

PSYCHOLOGICAL WELL-BEING AND BIOLOGICAL CORRELATES IN AFRICAN WOMEN

Elizabeth M. Botha

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at the North-West University**

**Promotor: Prof. M.P. Wissing
Co-promotor: Prof. H.H. Vorster**

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Contents

Acknowledgements	p. ii
Summary	iv
Opsomming	vii
Preface	xi
Letter of permission	xii
Section 1: Introduction	p. 1
Section 2: Article 1: Childhood relationships and adult bio-psycho-social well-being in African women	9
2.1 Guidelines for authors: <i>Psychological Reports</i>	10
2.2 Manuscript: Childhood relationships and adult bio-psycho-social well-being in African women	13
Section 3: Article 2: Psychological well-being and the Metabolic Syndrome in African and Caucasian women	43
3.1 Guidelines for authors: <i>Social Sciences and Medicine</i>	44
3.2 Manuscript: Psychological well-being and the Metabolic Syndrome in African and Caucasian women	51
Section 4: Article 3: Psychological well-being and (the absence of) obesity in African and Caucasian women	82
4.1 Guidelines for authors: <i>Psychology & Health</i>	83
4.2 Manuscript: Psychological well-being and (the absence of) obesity in African and Caucasian women	86
Section 5: Conclusions, implications and recommendations	122
Complete reference list	130

Summary

Psychological well-being and biological correlates in African women

Key words: Psychological well-being, biological, social, childhood relationships, metabolic syndrome, obesity, African and Caucasian women.

The aim of this study was to explore, from different perspectives, whether obesity related variables are associated with facets of psychological well-being, with a vision to future enhancement of health and the quality of life of people in the African context.

This study was undertaken from the perspective of positive psychology and focused on the metabolic syndrome and obesity as biological facets. This research was conducted as part of the multidisciplinary POWIRS (Profiles of Obese Women with Insulin Resistance Syndrome) project. African (n=102) and Caucasian (115) women took part in a cross-sectional design. The thesis consists of 3 articles: *1) Childhood relationships and bio-psycho-social well-being in African women*, *2) Psychological well-being and the metabolic syndrome in African and Caucasian women*, and *3) Psychological well-being and (the absence of) obesity in African and Caucasian women*.

In this study psychological well-being was conceptualized and operationalized by means of the *General Health Questionnaire* (GHQ); *Sense of Coherence Scale* (SOC-29); *Affectometer 2* (AFM) (short form); *Fortitude Questionnaire* (FORQ); *Cognitive Appraisal Questionnaire* (CAQ); *Psychological Well-being Scales* (SPWB); *Quality of Childhood Relationship Questionnaire* (QCR); *Satisfaction with Life Scale* (SWLS) and the *Jarel Spiritual Well-Being Scale* (SWS-H). These scales were chosen to include hedonic as well as eudaimonic psychological well-being facets, but also an index of psychological symptoms. As far as possible, scales with acceptable

psychometric properties as described in international as well as South African context were selected.

The first article focused on whether African women with a recalled higher level of quality of childhood relationships would differ significantly with regard to biological, psychological and social well-being from women with a recalled lower level of quality of childhood relationships. Body mass index (BMI) was used as objective measure of obesity to operationalize physical health. Findings were that the recalled quality of childhood relationships is linked with obesity and psycho-social well-being in this group of African women.

The second article focused on psychological well-being and (the absence of) the metabolic syndrome (MS). It explored the possible association between comprehensive psychological well-being and MS in different cultural contexts, and explored whether African and Caucasian women without MS markers and those with MS differ on specific indices of psychological well-being. The criteria of the NCEP ATPIII were implemented to determine markers of MS, and the absence of markers of MS was used as measure of physical health. Findings were that an association is found in Caucasian women between comprehensive psychological well-being and the absence of the metabolic syndrome, but not in the case of African women. Caucasian women without metabolic syndrome markers had significantly higher levels of psycho-social well-being than women with the metabolic syndrome, but a less apparent pattern of differences emerged for African women. MS markers for African women should be further explored.

The third article explored facets of psychological well-being as predictors for (the absence of) obesity (measured by BMI and WHR) in African and Caucasian women, and whether similar or different psychological well-being facets will emerge as

predictors of obesity in different cultural contexts. Obesity was operationalized in terms of waist-hip-ratio (WHR) and body-mass-index (BMI). The finding was that clusters of psychological well-being facets are practical significant predictors of obesity (measured by BMI and WHR) and that these clusters differ in some respects for African and Caucasian women.

It was concluded that, firstly, findings support holistic conceptualizations of health such as proposed by the WHO (1999). Secondly, it may be worthwhile to include facets of psychological well-being in already existing intervention programmes. The development of strengths that focus on life skills and behaviours related to positive interpersonal relationships, optimistic cognitive attributional styles, finding a sense of purpose and meaningfulness in life, may be particularly beneficial. Sensitivity for cultural contexts is indicated. In view of the increase in the occurrence of obesity in childhood and adolescence it is recommended that educational training programmes should be implemented early in life in order to facilitate protective strengths and to promote bio-psycho-social health in individuals and communities. Advocacy for more attention to psycho-social and protective factors in public health is needed.

Opsomming

Psigologiese welsyn en biologiese korrelate in Afrika-vroue

Sleutelwoorde: Psigologiese welsyn, biologiese, sosiale, kindertydverhoudings, metaboliese sindroom, obesiteit, Afrika- en Kaukasiese vroue.

Die doel van hierdie studie was om, vanuit verskillende perspektiewe, te ondersoek of obesiteitsverwante veranderlikes geassosieer kan word met fasette van psigologiese welsyn, met die oog op toekomstige verbetering van die gesondheid en lewenskwaliteit van mense in 'n Afrika-konteks. Hierdie studie is vanuit die perspektief van die positiewe psigologie benader en fokus op die metaboliese sindroom en obesiteit as biologiese fasette. Hierdie navorsing is uitgevoer as deel van die interdisiplinêre projek: Profiles of Obese Women with Insulin Resistance Syndrome (POWIRS). Swart Afrika- (n=102) en wit Kaukasiese (115) vroue het aan die ondersoek deelgeneem. 'n Dwarssnitvraelys-navorsingsontwerp is gebruik. Die proefskrif bestaan uit drie artikels: 1) *Childhood relationships and bio-psycho-social well-being in African women* (Kinderverhoudings en volwasse biopsigososiale welsyn in Afrika-vroue), 2) *Psychological well-being and the metabolic syndrome in African and Caucasian women* (Psigologiese welsyn en die metaboliese sindroom in Afrika- en Kaukasiese vroue), 3) *Psychological well-being and (the absence of) obesity in African and Caucasian women* (Psigologiese welsyn en (die afwesigheid van) obesiteit in Afrika- en Kaukasiese vroue).

In hierdie artikels is psigologiese welsyn gekonseptualiseer en geoperasionaliseer deur middel van die *General Health Questionnaire* (GHQ); *Sense of Coherence Scale* (SOC-29); *Affectometer 2* (AFM) (short form); *Fortitude*

Questionnaire (FORQ); *Cognitive Appraisal Questionnaire* (CAQ); *Psychological Well-being Scales* (SPWB); *Quality of Childhood Relationship Questionnaire* (QCR); *Satisfaction with Life Scale* (SWLS) en die *Jarel Spiritual Well-Being Scale* (SWS-H). Hierdie meetinstrumente is geselekteer ten einde die hedoniese en eudiamoniese komponente van psigologiese welsyn, asook 'n indeks van psigologiese simptome in te sluit. Meetinstrumente met aanvaarbare psigometrieë eienskappe soos blyk uit navorsing in die internasionale en Suid-Afrikaanse konteks is so ver moontlik gebruik.

Die eerste artikel het gefokus op die kwaliteit van kindertydverhoudings, soos die individu dit onthou, vanuit die perspektief van die positiewe psigologie. Moontlike assosiasies tussen kindertydverhoudings en biologiese, psigologiese en sosiale welsyn in Afrika-vroue is ondersoek. Die liggaam-gewigindeks (LGI/BMI) is gebruik as objektiewe maatstaf vir die bepaling van obesiteit om fisieke gesondheid te operasionaliseer. Die bevindinge was dat die kwaliteit van kindertydverhoudings, soos die individu dit onthou, saamhang met obesiteit en psigososiale welsyn in hierdie groep Afrika-vroue.

Die tweede studie het gefokus op psigologiese welsyn en (die afwesigheid) van die metaboolse sindroom. Moontlike verbande tussen omvattende psigologiese welsyn en die metaboolse sindroom is in verskillende kulturele kontekste ondersoek, asook of daar 'n verskil is tussen Afrika- en Kaukasiese vroue met en sonder die metaboolse sindroom op spesifieke indekse van psigologiese welsyn. Die kriteria van die NCEP ATPIII is gebruik om die simptome van die metaboolse sindroom te bepaal. Die afwesigheid van simptome van die metaboolse sindroom is beskou as aanduidend van fisieke gesondheid. Daar is 'n assosiasie gevind tussen omvattende psigologiese welsyn en die afwesigheid van metaboolsesindroomsimptome in Kaukasiese vroue, maar nie in Afrika-vroue nie. Kaukasiese vroue sonder die metaboolsesindroomsimptome het

betekenisvol hoër psigososiale welsyn getoon as vroue met die metaboliese sindroom.

Daar het egter 'n minder duidelike patroon van verskille in Afrika-vroue na vore gekom. Die metaboliese sindroom se kriteria vir Afrika-vroue behoort verder ondersoek te word.

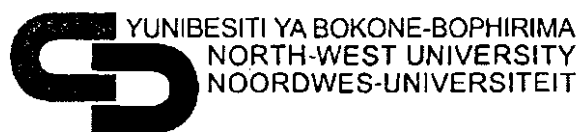
Die derde artikel se doel was om te bepaal of spesifieke fasette van psigologiese welsyn obesiteit kan voorspel, en of verskillende of soortgelyke fasette van psigologiese welsyn te voorskyn sal tree as voorspellers van obesiteit in verskillende kulturele kontekste. Obesiteit is geoperasionaliseer deur liggaamsgewigindeks (LGI/BMI) en middel-heupratio (MHR/WHR). Die bevindinge was dat groeperings van fasette van psigologiese welsyn na vore getree het as prakties betekenisvolle voorspellers van obesiteit en dat hierdie groeperings wel in sekere opsigte verskil het in die gevalle van Afrika- en Kaukasiese vroue.

Die konklusies van die ondersoek was, eerstens, dat die bevindinge holistiese konseptualiserings van gesondheid, soos voorgestaan deur die Wêreldgesondheidsorganisasie (WHO, 1999), ondersteun. Tweedens kan dit moontlik waarde toevoeg indien fasilitering van fasette van psigologiese welsyn in bestaande intervensieprogramme vir die bekamping van obesiteit ingesluit word. Die ontwikkeling van sterktes en lewensvaardighede wat gerig is op die fasilitering van positiewe interpersoonlike verhoudings, optimistiese kognitiewe attribusiestyle, en die vind van sin en betekenis in die lewe, kan spesifieke van waarde wees. 'n Sensitiwiteit vir kulturele konteks is noodsaaklik. Weens die toename in die voorkoms van obesiteit in kinders en adolessente word aanbeveel dat opvoedkundige opleidingsprogramme reeds vroeg in die kind se lewe geïmplementeer moet word om die ontwikkeling van beskermende sterktes en die bevordering van biopsigososiale gesondheid in individue en gemeenskappe te help fasiliteer. Daar sal aktief voorspraak gemaak moet word vir

beleidsaanpassings in publieke gezondheidsorg om ook psigososiale en veral
beskermingsfaktore in prevensie in ag te neem.

Preface

- This thesis was done in article format as indicated in rule A.14.4.2 of the yearbook of the North-West University.
- The three articles comprising this thesis were submitted for review to respectively the *Psychological Reports* (impact factor: 0,341), *Social Science and Medicine* (impact factor: 2,088), and the *Psychology & Health* (impact factor: 1,683). All articles are currently under review or will be submitted soon.
- All articles were formatted according to American Psychological Association (APA) guidelines, but in case of a difference the guidelines for authors of the *Psychological Reports*, *Social Science and Medicine* and *Psychology & Health* were used.
- For purposes of this thesis, these articles were page numbered consecutively. However, each individual article was numbered starting from page 1 for submission to the journals.
- Attached, please find the letter signed by the co-authors authorizing me to use these articles for purposes of submission for a Ph.D. degree.



Psychology

Tel (018) 018-2991721

Fax (018) 018-299 1730

E-Mail psgmpw@puk.ac.za

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LETTER OF PERMISSION

Hereby permission is granted that the following manuscripts:

- 1) *Childhood relationships and adult bio-psycho-social well-being in African women,*
- 2) *Psychological well-being and the metabolic syndrome in African and Caucasian women, and*
- 3) *Psychological well-being and (the absence of) obesity in African and Caucasian women*

may be used by the first author, Elsabé M. Botha, for purposes of obtaining a Ph.D. degree.

Prof. M.P. Wissing

Co-author

Prof. H.H. Vorster

Co-author

Dr. S.M. Ellis

Co-author

PSGMPW@PUK.AC.ZA c:\my documents\2004bneethoofde\psychology.doc



POTCHEFSTROOM CAMPUS
Private Bag X6001, Potchefstroom, South Africa, 2520
Tel: (018) 299-1111 • Fax: (018) 299-2799
Internet: <http://www.nwu.ac.za>



Section 1: Introduction

The focus of the current study was to explore possible associations between psychological well-being and its biological correlates, taking cultural context into account. The study was motivated by a need for a more holistic understanding of health in line with the WHO definition of health and holistic models of psychological wellness.

The science of Positive Psychology is growing fast (Aspinwall & Staudinger, 2003; Keyes & Haidt, 2003; Lopez & Snyder, 2003; Seligman & Csikszentmihalyi, 2000; Snyder & Lopez, 2002). It now also requires the exploration of the biological correlates of psychological well-being (Ryff & Singer, 1998, 2002, 2003; Taylor, Repetti & Seeman, 1997), because the core of positive health rests on the hypothesis that psychological well-being contributes to optimal functioning of numerous physiological systems (Ryff & Singer, 1998; Ryff, Singer & Dienberg Love, 2004; Singer & Ryff, 2001).

The definition of health by the World Health Organization (WHO, 2003) broadens the limited traditional concept of health as pertaining only to physical aspects and illnesses, and opens up the interdisciplinary field that embraces the human organism as a multi-dimensional being. Therefore, in order to prevent illness and enhance wellness the association of various facets of physical, psychological and social functioning needs to be explored and understood. However, in the past the focus in the western world, concerning health status, was mainly on disease, deficits, vulnerability, psychopathology, stress and rates of mortality and morbidity, neglecting wellness, positive functioning and physical and psychological thriving (Antonovsky, 1987; Aspinwall & Staudinger, 2003; Keyes, 2005a; Seligman & Csikszentmihalyi, 2000). An indication of this is that psychological assessment instruments and research

are notably weighed on the side of pathology and stress. Therefore, more holistic models of wellness need to be used in the exploration of a complete mental health state (Keyes, 2005a).

Conceptualizations of psychological well-being have shifted from mere indicators of disease or the absence of symptoms (pathogenic perspective) to an inclusion of positive indicators of wellness (i.e. a fortigenic perspective) (Seligman & Csikzentmihalyi, 2000; Wissing, 2000). In recent times the psychofortology / positive psychology perspective (Aspinwall & Staudinger, 2003; Diener, 2000; Fredrikson, 2001; Ickovics & Park, 1998; Keyes & Haidt, 2003; Linley & Joseph, 2004; Lopez & Snyder, 2003; Peterson & Seligman, 2004; Ryff & Singer, 1998; Seligman & Csikzentmihalyi, 2000; Snyder & Lopez 2002; Wissing & Van Eeden, 2002) has drawn attention to positive indicators of wellness.

