

Which personal quality of life domains affect the happiness of older South Africans?

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Abstract

Objective To ascertain which quality of life domains affect the happiness of older South Africans.

Method Seven hundred and ten respondents, aged between 50 years and 93 years, participated in the study. Seven single items assessed satisfaction with: oneself, family life, friendship, one's time to do things, neighbours, social life and health. Responses were summed for overall quality of life. A 31-item scale measured satisfaction with activities (16 items), financial situation (7 items) and people (8 items). One item measured global happiness.

Results Coefficient alpha was 0.90 (7-item quality of life scale), 0.95 (activities scale) and 0.87 (finances and people scales). Although there some racial differences on the 10 quality of life domains and happiness, Black respondents, who acted as caregivers, had a poorer quality of life and were less happy ($P < 0.05$) than those without these responsibilities. Stepwise multiple regression revealed that satisfaction with social life was the most important predictor of happiness for Blacks and Indians; satisfaction with oneself for Whites, and time to do things for Coloureds. Overall findings suggested that three out of the ten domains adequately represented perceived quality of life,

care-giving responsibilities negatively affect quality of life and happiness and race plays a role in predicting happiness.

Keywords Personal quality of life · Happiness · Older South Africans

Introduction

In the literature, the concepts happiness, life satisfaction, well-being and quality of life tend to be used interchangeably [1–5], which results in confusion with regard to the distinctness of these concepts. For example, Csikszentmihalyi [1] equates happiness with subjective well-being; Veenhoven [2] and Michalos [3] feel that happiness is synonymous with life satisfaction; and Jeffres and Dobos [4] consider that perceived quality of life is the same as well-being, as does Cummins and his associates [5]. There is evidence that happiness and life satisfaction are related, but not identical, concepts [6–8], since they share a maximum of 60 percent common variance. However, there is general consensus that happiness and life satisfaction are global concepts with underlying well-being or perceived quality of life domains [1–4, 9–14].

Cummins and his associates [5, 15–17] have argued that satisfaction with seven domains of life adequately represent subjective well-being. These include standard of living, personal health, achievements in life, personal relationships, personal safety, community-connectedness and future security. In contrast, Westaway [13] considers that nine domains represent quality of life: satisfaction with oneself, partner, family life, friends, time to do things, neighbours, income, social life, and own health. Other researchers have proposed additional domains such as satisfaction with one's job, spiritual life and housing [14, 18]. In Australia, standard of living

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was the most important predictor of life satisfaction [19], with standardised beta coefficients ranging between 0.26 and 0.37 for nine surveys. In South Africa, satisfaction with own health was the most important predictor, with standardised beta coefficients ranging between 0.27 and 0.53 [13, 20].

Domains differ in importance within and between countries [3, 4, 11–14, 17, 20]. For example, in 7 out of 11 Canadian surveys, satisfaction with oneself or self-esteem was the most important predictor of happiness, with standardised beta coefficients ranging between 0.23 and 0.38 [3]. Satisfaction with own health is an important quality of life domain in the US, UK and South Africa, but not in Canada or Australia [3, 4, 11–14, 17, 20]. Relationships or social contacts appear to be equally important for happiness and life satisfaction in the US, Canada, UK, Australia, Hong Kong and South Africa [3, 4, 11–14, 17, 20]. However, it has been shown that the determinants of happiness are more likely to be positive, close personal relationships, whereas the material conditions of life are more likely to affect life satisfaction [21].

In general, happiness, life satisfaction, well-being and quality of life are relatively stable [1–16]. However, these concepts can be influenced by beneficial or adverse life events, such as winning the lottery or chronic unemployment [22, 23]. For example, the classic study on lottery winners, controls and accident victims [22] showed that there were no differences between lottery winners and controls on past, current and future ratings of happiness. Paraplegics rated their past happiness as higher and their current happiness as lower than controls, but there were no differences between these three groups on future happiness. Although this study was not longitudinal in design, the findings suggest that people adapt to both positive and negative life events.

