

THE PSYCHOMETRIC PROPERTIES OF AN EMOTIONAL INTELLIGENCE MEASURE WITHIN A NURSING ENVIRONMENT

S. van der Merwe, Hon. B Com

Mini-dissertation submitted in partial fulfilment of the requirements for the degree Master
Commerce in Industrial Psychology at the North-West University (Potchefstroom Campus)

Study Leader: Dr. C.S. Jonker

Assistant Study Leader: Dr. W.J. Coetzer

November 2005

Potchefstroom

COMMENTS

The reader should keep the following in mind:

- The editorial style as well as the references referred to in this mini-dissertation follow the format prescribed by the Publication Manual (4th ed.) of the American Psychological Association (APA). This practice complies with the policy of the Programme in Industrial Psychology of the North-West University to use APA style in all scientific documents as from January 1999.
- The mini-dissertation is submitted in the form of a research article. The editorial style specified by the South African Journal of Industrial Psychology (which agrees largely with the APA style) is used, but the APA guidelines were followed in constructing the tables.

ACKNOWLEDGEMENTS

I would hereby like to express my gratitude to the following special individuals, without whom this mini-dissertation would not have been possible. I will be forever grateful to:

- My Lord Jesus Christ, who blessed me with the opportunities and potential to be able to accomplish this achievement.
- My family, who provided me with the opportunity to further my education, for their loving support and motivation, not only during this past year, but during every year of my life. Thank you!
- My study leader, Dr. Cara Jonker, who provided me with the needed guidance, support, encouragement and a caring ear, even though I had a different approach to this study.
- For my assistant study leader co-supervisor, Dr. Wilma Coetzer, who helped me tremendously with the statistics.
- Dr. Karina Mostert, for her contributions during the development of the questionnaire and data capturing.
- All the participants in the research project for their hard work in the collection and capturing of the data.
- All of the hospital matrons who took the time to listen to our requests and provided us with the opportunity to conduct research within their hospitals.
- Thank you to Mr. Blaauw for the professional manner in which he conducted the language editing.
- A special word of gratitude to Wihan, who kept me calm during those times when it was difficult to bear the stress, who coped with my mood swings and always stood by me, no matter what.
- Lastly, I would like to acknowledge the financial assistance of the National Research Foundation (NRF; TTK2004062133314) towards this research project. All opinions expressed and conclusions drawn are those of the author and not necessarily to be attributed to the NRF.

TABLE OF CONTENTS

List of Tables	v
Abstract	vi
Opsomming	vii

CHAPTER 1: INTRODUCTION

1.1	Problem statement	1
1.2	Research objectives	10
1.2.1	General objective	10
1.2.2	Specific objectives	10
1.3	Research method	11
1.3.1	Research design	11
1.3.2	Study population	11
1.3.3	Measuring battery	11
1.3.4	Statistical analysis	12
1.4	Overview of chapters	13
1.5	Chapter summary	13

CHAPTER 2: RESEARCH ARTICLE

CHAPTER 3: CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

6.1	Conclusions	53
6.2	Limitations of this research	59
6.3	Recommendations	59
6.3.1	Recommendations for the organisation	59
6.3.2	Recommendations for future research	60
	References	62

LIST OF TABLES

Table	Description	Page
Research Article 1		
Table 1	Measures of Ability Emotional Intelligence	25
Table 2	Measures of Trait Emotional Intelligence	27
Table 3	Characteristics of the Population	33
Table 4	Factor Loadings, Communalities (h^2), Percentage Variance and Covariance for Principal Factor Extraction and Oblique Rotation on EIS items	37
Table 5	Descriptive Statistics, Cronbach Alpha Coefficients of the EIS Dimensions (n = 511)	40
Table 6	Product-Moment Correlation Coefficients between the EIS Dimensions	40
Table 7	MANOVAS – Differences in the Emotional Intelligence Levels of Demographic Groups	42

ABSTRACT

Title: The psychometric properties of an emotional intelligence measure within a nursing environment

Key terms: Emotional intelligence, measures, assessment, validity, nurses, health care environment

Nurses' working environment, together with their patient relationships, can elicit emotions which they will need to manage in order to perform successfully in their daily work activities. It is for this reason that it is crucial that sound emotional intelligence measures should be developed which hospitals can utilise to identify emotionally intelligent individuals for emotionally laden jobs or even to identify their developmental needs within the area of emotional intelligence.

The objective of this study was to investigate the psychometric properties of the Emotional Intelligence Scale (EIS) developed by Schutte and colleagues in 1998 within a nursing environment. A convenience random sample of 511 nurses was taken from hospitals located in the areas of Klerksdorp, Potchefstroom, Krugersdorp, Johannesburg and Pretoria. The EIS was used as a measuring instrument. Cronbach alpha coefficients, Pearson-product correlation coefficients and MANOVAS were used to analyse the data.

The results showed a 5-factor solution for the EIS, which explained 50,04% of the total variance. All of the five dimensions had adequate internal consistencies, except for the Negative Emotions dimension. Lastly, group differences were identified between personnel area and emotional intelligence, as well as between race and emotional intelligence levels.

Recommendations were made for future research.

OPSOMMING

Titel: Die psigometriese eienskappe van 'n emosionele meetinstrument in 'n verpleegomgewing

Sleuteltermes: Emosionele intelligensie, meetinstrumente, assessering, geldigheid, betroubaarheid, verpleegsters, gesondheidsorgomgewing

Verpleegsters se werksomgewing, tesame met hul pasiëntverhoudings, kan emosies ontlok wat hulle sal moet bestuur sodat hulle suksesvol in hul daaglikse werksaktiwiteite kan funksioneer. Dit is om hierdie rede dat dit van die uiterste belang is om 'n grondige emosionele intelligensiemeetinstrument te ontwikkel wat hospitale kan gebruik om emosioneel intelligente individue te identifiseer vir emosioneel gelaaiete poste, of selfs om hul ontwikkelingsbehoefes binne die area van emosionele intelligensie te identifiseer.

Die doelstelling van die studie was om die psigometriese eienskappe van die Emosionele Intelligensieskaal (EIS) wat deur Schutte en kollegas in 1998 ontwikkel is binne 'n verpleegomgewing te ondersoek. 'n Ewekansige gerieflikheidsteekproef ($n = 511$) is onder verpleegsters in die Klerksdorp-, Potchefstroom-, Krugersdorp-, Johannesburg- en Pretoria-omgewing geneem. Die EIS is as meetinstrument gebruik. Cronbach-alfakoëffisiënte, Pearson-produktmomentkorrelasiekoëffisiënte en MANOVAS is gebruik om die data te ontleed.

Die resultate het 'n 5-faktoroplossing vir die EIS getoon, wat 50,04% van die totale variansie verduidelik het. Al vyf die dimensies het geskikte interne konsekwentheid getoon, behalwe vir die Negatiewe Emosies-dimensie. Laastens is daar groepsverskille tussen personeelarea en emosionele intelligensie asook tussen ras en emosionele intelligensievlakke geïdentifiseer.

Aanbevelings vir toekomstige navorsing is aan die hand gedoen.

CHAPTER 1

1. INTRODUCTION

The mini-dissertation determines the Psychometric properties of the Emotional Intelligence Scale developed by Schutte et al. (1998), within a nursing population from in the areas of Klerksdorp, Potchefstroom, Krugersdorp, Johannesburg and Pretoria.

This chapter contains the problem statement and a discussion of the research objectives, which consist of the general objective and specific objectives. The research method is explained and the division of chapters is given.

1.1 PROBLEM STATEMENT

The South African Health Care System has undergone massive changes since 1994 (Geyer, Naude & Sithole, 2002). These include changing laws, regulations and policies that affect daily health care practices (Ehlers, 2000). The way nurses cope with these changes is important since they comprise the largest group of all the health care professionals (Ehlers, 2000).

Nurses operate at primary, secondary and tertiary levels of care and employ a holistic view when treating patients. They focus not only on the medical treatment of the illness, but also on the human response of the patient to his or her problem. For this reason nurses form the backbone of the health care services (Geyer et al., 2002) and can have a great impact on the individual's ability to overcome the initial medical problem (Anon, 2001).

Selye (1976) indicated that nursing is one of the most stressful professions, since the health care setting is seen as lacking in autonomy, physical comfort, role clarity and involvement in decision-making (Williams, Michie & Pattani, 1998); it also places more emphasis on work demands than non-health care settings. Furthermore, assault, threatening behaviour from patients and visitors, verbal aggression and violence are also reported by hospital staff members (Arnetz, Arnetz & Petterson, 1996; Winstanley & Whittington, 2004).

In addition to the victimisation, nurses are exposed to long working hours, extended days and shift-work schedules and psychological strain, due to their permanent contact with human suffering and death (Poissonnet & Véron, 2000). Some staff members also experience profound psychological effects, such as post-traumatic stress (Rippon, 2000), anxiety (Ryan & Poster, 1993), fatigue, sleep disturbances and increased smoking and alcohol consumption (Whittington & Wykes, 1989).

The occurrence of psychological distress, post-traumatic stress, smoking and alcohol consumption amongst hospital staff can be moderated by their level of emotional intelligence (EI). EI has been found to be negatively correlated with psychological distress (Slaski & Cartwright, 2002), and negative associations were found between EI and smoking and alcohol consumption in adolescents (Trinidad & Johnson, 2002). Furthermore, preliminary evidence suggests that some forms of emotional intelligence may protect people from stress and lead to better adaptation (Ciarrochi, Deane & Anderson, 2002). Thus, individuals with higher EI tend to experience less trauma-related symptoms (Hunt & Evans, 2004), and it is for this reason that nurses need to possess certain emotional and social competencies, in order for them to be able to cope within their chaotic and stressful work environments (Bellack, 1999).

Emotions (such as disappointment, happiness and dissatisfaction) form an integral part of any individual's work life (Humpel, Caputi & Martin, 2001) this is especially true for nurses who's work is loaded with emotions. For this reason, research is beginning to focus on understanding the causes and effects of emotions (Weiss & Cropanzano, 1996) by conducting studies within the field of emotional intelligence.

A number of researchers have suggested that emotional intelligence can have a positive impact on an individual's life. These positive outcomes include increased life satisfaction (Austin, Saklofske & Egan, in press; Ciarrochi, Chan & Caputi, 2000; Mayer, Caruso & Salovey, 1999; Palmer, Donaldson & Stough, 2002; Saklofske, Austin & Minski, 2003), stress tolerance (Parker, Taylor & Bagby, 2001), empathy (Ciarrochi et al., 2000), smoother interpersonal interactions (Mayer, Salovey & Caruso, 2000a) with family members and peers (Mayer et al., 1999; Rice, 1999; Trinidad & Johnson, 2001) as well as increased job performance (Mayer et al., 2000a),

which could be the result of a "better prioritising of life needs and goals", as speculated by Mayer and Salovey (1993, p. 437). Individuals and organisations as a whole can benefit from EI, but it is important to note that when reference is made to the construct, the construct will be conceptualised either as ability-based EI or trait-based EI.

An ability model of emotional intelligence was first presented by Salovey and Mayer in 1990. This was later followed by mixed models (ability and personality characteristics), particularly those of Goleman (1995) Bar-On (1997).

Ability models define EI "as a set of conceptually related mental abilities to do with emotions and the processing of emotional information, that are a part of, and contribute to logical thought and intelligence in general" (Palmer, Manocha, Gignac & Stough., 2003). Salovey and Mayer considered EI to contain four domains of ability: perception and expression of emotion, assimilating emotion in thought, understanding and analysing emotion and reflective regulation of emotion.

Mixed models of EI, in comparison, define EI as a mixture of emotion-related competencies, personality traits and dispositions (Palmer et al., 2003). Goleman (1995) also proposed five key areas consisting of: intrapersonal and interpersonal skills, adaptability scales, stress management scales and general mood. Bar-On (1997) proposed five key areas: knowing one's emotions, managing emotions, motivating oneself, recognising emotions in others and handling relationships.

According to Mayer, Caruso and Salovey's (2000b) ability model, emotional intelligence refers to the abilities used to process information about one's own and others' emotions. This ability model consists of:

- *Emotional perception*, which refers to the ability to register, attend to and decipher emotional messages that are expressed within a variety of contexts, including facial expressions, tone of voice and works of art.

- *Emotional integration*, which refers to an individual's ability to assess and generate feelings that facilitate thought.
- *Emotional understanding*, which is the ability to comprehend the implications of emotions. Individuals with well-developed emotional understanding skills can understand how one emotion leads to another, how emotions change over time and how the temporal patterning of emotions can affect relationships.
- *Emotional management*, which is the ability to regulate emotions. Individuals can choose whether they want to be open to the experience of an emotion, and are able to control the way in which they express their emotions.

Thus, emotional intelligence involves “the ability to monitor one's own and others' feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions” (Salovey & Mayer, 1990, p. 189).

Results regarding emotional intelligence and gender differences have been replicated on various occasions. This is significant for this study, since women dominate and lead in the nursing profession (Van der Merwe, 1999). Empirical research indicates that women score higher in measures of EI than males (Charbonneaux & Nicol, 2002; Ciarrochi et al., 2000; Mayer & Geher, 1996; Mayer et al., 2000b; Petrides & Furnham, 2000; Van Rooy & Viswesvaran, 2003). Van Rooy and Viswesvaran (2003) further state that this occurrence is not surprising since women have better emotional and interpersonal skills than males. However, these gender differences appear to be more pronounced in studies examining ability-based EI (Day & Carroll, 2004).

Discrepancies regarding age differences in EI are also found in the literature. Research conducted by Bar-On (1997) found that EQ-i and scales scores were positively and significantly related to age. Age was broken into 10-year blocks, with the 40-49 year-old age group consistently having the highest mean values across domains. This finding was replicated by Derkesen, Kramer and Katzko (2002) and can also be supported by research conducted by

Hemmati, Mills and Kroner (2004). Mayer et al. (1999) found that adults score higher on EI, while Roberts, Zeidner and Matthews (2001) found no significant age differences.

Emotional intelligence models include a range of subcomponents covering inter- and intra-personal emotional skills (such as mood regulation and emotion perception), with the broad measure of emotional capabilities provided by the overall EI playing an analogous role (Austin, 2004). The most appropriate method of measuring EI is currently an area of controversy (Austin, 2004). This could be ascribed to the scarcity of published studies or scientific evidence on emotional intelligence (Barret, Miguel, Tan & Hurd, 2001).

