# "Emotion Processing, Neuropsychiatric Symptoms and Quality of Life after a Stroke"

Jeanine Blumenau University of the Witwatersrand

November 2010

A research project submitted in fulfilment of the requirements for the degree of Master of
Science by Dissertation in the field of Psychology for the Faculty of Science, University of the
Witwatersrand, Johannesburg

## **Declaration**

"I declare that this research entitled "Emotion processing, neuropsychiatric symptoms and quality of life after a stroke" is my own, unaided work. It has not been submitted before for any other degree or examination at this or any other university".

Signed:

Jeanine Blumenau

0308138H

November 2010

Word Count: 23938

#### Abstract

Cerebrovascular disease is one of the leading causes of death among persons aged 50 and above and when a stroke does not result in death, it can cause residual cognitive, motor and behavioural disabilities. Emotional effects of brain injury range from reduced quality of life to various neuropsychiatric disturbances and are of great interest in the South African context and throughout the world as they pose a major obstacle to the rehabilitation process. This study explored the relationship between emotion processing, neuropsychiatric symptoms and quality of life specifically, how they operate following a cerebrovascular accident. In order to achieve this, an adult population of high functioning stroke survivors completed the emotion processing scale (EPS), Minnesota Multiphasic Personality Inventory (MMPI-2) and comprehensive quality of life inventory (ComQOL-A5) and a factor analysis provided statistical evidence suggestive of intercorrelations among the variables. The results lent support to this theoretical relationship and determined the structure of this relationship as follows: The satisfaction with quality of life after a stroke that relates to traditional masculine or feminine roles, when not fulfilled, related to neuropsychiatric symptoms of general maladjustment i.e. schizophrenia and psychopathic deviate. The second factor encompassed symptoms of general anxiety both internally and externally directed: Internally directed anxiety included symptoms of hypochondriasis and hysterical conversion, while externally directed anxiety included neuropsychiatric symptoms of paranoia. The third factor was associated with mood modulation in that elevated mood connected to neuropsychiatric symptoms of hypomania and depressed mood connected to symptoms of depression and social introversion. Finally, emotion processing and psychasthenia made up the last principal component, namely emotion modulation. This meant that avoidance of emotional

content, suppression of emotion, unprocessed emotion etc. related to neuropsychiatric symptoms of obsessions or compulsions. High functioning stroke survivors' behaviours were thus characterised by general maladjustment, anxiety, and symptoms related to mood and emotion modulation. This study underlies the importance of diagnosing, treating and monitoring stroke survivors' emotional alterations and suggests the usefulness of its application in clinical settings to evaluate the effectiveness of treatments or more general interventions to improve the neuropsychiatric sequelae and quality of life of stroke survivors. Improved understanding of these constructs from the stroke survivor's perspective has obvious impact for the therapeutic interventions inherent in stroke rehabilitation and as such, contributes towards the fields of neuropsychology, neuropsychotherapy and the social sciences.

Keywords: emotion processing, neuropsychiatric symptoms, quality of life

#### Acknowledgements

I would like to thank my supervisor Enid Schutte, for her patience, enthusiasm, guidance and support over the past couple of years. Thank you for believing in me and constantly encouraging me to persevere. Thank you for stimulating my interest in the brain, feeding that passion and guiding me throughout the research process. Thank you for being a friend, a mother and a mentor. My thanks go out to Peter Fridjhon and Mike Greyling for their conceptual and practical guidance with the statistical aspects of the study. I would also like to thank the staff of the Wits Psychology department, many of whom provided necessary advice, support and encouragement throughout this journey.

To my wonderful and special family: thank you!!! Mom and dad, I cannot thank you enough for your constant unwavering support, both emotionally and financially. You have always placed my need above your own and for that I cannot begin to express my gratitude. Nat, you are such an inspiration to me, thank you for all the indispensable chats over Skype, e-mails back and forth between continents (not to mention thank you for correcting any unsightly grammatical errors), and thank you for all the valuable contributions you have made to this study. Pauli, without the copious amounts of coffee, cigarettes and Chuckles we've shared together, I don't think I would've completed my research sane. Thank you for helping me to keep my priorities in perspective and for constantly showing such genuine interest and enthusiasm towards my work. To my most incredible loving and patient husband Saul: thank you for finding me, thank you for marrying me, I couldn't have done it without your love and encouragement.