In the 1950s, Maslow [24] formulated his hierarchy of needs, which posited that behaviour is largely determined by certain deficiencies that must be satisfied before one may progress to the next highest level. The four need levels driven by deficiency are: physiological, safety and security, belongingness and love, and esteem needs. Although Maslow believed that human needs formed a hierarchy, he added the caveat that it was not necessarily a rigid one. For example, in some individuals, the need for self-esteem appeared to over-ride that of belongingness and love. In others, creativity (usually associated with self-actualization) flourished in spite of deficits in the fulfilment of lower-level needs. More importantly, gratification of basic needs, the liveability factor, is essential for human functioning, survival and quality of life [2, 10]. No wonder that quality of life is lower in poor countries, with high levels of malnutrition, since one basic need has not been met [2].

In South Africa, it has been shown that happiness and life satisfaction follow a racial hierarchy, with one exception in 1994 [25]. From 1983 to 1999, White South

Africans were happier and more satisfied with their lives than Black South Africans. This trend was interrupted in 1994 where, for the first time, happiness and life satisfaction were on a par, at ± 80 percentage points for Black, White, Indian and Coloured South Africans. Møller [25] attributed this finding to the euphoria surrounding the first democratic general elections. There was a downward trend in happiness (below 60 percentage points) and life satisfaction (below 50 percentage points) for all four population groups from 1995 to 1997, only reversing upward in 1999 (the second democratic general election). In contrast, Haller and Hadler [21] reported that, for South Africa between 1995 and 1997, the average happiness score was 1.84 (ranging between quite happy and very happy), and the average life satisfaction score was 6.08 (above the mid-point for life satisfaction). Given a South African Gini coefficient of 0.59, a reflection of inequalities in living circumstances, it is no wonder that South Africans portray higher levels of happiness than life satisfaction [21].

With some deviations, the findings for White South Africans showed that quality of life was very similar to that found in Western nations [15, 16]. However, there remained a significant gap on quality of life between Black and White South Africans in 1999 [25]. In contrast with Møller's findings [25], a longitudinal study with Black residents of an informal settlement found that quality of life for the total sample improved from 74 percentage points in 1999 to 85 percentage points in 2002, with the group from the squatter camp being the least satisfied with their quality of life [13], suggesting that changes in living circumstances were beneficial for quality of life [2].

In Western nations, socio-demographic characteristics (age, education, race and income) explain a low proportion of the variance in happiness [11, 12, 26, 27]. Some studies have found no relationship between age and happiness [28–30], whereas others have reported a concave relationship (U shaped) between age and happiness, with happiness reaching a minimum in the midlife years, and then increasing in later years [31, 32]. With regard to education, race and income, most studies find a modest positive relationship between education and happiness [28–30]; Black Americans consistently rate their happiness as lower than White Americans [30, 33]; and, in the main, the rich do not appear to be happier than the poor [1, 34].

South Africa has one of the most rapidly ageing populations in Africa, with 7.3 percent of the population aged 60 and older in 2001 [35]. Despite the impact of AIDS, this proportion is expected to increase to 9.5 percent in 2015 [35]. The age structure for Black South Africans has a broad base (35 percent under 15 years of age) and a narrow apex (12 percent aged 50 and older), corresponding to the early stages of the demographic transition [36]. The age structure for the White population has a narrower base (19 percent under 15 years of age) and a broader apex (33 percent aged 50 and

older) than the Black population [36]. Despite these differences, 4.5 million of the country's population were Black aged 50 and over in 2005 [36].