Since Salovey and Mayer's conceptualisation of emotional intelligence, a number of different EI models and measures have been developed (e.g. ability and mixed). These models and measures all share a common feature, namely a hierarchical structure (Austin, 2004). The Emotional Intelligence Scale of Schutte et al. (1998) is a unidimensional self-report measure of EI, which is based on Salovey and Mayer's (1990) ability model of EI (Van Rooy, Alonso & Viswesvaran, 2005) and is widely used for research purposes.

The 33-item emotional intelligence scale (EIS; Schutte et al., 1998) assesses EI based on self-report responses tapping the appraisal and expression of emotions in self and others; regulation of emotions in self and others; and utilisation of emotions in problem solving. Three of the scale's items (5, 28 and 33) are reverse-scored (Petrides & Furnham, 2000) and participants respond by indicating their agreement to each of the 33 statements using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). A high score reflects a high level of emotional intelligence (Venter, 2003).

Validity of the EIS

Validity refers to the extent to which a measure accurately reflects the concept that it is intended to measure (www.iffgd.org/GIDisorders/glossary.html). Validity implies reliability (accuracy). A valid measure must be reliable, but a reliable measure need not be valid ([en.wikipedia.org/wiki/Validity\(statistics\)](http://en.wikipedia.org/wiki/Validity(statistics))).

Schutte and colleagues demonstrated the measure's good reliability and predictive validity. But before the predictive validity of an EI measure can be tested empirically, the construct validity of the EI measure must first be established (Day & Carrol, 2004). Various methods can be used to demonstrate a measure's construct validity:

- A specific measure of EI can be correlated with existing measures of the same construct, referred to as convergent validity (Crocker & Algina, 1986). In the case of emotional intelligence it would be difficult to determine its convergent validity due to the fact that very few valid measures of EI exist (Day & Carrol, 2004).
- A measure's factor structure can be examined. The measure's factor structure should comprise the theorised number and pattern of factors (Crocker & Algina, 1986).
- The measure's discriminate validity can be determined. Discriminate validity can be established by showing that the specific measure does not correlate with theoretically unrelated constructs. The EIS should demonstrate low or non-significant correlations with personality (Day & Carrol, 2004) if it is to be consistent with the ability-based EI model of Mayer et al.'s (2000a). It should be noted that the EIS has consistently been found to be significantly related to measures of personality (Saklofske, Austin & Minski, 2003; Schutte et al., 1998). Furthermore, evidence suggests that emotional intelligence has substantial and significant correlations with theoretically related constructs such as alexithymia, mood repair, optimism and impulse control (Schutte et al., 1998).
- The extent to which the measure differentiates between groups, on theoretical grounds, can be established, which can also support inferences about construct validity (Day & Carrol, 2004). Roberts et al. (2001) conducted one of the few studies that evaluated ethnic group differences in EI and found conflicting results. In the light of their mixed findings, Roberts et al. (2001) state that there is currently an urgent need for studies exploring group differences in EI.

Research conducted by Petrides and Furnham (2000) suggests that the scale has face validity, as well as some evidence of construct, predictive and discriminate validities.

Reliability of the EIS

Reliability refers to the extent to which a measurement instrument yields consistent, stable and uniform results over repeated observations or measurements under the same conditions each time (www.jrsa.org/jjec/resources/definitions.html).

Studies conducted by Ciarrochi and colleagues indicate that the reliability of the EIS factors are considerably lower than the reliability of the full measure, which has proven to be very reliable (Ciarrochi et al., 2002). Furthermore, the EIS has demonstrated high internal consistency (Cronbach α ranging from 0, 87 to 0, 90) and good two-week test-retest reliability ($r = 0, 78$) (Schutte et al., 1998).

Even though studies conducted on the psychometric properties of the EIS indicate that it possesses some form of validity and reliability, the major criticism against the usability of the EIS is its factor structure. Schutte et al. (1998) proposed that their scale was unidimensional, but in contrast research conducted by others suggests otherwise. A factor analysis of Canadian data resulted in a three-factor structure for the EIS (Austin et al., in press). Petrides and Furnham (2000) settled on a four-factor solution after finding evidence for two-factor and ten-factor structures, while stating that they might have overestimated the number of factors. Ciarrochi et al. (2002) replicated a four-factor structure but there were differences in some of the item loadings and classifications. Similarly, Saklofske et al. (2003) replicated a four-factor solution, but again, not all of the items loaded on the same factors. Results attained by Chan (2004) through the use of an exploratory item factor analysis indicated that the 33 items emerged in meaningful clusters, describing four dimensions of perceived emotional intelligence.

Based on the research and findings of Petrides and Furnham (2000) a four sub-scale structure is proposed for the EIS:

- *Optimism/mood regulation*

This sub-scale indicates the extent to which an individual expects that he or she can overcome a problem and be successful in performing activities and tasks. These individuals have the ability to seek out activities that will enable them to experience positive emotions. Furthermore, they are able to motivate themselves by imagining that a task has a positive outcome (Venter, 2003).

- *Appraisal of emotions*

This sub-scale indicates the extent to which an individual is aware of the emotions he or she is experiencing. It also includes the awareness of the individual regarding the non-verbal messages he or she is sending to others, as well as the individual's ability to appraise non-verbal communication of others (Venter, 2003).

- *Social skills*

This sub-scale indicates the extent to which an individual feels comfortable in sharing his or her emotions with others, whether he or she can sense when to share emotions and when not to. At the same time it indicates the extent to which the individual is available or open so that others can share their emotions with the individual. Lastly, it indicates the individual's ability to exhibit empathy (Venter, 2003).

- *Utilisation of emotions*

This subscale indicates the extent to which the individual utilises positive emotions to identify new possibilities, solve problems and generate good ideas (Venter, 2003).

Petrides and Furnham (2000) suggest that both the factor scores and a total score be used due to the clear evidence of the scales' multidimensionality when interpreting the EIS.

Even though the idea of emotional intelligence and its measurement is an appealing one, additional research on its psychometric properties and predictive validity is required (Austin et al., in press). A reliable and valid instrument is required in the measurement of emotional intelligence in order to conduct empirical research, and is also needed for the purpose of individual assessment.

In terms of the individual assessment, a valid and reliable EI measure can be used to:

- Understand an individual's own important characteristics so that they can better set goals and work toward these goals;
- Determine problems experienced in areas related to emotional intelligence (such as impulse control); and
- Determine for which careers or settings emotional intelligence would be a prerequisite (Schutte et al., 1998).

A valid and reliable EI measure is not only important for the individual, but also for organisations who wish to incorporate emotional intelligence within their selection criteria and training and development programs.

The following research questions emerge from the above-mentioned problem statement:

- How are emotional intelligence and the importance of emotional intelligence within a nursing environment, conceptualised in the literature?
- How are the most important measurements of emotional intelligence and the nature thereof conceptualised in the literature?
- What is the construct validity and internal consistency of the Emotional Intelligence Scale within the health care environment?
- What is the relationship of emotional intelligence with various demographic characteristics?
- What recommendations can be made regarding the use of an emotional intelligence measure?

- What recommendations can be made regarding future research on the psychometric properties of an emotional intelligence measure?

1.2 RESEARCH OBJECTIVES

The research objectives can be divided into general and specific objectives.

1.2.1 General objective

The general objective of this research is to determine the construct validity and internal consistency of the EIS for nursing staff situated in the areas of Klerksdorp, Potchefstroom, Krugersdorp, Johannesburg and Pretoria areas.

1.2.2 Specific objectives

The specific objectives in this research are as follows:

- To conceptualise emotional intelligence and the importance of emotional intelligence in a nursing environment.
- To conceptualise the most important measurements of emotional intelligence and the nature thereof.
- To determine the construct validity and internal consistency of the Emotional Intelligence Scale in a health care environment.
- To compare the relationship of emotional intelligence with various demographic characteristics.
- To make recommendations regarding the use of a standardised emotional intelligence measure.
- To make recommendations regarding future research on the psychometric properties of an emotional intelligence measure.

1.3 RESEARCH METHOD

The research method consists of a literature review and an empirical study. The results are presented in the form of a research article. Because separate chapters are not targeted for literature reviews, this paragraph focuses on aspects relevant to the empirical study that is conducted. The reader should note that a brief literature review is compiled for the purpose of the article.

1.3.1 Research design

A cross-sectional survey design is used to collect the data and to achieve the research objectives. Cross-sectional designs is used to examine groups of subjects in various stages of development simultaneously, while surveys involve a technique of data collection in which questionnaires are used to gather data about the identified population (Burns & Grove, 1993). This design is best suited to the descriptive and predictive functions associated with correlation research, whereby the relationships between variables are examined (Shaughnessy & Zechmeister, 1997).

1.3.2 Study population

The participants used in the research are selected randomly from the population, and this random process increased the accuracy of the conclusions drawn regarding the whole group (Spector, 2000). A convenience random sample ($n = 511$) is taken from hospitals in the Klerksdorp, Potchefstroom, Krugersdorp, Johannesburg, Pretoria and Vanderbijlpark areas.

1.3.3 Measuring battery

A biographical questionnaire is included in order to describe the population, while the EIS is used to measure Emotional Intelligence.

- The *Biographical Questionnaire* is included to describe the population. It includes basic biographical questions like age, gender, race, the area in which the individual is

employed, the number of years they have been employed and whether or not they were working on contract terms, as well as their educational level and the hours they worked per week.

- The *Emotional Intelligence Questionnaire (EIS)* (Schutte et al., 1998) comprises 33 items, three of which (5, 28 and 33) are reverse-scored. Participants rated themselves in terms of how much they agree or disagree with each statement on a 5-point Likert scale (1=strongly disagree; 5=strongly agree) and a total score was derived by summing up the item responses. Validation studies included correlations with theoretically related constructs (e.g. alexythimia, pessimism, and depression), *t*-tests between various groups (e.g. therapists, prisoners, clients in a substance abuse program) and correlations with each of the Big 5 higher-order factors (Petrides & Furnham, 2000).

1.3.4 Statistical analysis

The statistical analysis is carried out with the SPSS programme (SPSS, 2003). The dataset is studied to identify bivariate and multivariate outliers. To identify bivariate outliers, the data is standardised (to z-scores). Values higher than 2,58 are inspected to decide whether they should be deleted from the dataset. An inspection is also made of the anti-image scores of the different items. Items with scores lower than 0,6 are problematic and may therefore be excluded in the rest of the statistical analysis.

Furthermore, missing values are analysed and replaced where possible. Principal factor extraction with oblique rotation is performed on the measuring instrument to determine the factor structure. Principal component extraction is used prior to principal factor extraction to estimate the number of factors, presence of outliers and factorability of the correlation matrices. The eigenvalues and scree plot are studied to determine the number of factors underlying the specific measuring instrument. A second-order factor analysis is also computed on the extracted factors.

Descriptive statistics (e.g. means, standard deviations, range, skewness and kurtosis) and inferential statistics are used to analyse the data. In terms of statistical significance it is decided

to set the value at a 95% confidence interval level ($p \leq 0,05$). Effect size (Steyn, 1999) is used to decide on the practical significance of the findings. Pearson product-moment correlation coefficients are used to specify the relationship between the variables. A cut-off point of 0,30 (medium effect) (Cohen, 1998) is set for the practical significance or correlation coefficients. T-tests, ANOVA and MANOVA are used to determine the differences between groups.

Cronbach alpha coefficients are used to determine the internal consistency, homogeneity and unidimensionality of the measuring instrument (Clark & Watson, 1995). Coefficient alpha contains important information regarding the proportion of variance of the items of a scale in terms of the total variance explained by the particular scale.

1.4 OVERVIEW OF CHAPTERS

In Chapter 2, the psychometric properties of the Emotional Intelligence Scale are discussed. The chapter also deals with the empirical study and the results obtained will be given in table form and discussed briefly. Chapter 3 deals with the discussion, limitations and recommendations for this study.

1.5 CHAPTER SUMMARY

In this chapter the problem statement and research objectives were discussed. The measuring instruments and research method used in this research study were explained. Lastly, a brief overview of the chapters was given.

REFERENCES

- Anon. (2001). Registered nurses: A distinctive health care profession. *International Nursing Review*, 47, 38-39.
- Arnetz, J.E., Arnetz, B.B. & Petterson, I.L. (1996). Violence in the nursing profession: Occupational and lifestyle risk factors in Swedish nurses. *Work and Stress*, 10(2), 119-127.
- Austin, E.J. (2004). An investigation of the relationship between trait emotional intelligence and task performance. *Personality and Individual Differences*, 36, 1855-1864.
- Austin, E.J., Saklofske, D.H. & Egan, V. (in press). Personality, well-being and health correlates of trait emotional intelligence. *Personality and Individual Differences*.
- Bar-On, R. (1997). The Emotional Quotient Inventory (EQ-I): A test of emotional intelligence. In: R. Bar-On & J. Parker (Eds.). *The handbook of emotional intelligence*. San Francisco: Jossey-Bass Inc.
- Barret, G.V., Migual, R.F., Tan, J.A. & Hurd, J.M. (2001). Emotional intelligence: The Madison Avenue approach to science and professional practice. Paper presented at the 16th Annual Conference of the Society for Industrial and Organizational Psychology, San Diego, CA.
- Bellack, J.P. (1999). Emotional intelligence: A missing ingredient? *Journal of Nursing Education*, 28, 3-4.
- Burns, N. & Grove, S.K. (1993). *The practice of nursing research, conduct, critique, and utilization* (2nd ed.). Philadelphia, PA: Saunders.
- Chan, D.W. (2004). Perceived emotional intelligence and self-efficacy among Chinese secondary school teachers in Hong Kong. *Personality and Individual Differences*, 36, 1781-1795.
- Charbonneau, D. & Nicol, A.M. (2002). Emotional intelligence and pro-social behaviours in adolescents. *Psychological Reports*, 90(2), 361-370.
- Ciarrochi, J.V., Chan, A.Y.C. & Caputi, P. (2000). A critical evaluation of the emotional intelligence construct. *Personality and Individual Differences*, 28, 539-561.
- Ciarrochi, J.V., Deane, F.P. & Anderson, S. (2002). Emotional intelligence moderates the relationship between stress and mental health. *Personality and Individual Differences*, 32, 197-209.