These positive indicators of psychological well-being are mainly conceptualized from either a hedonic (maximizing of subjective happiness and enhancing of positive mood) or an eudiamonic perspective (focuses on purpose in life, meaning and actualization of human potential) (Diener & Larsen, 1993; Diener, Suh, Lucas & Smith, 1999; Kahneman, Diener & Schwarz, 1999; Keyes, Shmotkin & Ryff, 2002; Ryan & Deci, 2001; Ryff & Keyes, 1995; Waterman, 1993). The eudiamonic view put the emphasis on well-being as a dynamic process rather than a discrete end state. A multidimensional perspective, including aspects of the hedonic and eudiamonic conceptions, also exists (Ryan & Deci, 2001), as is found in the empirical study of Wissing and Van Eeden (2002).

Psychological well-being is conceptualized and operationalized in the current study in terms of the degree of (the absence of) symptoms of psychopathology, sense of coherence, satisfaction with life, affect-balance, spiritual well-being, cognitive

attributional style, environmental mastery, purpose in life as well as the quality of interpersonal relationships, and degrees of experienced social support (fortitude). These psychological facets were measured by means of the General Health Questionnaire (GHQ) (Goldberg and Hillier, 1979); Sense of Coherence Scale (SOC-29) (Antonovsky, 1987); Affectometer 2 (AFM) (short form) (Kammann & Flett, 1983); Fortitude Questionnaire (FORQ) (Pretorius, 1998); Cognitive Appraisal Questionnaire (CAQ) (Botha & Wissing, 2003); Psychological Well-being Scales (SPWB) (Ryff, 1989); Quality of Childhood Relationship Questionnaire (QCR) (Botha, 2003); Satisfaction with Life Scale (SWLS) (Diener, Emmons, Larsen & Griffin, 1985) and Jarel Spiritual Well-Being Scale (SWS-H) (Hungelmann et al., 1989). These scales were chosen to include pathological psychological symptomatology, and hedonic as well as eudaimonic psychological well-being facets. The specific questionnaires were selected to examine the major dimensions of human functioning, (spiritual, affective, social and cognitive) as is conceptualized in holistic models of psychological well-being, and taking into account psychometric properties of scales as described in international as well as South African context as far as possible.

It has long been known that symptoms of stress-related psychopathology may have biological correlates (Black, 2003; Brown, Varghese & McEwen, 2004; Friedman, Reichmann, Costanzo & Musante, 2002; McElroy et al., 2004; Salovey, Rothman, Detweiler & Steward, 2000; Stambor, 2006; Vaidya, 2006), but little is known about the relationship between psychological well-being and physical health (Ryff & Singer, 1998). Whether other psychological resources or strengths, than social relationships and social support (Ryff & Singer, 2002, 2003; Seeman, Singer, Ryff, Dienberg Love, & Levy-Storms, 2002; Uchino, Cacioppo & Keicolt-Glaser,

1996), are related to physical health deserves to be explored. It is known that cognitive-emotional processing of experiences (interpersonal or other) activate biochemical processes in various biological regulatory systems, and vice versa, but the exact nature of the physiological cascade is largely unknown (Ryff & Singer, 1998; Seeman, et al., 2004).

Explorations to determine associations between persistent psychological well-being on the one hand (for example experiencing positive emotions, purposeful engagement in living and quality human connections) and physiological substrates and reactions on the other hand, is essential (Ryff & Singer, 1998). Seeman et al. (2002) point out that research on physiological factors tend to focus on individual biological parameters only, and that positive and negative social experiences have an effect across numerous physiological systems and not only on a single biological parameter. In this study the metabolic syndrome and obesity were used as indicators of the degree of physical health – thus including various physiological systems simultaneously. The metabolic syndrome was determined with use of the criteria of the National Cholesterol Education Program's Adult Treatment Panel III (NCEP's ATP III). Markers for MS are (three or more indicate the metabolic syndrome): (i) Waist circumference >88 ; (ii) Fasting plasma glucose ≥ 6.1 mmol/L; (iii) Systolic Blood pressure ≥ 130 and/or Diastolic Blood pressure ≥ 85 ; (iv) Triglyceride ≥ 1.69 mmol/L and (v) HDL <1.29 mmol/L. Obesity was measured by body-mass-index (BMI) as well as waist-hip-ratio (WHR) to give an indication of body composition also.

Obesity is escalating worldwide and has been linked with various chronic disease risks, such as the metabolic syndrome (MS), cardiovascular disease, type 2 diabetes, cancer, gall-bladder disease, sleep apnea, respiratory problems,

osteoarthritis, and cataract (Stein & Colditz, 2004; Steinbaum, 2004; Mollentze et al., 1995; Vorster, 2002). Obesity, therefore, seems to put a physiological burden on various physiological systems. The concept of “allostatic load” refers to the cumulative wear and tear across multiple physiological systems and the diagnostic criteria for the metabolic syndrome are included in the variables of allostatic load. MS, also called insulin resistance syndrome or syndrome X, is a disease with many facets that is usually deemed to include the clustering of visceral obesity, hyperglycemia, dyslipidemia, hypertension and impaired glucose tolerance (Franciosi & Kasper, 2005; Niaura, Todaro, Stroud, Ill, Ward & Weiss, 2002; Rääkkönen, Matthews & Kuller, 2002; Starlien et al., 2001). This study explores obesity and the metabolic syndrome as biological markers of (ill)health because of their interdependency, the growing number of obese people (Wardle & Steptoe, 2005), and the importance of obesity in terms of implications for various chronic diseases.

In South Africa the occurrence of obesity in African women is double that of Caucasian women (Puoane et al., 2002). Walker, Adam and Walker (2001: 368) claim that African women have fewer health disadvantages of obesity than Caucasian women, and that obesity would therefore have less influence on their inclination to develop certain chronic diseases. Further, in a traditional African context, an obese figure appears to have positive cultural connotation, because it is still often regarded as a sign of affluence and happiness (Mvo, Dick & Steyn, 1999; Walker, 1998). With the incidence of the human immunodeficiency virus/AIDS that is increasing in the current South African situation, obesity even seems to be observed as an indication of a person’s health (Mvo, Dick & Steyn, 1999). Therefore, the exploration of obesity and MS is essential for a better understanding of the underlying dynamics, and the

implications it may have for physical health and psychological well-being in different cultural contexts.

Previous research indicated that psychological well-being might be protective of physical health. Taylor, Kemeny, Reed, Bower and Gruenewald (2000) found, when using HIV infection as disease model, that psychological beliefs such as the experience of meaning, control and optimism act as resources, which enhance and protect physical health. Keyes (2005b) indicated that directedness, low helplessness, resilience and having cherished relationships are protective of physical health and also observed that adults with complete mental health had the lowest occurrence of any cardiovascular disease (Keyes, 2004). Ryff and Singer (2002, 2003) found that positive relationship pathways could help counterbalance the likelihood of experiencing high allostatic load in the face of negative economic life experiences.

In African societies a distortion in the harmony between the individual and his or her world of relationships is associated with physical and mental illnesses (Bodibe & Sodi, 1997; Ebigbo, Oluka, Ezenwa, Obidigbo & Okawaraji, 1996). The importance of investigating the quality of childhood relationships in an African cultural context for adult bio-psycho-social health therefore appears to be vital, especially because in most of the previous studies the participants were mainly white and from Western descent (Seeman, Singer, Ryff, Dienberg Love & Levy-Storms, 2002).

The extraordinary opportunity exists in South Africa to search for association between physical health and psychological well-being in a relative individualist (Caucasian) as well as in a relative collectivist (African) cultural context within the same country, and not in an East versus West context. That cultural factors may play a role in the manifestation of psychological well-being and symptoms of ill-health is a

recognized fact (Basabe, Paez, Valencia, Gonzalez, Rimé, & Diener, 2002; Cutrona, Russel, Hessling & Brown, 2000; Massimini & Delle Fave, 2000; Taylor, Repetti & Seeman, 1997), but the dynamics thereof has hitherto not been clearly described. Collectivist (e.g. African) and individualist (e.g. Western) cultural contexts may differ in their patterns of psychological well-being (Wissing, Wissing, Du Toit & Temane, 2006). This study explores associations between obesity and obesity-related MS and (patterns of) psychological well-being in these cultural contexts.

The focus of the first article in this study is the possible relationship between recalled quality of childhood relationships and adult bio-psycho-social well-being in an African cultural context. Body mass index (BMI) as measure of obesity is implemented as an index of physical health, while psycho-social well-being is measured holistically. This article is submitted to *Psychological Reports*.

The second article is on psychological well-being and (the absence of) MS. It explores possible links between comprehensive psychological well-being and MS in different cultural contexts and explores whether African and Caucasian women without MS markers and those with MS (three or more markers) differ on specific indices of psychological well-being. It is submitted to *Social Science and Medicine*.

The third article aims to determine whether specific psychological well-being facets can predict (are associated with) obesity (BMI and WHR), and whether similar or different psychological well-being facets will emerge as predictors of obesity in different cultural contexts. This manuscript will be submitted to *Psychology & Health*.

The overall aim of this study was to determine whether (the absence of) obesity-related variables are associated with (facets of) psychological well-being with a view to eventually improve the quality of life of people in different cultural

contexts. Obesity has become a chronic condition that is slow to respond to interventions, and is also associated with several diseases as a risk factor. Obesity should, therefore, rather be prevented. If specific strengths or protective factors are associated with obesity this information could be used in the development of preventive interventions.

In a final section conclusions, implications and recommendations will be made based on findings from this study.

Section 2: Article 1

Childhood relationships and adult bio-psycho-social well-being in African women

submitted to

Psychological Reports

2.1 Guidelines for authors:

Psychological Reports

<http://ammons.ammonsscscientific.com/homepage/submission.php>

Psychological Reports

ISSN: 0033-2941

Impact factor: 0.341 (2004)

Accredited

Instructions for Submitting a Manuscript to Psychological Reports

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2. Begin with a Title Page, which must include:
 - (a) the complete title,
 - (b) names and affiliations of all authors in the order they should appear
 - (c) the running head, and
 - (d) contact information for readers (name, address, e-mail information)
3. Include a Summary or Abstract on a separate page following the title page. Length should be less than 150 words
4. A Reference List should be included at the end of the paper. Check to ensure that:
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2.2 Manuscript

Childhood relationships and adult bio-psycho-social well-being in African women

Elsabé M. Botha*¹, Marié P. Wissing¹ & Hester H. Vorster²

¹ = School for Psychosocial Behavioural Sciences, ² = School for Physiology, Nutrition and Consumer Sciences, North-West University (Potchefstroom Campus), Potchefstroom, South Africa

Correspondence to:

Elsabé Botha

P.O.Box 6175

Baillie Park,

2526,

South Africa

Email address - ebotha@cit.za.net

Abstract

This study explored whether African women with a recalled higher level of quality of childhood relationships would differ significantly with regard to bio-psycho-social well-being from women with a recalled lower level of quality of childhood relationships. One hundred and two women completed self-report questionnaires and anthropometrical measures were taken. Participants with recalled higher quality childhood relationships were practically significantly (large effect size) leaner, had a higher sense of coherence and had a more optimistic explanatory style than those with recalled lower quality childhood relationships. They also had practically significantly (medium effect size) more social support and purpose in life, better personal relationships, a greater sense of environmental mastery, and higher levels of spiritual well-being. Findings indicate that the quality of recalled childhood relationships of a group of African women, is related to body mass index and to various facets of psycho-social well-being as conceptualised from a Positive Psychology perspective.

Childhood relationships and adult bio-psycho-social well-being in African women.

The quality of interpersonal relationships plays an important role in the overall experience of quality of life (Ryff & Singer, 1996, 1998), especially in the case of women (Rothman, Kirsten & Wissing, 2003; Ryff & Singer, 1996). Various facets of interpersonal relationships had been linked to components of bio-psycho-social health in previous research. Few studies could be located that linked parental bonding with body mass as index of physical health in females (Turner, Rose & Cooper, 2005), but no such a study could be found for African women.

Research that links childhood experiences to adult psycho-social health as defined from a Positive Psychology perspective is also sparse. Most of the previous studies had been done on western groups, and research with African participants is underrepresented. Women have a high risk for cardiovascular diseases and the insulin resistance syndrome (type 2 diabetes) (Mollentze, Moore, Steyn, Joubert, Steyn, Oosthuizen & Weich, 1995 Steinbaum, 2004; Vorster, 2002), in which body mass is one of the risk indicators. Puoane, Steyn, Bradshaw, Laubscher, Fourie, Lambert and Mbananga (2002) indicated that the occurrence of obesity in African women is double that of Caucasian women in South Africa. Obesity is an important objectively measurable indicator of physical health and has also been linked to mortality in various studies (Allebeck & Bergh, 1992; Allison, Faith, Heo, Townsend-Butterworth & Williamson, 1999; Engeland, Bjorge, Tverdal & Sogaard, 2004; Fontaine, Redden, Wang, Westfall & Allison, 2003; Thorpe & Ferraro, 2004). The current study focuses on recalled quality of childhood relationships and adult bio-psycho-social well-being in a group of African women, where biological

well-being is indicated, inter alia, by body mass, and psycho-social well-being defined from a Positive Psychology perspective

Human relationships and bio-psycho-social well-being

The importance of human relationships in making our lives richer and more fulfilling is acknowledged in every culture across all generations. Ryff and Singer (2000:30) made this point by remarking that “quality ties to others are universally endorsed as central to optimal living”. Baumeister and Leary (1995) postulated that all humans in all cultures are intrinsically motivated to belong, and that happiness in life is strongly linked to close personal relationships. This is particularly the case in African societies where physical and mental illnesses are understood to be the result of a distortion of the harmony between the individual and his or her world of relationships (people, cosmos) (Bodibe & Sodi, 1997; Ebigbo, Oluka, Ezenwa, Obidigbo & Okawaraji, 1996).

Scholars from diverse disciplines (e.g. psychology, philosophy, ethnology, sociology, anthropology) have studied various facets of interpersonal relationships, with several domains in psychology (e.g. personality, social, developmental, clinical, family) contributing to a large extent, and with an interdisciplinary research approach emerging strongly. From the perspective of the attachment theory (Bowlby, 1973; Hazan & Shaver, 1994; Mallinckrodt, 1992; Sperling & Berman, 1994) it has been predicted that the lack of a secure, close relationship with a caregiver may disturb normal development and may be a risk for a range of emotional and behavioural problems in later life. This has been confirmed in many empirical studies (Carlson, 1998; Collins & Feeney, 2004; Dozier, Stovall, & Albus, 1999). From a Positive Psychology perspective it can be hypothesized that not only behavioural problems or the absence thereof will be related to the quality of

recalled childhood relationships, but also the degree of optimal, positive psycho-social functioning.

There is a large body of research demonstrating the importance of interpersonal relations and social support for health and well-being (Seeman, Singer, Ryff, Dienberg Love & Levy-Storrs, 2002; Uchino, Cacioppo & Kiecolt-Glaser, 1996). However, few studies were conducted with African participants, and a large proportion of previous studies defined well-being in terms of the absence of symptoms rather than the presence of strengths as defined from a Positive Psychology perspective. Several studies from the perspective of the attachment theory linked the quality of childhood relationships with adult bio-psycho-social health. In these studies 'health' is defined primarily in terms of (psycho)pathology or absence of pathology (Lizardi & Klein, 2000; Martin, Bergen, H., Roeger, & Allison, 2004; Rohner, & Britner, 2002).

Self-esteem and body image (weight and shape) have been linked. Body image evaluation, according to Friedman, Reichmann, Costanzo and Musante (2002), is related to the degree of obesity: obese women express less contentment with their appearances (in a Western context). Women who indicated dissatisfaction with their body image reported higher levels of depression and a low self-esteem (Friedman et al., 2002). Ryff and Singer (2000) demonstrated that cumulative positive and negative relationship pathways are related to allostatic load (including some body mass indices) and adult psychological well-being in Western groups. The question is whether the same findings will be manifested in non-Western samples and in a different cultural context.