The elderly in South Africa face a complex set of challenges [37, 38]. South Africans over age 50 have spent most of their lives under apartheid, with restricted access for Black, Indian and Coloured South Africans to education, residence and employment opportunities. Tellingly, only 42 percent of the Black population aged 60 and older, in comparison with 98 percent of the White population of the same age, has received any education [37]. Technically, the repeal of the Group Areas Act in 1986 meant better access to housing for Black, Indian and Coloured South Africans; in practice, the majority of Black South Africans are poorly educated, unemployed (estimated at 57 percent in 1997) and, if employed, paid minimal wages. These factors in combination restrict access to better housing to more affluent Blacks, Indians and Coloureds. A high unemployment rate combined with the AIDS epidemic has brought added responsibility to older Black South Africans. At a time when considerations about retirement should be made (at age 50), older Black South Africans have little choice but to look after and support their children, grandchildren and other relatives infected or affected by the epidemic [37].

Chronic poverty (household income <R400 per month) affects one in four older South Africans, with the bulk of chronic poverty affecting the Black population [37, 38]. For example, 33 percent of Blacks aged 50 is affected by chronic poverty in comparison with 7 percent of Whites. Originally designed to provide protection for poor Whites, the extension of the Old Age Pension to Blacks in 1944 constituted a turning point in the social history of ageing in South Africa. From this point, pension-able age for Blacks (60 for women and 65 for men) began to mark a biographical orientation point by which the life course was organised [37]. In the 1980s, this social grant was approximately twice as much for White than Black South Africans [39]. Only in 1993 did government pensions reach parity for all population groups. This non-contributory Older Persons Grant (applicable by means-test to women at 60 and men at 65) has played a role in poverty alleviation and income redistribution for Blacks. However, this income (R820/US\$117 per month in 2006) has been eroded by inflation and re-routed to provide for family and household needs. Income and pension-sharing, which is the norm rather than the exception, means that the basic needs of Black older persons are not met [37].

Rationale for the study

Although the South African government continues to stress the importance of achieving a good quality of life for all, there have been few attempts to systematically monitor

quality of life and happiness of South Africans from a subjective perspective [40]. There is some evidence that quality of life and happiness in South Africa follows a racial hierarchy [25], but a more recent South African study found no differences between Blacks and Whites on quality of life [20]. Most studies have shown that socio-demographic characteristics such as age, gender, education, socio-economic status and race explain less than 10 percent of the variance in happiness/life satisfaction [11, 12, 26, 27]. In addition, the paucity of information on quality of life and happiness in early and later old age, and the effects of care-giving on quality of life and happiness hampers the development of policy and interventions to support older South Africans in ageing well. An essential first step in assessment is to examine the psychometric properties of measuring instruments [41–45]. Therefore, the aims of the study were to ascertain: (1) the reliability and validity of the measures; (2) racial differences in quality of life domains, overall quality of life and happiness; (3) the effects of care-giving on quality of life and happiness; and (4) the most important quality of life domain predictors of happiness.

Methods

Sampling

Different sampling points were used, due to difficulties in accessing respondents. Black, White, Indian and Coloured residents of Greater Pretoria, aged 50 and older, are more likely to live in the former Apartheid-restricted areas. Black and Indian residents tend to live in extended family situations, but for Blacks this is an economic necessity, rather than the cultural factor of caring for older Indians. With the exception of Church groups, there are minimal social amenities, such as social clubs, senior citizen clubs, retirement centres and complexes in Pretoria's Black townships. Due to the high crime rate, White, Indian and Coloured residents are barricaded in, many with guns and fierce dogs for additional protection. In our experience of fieldwork, it is dangerous for fieldworkers in these areas without making prior contact [20].

For the Black sample, a simple random sample of 450 sampling points was drawn from a well-established Black township in Greater Pretoria. For the Indian, Coloured and White samples, social clubs, senior citizen clubs, retirement centres and complexes acted as sampling points. As the majority of South Africa's population are Black [36], proportional sampling was regarded as representative of Pretoria's racial composition. Our target sample was 400 Black, 100 White, 100 Coloured and 100 Indian respondents. Stephens [46] has argued cogently that with a synergy of factors, as occurs with quality of life, integrated

Multivariate statistical procedures are required. This size of sample was necessary for conducting these statistical procedures and allowed for attrition in follow-up studies.