- Clark, L.A. & Watson, D. (1995). Constructing validity: Basic issues in objective scale development. *Psychological Assessment*, 7, 309-319.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum & Associates.
- Crocker, L. & Algina, A. (1986). *Introduction to classical and modern tests theory*. Toronto, ON: Harcourt Brace Jovanovich College Publishers.
- Day, A.L. & Carroll, S.A. (2004). Using an ability-based measure of emotional intelligence to predict individual performance, group performance, and group citizenship. *Personality and Individual Differences*, 36, 1443-1458.
- Definitions on the Web. Retrieved 22 August 2005 from the World Wide Web: www.jrsa.org/jjec/resources/definitions.html.
- Definitions on the Web. Retrieved 22 August 2005 from the World Wide Web: [www.en.wikipedia.org/wiki/Validity \(statistics\)](http://www.en.wikipedia.org/wiki/Validity_(statistics))
- Definitions on the Web. Retrieved 22 August 2005 from the World Wide Web: www.iffgd.org/GIDisorders/glossary.html.
- Derkesen, J., Kramer, I. & Katzko, M. (2002). Does a self-report measure for emotional intelligence assess something different than general intelligence? *Personality and Individual Differences*, 32, 37-48.
- Ehlers, V.J. (2000). Nursing and politics: A South African perspective. *International Nursing Review*, 47, 74-82.
- Geyer, N., Naude, S. & Sithole, G. (2002). Legislative issues impacting on the practices of the South African nurse practitioner. *Journal of the American Academy of Nurse Practitioners*, 14(1), 11-15.
- Goleman, D. (1995). *Emotional intelligence*. New York: Basic Books.
- Hemmati, T., Mills, J.F. & Kroner, D.G. (2004). The validity of the Bar-On emotional intelligence quotient. *Personality and Individual Differences*, 37, 695-706.
- Humpel, N., Caputi, P. & Martin, C. (2001). The relationship between emotions and stress among mental health nurses. *Australian and New Zealand Journal of Mental Health Nursing*, 10, 55-60.
- Hunt, N. & Evans, D. (2004). Predicting traumatic stress using emotional intelligence. *Behaviour Research and Therapy*, 42, 791-798.

- Mayer, J.D. & Geher, G. (1996). Emotional intelligence and the identification of emotion. *Intelligence*, 22, 89-113.
- Mayer, J.D. & Salovey, P. (1993). The intelligence of emotional intelligence. *Intelligence*, 17, 433-442.
- Mayer, J.D., Caruso, D.R. & Salovey, P. (1999). Emotional intelligence meets traditional standards for an intelligence. *Intelligence*, 27, 267-298.
- Mayer, J.D., Salovey, P. & Caruso, D.R. (2000a). Models of emotional intelligence. In: R.J. Sternberg (Ed.). *Handbook of human intelligence* (396-420). New York: Cambridge.
- Mayer, J.D., Salovey, P. & Caruso, D. (2000b). Test manual for the Mayer, Salovey, Caruso emotional intelligence test. *Research version 1.1* (3rd ed.). Canada, Toronto: MHS.
- Palmer, B., Donaldson, C. & Stough, C. (2002). Emotional intelligence and life satisfaction. *Personality and Individual Differences*, 33, 1091-1100.
- Palmer, B.R., Manocha, R., Gignac, G. & Stough, C. (2003). Examining the factor structure of the Bar-On emotional quotient inventory with an Australian general population sample. *Personality and Individual Differences*, 35, 1191-1210.
- Parker, D.A., Taylor, G.J. & Bagby, R.M. (2001). The relationship between emotional intelligence and alexithymia. *Personality and Individual Differences*, 30, 107-115.
- Petrides, K.V. & Furnham, A. (2000). On the dimensional structure of emotional intelligence. *Personality and Individual Differences*, 29, 313-320.
- Poissonnet, C.M. & Véron, M. (2000). Review: Health effects of work schedules in health care professions. *Journal of Clinical Nursing*, 9, 3-10.
- Rice, C.L. (1999). *A quantitative study of emotional intelligence and its impact on team performance*. Unpublished master's thesis, Pepperdine University, Malibu, CA.
- Rippon, T. (2000). Aggression and violence in health care professions. *Journal of Advanced Nursing*, 31, 452-460.
- Roberts, R.D., Zeidner, M. & Mathhews, G. (2001). Does emotional intelligence meet traditional standards for an intelligence?: Some new data and conclusions. *Emotion*, 1, 196-231.
- Ryan, J. & Poster, E. (1993). Workplace violence: Nurses' experiences of assault by patients. *Nursing Times*, 89, 38-41.

- Saklofske, D.H., Austin, E.J. & Minski, P.S. (2003). Factor structure and validity of a trait emotional intelligence measure. *Personality and Individual Differences*, 34, 707-721.
- Salovey, P. & Mayer, J.D. (1990). Emotional intelligence. *Imagination, Cognition and Personality*, 9, 185-211.
- Schutte, N.S., Malouff, J.M., Hall, L.E., Haggerty, D.J., Cooper, J.T., Golden, C.J. & Dornheim L. (1998). Development and validation of a measure of emotional intelligence. *Personality and Individual Differences*, 25, 167-177.
- Selye, H. (1976). *The stress of life*. New York: McGraw-Hill.
- Shaughnessy, J. J. & Zechmeister, E. B. (1997). *Research methods in psychology* (4th ed.). New York: McGraw-Hill.
- Slaski, M. & Cartwright, S. (2002). Health, performance and emotional intelligence: An exploratory study of retail managers. *Stress and Health*, 18, 63-68.
- Spector, P.E. (2000). *Industrial and organizational psychology: Research and practice* (2nd ed.). New York: John Wiley.
- SPSS Inc. (2003). *SPSS 12.0 Windows*. Chicago, IL: Author.
- Steyn, H.S. (1999). *Praktiese betekenisvolheid: Die gebruik van effekgroottes*. Wetenskaplike bydraes – Reeks B: Natuurwetenskappe Nr. 117. Potchefstroom: PU vir CHO.
- Trinidad, D.R. & Johnson, C.A. (2001). The association between emotional intelligence and early adolescent tobacco and alcohol use. *Personality and Individual differences*, 32, 95-105.
- Van der Merwe, A.S. (1999). The power of women as nurses in South Africa. *Journal of Advanced Nursing*, 30(6), 1272-1279.
- Van Rooy, D.L. & Viswesvaran, C. (2003). *The emotionally intelligent female: A meta-analysis of gender differences*. Unpublished data, Florida International University.
- Van Rooy, D.L., Alonso, A. & Viswesvaran, C. (2005). Group differences in emotional intelligence scores: Theoretical and practical implications. *Personality and Individual Differences*, 38(3), 689-700.
- Venter, M. (2003). *Die verwantskap tussen koherensiesin en emosionele intelligensie*. Ongepubliseerde meestersverhandeling, Randse Afrikaanse Universiteit, Johannesburg.
- Weiss, H.M. & Cropanzano, R. (1996). Affective events theory: A theoretical discussion of the structure, causes, and consequences of affective experience at work. In: B.M. Staw & L.L. Cummings (Eds.). *Research in Organizational Behaviour*, 18. London: JAI Press Inc.

- Whittington, R. & Wykes, T. (1989). Invisible injury. *Nursing Times*, 85, 30-32.
- Williams, S., Michie, S. & Pattani, S. (1998). *Improving the health of the NHS workforce: Report of the partnership on the health of the NHS workforce*. London: Nuttfield Trust.
- Winstanley, S. & Whittington, R. (2004). Aggression towards health care staff in a UK general hospital: Variations among professions and departments. *Journal of Clinical Nursing*, 13, 3-10.

THE PSYCHOMETRIC PROPERTIES OF AN EMOTIONAL INTELLIGENCE MEASURE WITHIN A NURSING ENVIRONMENT

S. VAN DER MERWE

C.S. JONKER

W.J. COETZER

*WorkWell: Research Unit for People, Policy and Performance, Faculty of Economic and
Management Sciences, Potchefstroom Campus, North-West University*

ABSTRACT

The objective of this study was to investigate the psychometric properties of the Emotional Intelligence Scale (EIS) developed by Schutte and colleagues in 1998 within a nursing environment. A convenience random sample of 511 nurses was taken from hospitals located in the areas of Klerksdorp, Potchefstroom, Krugersdorp, Johannesburg and Pretoria. The EIS was used as a measuring instrument. Cronbach alpha coefficients, Pearson-product correlation coefficients and MANOVAS were used to analyse the data. The results showed a 5-factor solution for the EIS, which explained 50,04% of the total variance. All of the five dimensions had adequate internal consistencies, except for the Negative Emotions dimension. Lastly, group differences were identified between personnel area and emotional intelligence, as well as between race and emotional intelligence levels.

OPSOMMING

Die doelstelling van die studie was om die psigometrie eienskappe van die Emosionele Intelligensieskaal (EIS) wat deur Schutte en kollegas in 1998 ontwikkel is binne 'n verpleegomgewing te ondersoek. 'n Ewekansige gerieflikheidsteekproef ($n = 511$) is onder verpleegsters in die Klerksdorp-, Potchefstroom-, Krugersdorp-, Johannesburg- en Pretoria-omgewing geneem. Die EIS is as meetinstrument gebruik. Cronbach-alfakoëffisiënte, Pearson-produktmomentkorrelasiekoëffisiënte en MANOVAS is gebruik om die data te ontleed. Die resultate het 'n 5-fakteloplossing vir die EIS getoon, wat 50,04% van die totale variansie verduidelik het. Al vyf die dimensies het geskikte interne konsekwentheid getoon, behalwe vir die Negatiewe Emosies-dimensie. Laastens is daar groepsverskille tussen personeelarea en emosionele intelligensie asook tussen ras en emosionele intelligensievlakke geïdentifiseer.

* The financial assistance of the National Research Foundation (NRF) towards research is hereby acknowledged. Opinions expressed and conclusions drawn are those of the authors and are not necessarily to be attributed to the NRF.

Human service occupations are sometimes called “direct person-related jobs”, since their primary task is to modify a patient physically or psychologically. Human services comprise occupations such as counsellors, social workers, nurses and teachers. Individuals who find themselves within the nursing profession possess qualities of dedication, care, nurturing, comfort; concern for others, and they are also motivated by their desires to help people (Davies, 1994) and to preserve life (Brysiewicz, 2002).

Since the elections in 1994, there have been major changes in the nursing profession. In November 1996, the South African Nursing Association dissolved and transferred its assets to the Democratic Nursing Organization of South Africa (DENOSA) to form a unitary, non-racial professional association. Even though the South African Nursing Council’s members are now more representative of the general population and legal discrimination has been removed, nurses still find themselves working under very difficult conditions (Jewkes, Abrahams & Mvo, 1998).

In many parts of South Africa, hospital overcrowding and staff shortages persist (Jewkes et al., 1998). The health care setting can be described as lacking in autonomy, physical comfort, role clarity and involvement in decision-making (Williams, Michie & Pattani, 1998). Furthermore, nurses are also exposed to long working hours, extended days and shift-work schedules (Poissonnet & Véron, 2000), which increase the burden of balancing their work and home lives (Jewkes et al., 1998).

The increase in the occurrence of violence is another serious problem for South Africa, and it is affecting the nursing profession too. Jewkes et al. (1998) state that violence on taxi routes, including the indiscriminate shooting of commuters, is an ever-present problem for many nurses who lack own transport. Criminal violence is pervasive, with very high rates of rape and murder. In addition many nurses, as lots of other South African women, have to contend with very high levels of domestic violence (Jewkes et al., 1998). This permanent contact with human suffering and death causes psychological strain (Poissonnet & Véron, 2000).

Nurses' working conditions, along with their unique characteristics, knowledge, skills, motivation and expectations as well as the behaviour of patients (Dollard, Dormann, Boyd,

Winefield & Winefield, 2003) will determine the quality of the care provided by the nurse. It should be remembered that the performance of human service professionals is inextricably related to strain and emotions (Oginska-Bulik, 2005), which are caused by both the interaction with others and the working conditions experienced. These inherent factors could lead to stress (Oginska-Bulik, 2005) and other psychological effects, such as post-traumatic stress (Rippon, 2000), anxiety (Ryan & Poster, 1993), fatigue, sleep disturbances and increased smoking and alcohol consumption (Whittington & Wykes, 1989). Thi Lam and Kirby (2002) believe that the specific emotions experienced and their interpretation and regulation, rather than their presence per se, may cause problems for task performance.

Emotions (such as disappointment, happiness and dissatisfaction) form an integral part of any individual's work life (Humpel, Caputi & Martin, 2001), but the presence of emotions in itself can be stressful. Such is the case with human service occupations, for example the nurse-patient relationship, which requires the expression of positive, and sometimes negative, emotions towards clients/patients (Oginska-Bulik, 2005). Human service professionals frequently display emotions, usually positive, that are incongruent with those genuinely felt (neutral or negative). This frequent experience of emotional dissonance leads to the loss of the capability to regulate one's own emotions (Oginska-Bulik, 2005), which according to Ciarrochi, Deane and Anderson (2002) increases the likelihood of experiencing depression, hopelessness and suicide ideation when under stress.

Individuals do not cause or have control over the emotions that they experience (Thi Lam & Kirby, 2002), because the "connections from the emotional systems to the cognitive systems are stronger than connections from the cognitive systems to the emotional systems of the brain" (LeDoux, 1996, p.19). However, once emotions occur and are recognised by the cognitive system (Thi Lam & Kirby, 2002), individuals are able to identify and control their own and others' emotions and be less likely to become paralysed by fear and strangled by anxiety (Seipp, 1991); they are also more likely to be able to channel their positive emotions and use them to achieve maximum personal engagement and productivity within themselves and others (Thi Lam & Kirby, 2002).

According to Oginska-Bulik (2005), the ability to regulate your own emotions, together with the ability to recognize others' emotions (defined as emotional intelligence), seems to be very important in human service work. Emotional intelligence encompasses the human skills of empathy, self-awareness, motivation, self-control (Reynolds & Scott, 2000) and adeptness in relationships, all of which are recognized as being central in effective clinical nursing practice (McCormack, 1993; Taylor, 1994).

Empathy forms the basis of the therapeutic relationship. The nurse-patient relationship will be without care or compassion if empathy is lacking or if there is no sense of another person's need or despair (Reynolds & Scott, 2000). This will result in the non-realisation of the beneficial client/patient outcome (Cadmman & Brewer, 2001; Reynolds & Scott, 2000). Thus, to ensure the successful and effective job performance of nurses, they must be able to respond with empathy, warmth and communicate genuine concern (Cadmman & Brewer, 2001), in short, be emotionally intelligent.

When the focus is shifted from the therapeutic relationship between the health care worker and the client/patient towards working conditions, research indicates that emotional intelligence plays a significant role. Svyantek and Rahim (2002) indicate that EI may be an important adaptive mechanism for helping individuals interact with their environment, including their work environment. Furthermore, Goleman (1998) states that EI is twice as important as technical skills and more important than IQ for success in jobs at all levels. Weisinger (1998) also supports this statement by suggesting that EI is related to success at work and plays a significant role in certain aspects of effective team leadership and team performance.