The influences of culture on bio-psycho-social well-being

The development of attachments is a universal phenomenon. However, culture may influence the manifestation and correlates of attachments, and this may differ between collectivist (e.g. African, Korean) and individualist (e.g. Western) cultural contexts. Diener, Lucas and Oishi (2002) indicated that collectivist cultures differ from individualist cultures in their level of subjective well-being, and that the cultural norms can change the correlates of subjective well-being. Ryff and Singer (1996) reported higher scores on positive relationships on the one hand, and lower scores on self-acceptance, personal growth and autonomy on the other hand, in a collectivist (Korean) culture compared to an individualist (Western) culture where self-acceptance, autonomy and personal growth are more important contributors of psychological well-being. Myers (1999) argued that cultural variations might influence both the benefits and burdens of interpersonal relationships.

In a more collectivistic African group the extended family plays an important role in children's lives, which may be a benefit in some respects. In other instances the obligations to care for others when little resources are available may be experienced as a burden by some. The question is whether the experienced quality of childhood relationships (with father, mother, others) will be differentially related to adult bio-psycho-social well-being in Western societies (mostly individualist societies) and in African societies (mostly collectivist societies).

The influence of gender on bio-psycho-social well-being

In their review of literature on gender differences Ryff and Singer (2000) found that men and women differ substantially in their relational experiences and physiological reactions.

Being traditionally the caretakers within the family may put more pressure on women (Ryff & Singer, 2000). Women rate positive relationships with others and personal growth significantly higher than men do (Ryff & Singer, 1996). The authors also stated that women have greater psychological strength compared to men in certain aspects of well-being. This is important to note seeing that women also seem to have a higher incidence of psychological problems, especially depression (Strickland, 1992). In the current study the experience of African women is explored.

Psycho-social well-being

Conceptualizations of psycho-social well-being have shifted from mere indicators of disease or the absence of symptoms (pathogenic perspective) to an inclusion of positive indicators of wellness (i.e. a fortigenic perspective) (Seligman & Csikzentmihalyi, 2000; Wissing, 2000). In recent times the psychofortology / positive psychology perspective (Aspinwall & Staudinger, 2003; Diener, 2000; Fredrikson, 2001; Keyes, & Haidt, 2003; Linley & Joseph, 2004; Lopez & Snyder, 2003; Peterson & Seligman, 2004; Ryff & Singer, 1998; Seligman and Csikszentmihalyi, 2000; Snyder & Lopez 2002, Wissing & Van Eeden, 2002) has drawn attention to positive indicators of wellness.

These positive indicators of psycho-social well-being are mainly conceptualized from either a hedonic (maximizing of subjective happiness and enhancing of positive mood) (Diener & Larsen, 1993) or an eudaimonic perspective (focuses on purpose in life, meaning and actualization of human potential) (Ryff & Keyes, 1995). A multidimensional perspective, including aspects of the hedonic and eudaimonic conceptions, also exists (Ryan & Deci, 2001), as is found in the empirical study of Wissing and Van Eeden (2002). In the current study psycho-social well-being is

conceptualized and operationalized in terms of the degree of psychological symptoms, sense of coherence, satisfaction with life, affect-balance, spiritual well-being, cognitive attributional style, environmental mastery, purpose in life as well as the quality of interpersonal relationships, and degrees of experienced social support (fortitude).

The present study aims to determine whether an adult group of African women with a retrospectively experienced higher level of quality of childhood relationships would differ significantly with regard to bio-psycho-social well-being from women with a retrospectively experienced lower level of quality of childhood relationships.

Method

Design and Participants

Data were gathered in a cross-sectional design as part of the multi-disciplinary POWIRS-project (POWIRS = Profiles of Obese Women with Insulin Resistance Syndrome) (Schutte, Kruger, Wissing, Underhay & Vorster, 2005). Participants were recruited in a governmental organization of the North West Province of South Africa. Hundred and two apparently healthy African women were selected on basis of anthropometric measures (BMI) as the group had to include both lean and obese women for purposes of the POWIRS project. Most of the women were Setswana speaking, between 19 to 56 years of age, and with educational levels ranging from primary school to post graduation qualifications. English is their second language and the language that is formally used in their work environment. The study was explained to participants during recruitment as an exploration of health-related factors. Written informed consent was obtained from each participant before further research procedures were initiated.

Measures

Childhood relationships

The *Quality of Childhood Relationship Questionnaire (QCR)* (Botha, 2003), is based on Ryff and Singer's approach in the Wisconsin study (Ryff & Singer, 2002). It incorporates a Likert type 5-point scale. The QCR consists of 9 questions referring to the quality of relationships with the mother, father and significant others in terms of the amount of (a) caring; (b) support; and (c) affection/love; the child experienced, for example "When I was growing up I experienced my mom as caring". In the current study a Cronbach alpha reliability index of .71 was obtained. Face and content validity were assured by feedback from a panel of psychologists.

Physical health

Physical health was determined by a body mass index, and incidence of somatic symptoms. *Body Mass Index (BMI)*, as indicator of biological health is calculated as follows:

$$\text{BMI} = \frac{\text{Weight in kg}}{(\text{Height in m})^2}$$

People with a BMI ≥ 30 are considered obese (Caro, 2002). The *Somatic Symptoms (SS)* sub-scale of the *General Health Questionnaire (GHQ)* (Goldberg and Hillier, 1979) measures the presence of physical symptoms. In the current study this sub-scale had a Cronbach alpha reliability index of 0.79.

Psycho-social well-being

The *General Health Questionnaire (GHQ)* (Goldberg and Hillier, 1979). This scale measures an individual's current mental state by detecting common symptoms that are associated with mental disorders and the prevalence of stress symptomatology, like

anxiety and sleeplessness (AS), social dysfunction (SD) and depression (DS). In the current study the following Cronbach alpha reliability indices were found: GHQ-AS 0.79; GHQ-SD 0.69; and GHQ-DS 0.78. Wissing, Thekiso, Stapelberg, Van Quickelberge, Choabi, Moroeng and Nienaber (1999) reported reliability indices of 0.86 to 0.91 in South African populations.

The *Satisfaction with Life Scale (SWLS)* (Diener, Emmons, Larsen & Griffin, 1985). This scale measures satisfaction with life according to own criteria for what is perceived as the general standard of living. In the current study a Cronbach alpha reliability index of 0.75 was found. Wissing et al. (1999) reported reliability indices of 0.67 to 0.85 in South African populations.

The *Sense of Coherence Scale (SOC)* (Antonovsky, 1987). The SOC is fundamentally based on an individual's cognitive self-evaluation of his/her life and the world as he/she experiences it, indicating whether it is comprehensible, manageable, and meaningful to him/her. In the current study a Cronbach alpha reliability index of 0.81 was obtained. Wissing et al. (1999) reported reliability indices of 0.70 to 0.91 in South African populations.

The *Affectometer 2 (AFM) (short form)* (Kammann & Flett, 1983). The AFM measures a general feeling of happiness and sense of well-being. The extent to which positive affect (PA) predominates over negative affect (NA) determines the balance between positive and negative affect (PNB) and the level of well-being. In the current study the following Cronbach alpha reliability indices were found: AFM-PA 0.78; AFM-NA 0.82; and AFM-PNB 0.85. Wissing et al. (1999) reported reliability indices of 0.68 to 0.90 in South African populations.

The *Fortitude Questionnaire (FORQ)* (Pretorius, 1998). The FORQ is a self-report questionnaire that measures an individual's ability to manage stress and still experience psychological health/well-being. Fortitude is operationalized by the individual's perception of the self (S); the perceived support of his/her family (F); and the perceived support from others (SP). In the current study the following Cronbach alpha reliability indices were found: FORQ-S 0.63; FORQ-SP 0.75; FORQ-F 0.86; and FORQ-T 0.86. Pretorius (1998) developed this scale in the South African context and reported reliability indices of 0.74 to 0.85.

The *Cognitive Appraisal Questionnaire (CAQ)* (Botha & Wissing, 2003). The CAQ is a self-report questionnaire with eight items based on the explanatory style theory of Buchanan and Seligman (1995). The degree of an optimistic vs. a pessimistic explanatory style is measured by this questionnaire. A more optimistic style is characterized by viewing positive events as ascribed to internal, global and stable factors and assessing the causes of bad events as external, specific, and unstable. In the current study a Cronbach alpha reliability index of 0.72 was obtained.

The *Psychological Well-being Scales (SPWB)* (Ryff, 1989). The SPWB conceptualize psychological well-being as consisting of the dimensions of autonomy, environmental mastery, personal growth, positive relationships with others, purpose in life and self-acceptance. These self-report scales assess an individual's well-being at that particular moment on each of the different dimensions. For the purpose of this study only positive relationships with others (PR), environmental mastery (EM), and purpose in life (PL) were used, obtaining the following Cronbach alpha reliability indices: SPWB-PR 0.71; SPWB-EM 0.69 and SPWB-PL 0.77. Erasmus, Kirsten and Breytenbach (2005)

reported reliability indices for SPWB-PR 0.83; SPWB-EM 0.85 and SPWB-PL 0.85 in South African populations.

The *Jarel Spiritual Well-Being Scale (SWS-H)* (Hungelmann, Kenkel-Rossi, Klassen & Stollenwerk, 1989). The SWS-H conceptualizes spirituality as a multidimensional construct. The harmonious interdependency of the different components of an individual's spirituality is measured by a sense of responsibility (for self and life), life satisfaction / self actualization, and religious conviction. In the current study a Cronbach alpha reliability index of 0.78 was obtained. Fourie (1999) reported reliability indices of 0.83 in South African populations.

Procedure

Subgroups of ten participants stayed overnight in the Metabolic Unit of the Potchefstroom Campus of the North-West University, for purposes of the multi-disciplinary POWIRS project. Anthropometric measurements, which included stature, and body mass were taken and psychological questionnaires were completed during the evening under supervision of the first author and a Setswana speaking African psychologist. Each participant was assigned a subject number for the duration of the relevant research to ensure anonymity and to protect the privacy of the participants. The Ethics Committee of the North-West University approved of this study (reference number 03M03).

Results

Pearson's correlation coefficients were determined between quality of childhood relationships (QCR) and the biological and the psychosocial measures with control for age. QCR and BMI correlated statistically significantly ($r = -0.26$) with medium practical

significant effect. No correlation was found between QCR and GHQ-SS. QCR correlated with all the measures of psychosocial well-being statistically significantly (r between 0.21 - 0.40), indicating medium effect practical significance, except with SWLS, GHQ-AS and GHQ-SD. To investigate this relationship in more detail, participants were divided into three groups, namely those with lower quality of childhood relationships, LQRC ($n = 34$) and those with higher quality of childhood relationships, HQRC ($n = 40$) (approximately the lower and upper third of the data) by means of trichotomy. The middle group was omitted in further analysis.

An ANCOVA, with adjustment for age of participants, was used to determine whether a significant difference could be identified between the LQCR and the HQCR group for psychosocial and physical health factors. A statistically significant Wilks multivariate p -value of 0.039 for the psychosocial factors and of 0.007 for the physical health factors was indicated between the LQCR and the HQCR groups. The results of univariate ANCOVAs (see Table 1) indicate which of the individual measures differed according to QCR. To determine whether these differences were of practical significance, effect sizes were determined. Practical significance can be understood as a large enough difference to have an effect in practice. A natural way to comment on practical significance is to use the standardized difference between the means of two populations, i.e. the difference between the two means divided by the estimate for standard deviation (Ellis & Steyn, 2003). According to Cohen (1988) an effect size is small when $d = 0.2$, medium when $d = 0.5$ and large when $d = 0.8$. In this study large effect size and medium effect size differences will be elsewhere discussed. Data with $d \geq 0.8$ are considered as practically significant. Values of $d \approx 0.5$ (medium effect) will be considered to be large

enough for possible practical significance.

Since this study consists of an availability sample, no generalizations can be made and only practical significant differences will be discussed. The practical significance of differences between HQCR and LQCR groups on all bio-psycho-social indices are indicated in Table 1. Practically significant differences (large effect size) were found on BMI as a measure of physical health, and on several indices of psycho-social well-being. In this study HQCR participants are leaner (BMI), have a higher sense of coherence (SOC) and have a more optimistic explanatory style (CAQ) than those with LQCR (large practical significant effect). Medium effect sizes indicated that there is a possibility that HQCR participants also in practice experience better social support (FORQ), better personal relationships (SPWB-PR), better sense of environmental mastery (SPWB-EN), experience more purpose in life (SPWB-PL), and higher levels of spiritual well-being (SWS-H) than LQCR participants.

[Table1]

Discussion

The subjective experienced quality of childhood relationships in this group of African women is associated with adult bio-psycho-social well-being.

Quality of childhood relationships (QCR) and biological well-being

In this study recalled quality of childhood relationships is related to body mass. In this group of African women, those with higher quality childhood relationships were practically significantly (large effect size) leaner than those with lower quality childhood relationships. This finding resonates with that of Lissau and Sørensen (1994) who found in a longitudinal study that parental neglect in childhood, in the form of poor general

hygiene and lack of parental support, significantly increased the risk for obesity in adulthood. Obesity hampers optimal biological functioning and thus health-related quality of life. The problem of obesity is complex, pervasive and has health-related risks (Marcus, 2002).

Although the quality of childhood relationships was strongly linked with an objectively measured level of obesity, no relationship was found in this group of African women, with symptomatic symptoms. This may indicate that not all physical indices are equally sensitive to quality of childhood relationships in this particular group. It may be that obesity is associated with a lower quality of recalled childhood relationships, via the dynamics of unfulfilled security needs. Hazan and Shaver (1994) argued that feelings of a lack of security in the caregiving environment during childhood partially shape beliefs about the self and interpersonal relationships. Obesity may therefore be related to oral compensatory processes, i.e. looking for security in food when it is lacking in interpersonal relationships.

Quality of Childhood Relationships (QCR) and psycho-social well-being

In this study recalled quality of childhood relationships was related to psycho-social well-being. The group of African women with higher quality of experienced childhood relationships had practically significantly (large effect size) higher levels of a sense of coherence (i.e. an outlook on life as comprehensible, manageable and meaningful), and a more optimistic cognitive attributional style in adulthood. This finding supports Ryff and Singer's (1998) contention that deep connections to others are linked to a sense of purposefulness and mastery. The current group of African women with higher levels of recalled quality childhood relationships also had a greater sense of environmental

mastery and positive relationships with others, experienced more purpose in life, as well as higher spiritual well-being (medium effect sizes). These women thus seem to enjoy in practice greater psychological well-being in adulthood than those with recalled lower quality childhood relationships. These findings confirm that the quality of childhood relationship is just as important in the case of African women's adult psychological well-being, than it is for women in Western samples.

In this study recalled quality of childhood relationships was practically significantly (medium effect) related to indices of social well-being. This is in line with expectations from the attachment theory. Hazan and Shaver (1994) claimed that the attachment system is organized and regulated by social input. The primary caregiver's responsiveness or the lack thereof to the infant's distress signals in repeated interactions, instigates the establishment of a mental representation of the behaviour that can be expected. The attachment theory hence implies that the caregiving environment, in part, determines feelings and beliefs about the self and guides thoughts, feelings and behaviour in subsequent close relationships (Bowlby, 1973). Participants with higher quality childhood relationships seem to have in practice (medium effect sizes) more positive relationships than those with lower quality childhood relationships and they may also experience more social support (fortitude). These results thus support attachment theory's hypothesis that the quality of bonds between children and caregivers are important throughout the life cycle (Feeney, 1999).

Conclusions

The finding of this study that the recalled quality of childhood relationships are linked to adult bio-psycho-social well-being for this group of African women, supports facets of

both the attachment and self-determination theories. The attachment theory hypothesizes the crucial role of close relationships in overall feelings about and adjustment to life (Hazan & Shaver, 1994) and testifies that a secure attachment is considered as a general resilience mechanism across the life span (Mikuliner & Florian, 1998). The self-determination theory (Ryan & Deci, 2000) indicates that autonomy, competence and relatedness are three basic psychological needs and theorizes that fulfillment of these needs is vital for growth and psychological well-being. Findings of this study support the importance of the relationship component in this theory.