The questionnaire

A structured questionnaire, with a consent form, was used to obtain information on: socio-demographic characteristics (age, gender, education, marital status, employment status, dependency status and care-giving status); quality of life and happiness; and satisfaction with work and activities, financial situation and associations with people.

A 9-item scale, which measures satisfaction with the personal domains of life (self, partner, family, friends, time to do things, neighbours, income, social life and health), was used to measure personal quality of life. An additional item measures global happiness. Each item is scored from 1 (completely dissatisfied) to 5 (completely satisfied). Responses were transformed linearly from 0 to 100 percentage points, in accordance with Cummins' formula [15]. This process converts Likert-scale data to a standard form called the Percentage of Scale Maximum (%SM) (pp. 310–311) [15]. The formula for the conversion of these 10 items is: $\%SM = ((\text{scale score} - 1)/4) \times 100$ [15].

All 9 items are summed and transformed linearly from 0 to 100 percentage points for an overall personal quality of life (%PQOL) percentage score with the formula: $\%PQOL = ((\text{self} + \text{partner} + \text{family} + \text{friends} + \text{time to do things} + \text{neighbours} + \text{income} + \text{social life} + \text{health} + 9)/36) \times 100$. Previous South African research has found that overall %PQOL ranges between 60 and 86 [13], with the low point for squatter camp residents and the high point for residents of new Johannesburg housing estates or previously White-only suburbs [13, 20]. These ranges were comparable to the World range of 60%SM to 80%SM reported by Cummins [15]. Previous South African studies [13, 20, 47] have reported alpha coefficients between 0.79 and 0.82, indicative of good reliability [41–45].

Satisfaction with work and activities, financial situation and associations with people were taken from Smith, Kendall and Hulin's [48] work on the study of satisfaction in work and retirement. For each of the three scales, there is a list of 18 adjectives or short phrases describing that area. For example, exciting, useless, nothing to do, gives a sense of accomplishment (activities); worried, boring, narrow interests, too quiet (people you associate with); and barely live on income, well off, good pension plan, no money to meet emergencies, income provides luxuries (finances). For each item, respondents are asked to say yes (Y) if that item described his/her particular situation, no (N) if that item did not describe his/her situation and a question mark (?) if she/he was unsure. Responses are scored 3 (yes to a positive item and no to a negative item), 1 (? to any item) and 0 (yes

to a negative item and no to a positive item) [48]. Responses are summed for an overall score.

Normative data are presented by the authors [48]. In general, male and female American retirees expressed the least satisfaction with their financial situation [48]. This was due to stopping work before the introduction of company-individual contributory pension schemes. Consequently, the majority of the sample had few personal resources. There were no differences between male and female retirees on satisfaction with activities or associations with people. However, age and income negatively affected satisfaction with activities, finances and people.

Reliability (internal consistency) coefficients for the sub-scales were ≥ 0.80 [48], demonstrating good reliability [41–45]. The sub-scales were modestly related to each other, indicative of the relative independence of these measures [48].

Procedure

Four multilingual fieldworkers were trained to administer the questionnaire. Particular attention during this training period was given to the consent form, in accordance with the World Association Declaration of Helsinki Ethical Principles for Medical Research involving Human Subjects. The questionnaire was not translated into Afrikaans or the nine recognised Black languages, as the languages in Pretoria's Black townships are not pure Sepedi, Sesotho or Setswana, but a mixture of Afrikaans, English, Sepedi and Isizulu. In addition, the high rates of functional illiteracy among older Black and Coloured South Africans, and a lack of questionnaire sophistication among Blacks, Indians, Coloureds and Whites (Afrikaans-speaking), meant that translated self-report questionnaires would have little meaning to the majority of prospective respondents. During this training period, emphasis was placed on translating the essence of the questions, statements and phrases. One White female, bilingual in English and Afrikaans, administered the questionnaire to White and Coloured men and women. One Black male administered the questionnaire to Black and Indian men, and two Black female fieldworkers administered the questionnaire to the Black and Indian women. The fieldworkers used the 450 sampling points as a starting point for data collection in the Black township. Where the sampling point was a garage or shop, they went to the first available house on the right/left. Where no one was at home, refused to participate or under 50 years of age, the fieldworkers went to the next house on the right/left, until there was a willing participant. It was recognised that this process was likely to result in some non-response bias, in favour of caregivers rather than those in paid employment, but the high unemployment rate (± 60