Within the human service environment, work overload, lack of rewards and social relations were found to be most stressful (Oginska-Bulik, 2005). A study conducted by Cadmann and Brewer (2001) amongst health service professionals indicates the buffering role of emotional intelligence in relation to stress. They found a significant negative relationship between emotional intelligence and perceived workplace stress. Supporting research evidence provided by Bellack (1999) states that nurses need to possess certain emotional and social competencies in order for them to be able to cope within their chaotic and stressful work environments.

When referring to emotional intelligence, recognition should be given not only to the ways in which people differ in their ability to understand and make use of their own and others' emotions (Austin, 2005), but also to the way individuals differ demographically in terms of EI.

A demographic variable widely analysed in organizational research is gender differences (Dietz-Uhler & Murrell, 1998; Eagly, 1995; Fiske, 1993; Gutek, 1988; Hyde & Plant, 1995). Gender differences regarding emotional intelligence have been replicated on various occasions. Empirical research indicates that women score slightly higher in measures of EI than males (Charbonneaux & Nicol, 2002; Ciarrochi, Chan & Caputi, 2000; Mayer, Caruso & Salovey, 1999; Mayer & Geher, 1996; Petrides & Furnham, 2000; Van Rooy, Alanso & Viswesvaran, 2005; Van Rooy & Viswesvaran, 2003). Van Rooy and Viswesvaran (2003) further state that this occurrence is not surprising, since women have better emotional and inter-personal skills than males. However, these gender differences appear to be more pronounced in studies examining ability-based EI (Day & Carroll, 2004).

Differences in EI levels within gender groups were also identified. Studies conducted by Block (1995) indicate that men with high levels of EI are more socially poised, outgoing and cheerful, and not prone to worry. Furthermore, they exhibited a notable capacity for commitment to people (caring and sympathetic in their relationships) or causes, for taking responsibility, and for having an ethical outlook. Emotionally intelligent women tended to reach out to people due to their social poise and expressed their feelings more directly towards others. They also exhibited assertiveness and were able to adapt well to stress (Block, 1995).

In terms of the demographic variable of “age” both Bar-On (1997a) and Mayer et al. (1999) created age categories in order to determine the relationship between age and emotional intelligence. They separately found that, unlike cognitive ability that remains relatively stable beyond the teenage years, EI scores were found to increase with age. The same findings were also replicated by Derkesen, Kramer and Katzko (2002), and can also be supported by research conducted by Hemmati, Mills and Kroner (2004) and Van Rooy et al. (2005). In contrast Roberts, Zeidner and Matthews (2001) found no significant age differences, but they speculated that their findings were attributable to sample range restrictions.

Several studies have reported ethnic group differences in the field of psychometric evaluation. Ethnic group differences were documented in cognitive ability tests (e.g. Schmitt et al., 1997) and integrity tests (Ones & Viswesvaran, 1998). Sub-group differences in test-taking motivation, test performance and selection rates were also documented (Ployhart & Ehrhart 2002). Given that EI is increasingly being used in the workplace as a predictor, it is imperative that it's potential for adverse impact and other legal implications be assessed (Van Rooy et al., 2005).

Conflicting results were reported by Roberts et al. (2001), who conducted one of the few studies that evaluated ethnic group differences in EI. A study conducted by Van Rooy et al. (2005), making use of an ability-based EI measure, identified existing group differences for ethnicity, with minority groups scoring higher in EI than majority groups. In the light of the mixed findings, Roberts et al. (2001) state that there is currently an urgent need for studies exploring group differences in EI.

Even though controversial research evidence in EI exists, the use of EI measure in personnel selection contexts is increasing (Wong & Law, 2002). This can be attributed to the beliefs that emotional intelligence has positive real-life consequences (Austin, 2005), such as the ability to manage occupational stress and the maintenance of psychological well-being (Cadmans & Brewer, 2001). According to Goleman (1996), emotionally intelligent individuals excel in human relationships, show marked leadership skills and perform well at work. Therefore it seems reasonable to assume that emotionally intelligent individuals would contribute positively in the workplace, thereby addressing current concerns such as quality, improved client outcomes, recruitment and retention of staff for organisations (Cadmans & Brewer, 2001).

When deciding on which EI measure to include in a selection battery or even for research purposes, it is important that the conceptualisation of a measurement (Davies, Stankov & Roberts, 1998) of emotional intelligence be understood.

Emotional intelligence can be classified into two distinct groups, namely "ability or information-processing models" (Mayer & Salovey, 1997) and "trait or mixed models" (Bar-On, 1997b;

Goleman, 1995; Weisinger, 1998). All EI models have a common feature, namely a hierarchical structure that includes a range of subcomponents covering inter- and intra-personal emotional skills, such as mood regulation and emotion perception, with overall EI playing an analogous role to general ability in providing a broad measure of emotional capabilities (Austin, 2005, July).

Ability models of emotional intelligence

The ability models conceptualise emotional intelligence as a mental ability that is separated from social-emotional personality traits (Mayer & Salovey, 1997). Emotional intelligence is defined as a series of conceptually related mental abilities that can be divided into four branches: (1) perception of emotion, (2) emotional facilitation of thought, (3) understanding emotions, and (4) managing emotions (Freudenthaler & Neubauer, 2005).

To measure these branches empirically, the Multifactor Emotional Intelligence Scale (MEIS; Mayer et al., 1999) and the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT; Mayer, Salovey, Caruso & Sitarenios, 2003) have been developed, which consist of performance tasks requiring responses that are evaluated against predetermined scoring criteria (Freudenthaler & Neubauer, 2005).

Table 1

Measures of Ability Emotional Intelligence

Emotional Intelligence Measurement	Description of the Measurement
A. Emotional Accuracy Research Scale developed by Mayer & Geher (1996) (EARS)	<ul style="list-style-type: none"> Internal consistencies: low internal consistencies were reported by Mayer and Geher (1996), with target scoring having an internal consistency of $\alpha = 0,24$ and consensus scoring an $\alpha = 0,53$. But a study conducted by Geher, Warner and Brown (2001) indicated that internal consistencies could be increased if some items of the measure were deleted ($\alpha = 0,75$ for target scoring and $\alpha = 0,80$ for consensus scoring).

Table 1 (continued)

Measures of Ability Emotional Intelligence

Emotional Intelligence Measurement	Description of the Measurement
A. Emotional Accuracy Research Scale developed by Mayer & Geher (1996) (EARS)	<ul style="list-style-type: none"> Discriminant and convergent validities: Small and unstable correlations with self-report empathy.
B. Multifactor Emotional Intelligence Scale developed by Mayer et al. (1999) (MEIS)	<ul style="list-style-type: none"> Sub-scales include: <ul style="list-style-type: none"> i. Ability to perceive, ii. Assimilate, iii. Understand, and iv. Manage one's own and that of others Make use of consensus scoring. Legree (1995) states that the judgments of experts are equivalent to those of non-experts, except for the fact that the non-experts will be less consistent and therefore less reliable.
C. Mayer-Salovey-Caruso Emotional Intelligence Test developed by Mayer, Salovey, Caruso and Siteranios (2003) (MSCEIT)	<ul style="list-style-type: none"> Consists of 141 items to which the participant responds on a five-point Likert scale (1= no happiness; 5 = extreme happiness). Sub-scales include: <ul style="list-style-type: none"> i. Emotional Management ($\alpha = 0,82$) ii. Emotional Understanding ($\alpha = 0,73$) iii. Emotional Interpretation ($\alpha = 0,76$) iv. Emotional Perception ($\alpha = 0,87$) (Mayer et al., 2003). Full scale split half reliability ranging from $r = 0,91$ to $r = 0,93$. Full scale internal consistency of $\alpha = 0,92$. Excellent face validity and good content validity (Mayer et al., 2003). Low or non-significant correlation with personality (Day & Carrol, 2004).

A correlation with other intelligences serves as an indication of an ability EI measure's convergent and discriminant validities. According to Mayer and Salovey, ability EI should be moderately correlated with other intelligences in order to demonstrate that it belongs to a domain

of “intelligences”, but that it is also sufficiently distinct from traditional intelligences (Freudenthaler & Neubauer, 2005). Supportive research evidence has found that performance EI measures do show positive correlations with intelligence measures (Matthews, Zeidner & Roberts, 2002; Mayer, Caruso & Salovey, 2000b; Roberts et al., 2001).

Mixed models do not claim EI to be intelligence (Van Rooy et al., 2005). These models define emotional intelligence with a much broader and expansive meaning of the construct by integrating a wide range of personality characteristics under the umbrella term of emotional intelligence (Freudenthaler & Neubauer, 2005). Thus emotional intelligence, according to the mixed model conceptualisation, refers to the combination of cognitive, motivational, and affective constructs (Van Rooy et al., 2005).

In contrast to ability models’ performance-based measures, the mixed or trait models’ strongly rely on self-report measures (e.g., Bar-On, 1997a; Goleman, 1995; Schutte et al., 1998), which raises the issue whether individuals can accurately self-report their own emotional skills (Austin, 2005).

Table 2

Measures of Trait Emotional Intelligence

Emotional Intelligence Measurement	Description of the Measurement
A. Trait Meta Mood Scale developed by Salovey, Mayer, Goldman, Turvey & Palfai (1995) (TMMS)	<ul style="list-style-type: none"> ▪ A self-report measure consisting of 45 items, with several reversed-keyed items.. ▪ Makes use of a five-point scale (1 = strongly disagree, 5 = strongly agree), with a high score indicating a high level of emotional intelligence. ▪ Sub-scales include: <ul style="list-style-type: none"> i. Attention to feelings ($\alpha = 0,86$) ii. Clarity of feelings ($\alpha = 0,87$) iii. Mood repair ($\alpha = 0,82$) (Salovey et al., 1995). ▪ Full-scale internal consistency of $\alpha = 0,82$ (Salovey et al., 1995).

Table 2 (continued)

Measures of Trait Emotional Intelligence

Emotional Intelligence Measurement	Description of the Measurement
A. Trait Meta Mood Scale developed by Salovey, Mayer, Goldman, Turvey & Palfai (1995) (TMMS)	<ul style="list-style-type: none"> ▪ Distinct from the Big Five Personality Dimensions' Extroversion and Neurotism (Davies et al., 1998; Salovey et al., 1995).
B. Emotional Quotient Inventory developed by Bar-On (1997a) (EQ-i)	<ul style="list-style-type: none"> ▪ Self-report questionnaire that consists of 133 items. ▪ Respondents indicate the degree to which the statements describe them on a five-point scale (1 = not true for me, 5 = true for me). ▪ Scales consist of five broader concept components: <ul style="list-style-type: none"> i. Intrapersonal EQ ii. Interpersonal EQ iii. Adaption EQ iv. Stress Management EQ and v. General Mood EQ, along with 15 sub-scales. ▪ Convergent or discriminant validities: Moderate to high correlations with the Big Five.
C. Schutte Self-Report Inventory developed by Schutte et al. (1998) (SSRI)	<ul style="list-style-type: none"> ▪ Total internal consistency of $\alpha = 0,96$. ▪ Consists of 33 statements. ▪ Respond on a five-point scale (1 = strongly agree, 5 = strongly disagree). ▪ Sub-scales: <ul style="list-style-type: none"> i. Emotion Perception ii. Utilising Emotions iii. Managing Self-Relevant Emotions iv. Managing of Others Emotions. ▪ Full scale internal consistency of $\alpha = 0,88$.

Table 2 (continued)

Measures of Trait Emotional Intelligence

Emotional Intelligence Measurement	Description of the Measurement
D. Schutte Emotional Intelligence Scale developed by Schutte et al. (1998) (SEIS)	<ul style="list-style-type: none"> ▪ 33-item self-report measure. ▪ Respond on a five-point scale (1 = strongly agree, 5 = strongly disagree). ▪ Sub-scales: <ul style="list-style-type: none"> i. Appraisal and expression of emotions in self and others ii. Regulation of emotions in self and others iii. Utilization of emotions in solving problems. ▪ Two-week test-retest reliability ($r = 0,78$). ▪ Internal consistency ranging from $\alpha = 0,87$ to $\alpha = 0,90$. ▪ Measure is related to theoretically related constructs such as alexithymia, mood repair, optimism and impulse control.
E. Workgroup Emotional Intelligence Profile (Version 3) developed by Jordan, Ashkanasy, Härtel & Hooper (2002) (WEIP-3)	<ul style="list-style-type: none"> ▪ Consist of 52 items. ▪ Respond on a seven-point Likert Scale (1 = strongly disagree, 7 = strongly agree). ▪ Scales: <ul style="list-style-type: none"> 1. Ability to deal with your own emotions 2. Ability to deal with others' emotions 3. Ability to use emotions to assist in problem-solving and decision-making (Salovey & Mayer, 1990).

Negative responses are elicited from researchers when they are confronted by the EI construct; this negativity may be due to the lack of evidence regarding the psychometric properties of EI measures. For instance Newsome, Day and Catano (2000) concluded that objective measures of emotional intelligence are unreliable and that self-report measures show considerable overlap with traditional measures of personality (Newsome et al., 2000). In defence of EI, Mayer et al. (2001) recognise that it took decades to construct measures of General Mental Ability and

therefore the EI construct can only profit from continuous research regarding the measurement of EI.

In this study the trait-based measure of EI, the Emotional Intelligence Scale (EIS), will be used. The main reason is that the questionnaire-type EI measures are quicker to administer than task-based EI measures and require less supervision (meaning that they can be used, for example, in postal surveys). Furthermore, Jonker (2002) identified the deficiency of research done in South Africa on the validation of EI measures and states that, except for one study conducted with a South African sample in determining the validity of the Bar-On EQ-i, no other instrument is validated and standardised for employees in South Africa.

Emotional Intelligence Scale (EIS)

The EIS (Schutte et al., 1998) consists of 33 items that load on one factor, with the total variance explained by 17,4%, and represents all portions of the conceptual model of Salovey and Mayer (1990). Thirteen of the 33 items came from the items generated for the appraisal and expression of emotion category of the model; ten items came from the items generated for the regulation of emotion category and ten items came from items generated for the utilisation of emotion category of the model. The 33 items reflect each of the components and subcomponents of each category, such as regulation of emotion in the self, regulation of emotion in others, with items 5, 28 and 33 being reversed-scored.

When the validity of the EIS was determined by Schutte et al. (1998), they found that the scale was related to eight out of nine measures that assess theoretically related constructs, such as awareness of emotion, outlook on life, depressed mood, ability to regulate emotions and impulsivity.

Research results also indicated that the scales' scores differed between groups one would expect to differ on emotional intelligence level, with therapists scoring significantly higher than prisoners. Women also scored higher than men.