A limitation of the present study was that the quality of childhood relationships was measured according to data recalled in retrospect, and not according to first-hand observations of the quality of childhood relationships. The small number of participants in the different groups and the cross-sectional nature of the study caution against attaching too much meaning to medium effect size practical significances. Therefore, further research is indicated with larger numbers of randomly selected participants and with use of longitudinal designs. Nevertheless, the present findings provide evidence for a strong hypothesis that recalled quality of childhood experiences are linked to indices of bio-psycho-social health in adulthood for African women, as was previously established for participants from Western contexts. In this study the link is made to body mass and psycho-social well-being as conceptualized from a Positive Psychology perspective.

Obesity is escalating worldwide (Gotlieb, 2003; Mudur, 2003). In this group of African women there is a clear indication that participants with recalled higher quality of childhood relationships are leaner and have better psycho-social well-being. This is in line with the findings of Turner, et al. (2005) in a Western context that positive parent-

child relationships may aid to shield overweight adolescents from developing eating disorders and psychological distress later in life. This points in the direction that training programmes in childcare and education, for women as primary care givers, may help to promote bio-psycho-social health in individuals and communities, and may even help to prevent chronic diseases related to obesity in adulthood. It is noteworthy that a lower body mass is associated with better psychosocial well-being in this group of African women, as obesity is still often regarded as a sign of prosperity in the African cultural context (Walker, 1998). Although Walker, Adam and Walker (2001) suggest that obesity does not have as many health disadvantages for African women than for Caucasian women, it is associated with lower levels of psycho-social well-being in this group of African women. Further research in this field seems to be necessary.

If a general relationship between quality of childhood relationships and psycho-social well-being would be established as is suggested by findings in the current group of participants, it may be wise to include psycho-social facets in health promoting programmes from very early on in life to promote especially women's health. Children, and girls in particular, because of their vulnerability, can be taught in life skills programmes how to identify safe, caring and supportive adults apart from their parents. In the current South African situation, where it is estimated that by 2008 there will be 1.6 million children orphaned by AIDS, it may be essential to take a closer look at how to teach children to seek, build and maintain positive relationships with safe, caring and supportive significant adults in their lives.

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Table 1: Significance of differences between the LQCR group and the HQCR group on bio-psycho-social indices.

Measures	LQCR (n=34)		HQCR (n=40)		p	Effect size d
	M	SD	M	SD		
BMI	30.52	6.76	25.15	5.19	0.0002 +	0.79**
GHQ-SS	2.62	2.42	2.63	2.10	0.99	0.003
GHQ-AS	2.62	2.19	2.08	2.28	0.30	0.23
GHQ-SD	1.94	1.58	1.78	2.08	0.70	0.07
GHQ-DS	1.91	1.75	1.15	1.76	0.07	0.43
SWLS	23.35	6.45	23.25	6.65	0.95	0.01
SOC	116.03	16.15	133.30	22.63	0.0003 +	0.76**
AFM-PNB	8.03	8.14	13.05	13.22	0.05	0.37
FORQ	58.59	9.55	63.5	8.18	0.02 +	0.51*
CAQ	26.53	4.95	30.63	4.52	0.0005 +	0.83**
SPWB-PR	53.91	7.83	60.8	9.42	0.002 +	0.73*
SPWB-EN	54.25	6.6	60.28	9.92	0.003 +	0.61*
SPWB-PL	57.88	12.43	63.23	13.91	0.03 +	0.50*
SWS-H	96.35	11.53	103.13	11.32	0.01 +	0.59*

Note. LQCR=Lower Quality of Childhood Relationship; HQCR=Higher Quality of

Childhood Relationship; BMI=Body Mass Index; GHQ-SS=General Health

Questionnaire – Somatic Symptoms; GHQ-AS=General Health Questionnaire –

Symptoms of Anxiety and Sleeplessness; GHQ-SD=General Health Questionnaire –

Social Dysfunction; GHQ-DS=General Health Questionnaire – Symptoms of Depression;

SWLS=Satisfaction With Life Scale; SOC=Sense of Coherence; AFM-PNB=
 Affectometer – Affect Balance; FORQ=Fortitude Questionnaire; CAQ=Cognitive
 Appraisal Questionnaire; SPWB-PR=Psychological Well-Being – Positive Relationships;
 SPWB-EN=Psychological Well-Being – Environmental Mastery;
 SPWB-PL=Psychological Well-Being – Purpose in Life; SWS-H=Jarek Spiritual
 Well-Being Scale.

+ An indication of a statistically significant effect; * an indication that there may be an
 effect of practical significance and ** indicates a practical significant effect.

Section 3: Article 2

Psychological well-being and the metabolic syndrome in African and Caucasian women

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3.2 Manuscript

Psychological well-being and the metabolic syndrome
in African and Caucasian women

Elsabé M. Botha*¹, Marié P. Wissing¹, Suria M. Ellis² & Hester H. Vorster³
¹ = School for Psychosocial Behavioural Sciences, ² = Statistical Consultation
Services, ³ = School for Physiology, Nutrition and Consumer Sciences, North-
West University (Potchefstroom Campus), Potchefstroom, South Africa

Correspondence to:
Elsabé Botha
P.O.Box 6175
Baillie Park,
2526,
South Africa
Email address - ebotha@cit.za.net

Abstract

This study explores firstly, the possible association between comprehensive psychological well-being and the absence of the metabolic syndrome (MS) in African and Caucasian women, and secondly, whether women without MS markers differ significantly from women with MS (three or more markers) on specific facets of psychological well-being. African (n=102) and Caucasian (n=115) women completed self-report questionnaires on psychological well-being, and biological measures were taken to determine the presence of MS, using the criteria of the National Cholesterol Education Program's Adult Treatment Panel III. Results indicated a practically significant association between comprehensive psychological well-being and the absence of MS in Caucasian women, but not in the case of African women. Caucasian women without MS markers had higher levels of perceived support from friends and family, environmental mastery, purpose in life, sense of coherence, affect balance and positive relationships, than those with MS. African women without MS markers had higher levels of positive relationships and an optimistic explanatory style, but lower levels of perceived support from family. Further research is necessary, especially in the case of African women, to explore the role of the dynamics on an interpersonal and social level.

Abstract word count: 189 words

Keywords: Metabolic syndrome (MS), psychological well-being, women, cultural context

Full word count: 6 497 words

Psychological well-being and the metabolic syndrome in African and Caucasian women

As part of a multi-disciplinary research project on profiles of obese women with the insulin resistance syndrome (POWIRS project) (Schutte, Kruger, Wissing, Underhay & Vorster, 2005), the question arose whether psychosocial variables such as the degree of psychological well-being and cultural context may be related to the metabolic syndrome (MS). Therefore this study explores, firstly, the association between comprehensive psychological well-being (social, affective, cognitive, environmental, sense of coherence and purpose in life) and the absence of the metabolic syndrome (MS) in African and Caucasian women. Secondly it explores, whether African and Caucasian women without MS markers and those with MS (three or more markers) differ on specific facets of psychological well-being.

The rapidly developing science of Positive Psychology (Aspinwall & Staudinger, 2003; Keyes & Haidt, 2003; Lopez & Snyder, 2003; Seligman & Csikszentmihalyi, 2000; Snyder & Lopez, 2002) now also compels the exploration of the biological correlates of psychological well-being (Ryff & Singer, 1998, 2002, 2003; Taylor, Repetti & Seeman, 1997), because at the heart of positive health is the hypothesis that psychological well-being contributes to optimal functioning of numerous physiological systems (Ryff & Singer, 1998; Ryff, Singer & Dienberg Love, 2004; Singer & Ryff, 2001). Seeman, Glei, Goldman, Weinstein, Singer, and Lin (2004; p 2245) remarked that urgent research is needed on whether or not “contextual, normative influences on social experience affect the patterns of association between features of those social worlds and the physiological substrates of health”. The interplay of psychological, biological and cultural factors will

be explored in this study with its focus on psychological well-being and the absence (no markers) of the metabolic syndrome in African and Caucasian women.

Psychological well-being and biological correlates

It has long been known that symptoms of stress-related psychopathology may have biological correlates. Whether psychological resources or strengths, other than social relationships and social support (Ryff & Singer, 2002, 2003; Seeman, Singer, Ryff, Dienberg Love, & Levy-Storrs, 2002), are related to physical health deserves to be explored. It is known that cognitive-emotional processing of experiences (interpersonal or other) activate biochemical processes in various biological regulatory systems, and vice versa, but the exact nature of the physiological cascade is largely unknown (Ryff & Singer, 1998; Seeman et al., 2004). Explorations to determine associations between persistent psychological well-being on the one hand (for example experiencing positive emotions, purposeful engagement in living and quality human connections) and physiological substrates and reactions on the other hand, is essential (Ryff & Singer, 1998). Seeman et al. (2002) point out that research on physiological factors tend to focus on individual biological parameters only, and that positive and negative social experiences have an effect across numerous physiological systems and not only on a biological parameter.

Taylor, Kemeny, Reed, Bower and Gruenewald's (2000) findings suggested that psychological beliefs such as the experience of meaning, control and optimism act as resources, which preserve mental health in the context of traumatic events, but may also enhance and be protective of physical health. Ryff and Singer (2002, 2003) also found that positive relationship pathways could help offset the likelihood of experiencing high

allostatic load (a measure of cumulative wear and tear across multiple physiological systems) in the face of negative economic life experiences. In the above mentioned studies the participants were mainly white and from Western descent (Seeman et al., 2002), and findings need to be explored in other cultural contexts, in order to take cognizance of the possible role of social factors.

Psycho-social facets and the metabolic syndrome

The indices that are used to diagnose MS and those used for measuring allostatic load overlap to a great extent. MS, also called insulin resistance syndrome, is a disease with many facets that is usually deemed to include the clustering of visceral obesity, hyperglycemia, dyslipidemia, hypertension and impaired glucose tolerance (Franciosi & Kasper, 2005; Niaura, Todaro, Stroud, III, Ward & Weiss, 2002; Räikkönen, Matthews & Kuller, 2002). These disorders increase the risk of cardiovascular disease and non-insulin-dependent diabetes mellitus with implications for the quality of life, also on a psychosocial level.

Räikkönen, Matthews and Kuller (2002) suggest that a reduction in psychological distress (depression, anxiety, anger and tension) may prevent the development of the metabolic syndrome. Social isolation was associated with MS in middle-aged Swedish women and it is suggested that MS might be a mediator between social isolation and cardiovascular disease (Horsten, Mittleman, Wamala, Schenck-Gustafsson & Orth-Gomer, 1999). Compared to the general population metabolic syndrome seems to be more prevalent in people with mental illness like schizophrenia (Holt, Peveler & Byrne, 2004) and bipolar disorder (Fagiolini, Frank, Scott, Turkin & Kupfer, 2005).

Cultural context, the metabolic syndrome and psychological well-being

Walker, Adam and Walker (2001: 368) state that “evidence suggests that the health disadvantages of obesity in African women is less than that in white women, and would have little influence on their proneness to hypertension, coronary heart disease and breast cancer”. Obesity is part of the markers for allostatic load as well as for MS. The obesity markers in the research of Ryff et al. (2004) were negatively linked to positive relations with others. If what Walker et al. (2001) state is correct, it may suggest that differences in association between psychological well-being and the absence of MS may be expected for Africans and Caucasians. It is known that cultural factors may play a role in the manifestation of psychological well-being and symptoms of allostatic load or ill-health (Basabe, Paez, Valencia, Gonzalez, Rimé, & Diener, 2002; Cutrona, Russel, Hessling & Brown, 2000; Massimini & Delle Fave, 2000; Taylor, Repetti & Seeman, 1997), but the dynamics thereof are not hitherto clear.

Although a monolithic model cannot sufficiently explain cultural complexity, the individualist/collectivist concept is a helpful exploratory framework for the current study. Collectivist (e.g. African, Korean) and individualist (e.g. Western) cultural contexts can differ considerably. Seeman et al. (2004) voiced the opinion that differences in social norms in diverse cultures may have an effect on the structural characteristics as well as on the qualitative experiences they have of their social worlds. In South Africa the rare opportunity exists to explore phenomena in an individualist (Caucasian) and collectivist (African) cultural context within the same country, and not in an East versus West context.

Research by Ryff and Singer (1998), in an Eastern-Western context, indicated that

higher scores were reported in a collectivist (Korean) culture on positive relationships and lower scores on self-acceptance, personal growth and autonomy, compared to an individualist (Western) culture where self-acceptance, autonomy and personal growth are more important in contributing to psychological well-being. Taylor, Sherman, Kim, Jarcho, Takagi and Dunagan (2004) found that European Americans overly employ their social networks for help and comfort when they have to cope with stressful events, but that Asians and Asian Americans do so to a lesser degree. It may be that sharing one's problem in an Eastern collectivistic cultural context elicit concern for disruption of the group harmony, receiving of criticism from important others and it could cause one to lose face in the eyes of the group, which could worsen the situation. Cultural context thus seems to influence an individual's particular outlook on relationships and the seeking of social support. The role of social support in Eastern and African collectivist context may, however, also differ.

Conceptualization and operationalization

In the current study psychological well-being is conceptualized and operationalized by indices of general mental health, sense of coherence, fortitude, affect balance, cognitive attributional style, positive relationships, environmental mastery and purpose in life.

Comprehensive or general psychological well-being refers to indices summarily, whereas specific facets of psychological well-being are indicated by individual measures.

Although various specific indices for MS are found in literature (Bloomgarden, 2004), there is a general overlap. Definitions of the World Health Organization (WHO) (1999), the National Cholesterol Education Program's Adult Treatment Panel III (NCEP ATP III) (2002) and the American College of Endocrinology (ACE) (2003), for example, exist.

The criteria of the NCEP ATPIII are used for the purpose of this study to determine markers of MS. It must, however, be noted that the criteria for MS were developed for Western populations, and that Kruger (2000) speculated that the cut-off values for markers that are used to determine MS, might not be the most appropriate ones for Africans, and that a classification for African people is yet to be developed. Cultural context is heuristically described in terms of African and Caucasian (white) descent.

The aim of this study was to determine whether there is an association between comprehensive psychological well-being and the absence of MS in African and Caucasian women, and to determine whether African and Caucasian women without markers of MS differ on specific facets of psychological well-being from those with MS (three or more markers).

Method

Study design and participants

A cross-sectional survey design was implemented. This investigation was part of the larger multi-disciplinary POWIRS-project (Schutte et al., 2005). One hundred and two apparently healthy Setswana speaking African women and one hundred and fifteen apparently healthy Afrikaans speaking Caucasian women, living in the North West Province of South Africa were recruited on the basis of anthropometric measures (BMI). A dietician or nurse assisted in recruitment of participants. The women were between 19 to 56 years of age. English is their second language, and the language that is formally used in their work environment. The group of Caucasian women were recruited nearly a year later than the African women.

Measures

Metabolic syndrome

Physical health was measured by the National Cholesterol Education Program's Adult Treatment Panel III (NCEP's ATP III) criteria for the metabolic syndrome. The criteria consist of the following markers (three or more of the markers indicate the metabolic syndrome): (i) Waist circumference >88 ; (ii) Fasting plasma glucose ≥ 6.1 mmol/L; (iii) Systolic Blood pressure ≥ 130 and/or Diastolic Blood pressure ≥ 85 ; (iv) Triglyceride ≥ 1.69 mmol/L and (v) HDL <1.29 mmol/L. For details of measurements see Schutte et al. (2005).

Psychological well-being

Psychological well-being is comprehensively operationalized with indices of affective, cognitive, interpersonal, social and contextual well-being, as well as measures of subjective experiences of mental/physical ill-health and experienced purpose and meaningfulness in life.

The *General Health Questionnaire (GHQ)* (Goldberg & Hillier, 1979) aims to measure an individual's current mental state by detecting symptoms that are commonly associated with mental disorders and the prevalence of stress symptomatology, like somatic symptoms, anxiety and sleeplessness, social dysfunction and severe depression. Only the total score for the GHQ was used for the purpose of this study. In the current study the Cronbach alpha reliability index for the GHQ was 0.88 for the African group, and 0.90 for the Caucasian group. Wissing, Thekiso, Stapelberg, Van Quickelberge, Choabi, Moroeng and Nienaber (1999) reported reliability indices of 0.86 to 0.91 in

African groups. Goldberg, Garter, Sartorius, Ustun, Piccinelli, Gureje and Rutter (1997) reported reliability indices of 0.82 to 0.86 in western samples.

