upon them.

CHAPTER TEN

DESCRIPTIVE DATA AND COMMENT

10.1 SELF-REPORT RESPONSES ON THE MANAGEMENT OF EXAM ANXIETY

(See Appendix D for the Management of Exam Anxiety Questionnaire).

10.1.1 A SYNOPSIS OF SOME DESCRIPTIVE RESPONSES REPORTED BY STUDENTS

(See Appendix P for a summary of the results of the Descriptive Schedule).

To obtain an enriched picture of just what constitutes "exam anxiety" and to assess just how anxious the participating students were, a descriptive schedule was administered to the students during the initial introductory session. This schedule (or information sheet) is concerned with general and test anxiety experiences of the students. It seeks information concerning the first noticed onset of disabling exam tension; the extent to which the subject would commit self-injury to avoid sitting an examination; physiological reactions experienced during and prior to an examination, and strategies used by the students in an attempt to alleviate this undue tension.

The following information was obtained from this questionnaire:

1. 78% of the students reported experiencing "mental blocks" during examinations;
2. 45% of the students considered themselves to be a "naturally tense person" (i.e. they felt anxious about something most of the time).

3. When looking at disabling exam anxiety:
   a) 18% of the students said that they first experienced this type of anxiety in primary school;
   b) 38% of the students cited high school as the time that they first experienced disabling exam anxiety;
   c) 29% first noted its occurrence in Matric (Std 10/Form 5);
   d) 1% said that it first started in College; and
   e) 14% of the students said that they did not experience this type of anxiety at all.
4. A percentage of the students had previously considered committing self-injury to avoid sitting an examination. While 19% had occasionally considered this type of evasive action, they emphasised that this was only a thought and that they would not consider taking any action. Only 3% had thought about it seriously and had taken some form of action. The remaining 78% of the students had never considered self-injurious acts in order to evade sitting examinations.
5. There were only 6% of the students who did not experience any physiological reactions to stress. The remaining students experienced one or more of the physiological reactions: 27% experienced one reaction; 30% experienced two reactions; 15% experienced three; and 15% experienced four; while 7% experienced five or more reactions.

The percentage of students who reported each particular physiological reaction can be seen in the following table:

PERSPIRATION 30% (mainly palms of the hands, face, under arms and back of neck)
"SHAKES" 27% (mostly of the hands. One subject reported : "... my legs go to jelly")
DRY MOUTH 18%
DIFFICULTIES IN BREATHING 5%
"RACING" HEARTBEAT 51%
HEADACHES 23% (5% specifically stating that they suffer from migraines at this time)
FEELING OF NAUSEA 15%
INSOMNIA 25%
OTHER 35% (including "indigestion", "biting of lip", "biting nails", "nightmares", "enuresis", "sleep walking", "stuttering", "diarrhoea", "frequency of micturation", "irritability", etc.)

6. Strategies used in an attempt to alleviate undue tension varied from subject to subject. 17% of the students did not need to use any strategies, while 60% used one strategy, 22% used two strategies and only 1% used three different strategies.

These strategies included 4 students who used "CALMETTES"; 28 students who increased their smoking noticeably before an examination; 24 who engaged in generally exhausting exercise, while 13 students practised some form of relaxation technique. The "other" strategies included deep breathing (8 students), listening to or playing music (9 students), reading (4 students), walking, eating junk food, taking vitamin tonic, biting nails (3 students in each category).

10.2 TREATMENT EVALUATION QUESTIONNAIRE

(See Appendix H for a copy of this questionnaire).

10.2.1 RESULTS OF TREATMENT EVALUATION QUESTIONNAIRE

(See Appendix Q for full details of these results).

Used as an index of the student's confidence in the treatment programme. This questionnaire had a range of 6 - 42. A score of 4 or more on each individual item (or a total score of 24 or more) indicates a positive attitude about the effectiveness of the treatment programme. Scores lower than 4 (or a total of less than 24) indicates a lack of confidence in the effectiveness of the programme.

As the Control Group did not undergo any form of treatment, the results of this questionnaire are for the three treatment Groups only and the group means and standard deviations for the six questions are presented in TABLE 10.1.

TABLE 10.1

MEANS AND STANDARD DEVIATIONS FOR TREATMENT EVALUATION QUESTIONNAIRE

		GROUP 1 (SD) MEAN	SD	GROUP 2 (PMRT) MEAN	SD	GROUP 4 (SST) MEAN	SD
QUESTION	1	3.8	2.0	4.2	0.7	4.7	2.1
	2	5.0	1.7	6.4	0.6	4.9	2.0
	3	3.4	1.5	5.0	1.2	2.8	1.6
	4	3.2	1.6	4.8	1.0	2.8	1.6
	5	3.1	1.6	4.1	1.1	2.9	1.8
	6	3.4	1.9	5.0	1.1	3.3	2.0
TOTAL		21.9		29.5		21.5	

From TABLE 10.1 it was evident that only Group 2 scored more than a total of 24 or scored more than 4 for each individual item. Both Group 1 and Group 4 scored less than 24, but not significantly less. In Group 2 83% of the students indicated their confidence in the programme by scoring 24 or more, while in Group 1 only 41% and in Group 4 only 44% reported a similar confidence level. As previously mentioned the Treatment Evaluation Questionnaire was administered four weeks after the completion of the programme and the day before the students wrote their third examination. It was hypothesised that the students would be relatively anxious about their examinations and only those students who really felt that they had benefitted from the programme would give it a rating of more than 24.

10.3 WRITTEN EVALUATION

All the students involved in the treatment programme were asked to comment on their experiences, unfortunately not very many students did in fact, hand in written comments. These students also commented on whether on not they had been practising in between sessions - and even these, presumably more conscientious students, had difficulty finding the time to fit relaxation etc. into their busy day. There were both positive and negative comments from each of the groups; although there were few negative comments about the programme, this is possibly due to the fact that the students who did not practise or who did not find the programme beneficial, did not bother to comment.

10.3.1 DESCRIPTIVE COMMENTS

Some verbatim excerpts from the students' written evaluations, typical of the general pattern of response, are included in this section.

Apart from a few specific references to minor interpersonal conflicts with other groups members, the content in the comments could be classified into different categories:

1. the students' feelings about their participation;
2. the atmosphere within the group;
3. the need to be taught the techniques;
4. the scheduling of time in order to practise the skills they had learnt;
5. the beneficial effect of the relaxation technique e.g. on sleeping habits;
6. the need to include an exercise component in a stress management programme;
7. being more aware of their physical and emotional feelings;
8. clarity of thought;
9. feeling more positive about the course and themselves;
10. feeling that they had learnt a useful technique.

1. The Student's Feelings about their Participation

I felt initially annoyed since we were not asked if we wanted to participate in the programme. I felt we were being used as guinea-pigs, not having been properly consulted or informed as to what was going to happen.
Group 1 student

This statement requires clarification and ultimately the researcher takes the responsibility for the students' not being correctly informed. In discussion with the person supervising the First Year students - the researcher was assured that all the students had been adequately and correctly informed as to what was going to happen and the rationale behind the entire study. However, the students were not given any choice as to whether they wished to participate in this research programme.

The initial battery of tests was fairly lengthy and exhausting and also obviously stressed some of the students. It is a well known phenomenon that test-anxious students become anxious when completing questionnaires about their test anxiety, as they worry about their performance (Richardson, 1973, cited in Meichenbaum & Butler, 1980).

> *Attitude at first: very skeptical [sic] because I thought all those tests were like an aptitude test. I was quite tense and exhausted afterwards, just as if I had written a 3 hour exam.*
>
> Group 2 student

Some of the students did, however, notice a difference between the initial session of completing forms and the actual relaxation therapy.

> *Week 1:*
> *We went to stress therapy today and it wasn't very pleasant since we were given questionnaires and we were put under a lot of stress - if this is what stress therapy is about, I'm not looking forward to the next session.*
> *Week 2:*
> *Very different from last week. We did relaxation exercises and I felt a tingling feeling in my hands and I felt really relaxed.*
>
> Group 1 student

2. The Atmosphere Within the Group

In Group 1, particularly in the 1B sub-group, there was a strained atmosphere which was caused by a couple of disruptive students. These students were rather immature, uninterested and self-centered, and they giggled through most of the sessions and became obstreperous when asked to refrain.

> *Didn't feel as relaxed as I had in the previous week's session, was distracted by people fidgeting. I find it extremely rude and annoying when a few who are not interested and have a mental block against this experiment (?!) spoil it for others.*
>
> Group 1 student

3. The Need to be Taught the Techniques

> *I have known about relaxation techniques for quite a while but have never known how to personalize them. This has been quite an insight. I don't need to use it every day but when I feel stressed, I have used it.*
>
> Group 2 student

and the need for supervision

> *This has been a tense month for me. I have had quite a few hassles and these have left me tense. I did not have very much objectivity and didn't concentrate on the stress exercises. They need to become an automatic response to stress. At this stage, perhaps I still need quite a bit of supervision or someone to initiate them.*
>
> Group 2 student

The need for live supervision was stressed by some students. Difficulties often arise when the participant tries to practice on her own, even with the aid of the audio-recording supplied to each of the students by the researcher.

I have had no difficulty relaxing and visualizing during the sessions and have come away feeling very good. However the times I have practised it since have not been as successful.

Group 2 student

4. The Scheduling of Time in Order to Practice the Skills Learnt

Fitting this into a tight schedule sounds easy but it takes a lot of discipline.

Group 1 student

I haven't been practising the visualization much lately, but I want to make an effort so I'll make the time.

Group 2 student

5. The Beneficial Effect of the Relaxation Techniques on Sleeping Habits

One particular area where the exercises have been a great help is in my sleeping pattern. I always have problems getting to sleep at night although I am never anxious about anything prior to going to bed. I found the exercises relaxed me and I was able to sleep.

Group 2 student

So far I have only used the relaxation technique before sleep and even when it hasn't been very successful - I have slept very well.

Group 2 student

We had a test yesterday. I felt tense afterwards. My mind was active and I lay in bed and decided to do the exercises. My back was very sore. By the time I had finished the exercises, my back was relaxed and not sore anymore and I was relaxed and had a good night's sleep.

Group 2 student

This past week everyone seems to be on edge. Especially me. I had problems sleeping - probably because I'm so tense, so I did the relaxation and visualization. It was amazing. It worked wonders because I felt fine for days afterwards.

Group 2 student

6. The Inclusion of an Exercise Component in a Stress Management Programme

During a discussion on exercise as a necessary component in a healthy lifestyle, it became evident that although the majority of the students had played a lot of sport at school and had thus previously had a regular amount of exercise; since commencing nursing many of them had stopped sport (and exercise) altogether. This situation appeared to be even worse when they were at college in a sedentary occupation as they were not even getting the normal exercise that a nurse gets while at work in the hospital.

> *During one of our sessions exercise was mentioned (by the researcher) particularly in relation to insomnia. But, there is no gym on the premises, I had no transport, I hated jogging and kept making excuses.*
>
> Group 1 student

> *Exercise exhilirates [sic] and helps to discipline and condition the mind for the task ahead.*
>
> Group 2 student

> *I have started exercising, about an hour of aerobics every 2 days and its' helping a lot with the release of tension.*
>
> Group 2 student

> *I've been visualizing and taking long walks and it seems to help to reduce my stress levels.*
>
> Group 2 student

> *I started listening to the tape more regularly. I also started doing half-hour long exercises in my room and checked my eating habits. It now seemed easier to sit at my desk and study.*
>
> Group 2 student

I did do the (relaxation) excersises [sic], but found on the whole that the actual excersises [sic] didn't help much - it was more just the fact that I set aside a few minutes each day to rest completely and by being encouraged to play sport, this has also encouraged a transferal of energy - concentration on squash blocks out other stresses at the time.

Group 1 student

7. **Being More Aware of Physical and Emotional Feelings**

Lately when I'm driving I am very aware of how tensed up I become and I'm slowly learning to relax my body and still keep up my concentration.

Group 2 student

Today I took half an hour and did the relaxation programme. I found it cleared my mind, relaxed my body, and increased my concentration. Only then did I tackle my work. It was a great help!

Group 2 student

Felt very relaxed during the session with the class. Was amazed that others' hands also felt numb like mine had felt. I was interested to know the physiology of this.

Group 2 student

I have become very much more aware of the fact that I'm under pressure when the situation does present itself - so I'm able to make a conscious effort to deal with it.

Group 1 student

During the weeks of relaxation classes, I have become aware of my mood and linked with interpersonal skills have become aware of my attitude to others. I notice how tension in myself affects others and how they relate to me.

Group 2 student

I do not cope so well when I feel stressed because the problem fills my whole mind and I cannot think of anything else.

Group 1 student

Since the concious mind is by-passed when using imagery, this approach may stimulate strong emotional reactions and occasionally a participant may seem confused by the strong feelings experienced (Clark, 1988).

I found that my emotions came out when I relaxed, and for me that is not very pleasant. I can see that keeping emotions inside can be harmful and I must have a vent for them - not only in sport: but to actually find a solution for the cause.

Group 2 student

8. **Clarity of Thought**

After the stress technique I found that my mind was a lot clearer and that I was much more objective.

Group 1 student

I have been doing my stress exersizes [sic] fairly regularly. I have my first exam tomorrow. I have a lot of work to get through. I am studying faster now than before.

Group 2 student

I am trying to see studying in a more positive light instead of trying to get out of it all the time, so we'll see how that goes.

Group 1 student

During the relaxation programme I realised that my approach to exams was changing and that if I learnt my work my nervousness all but disappeared.