Schutte et al. (1998) also found that the measure showed evidence of predictive validity in that incoming college students' emotional intelligence scores predicted their end-of-year grade point average.

In terms of discriminant validity the scale proved to be different from cognitive ability as measured by the SAT. Furthermore, the measure was not significantly related to four of the big five personality dimensions, it was only significantly correlated with openness to experience, but not so high as to be redundant.

An internal consistency of the scale is indicated by a Cronbach alpha of 0,87, as well as by a two-week interval test-retest reliability of 0,78.

The Emotional Intelligence Scale (Schutte et al., 1998) assesses perception, understanding, expression, regulating and harnessing of emotion in the self and others. The brevity of the scale and its accumulating reliability and validity evidence makes this scale a reasonable choice for those who are seeking a brief self-report measure of global emotional intelligence. Potential uses of the scale in theoretical research involve exploring the nature of emotional intelligence, the effect of emotional intelligence and whether emotional intelligence can be enhanced (Schutte et al., 1998). The evidence suggests that this measure may be both reliable and distinct from the big five personality factors (Schutte et al., 1998), which is an improvement over many of the old measures (Ciarrochi et al., 2002).

The scale has face validity as well as some evidence of construct, predictive and discriminant validities (Petrides & Furnham, 2000). But the main concern when making use of the EIS is the underlying dimensionality of the scale (Petrides & Furnham, 2000). Schutte et al. (1998) proposed a uni-factorial structure for the EIS, but various studies conducted on the EIS indicated the contrary. Austin, Saklofske, Huang and McKenny (2004) identified a three-factor structure for the EIS. Petrides and Furnham (2000) settled on a four-factor solution after finding evidence for two-factor and ten-factor structures, while stating that they might have overestimated the number of factors. Ciarrochi et al. (2002) replicated a four-factor structure but there were differences in some of the item loadings and classifications. Similarly, Saklofske, Austin &

Minski (2003) replicated a four-factor solution, but again, not all of the items loaded on the same factors. Results attained by Chan (2004) through the use of an exploratory item factor analysis indicated that the 33 items emerged in meaningful clusters, describing four dimensions of perceived emotional intelligence.

The only way to counteract the shortcomings of this scale is to conduct further research into its theoretical and psychometric properties. For this reason this study will attempt to replicate earlier findings regarding the EIS by using a different sample group.

METHOD

Research design

The cross-sectional design was used to examine groups of subjects in various stages of development simultaneously, while a survey involves a technique of data collection in which questionnaires are used to gather data about an identified population (Burns & Grove, 1993). The design can also be used to assess interrelationships. According to Shaughnessy and Zechmeister (1997), this design is ideal to address the descriptive functions in correlational research.

Study population

A convenience random sample ($N = 551$) was taken of nursing practitioners from various private hospitals situated in Klerksdorp, Potchefstroom, Krugersdorp, Johannesburg and Pretoria in South Africa. Only 511 of the responses could be utilised (93%). Table 3 presents some of the characteristics of the participants.

Table 3

Characteristics of the Population (n=511)

Item	Category	Frequency (Percentage)
Age	21-29 years	69 (13,68%)
	30-39 years	167 (32,5%)
Age	40-49 years	168 (32,7%)
	50-59 years	67 (13%)
	60-65 years	13 (2,6%)
Gender	Male	12 (2,3%)
	Female	494 (96,70%)
Race	White	394 (77,1%)
	African	76 (14,9%)
	Coloured	29 (5,7%)
	Indian	3 (0,6%)
	Other	1 (0,2%)
Language	Afrikaans	379 (74,2%)
	English	52 (10,2%)
	Sepedi	11 (2,2%)
	Sesotho	6 (1,2%)
	Setswana	27 (5,3%)
	Tshivanda	1 (0,2 %)
	isiNdebele	2 (0,4%)
	isiXhosa	6 (1,2%)
	isiZulu	10 (2,0%)
	Xitsonga	1 (0,2%)
	Other	2 (0,4%)
Position	Enrolled auxiliary nurse	105 (20,5%)
	Enrolled nurse (staff nurse)	63 (12,3%)
	Registered nurse	252 (49,3%)
	Unit manager	39 (7,6%)
	Process manager	3 (0,6%)
	Nursing services specialist	11 (2,2%)
	Nursing services manager	27 (5,3%)
	Ward secretary	2 (0,4%)
	Pupil enrolled	1 (0,2%)
	Paramedic	1 (0,2%)

Table 3 (continued)

Characteristics of the Population (n=511)

Item	Category	Frequency (Percentage)
Personnel Area	Klerksdorp	128 (25,0%)
	Krugersdorp	81 (15,9%)
	Johannesburg	54 (10,6%)
	Potchefstroom	56 (11,0%)
	Pretoria	183 (35,8%)
	Other	6 (1,2%)
Educational Level	Less than grade 10	11 (2,2%)
	Grade 10 (Std 8)	49 (9,6%)
	Grade 11 (Std 9)	16 (3,1%)
	Grade 12 (Std 10)	121 (23,7%)
	Technical college diploma	77 (15,1%)
	Technikon diploma	31 (6,1%)
	University degree	60 (11,7%)
	Postgraduate degree	46 (9,0%)
	Ambulance training	84 (16,4%)
Number of working years in current hospital	Caregiver	1 (0,2%)
	0-9 years and 9 months	207 (40,9%)
	10 years-19 years and 9 months	131 (26,2%)
	20 years-29 years and 9 months	109 (21,7%)
	30 years-39 years and 9 months	40 (8%)
Type of contract	40 years-49 and years 9 months	6 (1,2%)
	Permanent	469 (91,8%)
	Fixed term of 1 year and possibility of permanent employment	15 (2,9%)
	Bursary	14 (2,7%)
Hours worked per week	20-29 hours	7 (1,4%)
	30-39 hours	28 (5,4%)
	40-49 hours	432 (84,2%)
	50-60 hours	8 (1,6%)???

The study population consisted mainly of females (96,70%) between the ages of 30 and 39 (32,5%) and 40 to 49 (32,7%) years of age. The majority of the sample was represented by

Afrikaans-speaking (74,2%) white individuals (77,1%). Furthermore, most of the sample consisted of registered nurses (49,3%), employed for up to 9 years and 9 months within their current hospital (40,9%) on a permanent contract basis (91,8%) in the areas of Klerksdorp (25,0%) and Pretoria (35,8%), and working 40 to 49 hours per week (48,2%). The majority of the population's education level was represented by a Grade 12 (23,7%) or a Technical College diploma (15,1%), along with additional ambulance training (16,4%).

Measuring battery

The EIS was used to measure Emotional Intelligence. A biographical questionnaire was included in order to describe the population.

- A *Biographical Questionnaire* was included in order to describe the population. It includes basic biographical questions like age, gender, race, the area in which the individual is employed, the number of years they have been employed and whether they are working under contract terms or not, as well as their educational level and the hours they work per week.
- The *Emotional Intelligence Questionnaire (EIS)* (Schutte et al., 1998) comprises 33 items, three of which (5, 28 and 33) are reverse-scored. Participants rate themselves in terms of how much they agree or disagree with each statement on a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree), and a total score was derived at by summing up the item responses. Validation studies included correlations with theoretically related constructs (e.g. alexythymia, pessimism, and depression), *t*-tests between various groups (e.g. therapists, prisoners, clients in a substance abuse program) and correlations with each of the Big 5 higher-order factors (Petrides & Furnham, 2000).

Statistical analysis

The statistical analysis was carried out with the SPSS programme (SPSS, 2003). The dataset was studied to identify bivariate and multivariate outliers. To identify bivariate outliers, the data

was standardised (to z-scores). Values higher than 2,58 were inspected to decide whether they should be deleted from the dataset. An inspection was also made of the anti-image scores of the different items. Items with scores lower than 0,6 is problematic and may therefore be excluded in the rest of the statistical analysis.

Furthermore, missing values were analysed and replaced where possible. Principal factor extraction with oblique rotation was performed on the measuring instrument to determine the factor structure. Principal component extraction was used prior to principal factor extraction to estimate the number of factors, presence of outliers and factorability of the correlation matrices. The eigenvalues and scree plot were studied to determine the number of factors underlying the specific measuring instrument. A second-order factor analysis was also computed on the extracted factors.

Descriptive statistics (e.g. means, standard deviations, range, skewness and kurtosis) and inferential statistics were used to analyse the data. In terms of statistical significance, it was decided to set the value at a 95% confidence interval level ($p \leq 0,05$). Effect size (Steyn, 1999) was used to decide on the practical significance of the findings. Pearson product-moment correlation coefficients were used to specify the relationship between the variables. A cut-off point of 0,30 (medium effect) (Cohen, 1988) was set for the practical significance of correlation coefficients. T-tests, ANOVA and MANOVA were used to determine the differences between groups.

Cronbach alpha coefficients were used to determine the internal consistency, homogeneity and unidimensionality of the measuring instrument (Clark & Watson, 1995). Coefficient alpha contains important information regarding the proportion of variance of the items of a scale in terms of the total variance explained by the particular scale.

RESULTS

Principal factor extraction through SPSS was carried out on the 33 items of the Emotional Intelligence Scale (EIS) and showed five factors, which explained 50,04% of the total variance. Seven factors with eigenvalues larger than one were obtained. However the scree plot showed a sharp break after the fifth factor and it was decided to extract five factors. A principal components analysis with an oblimin rotation was then performed on the 33 items. The results of the factor analysis for the EIS are given in Table 4. Loadings of variables on factors, communalities and percent of variance explained are also shown in Table 4. Loadings under 0,40 (20% of variance) are replaced by zeros. Labels are suggested for each factor in a footnote.

Table 4

Factor Loadings, Communalities (h^2), Percentage Variance and Covariance for Principal Factor Extraction and Oblique Rotation on EIS items

Item	F ₁	F ₂	F ₃	F ₄	F ₅	h^2
16. I present myself in a way that makes a good impression on others	0,61	0,00	0,00	0,00	0,00	0,46
17. When I am in a positive mood, solving problems is easy for me	0,66	0,00	0,00	0,00	0,00	0,51
19. I know why my emotions change	0,35	0,00	0,00	0,00	0,00	0,35
20. When I am in a positive mood, I am able to come up with new ideas	0,41	0,00	0,00	0,00	0,00	0,41
21. I have control over my emotions	0,83	0,00	0,00	0,00	0,00	0,58
22. I easily recognise my emotions as I experience them	0,79	0,00	0,00	0,00	0,00	0,59
23. I motivate myself by imagining a good outcome to tasks I take on	0,72	0,00	0,00	0,00	0,00	0,62
24. I compliment others when they have done something well	0,42	0,00	0,00	0,00	0,00	0,42
31. I use good moods to help myself keep trying in the face of obstacles	0,45	0,00	0,00	0,00	0,00	0,48
1. I know when to speak to others about my personal problems	0,00	0,52	0,00	0,00	0,00	0,41
2. When I am faced with obstacles, I remember times I faced similar obstacles and overcame them	0,00	0,58	0,00	0,00	0,00	0,54
3. I expect that I will do well on most things I try	0,00	0,58	0,00	0,00	0,00	0,56
4. Other people find it easy to confide in me	0,00	0,37	0,00	0,00	0,00	0,38

Table 4 (continued)

Factor Loadings, Communalities (h^2), Percentage Variance and Covariance for Principal Factor Extraction and Oblique Rotation on EIS items

Item	F ₁	F ₂	F ₃	F ₄	F ₅	h^2
6. Some of the major events of my life have led me to re-evaluate what is important and not important	0,00	0,72	0,00	0,00	0,00	0,50
7. When my mood changes, I see new possibilities	0,00	0,67	0,00	0,00	0,00	0,49
8. Emotions are one of the things that make my life worth living	0,00	0,59	0,00	0,00	0,00	0,51
9. I am aware of my emotions as I experience them	0,00	0,66	0,00	0,00	0,00	0,53
10. I expect good things to happen	0,00	0,39	0,00	0,00	0,00	0,46
5. I find it hard to understand the non-verbal messages of other people	0,00	0,00	0,63	0,00	0,00	0,46
28. When I am faced with a challenge, I give up because I believe I will fail	0,00	0,00	0,53	0,00	0,00	0,46
33. It is difficult for me to understand why people feel the way they do	0,00	0,00	0,72	0,00	0,00	0,51
18. By looking at their facial expressions, I recognise the emotions people are experiencing	0,00	0,00	0,00	0,51	0,00	0,56
25. I am aware of the non-verbal messages other people send	0,00	0,00	0,00	0,46	0,00	0,55
26. When another person tells me about an important event in his life, I almost feel as though I have experienced this event myself	0,00	0,00	0,00	0,37	0,00	0,39
29. I know what other people are feeling just by looking at them	0,00	0,00	0,00	0,78	0,00	0,59
32. I can tell how people are feeling by listening to the tone of their voice	0,00	0,00	0,00	0,58	0,00	0,58
11. I like to share my emotions with others	0,00	0,00	0,00	0,00	0,75	0,55
12. When I experience a positive emotion, I know how to make it last	0,00	0,00	0,00	0,00	0,43	0,54
13. I arrange events others enjoy	0,00	0,00	0,00	0,00	0,78	0,59
14. I seek out activities that make me happy	0,00	0,00	0,00	0,00	0,64	0,56

Table 4 (continued)

Factor Loadings, Communalities (h^2), Percentage Variance and Covariance for Principal Factor Extraction and Oblique Rotation on EIS items

Item	F ₁	F ₂	F ₃	F ₄	F ₅	h^2
15. I am aware of the non-verbal messages I send to others	0,00	0,00	0,00	0,00	0,40	0,33
27. When I feel a change in emotions, I tend to come up with new ideas	0,00	0,00	0,00	0,00	0,42	0,52
30. I help other people feel better when they are down	0,00	0,00	0,00	0,00	0,46	0,54

a. Factor labels: F₁ Positive State; F₂ Own Emotions; F₃ Negative Emotions; F₄ Emotions of Others; F₅ Emotional Management

Table 4 indicates that a principal component analysis with an oblimer rotation resulted in five factors that explained 50,04% of total variance. Items loading on the first factor relate to Positive State. It deals with, amongst other things, positive mood, knowledge of emotions, recognition of emotions and motivation. The second factor addresses Own Emotions and includes knowledge of when to speak about own emotions to others, expectations to do well, ability to see possibilities when mood changes and awareness of own emotions.