The *Sense of Coherence Scale (SOC)* (Antonovsky, 1987) measures individuals' cognitive self-evaluation of their life and the world as they experience it, indicating whether it is comprehensible, manageable, and meaningful. In the current study the Cronbach alpha reliability index for the SOC was 0.81 for the African group, and 0.88 for the Caucasian group. Wissing et al. (1999) reported reliability indices of 0.70 to 0.91 in African groups. Antonovsky (1993) reported reliability indices of 0.83 to 0.93 in western samples.

The *Affectometer 2 (AFM) (short form)* (Kammann & Flett, 1983) measures a general feeling of happiness and sense of well-being. The extent to which positive affect predominates over negative affect is expressed as affect balance (PNB). In the current study the Cronbach alpha reliability index for the AFM-PNB was 0.85 for the African group, and 0.91 for the Caucasian group. Wissing et al. (1999) reported reliability indices of 0.68 to 0.90 in African groups. Kammann and Flett (1983) reported a reliability index of 0.95 in a western sample.

The *Fortitude Questionnaire (FORQ)* (Pretorius, 1998) measures an individual's ability to manage stress and still experience psychological health/well-being. Fortitude is operationalized by the individual's perception of the self (S); the perceived support of his/her family (F); and the perceived support from others (SP). In the current study the latter two sub-scales were used. The Cronbach alpha reliability index for the FORQ-SP was 0.75 for the African group, and 0.86 for the Caucasian group and the Cronbach alpha reliability index for the FORQ-F was 0.86 for both the African and Caucasian groups.

This scale was developed in the South African context and Pretorius (1998) reported reliability indices of 0.74 to 0.85.

The *Cognitive Appraisal Questionnaire (CAQ)* (Botha & Wissing, 2003) is a self-report questionnaire with eight items based on the explanatory style theory of Buchanan and Seligman (1995). It measures the degree of an optimistic vs. a pessimistic explanatory style. A more optimistic style is characterized by viewing the causes of bad events as external, specific, and unstable, while positive events are ascribed to internal, global and stable factors. In the current study the Cronbach alpha reliability index for the CAQ was 0.72 (CAQ [Pessimism] 0.69 and CAQ [Optimism] 0.78) for the African group, and 0.64 (CAQ [Pessimism] 0.76 and CAQ [Optimism] 0.74) for the Caucasian group. It is the first time that this measure has been used and therefore no other reliability indices are available.

The *Psychological Well-being Scales (SPWB)* (Ryff, 1989) conceptualize psychological well-being as consisting of the dimensions: autonomy, environmental mastery, personal growth, positive relationships with others, purpose in life, and self-acceptance. For the purpose of this study the scales Positive Relationships with Others (PR), Environmental Mastery (EM), and Purpose in Life (PL) were used. In the current study the Cronbach alpha reliability index was 0.71 for the SPWB-PR in the case of the African group, and 0.88 for the Caucasian group. It was 0.69 for the SPWB-EM in the African group and 0.88 for the Caucasian group, and was 0.77 for the SPWB-PL in the African group and 0.90 for the Caucasian group. Erasmus, Kirsten and Breytenbach (2005) reported reliability indices for SPWB-PR 0.83; SPWB-EM 0.85 and SPWB-PL 0.85 in a South African population.

Procedure

Subgroups of ten participants stayed overnight in the Metabolic Unit of the Potchefstroom Campus of the North-West University. During the evening anthropometric measurements were taken, which included stature, body mass and waist girth for the calculation of body fat. The psychological questionnaires involved in this study were also completed during the evening under supervision of the first author. The English version of the questionnaires was used. A Setswana speaking African psychologist was also present while the African women completed the questionnaires. Other measures for the multidisciplinary POWIRS project (e.g. blood pressure measurements, fasting blood samples, and urine samples) were taken the next morning.

Participants were informed about the objectives and procedures of the study as well as ethical issues involved (e.g. voluntary participation, anonymity, etc.). Informed consent was obtained in writing. By assigning each participant a subject number for the duration of the research, anonymity was achieved and privacy protected. The Ethics Committee of the North-West University approved of this study (reference number 03M03).

Results

Participants were divided into high and low psychological well-being groups according to scores above or below the median on each separate index of psychological well-being. The median was used as cut-off point, as scores on the psychological well-being measures were not normally distributed. Spearman correlation coefficients were determined between the number of psychological well-being measures with means above the median and the number of MS markers per person. For Caucasian women a

statistically significant Spearman correlation coefficient of -0.26 was obtained between number of psychological well-being measures with means above the median and number of MS markers, indicating a possibility of a practical significant relationship. For African women no statistical significant relationship between number of psychological well-being measures with means above the median and number of metabolic syndrome markers was found (Spearman correlation coefficient = -0.09). The participants were then categorized in a Low Psychological Well-Being (LPWB) group (African and Caucasian women with 0 to 2 psychological well-being indices above the median) (African $n = 36$ and Caucasian $n = 37$) and a High Psychological Well-Being (HPWB) group (Caucasian women with 6 to 9 psychological well-being indices above the median and African women with 5 to 9 psychological well-being indices above the median) (African $n = 20$ and Caucasian $n = 45$). The women were also categorized according to the number of MS markers present, a group with MS (3 or more markers) and another group without MS markers were created. In this analysis participants not in the LPWB or HPWB groups as well as those with only 1 or 2 MS markers were omitted. The association between the HPWB and LPWB groups and those without any MS markers and with three or more MS markers was determined by means of an effect size for the contingency table. Effect sizes for the strength of the relationship are given by $w = \sqrt{\frac{\chi^2}{n}}$, where χ^2 is the usual Chi-square statistic for the contingency table and n is the sample size (Ellis & Steyn, 2003). The following guidelines for the interpretation of it in the current case is: small effect: $w = .1$, medium effect: $w = .3$ and large effect: $w = .5$. A relationship with $w \geq .5$ is considered as practically significant.

The results of the relationships between the LPWB and HPWB groups and (the absence of) MS are indicated in Table 1.

[Table 1 approximately here]

A practical significant relationship for Caucasian women was indicated by the contingency table as indicated in Table 1 (effect size=0.47). For Caucasian women 13 of the 18 (72%) in the LPWB group had three or more MS markers while only 4 of the 16 (25%) women in the HPWB group had three or more markers of MS. This indicates that Caucasian women with LPWB in practice are more likely to have MS. No practical significant relationship was indicated by the contingency table for African women (effect size = 0.16).

To investigate this association in more detail, differences on specific indices of psychological well-being were determined for groups with MS (three or more markers) and without markers of MS, by means of an ANCOVA, controlling for the age of participants. The participants with one or two MS markers were omitted.

The standardized difference between the means of the two samples was used to determine practical significance of differences by means of effect sizes. Cohen (1988) gives the following guidelines for the interpretation of the effect size in the current case: small effect: $d = 0.2$, medium effect: $d = 0.5$ and large effect: $d = 0.8$. In this study data with $d \geq 0.8$ are considered as practically significant and a value of $d \approx 0.5$ (medium effect) will be considered to be large enough that it may indicate practical significant differences. As indicated in Table 2, African and Caucasian women with MS (three or more markers), and those without markers of MS, differed significantly on several specific indices of psychological well-being.

[Table 2 approximately here]

In the case of African women, those with and without MS differed practically significantly (large effect size) on personal relationships (SPWB-PR), possibly practically significantly (medium effect size) on explanatory style (CAQ-T) and perceived support from family (FORQ-F). In the case of Caucasian women, those with and without MS differed practically significantly (large effect size) on perceived support from friends (FORQ-SP) environmental mastery (SPWB-EN), purpose in life (SPWB-PL), and possibly practically significantly (medium effect size) on sense of coherence (SOC), perceived support from family (FORQ-F), affect balance (AFM-PNB), and personal relationships (SPWB-PR). Non-parametrical Mann-Whitney tests were also performed on the data, and indicated small p-values for all the indices of psychological well-being in African and Caucasian women. However, as these tests do not control for age, which is an important variable in this kind of study, the results will not be used and only the parametric ANCOVA are reported.

Discussion

In this study an association is found between comprehensive psychological well-being and the absence of MS in the case of Caucasian women, but not in the case of African women. Caucasian women with no MS markers had significantly higher scores on most of the specific indices of psychological well-being than those with MS. For African women a less clear pattern of differences emerged.

Comprehensive psychological well-being and the absence of the metabolic syndrome

In the case of the Caucasian women, comprehensive psychological well-being, as measured in this study, is related to physical health as measured by the absence of MS.

Trends showing that psychological well-being can be related to physical health had already been indicated by previous research (Ryff & Singer 2001, 2002; Ryff et al., 2004; Seeman et al., 2002; Seeman et al., 2004; Taylor et al., 2004; Taylor et al., 2000). From a psychopathological viewpoint Räikkönen et al. (2002) indicated that a reduction of psychological distress (anxiety, depression, tension, stress, anger) might prevent the development of specifically the metabolic syndrome. Franciosi and Kasper (2005) suggested that the metabolic syndrome is more prevalent in people with schizophrenia (Holt, Peveler & Byrne, 2004), bipolar disorder (Fagiolini, Frank, Scott, Turkin & Kupfer, 2005) and unipolar disorder.

An association between comprehensive psychological well-being and physical health was not found in the case of the present group of African women. This may be because contextual and normative influences affect the pattern of association between social experiences and the physiological substrates of health as suggested by Walker et al. (2001). Alternative explanations are, however, also possible: Firstly, it may be that psychological well-being should be measured more indigenously in this relatively more collectivist group of African women (although all the scales had acceptable reliability indices in this study, and the validity of the used measures seemed to be supported – Wissing, Wissing, Du Toit, Temane & Botha, submitted). What is viewed as ‘the good life’ may differ in various cultural contexts, because the values may differ among cultures, and therefore the criteria by which success is judged (Diener & Suh, 2000). Secondly, the lack of association between comprehensive psychological well-being and the absence of MS as was found in the current group of African woman may be explained by the fact that various indices of well-being may have opposite kinds of associations

with MS, as indicated in Table 2 and discussed below. Thirdly, it may be that the markers used for MS, or the cut-off values for the markers implemented, are not appropriate for an African population. Kruger (2000) suggested in view of her findings in the THUSA project (THUSA= Transition and Health during Urbanization of South Africans), done with African participants of the North West Province of South-Africa, that different cut-off values may be needed to identify metabolic markers for MS and hyperinsulinaemia in different ethnic groups. Further research in this regard is necessary.

Specific psychological well-being facets and the metabolic syndrome

The patterns of differences between women with and without MS markers on specific indices of psychological well-being were not the same in the current groups of African and Caucasian participants. In the case of Caucasian (more individualistic) participants, a consistent trend was found, but a mixed pattern emerged for the African (more collectivistic) women.

The group of Caucasian women without MS markers experienced a higher level of perceived support from friends, environmental mastery, purpose in life (all large effect size), sense of coherence, perceived support from family, affect balance, and positive relations with others (all medium effect size) than those with MS (three or more markers). In a similar research project with ageing women Ryff et al. (2004) focused on connecting well-being with biology. Some markers coincide with the metabolic syndrome and indicated a connection with positive relations, personal growth and purpose in life. The current findings support the latter. Similar findings on positive relationships were also found by Seeman et al. (2002) when using allostatic load, which has health indicators that overlap with metabolic syndrome. Taylor et al. (2000) also

indicated that meaning and optimism may be protective of health but used other indicators of health. The current findings also expand on that of R  ikk  nen et al. (2002) who suggested that a reduction in psychological distress may prevent the development of the metabolic syndrome, as well as that of Horsten, Mittleman, Wamala, Schenck-Gustafsson and Orth-Gomer (1999) who indicated that social isolation was associated with metabolic syndrome in Swedish women. The current findings indicate that several facets of positive psychological functioning differentiate between women with and without MS markers, thus suggesting that these strengths may act as protective or buffering variables. Previous studies demonstrated the link between positive interpersonal relationships and social support on the one hand, and indices of physical well-being on the other hand in western groups of participants (cf. Ryff & Singer, 2000, 2001, 2002; Seeman et al., 2002; Seeman et al., 2004; Taylor et al., 2004;). The current findings in the Caucasian group indicate that various other intra-psychological strengths (such as sense of coherence, environmental mastery, and affect balance) in addition to interpersonal and social resources are also linked with the absence of MS as an index of physical health.

The current group of African women with better physical health as indicated by the absence of MS markers, had more positive relationships with others (large effect size) and a more optimistic explanatory style (medium effect size), than those with MS. These findings concur with that found in the case of the Caucasian group, and are similar to previous findings. However, this same group of African women without MS markers reported a lower level of perceived support from their family, than those with MS markers. This finding differs in some regards from those of Seeman et al. (2002) and Uchino, Cacioppo and Kiecolt-Glaser (1996) who found that interpersonal relationships,

social integration and support are protective of physical health. The discrepancy in the current findings with regard to positive relationships with others and perceived social support from the family in the case of this African group, is difficult to explain, and needs to be explored further in larger groups of participants, and in various socio-economic contexts. It may be that relationships in groups with high levels of poverty and high levels of responsibility for extended families, as is the case in collectivistic cultural contexts, (Bodibe & Sodi, 1997; Ebigbo, Oluka, Ezenwa, Obidigbo & Okawaraji, 1996; Makgoba, 1997; Nyasani, 1997) may be both a benefit and a burden. The nature and meaning of quality of relationships and social support in the dynamics of psychological well-being and physical health may differ in various cultural contexts as suggested by the findings of Wissing, Wissing, Du Toit and Temane (2006). These authors identified somewhat different patterns of well-being in South African individualistic and collectivistic cultural contexts. Satisfaction with life and perceived social support formed a unique factor in African collectivist groups, separately from general psychological well-being.

This study had several limitations. The small number of participants in the sub-groups, as well as the cross-sectional nature of the study caution against attaching too much meaning to medium effect sizes. Therefore, further research is indicated with larger numbers of randomly selected participants. Nevertheless, the present findings provide strong evidence that psychological well-being can be associated with health as measured by the absence of the metabolic syndrome, in this group of Caucasian women. Further research is also indicated with use of other indices of psychological well-being that may more precisely reflect traits and expressions valued in an African cultural

context. The cut-off values for the metabolic syndrome in the case of African women, also need to be explored before clarity can be obtained about relationships between psychological well-being and the metabolic syndrome, and before it could be established how and to what extent social context matters in this regard.



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Table 1: Contingency tables for LPWB and HPWB groups in African and Caucasian women without markers of MS (NMS) and with MS (3 or more markers).

African	<u>NMS</u>	<u>MS (3 or more markers)</u>	Row totals
Effect size=0.16			
LPWB	7	6	13
	53.85%	46.15%	
HPWB	9	4	13
	69.23%	30.77%	
Totals	16	10	26

Caucasian	<u>NMS</u>	<u>MS (3 or more markers)</u>	Row totals
Effect size=0.47			
LPWB	5	13	18
	27.78%	72.22%	
HPWB	12	4	16
	75.00%	25.00%	
Totals	17	17	34

Note: LPWB = Low Psychological Well-Being; HPWB = High Psychological Well-Being; MS = Metabolic Syndrome; NMS = no markers of MS.