Group 2 student

My first exam was marvellous, I was prepared and I am sure that it went well. But the following 2 hung over me like a dark cloud. I studied right through the night for both these exams - I learned so much but remembered so little. I wanted to die. Then (during the exams) I concentrated on relaxing each set of muscles and mentally relaxed and although I was physically exhausted from lack of sleep - the panic and anxiety subsided considerably. I was remembering more!

Group 2 student

I have thoroughly enjoyed the relaxation exercises. They enable me to relax completely. I have never been an overly tense person. I don't often get overly anxious about tests or exams. I do however become slightly nervous prior to an assessment/procedure on the wards. I now just take a few quiet moments and re-arrange my thoughts, encouraging myself and boosting my confidence.

Group 2 student

Some students view studying and examinations differently:

> *Can feel the stress building up now. The tension in the class is almost tangible and there have been a couple of temper tantrums. Personally, I'm aware of the increased tension in myself. It's not a problem in any way, if anything it motivates me to learn.*
>
> Group 1 student

> *Starting to swot for exams today. Not really concerned - rather mildly alarmed at the huge amount of work there is to wade through.*
>
> Group 2 student

9. Feeling More Positive about the Course and Themselves

> *My new approach and my new-found confidence in myself have helped me tremendously. The relaxation of course helps overall - especially in extramural activities. Armed with the above, the exams did not pose any threat and I managed to write quite calmly, the first two. However, my composure slipped somewhat for our last exam. The enormity of the work overtook me and I panicked a bit. This soon passed as I began to write.*
>
> Group 2 student

Some students, however, regretted that they did not put more effort into acquiring and practising the relaxation technique.

> *I'm really sad that I didn't try harder with the stress therapy because I'm sure it would help with a lot of things in my life.*
>
> Group 1 student

10. Feeling they had Learnt a Useful Technique

> *I intend keeping up with the visualization but (if I don't manage) it's not a problem because I can fall back on it any time when I feel I need to get my feet under me.*
>
> Group 2 student

> *I honestly have enjoyed the stress management course. I feel it has already benefitted me and will in the future.*
>
> Group 2 student

The students in the Study Skills Training Programme did not feel that they had acquired a particular skill and certainly felt the same level of pre-exam anxiety as previously. Unlike the students in Group 1 and Group 2 they had not been taught any particular method of reducing this anxiety as was evidenced by their comments.

> *Day before the exams! Feeling anxious +++. Couldn't study well because I couldn't settle. Slept badly - woke up every hour.*
>
> Group 4 student

> *Stress levels extremely high - very moody and anxious before the exams. Still feeling 'hyped up' and can't relax two days after the exams.*
>
> Group 4 student

> *Having just finished exams - we have been told that we are writing a test on Friday!! I can't believe it! Here we go with our stress again!!*
>
> Group 4 student

It was apparent that although a great deal of time was spent on presenting more appropriate methods of studying (to Group 4), some students still preferred to use their old methods. Even although in one of the sessions, it was unanimously agreed that memorising the work was an inadequate and inappropriate method in a tertiary education system, some students continued to fall back on this method in times of stress and pressure. The students who felt the need to memorise work in preference to understanding and obtaining an overview, came from the High-Anxious sub-group of Group 4.

> *Don't seem to do as well on tests if I change my method of studying. My results are better when I memorize the work.*
>
> Group 4 student

The majority of the comments about the programme came from the students in Group 2, who responded positively. On the evaluation questionnaire previously discussed (see 10.2.1) it was apparent that the majority of the students in the PMRT & GI Group - (Group 2) enjoyed the sessions and felt that the treatment skills were easy to acquire, and that their time was being usefully employed. Many of them also experienced a generalisation effect and their comments reflect this. These sentiments were, however, expressed to a lesser extent by the students in the SD Group - (Group 1) and in the SST Group (Group 4) - the majority of the students were not satisfied with their programme, as is evident by their comments.

CHAPTER ELEVEN

DISCUSSION AND INTERPRETATION

11.1 DISCUSSION OF OVERALL PERFORMANCE OF EACH TREATMENT GROUP

11.1.1 THE SYSTEMATIC DESENSITISATION "PROGRAMME": GROUP 1

The results of this study indicate that the Systematic Desensitisation programme was the most successful in producing an improvement on the self-report measures completed during the last session of the programme, particularly in the High-Anxious students i.e. the High-Anxious students appeared to benefit the most in this compulsory programme. On closer examination of this apparent success, it was evident that the High-Anxious students with above average Matric scores benefitted the most and had improved post-intervention scores, while the same success was not evident in the High-Anxious students with low Matric scores. However, the students in Group 1 were not enthusiastic about their programme scoring only marginally more than the lowest group (Group 4) on the Treatment Evaluation Questionnaire. They scored a mean total of 21.9, only scoring more than 4 - the pre-determined "high Confidence Index" per item - (their score was 5) on question 2 which enquired as to whether they felt that the programme had been competently run.

In the long-term the gains made by Group 1 appeared to have been ephemeral, as at the 1 year follow-up 9 of the 25 group members had failed, 7 of these being from the High-Anxious sub-group, all of whom had Matric scores below 25.
It would appear that the apparent gains made by this group may have been partly due to non-specific effects, in particular regression effects: as a general rule, the more extreme the score, the more likely it is to regress to the mean on re-test (Kazdin, 1980).

Kirkland & Hollandsworth (1980) suggest that there is scant evidence in the literature for academic performance to be improved by SD, and while this group demonstrated a significant change in exam scores, this was not significant when contrasted with the Control Group, and was almost certainly due to differences in Examination assessment, as previously discussed. The anxiety experienced by Low-Achievers may be perceived as realistic in the light of the academic demands made upon them, and not easily allayed on a permanent basis.

11.1.2 THE PROGRESSIVE MUSCLE RELAXATION TRAINING AND GUIDED IMAGERY "PROGRAMME": GROUP 2

The results for Group 2 are somewhat paradoxical: on the one hand they showed no improvement on their self-report measures of anxiety, while on the other they reported positively on treatment in the Evaluation Questionnaire.

They enjoyed the treatment sessions, felt that their time was being usefully employed, found the research programme valuable in terms of its potential durability as a training procedure and to a lesser extent (mean score = 4.1 out of 7) experienced a generalisation effect. Their highest score (6.4) was in reply to the question "Did you feel that the programme was run competently by the supervisor?" This score was higher than the other groups at 5.0 and 4.9 and the fact that the researcher has had far more experience in PMRT & GI than SD and SST may indicate that PMRT & GI Groups were the most competently run.

Of interest is that the self-report measures were all completed during the last session of the treatment programme, whereas the Treatment Evaluation Questionnaire was completed while students were in the midst of writing examinations. It might be that this particular group found they were able to use the techniques they had learnt in vivo, and found them more effective than expected.

PMRT & GI, particularly with a Cognitive Restructuring Component included in the `package', has the ability to "dissolve negative habit patterns" (Gawain, 1978). Because "images, indeed all thoughts, are electrochemical events, which are intricately woven into the fabric of the brain and the body" (Achterberg, 1985, p. 9), it is thus permissible to presume that the programme will gradually produce a change in both somatic and cognitive components, because they comprise a unity (Benson, Beary & Carol, 1974). Generally, the participant gains a sense of mastery through the imagery process and as this develops it becomes self-

reinforcing, and acts as a buffer against the effects of stress (Clark & Montague, 1980; Clark, 1988; Zahourek, 1988).

11.1.3 STUDY SKILLS TRAINING "PROGRAMME": GROUP 4

Students involved in this group, particularly the High-Anxious sub-group achieved greater changes on the Anxiety related self-report measures than anticipated from their response to the programme, while it was in progress. This sub-group achieved the most significant change ($p < .05$) on the Facilitative Anxiety Scale and the second highest mean difference on the Debilitative Anxiety Scale (second to SD High-Anxiety sub-group). Although this sub-group achieved improved scores on the Facilitative and Debilitative Anxiety Scale they had a negative mean score in the change in examination results. Only 1 student in this Group achieved a higher percentage in the post-intervention examinations while the remainder all had fairly small negative scores resulting in a mean difference of -5.80 which was however, not significant. This is worthy of comment in light of the general improvement in Examination results at post-test (already discussed).

The Low-Anxiety sub-group, although they achieved a positive change in examination scores, reflected negative changes in Debilitative Anxiety and AARS (both significant, $p < .05$). It would appear, therefore, that changes in self-report measures were unrelated in any meaningful way to changes in exam performance in Group 4.

This group scored the least (total of 21.5) on the Treatment Evaluation Questionnaire, although only minimally less than the SD Group's 21.9; such a total is below 24, the pre-determined "high confidence level". Moreover, the SST group scored the least on 5 of the 6 items on the index. This finding is in keeping with the literature presented on SST (Marston & Feldman, 1971; Beneke & Harris, 1972), where it is reported that students do not generally favour study skills training programmes, because of their "frequent textbook orientation".

When taking into consideration the time difference between post-testing in self-report measures and the actual examination situation, it is possible that although these students may have felt a little less anxious during the last session of the programme, this anxiety reduction was to a certain degree lost in the interim period. Thus when they completed the Evaluation Questionnaire they were anxious about their examinations and this is reflected both in the low "Confidence Index" and their minimal change (and in the case of the High-Anxious sub-group negative change) in examination percentages.

These findings are in contrast to those of Bodibe (1986) who concluded in his study on test-anxious black students at Vista University that "the effectiveness of a simple method, like study skills training only, in improving academic performance was demonstrated " (p. 93). This may reflect a difference between black and white students in regard to past exposure to SST. By the time white students are at College and University, the

majority of them will have been exposed to study skills methods, whereas black students are not so fortunate by reason of disadvantaged education at school level. Evidence of this is the opinion of a number of Group 4 members, that they had not really obtained new and helpful information, having "learnt that at school" (a comment made by one of them). It appears that only the students who have not previously been exposed to study skills methods will benefit from a study skills programme alone.

11.2 DISCUSSION OF ANXIETY LEVELS

In the various comparative analyses for the three anxiety levels, there are certain factors that require consideration.

1. In the students' Matric scores the High-Anxious Group have the lowest mean Matric score of 23.06 which is significantly different from the Low-Anxious Group's score of 27.77 ($p < .01$).
2. The High-Anxious Group's mean Pre-Intervention Examination score of 53.26 was significantly different from the Low-Anxious Group's score of 63.06 ($p < .01$).
3. The Post-Intervention Examination score showed a similar difference in that the High-Anxious Group's mean score of 59.00 was significantly lower than the Low-Anxious Group's mean score of 69.20 ($p < .01$).
4. Although the High-Anxious Group's mean difference score on Debilitative Anxiety (-AAT) was significantly better than that of the Low-Anxious Group, cognisance must be taken of the fact that Facilitative Anxiety and Debilitative Anxiety

were the variables on which the initial division into anxiety levels was made. In the light of this fact, this difference becomes less significant - as the High-Anxious Group's mean Debilitative Anxiety score improved by 4.3 (from 32.91 to 28.61); the Low-Anxious Group's mean Debilitative Anxiety score indicated that their Debilitative Anxiety worsened by 1.5 points (increased from 19.71 to 21.21); while the Mid-Anxious Group's mean difference score improved by 0.6 (from 27.59 to 26.99). This indicates that the Pre-Intervention mean score for Debilitative Anxiety for all the groups was 26.74 and the Post-Intervention score was 25.46 and that the notion of Regression towards the mean must be considered when repeating self-report questionnaires, as previously discussed.

5. There were no significant differences between the anxiety levels on the change in examination scores. Although it initially appeared as if the High-Anxious Group had improved their scores more than other Groups - this difference was reduced by the fact that Group 4 (SST) High-Anxious sub-group had a -5.80 change in their scores. The High-Anxious students in Group 4, thus clearly did not benefit from being exposed to a programme of Study Skills Training.

6. It would have been of interest to observe from which anxiety level the ratings of the Treatment Evaluation (Confidence Index) came, i.e. did the High-Anxious students score higher `confidence levels' than the Low-Anxious students. This comparison was, however, not possible as these

questionnaires were anonymous, and the only identification was that of Treatment Group as a whole.

11.2.1 HIGH ANXIOUS GROUP (n = 34)

From the 1 year follow up of this study it was evident that the highly test anxious student with a low matric score (based on the UCT Medical School rating scale) had major difficulties coping with the academic aspect of the nursing curriculum, and that by the eighteenth month of their training, 47% of the High-Anxious group had already left nursing.

This high attrition rate was in spite of the fact that it was the High-Anxious sub-group students who (on the self-report measures) appeared to improve their response to test-anxiety the most. Of the total of 17 students who failed 9 (53%) came from Group 1 and of these 7 (78%) came from the High-Anxious sub-group.

It is evident that although more High-Anxious students from Group 1 failed, there were more High-Anxious students in Group 1 at the commencement of the programme than there were in any of the other treatment groups and thus at the 1 year follow up the data indicates a more uniform number of students within each group.

At follow-up 1 year later, those High-Anxious students who had successfully remained in nursing, appear to have been those whose academic ability was average (as evidenced in Matric scores), or slightly above i.e. they had the ability to cope successfully with the requirements of the programme.

11.2.2 LOW-ANXIOUS GROUP (n = 34)

Of the total of 17 students who failed only 4 (23.5%) were Low-Anxious, and 5 (31%) of the total of 16 resignations came from the Low-Anxious Group, 2 of which were transfers and not lost to the nursing profession. There were no significant differences in numbers between the Treatment Groups on these figures. It appears that this group were able to cope with the requirements of the curriculum because of their above-average ability.