The third factor relates to Negative Emotions. The items loading on this factor include inability to understand others' emotions and non-verbal messages, and feelings that one will not succeed. The fourth factor consists of the Emotions of Others and includes the ability to understand and recognise others' emotions and non-verbal messages. Lastly, the fifth factor, Emotional Management, includes the ability to use one's positive emotions for constructive purposes.

The descriptive statistics and the Cronbach alpha coefficients of the factors of the EIS are given in Table 5.

Table 5

Descriptive Statistics and Cronbach Alpha Coefficients of the EIS Dimensions (n = 511)

Item	Mean	SD	Skewness	Kurtosis	α
Positive Emotions	47,07	7,30	-1,05	2,11	0,85
Own Emotions	41,00	7,36	-1,153	2,44	0,82
Negative Emotions	7,52	3,80	0,13	-0,62	0,58
Emotions of Others	17,18	3,41	-0,39	0,15	0,73
Emotional Management	29,74	6,05	-0,52	0,39	0,79

Table 5 indicates that acceptable Cronbach alpha coefficients were obtained for all the scales of the EIS, except for the Negative Emotions scales ($\alpha = 0,58$), according to the guideline for $\alpha > 0,70$ (Nunnally & Bernstein, 1994). The scores on the EIS are negatively skewly distributed and have a high kurtosis. Therefore the measuring instrument appears to have acceptable internal consistency.

The product-moment correlation coefficients between Positive State, Own Emotions, Negative Emotions, Emotions of Others and Emotional Management are reported in Table 6.

Table 6

Product-Moment Correlation Coefficients between the EIS Dimensions

Item	1	2	3	4	5
Positive Emotions	1,00	-	-	-	-
Own Emotions	0,53 ⁺⁺⁺	1,00	-	-	-
Negative Emotions	-0,12 [*]	-0,11 [*]	1,00	-	-
Emotions of Others	0,58 ⁺⁺⁺	0,38 ⁺⁺	0,04	1,00	-
Emotional Management	0,65 ⁺⁺⁺	0,58 ⁺⁺⁺	-0,02	0,52 ⁺⁺⁺	1,00

* Correlation is significant at the 0,01 level

+ Correlation is practically significant $r > 0,30$ (medium effect)

++ Correlation is practically significant $r > 0,50$ (large effect)

Table 6 shows a statistically and practically significant correlation coefficient of large effect between Positive State and Own Emotions, Emotions of Others and Emotional Management.

Positive State is also statistically but not practically significantly related to Negative Emotions. Own Emotions are statistically significantly related to Negative Emotions, Emotions of Others and Emotional Management, but only practically significantly related (medium effect) to Emotions of Others and practically significantly correlated with Emotional Management (large effect). Furthermore, Emotions of Others is statistically and practically significantly related (large effect) to Emotional Management. Finally, Table 6 indicates no significant or practical correlation between Negative Emotions and Emotions of Others or Emotional Management.

MANOVA analysis was used to determine the relationship between Emotional Intelligence and the different demographic characteristics, such as personnel area, race, language and educational level. Demographic characteristics were first analysed for statistical significance using Wilks' lambda statistics.

The following formula was used to determine the practical significance of means of more than two groups (Steyn, 1999):

$$d = \frac{Mean_A - Mean_B}{Root\ MSE}$$

where

$Mean_A$ = Mean of the first group

$Mean_B$ = Mean of the second group

Root MSE = Root Mean Square Error

A cut-off point of 0,50 (medium effect) (Cohen, 1988) was set for the practical significance of differences between means.

The results of the comparison are given in Table 7.

Table 7

MANOVAS – Differences in the Emotional Intelligence Levels of Demographic Groups

Variable	Value	F	Df	p	Partial Eta Squared
Personnel Area	0,91	1,97	25	0,00	0,19
Race	0,91	2,02	25	0,00	0,19
Language	0,87	1,27	55	0,09	0,27
Educational level	0,87	1,24	55	0,11	0,27

* Statistically significant difference: $p < 0,05$

Table 7 shows that there was a significant effect on personnel area of the combined dependent variable Emotional Intelligence ($F_{(25.1862,63)} = 1,97, p < 0,05$; Wilks' lambda = 0,91; partial eta squared = 0,19). This was a large effect (Cohen, 1988), where 19% of the variance is explained. Analysis of each independent variable, using a Bonferroni adjusted alpha level of 0,01, showed that there were significant differences between the levels of Negative Emotions ($F_{(5,0,00)} = 3,50$; $p = 0,00$), where nurses from Krugersdorp area showed higher levels of Negative Emotions than other areas, and Emotions of Others ($F_{(5,0,00)} = 3,87$; $p = 0,00$), with nurses from the Potchefstroom area showing a higher level of Emotions of Others.

Furthermore, there was also a significant effect on race of the combined dependent variable Emotional Intelligence ($F_{(25.1862,63)} = 2,02, p < 0,05$; Wilks' lambda = 0,91; partial eta squared = 0,19). This was a large effect (Cohen, 1988), where 19% of the variance is explained. Analysis of each independent variable, using a Bonferroni adjusted alpha level of 0,01, showed there were significant differences between the levels of Positive State ($F_{(5,0,00)} = 3,96$; $p = 0,00$), with Indian ethnicity showing a lower Positive State than the other races, and Emotional Management ($F_{(5,0,00)} = 4,74$; $p = 0,00$), with the white ethnicity showing lower Emotional Management than the other races.

Lastly, Table 7 indicates that there are no significant differences between Emotional Intelligence and the other demographic characteristics of language and educational level.

DISCUSSION

The aim of this study was to investigate the psychometric properties of the EIS for nurses situated in the Klerksdorp, Potchefstroom, Krugersdorp, Johannesburg and Pretoria areas of South Africa. The psychometric soundness of the EIS was tested. A simple factor analysis was conducted on the 33 items of the EIS to determine the factor structure. A five factor structure was identified on the EIS, explaining 50,04 % of the total variance. The five factors were labelled: Positive State ($\alpha = 0,85$), Own Emotions ($\alpha = 0,80$), Negative Emotions ($\alpha = 0,58$), Emotions of Others ($\alpha = 0,73$) and Emotional Management ($\alpha = 0,78$).

In contrast Saklofske et al. (2003) identified a one-factor solution which explained 23% of the total variance as well as a four-factor structure solution explaining 40% of the variance. Petrides and Furnham (2000) settled on a four-factor solution explaining 40,4% of the total variance; after they had also found evidence for two and ten-factor structures. The four-factor structures of Petrides and Furnham (2000) were matched by the previously mentioned factor solution of Saklofske et al. (2003) and both labelled the factors: 'optimism/mood regulation', 'appraisal of emotions', 'social skills' and 'utilisation of emotions'. Ciarrochi et al. (2002) replicated a four-factor structure but differences were found in some of the item loadings and classifications. Austin et al.'s (2004) findings differed from those carried out (e.g. Ciarrochi et al., 2002; Petrides & Furnham, 2000; Saklofske et al., 2003) in that they only found a three-factor solution for the EIS. The few studies conducted on the validation of the EIS were done in the United States (e.g. Schutte et al., 1998), Canada (e.g. Ciarrochi et al., 2002; Saklofske et al., 2003) and Europe (e.g. Petrides & Furnham, 2000) and do not reflect the instrument's inherent weaknesses, but rather the possibilities of the instrument, if more studies were to be conducted regarding its psychometric properties.

In South Africa only one study regarding the psychometric properties of the EIS has been done up to date. Vosloo (2005) found a six-factor solution which explained 45,25% of the total variance, which she labelled Positive Affect, Emotion-Others, Happy Emotions, Emotions-Own, Non-verbal Emotions and Emotional Management. The five-factor solution identified in this study explained 50,04% of total variance. The possible reason for the differing factor solutions

for the two studies conducted in South Africa might be the study populations used. Vosloo (2005) used students from the Economic Sciences faculty of the North-West University, while the current study utilised a nursing population. Nurses are involved in more emotional work than students.

Secondly, in terms of the construct validity and internal consistency the five-factor solution identified in this study included Positive State (items 16, 17, 19, 20, 21, 22, 23, 24 and 31, with $\alpha = 0,85$), Own Emotions (items 1, 2, 3, 4, 6, 6, 7, 8, 9 and 10, with $\alpha = 0,80$), Negative Emotions (all the reverse-keyed items 5, 28 and 33, with $\alpha = 0,58$), Emotions of Others (items 18, 25, 26, 29 and 32, with $\alpha = 0,73$) and Emotional Management (items 11, 12, 13, 14, 15, 27 and 30, with $\alpha = 0,78$). These alpha coefficients compared reasonably well with the guideline of $\alpha > 0,70$, except for the scale Negative Emotions (this may have been due to the fact that the scale consists of the few reverse-keyed items), demonstrating that a large portion of the variance is explained by the dimensions, thus indicating the internal validity of the dimensions (Nunnally & Bernstein, 1994). The scales of the measuring instrument had a negatively skew distribution with a high kurtosis, indicating the participants' tendency to choose answers 4 or 5 on the five-point Likert scale of the EIS.

The analysis of the Pearson correlations in this study indicated that Positive State is positively related to Own Emotions, Emotions of Others and Emotional Management, while being negatively related to Negative Emotions. Higher levels of Own Emotions may lead to higher levels of Emotions of Others and Emotional Management and lower levels of Negative Emotions. Furthermore, higher levels of Emotions of Others may lead to higher levels of Emotional Management. Lastly, it was found that Negative Emotions was not correlated with either Emotions of Others or Emotional Management.

This study also aimed to compare the relationship of Emotional Intelligence with various demographic characteristics. A MANOVA analysis was conducted in order to determine the relationships. The results indicated that small significant differences were found between Emotional Intelligence, personnel area and race, with no significant differences found between Emotional Intelligence, language or level of educational. In terms of Emotional Intelligence and

personnel area, results indicated that nurses from the Krugersdorp area showed higher levels of Negative Emotions and nurses from the Potchefstroom area showed a higher level of Emotions of Others. The differences found between Emotional Intelligence and race indicates that the Indian race shows a lower Positive State than the other races, and the white race showed lower Emotional Management than other races.

The current study also has some limitations that should be considered. A cross-sectional design was used and as a result, no causal inferences could be drawn. Therefore, the causal relationships between variables were interpreted rather than established. Prospective longitudinal studies and quasi-experimental research designs are needed to further validate the hypothesised causal relationships, and therefore deal with the limitations imposed by the use of a cross-sectional design. Secondly, self-report measures were exclusively relied upon. Future studies conducted in this manner should confirm whether bias and equivalence do indeed exist for the different language groups.

In terms of the South African context, which is multicultural and multilingual, the research population was not representative of the country. A staggering 77,1% of the population were white and spoke Afrikaans (74,2%), with females dominating the study population by 96,7%. Future studies could benefit hugely in terms of a stratified random-sample design, which would ensure sufficient representation of the different groups making up the total population of nursing professionals in South Africa.

RECOMMENDATIONS

The purpose of this study was to determine the psychometric properties of the EIS in order to contribute to the verification of its reliability and validity as an emotional intelligence measure. According to the results obtained in this study, the use of the EIS is recommended to assess emotional intelligence of nurses in South Africa.

The study population should be more representative of South African society in order to determine the measure's suitability for all our cultures. Secondly, a more equal representation of

gender is needed to determine relationship differences between Emotional Intelligence and gender.

It is suggested that future research focus on the reliability and validity of the EIS for other occupational settings, as the EIS was found to be reliable and valid for this sample specifically. It is also important to determine norm levels for other occupations in South Africa for both questionnaires. It is recommended that larger samples with a more powerful sampling method be utilised to enable generalisation of the findings to other similar groups. Also, the use of adequate statistical methods, such as structural equation modelling, equivalence and bias analysis is recommended. It might also be necessary to translate the EIS into other languages used in South Africa.

REFERENCES

- Austin, E.J. (2005, July). Emotional intelligence and emotional information processing. *Personality and Individual Differences*, 39(2), 403-414.
- Austin, E.J., Saklofske, D.H., Huang, S.H.S. & McKenny, D. (2004, February). Measurement of trait emotional intelligence: Testing and cross-validating a modified version of Schutte et al.'s (1998) measure. *Personality and Individual Differences*, 36(3), 555-562.
- Bar-On, R. (1997a). *Bar-On Emotional Quotient Inventory: Technical manual*. Toronto: Multihealth Systems.
- Bar-On, R. (1997b). *The Emotional Quotient Inventory (EQ-I): A test of emotional intelligence*. Toronto: Multihealth Systems.
- Bellack, J.P. (1999). Emotional intelligence: A missing ingredient? *Journal of Nursing Education*, 28, 3-4.
- Block, J. (1995). *IQ vs. emotional intelligence*. Unpublished manuscript. University of California, Berkeley.
- Brysiewicz, P. (2002, March). Violent death and the South African emergency nurse. *International Journal of Nursing Studies*, 39(3), 253-258.
- Burns, N. & Grove, S.K. (1993). *The practice of nursing research, conduct, critique, and utilization* (2nd ed.). Philadelphia, PA: Saunders.
- Cadmann, C. & Brewer, J. (2001). Emotional intelligence: A vital prerequisite for recruitment in nursing. *Journal of Nursing Management*, 9, 321-324.
- Chan, D.W. (2004). Perceived emotional intelligence and self-efficacy among Chinese secondary school teachers in Hong Kong. *Personality and Individual Differences*, 36, 1781-1795.
- Charbonneau, D. & Nicol, A.M. (2002). Emotional intelligence and pro-social behaviours in adolescents. *Psychological Reports*, 90(2), 361-370.
- Ciarrochi, J.V., Chan, A.Y.C. & Caputi, P. (2000). A critical evaluation of the emotional intelligence construct. *Personality and Individual Differences*, 28, 539-561.
- Ciarrochi, J.V., Deane, F.P. & Anderson, S. (2002). Emotional intelligence moderates the relationship between stress and mental health. *Personality and Individual Differences*, 32, 197-209.