Table 2: Significance of mean differences between women with (MS) and without markers of the metabolic syndrome (NMS) on various indices of psychological well-being with adjustment for age (ANCOVA)

Groups and Measures	Mean NMS	Mean MS	MSE	ANCOVA p-value	Effect size d
African	(n=23)	(n=16)			
SOC	132.8	129.6	541.0	0.73	0.14
FORQ-SP	18.9	17.9	8.2	0.35	0.35
FORQ-F	19.4	21.9	26.0	0.21	0.54*
AFM-PNB	14.6	12.8	161.3	0.72	0.14
GHQ	6.8	5.0	31.7	0.41	0.33
CAQ	29.3	26.5	24.9	0.15	0.57*
SPWB-PR	63.7	55.3	104.5	0.04+	0.82**
Caucasian	(n=26)	(n=20)			
SOC	140.6	127.2	396.7	0.04+	0.67*
FORQ-SP	19.5	18.8	12.6	0.02+	0.76**
FORQ-F	19.9	17.4	20.5	0.08	0.55*
AFM-PNB	16.1	8.1	116.2	0.02+	0.74*
GHQ	5.7	7.7	28.1	0.24	-0.38
CAQ	28.4	27.3	16.0	0.39	0.28
SPWB-PR	65.6	59.4	125.5	0.08	0.55*
SPWB-EN	64.8	54.2	108.6	<0.01+	1.02**
SPWB-PL	66.7	57.2	119.2	0.01	0.87**

Note: NMS = no markers of MS; MS = Metabolic Syndrome; SOC = Sense of

Coherence; FORQ-SP = Fortitude Questionnaire – support from others; FORQ-F = Fortitude Questionnaire – support from family; AFM-PNB = Affectometer – Affect Balance; GHQ = General Health Questionnaire; CAQ = Cognitive Appraisal Questionnaire; SPWB-PR = Psychological Well-Being – Positive Relationships; SPWB-EN = Psychological Well-Being – Environmental Mastery; SPWB-PL = Psychological Well-Being – Purpose in Life.

+ An indication of a statistically significant effect;

*An indication that there may be an effect of practical significance

** Indicates a practical significant effect.

Section 4: Article 3

**Psychological well-being and (the absence of) obesity in
African and Caucasian women**

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PSYCHOLOGICAL WELL-BEING AND (THE ABSENCE OF) OBESITY IN AFRICAN AND CAUCASIAN WOMEN

Elsabé M. Botha*¹, Marié P. Wissing¹, Suria M. Ellis² & Hester H. Vorster³

¹ = School for Psychosocial Behavioural Sciences, ² = Statistical Consultation Services, ³ =
School for Physiology, Nutrition and Consumer Sciences, North-West University
(Potchefstroom Campus), Potchefstroom, South Africa

Correspondence to:

Elsabé Botha

P.O.Box 6175

Baillie Park,

2526,

South Africa

Email address - ebotha@cit.za.net

ABSTRACT

This study explored facets of psychological well-being as predictors for (the absence of) obesity (measured by BMI and WHR) in African (n=102) and Caucasian (115) women with control for age. Women completed self-report psychological questionnaires and antropometric measures were taken. Canonical correlations indicated relationships between sets of indices for obesity and psychological well-being in both groups (medium and large effect sizes). Partial stepwise multiple regression models indicated the best clusters of psychological predictors for obesity. For Caucasian women, high spirituality and low meaningfulness in life were robust predictors of obesity. In the case of African women, high support from family and low levels of personal relationships and a more pessimistic attributional style were robustly associated with obesity across indices. In the case of WHR as measure of obesity, higher levels of spirituality were associated with higher levels of obesity in both groups. Implications for prevention of obesity are noted.

(149 words)

Keywords: Obesity, psychological well-being, cultural context, African and Caucasian women, WHR=waist-hip-ratio; BMI=body mass index.

PSYCHOLOGICAL WELL-BEING AND (THE ABSENCE OF) OBESITY IN AFRICAN AND CAUCASIAN WOMEN

The world seems to be facing a new pandemic, namely obesity. It has been linked to mortality in various studies (Allebeck & Bergh, 1992; Allison, Faith, Heo, Townsend-Butterworth & Williamson, 1999; Engeland, Bjorge, Tverdal & Sogaard, 2004; Fontaine, Redden, Wang, Westfall & Allison, 2003; Stein & Colditz, 2004; Thorpe & Ferraro, 2004) but still it seems to be escalating worldwide. It has become a chronic condition that is slow to respond to interventions and difficult to treat. It is also associated with several diseases as a risk factor. Keyes (2005a) argues that as chronic conditions appear to be resistant to eradication, they should rather be prevented. It would, therefore, of necessity serve a good purpose to determine possible protective factors associated with obesity.

In the past obesity has been associated with negative psychological states, such as stress, depression, low self-esteem and impairment in emotional well-being (Doll, Petersen & Stewart-Brown, 2000; Friedman, Reichmann, Costanzo & Musante, 2002; McElroy, Kotwal, Malhotra, Nelson, Keck & Nemeroff, 2004; Vaidya, 2006). The question now arises whether positive psychological states could be associated with the absence of obesity. If this is the case, these facets can be utilized in preventive, coping and adapted life style programmes.

Research on the biological correlates of psychological well-being is in progress (Keyes, 2004, 2005a; Ryff & Singer, 1998; Taylor, Kemeny, Reed, Bower & Gruenewald, 2000). Keyes (2004) found that adults with complete mental health had the lowest occurrence of any cardiovascular disease. In another study he found that complete

mental health is associated with “fewest health limitations of activities of daily living, the fewest missed days of work, the fewest half-day work cutbacks, and the healthiest psychosocial functioning (low helplessness, clear life goals, high resilience, and high intimacy)” (Keyes, 2005b: 539). He concluded that complete mental health may act as a protective factor against chronic diseases. Taylor et al. (2000) conducted longitudinal research with HIV infected men and indicated that psychological resources such as optimism, a belief in personal control and finding meaning, protect health. They suggest that psychological resources are “important weapons in the arsenal of prevention” (Taylor et al., 2000: 107).

The current study takes the search for biological correlates of psychological well-being a step further by exploring the association between facets of psychological well-being and indicators of obesity. A focus on obesity as biological variable is important as obesity is indicated as an important risk factor for many chronic diseases. Various specific facets of psychological well-being are explored as possible predictors of (the absence of) obesity in African and Caucasian women.

Obesity as risk factor

Obesity is an excessive accumulation of body fat, which impairs health and has been linked to several disease risks, such as cardiovascular disease, type 2 diabetes, cancer, gall-bladder disease, sleep apnea, respiratory problems, osteoarthritis, and cataract (Mollentze, Moore, Steyn, Joubert, Steyn, Oosthuizen, & Weich, 1995; Stein & Colditz, 2004; Steinbaum, 2004; Vorster, 2002). Obese individuals, consequently, seem to have poorer physical quality of life than lean individuals. Stein and Colditz (2004) point out that body-mass-index (BMI) does not differentiate between fat and lean mass and

therefore other measures like waist circumference, waist-hip ratio (WHR), fat percentage and bioimpedance can also be used to estimate body fat and quantify health risk more accurately.

Puoane, Steyn, Bradshaw, Laubscher, Fourie, Lambert and Mbananga (2002) state that abdominal obesity has more harmful health consequences than peripheral obesity and that those with abdominal obesity are more at risk to develop hypertension, type 2 diabetes, cardiovascular disease and stroke. It is, therefore, important to include some measure of actual body composition, like waist circumference and/or WHR, in the estimation of obesity. In this way a clearer picture of body composition can be formed.

Psychological facets and obesity

The association between psychological distress and obesity has been documented.

Obesity has been associated with stress and depression (Friedman et al., 2002; McElroy et al., 2004; Vaidya, 2006). Stambor (2006) reported that people experiencing stress are more likely to report hypertension, anxiety, depression and obesity. Stress and associated comfort eating start a vicious cycle. Comfort eating is more prevalent in women (31%) than in men (19%). Vaidya (2006) indicates that depression and obesity seem to influence and affect each other and argue that some neuro-endocrine changes that are linked with depression and stress may trigger metabolic changes that are responsible for obesity. Doll et al. (2000) indicated that the co-occurrence of obesity and chronic illness is associated with significant impairment in emotional well-being. Roberts, Strawbridge, Deleger and Kaplan (2002), on the other hand, found no relationship between obesity and unhappiness or low optimism.

Self-esteem and body image (weight and shape) have been linked. Body image evaluation, according to Friedman et al. (2002), is related to the degree of obesity: obese women express less contentment with their appearances (in a Western context). Women who indicated dissatisfaction with their body image reported higher levels of depression and a low self-esteem (Friedman et al., 2002). Friedman and Brownell (1995) point out that obese individuals are noticeably heterogeneous with regard to etiology and other health-related variables. Such heterogeneity most probably explains the inconsistent findings when comparing obese and lean individuals.

Cultural context, psychological facets and obesity

In a Western context, women who are dissatisfied with their body image reported higher levels of depression and a low self-esteem and because their body image evaluation was related to their degree of obesity they expressed less contentment with their appearances than lean women (Friedman et al., 2002). This seems to be true for a Western cultural context where a lean body is the norm, but in an African context an obese figure may have positive cultural connotation, where obesity is still often regarded as a sign of prosperity and happiness (Mvo, Dick & Steyn, 1999; Walker, 1998). In the current South African situation in which the incidence of the human immunodeficiency virus/AIDS is increasing, obesity even seems to be observed as an indication of a person's health (Mvo et al., 1999). The occurrence of obesity in African women is double that of Caucasian women in South Africa. Puoane et al. (2002) also suggested that the highest rates of abdominal obesity were observed in urban African women and that abdominal obesity has been linked to hypertension and diabetes in previous studies in South Africa.

African women perceive themselves as less overweight than they actually are, while Caucasian women have a more accurate evaluation of their level of obesity (Puoane et al., 2002). Fontaine et al. (2003) indicate differences in years of life lost due to obesity between blacks and whites. These disparities between the perceptions and consequences of obesity in African and Caucasian women may also be reflected in psychological functioning. There is a need to investigate psychological facets as predictors for (the absence of) obesity in African and Caucasian women to determine whether similar or different psychological facets will emerge as predictors in different cultural contexts.

Psychological well-being and (the absence of) obesity

The core hypothesis of positive health is that psychological well-being contributes to optimal functioning of numerous physiological systems (Ryff & Singer, 1998; Ryff, Singer & Dienberg Love, 2004; Singer & Ryff, 2001). Obesity is a chronic condition that has an effect on different physiological systems, i.e. cardiovascular, metabolic and immunity. A positive correlation exists between BMI (as objective measure of obesity) and the number of chronic diseases an individual has (Keyes, 2004). Different studies on social relationships and support (Ryff & Singer 2001; 2002; Seeman, 1996; Seeman, Gleit, Goldman, Weinstein, Singer & Lin, 2004; Seeman, Singer, Ryff, Dienberg Love & Levy-Storrs, 2002; Taylor, Sherman, Kim, Jarcho, Takagi & Dunagan, 2004; Uchino, Cacioppo & Kiecolt-Glaser, 1996) already indicated beneficial effects on aspects of the cardiovascular, endocrine and immune systems. Keyes (2005a) also indicates that completely mentally healthy individuals suffer least from cardiovascular diseases. Research on allostatic load (an indicator of cumulative biological wear and tear across

multiple physiological systems) indicates that experiencing positive social relationships is linked to lower allostatic load (Seeman et al., 2002). Especially social support and interpersonal relationships seem to be strongly associated with prevention or lowering of the risk of cardiovascular, endocrine and inflammatory conditions.

In the current study psychological well-being is conceptualized holistically (cognitive, affective, spirituality, interpersonal and contextual) and operationalized with measures of the degree of sense of coherence, satisfaction with life, affect valence, spiritual well-being, cognitive attributional style, environmental mastery, purpose in life, quality of interpersonal relationships, and degree of experienced social support (fortitude), as well as symptoms of distress. Obesity is operationalized in terms of body-mass-index (BMI) and waist-hip-ratio (WHR).

The aim of this study was to determine whether facets of psychological well-being can predict (the absence of) obesity and whether similar or diverse psychological facets will emerge as predictors of obesity in different cultural contexts.

METHOD

Design and Participants

The data on African women were collected in 2003 and for Caucasian women in 2004. The process of obtaining information was conducted in a two-phase cross-sectional design as part of the multi-disciplinary POWIRS-project (POWIRS = Profiles of Obese Women with Insulin Resistance Syndrome) (Schutte, Kruger, Wissing, Underhay & Vorster, 2005). One hundred and two apparently healthy Setswana speaking African women and one hundred and fifteen apparently healthy Afrikaans speaking Caucasian women, living in the North West Province of South Africa were recruited on basis of

anthropometric measures. A dietician or nurse recruited the participants in both studies. The women were between 19 to 56 years of age. English was the second language for both groups, and the language that is formally used in their work environment. Thirty-eight per cent of African and 36% of Caucasian women were lean, 25% of African and 28% of Caucasian women were overweight, while 37% of African and 36% of Caucasian women were obese as indicated by BMI measurements. The WHR indicated that 33% of African and 30% of Caucasian women were on a low, 38% of African and 42% of Caucasian women were on a moderate, 29% of African and 28% of Caucasian women were on a high or very high level of obesity.

Fat percentage and waist circumference were measured but not included as obesity measures because of their high correlation with BMI (see Table 1). Therefore only BMI and WHR were used as obesity indices.

[Table 1 approximately here]

Measures

Obesity indices

Body mass index (BMI) and waist-hip-ratio (WHR) were used as measures of obesity.

BMI and WHR are calculated as follows:

$$\text{BMI} = \frac{\text{Weight in kg}}{(\text{Height in m})^2} \quad \text{and} \quad \text{WHR} = \frac{\text{Waist circumference (cm)}}{\text{Hip circumference (cm)}}$$

People with a BMI ≥ 30 are considered obese (Caro, 2002). A woman with a BMI < 25 is lean and one with a BMI between 25 and 29 is considered overweight. The cutoff value for the levels of WHR is: below 0,73 is considered as low, between 0,73 and 0,8 as moderate, between 0,8 and 0,88 as high and above that as very high.

Indices of psychological well-being

Psychological well-being has been measured comprehensively by including indices of cognitive, affective, interpersonal, spiritual and contextual well-being. A measure of psychological distress is also included for validating purposes. Scales with acceptable psychometric properties were selected.

The *General Health Questionnaire (GHQ)* (Goldberg & Hillier, 1979) aims to measure an individual's current mental state by detecting symptoms that are commonly associated with mental disorders and the prevalence of stress symptomatology, such as somatic symptoms, anxiety and sleeplessness, social dysfunction and severe depression. Only the total score for the GHQ was used for the purpose of this study. In the current study the Cronbach alpha reliability index for the GHQ was 0.88 for the African group, and 0.90 for the Caucasian group. Wissing, Thekiso, Stapelberg, Van Quickelberge, Choabi, Moroeng and Nienaber (1999) reported reliability indices of 0.86 to 0.91 in African groups. Goldberg, Garter, Sartorius, Ustun, Piccinelli, Gureje and Rutter (1997) reported reliability indices of 0.82 to 0.86 in western samples.

The *Quality of Childhood Relationship Questionnaire (QCR)* (Botha, 2003), is based on Ryff and Singer's approach in the Wisconsin study (Ryff & Singer, 2002). It incorporates a Likert type 5-point scale. This questionnaire consists of 9 statements referring to the quality of relationships with the mother, father and significant others in terms of the amount of (a) caring; (b) support; and (c) affection/love; the child experienced, for example "When I was growing up, I experienced my mom as caring". A high score on the QCR indicates positively recalled childhood relationships with significant others and a low score negatively recalled childhood relationships with

significant others. In the current study the Cronbach alpha reliability index for the QCR was 0.71 for the African group and 0.83 for the Caucasian group. Face and content validity were assured by feedback from a panel of psychologists.

The *Sense of Coherence Scale (SOC)* (Antonovsky, 1987) measures individuals' cognitive self-evaluation of their life and the world as they experience it, indicating whether it is comprehensible, manageable, and meaningful. In the current study the Cronbach alpha reliability index for the SOC was 0.81 for the African group, and 0.88 for the Caucasian group. Wissing et al. (1999) reported reliability indices of 0.70 to 0.91 in African groups. Antonovsky (1993) reported reliability indices of 0.83 to 0.93 in western samples.