percent) [13] among the Black population suggested that this bias was not extreme. There were only 19 refusals, due to time constraints, indicating that Black South Africans are very willing to participate in research activities.

For the Indian, Coloured and White samples, appointments were made at the social clubs, senior citizen clubs, retirement centres and complexes to administer the questionnaire in the prospective respondents' own home or at these facilities. This sampling procedure was essential as White South Africans show considerable reluctance to participate in research activities. The questionnaire was administered during 2005/2006.

Data analysis

All data were analysed with SPSS Version 13.0 and STATA8 PC statistical packages. Descriptive statistics were the first step for data analysis. During this first step, the interviewer effect was examined. Where there were significant interviewer effects, this was controlled for in subsequent analyses. Based on previous South African research [37], four age groups were created to represent: near old age (50–63 years), old age (64–73 years), late old age (74–83 years), and frail old age (84+ years). *T* tests were used to examine gender and employment status effects; Pearson product-moment correlation coefficients examined the effects of age and number of years of education; and one way analysis of variance (ANOVA), with Bonferroni adjustments for multiple comparisons, examined age group and marital status effects.

Coefficient alpha determined the reliability of the quality of life scale and the satisfaction with activities, finances and people sub-scales. Coefficient alpha of 0.70 is regarded as acceptable, between 0.71 and 0.80 as respectable, >0.80 as good and >0.90 as excellent [41–45]. Item convergent and discriminant procedures were used as the first step in establishing validity. For item convergent validity, corrected item-total correlation coefficients are the relationship between the specific item and a summation of the other items in the scale. The criterion for corrected item-total correlation coefficients was set at $r > 0.40$ [41]. For item discriminant validity, Fisher's z test was used to compare the inter-correlation coefficients among items in the scale with coefficient alpha, with the criterion of $z > 1.96$ [49]. Alpha factoring was conducted on the quality of life scale to ascertain a common factor model [50]. Principal components analysis, with an orthogonal (VARIMAX) rotational solution, was used to establish content and construct validity of the satisfaction with activities, finances and people sub-scales.

One-way analysis of variance (ANOVA), with Bonferroni adjustments for multiple comparisons, was used for racial comparisons of the 10 quality of life domains, overall quality of life (7 single items) and happiness. The

formula for the standard error of the difference was the square root of $2 ms/n$. *T* tests were used to compare the 10 quality of life domains, overall quality of life (7 single items) and happiness of Black respondents, who were caregivers and non-caregivers.

Stepwise multiple regression, separately by race (Black, Indian, White and Coloured), determined the most important quality of life domain predictors of happiness. A hierarchical analysis was conducted, with step 1 the entry of the 7 single domains and step 2 the entry of satisfaction with activities, finances and people. The criteria for entry were set at 0.05. Standardised beta coefficients were used for comparisons with previous research.

Ethics

Ethical approval for the study was obtained from the Faculty of Health Sciences Ethical Committee, University of Pretoria. Greater Pretoria community structures were consulted regarding the study. Written informed consent was obtained from all respondents who were willing to participate in the study.

Results

Socio-demographic characteristics

A total of 710 respondents participated in the study. There were 400 Black, 101 Indian, 107 White and 102 Coloured respondents. Participation rates varied across racial groups, since data collection for the Black sample was completed in 2005, whereas data collection for Indian, White and Coloured samples was only completed in July 2006. In addition, there were only 19 refusals among the Black sample in comparison with twice that number for the Indian, White and Coloured samples. Therefore, 854 prospective respondents were approached for the current sample size of 710.