## **Table of Contents**

Title Page	i
Declaration	ii
Abstract	iii
Acknowledgements	v
Table of Contents	vi
Chapter One: Introduction	1
Chapter Two: Literature Review	5
2.1. Neuroscientific methodologies	6
2.2. Organic Perspectives	10
2.3. Stroke	14
2.4. Emotion Processing	19
2.5. Neuropsychiatric Symptoms	23
2.6. Quality of Life	28
2.7. Consequences of a Stroke	
2.7.1. Cognitive functions	29
2.7.2. Anosognosia	34
2.8. Demographic Risk Factors	
2.8.1. Age and gender	35
2.8.2. Education level	36
2.8.3. Marital status	36
2.9. Research Questions	37

Chapter Three: Methodology	38
3.1. Research Aims	38
3.2. Research Design	39
3.3. Participants	40
3.4. Instruments	
3.4.1. Functional mobility	44
3.4.2. Neuropsychological functioning	44
3.4.3. Emotion processing	45
3.4.4. Neuropsychiatric disturbances	47
3.4.5. Quality of life	51
3.5. Procedure	54
3.6. Ethical Considerations	55
Chapter Four: Results	56
4.1. Introduction	56
4.2. Instrument Reliability	57
4.3. Descriptive Statistics	60
4.3.1. Emotion processing	62
4.3.2. Neuropsychiatric disturbances	63
4.3.3. Quality of life	66
4.4. Assumptions	68
4.5. Factor Analysis	71
Chapter Five: Discussion	77
5.1. Introduction	77

5.2. Results and Interpretation	79
5.2.1. Instrument reliability	79
5.2.2. Comparison of stroke survivors to a normal population	82
5.2.2.1. Emotion processing	82
5.2.2.2. Neuropsychiatric symptoms	84
5.2.2.3. Quality of life	86
5.2.3. Demographic variables	87
5.2.4 Factor analysis	89
5.3. Limitations and Directions for Future Research	92
5.3.1. Statistical limitations	92
5.3.2. Measures and norms	92
5.3.3. Socioeconomic status	95
5.3.4. Methodological contribution of the research	95
5.4. Conclusion	96
References Appendices	100 114
Appendix A: The Emotion Processing Scale	114
Appendix B: Subject Information Sheet	116
Appendix C: Participant Consent Form	118
Appendix D: Application to the Human Research Ethics Committee (Medical)	119

Appendix E: Ethical Clearance from the University of the Witwatersrand	135
Appendix F: Eigenvalues of the Correlation Matrix and Proportion of Variance	136
Appendix G: Distribution of Residuals for all Variables Measured	137
Appendix H: Kaiser-Meyer-Olkin's Measure of Sampling Adequacy	144

### **Tables**

Table 1: Summary of the Demographic Information of the Stroke Survivors

Table 2: Cronbach's Alpha Correlations Highlighting the Psychometric Qualities of the MMPI-2TM

Table 3: Internal Consistencies as Measured through Cronbach's Alpha for Subscales of Emotion Processing, Neuropsychiatric Symptoms and Quality of Life

Table 4: Descriptive Statistics: Mean Raw Scores and (Standard Deviations) of the Stroke Survivors

Table 5: Mean T Scores of Stroke Survivors on the 10 Clinical Scales of the MMPI-2

 $Table\ 6:\ Goodness\ of\ Fit\ for\ Normality\ of\ Distribution$ 

Table 7: Correlation Matrix of all Variables Included in the Common Factor Analysis

Table 8: Varimax Rotated Factor Pattern

### **Figures**

Figure 1: Pie graph showing the cortical areas affected by stroke

Figure 2: Line diagram comparing the stroke survivors to a normal population and mental health patients.

Figure 3: Comparison of stroke survivors and normal population's Quality of Life (OQOL, SQOL and IQOL).

Figure 4: Comparison of stroke survivors and normal population's objective Quality of Life on all domains.