11.2.3 MID-ANXIOUS GROUP (n = 35)

Some of the more recent studies (e.g. Brown & Nelson, 1983; Paulman & Kennelly, 1984), that compare levels of anxiety, do not include the Mid-Anxious students in their studies as the major differences usually exist between the High-Anxious and the Low-Anxious students. This finding is true of this study as well, however, certain important information has been obtained by including the Mid-Anxious group of students in this research.

The Mid-Anxious students were fairly evenly distributed amongst the Treatment Groups and at the 1 year follow-up, of the total of 17 students that failed only 4 (23.5%) came from the Mid-Anxious group and 4 (25%) of the total of 16 resignations also came from the Mid-Anxious Group. There were no significant differences in numbers between the treatment groups.

From analysing the matric scores it appears that students with low matric scores who fall into the Mid-Anxious Group, appear to fare better than most low matric scorers.

The other factor of which to take cognisance is that of age, as it was the Mid-Anxious Group whose mean age was the highest at 23.50 years. (The High-Anxious Group's mean age was 19.75 years and the Low-Anxious Group's mean age was 19.60 years). The fact that these students were slightly older and possibly more mature and motivated, may have contributed to the fact that they appeared more able to cope with the demands of the academic aspect of nursing even when they had average (or slightly below) Matric scores.

11.3 PERCEIVED LIMITATIONS OF THE PRESENT STUDY

11.3.1 THE ROLE OF THE RESEARCHER AS THERAPIST

Much has been written about the role of the therapist (or facilitator) in behaviour therapy. Allen (1980) observed that only a little over 25% of investigations (reviewed by him)

11.3.3 THE PROBLEM OF COMPULSORY PARTICIPATION

Bednar & Weinberg (1974) have cautioned that when volunteer subjects were used in both experimental and control groups, 80% of the eight studies they reviewed, reported positive findings. On the other hand, when all of the subjects were "forced" to participate in either the experimental or control group, only 55% of nine studies reported positive findings.

Volunteers were not used in this study since its aim was to assess the viability of introducing a "Test-Anxiety Management Programme" for classes of Student Nurses and not just highly test-anxious students. In the light of Bednar & Weinberg's (1974) observation, however, this probably made it less likely that significant results would be achieved.

11.3.4 NON-GENERALIZABILITY OF THIS STUDY

It should be noted that this study was carried out on "white", English-speaking student nurses at Carinus Nursing College in Cape Town. No generalizations can be made about the possible effects of the treatment programmes on student nurses from different backgrounds and working in different institutions.

It would be beneficial if research programmes could be carried out in other Colleges in order to assess whether these results are also applicable to students of different socio-cultural backgrounds.

11.3.5 QUESTIONING THE VALIDITY OF SELF-REPORT MEASURES

The extent to which self-report measures can be said to truly reflect the efficacy of a particular treatment programme is questionable. Kazdin (1980) supplies an excellent discussion of these difficulties.

CHAPTER TWELVE

CONCLUSIONS AND RECOMMENDATIONS

12.1 CONCLUSIONS

The findings of these studies (i.e. the main study and the subsidiary study) suggest that on the whole the CNC Nursing Students' test-anxiety is realistic when taken in context of their academic ability. It appears that those with comparatively low Matric scores find the expectations and stresses placed upon them too much with which to cope, and they become particularly anxious under test and examination conditions.

The new Diploma in Nursing (General, Community & Psychiatry) and Midwifery, is a course that is stressful for the students both in terms of the actual work load and the academic standard required; two factors to which students of high academic ability adapt with relative ease (as is evident from the results and comments of the student nurses with above average Matric scores), but which are simply beyond the reach of those less able.

When compared with other first year paramedical students, CNC nurses had lower ability, as evidenced by their Matric results, and less healthy lifestyles. It appeared that their method of coping with stress was somewhat self-destructive. They smoked more, exercised less, were less careful about the use of drugs

and alcohol, and rated themselves as less healthy than the other paramedical students.

None of the methods of treatment used in this study appeared to yield lasting effects in high test-anxious nursing students. Any changes were short-lived, with the possible exception of PMRT & GI. In keeping with other research, SD appeared to be most effective in the short term. None of the interventions had a significant effect on academic performance, and in this may probably be seen the reason for the lack of alleviation of anxiety. The groups, unlike most other studies in this field, were not homogeneous in test anxiety level and therefore it is not unexpected to find differences in the way in which the treatments affected group members. It is naive to expect a six-week intervention programme to have any effect on ability or realistic anxiety.

The students who underwent treatment did not show a reduced drop-out or failure rate at 1 year follow-up compared with controls, though the rate of attrition was, in fact disturbingly high, particularly among High Anxious, Low Ability students. One of the questions that this research undertook to address was to determine the feasibility of a group test-anxiety management programme for all first year student nurses. The conclusion reached is that, given the demands made upon this group, no short generalised treatment programme can hope to alleviate the level of stress experienced.

12.2 RECOMMENDATIONS

Perhaps the most important recommendation the author can make is with regard to the new comprehensive system of training student nurses. The 4-year comprehensive Nursing Diploma is a demanding course. It requires a high level of academic ability and clinical skills. It differs from the previous Diploma course in that greater emphasis is placed on the academic aspect while at the same time additional clinical requirements also need to be met, leaving the student under constant pressure to meet the requirements with little or no respite.

In the light of the above requirements of the comprehensive Diploma course, it appears that the present selection criteria at CNC are inadequate for the following reasons:

1. When students with Matric scores of less than 20 are accepted into the present course, not only are they being set up for failure, as they are academically unable to cope; but limited resources, both human and financial are being used on students who ultimately will not become Registered Nurses.
2. There do not appear to be any selection criteria to assess the level of state or trait anxiety in prospective students. Nursing is a stressful career and students who enter the profession with high stress levels require additional support and encouragement to continue with their training. Support of this magnitude is not currently available at CNC

or the affiliated hospitals and is unlikely to be in the near future.

In order to cope with the demands of the comprehensive Nursing Diploma course, it is recommended that no student be accepted without a Matric score of 25 or over (except in the case of more mature students, who would need to be individually assessed).

Such a stringent requirement will obviously reduce the already limited applications from prospective student nurses. In the opinion of the researcher, a solution might be to introduce or re-introduce the 2-tiered system with certain changes:

1. The 4-year comprehensive Diploma course to remain as it is, with the proviso that no student be accepted without proven adequate academic ability. This course would thus admit fewer, more able students who would require less support and assistance and would ultimately become the Nurse Managers and Educators of the future.
2. A course that is similar to the `old´ Diploma course for student nurses, i.e. a 3-year course leading to the Registration as a General Nurse. The academic standard of this course would be somewhat less than that of the 4-year course and more emphasis would be placed on clinical skills, to ensure that the patients receive a high standard of nursing care.

An alternative method of adopting a two-tiered system would be to allow all students to do the same `core´ first year course, and

then after their first year examinations they could be 'streamed'. Those students, who on the basis of their Matric scores and Examination results, are considered to have the academic ability to cope with the comprehensive Diploma in Nursing course could move in that direction, while the others could follow a course that is more clinically orientated that would still lead to Registration as a General Nurse after three years.

The author is of the opinion that there are at present many student nurses who would make good clinical nurses but because of their lower academic ability, often compounded by high anxiety levels, they fail the present comprehensive Diploma in Nursing (General, Community & Psychiatry) and Midwifery course and are excluded from nursing. Within the present system, the high test anxious, low-ability student becomes increasingly anxious as each negative test experience is accumulated with the increasing possibility of failure and forced resignation.

It is apparent that a uniform test-anxiety management programme for all students is not appropriate and that test anxiety could be more appropriately managed by offering test-anxious students a programme that was more suited to their individual needs. This method of applying a test-anxiety management programme would be beneficial for the individuals who most require it; and cost-effective in terms of already overburdened college resources. What is needed in the nursing profession is a re-evaluation of worth. The changes that have taken place in the profession

relate to the competitive achievement-oriented society in which we find ourselves. It is therefore important to improve Interpersonal Skills in the often dehumanised, highly technological hospitals in which the student nurses work, and to ensure that the "personal touch" is not lost.

In considering the stress levels of the student nurses (Biggers, Zimmerman & Alpert, 1988), the author would recommend that a Stress Management programme be introduced for all students as part of their nursing training. This prophylactic Stress- or Anxiety-Management programme, teaching nurses to cope effectively with future stresses, should be continuous in approach i.e spread over the four years of the Diploma Course. This ensures that the programme is not too involved and that it allows the students the opportunity to apply the techniques which they have learnt. From the experience gained in this research, it would appear to be most beneficial to start the programme with the teaching of a relaxation technique and visualisation, followed by cognitive restructuring with additional information in lifestyle management. From the literature (Manderino, Ganong & Darnell, 1988; Caldwell & Weiner, 1981) it is apparent that additional techniques such as breathing exercises, meditation, autogenic training (Snider & Oetting, 1966), biofeedback (Brown, 1981), self-hypnosis and exercise would also be beneficial in providing the nursing students with the necessary skills to decrease their own autonomic reactivity.

The students must be given enjoyable options when introducing a Stress and Lifestyle Management programme. From the author's experience in running support groups for third year student nurses, it is apparent that the majority find PMRT & GI pleasant and beneficial and this technique could be introduced at the first year level in combination with a healthier approach to life.

Although nurses and particularly Nurse Educators should be well aware of the need for a healthy lifestyle, which includes a healthy diet, sufficient sleep, regular exercise and no smoking, these aspects require a more dynamic approach, rationale and presentation and above all - a good example (Hawkins, White & Morris, 1982; Hawkins, 1987).

It would thus be important that the member of the College staff implementing the programme was herself convinced of the benefits of a healthy lifestyle. Training and assistance could be obtained from consultant Health psychologists particularly with respect to Relaxation Techniques, Cognitive Restructuring and Motivation.

The link between one's state of wellness and the ability to learn has been well documented in the literature (Jones,1988). This applies particularly to student nurses who have to contend with lengthy clinical hours while at the same time attempting to maintain a certain academic standard.

Recent research into the field of Psychoneuroimmunology reveals that when we are stressed a gradual reduction occurs in the ability of the immune system to assist in maintaining health. Matarazzo (1983) suggests that there are factors called "behavioural immunogens" - a healthy diet, sufficient sleep and regular exercise are examples - and production of these factors can be encouraged by living an improved, more health-oriented life.

A year ago, Manderino, Ganong and Darnell warned that, in addition to affecting the well-being of nurses, stress could adversely affect the quality of nursing care delivery:

> "Prolonged occupational stress in nursing can be costly for nurses themselves, to the patients in their care, and to the hospitals in which they work" (1988, p. 321)

As Nurse Educators and Health Educators, it is thus essential that we acquire more knowledge about the characteristics of effective and ineffective anxiety management and about the teaching methods that will assist in improving anxiety management skills, as well as the more healthy and adaptive methods of coping that can be instituted. As very little nursing research has been carried out in this area, initiatives will be required, as well as the ability and flexibility to use findings from other fields where the problem of test anxiety management is being researched.

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APPENDIX A1

SYSTEMATIC DESENSITISATION PROGRAMME

SESSION ONE
Stress management lecture as described in 6.2.4 and the completion of questionnaires.

SESSION TWO
At the outset students were briefed on the rationale behind the systematic desensitisation technique; the concept of desensitisation as a counter-conditioning procedure - involving the conditioning of relaxation to anxiety-arousing cues.

Students were told:

> "... an important part of the method involves teaching you to relax as completely as possible. You may think you don't have to be taught how to relax, but the fact is that most people are frequently unaware of their tensions." (Garlington & Cotler, 1968, p. 249)

Students were then introduced to the deep-muscle (or progressive) relaxation training procedure developed by Jacobson (1938), modified by Wolpe (1958) (see Appendix B2 for relaxation technique).

The group as a whole was then coached on how to construct an anxiety hierarchy and they were told what such an hierarchy was intended to represent. Students were instructed to limit their hierarchy to 14 items. The students were given fifteen minutes to work on their hierarchy (see Appendix A2 for hierarchy produced).

For the inter-session period, students were instructed to spend between 15 - 20 minutes, twice a day, practising relaxation exercises - a taped relaxation was given to each student for this purpose.

SESSION THREE
The session began with a reiteration of the importance of positive self-statements in an attempt to reinforce motivating cognitions related to exams. Students were questioned as to the difficulties encountered with the relaxation exercises, thereafter all students practised the relaxation programme again.

Students were then introduced to the desensitisation procedure. They were told:

> They would now systematically move through their scenarios, visualising one at a time, while employing their heightened awareness of muscle tension (being achieved through the deep-muscle relaxation exercises) to locate and relieve areas of tension.

APPENDIX A1 (cont)

Using just the first four `least-anxiety-inducing' scenarios, students were directed to visualise the first scene following the specific instructions:

"IMAGINE THE FOLLOWING SCENE"

After 20 seconds, on a pre-determined cue-word "CALM", students were instructed to "LOCATE ANY TENSION IN THE BODY".

They then concentrated on the areas of tension detected, while employing their deep-muscle relaxation skills to relax areas of tension. TEN seconds later, students were told to imagine the SAME scene again (on the cue word "SCENE"), until, after 20 seconds, the cue "CALM" was again declared, while students attended to points of tension experienced for a further 15 seconds.

The next scenario in the hierarchy was cued by "IMAGINE THE FOLLOWING SCENE".

The session ended with a brief resume of the session contents and programme progression; students were instructed to continue to practice the relaxation exercises for at least 15 minutes a day.

SESSION FOUR
Following a brief feedback session, students practised a few relaxation exercises. Desensitisation was then initiated and the full hierarchy was utilised.

Students were reminded of the importance of developing a SUD-scale to determine their felt anxiety level during the desensitisation procedure.

Students were instructed on the technique of Cognitive Restructuring (see Appendix A3).