The *Affectometer 2 (AFM) (short form)* (Kammann & Flett, 1983) measures a general feeling of happiness and sense of well-being. The extent to which positive affect predominates over negative affect is expressed as affect balance (PNB). In the current study the Cronbach alpha reliability index for the AFM-PA was 0.78 for the African group and 0.87 for the Caucasian group; AFM-NA was 0.82 for the African group and 0.86 for the Caucasian group and the AFM-PNB was 0.85 for the African group, and 0.91 for the Caucasian group. Wissing et al. (1999) reported reliability indices of 0.68 to 0.90 in African groups. Kammann and Flett (1983) reported reliability indices of 0.95 in western samples.

The *Jarel Spiritual Well-Being Scale (SWS-H)* (Hungelmann, Kenkel-Rossi, Klassen & Stollenwerk, 1989). The SWS-H conceptualizes spirituality as a multidimensional construct. The harmonious interdependency of the different components of an individual's spirituality is measured by a sense of responsibility (for

self and life), life satisfaction / self-actualization, and religious conviction. In the current study the Cronbach alpha reliability index for SWS-H was 0.78 for the African group and 0.82 for the Caucasian group. Fourie (1999) reported reliability indices of 0.83 in South African populations.

The *Satisfaction with Life Scale (SWLS)* (Diener, Emmons, Larsen & Griffin, 1985). This scale measures satisfaction with life according to own criteria. In the current study the Cronbach alpha reliability index for SWLS was 0.75 for the African group and 0.89 for Caucasian groups. Wissing et al. (1999) reported reliability indices of 0.67 to 0.85 in South African populations.

The *Fortitude Questionnaire (FORQ)* (Pretorius, 1998) measures an individual's ability to manage stress and still experience psychological health/well-being. Fortitude is operationalized by the individual's perception of the self (S); the perceived support of his/her family (F); and the perceived support from others (SP). The Cronbach alpha reliability index for the FORQ-S was 0.63 for the African group and 0.78 for the Caucasian group; FORQ-SP was 0.75 for the African group, and 0.86 for the Caucasian group and the Cronbach alpha reliability index for the FORQ-F was 0.86 for both the African and Caucasian groups. This scale was developed in the South African context and Pretorius (1998) reported reliability indices of 0.74 to 0.85.

The *Cognitive Appraisal Questionnaire (CAQ)* (Botha & Wissing, 2003) is a self-report questionnaire with eight items based on the explanatory style theory of Buchanan and Seligman (1995). It measures globality, internality and stability when appraising a situation. A more optimistic explanatory style is characterized by viewing the causes of bad events as external, specific, and unstable, while positive events are ascribed to

internal, global and stable factors. In the current study the Cronbach alpha reliability index for the CAQ was 0.72 (CAQ [Pessimism] 0.69 and CAQ [Optimism] 0.78) for the African group, and 0.64 (CAQ [Pessimism] 0.76 and CAQ [Optimism] 0.74) for the Caucasian group. Higher scores on the total scale indicate higher levels of optimism. It is the first time that this measure has been used therefore no other reliability indices exist. Face and content validity were assured by feedback from a panel of psychologists.

The *Psychological Well-being Scales (SPWB)* (Ryff, 1989) conceptualize psychological well-being as consisting of the dimensions: autonomy, environmental mastery, personal growth, positive relationships with others, purpose in life, and self-acceptance. For the purpose of this study the scales Positive Relationships with Others (PR), Environmental Mastery (EM), and Purpose in Life (PL) were used. In the current study the Cronbach alpha reliability index was 0.71 for the SPWB-PR in the case of the African group, and 0.88 for the Caucasian group. It was 0.69 for the SPWB-EM in the African group and 0.88 for the Caucasian group, and was 0.77 for the SPWB-PL in the African group and 0.90 for the Caucasian group. Erasmus, Kirsten and Breytenbach (2005) reported reliability indices for SPWB-PR 0.83; SPWB-EM 0.85 and SPWB-PL 0.85 in a South African group.

Procedure

Subgroups of ten participants stayed overnight in the Metabolic Unit of the Potchefstroom Campus of the North-West University on consecutive nights for approximately one month for both African and Caucasian women. During the evening anthropometric measurements were taken, which included stature, body mass and waist and hip girth for the calculation of body fat. The psychological questionnaires involved

in this study were also completed during the evening under supervision of the first author. The English version of the questionnaires was used. A Setswana speaking African psychologist was also present while the African women completed the questionnaires. Other measures for the multidisciplinary POWIRS project (e.g. blood pressure measurements, fasting blood samples, and urine samples) were taken the next morning.

Participants were informed about the objectives and procedures of the study as well as ethical issues involved (e.g. voluntary participation, anonymity, etc.). Informed consent was obtained in writing. By assigning each participant a subject number for the duration of the research, anonymity was achieved and privacy protected. The Ethics Committee of the North-West University approved of this study (reference number 03M03).

RESULTS

As obesity correlates with age (Lohman, 1987), age was controlled in all calculations. Partial canonical correlation analyses, controlling for age, were calculated between the two sets of indices for obesity and psychological facets. In the case of the African group the canonical R was 0.52 ($\text{Chi}^2(28) = 39.94$; $p = 0.067$) and the total redundancy 23.06%. In the Caucasian group the canonical R was 0.44 ($\text{Chi}^2(28) = 35.80$; $p = 0.148$) and the total redundancy 16.85%. The redundancies in the current canonical correlation analyses indicated a medium and a large practically significant association between psychological well-being and obesity measures in the Caucasian and African groups respectively.

The redundancy of the set of criteria variables, given the set of predictors, gives the proportion of the criterion variables that can be explained by the predictors. Steyn (2005) suggests that it is the best measure of practical significance for multivariate

associations and can be interpreted with the same guidelines as a multiple R^2 . The following guidelines for interpretation of a multiple R^2 as effect size are used: 0.01 – small effect size; 0.13 – medium effect size and 0.25 – large effect size (Steyn, 2005).

Further analysis of this association involved the fitting of forward and backward partial stepwise multiple regression models to determine which combination of the psychological facets could be considered the best predictors for WHR and BMI in African and Caucasian women. The best models were selected by means of the adjusted R^2 of the models. Normal probability plots on the residuals of the regression fit were used to test the normality assumption and no serious deviations from normality were detected. Correlations between psychological indices were also checked for multicollinearity in the regression fit.

Model fits were as follows: a substantial proportion ($R^2 = 0.16$) of the variance in WHR (see Table 2) is explained for African women indicating positive associations with Spirituality (SWS-H) and support from family (FORQ-F) and negative associations with cognitive appraisal style (CAQ-T) and cherished interpersonal relationships (SPWB-PR). A substantial proportion ($R^2 = 0.11$) of the variance in WHR (see Table 2) is explained for Caucasian women indicating positive associations with spirituality (SWS-H) and satisfaction with life (SWLS) and negative associations with sense of coherence (SOC) and purpose in life (SPWB-PL).

[Table 2 approximately here]

A substantial to large proportion ($R^2 = 0.19$) of the variance in BMI (see Table 3) is explained for African women indicating a positive association with support from family (FORQ-F), and negative associations with cognitive appraisal style (CAQ-T), quality of

childhood relationships (QCR) and cherished interpersonal relationships (SPWB-PR). A substantial proportion ($R^2 = 0.15$) of the variance in BMI (see Table 3) is explained for Caucasian women indicating positive associations with spirituality (SWS-H) and positive affect (AFM-PA) and a negative association with purpose in life (SPWB-PL).

[Table 3 approximately here]

An overview summary of the associations between the indices of obesity and the indices of psychological well-being in African and Caucasian women is presented in Table 4.

[Table 4 approximately here]

DISCUSSION

The main finding of this study is that clusters of psychological well-being facets are practical significant predictors of obesity (measured by BMI and WHR) as determined by the best fitting of regression models, and that these clusters differ in some respects for African and Caucasian women. No causality can be deduced from these predictions, and only clear associations are established.

In both the African and Caucasian women, a higher level of spirituality was associated with a higher level of obesity as measured by waist-hip-ratio (WHR). This may support the notion (cf. Puoane et al., 2002; Stein & Colditz, 2004) that body composition should be taken into account when correlates of obesity are explored, and not body mass (BMI) only. An explanation for the association of higher levels of spirituality with obesity may be that surrendering to a higher power may be a coping mechanism with stress as suggested by previous research. Young, Cashwell and Sherbakova (2000) found that spirituality moderates the relationship between negative

life experiences and psychological adjustment. Spirituality, optimism and social support are also significant predictors of adjustment according to Salsman, Brown, Brechting and Carlson (2005). According to Peterson and Seligman (2004) religious belief is in general related to the ability to cope with stressful life events. Spirituality and/or feelings of acceptance in a relationship with God, may thus be used as a coping mechanism, act as a buffer against the effects of negative life events, or even compensate for the lack of satisfactory other interpersonal relationships.

Within the African and Caucasian groups, different clusters of psychological well-being facets were the best predictors of obesity as measured by the BMI and WHR, with the most robust psychological predictors probably those included in the clusters of prediction for both BMI and WHR.

In the African group of women the most robust psychological predictors for obesity (BMI and WHR) were higher levels of support from family, and lower levels of (other) personal relationships and lower levels of optimistic cognitive appraisal style. A lower quality of experienced childhood relationships was also included as a variable in the best cluster of predictors for BMI, and higher levels of spirituality as predictor for WHR in the African group. These findings resonate with those from previous research on the dynamics of psychological well-being in cultural context, and research on interpersonal relationships and health. African women in this study were from a relatively collectivist cultural background, but as they were in an urban area during this study, they might be in a transitional phase in which some more individualistic notions also play a role.

Cultural factors may play a role in the manifestation of psychological well-being and symptoms of ill-health (Basabe, Paez, Valencia, Gonzalez, Rimé & Diener, 2002; Cutrona, Russel, Hessling & Brown, 2000; Massimini & Delle Fave, 2000; Taylor, Repetti & Seeman, 1997). In a collectivistic culture (African), aspects of the self are to a great extent derived from in-group belonging, i.e. the collective self (Chen, Boucher & Parker Tapias, 2006). Collective selves therefore “see themselves more in terms of ‘we-ness’ than in terms of ‘I-ness’” (Stapel & Van der Zee, 2006: 260). According to the self-categorization theory (Turner, Oakes, Haslam & McGarty, 1994) the collective self defines himself or herself in terms of stereotypical group characteristics and therefore becomes an identical archetype of the group. According to Peterson and Chang (2002) the emphasis in a collectivistic culture is on interdependency and “fitting in” with the group, which leads to seeing oneself as more average (self-effacement) and under the control of others (the making of individual decisions might disrupt the group harmony). These beliefs about oneself may lead to a pessimistic explanatory style in collectivistic cultures (Peterson & Chang, 2002). Peterson and Chang (2002) also indicate that a pessimistic explanatory style correlates with poor adjustment in various domains, while an optimistic explanatory style is related to mastery, achievement and control. Diener and Diener (1995) indicated that in mixed cultural contexts people’s feelings about themselves might be more dependent on the family because they have shared principles, values and morals. In the traditional African cultural context obesity is still considered as a sign of prosperity and health (Mvo, Dick & Steyn, 1999; Walker, 1998). Myers (1999) indicates that individualist cultures prejudge people often by personal attributes like physical attractiveness, while collectivist cultures tend to place more emphasis on social

identity. Although the social identity of their family is accepting towards obesity the out-group in the western cultural context might stigmatize and negatively stereotype obese individuals as repulsive, brainless, mean and slothful (Falkner, Neumark-Sztainer, Story, Jeffery, Beuhring & Resnick, 2001).

The “relational self” develops through experiences in the interaction with significant other(s) (Chen, Boucher & Parker Tapias, 2006; Stapel & Van der Zee, 2006). According to predictions from the attachment theory (Bowlby, 1973; Hazan & Shaver, 1994; Mallinckrodt, 1992; Sperling & Berman, 1994;) the lack of a stable, intimate relationship with a significant other may hinder normal development. This may be why both the experienced quality of childhood relationships and contemporary adult interpersonal relationships were negatively associated with BMI. Lissau and Sørensen (1994) found in a longitudinal study that parental neglect in childhood, in the form of poor general hygiene and lack of parental support, significantly increased the risk for obesity in adulthood. Grant and Boersma (2005) imply that eating is used to numb the pain connected with child abuse and is used as a substitute to fulfil the needs for relationship and belonging. Obesity may thus be related to oral compensatory processes, looking for security in food when it is lacking in interpersonal relationships. The development of positive interpersonal relations requires that the “relational self” connect with others on an individual level in dyadic interactions (Chen, Boucher & Parker Tapias, 2006; Stapel & Van der Zee, 2006). In order for these relationships to be positive they should be marked by warm, trusting and satisfying connections and consist of elements of empathy, affection, and concern about the welfare of others (Ryff & Keyes, 1995). This

group of African women seems to lack such warm and trusting (personal) relationships despite support from family.

In the case of Caucasian women robust predictors of obesity across indices (BMI and WHR) were higher levels of spirituality, and lower levels of purpose and meaningfulness in life. These findings seem to include a contradiction, which in turn is further accentuated by the fact that higher levels of obesity were also associated with positive affect and satisfaction with life on the one hand, but then also with a lower sense of coherence on the other hand, indicating an orientation in which life is viewed as less comprehensible, manageable and meaningful. This split in findings is difficult to explain. It has been shown that religiousness (part of spirituality) is associated with greater life satisfaction (Salsman et al., 2005), and it may be that more obese participants, as suggested above, use spirituality as a coping mechanism. Purpose in life motivates individuals to set goals and give them a feeling of directedness. If there is a lack of purpose in life, life becomes meaningless (Ryff & Keyes, 1995). It may be that obesity is related to satisfaction in the present (as in oral gratification), but also to lack of purpose and meaningfulness in the longer term. Further research in this regard is needed.

Implications of the results of this study for health are that physical health, and in particular normal body weight and composition, may be enhanced through the development of psychological strengths. This may be most effective if linked to interventions based on cognitive behavioural treatment that is indicated by Wardle and Steptoe (2005) as the “gold standard” for treatment of obesity. Further research is necessary to determine the dynamics involved in the relationship between the psychological well-being facets and indices of obesity. If longitudinal research would

show that the lack of psychological strengths, that are associated with obesity in this study, indeed predict higher levels of obesity, it may be assumed that such strengths are protective in nature. Therefore it may be profitable to include the enhancement of these strengths in health promoting and obesity preventative interventions.

In the current study (the lack of) different psychological strengths were associated with obesity in the case of African and Caucasian women. This may be related to cultural differences, but may also be ascribed to socio-demographic differences such as different levels of education. Therefore too much should not be made of these differences. It may, however, be that these differences carry some weight, and in such a case they can be incorporated in intervention programmes for specific target groups. Peterson and Chang (2002: 72) were of the opinion that "If we wish to encourage well-being and help people flourish, we need more than a one-size-fits-all ... program". In the case of African women, fostering an optimistic cognitive attributional style and positive, social interpersonal relationship would be indicated specifically. In the case of the Caucasian women building a sense of coherence, developing purpose in life and exploring ways to give meaningfulness to life are strengths to be developed. The inclusion of the aforementioned strengths in psychological preventive or promotive programmes, are supported by findings from Ryff, Singer and Dienberg Love (2004). They found that eudaimonic well-being, especially on the dimensions of positive relations with others, personal growth and purpose in life, were linked to lower WHR, lower total/HDL cholesterol ratios and a lower body mass in older women. Spirituality is usually indicated as a protective factor for physical health, but in this study spirituality is associated with a risk factor for ill-health, and may be a coping mechanism rather than a protective factor.

Enhancement of psychological strengths as part of health promotion and risk (obesity) prevention may also contribute to a higher quality of life as described by Keyes (2005a) in his model of complete mental health. Keyes (2002; 2005a) indicates that mental health cannot simply be based on the presence or absence of mental illnesses but must also include the presence of specific dimensions of subjective well-being. The completely mentally healthy adult is flourishing and there is an absence of pathologies such as depression. It is noteworthy that indices of psychopathology (such as depression, anxiety and physical symptoms measured by the GHQ) did not contribute significantly to the prediction of obesity in this study. Flourishing individuals have psychological resources such as direction in life, intimate and warm relationships, resilience and low levels of helplessness (Keyes, 2005a). In the current study lower levels of positive personal relationships and lower levels of purposefulness and experienced meaningfulness were associated with higher levels of obesity, and are thus indicative of the absence of flourishing in these women. Prevention and change of life style programmes focused on obesity or obesity prevention should thus not only (but also) try to alleviate stress, anxiety and depression, prevent or stop the vicious circle of comfort eating, and enhance physical fitness. These programmes should also focus pertinently on life skills and behaviours related to interpersonal relationships, cognitive attributional styles, finding a sense of purpose and meaningfulness in life. Such a holistic approach to health promotion may prove in the long run to be very cost-effective (Keyes, 2006; Wardle & Steptoe, 2005).