- Clark, L.A. & Watson, D. (1995). Constructing validity: Basic issues in objective scale development. *Psychological Assessment*, 7, 309-319.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum & Associates.
- Davies, C. (1994). *Gender and the professional predicament in nursing*. London: Routledge.
- Davies, M., Stankov, L. & Roberts, R.D. (1998). Emotional intelligence: In search of an elusive construct. *Journal of Personality and Social Psychology*, 75, 989-1015.
- Day, A.L. & Carroll, S.A. (2004). Using an ability-based measure of emotional intelligence to predict individual performance, group performance, and group citizenship behaviours. *Personality and Individual Differences*, 36, 1443-1458.
- Derksen, J., Kramer, I. & Katzko, M. (2002). Does a self-report measure for emotional intelligence assess something different than general intelligence? *Personality and Individual Differences*, 32, 37-48.
- Dietz-Uhler, B. & Murrell, A.J. (1998). Evaluations of affirmative action applicants: Perceived fairness, human capital, or social identity? *Sex roles*, 38, 933-951.
- Dollard, M.F., Dormann, C., Boyd, C.M., Winefield, H.R. & Winefield, A.H. (2003). Unique aspects of stress in human service work. *Australian Psychology*, 28(2), 84-91.
- Eagly, A.H. (1995). The science and politics of comparing women and men. *American Psychologist*, 50, 145-158.
- Fiske, S.T. (1993). Social cognition and social perception. *Annual Review of Psychology*, 44, 155-197.
- Freudenthaler, H.H. & Neubauer, A.C. (2005). Emotional intelligence: The convergent and discriminant validities of intra- and interpersonal emotional abilities. *Personality and Individual Differences*, 39(3), 569-579.
- Geher, G., Warner, R.M. & Brown, A.S. (2001). Predictive validity of emotional accuracy research scale. *Intelligence*, 29(5), 373-388.
- Goleman, D. (1995). *Emotional Intelligence: Why it can matter more than IQ*. New York: Bantam Books.
- Goleman, D. (1996). *Emotional intelligence*. Bloomsbury, London.
- Goleman, D. (1998). *Working with emotional intelligence*. New York: Bantam Books.

- Gutek, B.A. (1988). Sex segregation and women at work: A selective review. *Applied Psychology: An International Review*, 37, 103-120.
- Hemmati, T., Mills, J.F. & Kroner, D.G. (2004). The validity of the Bar-On emotional intelligence quotient. *Personality and Individual Differences*, 37, 695-706.
- Humpel, N., Caputi, P. & Martin, C. (2001). The relationship between emotions and stress among mental health nurses. *Australian and New Zealand Journal of Mental Health Nursing*, 10, 55-60.
- Hyde, J.S. & Plant, E.A. (1995). Magnitude of psychological gender differences: Another side to the story. *American Psychologist*, 50, 159-161.
- Jewkes, R., Abrahams, N. & Mvo, Z. (1998). Why do nurses abuse patients? Reflections from South African obstetric services. *Social Sciences & Medicine*, 47(11), 1781-1795.
- Jonker, C. S. (2002). *The compilation and evaluation of a development program aimed at emotional intelligence*. Unpublished doctoral thesis, PU for CHO, Potchefstroom.
- Jordan, P.J., Ashkanasy, N.M., Härtel, C.E.J. & Hooper, G.S. (2002). Workgroup emotional intelligence scale: Scale development and relationship to team process efficiency and goal focus. *Human Resource Management Review*, 12(2), 195-214.)
- LeDoux, J. (1996). *The emotional brain: The mysterious underpinnings of emotional life*. New York: Touchstone.
- Legree, P.J. (1995). Evidence for an oblique social intelligence factor established with a Likert-based testing procedure. *Intelligence*, 21, 247-266.
- Matthews, G., Zeidner, M. & Roberts, R. (2002). *Emotional intelligence: Science and myth*. Cambridge: MIT Press.
- Mayer, J.D. & Geher, G. (1996). Emotional intelligence and the identification of emotion. *Intelligence*, 22, 89-113.
- Mayer, J.D. & Salovey, P. (1997). *What is emotional intelligence?* In P. Salovey and D.J. Sluyter (Eds.). *Emotional development and emotional intelligence*. New York: Basic Books.
- Mayer, J.D., Caruso, D.R. & Salovey, P. (1999). Emotional intelligence meets traditional standards for an intelligence. *Intelligence*, 27, 267-298.
- Mayer, J.D., Salovey, P. & Caruso, D. (2000). Test manual for the Mayer, Salovey, Caruso Emotional Intelligence Test. *Research version 1.1* (3rd ed.). Canada, Toronto: MHS.

- Mayer, J.D., Salovey, P. & Caruso, D.R. (2000b). Models of emotional intelligence. In: R.J. Sternberg (Ed.). *Handbook of human intelligence* (396-420). New York: Cambridge..
- Mayer, J.D., Salovey, P., Caruso, D.R. & Sitarenios, G. (2001). Emotional intelligence as a standard intelligence. *Emotion*, 1, 232–242.
- Mayer, J.D., Salovey, P., Caruso, D.R. & Sitarenios, G. (2003). Measuring emotional intelligence with the MSCEIT V2.0. *Emotion* 3 (2003), 97–105.
- McCormick, B. (1993). Intuition: Concept analysis and application of curriculum development. *Journal of Clinical Nursing*, 2, 11-17.
- Newsome, S., Day, A.L. & Catano, V.M. (2000). Assessing the predictive validity of emotional intelligence. *Personality and Individual Differences*, 29, 1005-1016.
- Nunnally, J.C. & Bernstein, I.H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.
- Oginska-Bulik, N. (2005). Emotional intelligence in the workplace: Exploring its effects on occupational stress and health outcomes in human service workers. *International Journal of Occupational Medicine and Environmental Health*, 18(2), 167-175.
- Ones, D.S. & Viswesvaran, C. (1998). Gender, age, and race differences on overt integrity tests: Results across four large scale job applicant datasets. *Journal of Applied Psychology*, 82, 26-34.
- Petrides, K.V. & Furnham, A. (2000). On the dimensional structure of emotional intelligence. *Personality and Individual Differences*, 29, 313-320.
- Ployhart, R.E. & Ehrhart, M.G. (2002). Modeling the practical effects of applicant reactions: Subgroup differences in test-taking motivation, test performance, and selection rates. *International Journal of Selection and Assessment*, 10, 258-270.
- Poissonnet, C.M. & Véron, M. (2000). Review: Health effects of work schedules in health care professions. *Journal of Clinical Nursing*, 9, 3-10.
- Reynolds, W.J. & Scott, B. (2000). Do nurses and other professional helpers normally display much empathy? *Journal of Advanced Nursing* 31(1), 226-234.
- Rippon, T. (2000). Aggression and violence in health care professions. *Journal of Advanced Nursing*, 31, 452-460.
- Roberts, R.D., Zeidner, M. & Matthews, G. (2001). Does emotional intelligence meet traditional standards of intelligence?: Some new data and conclusions. *Emotional*, 1, 196-231.

- Ryan, J. & Poster, E. (1993). Workplace violence: Nurses' experiences of assault by patients. *Nursing Times*, 89, 38-41.
- Saklofske, D.H. Austin, E.J. & Minski, P.S. (2003). Factor structure and validity of a trait emotional intelligence measure. *Personality and Individual Differences*, 34, 707-721.
- Salovey, P. & Mayer, J.D. (1990). Emotional intelligence. *Imagination, Cognition and Personality*, 9, 185-211.
- Salovey, P., Mayer, J.D., Goldman, S.L., Turvey, C. & Palfai, T.P. (1995). *Emotional attention, clarity, and repair: Exploring emotional intelligence using the Trait Meta-Mood Scale*. In: J.W. Pennebaker, (Ed.). *Emotion, disclosure, & health*. Washington: American Psychological Association, 125–154.
- Schutte, N.S., Malouff, J.M., Hall, L.E., Haggerty, D.J., Cooper, J.T., Golden, C.J. & Dornheim L. (1998). Development and validation of a measure of emotional intelligence. *Personality and Individual Differences*, 25, 167-177.
- Schmitt, N., Rogers, W., Chan, D., Sheppard, L., & Jennings, D. (1997). Adverse impact and predictive efficiency of various predictor combinations. *Journal of Applied Psychology*, 82, 719-730.
- Seipp, B. (1991). Anxiety and academic performance: A meta-analysis. *Anxiety Research*, 4, 46-53.
- Shaughnessy, J. J. & Zechmeister, E. B. (1997). *Research methods in psychology* (4th ed.). New York: McGraw-Hill.
- SPSS Inc. (2003). *SPSS 12.0 Windows*. Chicago, IL: Author.
- Steyn, H.S. (1999). *Praktiese betekenisvolheid: Die gebruik van effekgroottes*. Wetenskaplike bydraes – Reeks B: Natuurwetenskappe Nr. 117. Potchefstroom: PU vir CHO.
- Svyantek, D. & Rahim, M. (2002). *Links between emotional intelligence and behavior in organizations: Findings from empirical studies*
- Taylor, B.J. (1994). *Being human: Ordinariness in nursing*. Melbourne: Churchill Livingstone.
- Thi Lam, L. & Kirby, S.L. (2002). Is emotional intelligence an advantage? An exploration of the impact of emotional and general intelligence on individual performance. *The Journal of Social Psychology*, 142(1), 133-143.

- Van Rooy, D. L., Alanso, A. & Viswesvaran, C. (2005, February). Group differences in emotional intelligence scores: Theoretical and practical implications. *Personality and Individual Differences*, 38(3), 689-700
- Van Rooy, D.L. & Viswesvaran, C. (2003). *The emotionally intelligent female: A meta-analysis of gender differences*. Unpublished data, Florida International University.
- Vosloo, C. (2005). *The psychometric properties of a measure of emotional intelligence*. Unpublished doctoral thesis, North-West University, Potchefstroom Campus, Potchefstroom.
- Weisinger, H. (1998). *Emotional intelligence at work: The untapped edge for success*. San Francisco: Jossey-Bass.
- Whittington, R. & Wykes, T. (1989). Invisible injury. *Nursing Times*, 85, 30-32.
- Williams, S., Michie, S. & Pattani, S. (1998). *Improving the health of the NHS workforce: Report of the partnership on the health of the NHS workforce*. London: Nuttfield Trust.
- Wong, C. & Law, K.S. (2002). The effect of leader and follower emotional intelligence on performance and attitude: An exploratory study. *The leadership Quarterly*, 13, 243-274.

CHAPTER 3

CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

This chapter comprises conclusions regarding the literature review and the empirical study according to the specific objectives. The limitations of the research are discussed, followed by recommendations for the research problem in organisations, and lastly, suggestions are made for future research.

3.1 CONCLUSIONS

The general objective of this study was to determine the construct validity and internal consistency of the EIS for nursing staff situated in the areas of Klerksdorp, Potchefstroom, Krugersdorp, Johannesburg and Pretoria.

The first specific research objective was to conceptualise emotional intelligence and the importance of emotional intelligence in a nursing environment. Salovey and Mayer raised the possibility of individual differences in abilities to perceive and express emotion, to understand and manage emotion-related information, and that these abilities may be learned. According to Mayer and Salovey (1997), emotional intelligence reflects not a single trait or ability, but rather a composite of distinct emotional reasoning abilities: perceiving, understanding and regulating emotions. *Perceiving emotions* consists of the recognition of and interpreting the meaning of various emotional states, as well as their relations to other sensory experiences (Thi Lam & Kirby, 2002). *Understanding emotions* involve comprehension of how basic emotions are blended to form complex emotions, how emotions are affected by events surrounding experiences, and whether various emotional reactions are likely in given situations. *Regulating emotions* encompasses the control of emotions in oneself and in others. An individual's emotional intelligence is an indication of how he or she perceives, understands and regulates emotions (Thi Lam & Kirby, 2002).

Emotional intelligence serves as a buffer against stress, which could result in depression, hopelessness and suicide ideation (Ciarrochi, Dean & Anderson, 2002; Dawda & Hart, 2000; Schutte et al., 1998). Furthermore, Goleman (1995, 1998) claims that EI predicts life and work success, while Mayer supports this notion by suggesting that EI may influence work-related outcomes, such as job performance and interpersonal interactions (e.g. during a job interview). Bar-on proposed that emotional intelligence can contribute to psychological well-being. He suggested that in addition to traditional IQ tests, what he referred to as EQ-i can make a unique contribution to the “better understanding of people and their potential to succeed in various aspects of life” (Bar-on, 1997, p.4).

EI can be conceptualised according to two types of models. Petrides and Furnham (2000, 2001) made the distinction between trait EI (or emotional self-efficacy) and ability EI (or cognitive-emotional ability). According to the ability models EI is a related set of mental abilities having to do with emotions and emotional information processing, which is part of and contributes to logical thought and intelligence in general (Palmer, Manocha, Gignac & Stough, 2003). Salovey and Mayer considered EI to contain four domains of ability: perception and expression of emotion, assimilating emotion in thought, understanding and analysing emotion and reflective regulation of emotion.

Mixed models of EI, in comparison, define EI as a mixture of emotion-related competencies, personality traits and dispositions (Palmer et al., 2003). Goleman (1995) also proposed five key areas consisting of intrapersonal and interpersonal skills, adaptability scales, stress management scales, and general mood. Bar-On (1997) proposed five key areas: knowing one’s emotions, managing emotions, motivating oneself, recognising emotions in others and handling relationships.

When conceptualising the importance of emotional intelligence for a nursing environment it should be kept in mind that the nursing profession has two distinct characteristics that could elicit stress from nurses, they include: work characteristics and the relationships with the patients. The former includes exposure to long working hours, extended days and shift-work schedules, while the latter includes the psychological strain caused by the permanent contact

with human suffering and death (Poissonnet & Véron, 2000). Nurses need to possess certain emotional and social competencies in order to cope with these chaotic and stressful work environments (Bellack, 1999). One way of enhancing their ability to adapt to their environment is by utilising their emotional intelligence (Ciarrochi et al., 2002), that serves as a buffer against stress (Cadmenn & Brewer, 2001). Furthermore, the conclusion can be drawn that the nursing profession can profit from emotional intelligence. This is based on literature that states that high emotional intelligence levels can lead to an individual experiencing less trauma-related symptoms (Hunt & Evans, 2004), enhance interactions with others (Mayer, Caruso & Salovey, 1999; Rice, 1999; Trinidad & Johnson, 2001), and increase empathy (Ciarrochi, Chan & Caputi, 2000; Reynolds & Scott, 2000) and job performance (Mayer, Salovey & Caruso, 2000).

The second specific research objective was to conceptualise the most important measurements of emotional intelligence and the nature thereof. Emotional intelligence can be assessed in different manners. The choice of method will depend on the conceptualisation of EI. Two methods are currently employed for the assessment of EI (Zeidner, Shani-Zinovich, Matthews & Roberts, 2005). The first method was developed by Mayer, Salovey and Caruso and refers to objective, performance-type measures that assess four facets of ability-base EI: to perceive emotions, to access and generate emotions so as to assist thought, to understand emotions and emotional knowledge, and to reflectively regulate emotions so as to promote emotional and intellectual growth (Mayer & Salovey, 1997). The subtests make use of either multi-choice items or Likert-type rating scales and are scored either with expert judgement or consensus scoring (Zeidner et al., 2005).