SESSION FIVE
Students were given elementary tips on how to improve their exam technique and a brief recapitulation of the importance of positive motivating cognitions in the pre-exam and intra-exam context.

The remainder of the session was utilised in practising the desensitisation procedure, working with complete hierarchies.

SESSION SIX
All components introduced in this package were reviewed during this session. In addition, the four MOST anxiety-provoking scenarios were used for a desensitisation exercise. Students also completed a self-report schedule during this session and were thanked for their involvement.

APPENDIX A2

HIERARCHY PRODUCED BY SYSTEMATIC DESENSITISATION GROUP

1. Preparation for studying - amount of work to learn.
2. Disturbances while trying to study e.g. clock ticking, other students making a noise etc.
3. The night before an exam - cramming, panicking.
4. Getting up on the morning of an exam. Getting organised.
5. Driving to the place to write the exam.
6. Discussions outside the exam room before entering.
7. People falsely saying they are going to fail - then ask you if you've learnt "such and such".
8. Looking at the "face down" exam paper. Waiting to be told "you may start".
9. Reading the first question and realizing that you haven't prepared for that question and don't even understand it.
10. Looking around the hall at the others writing already.
11. Tutor leaning over your shoulder.
12. Time limits being announced.
13. Time to start finishing - still on long question.
14. People start leaving the hall and you are nowhere near finishing.

APPENDIX A3

COGNITIVE RESTRUCTURING

The following cognitive restructuring procedure was utilised as part of the secondary component in each of the three multicomponent treatment packages.

The following instructions were delivered by the facilitator:

> "We all have to cope almost daily with a number of stressful situations and events related to studying and exams that may and often do produce some anxiety. These situations may be difficult and irritating involving decisions with uncertain outcome, or in some other way constitute a `problem´".
>
> You are asked to now brainstorm over - and briefly discuss (for about ten minutes) - as many of these situations as you can.
>
> Write down statements which typify your thoughts both when studying and sitting for exams.
>
> Then discuss:
> a) The nature of statements made (i.e. positive or negative); if negative, then write down the positive version of the same statement; and
> b) The content of statements made; i.e. were they appropriate to the task on hand? If not, write down statements which focus your cognitions more forcible on the task to hand."

APPENDIX B1

PROGRESSIVE MUSCLE RELAXATION AND VISUALISATION PROGRAMME

SESSION ONE
Stress management lecture as described in 6.2.4 and the completion of questionnaires.

SESSION TWO
At the outset students were briefed on the rationale behind the relaxation and visualisation technique.

Students were told:

> "... an important part of the method involves teaching you to relax as completely as possible. You may think you don't have to be taught how to relax, but the fact is that most people are frequently unaware of their tensions." (Garlington & Cotler, 1968, p. 249)

Students were then introduced to the deep-muscle (or progressive) relaxation training procedure developed by Jacobson (1938), modified by Wolpe (1958). For a detailed account of this technique, introduced by the researcher, see Appendix B2.

Instead of being told to end the relaxation session; students were told:

> "You have learnt how to relax physically, now you can learn how to relax mentally by using a technique of visualisation".

For a detailed account of this technique see Appendix B3.

An audiotape of a similar relaxation and guided imagery/ visualisation recorded by the researcher was given to each subject so that they could practice the technique daily between sessions.

SESSIONS THREE TO FIVE
A shortened version of the relaxation and visualisation was supervised by the researcher.

Students were instructed on the technique of Cognitive Restructuring (see Appendix A3).

SESSION SIX
A relaxation and visualisation exercise was carried out. All components introduced in this package were reviewed during this session. Students also completed a self-report schedule during this session and were thanked for their involvement.

APPENDIX B2

PROGRESSIVE MUSCLE RELAXATION TECHNIQUE

"Lie down comfortably on the floor with a cushion under your head.

Keep your breathing steady, regular and relaxed. Try to concentrate on the word relax each time you breathe out.

And now a set of exercises for each major muscle group to learn the difference between tension and relaxation.

First the muscles in your hands and forearms. You can tense these muscles by clenching your fists as tightly as you can and feel the tension in your hands and forearms.

Now clench your fists ... tight ... feel the tension in your hands and forearms ... feel that tension ... and relax. Relax your hands. Notice the difference between tension and relaxation in your hands and forearms, and focus on the word relax while letting the muscles in your hands and forearms unwind and relax more and more deeply. Concentrate on the feeling of letting go.

And now the muscles in the front of your upper arms. You can tense these by bending your arms at the elbows and trying to touch your wrists to your shoulders.

Now bend your arms at the elbows and try to touch your wrists to your shoulders and tense your muscles ... tight ... feel the tension ... hold it ... and relax. Let your arms fall back by your sides and notice the difference between tension and relaxation in the muscles of the upper arm. Concentrate on the word relax and let your muscles loosen and unwind more and more deeply and carry on with that feeling of letting go. Let the muscles unwind and relax.

And now the muscles in the back of your upper arms. You can tense these by straightening your arms as hard as you can.

Now straighten your arms ... hard ... harder ... feel that tension ... hold it ... and relax. Relax the muscles in the back of your upper arms and as you let go more and more deeply concentrate of the word relax and just continue that feeling of relaxation throughout your arms. Let your arms loosen, unwind and relax.

And now the muscles in your shoulders. You can tense these by shrugging your shoulders, by drawing them up into your neck as tightly as you can.

APPENDIX B2 (cont)

Now shrug your shoulders ... tight ... feel the tension in your shoulders ... and relax ... let your shoulders drop and relax and feel the tension ease away. And as you let your shoulders relax and unwind concentrate on the word relax, let the muscles relax more and more.

And now the muscles in your neck. You can tense these by pressing your head back as hard as you can.

Now press your head back ... hard ... feel the tension in you neck ... hold it ... and relax. Relax your neck and let your head rest back gently. No effort ... no tension. Notice the difference between tension and relaxation. Concentrate on the word relax while letting your neck unwind more and more. Continue the feeling of letting go.

And now the muscles in your forehead. You can tense these by raising your eyebrows.

Now raise your eyebrows ... and feel the tension in your forehead ... hold it ... feel the tension ... and relax. Let your eyebrows drop and relax. No tension in your forehead. Notice the difference between the feelings of tension and relaxation. Continue letting go.

And now for the muscles in your brows and eyelids. You can tense these by frowning as hard as you can and squeezing your eyes tightly closed.

Now frown and squeeze your eyes as tightly closed as your can. Feel the tension in your eyelids and eyebrows ... hold it ... and relax. Smooth out your brow and notice the difference between tension and relaxation around your eyes, and as you focus on the word relax, continue to let the muscles around your eyes relax more and more deeply.

And now for the muscles in your jaw. You can tense these by biting your teeth together as tightly as you can.

Now bite your teeth together ... tight ... tighter. Feel the tension in your jaw ... hold it ... and relax.
Part your teeth slightly so that there is no pressure between your teeth and feel the difference between tension and relaxation in your jaw. Feel the relief of letting go and carry on letting your jaw relax more and more deeply. Teeth slightly apart, no pressure between your teeth, no tension in your jaw.

APPENDIX B2 (cont)

And now the muscles in your tongue and throat. You can tense these by pushing your tongue up against the roof of your mouth as hard as you can.

Now push your tongue up against the roof of your mouth ... hard ... harder ... feel the tension in your tongue and throat ... and relax. Let your tongue drop down to the bottom of your mouth, still and relaxed. Feel the tension ease away from your tongue and throat. Notice the difference between tension and relaxation in your tongue and throat.

And now the muscles in your lips and face. You can tense these by pressing your lips together as tightly as you can.

Now press your lips together ... tight ... tighter... feel the tension in your lips and face ... hold it ... and relax. Relax your lips and face as deeply as you can. Continue to let the muscles in your lips and face unwind more and more. Let your face relax completely. No tension in your face, let everything unwind and relax.

And now for the muscles in your legs. You can tense these by straightening your legs and pointing your toes down.

Now straighten your legs and point your toes to tense your feet and calf muscles ... feel the tension in your legs ... hold it ... and relax. Relax your legs and let them loosen and unwind.

And now for the other muscles in your calves. Point your toes up to your head ... tight ... feel that tension ... hold it ... and relax. Relax your legs and let them loosen and unwind. Concentrate on the word relax and notice the difference between tension and relaxation in your legs. Let the muscles in your legs unwind more and more, let them be supported by the floor. Relax more.

And now for the muscles in your hips and lower back. You can tense these by arching your back, and tensing your buttocks as tightly as your can.

Now arch your back and tense your buttocks ... tight ... tighter ... feel the tension ... hold it ... and relax. Relax your hips and your back and let all the tension ease away. Notice how it feels to let the muscles loosen and relax.

And now for your stomach muscles. You can tense these by making your stomach hard and rigid as though you are preparing to receive a blow in the abdomen.

APPENDIX B2 (cont)

Now tense your stomach muscles ... tight ... tighter ... feel the tension in your stomach ... hold it ... and relax. Relax your stomach muscles, let them loosen and unwind and let go. Let a feeling of relaxation spread throughout your stomach muscles. Notice the difference between tension and relaxation and let your stomach muscles unwind more and more.

And as you are becoming more and more relaxed, become aware of your body. Can you feel your heart beating? Become aware of your breathing.

And now we will tense the muscles in your chest. You can tense these by taking in a deep breath.

Now breathe in as deeply as you can ... hold it ... feel the tension in your chest ... and relax. Breathe right out and feel the relief of letting go. Now keep your breathing shallow, do not breathe too deeply and notice that every time you breathe out you can relax a little more. Relax a little more each time you breathe out.

As you breathe in imagine the air going to the areas of tension. Dissolving that tension and allowing you to relax a little more each time you breathe out.

Now try to let that feeling of relaxation spread throughout your body. Keep your breathing regular and relaxed, and every time you breathe out, relax a little more. Let the relaxation flow over you. Feel as though you are becoming more and more deeply relaxed. Comfortable, calm and relaxed. Let all the tension ease away and enjoy that feeling of relaxation for the next few moments.

Relax and listen to the music and when you are ready you can slowly sit up, feeling alert, refreshed, but still completely relaxed.

APPENDIX B3

VISUALISATION TECHNIQUE

"Take up a comfortable position and let the conflict flow out, and just unwind and relax. As you breathe deeply, let peace and relaxation come in.

Visualise a beautiful rainbow and relax more and more with each breath. And once again settle down and let that wave of colour move down and through your body bringing peace and relaxation. Let your eyes close if you want to.

Now take yourself to a special place ... a lovely place with pleasant aromas and vivid textures, and familiar sounds and colours ... and just be there. Taking a moment to allow the warmth of the sun and the energy of the earth to heal you. Feel safe and at peace.

Now, imagine yourself on a hill top, not too high, just a medium-sized hill, but one from which you have a good view, and look out at the scenery. Look carefully at what you see. Look all around at the beauty of nature and there in one direction you can see the sea and you decide to walk down toward that sea. Move to the side of the hill where you then find some steps and you slowly start walking down the steps ... which lead to a path, which winds round the hill so that the decline is gentle and so that as you walk down, you walk right around and have a good view and can see everything in perspective.

As you near the bottom there is a large area of grass with some flowers on the one side. Move towards the flowers and there you see a special flower and watch it carefully as it turns from a bud into a beautiful open unique flower. And take some of that beauty and uniqueness with you as you continue on your journey ... as you move down towards the beach.

As you come to the sand, feel the sand between your toes, feel the warmth of the sand as the sun has been shining on it, it is warm and dry and each grain is separate. And then slowly start walking down towards the water, and as you get closer to the water, so the temperature, and the feeling of the sand, changes - it becomes firmer and cooler as you near the water.

And then stand at the waters' edge for a while and watch the waves. Feel the water as it gently trickles over your feet, as the water comes in and goes out. Enjoy that feeling, letting yourself feel more and more relaxed as the water washes over your feet. Stand there for a while taking in one or two deep breaths, and letting that clean, fresh sea air come into your lungs, feel it coming in and then breathe out. And as you breathe out let the cares of the day float away over the water.

APPENDIX B3 (cont)

As you watch the water - you see a seagull swooping down, playing in the water. Watch it, as it gently glides on the air, effortless. Look how its enjoying that, listen to the call that it makes. As it flies up, picture it against the clear blue sky and as you watch the bird, allow yourself to become calmer and more at peace.

Then move out of the water and up onto the sand. Sit down on the sand for a while, where it's warm and you can feel the warmth from the sand and the warmth from the sun. Enjoy that feeling of the warmth coming in and encircling your body.

Enjoy the feeling of relaxation that it brings - the feeling of peace and calm and then when you're ready you can walk back up the beach - slowly, calmly.

And as you look around, you see people - you didn't notice them before. Perhaps some of these are your friends. Greet them if you want to. You can even ask one or two of them to join you on your walk back if you need company.

And then continue on your walk back up the beach, back up to the grass, to the flowers and along the winding path. Taking time to look at the scenery and taking time to rest. Giving your body time to rest and then carrying on with the walk up the path.

Climb up the stairs - back to the hilltop. Look around - where you've been and how you felt. Keep these feelings with you and know that you can return whenever you want to.

When you are ready you can slowly sit up, feeling alert, refreshed, but still completely relaxed."

APPENDIX C1

STUDY SKILLS TECHNIQUE PROGRAMME

SESSION ONE
Stress management lecture as described in 6.2.4 and the completion of questionnaires.

SESSION TWO
Before starting work on the study skills, students were instructed on Cognitive Restructuring (see Appendix A3) and were told about deep-muscle relaxation and how to blend such relaxation in with their regular study curricula. Students did, however, not receive training in this technique.