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Table 1: Correlations between BMI, WHR, waist circumference and fat percentage in Caucasian and African women.

African women		Correlations are significant at $p < 0.05$		
Variable	BMI	WHR	Waist circum	Fat percentage
BMI	1.00	0.42	0.88	0.91
WHR	0.42	1.00	0.58	0.47
Waist circum	0.88	0.58	1.00	0.85
Fat percentage	0.91	0.47	0.85	1.00
Caucasian women		Correlations are significant at $p < 0.05$		
Variable	BMI	WHR	Waist circum	Fat percentage
BMI	1.00	0.46	0.92	0.95
WHR	0.46	1.00	0.54	0.55
Waist circum	0.92	0.54	1.00	0.92
Fat percentage	0.95	0.55	0.92	1.00
Note: Waist circum = waist circumference				

Table 2. Partial multiple regression summary for dependent variable: Waist-hip-ratio (WHR) $R^2 = 0.16$, $F(4,89)=4.20$ and $p = 0.004$ for African and $R^2 = 0.11$, $F(4,110)=2.30$ and $p = 0.022$ for Caucasian women.

African	Beta	Standard Error Beta	B	Standard Error B	t (88)	p-level
Intercept			0.002	0.006	0.34	0.733
SWS-H	0.23	0.11	0.001	0.001	2.05	0.043
FORQ-F	0.30	0.11	0.004	0.002	2.80	0.006
CAQ	-0.27	0.12	-0.004	0.002	-2.36	0.021
SPWB-PR	-0.29	0.12	-0.002	0.001	-2.50	0.014
Caucasian	Beta	Standard Error Beta	B	Standard Error B	T (108)	p-level
Intercept			0.000	0.005	0.00	1.000
SWS-H	0.27	0.13	0.002	0.001	2.04	0.044
SWLS	0.21	0.13	0.002	0.001	1.61	0.110
SOC	-0.29	0.16	-0.001	0.001	-1.85	0.067
SPWB-PL	-0.28	0.16	-0.001	0.000	-1.77	0.080

Note: FORQ-F = Fortitude Questionnaire – support from family; CAQ = Cognitive

Appraisal Questionnaire; SPWB-PL = Psychological Well-Being – Purpose in Life;

SPWB-PR = Psychological Well-Being – Positive Relationships; SWLS = Satisfaction

With Life Scale; SWS-H = Jarek Spiritual Well-being Scale; SOC = Sense of Coherence Scale.

Table 3. Partial multiple regression summary for dependent variable: Body Mass Index (BMI) $R^2 = 0.19$; $F(4,89)=5.09$ and $p < 0,001$ for African and $R^2 = 0.15$; $F(3,111)=6.74$ and $p < 0,001$ for Caucasian women.

African	Beta	Standard Error Beta	B	Standard Error B	t (87)	p-level
Intercept			-0.10	0.56	-0.18	0.854
FORQ-F	0.19	0.11	0.24	0.13	1.83	0.070
QCR	-0.17	0.11	-1.52	0.97	-1.57	0.120
CAQ	-0.21	0.11	-0.25	0.14	-1.83	0.071
SPWB-PR	-0.24	0.11	-0.14	0.07	-2.16	0.033
Caucasian	Beta	Standard Error Beta	B	Standard Error B	T (110)	p-level
Intercept			0.00	0.63	0.00	1.000
SPWB-PL	-0.60	0.14	-0.36	0.08	-4.47	<0.0001
AFM-PA	0.25	0.14	0.28	0.16	1.76	0.081
SWS-H	0.20	0.13	0.14	0.10	1.47	0.143

Note: FORQ-F = Fortitude Questionnaire – support from family; CAQ = Cognitive

Appraisal Questionnaire; AFM-PA = Affectometer – Positive Affect; SPWB-PL =

Psychological Well-Being – Purpose in Life; SPWB-PR = Psychological Well-Being –

Positive Relationships; SWS-H = Jarel Spiritual Well-being Scale; QCR = Quality of

Childhood Relationship.

Table 4: Summary of facets of psychological well-being as predictors of obesity (BMI and WHR) in African and Caucasian women according to regression models.

African		Caucasian	
BMI	WHR	BMI	WHR
Support from Family ⁽⁺⁾	Support from Family ⁽⁺⁾	Purpose in Life ⁽⁻⁾	Purpose in Life ⁽⁻⁾
Positive Relations ⁽⁻⁾	Positive Relations ⁽⁻⁾	Positive Affect ⁽⁺⁾	Sense of Coherence ⁽⁻⁾
Cognitive Appraisal ⁽⁻⁾	Cognitive Appraisal ⁽⁻⁾	Spirituality ⁽⁺⁾	Spirituality ⁽⁺⁾
Quality of childhood Relations ⁽⁻⁾	Spirituality ⁽⁺⁾		Satisfaction with life ⁽⁺⁾

Section 5: Conclusions, implications and recommendations

The aim of this study was to explore, from various perspectives, the possible link between psychological well-being and biological correlates, with specific reference to facets related to obesity, in an African context. Obesity is escalating worldwide and is taking on pandemic proportions. It has been linked to mortality in various studies (Allebeck & Bergh, 1992; Allison et al., 1999; Engeland et al., 2004; Fontaine et al., 2003; Stein & Colditz, 2004; Thorpe & Ferraro, 2004) and is indicated as an important risk factor in many chronic diseases, such as the metabolic syndrome. Obesity also has a higher prevalence in African Americans than in non-black women (Robert & Reither, 2004). About 46% of South African women are overweight or obese, with the highest prevalence in black African women (Steyn, Bradshaw, Norman, Joubert, Schneider & Steyn, 2006). This presence of obesity has been linked to the increased prevalence of cardiovascular disease, diabetes, hypertension, dyslipidaemia and certain cancers (Steyn et al., 2006). Keyes (2005a) indicates that a lesser degree of complete mental health (languishing with an episode of major depression) is associated with the greatest reported occurrence of specific chronic conditions and they also have the largest amount of chronic conditions. This author also argues that as chronic conditions appear to be resistant to treatment, they should rather be prevented. Therefore, various specific facets of psychological well-being were explored to determine possible predictors of (the absence of) obesity in African and Caucasian women to eventually assist in the prevention of obesity and the obesity-related metabolic syndrome.

Findings from this study were reported in three articles. They were, firstly,

“Childhood relationships and adult bio-psycho-social well-being in African women”, secondly, “Psychological well-being and the metabolic syndrome in African and Caucasian women” and lastly, “Psychological well-being and (the absence of) obesity in African and Caucasian women ”. In all studies psychological well-being was operationalized by combinations of scales measuring facets of cognitive, affective, interpersonal, spiritual and contextual well-being and a measure of psychological distress was included for validating purposes.

The first article explored (from a positive psychology perspective) whether African women with a recalled higher level of quality of childhood relationships would differ significantly with regard to biological, psychological and social well-being from women with a recalled lower level of quality of childhood relationships. Physical health was indicated by body mass as measure of obesity. Research that links childhood experiences to adult bio-psycho-social health as defined from a Positive Psychology perspective is sparse and research with African participants is underrepresented. Findings were that the quality of childhood relationships is linked with obesity in this group of African women. Recalled quality of childhood relationships is related to psycho-social well-being as well. These findings provide evidence that the quality of childhood relationship is just as important in the case of African women’s adult psychological well-being, than it is for women in Western samples as previously reported by Seeman, Singer, Ryff, Dienberg Love and Levy-Storms (2002), Ryff and Singer (2002; 2003).

In the second article two notions were explored. Firstly, the possible association between comprehensive psychological well-being (affective, cognitive, environmental, social and spiritual) and the absence of the metabolic syndrome in African and Caucasian

women. Secondly it was investigated whether women without metabolic syndrome markers differ significantly from women with the metabolic syndrome on specific psychological well-being facets. Physical health was conceptualized in terms of the absence of MS, and measured taking into account the National Cholesterol Education Program's Adult Treatment Panel III (NCEP's ATPIII) criteria for the metabolic syndrome. Findings were, firstly, that an association exists in Caucasian women between comprehensive psychological well-being and the absence of the metabolic syndrome, but not in the case of African women. Secondly, when investigating whether women without metabolic syndrome markers differ significantly from women with metabolic syndrome on specific psychological well-being facets, Caucasian women without metabolic syndrome markers had significantly higher psycho-social well-being than women with the metabolic syndrome. A less apparent pattern of differences emerged for African women.

The third article explored the relationship between psychological well-being and (the absence of) obesity in both African and Caucasian women. The aim of this study was to detect whether facets of psychological well-being can predict (the absence of) obesity and whether similar or different psychological facets will emerge as predictors of obesity in different cultural contexts. Obesity was operationalized in terms of waist-hip-ratio (WHR) and body-mass-index (BMI). Findings from this sub-study were that clusters of psychological well-being facets are practical significant predictors of obesity (measured by BMI and WHR) and that these clusters differ in some respects for African and Caucasian women. In African women robust associations were found between pessimistic explanatory style, high support from family and lower levels of positive

interpersonal relationship on the one hand, and obesity on the other hand. In Caucasian women lower levels of a sense of coherence and lower levels of purpose in life were associated with higher levels of obesity. In both groups of participants obesity was associated with higher levels of spirituality.

The main conclusions that can be drawn from the above studies are the following: Firstly, the association between facets of psychological well-being and facets of physical health as found in all of these studies supports holistic conceptualizations of health as proposed by the World Health Organization (1999). This means that a proper understanding and enhancement of complete health should take physical, psychological, social and contextual aspects into account. Secondly, it can be concluded that some specific facets of psychological well-being are associated with (the absence of) obesity and its interdependent chronic disease, the metabolic syndrome. This may have important implications for further research and possible use in intervention and preventative programmes focusing on health enhancement. The inclusion of efforts to facilitate relevant psychological strengths in programmes to remediate or prevent obesity will be a fresh approach that may add value to existing behaviour modification programmes.

It is estimated that about 65% of the adult population in the United States are overweight or obese (Flegal, Carroll, Ogden & Johnson, 2002) and about half of the population in South African (Steyn et al., 2006). The escalation in the incidence of obesity contributes to an increase in the prevalence of different chronic diseases that leads to higher health care costs (Allison, Zannolli & Narayan, 1999). In the United States alone, an estimated \$117 billion is annually spent on the direct or indirect costs of obesity (Stein & Colditz, 2004). Obesity will not be prevented by merely telling

individuals and communities to make lifestyle changes (changing diet and exercise activities). A multilevel approach to improve the social, cultural and economic environments through hard work and motivation by the whole sector of the population (government, food industry, media, communities and individuals) is needed (WHO, 1998). The report of the South African Medical Research Council (Steyn et al., 2006) suggested a holistic approach in terms of the external environment by addressing the need for fiscal policies and levies, food labelling and claims, marketing and advertising standards, policies aimed at improving the environment, school-based intervention programmes, nutrition health logos and nutrition education programmes at primary health care facilities. Unfortunately, the only strategies that appear to be suggested in the school-based intervention programme and in the nutrition education programme are the "...tool of nutrition education..." and the progress of physical activity in the prevention of chronic disease (Steyn et al., 2006: 40). Thus far no cognizance has been taken of other relevant behavioural facets such as the psychological well-being facets indicated in this study to be associated with (the absence of) obesity.

Obesity prevention or remediation may be especially challenging in black Africans because of the positive traditional and cultural connotations ascribed to obesity (Puoane, Steyn, Bradshaw, Laubscher, Fourie, Lambert & Mbananga, 2002; Walker, Adam & Walker, 2001). Puoane et al. (2002) indicated that the highest number of abdominal obesity sufferers was observed in urban African women and that abdominal obesity has been linked to hypertension and diabetes in previous studies in South Africa. A further complication in personal motivation, in the newly liberated black African men and women, may be the wish to fully imitate the seemingly appealing lifestyle of the

neighbouring white Africans with a craving for more appetizing and energy denser foods, and the occurrence of decreased levels of physical activity in the workplace (Walker, Adam & Walker, 2001).

As it is, nearly all efforts made to treat obesity in the long-term resulted in failure (95% failure over a 5 year period) (Boisaubin, 1996). Interventions hereto have been focusing on lifestyle interventions (diets, increased physical activity and behaviour therapy), pharmacotherapy and surgery in the morbidly obese individuals (Martin, Myers & Brantley, 2004). Programmes like Shape Up America, the 10,000 Steps Program (Moore, 2003), Anne Collins 28-Day Quick Start Diet (Collins, 2003), and the 41 year old Weight Watchers Programme (ANRED, 2006) mainly focus on lifestyle interventions. Future research should explore whether enhancement of specific facets of psychological well-being may add value to these existing efforts. Research has indicated that psychological well-being can act to protect physical health and prevent (ill)health, especially through social support (Ryff & Singer, 2002, 2003; Seeman, Singer, Ryff, Dienberg Love & Levy-Storms, 2002; Taylor, Kemeny, Reed, Bower & Gruenewald, 2000; Uchino, Cacioppo & Keicolt-Glaser, 1996). Investigating the effect of enhancement of facets of psychological well-being as part of the prevention of obesity and obesity-related diseases therefore is necessary, as has also been suggested by Wardle, Steptoe and Hasse (2003). Until now behavioural interventions have mainly been focusing on alleviation of stress and depression, and minimizing comfort eating. Cognitive behavioural therapy is the most frequently used strategy in lifestyle modification programmes. The learning of strategies such as stress management, contingency management, stimulus control, problem solving, self-monitoring, cognitive

restructuring and social support are included in such programmes as suggested by the APA Help Center (2004). The development of optimistic cognitive appraisal styles may fit in very well with the cognitive approach. Martin, Myers and Brantley (2004: 20) stated that "...individuals who possess skills to cope with challenges are less likely to relapse".

Recommendations are made that further research should explore the dynamics of psychological well-being and obesity and the obesity-related metabolic syndrome in the different cultural contexts. Because of the cross-sectional nature of the present study design, no causality can be deduced. The specific psychological strengths that are related to obesity in this study should also be verified in other groups, and with control for levels of education and other socio-economic variables. Therefore further research is indicated with longitudinal data and larger numbers of randomly selected participants.

It is further recommended that programmes including facets of psychological well-being in addition to other behavioural facets should be developed and their effect evaluated in comparison to the traditional programmes only. Specific strengths that can be included are behavioural skills related to close interpersonal relationships, optimistic cognitive attributional styles, and a life orientation of directedness to purpose and meaningfulness in life. A sensitivity for cultural contexts should be promoted in these programmes (Karanja, 2003) because, as Peterson and Chang (2002) suggested, a one-size-fits-all programme might not be the most effective when we want to help people thrive. Smith (2006) also argued strongly for the importance of culture specificity in strength enhancement counselling programmes.

The occurrence of obesity in childhood and adolescence has increased significantly over the last few years (Turner et al., 2005), causing the prevalence of

chronic diseases at an ever-earlier age. Therefore early educational training programmes that develop strengths to promote bio-psycho-social health in individuals and communities should be implemented from an early age.

It may be that the time has come for a more holistic approach in public health, including attention to physical, mental, social and contextual factors (as included in the conceptualization of health by the WHO (1999)). Until now the focus in public health has mainly been on physical health and prevention of risk factors. The problem of AIDS accentuated the importance of behavioural facets in prevention, and psycho-social components in public health agendas are creeping in. However, the focus is still only on prevention of risk factors. From now on development of strengths as possible protective factors could also be included. But this will require, first of all, much advocacy and many efforts to influence public policy. This is a major challenge for the future.

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