Ages ranged between 50 years and 93 years ($m = 69.7$, $sd = 9.7$). In 2005, 33 percent of the White population, 20 percent of the Indian population, 14 percent of the Coloured population and 12 percent of the Black population were aged 50 or older [36]. As expected, White respondents were significantly older than Black, Indian and Coloured respondents ($P < 0.001$). However, an unexpected finding was that Black respondents were significantly older than Indian respondents ($P = 0.001$). This was most likely due to using different sampling points for the Black and Indian samples. There were 203 participants in the created near old age category (50–63 years), 250 in the old age category (64–73 years), 194 in the late old age category (74–83 years), and 63 in the

frail old age category (84+ years). The usual gender imbalance was found [13, 20, 47], with 498 women and 212 men participating in the study.

Education ranged between none and 12 years. In South Africa, 12 years of education encompasses primary and secondary schooling, but not tertiary education. White respondents had significantly more education than Black, Indian or Coloured respondents ($P < 0.001$), indicative of restricted access to education for older Black, Indian and Coloured South Africans [37]. Only 72 participants had a post-high school academic qualification, predominantly a Nursing or Teaching Certificate. As expected, the major language for 88 percent of Black respondents was Sepedi/Sesotho/Setswana; 98 percent of White and 94 percent of Coloured participants were Afrikaans-speaking; and 96 percent of Indian participants spoke English. Coloured participants were significantly more likely than Black, White and Indian participants to be single, never married ($P < 0.001$).

Only 20 respondents were working: 17 (8 percent) of these were in the near old age category. Government pensions were the major source of income for 499 (70 percent) and private pensions for 75 (11 percent). Of those aged 64 and older, 84 percent were in receipt of a government pension. It would appear that the non-contributory government scheme is the major source of income in old age, late old age and frail old age. Black and Coloured respondents were significantly less likely than White respondents to have a bank account and savings ($P < 0.001$).

The median household size was 5 (Range: 1–15) for Black respondents, 3 (Range: 1–10) for Indian respondents, 2 (Range: 1–14) for Coloured respondents and 1 (Range: 1–2) for White respondents. Fifty five percent of Black respondents financially supported their families, with 83 percent dependent on a government pension or disability grant of between R780 and R820 (\pm US\$116) per month. Black participants were more likely than Indian, Coloured and White participants to be living in an extended family situation, and take care of children and grandchildren ($P < 0.001$), a reflection of necessity [37]. However, Black respondents, who acted as caregivers, were equally likely to be unemployed as those without this responsibility ($P > 0.05$). This finding demonstrated little bias in the sampling approach for Black respondents. White participants were more likely than Black, Indian and Coloured participants ($P < 0.001$) to have lived in their current residence for a shorter period of time, indicative of the propensity for older White South Africans to move to smaller residences in early and later old age.

Chronic disease/disability

Five hundred and twenty respondents (73 percent) reported a chronic disease/disability. Indian respondents were

more likely ($P < 0.001$) than the other three groups to report a chronic disease/disability. Hypertension alone (34 percent), followed by hypertension and diabetes mellitus (11 percent), hypertension and arthritis (11 percent), arthritis alone (10 percent) and diabetes mellitus alone (7 percent) were the most commonly mentioned chronic diseases.

Reliability and validity of the measures

Quality of life domains

Two items were removed from the scale: satisfaction with partner, due to the high number of widowed participants, and satisfaction with income, as this item did not meet the criterion for item convergent validity ($r > 0.40$) [41]. Coefficient alpha for the seven items was 0.90, approaching excellent as a reliability coefficient [41–45]. Corrected item-total correlation coefficients ranged between 0.62 and 0.81, providing some evidence of item convergent validity [41]. All seven domains were positively inter-related. However, the largest of these was significantly lower ($z = 9.79$, $P < 0.001$) than the scale's alpha coefficient, providing support for item discriminant validity [49]. As only seven out of the nine perceived quality of life domains were used in this study, the formula [15] for satisfaction with overall quality of life was: %PQOL = ((self + family + friends + time to do things + neighbours + social life + health – 7)/28) \times 100. Table 1 shows mean scores, standard deviations and inter-correlations among the 7 items and overall quality of life.