The SQ3R method was also introduced during this session, in accordance with Robinson's presentation of her method (see Appendix C2). This method was then discussed in relation to the personalised study habits of each student, focussing specifically on:
* the use of underlining in textbooks and lecture notes
* studying graphs, tables, diagrams & maps.

SESSION THREE
The following techniques were introduced:

SKILLS IN ATTACK AND CONCENTRATION

(1) Self Evaluation of time and activities:
Because of the individualistic circumstances of each student, they were instructed to plot-out their use of time in accordance with a self-constructed table of activities; the guide item-table provided to students appears in Appendix C3.

Students were, moreover, instructed how to evolve a time-tied daily roster in advance of a set of up-coming exams. A check-list of work behaviour was also given to students (see Appendices C4-C5).

(2) Examination of Study Conditions:
See Appendix C6.

(a) Minimising distractions during study such as:
- interpersonal interruptions (e.g. conversations; people walking past location of study; etc.)
- the setting (e.g. having an orderly layout of materials on the desk; presence of few distracting posters, etc.)
- restricting background music during study
- having good lighting (e.g. no glare; an adequate and well-distributed illumination.)

(b) Physiological factors affecting concentration:
- temperature
- ventilation
- physical fitness

APPENDIX C1 (cont)

(3) Motivation Behind Studying:

A general discussion was pursued on the whys and wherefores of the methods used to evaluate academic achievement (i.e. precisely what students themselves understood exams were trying to measure).

SESSION 4
The following aspects were discussed:

HOW TO DEAL WITH MATERIAL ULTIMATELY INTENDED FOR EVALUATION

(a) Cues in Course Material

Including a look at textbook cues (e.g. typographical devices used to highlight important sub-aspects of a topic); cues in the lecture theatre (using the so-called LISAN METHOD - see Appendix C7) and cues from previous exams.

(b) Ways to Retard Forgetting

It was explained to the students that the problem of studying is two fold:
* firstly, learning what should be known, and
* secondly, to fix it in one's memory so that it is available when required.

Four primary methods of tackling the process of forgetting were introduced and discussed:
* interest and intention to remember;
* selection of major points and key phrases;
* self-recitation (to aid in fixing material in the memory and to reduce reactive inhibition in learning); and
* distributed learning (notably a caution against "cramming", where there is reasonably good immediate recall, but rapid subsequent forgetting).

(c) Reading Rate Practice:

Covering tips on improving reading speed, while retaining comprehension (see Appendix C8).

SESSION 5
The following aspects were presented and discussed:

EFFECTIVE EXAMINATION SKILLS

(a) Preparation

Methods of review
- predicting likely exam questions (focus here on emphasising certain aspects of the material, rather than engaging in highly

APPENDIX C1 (cont)

risky spotting of specific areas).
- Use of mnemonics (a popular device to aid memory recall)

Preparation for different types of exams
- objective/multiple-choice type; and
- essay-type exams (looking at key-word instructions in questions)

Use of diagrams
- a discussion of the cautious and meaningful use of diagrams and flow-charts in exams.

(b) **Introduction to the scorer system for tackling exams**
see Appendix C9 for outline.

SESSION SIX
This encompassed a detailed review and discussion of all components introduced in this programme. Students also completed self-report questionnaires and were thanked for their involvement.

APPENDIX C2

STEPS IN THE SQ3R STUDY METHOD

1. **Survey:**
Glance over the headings in the chapter to see the few big points that will be developed. Also read the final summary paragraph if the chapter has one. This survey should not take more than a minute and will show the three to six core ideas around which the discussion will cluster. This orientation will help you organize the ideas as you read them later.

2. **Question:**
Now begin to work. Turn the first heading into a question. This will arouse your curiosity and thereby increase comprehension. It will bring to mind information already known, thus helping you to understand that section more quickly. The question also will make important points stand out at the same time that explanatory detail is recognized as such. Turning a heading into a question can be done at the instant of reading the heading, but it demands a conscious effort on your part.

3. Read:
Read to answer that question i.e. to the end of the first headed section. This is not a passive plodding along each line, but an active search for the answer.

4. Recite:
Having read the first section, look away from the book and try briefly to recite the answer to your question. Use your own words and cite an example. If you can do this you know what is in the book; if you cannot, glance over the section again. An excellent way to do this reciting from memory is to jot down brief cue phrases in outline form on a sheet of paper.
Now repeat steps 2,3 and 4 with each successive headed section: that is, turn the next heading into a question, and recite the answer by jotting down cue phrases in your outline. Read in this way until the entire lesson is completed.

5. Review:
When the lesson has been read through in this way, look over your notes to get a bird's-eye view of the points and their relationship and check your memory as to the content by reciting the major sub-points under each heading. This checking of memory can be done by covering up the notes and trying to recall the main points. Then expose each major point and try to recall the sub-points listed under it.

These five steps of the SQ3R method - **survey, question, read, recite, and review** - when polished into a smooth and efficient method should result in faster reading, picking out the important points, and fixing them in memory.

(EXTRACTED FROM ROBINSON, 1970, pps 32 - 33)

APPENDIX C3

GUIDE-ITEM TABLE

Week-day Distribution of Time in hours and minutes of First Year Students: Data given for median, lowest and highest times.

	MEDIAN	LOWEST	HIGHEST
Sleep	8hr 00m	7hr 40m	8hr 30m
Meals	1hr 13m	1hr 0m	1hr 26m
Class	3hr 07m	2hr 39m	3hr 35m
Study	3hr 05m	2hr 18m	3hr 52m
Recreation	3hr 26m	2hr 34m	4hr 18m
Work	1hr 39m	57m	2hr 21m
Personal	1hr 50m	1hr 26m	2hr 14m
Travel	52m	33m	1hr 11m
Miscellaneous	2hr 08m	1hr 15m	3hr 03m

APPENDIX C4

A TIME CHART

Present use of Time.
(Keep a careful record each hour of what was done in the preceding time)

Day or Days summarised?.....

7.00.....	12.30	6.00 .....
7.15.....	12.45	6.15 .....
7.30	1.00	6.30 .....
7.45	1.15	6.45 .....
8.00	1.30	7.00 .....
8.15	1.45	7.15 .....
8.30	2.00	7.30 .....
8.45	2.15	7.45 .....
9.00	2.30	8.00 .....
9.15	2.45	8.15 .....
9.30	3.00	8.30 .....
9.45	3.15	8.45 .....
10.00	3.30	9.00 .....
10.15	3.45	9.15 .....
10.30	4.00	9.30 .....
10.45	4.15	9.45 .....
11.00	4.30	10.00 .....
11.15	4.45	10.15 .....
11.30	5.00	10.30 .....
11.45	5.15	10.45 .....
12.00	5.30	11.00 .....
12.15	5.45	11.15 .....

(Extracted from Robinson, 1970, pp. 74 - 75)

APPENDIX C5

CHECK LIST OF WORK BEHAVIOUR

WORK ACTIVITIES:	TIME "A"	TIME "B"
Reading		
Note-taking		
Self-recitation		
Working problems		
DISTRACTIONS:		
Aimless looking around		
Aimless leafing through books		
Students going by		
Applying make-up		
Attracted by others		
Daydreaming		
Reading or writing letters		
Arranging hair and clothes		
Miscellaneous		

TIME USE:

About what proportion of the time was spent in studying?

APPENDIX C6

EVALUATION OF STUDY CONDITIONS AND PLANS FOR CORRECTION

AREA	WHATS WRONG	SPECIFIC PLAN
Auditory distractions in the room		
Visual distractions in the room		
Personal worries and interests that distract		
Auditory distractions in library		
Visual distractions in library		
Constancy of study conditions to stimulate study		
Posture while studying		
Adequacy of lighting		
Adequacy of work space		
Availability of materials		

APPENDIX C7

OUTLINE OF THE LISAN METHOD

DESIGNED TO ASSIST SUBJECTS IN BECOMING BETTER LISTENERS IN LECTURES.

L : **LEAD**, don't follow; anticipate what's going to be said

I : **IDEAS**, find them

S : **SIGNALS**, watch for them

A : **ACTIVE**, not passive involvement

N : **NOTES**, take them and organise your material (this included a look at the use of concepts)

(EXTRACTED FROM CARMEN & ROYCE ADAMS, 1972, p 30)

APPENDIX C8

READING TEST ADMINISTERED TO STUDY SKILLS SUBJECTS

This exercise will take about five to ten minutes. Do not begin until you have access to a watch or a clock with a second hand.

You are going to time yourself while you read from the beginning of the article, "Should It Be Legalized?" Judging from the title, state what you think will be your purpose for reading the article.

Reading Purpose: _____

Check your watch or clock and write down your beginning reading time. Start exactly on the minute.

Starting Time: _____

Begin reading.

SHOULD IT BE LEGALIZED?
by Dr. James L. Goddard

(1) Man has used marijuana both socially and medicinally for several thousand of years and yet today there is little scientific knowledge of its dangers or merits. In spite of our lack of knowledge, an estimated 12 million Americans have used the drug in recent years. Now we are in a near crisis caused by ignorance and the blanket of misinformation which governmental agencies have used to cover their ineptitudes.

(2) One thing we know about marijuana is that it is definitely not a narcotic, even though our federal laws (and most of our state laws) restricting its usage erroneously define it as such. The effects of the drug are variable, depending largely on the experience of the user, his mood, the quantity smoked or eaten, the potency of the plant and the form the drug is used in - leaf (grass) or resin (hashish). The drug effects sought by the user are a state of relaxation, an enhancement of sensory stimuli, particularly sound, an apparent expansion of time, a dispelling of the problems of the day. He may also experience a marked increase in appetite, a slight increase in pulse rate, a pronounced dryness of the mouth and throat, a sensation of heaviness of the extremities. He may even experience a mild period of depression and, in some rare cases, an acute panic reaction which may lead to brief hospitalization.

(3) Marijuana, unlike narcotics, does not produce tolerance, requiring higher dosages to produce the same effect. Nor does it produce addiction, which is true of narcotics. But this does not mean it is without its dangers. The principal danger is that one

APPENDIX C8 (cont)

may become psychologically dependent on marijuana and, instead of coping with everyday problems, withdraw through frequent use of the drug. Adolescents are particularly vulnerable to this danger because of their limited experience and less well-developed habits of living.

(4) Though marijuana has been the drug first used by 10% to 95% of heroin users in the U.S., there is nothing inherent in it to cause people to switch from it to the addictive and more potent drugs. Rather it is thought that personality factors are responsible. I find parents to be most concerned about this one facet of the problem, and the only reassurance I can offer them is that while marijuana usage has skyrocketed in the last decade, heroin addiction has increased only gradually.

(5) Some of the questions we must answer are: Does long-term usage of marijuana have harmful effects? Does it affect the reproductive processes? What conditions favour continuation of marijuana use as opposed to moving to hard drugs? What kinds of educational approaches are most effective in reducing misuse? Does marijuana affect human chromosomes?

(6) Steps are being taken to obtain answers to these and other questions. The major support for this research comes from an element of the U.S. Public Health Service - the National Institute of Mental Health. Its programme was initiated early this year, although limited studies had been supported in earlier years, and involves providing funds ($1 Million in fiscal year 1969) and supplies of the drug in both natural and synthetic forms to scientists in institutions across the U.S.

(7) Phase 1 of the programme - assuring adequate supplies of the drug for testing - has been largely completed. Phase 2 - study of the effects on various animals - is under way. Parts of Phase 3 - clinical tests on humans - have been started. Answers to some of our questions will be forthcoming within a matter of months. Within two or three years, according to Dr. Stanley Yolles, director of NIMH, most of what we need to know will be available.

(8) Our laws governing marijuana are a mixture of bad science and poor understanding of the role of law as a deterrent force. They are unenforceable, excessively severe, scientifically incorrect and revealing of our ignorance of human behaviour. The federal and state laws should be revised to reflect the fact that marijuana is a hallucinogen and should be classified as such. The federal statutes should be repealed, and the Food, Drug and Cosmetic Act should be amended to bring marijuana under the jurisdiction of that Act, thereby automatically de-escalating the penalties for simple possession to a more reasonable level (a misdemeanor, with the judge being given considerable authority to adjust the penalty to more nearly fit the circumstances). At the same time sufficiently serious penalties should be provided to

APPENDIX C8 (cont)

handle the major traffickers in the drug. State laws should then be revised in conformance with a model law containing similar provisions.

(9) I do not believe that marijuana should now be legalized and the steps which I have suggested will not satisfy those who seek to legalize it. Their arguments are that the laws are not enforceable, that the use of marijuana is a private act and does not harm society, and that marijuana is less a danger than alcohol. These are attractive arguments, but they begin to break down upon closer examination. First, although not precisely defined, law may have a deterrent effect. Second, although the use of marijuana is a private act, it has the potential to cause harm to society. One has only to visualize marijuana being more freely available and more widely used by adolescents who have not learned to cope with the problems of daily life, and it is not difficult to reach the conclusion that cannabis would become a societal problem. Our inability to keep cigarettes away from minors should serve as a reminder that we would not be able to keep marijuana out of their hands.

(10) I know that my stand on marijuana may seem contradictory. If the known harmful effects of alcohol and tobacco are greater than those of marijuana, and those substances are legal, why do I not advocate legalizing marijuana? I believe that if alcohol and tobacco were not already legal, we might very well decide not to legalize them - knowing what we now know. In the case of marijuana, we will know in a very few years how harmful it is or is not. If it turns out to be quite harmful - a distinct possibility - we will have introduced yet another public-health hazard that for social and economic reasons might become impossible to dislodge.

(EXTRACTED FROM CARMEN & ROYCE ADAMS, 1972, pp. 81 - 84)

APPENDIX C8 (cont)

Record your finishing time: _____

Now subtract your starting time from your finishing time to see how many minutes and seconds it took you to read the article.