In addition, the mixed or trait models strongly rely on self-report measures (e.g. Bar-On, 1997; Goleman, 1995; Schutte et al., 1998), which relies on the individual's understanding of their own emotions and management of emotional encounters (Zeidner et al., 2005).

Based on the distinction made between ability-based EI and trait-based EI, a brief summary is provided of the most important measurements, and with this the third specific objective was achieved:

- **Ability-based emotional intelligence measurements**

- A. Emotional Accuracy Research Scale developed by Mayer & Geher (1996) (EARS)
- B. Multifactor Emotional Intelligence Scale developed by Mayer et al. (1999) (MEIS)
- C. Mayer-Salovey-Caruso Emotional Intelligence Test developed by Mayer, Salovey, Caruso and Siteranios (2003) (MSCEIT)

- **Trait-based emotional intelligence measurements**

- A. Trait Meta Mood Scale developed by Salovey, Mayer, Goldman, Turvey and Palfai (1995) (TMMS)
- B. Emotional Quotient Inventory developed by Bar-On (1997) (EQ-i)
- C. Schutte Self-Report Inventory developed by Schutte et al. (1998) (SSRI)
- D. Schutte Emotional Intelligence Scale developed by Schutte et al. (1998) (SEIS)
- E. Workgroup Emotional Intelligence Profile (Version 3) developed by Jordan, Ashkanasy, Härtel and Hooper (2002) (WEIP-3)

The fourth specific objective was to determine the construct validity and internal consistency of the EIS in a health care environment. A principal factor extraction with oblimin rotation resulted in a five-factor solution with 50,04% explaining the total variance for the EIS as sampled from a nursing environment. All the items loaded on the various factors. The five factors were labelled according to their item loadings:

- *Positive State* consisted of items 16, 17, 19, 20, 21, 22, 23, 24 and 31, with a Cronbach alpha coefficient of 0,85;
- *Own Emotions* consisted of items 1, 2, 3, 4, 6, 7, 8, 9 and 10, with a Cronbach alpha coefficient of 0,80;

- *Negative Emotions* consisted of the reverse-keyed items 5, 28 and 33, with a Cronbach alpha coefficient of 0,58;
- *Emotions of Others* consisted of items 18, 25, 26, 29 and 32, with a Cronbach alpha coefficient of 0,73; and
- *Emotional Management* consisted of items 11, 12, 13, 14, 15, 27 and 30, with a Cronbach alpha coefficient of 0,78.

All of the scales except the Negative Emotion scale ($\alpha = 0,58$) had acceptable levels of internal consistency, according to the guideline of $\alpha > 0,70$ (Nunnally & Bernstein, 1994). The reason may be the fewer items loading on this scale. The results indicate that the EIS shows an acceptable level of internal consistency. The scores of the EIS were distributed negatively skewly, indicating that most of the participants chose either four or five on the five-point Likert scale, which might be ascribed to the participants' tendency to answer in a socially desirable manner.

The only other study conducted on the validation of the EIS in South Africa was done by Vosloo (2005). A six-factor solution was extracted, which explained 45,25% of the total variance. The six factors were: Positive Affect ($\alpha = 0,73$), Emotion-Others ($\alpha = 0,67$), Happy Emotions ($\alpha = 0,63$), Emotions-Own ($\alpha = 0,63$), Non-Verbal Emotions ($\alpha = 0,56$), Emotion Management ($\alpha = 0,54$). Item 33 did not load on any of the factors.

In conclusion it is proposed that a factor-analysis be performed on the EIS before it is used for research or administering purposes (Petrides & Furnham, 2000).

The results of the product-moment coefficients between the EIS dimensions indicated that an increase in Positive State could result in an increase of Own Emotions, Emotions of Others and Emotional Management, but will result in a decrease of an individual's Negative Emotions. Higher levels of Own Emotions may lead to higher levels of Emotions of Others and Emotional Management and lower levels of Negative Emotions. Furthermore, higher levels of Emotions of Others may lead to higher levels of Emotional Management. Lastly, it was found that Negative Emotions did not correlate with either Emotions of Others or Emotional Management.

The fifth specific objective was to determine the relationship between emotional intelligence levels and the various demographic characteristics of the study population. The results of the MANOVA analysis indicated that a small significant difference was found between Emotional Intelligence, personnel area and race, with no significant differences found between Emotional Intelligence, language or educational level.

Nurses from the Krugersdorp area showed higher levels of Negative Emotions than those from other areas, whilst nurses from the Potchefstroom area showed a higher level of Emotions of Others in comparison with those from other areas. In terms of the differences between Emotional Intelligence and race, results indicated that the Indian race showed a lower level of Positive State than the other races, with levels of Emotional Management being the lowest for the white race when compared to the other races.

The sixth specific objective was to make recommendations for organizations regarding the use of a standardised emotional intelligence measures. According to Mayer et al. (2000), organisations can benefit from emotionally intelligent employees, because these individuals are experts at identifying, and responding appropriately to, the emotions of co-workers, customers and supervisors. Hence they will have smoother interaction with members of their work teams, may be better able to monitor how work group members feel and may take the appropriate action accordingly (Mayer et al., 2000) Furthermore, high EI employees are also likely to be empathetic (e.g. Ciarrochi et al., 2000) and therefore, able to adopt the organisation's perspective and act in a manner that will benefit the organization (Abraham, 1999). Lastly, EI measures may contribute to the wellness programmes of organisations. The literature indicates a clear relationship between nurses' emotional intelligence levels and burnout (Gerits, Derkensen, Verbruggen & Katzko, 2005).

The last specific research objective was to make recommendations for future research in terms of the psychometric properties of the EIS. Recommendations will mostly be based on the measure's obvious multi-dimensionality, even though Schutte et al. (1998) stated its uni-dimensionality. Another focus may also be on the coexistence of trait and ability emotional intelligence and the differing measures. Recommendations are made below regarding further

research on the EIS, specifically within South African society to develop a valid and reliable measurement of EI for all subcultures.

3.2 LIMITATIONS

- A cross-sectional design was used, and as a result, no causal inferences could be drawn. The causal relationships between variables were interpreted rather than established, and more complex forms of non-recursive linkages should be examined. Prospective longitudinal studies and quasi-experimental research designs are needed to further validate the hypothesised causal relationships, and thus deal with the limitation imposed by the use of a cross-sectional design.
- The results of the study were obtained solely by means of self-report questionnaires. This may lead to a problem commonly referred to as “method variance” or “nuisance”.
- The majority of participants were female, white and spoke Afrikaans, facts which limited the representation of the various language and cultural groups within South Africa.
- The fact that the majority of participants were female limited the investigation of gender differences and emotional intelligence levels.
- The first language of the majority of the participants was Afrikaans, while the questionnaire was only available in English. This could have influenced the way in which the respondents answered the questionnaire, which could have led to misunderstandings and incorrect interpretations.
- There was a shortage of research conducted on the EIS in South Africa.

3.3 RECOMMENDATIONS

The following recommendations for organizations as well as for future research are made:

3.3.1 Recommendations for organisations

- A standardised psychometric measurement of emotional intelligence could be beneficial for organisations during their selection, recruitment, training and development

programmes. EI measurements would especially be beneficial for the professions that are loaded with emotional work, for example health care professions and police services.

- EI promotes the well-being of individuals and therefore it would be beneficial for organisations to have a valid and reliable measure of EI in order to determine those employees that have specific EI needs that can be addressed by EI development programs.
- EI can enhance personal and group engagement, as well as productivity.
- EI enhances an individual's ability to balance their work and family matters (Sjöberg, 2001); therefore organisations that focus on work/family balance issues can integrate emotional intelligence measures within their work/family programmes.
- In general EI measures can contribute to organisations' wellness programmes in various manners.

3.3.2 Recommendations for future research

- A larger pool of reverse-keyed items should be generated in order to ensure a balanced EI measurement.
- The results of the study provide supporting evidence for the construct validity of EIS, although further research on the development and psychometric properties of the EIS is suggested.
- For the future development of the EIS the findings of the present study need to be replicated within public hospitals as well as within other study populations.
- More research is needed regarding the extent to which EI measures can act as predictors for work and general life outcomes.
- The coexistence of two conceptualisations of EI with its two different types of EI measurements implies that two separate constructs are being measured. Future research can be conducted on the relationship between ability-based EI and trait-based EI, and how the two types can contribute to our understanding and knowledge of EI.
- How EI measures can contribute to the knowledge of individual differences in terms of emotional skills is an important area for future research.
- More research, with the inclusion of the EIS, should be undertaken in South Africa.

- Future research should be conducted on the validation of EI measures within the South African context, seeing that South Africa is one of the countries with the richest cultural diversity and its own unique problems.
- Validation of EI measures should be based on larger population groups. With further research in mind, it is recommended that a stratified random sample be used instead of a convenience sample in order to attain a larger and more representative sample of nurses. This will enable the researcher to apply inferential statistical procedures to establish the significance of the results.
- The EIS can be translated into one or more of the official eleven languages of South Africa.

REFERENCES

- Abraham, R. (1999). Emotional intelligence in organizations: A Conceptualisation. *Genetic, Social, and General Psychology*, 125, 209-215.
- Bar-On, R. (1997). *EQ-i Bar-On Emotional Intelligence Quotient*. Toronto, ON: Multihealth Systems.
- Bellack, J.P. (1999). Emotional intelligence: A missing ingredient? *Journal of Nursing Education*, 28, 3-4.
- Cadmam, C. & Brewer, J. (2001). Emotional intelligence: A vital prerequisite for recruitment in nursing. *Journal of Nursing Management*, 9, 321-324.
- Ciarrochi, J.V., Chan, A.Y.C. & Caputi, P. (2000). A critical evaluation of the emotional intelligence construct. *Personality and Individual Differences*, 28, 539-561.
- Ciarrochi, J.V., Deane, F.P. & Anderson, S. (2002). Emotional intelligence moderates the relationship between stress and mental health. *Personality and Individual Differences*, 32, 197-209.
- Dawda, D. & Hart, S.D. (2000). Assessing emotional intelligence: Reliability and validity of the Bar-On Emotional Quotient Inventory (EQ-i) in university students. *Personality and Individual Differences*, 28, 797-812.
- Gerits, L., Derkensen, J.J.L., Verbruggen, A.B. & Katzko, M. (2005, January). Emotional intelligence profiles of nurses caring for people with severe problems. *Personality and Individual Differences*, 38(1), 33-43.
- Goleman, D. (1995). *Emotional intelligence: Why it can matter more than IQ*. New York: Bantam Books.
- Goleman, D. (1998). *Working with emotional intelligence*. New York: Bantam Books.
- Hunt, N. & Evans, D. (2004). Predicting traumatic stress using emotional intelligence. *Behaviour Research and Therapy*, 42, 791-798.
- Jordan, P.J., Ashkanasy, N.M., Härtel, C.E.J. & Hooper, G.S. (2002). Workgroup Emotional Intelligence Scale: Scale development and relationship to team process efficiency and goal focus. *Human Resource Management Review*, 12(2), 195-214.
- Mayer, J.D. & Geher, G. (1996). Emotional intelligence and the identification of emotion. *Intelligence*, 22, 89-113.

- Mayer, J.D. & Salovey, P. (1997). *What is emotional intelligence?* In P. Salovey and D.J. Sluyter (Eds.). *Emotional development and emotional intelligence*. New York: Basic Books.
- Mayer, J.D., Caruso, D.R. & Salovey, P. (1999). Emotional intelligence meets traditional standards for an intelligence. *Intelligence*, 27, 267-298.
- Mayer, J.D., Salovey, P. & Caruso, D.R. (2000). Models of emotional intelligence. In: R.J. Sternberg (Ed.). *Handbook of human intelligence* (396-420). New York: Cambridge..
- Mayer, J.D., Salovey, P., Caruso, D.R. & Sitarenios, G. (2003). Measuring emotional intelligence with the MSCEIT Version 2.0. *Emotion*, 3(2003), 97-105.
- Nunnally, J.C. & Bernstein, I.H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.
- Palmer, B.R., Manocha, R., Gignac, G. & Stough, C. (2003). Examining the factor structure of the Bar-On Emotional Quotient Inventory with an Australian general population sample. *Personality and Individual Differences*, 35, 1191-1210.
- Petrides, K.V. & Furnham, A. (2000). On the dimensional structure of emotional intelligence. *Personality and Individual Differences*, 29, 313-320.
- Petrides, K.V. & Furnham, A. (2001). Trait emotional intelligence: Psychometric investigation with reference to established trait taxonomies. *European Journal of Personality*, 15, 425-448.
- Poissonnet, C.M. & Véron, M. (2000). Review: Health effects of work schedules in the health care professions. *Journal of Clinical Nursing*, 9, 3-10.
- Reynolds, W.J. & Scott, B. (2000). Do nurses and other professional helpers normally display much empathy? *Journal of Advanced Nursing*, 31(1), 226-234.
- Rice, C.L. (1999). *A quantitative study of emotional intelligence and its impact on team performance*. Unpublished master's dissertation, Pepperdine University, Malibu, CA.
- Salovey, P., Mayer, J.D., Goldman, S.L., Turvey, C. & Palfai, T.P. (1995). *Emotional attention, clarity, and repair: Exploring emotional intelligence using the Trait Meta-Mood Scale*. In: J.W. Pennebaker, (Ed.). *Emotion, disclosure, & health*. Washington: American Psychological Association, 125-154.
- Schutte, N.S., Malouff, J.M., Hall, L.E., Haggerty, D.J., Cooper, J.T., Golden, C.J. & Dornheim L. (1998). Development and validation of a measure of emotional intelligence. *Personality and Individual Differences*, 25, 167-177.

- Sjöberg, L. (2001). *Emotional intelligence and life adjustment: A validation study*. In: SSE/EFI working paper series in business admin (13), Stockholm School of Economics, Stockholm.
- Thi Lam, L. & Kirby, S.L. (2002). Is emotional intelligence an advantage? An exploration of the impact of emotional and general intelligence on individual performance. *The Journal of Social Psychology*, 142(1), 133-143.
- Trinidad, D.R. & Johnson, C.A. (2001). The association between emotional intelligence and early adolescent tobacco and alcohol use. *Personality and Individual differences*, 32, 95-105.
- Vosloo, C. (2005). *The psychometric properties of a measure of emotional intelligence*. Unpublished doctoral thesis, North-West University, Potchefstroom Campus, Potchefstroom.
- Zeidner, M., Shani-Zinovich, I., Matthews, G. & Roberts, R.D. (2005). Assessing emotional intelligence in gifted and non-gifted high school students: Outcomes depend on the measure. *Intelligence*, 33(4), 369-391.