Finishing Time: _____

Starting Time: _____

Total Reading Time: _____

Use the chart below to figure out how many words per minute you read. For instance, if your read the article in 4 minutes and 15 seconds, your rate is 270 words per minute (WPM).

TIME	WPM	TIME	WPM
1:00	1150	4:00	287
1:15	920	4:15	270
1:30	766	4:30	255
1:45	657	4:45	242
2:00	575	5:00	230
2:15	511	5:15	219
2:30	460	5:30	209
2:45	418	5:45	200
3:00	383	6:00	191
3:15	353	6:15	184
3:30	328	6:30	too slow - you need to practice to increase your reading speed
3:45	306		

Record your WPM: _____

APPENDIX C9

OUTLINE OF THE SCORER SYSTEM OF TACKLING EXAMS

S : **SCHEDULE** your time and your work

C : **CLUE** words (repeat of key word instructions)

O : **OMIT** difficult questions initially (depending on the mark distribution, advice involved telling Ss to take the questions they knew first)

R : **READ** questions carefully (be certain you know what's expected)

E : **ESTIMATE** your answers - don't "pad" responses; always relate questions to important core ideas delivered in the course

R : **REVIEW** your work if time permits; always use all the time available

(EXTRACTED FROM CARMEN & ROYCE ADAMS, 1972, p 225)

APPENDIX D

MANAGEMENT OF EXAM ANXIETY - DESCRIPTIVE SCHEDULE

ANSWER THE FOLLOWING QUESTIONS AS FULLY AS YOU CAN; BEAR IN MIND THAT ALL INFORMATION OFFERED HERE BY YOU IS STRICTLY CONFIDENTIAL.

A) With reference to statements 14,15 & 19 in the Modified AAT (Appendix E), do you in fact ever experience "mental blocks" (or "blanks") in an exam?

YES NO

If "YES", what form do these "blocks" take? (Offer a brief description of its nature and intensity):

_____

_____

_____

B) Do you personally regard yourself as a "naturally tense person" (i.e. are you anxious about something most of the time)?

YES NO

If "YES", elaborate on this:

_____

_____

_____

C) How far back in your academic career are you able to trace evidence of disabling exam anxiety? (Tick appropriate block)

¦_¦ At Primary School (pre-Std 6/Form 1)

¦_¦ At High School (pre-Std 10/Form 5)

¦_¦ In "Matric" (Std 10/Form 5)

¦_¦ While at University/College

D) Would you/have you ever seriously considered committing self-injury in order to tentatively avoid sitting an exam about which you feel/felt particularly anxious? (Please give details)

_____

_____

_____

APPENDIX D (cont)

E) Given the following list of physiological reactions to stress, which, if any do you experience during or prior to an exam? (Tick appropriate block)

- [ ] PERSPIRATION (Specify area) _____
- [ ] "SHAKES" (Detail) _____
- [ ] DRY MOUTH
- [ ] DIFFICULTIES IN BREATHING
- [ ] "RACING" HEART BEAT
- [ ] HEADACHES (Detail Intensity) _____
- [ ] FEELING OF NAUSEA
- [ ] INSOMNIA (Detail Intensity) _____
- [ ] OTHER (Specify) _____

F) What "strategies" do you use (if any) in an attempt to alleviate undue tension before or during an exam? (Tick and specify)

- [ ] Taking Barbiturates/Analgesics (e.g. "Calmettes")
- [ ] Increase Smoking rate or the intake of alcohol
- [ ] Engage in generally exhaustive exercise
- [ ] Practice T.M., Yoga, or related relaxation techniques _____
- [ ] Other "strategies"

APPENDIX E

MODIFIED ACHIEVEMENT ANXIETY TEST (AAT)

In the course of this schedule, a number of statements are presented for your consideration in an attempt to determine various personality traits involved in College examinations. Alongside each of these statements is a set of figures, the meaning of which appears below (see "Frequency Code"). By placing an "X" in the appropriate square, you are required to indicate which frequency (1 - 5) best describes you, given the statement in question. Remember that there is no "ideal" response; give the one that is most true of your experience.

FREQUENCY CODE

WHERE 1 means "no"; "never"; "not at all"; etc.
2 means "sometimes"; "seldom"; "a little"; etc.
3 means "about as often as not"; "an average amount" etc.
4 means " quite often"; "usually"; "a good deal"; etc
5 means "practically always"; "entirely"; etc.

1. I work most effectively under pressure, such as when the task is very important.

| 1 | 2 | 3 | 4 | 5 |

2. While I may (or may not) be nervous before taking an exam, once I start, I seem to forget to be nervous.

| 1 | 2 | 3 | 4 | 5 |

3. Nervousness while taking a test helps me do better.

| 1 | 2 | 3 | 4 | 5 |

4. When I start a test, nothing is able to distract me.

| 1 | 2 | 3 | 4 | 5 |

5. In the courses in which the total grade is based mainly on one exam, I seem to do better than other people.

| 1 | 2 | 3 | 4 | 5 |

6. I look forward to exams.

| 1 | 2 | 3 | 4 | 5 |

APPENDIX E (cont)

7. Although "cramming" under pre-examination tension is not effective for most people, I find if the need arises, I can learn material immediately before an exam, even under considerable pressure, and successfully retain it to use in the exam.

| 1 | 2 | 3 | 4 | 5 |

8. I enjoy taking a difficult exam even more than an easy one.

| 1 | 2 | 3 | 4 | 5 |

9. The more important the exam or test, the better I seem to do.

| 1 | 2 | 3 | 4 | 5 |

10. Nervousness while taking an exam or test hinders me from doing well.

| 1 | 2 | 3 | 4 | 5 |

11. In a course where I have been doing poorly, my fear of a bad grade cuts down my efficiency.

| 1 | 2 | 3 | 4 | 5 |

12. When I am poorly prepared for an exam or test, I get upset, and do less well than even my restricted knowledge should allow.

| 1 | 2 | 3 | 4 | 5 |

13. The more important the examination the less well I seem to do.

| 1 | 2 | 3 | 4 | 5 |

14. During exams or tests, I "block" on questions to which I know the answers, even though I might remember them as soon as the exam is over.

| 1 | 2 | 3 | 4 | 5 |

APPENDIX E (cont)

15. I find that my mind goes blank at the beginning of an exam and it takes me a few minutes before I can function normally.

| 1 | 2 | 3 | 4 | 5 |

16. I am so tired from worrying about an exam, that I find I almost don't care how well I do by the time I start the test.

| 1 | 2 | 3 | 4 | 5 |

17. Time pressure in an exam causes me to do worse than the rest of the group under similar conditions.

| 1 | 2 | 3 | 4 | 5 |

18. I find myself reading exam questions without understanding them, and I must go back over them so that they will make sense.

| 1 | 2 | 3 | 4 | 5 |

19. When I don't do well on a difficult item at the beginning of an exam, it tends to upset me so that I "block" on even easy questions later on.

| 1 | 2 | 3 | 4 | 5 |

APPENDIX F

THE ANTICIPATED ANXIETY RATING SCALE (AARS)

ANXIETY CONTINUUM KEY

```
            1        4        7         10
           -----------------------------
          LOW    OPTIMAL   HIGH    VERY HIGH
                    |        Anxiety
                    |-- experienced as------
                    |       "disabling"
```

WHERE

"LOW ANXIETY" refers to a totally carefree attitude; entirely devoid of any conscious feelings of anxiety.

"OPTIMAL ANXIETY" indicates that the individual experiences a moderate amount of anxiety consciously, but far from being "disabling", the feeling is found to be stimulating; almost exciting.

"HIGH ANXIETY" indicates that the anxiety experienced is somehow discomforting, to the extent that it becomes disabling.

"VERY HIGH ANXIETY" indicates that the anxiety is experienced as totally uncontrollable and is extremely upsetting to the subject; fundamental physiological side-effects come to the fore at this level of intensity.

GIVEN THE ABOVE CONTINUUM CODE, RATE THE FOLLOWING LIST OF EXAM SITUATIONS (SET IN THE CONTEXT OF CARINUS NURSING COLLEGE), BY CLEARLY PLACING AN ASTERISK (*) AT THE APPROPRIATE POINT ALONG THE CONTINUUM.

1. One month prior to an exam.

```
            1        4        7         10
           -----------------------------
          LOW    OPTIMAL   HIGH    VERY HIGH
```

2. Three days prior to an exam.

```
            1        4        7         10
           -----------------------------
          LOW    OPTIMAL   HIGH    VERY HIGH
```

APPENDIX F (cont)

3. The evening prior to an exam.

1	4	7	10
LOW	OPTIMAL	HIGH	VERY HIGH

4. Walking/driving to the exam hall on the day of the exam.

1	4	7	10
LOW	OPTIMAL	HIGH	VERY HIGH

5. Sitting in the exam hall, in anticipation of the distribution of the exam scripts.

1	4	7	10
LOW	OPTIMAL	HIGH	VERY HIGH

6. During "reading time", five minutes prior to the start of an exam.

1	4	7	10
LOW	OPTIMAL	HIGH	VERY HIGH

7. While writing the exam paper.

1	4	7	10
LOW	OPTIMAL	HIGH	VERY HIGH

8. Awaiting the results of the exam.

1	4	7	10
LOW	OPTIMAL	HIGH	VERY HIGH

APPENDIX G

THE SUBJECTIVE UNITS OF DISTURBANCE (SUD) SCALE

In order to determine more accurately subjective assessments about one's own level of anxiety at any given moment, an anxiety score-scale of **0 - 100** has been proposed - based on the following ranked guidelines:

0	TOTALLY DEVOID OF ANXIETY
25	SLIGHTLY TENSE, BUT THIS TENSION IS NOT EVIDENT, UNLESS SPECIFICALLY REFLECTED UPON
50	STRONG FEELINGS OF ANXIETY, BUT NOT TO THE EXTENT OF EXPERIENCING ANY PHYSIOLOGICAL SIDE-EFFECTS
75	EXTREMELY ANXIOUS WITH EVIDENCE OF MILD PHYSIOLOGICAL SIDE-EFFECTS (nausea, tension headache)
100	UNCONTROLLABLY ANXIOUS, WITH EXTREME PHYSIOLOGICAL SIDE-EFFECTS (vomiting, migraine, shakes)

FOR EXAMPLE, while completing this document, you may be feeling just a little anxious, but may acknowledge the presence of minimal anxiety only upon reflection; hence you may indicate your anxiety level presently to be about **32**.
With this scale in mind, score your anticipated anxiety level for each of the following situations (which are presented here chronologically for reasons of convenience only).

ANXIETY SCORE SCALE: 0-100

a) While completing this questionnaire ..... ----
b) One week before an exam ..... ----
c) Four days before an exam ..... ----
d) Three days before an exam ..... ----
e) Two days before an exam ..... ----
f) One day before an exam ..... ----
g) The night before an exam ..... ----
h) An hour before an exam ..... ----
i) Walking/driving to the exam hall ..... ----
j) Standing before the unopened doors of the exam hall ----
k) Awaiting distribution of the exam papers ..... ----
l) Staring at the "face down" exam paper ..... ----
m) Reading the paper during "reading time" ..... ----
n) In the process of answering the paper ..... ----
o) When the final 5 mins is called at the end of the exam ..... ----
p) Waiting for the final results ..... ----

APPENDIX H

TREATMENT EVALUATION QUESTIONNAIRE

PLEASE COULD YOU ANSWER THE FOLLOWING STATEMENTS HONESTLY AND OBJECTIVELY.

1. DID YOU FIND THE TREATMENT SKILLS EASY TO ACQUIRE?

1	4	7
difficult		easy

2. DID YOU FEEL THAT THE PROGRAMME WAS RUN COMPETENTLY BY THE SUPERVISOR?

1	4	7
disorganised		organised

3. DID YOU ENJOY THE TREATMENT SESSIONS?

1	4	7
not at all		very much

4. DID YOU FEEL THAT YOUR TIME WAS BEING EMPLOYED USEFULLY?

1	4	7
not at all		very much

5. DID YOU EXPERIENCE A GENERALISATION EFFECT - i.e. diminished feeling of irritability concerning interpersonal relationships around exam time, not just the ability to control exam anxiety?

1	4	7
not at all		very much

6. DID YOU FIND THE RESEARCH PROGRAMME VALUABLE IN TERMS OF ITS POTENTIAL DURABILITY AS A TRAINING PROCEDURE?

1	4	7
not at all		very much

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE.

APPENDIX I

POMS PROFILE SHEET

COLLEGE NORMS

Name: _____ Date: _____

T Score	FACTOR						T Score
	Ten	Dep	Ang	Vig	Fat	Con	
80+	35-6	47+	32+			28	80+
79	34	46				27	79
78		45	31				78
77	33	44	30		28	26	77
76	32	43	29	32			76
75		42			27	25	75
74	31	41	28	31			74
73	30	40	27	30	26	24	73
72	29	38-9	26		25	23	72
71		37		29			71
70	28	36	25	28	24	22	70
69	27	35	24		23		69
68		34	23	27		21	68
67	26	33			22		67
66	25	32	22	26	21	20	66
65	24	31	21	25			65
64		30	20		20	19	64
63	23	28-9		24	19	18	63
62	22	27	19	23			62
61		26	18		18	17	61
60	21	25	17	22	17		60
59	20	24		21		16	59
58	19	23	16		16		58
57		22	15	20	15	15	57
56	18	21	14				56
55	17	20		19	14	14	55
54	16	19	13	18	13		54
53		17-8	12			13	53
52	15	16	11	17	12	12	52
51	14	15	10	16	11		51
50		14				11	50
49	13	13	9	15	10		49
48	12	12	8	14	9	10	48
47	11	11	7				47
46		10		13	8	9	46
45	10	9	6		7		45
44		7-8	5	12		8	44
43	9	6		11	6	7	43
42	8	5	4				42
41	7	4	3	10	5	6	41
40	6	3	2	9	4		40
39		2	1			5	39
38	5	1		8	3		38
37	4	0	0	7	2	4	37
36							36
35	3			6	1	3	35
34	2				0		34
33	1			5		2	33
32				4		1	32
31	0						31
30				3		0	30
T Score	_____	_____	_____	_____	_____	_____	T Score
Raw Score	_____	_____	_____	_____	_____	_____	Raw Score
	Ten	Dep	Ang	Vig	Fat	Con	

APPENDIX J

HEALTH BEHAVIOUR ASSESSMENT SCALE

PLEASE COMPLETE THE QUESTIONNAIRE BY CIRCLING THE NUMBER, (WHERE 1 = **ALMOST ALWAYS; 2 = SOMETIMES AND 3 = ALMOST NEVER**) THAT BEST DESCRIBES YOUR BEHAVIOUR. YOU MUST ANSWER QUESTIONS HONESTLY TO GET ANY REAL VALUE FROM THE QUESTIONNAIRE. THANK YOU.

Cigarette Smoking

IF YOU ARE A NON-SMOKER SKIP THESE ITEMS AND TICK I NEVER SMOKE

1.	I avoid smoking cigarettes.	1	2	3
2.	I smoke only low tar and nicotine cigarettes or smoke a pipe or cigars.	1	2	3

Eating Habits

1.	I eat a variety of foods each day, such as fruits and vegetables, whole grain breads and cereals, lean meats, diary products, dry peas and beans, nuts and seeds.	1	2	3
2.	I limit the amount of fat, saturated fat, and cholesterol I eat (including fat on meats, eggs, butter, cream, shortenings, and organ meats such as liver).	1	2	3
3.	I avoid eating too much sugar (especially frequent snacks of sticky sweets or soft drinks).	1	2	3
4.	I limit the amount of salt I eat by cooking with only small amounts, not adding salt at the table, and avoiding salty snacks.	1	2	3

APPENDIX J (cont)

Alcohol and Drugs

1.	I avoid using alcohol or other drugs (especially illegal drugs) as a way of handling stressful situations or the problems in my life.	1	2	3
2.	I read and follow the label directions when using prescribed and over-the-counter drugs.	1	2	3
3.	I am careful not to drink alcohol when taking certain medicines (for sleeping, pain, colds and allergies), or when pregnant.	1	2	3
4.	I am careful when using potentially harmful products or substances (such as household cleaners, poisons, and electric devices).	1	2	3

Exercise/Fitness

1.	I maintain a desired weight, avoiding overweight and underweight.	1	2	3
2.	I do exercises that enhance my muscle tone for 15 - 30 minutes at least 3 times a week (examples include yoga and calisthenics).	1	2	3
3.	I do vigorous exercises for 15 - 30 minutes at least 3 times a week (examples include running, swimming, brisk walking).	1	2	3
4.	I use part of my leisure time participating in individual, family, or team activities that increase my level of fitness (such as gardening, bowling, golf, and baseball).	1	2	3

APPENDIX J (cont)

Stress Control

1.	I have a job or do other work that I enjoy.	1	2	3
2.	I participate in group activities (such as church and community organizations) or hobbies that I enjoy.	1	2	3
3.	I have close friends, relatives, or others whom I can talk to about personal matters and call on for help when needed.	1	2	3
4.	I recognize early, and prepare for, events or situations likely to be stressful for me.	1	2	3
5.	I find it easy to relax and express my feelings freely.	1	2	3

Safety

1.	I avoid smoking in bed.	1	2	3
2.	I wear a seat belt while riding in a car.	1	2	3
3.	I avoid drinking alcoholic beverages or I drink no more than 1 or 2 drinks a day.	1	2	3
4.	I obey traffic rules and the speed limit when driving.	1	2	3
5.	I avoid driving while under the influence of alcohol and other drugs.	1	2	3

FINALLY, PLEASE RATE ON THE POINT-SCALE BELOW HOW HEALTHY YOU THINK YOU ARE

EXTREMELY HEALTHY 10 9 8 7 6 5 4 3 2 1 UNHEALTHY

REASONABLY HEALTHY

APPENDIX K

CORRELATION MATRIX OF POMS AND HBAS VARIABLES FOR CNC NURSES

	TEN	DEP	ANG	VIG	FAT	CON
SMOKING	-0.1848*	-0.0686	-0.0590	0.0218	-0.1777*	-0.1143
EATING	-0.1384	-0.1591	-0.1145	0.0691	-0.1043	-0.2026*
DRUGS & A	-0.3066**	-0.2222*	-0.2905**	0.0461	-0.2334**	-0.1934*
EXERCISE	0.0099	0.0748	-0.0166	0.1183	-0.0672	0.0697
STRESS C	-0.2334**	-0.1913*	-0.2011*	0.1397	-0.2702**	-0.3349**
SAFETY	-0.1201	-0.0870	-0.1675*	-0.0141	-0.0965	-0.0548
SELF-A	-0.0939	-0.1150	-0.0168	0.1961*	-0.0125	-0.1302

df = 103 *r* crit 0.05 = 0.1638* *r* crit 0.01 = 0.2301**

CORRELATION MATRIX OF POMS AND HBAS VARIABLES FOR BSc NURSES

	TEN	DEP	ANG	VIG	FAT	CON
SMOKING	-0.2020	-0.2146	-0.3855	0.1511	-0.1733	-0.1181
EATING	-0.2988	-0.4445	0.1540	0.3166	-0.0739	-0.2711
DRUGS & A	-0.0830	-0.0920	-0.1446	0.1548	-0.1245	-0.2019
EXERCISE	-0.1077	-0.1765	-0.0256	-0.0888	-0.3054	0.0424
STRESS C	0.1971	0.0294	-0.0159	0.0795	0.0215	0.0000
SAFETY	-0.0678	-0.0627	-0.1563	0.1215	0.0121	-0.1499
SELF-A	0.0089	-0.3850	0.2769	0.4212	-0.1815	0.1845

df = 12 *r* crit 0.05 = 0.4973* *r* crit 0.01 = 0.6581**

APPENDIX K (cont)

CORRELATION MATRIX OF POMS AND HBAS VARIABLES FOR PHYSIOTHERAPY STUDENTS

	TEN	DEP	ANG	VIG	FAT	CON
SMOKING	-0.2317	-0.0792	-0.2397	0.1559	-0.6361**	-0.2881
EATING	-0.3280	-0.2809	-0.5259**	0.1961	-0.3081	-0.2079
DRUGS & A	-0.1060	-0.0142	-0.2001	0.2380	-0.3225	-0.3288
EXERCISE	-0.4666**	-0.5514**	-0.5232**	0.3583*	-0.1141	-0.4686**
STRESS C	-0.3962*	-0.5865**	-0.2320	0.4556*	-0.2363	-0.5489**
SAFETY	-0.2180	-0.2156	-0.3245	0.3117	-0.5074**	-0.3508*
SELF-A	-0.4950**	-0.4274*	-0.4736**	0.2491	-0.2763	-0.3193

df = 24 *r* crit 0.05 = 0.3438* *r* crit 0.01 = 0.4622**

CORRELATION MATRIX OF POMS AND HBAS VARIABLES FOR LOGOPAEDIC STUDENTS

	TEN	DEP	ANG	VIG	FAT	CON
SMOKING	-0.7357**	-0.8175**	-0.5022*	0.0231	-0.5025*	-0.6376*
EATING	-0.1287	-0.3254	0.0250	0.2968	-0.4991*	-0.0383
DRUGS & A	0.1108	0.2849	0.3829	-0.2056	0.1114	0.4039
EXERCISE	0.1491	-0.0134	0.1641	0.5450*	-0.1348	-0.1538
STRESS C	-0.4373	-0.6676**	-0.4458	0.5908*	-0.6035*	-0.5928*
SAFETY	0.3287	0.1707	-0.0714	0.0019	0.0956	0.1482
SELF-A	-0.0700	-0.1828	-0.0146	0.6983**	-0.4393	-0.2840

df = 12 *r* crit 0.05 = 0.4973* *r* crit 0.01 = 0.6581**

APPENDIX K (cont)

CORRELATION MATRIX OF POMS AND HBAS VARIABLES FOR OCCUPATIONAL THERAPISTS

	TEN	DEP	ANG	VIG	FAT	CON
SMOKING	0.2332	0.0982	0.3306	-0.2621	-0.0130	0.0248
EATING	-0.0673	-0.1087	-0.1720	0.1470	-0.0895	-0.2219
DRUGS & A	-0.3558	-0.4777*	-0.6500**	0.1246	-0.2542	-0.6948**
EXERCISE	-0.0924	-0.1183	-0.1029	0.3800	-0.4156*	0.1403
STRESS C	-0.3884	-0.4455*	-0.0696	0.4904*	-0.4202*	-0.1694
SAFETY	-0.5601**	-0.5756**	-0.4200*	0.1090	-0.4140*	-0.7138**
SELF-A	0.0334	0.0848	0.2735	0.6536**	-0.1187	0.0915

df = 18 *r* crit 0.05 = 0.3887* *r* crit 0.01 = 0.5425**

CORRELATION MATRIX OF POMS AND HBAS VARIABLES FOR RADIOGRAPHERS

	TEN	DEP	ANG	VIG	FAT	CON
SMOKING	0.2456	0.1755	0.0217	-0.0996	-0.1822	-0.1471
EATING	-0.1109	-0.1645	-0.2711	0.2988	-0.3365*	-0.2936
DRUGS & A	-0.1166	-0.1683	-0.1256	0.0752	-0.1348	-0.2323
EXERCISE	-0.2140	-0.3210	-0.2174	0.5171**	-0.0385	-0.2364
STRESS C	-0.1298	-0.3120	-0.1195	0.1573	-0.3919*	-0.1934
SAFETY	-0.1852	-0.1814	-0.0859	-0.1262	0.0869	-0.1620
SELF-A	-0.2464	-0.4085*	-0.4413*	0.3917*	-0.4328*	-0.2337

df = 27 *r* crit 0.05 = 0.3233* *r* crit 0.01 = 0.4451**

APPENDIX L

UCT MEDICAL SCHOOL MATRIC SCORING SYSTEM

SCORE	SYMBOL HG	SYMBOL SG
8	A	
7	B	
6	C	A
5	D	B
4	E	C
3	F	D
2	G	E
1	H	F

APPENDIX M1

TABLE OF PRE- AND POST-TREATMENT SCORES ON ANXIETY AND EXAMINATION VARIABLES FOR THE HIGH-ANXIOUS SUB-GROUPS

GROUP 1 **SYSTEMATIC DESENSITISATION**
n = 13

	FACIL	DEBIL	ANTIC	SUD	EXAMS
PRE	21.46	33.38	44.23	54.54	48.77
POST	23.84	25.31	39.85	42.54	55.85

GROUP 2 **PROGRESSIVE MUSCLE RELAXATION AND GUIDED IMAGERY**
n = 8

	FACIL	DEBIL	ANTIC	SUD	EXAMS
PRE	22.25	35.00	48.38	50.88	50.00
POST	23.63	32.50	51.88	56.63	61.87

GROUP 3 **CONTROL**
n = 8

	FACIL	DEBIL	ANTIC	SUD	EXAMS
PRE	19.13	30.13	39.38	48.75	57.25
POST	21.50	30.50	39.13	45.25	61.88

GROUP 4 **STUDY SKILLS TECHNIQUE**
n = 5

	FACIL	DEBIL	ANTIC	SUD	EXAMS
PRE	20.20	32.80	44.40	52.40	63.80
POST	25.40	26.00	40.40	56.60	58.00

APPENDIX M2

TABLE OF PRE- AND POST-TREATMENT SCORES ON ANXIETY AND EXAMINATION VARIABLES FOR THE LOW-ANXIOUS SUB-GROUPS

GROUP 1 **SYSTEMATIC DESENSITISATION**
n = 3

	FACIL	DEBIL	ANTIC	SUD	EXAMS
PRE	28.33	20.33	34.00	39.33	65.00
POST	28.00	22.00	31.00	34.33	63.33

GROUP 2 **PROGRESSIVE MUSCLE RELAXATION AND GUIDED IMAGERY**
n = 11

	FACIL	DEBIL	ANTIC	SUD	EXAMS
PRE	29.09	19.91	29.55	39.64	57.09
POST	28.55	22.27	30.00	35.55	66.73

GROUP 3 **CONTROL**
n = 9

	FACIL	DEBIL	ANTIC	SUD	EXAMS
PRE	29.22	18.56	28.56	32.22	59.89
POST	30.33	17.89	31.44	29.33	66.11

GROUP 4 **STUDY SKILLS TECHNIQUE**
n = 11

	FACIL	DEBIL	ANTIC	SUD	EXAMS
PRE	29.73	20.27	33.36	42.64	69.18
POST	32.82	22.91	38.55	40.09	75.18

APPENDIX M3

TABLE OF PRE- AND POST-TREATMENT SCORES ON ANXIETY AND EXAMINATION VARIABLES FOR THE MID-ANXIOUS SUB-GROUPS

GROUP 1 **SYSTEMATIC DESENSITISATION**
n = 9

	FACIL	DEBIL	ANTIC	SUD	EXAMS
PRE	26.00	27.22	41.11	46.89	54.22
POST	25.89	24.11	36.56	35.56	61.67

GROUP 2 **PROGRESSIVE MUSCLE RELAXATION AND GUIDED IMAGERY**
n = 9

	FACIL	DEBIL	ANTIC	SUD	EXAMS
PRE	27.56	28.00	44.44	48.00	56.56
POST	24.33	28.29	42.11	42.44	64.00

GROUP 3 **CONTROL**
n = 7

	FACIL	DEBIL	ANTIC	SUD	EXAMS
PRE	28.29	28.29	44.14	44.29	58.86
POST	26.57	29.00	47.00	45.14	63.14

GROUP 4 **STUDY SKILLS TECHNIQUE**
n = 10

	FACIL	DEBIL	ANTIC	SUD	EXAMS
PRE	26.30	27.00	40.30	50.50	60.20
POST	26.60	26.00	43.90	44.10	60.30

APPENDIX O

MULTIVARIATE ONE-WAY ANOVA SUMMARY TABLE FOR ANXIETY AND EXAMINATION DIFFERENCE SCORES COMPARING THE ANXIETY LEVELS

	SOURCE	SS	DF	MS	F	P
Anxiety Factor	Facilitative	236.19	2, 100	118.10	6.81	0.0017**
	Debilitative	662.79	2, 100	331.40	9.08	0.0002**
	Anticipated	256.39	2, 100	128.19	1.42	0.2477
	SUD	163.64	2, 100	81.82	0.63	0.5352
	Exam	58.96	2, 100	29.48	0.23	0.7913
High-Low Contrast	Facilitative	36.76	1, 100	36.76	2.12	0.1486
	Debilitative	648.53	1, 100	648.53	17.77	0.0001**
	Anticipated	248.53	1, 100	248.53	2.74	0.1008
	SUD	0.13	1, 100	0.13	0.00	0.9746
	Exam	11.53	1, 100	11.53	0.09	0.7626
Mid-Low Contrast	Facilitative	83.66	1, 100	83.66	4.82	0.0304*
	Debilitative	91.43	1, 100	91.43	2.51	0.1166
	Anticipated	107.36	1, 100	107.36	1.19	0.2789
	SUD	126.12	1, 100	126.12	0.97	0.3271
	Exam	58.68	1, 100	58.68	0.47	0.4959
High-Mid Contrast	Facilitative	232.68	1, 100	232.68	13.41	0.0004**
	Debilitative	258.82	1, 100	258.82	7.09	0.0090**
	Anticipated	30.44	1, 100	30.44	0.34	0.5634
	SUD	118.02	1, 100	118.02	0.91	0.3431
	Exam	17.98	1, 100	17.98	0.14	0.7060

APPENDIX P

RESULTS OF EXAM ANXIETY DESCRIPTIVE SCHEDULE

		GRP1	%	GRP2	%	GRP3	%	GRP4	%	ALL	%
A	YES	24	80	22	76	19	61	28	93	93	78
	NO	6	20	7	24	12	39	2	7	27	23
B	YES	12	40	10	34	15	48	17	57	54	45
	NO	18	60	19	66	16	52	13	43	66	55
C	NONE	3	10	7	24	4	13	3	10	17	14
	PRIMARY	4	13	4	14	10	32	4	13	22	18
	HIGH	14	47	10	34	8	26	13	43	45	38
	MATRIC	9	30	8	29	9	29	9	30	35	29
	VARSITY							1	3	1	1
D	NEVER	21	70	22	76	28	90	23	77	94	78
	NOT SERIOUS	8	27	6	21	3	10	6	20	23	19
	SERIOUS	1	3	1	3			1	3	3	3
E	NONE	1	3	4	14			2	7	7	6
	SWEATING	8	27	9	31	12	39	7	23	36	30
	SHAKES	8	27	6	21	7	23	11	37	32	27
	DRY MOUTH	7	23	5	17	3	10	7	23	22	18
	SOB	1	3	2	7	2	6	1	3	6	5
	TACHYCARDIA	13	43	15	52	16	52	17	57	61	51
	HEADACHE	6	20	4	14	7	23	11	37	28	23
	NAUSEA	6	20	6	21	4	13	2	7	18	15
	INSOMNIA	5	17	9	31	7	23	9	30	30	25
	OTHER	7	23	9	31	8	26	16	53	40	33
F	NONE	6	20	5	17	5	16	4	13	20	17
	DRUGS	1	3	1	3	1	3	2	7	5	4
	SMOKING	7	23	7	24	7	23	7	23	28	23
	EXERCISE	4	13	4	14	9	29	3	10	20	17
	RELAXATION	2	7	5	17	6	19	3	10	16	13
	OTHER	12	40	13	45	16	52	17	57	58	48

APPENDIX Q

CNC NURSES TREATMENT EVALUATION QUESTIONNAIRE

	GROUP 1A							GROUP 1B						
	1	2	3	4	5	6	TOTAL	1	2	3	4	5	6	TOTAL
	4.0	7.0	4.5	6.0	3.5	7.0	32.0	2.5	1.0	3.0	1.0	1.0	1.5	10.0
	1.0	4.0	4.0	6.0	6.0	6.0	27.0	7.0	7.0	7.0	7.0	7.0	7.0	42.0
	2.5	7.0	4.0	3.5	5.0	4.0	26.0	3.0	5.0	2.0	3.0	2.0	3.0	18.0
	6.5	6.5	4.0	4.0	4.0	4.0	29.0	4.5	6.0	5.0	4.0	4.0	4.0	27.5
	5.5	6.5	6.0	5.0	5.0	5.5	33.5	3.0	4.0	2.5	2.0	1.0	1.5	14.0
	2.5	7.0	2.5	2.5	2.0	6.0	22.5	2.5	3.0	1.0	1.0	1.0	1.0	9.5
	1.0	4.0	1.0	1.0	2.5	1.0	10.5	4.0	1.0	4.0	4.0	1.0	1.0	15.0
	6.0	7.0	3.5	2.5	2.0	1.0	22.0	7.0	7.0	4.0	4.0	4.0	5.0	31.0
	6.5	6.5	4.0	4.0	1.5	2.0	23.5	1.0	6.0	1.0	1.0	3.0	2.0	14.0
	4.0	4.0	3.0	3.0	3.0	3.0	20.0	5.5	3.5	4.0	2.5	3.5	4.0	23.0
	2.5	4.0	3.0	2.0	4.0	4.0	19.5	2.0	3.5	2.0	2.0	1.0	1.0	11.5
	2.0	4.0	1.5	3.5	3.5	4.0	18.5	5.5	5.0	4.0	4.0	4.0	3.0	25.5
MEAN	3.7	5.6	3.4	3.5	3.5	4.0	23.7	4.0	4.3	3.3	3.0	2.7	2.8	20.1
SD	2.0	1.4	1.3	1.5	1.3	1.9		1.9	2.0	1.7	1.7	1.8	1.8	
MEAN GROUP 1 (A+B)	3.8	5.0	3.4	3.2	3.1	3.4	21.9							

	GROUP 2A							GROUP 2B						
	1	2	3	4	5	6	TOTAL	1	2	3	4	5	6	TOTAL
	5.0	6.5	5.5	7.0	6.0	6.0	36.0	2.0	5.5	1.5	1.5	2.0	2.0	14.5
	4.0	6.5	6.0	6.0	5.5	4.5	32.5	5.5	6.5	7.0	4.0	3.0	6.0	32.0
	4.0	7.0	4.0	4.0	4.0	4.0	27.0	5.0	7.0	6.0	6.0	4.5	7.0	35.5
	4.0	7.0	5.0	5.0	4.0	5.0	30.0	3.0	7.0	5.5	3.5	3.5	4.0	26.5
	5.0	6.0	4.0	4.0	3.0	5.0	27.0	2.0	5.0	3.5	3.5	4.5	3.5	22.0
	4.0	5.0	3.5	6.0	5.5	6.0	30.0	6.0	6.5	6.5	5.0	5.0	6.0	35.0
	4.0	6.5	6.5	5.0	5.0	5.5	32.5	3.0	7.0	2.0	4.0	1.0	2.0	19.0
	6.0	6.0	3.0	5.0	7.0	7.0	34.0	6.0	7.0	6.0	5.0	4.0	5.5	33.5
	4.0	7.0	5.0	5.0	5.0	7.0	33.0	5.5	6.5	4.5	6.0	4.0	7.0	33.5
	4.5	7.0	6.0	5.5	4.5	6.5	34.0	3.5	5.0	6.0	4.0	2.0	2.0	22.5
	4.0	7.0	7.0	7.0	4.0	7.0	36.0	5.0	5.0	5.0	5.5	4.5	5.5	30.5
	2.5	7.0	5.0	4.5	4.0	4.0	27.0							
	4.5	6.5	5.5	4.0	4.0	4.0	28.5							
MEAN	4.3	6.5	5.1	5.2	4.7	5.5	31.3	4.2	6.2	4.9	4.4	3.5	4.6	27.7
SD	0.8	0.6	1.1	1.0	1.0	1.1		0.6	0.6	1.2	1.0	1.1	1.0	
MEAN	4.2	6.4	5.0	4.8	4.1	5.0	29.5							

GROUP 2 (A+B)

APPENDIX Q (cont)

CNC NURSES TREATMENT EVALUATION QUESTIONNAIRE

	GROUP 4A							GROUP 4B						
	1	2	3	4	5	6	TOTAL	1	2	3	4	5	6	TOTAL
	7.0	1.5	1.0	1.0	2.5	4.0	17.0	6.0	6.5	4.5	4.0	3.0	5.0	29.0
	6.0	4.5	4.0	4.0	6.0	3.0	27.5	1.0	3.0	1.0	1.0	1.5	2.5	10.0
	4.0	4.0	4.0	2.0	2.0	2.0	18.0	6.0	5.5	3.5	2.5	2.0	5.0	24.5
	3.0	5.0	3.0	2.0	5.0	6.0	24.0	7.0	5.5	2.0	2.0	1.0	1.0	18.5
	7.0	7.0	5.0	3.5	4.5	4.5	31.5	4.0	5.5	4.0	4.0	1.5	2.0	21.0
	7.0	7.0	4.0	6.0	5.5	7.0	36.5	4.0	4.0	4.0	4.0	4.0	4.0	24.0
	1.0	7.0	1.0	4.0	1.0	1.0	15.0	7.0	7.0	4.0	4.0	4.0	4.0	30.0
	4.0	1.5	1.0	1.0	1.0	1.0	12.5							
	4.0	7.0	1.0	1.0	1.0	1.0	15.0							
	2.0	2.0	1.0	2.0	2.0	2.0	11.0							
	4.0	4.0	1.0	1.0	4.0	4.0	18.0							
MEAN	4.5	4.6	2.4	2.5	3.4	3.2	20.5	5.0	5.3	3.3	3.1	2.4	3.4	22.4
SD	2.0	2.1	1.6	1.6	1.7	2.0		2.2	1.9	1.5	1.6	1.8	2.0	
MEAN GROUP 4 (A+B)	4.7	4.9	2.8	2.8	2.9	3.3	21.5							

APPENDIX N

TABLE OF DIFFERENCE SCORES ON ANXIETY AND EXAMINATION VARIABLES

VARIABLE		ALL GROUPS MEAN	ALL GROUPS SD	GROUP 1 MEAN	GROUP 1 SD	GROUP 2 MEAN	GROUP 2 SD	GROUP 3 MEAN	GROUP 3 SD	GROUP 4 MEAN	GROUP 4 SD
FAC	ALL	0.9	4.4	1.2	4.2	-0.9	4.5	0.7	4.0	2.4	4.4
+AAT	HI	2.8	4.5	2.4	5.2	1.4	4.3	2.4	3.2	5.2	4.8
	LO	0.8	4.2	-0.3	1.5	-0.5	4.0	1.1	4.9	3.1	4.0
	MID	-1.2	3.8	-0.1	2.4	-3.2	4.6	-1.7	2.8	0.3	4.1
DEB	ALL	1.3	6.5	5.1	6.9	-0.5	6.6	-0.1	4.5	0.6	6.4
-AAT	HI	4.3	7.3	8.1	7.1	2.5	9.7	-0.4	3.2	6.8	2.5
	LO	-1.5	5.1	-1.7	3.5	-2.4	4.5	0.7	5.6	-2.6	5.7
	MID	0.6	5.5	3.1	5.1	-0.9	5.2	-0.7	4.7	1.0	6.4
ANTI	ALL	-0.2	9.6	4.3	11.2	-0.4	8.4	-1.8	7.9	-2.8	9.5
ANX	HI	1.3	4.5	4.4	13.4	-3.5	11.9	0.3	5.2	4.0	13.0
	LO	-1.4	7.3	3.0	4.0	-0.5	5.7	-2.9	9.7	-5.2	6.6
	MID	0.1	9.4	4.6	10.1	2.3	7.3	-2.9	8.5	-3.6	9.7
SUD	ALL	4.4	11.4	10.9	11.1	1.8	13.1	2.0	7.9	2.7	10.3
	HI	1.4	13.0	12.0	11.3	-5.8	13.6	3.5	7.7	-4.2	9.6
	LO	3.6	9.8	5.0	11.1	4.1	12.2	2.9	6.8	2.6	10.1
	MID	5.6	11.0	11.3	11.6	5.6	12.2	-0.9	9.7	6.4	9.9
EXAM	ALL	5.6	11.1	6.2	11.9	9.6	12.3	5.1	9.5	1.5	9.2
	HI	4.4	12.8	7.1	14.0	11.9	10.0	4.6	13.2	-5.8	4.8
	LO	5.1	10.1	-1.7	6.1	9.6	13.4	6.2	7.9	6.0	8.2
	MID	4.8	10.8	7.4	9.8	7.4	13.8	4.3	7.8	0.1	9.7