The sample size of 708 fulfilled Nunnally's [42] minimum criterion for factor analysis of the 7-item scale (10 respondents per item). Alpha factoring was conducted on the scale to ascertain a common factor model [50]. One factor accounted for 59.5 percent of the variance. Loadings ranged between 0.65 and 0.86 for the seven items, fulfilling the criterion (>0.50) for factor loadings [42]. The Kaiser–Meyer–Olkin measure of item sampling adequacy was 0.92, in the “marvellous” category, according to Kaiser [51]. Bartlett's test of sphericity showed that the population matrix was not an identity ($\chi^2 = 2980$, $df = 21$, $P < 0.001$). Both tests confirmed that factor analysis was the correct procedure for the data. In addition, the measure of item sampling adequacy, one-factor model and factor loadings provided some evidence on content and construct validity [41, 42, 50–53].

Satisfaction with work and activities, people and finances

Principal components analysis was conducted initially on the 54-item scale. Two items were removed from the

Table 1 Percentage mean scores (*m*), standard deviations (*sd*) and inter-relationships among the seven quality of life domains and overall quality of life (QoL)

Domains	<i>m</i>	<i>sd</i>	Family	Friends	Time	Neighbours	Social	Health	QoL
Oneself	88.8	17.9	0.63	0.64	0.68	0.50	0.63	0.52	0.80
Family	88.5	17.3		0.68	0.61	0.50	0.58	0.41	0.76
Friends	85.6	19.9			0.72	0.54	0.72	0.50	0.84
Time	86.1	19.8				0.54	0.74	0.60	0.87
Neighbours	84.5	20.8					0.57	0.43	0.72
Social life	83.7	22.5						0.60	0.87
Health	72.4	28.2							0.76
QoL	84.2	16.8							–

All correlation coefficients are significant at the 0.01 level (2-tailed)

activities sub-scale, 11 items from the finances sub-scale and 10 items from the people sub-scale, due to them not meeting the criterion for reliable items ($h^2 > 0.30$) [52] or the criterion for factor loadings (>0.50) [42]. A second principal components analysis was conducted on the 31 remaining items, with a three-factor (VARIMAX) rotational solution. All further analyses were restricted to these 31 items. The Kaiser-Meyer-Olkin measure of item sampling adequacy was 0.93, in the “marvellous” category, according to Kaiser [51]. Bartlett’s test of sphericity showed that the population matrix was not an identity ($\chi^2 = 12854$, $df = 465$, $P < 0.001$). Both tests confirmed that factor analysis was the correct procedure for the data.

Three factors explained a total of 56.6 percent of the variance. Factor I, explaining 30.1 percent of the variance, was concerned with satisfaction with activities; Factor II, explaining 13.9 percent of the variance, related to satisfaction with people; and Factor III, explaining 12.6 percent of the variance, concerned satisfaction with financial situation (Table 2). Factor loadings on the activities sub-scale ranged between 0.56 and 0.89, between 0.59 and 0.81 on the people sub-scale, and between 0.65 and 0.79 on the financial situation sub-scale, meeting the criterion of >0.50 for factor loadings [42].

The 16 items in the satisfaction with activities, seven items for finances and 8 items for people sub-scales were summed and divided by the number of items in the scale. Thereafter the formulae were identical for overall satisfaction with activities, finances and people. For example, the formula for satisfaction with activities was: $\%ACT = ((\text{Total scale} + 1)/4) \times 100$ [15].

Coefficient alpha was 0.95 for satisfaction with work and activities, an excellent reliability coefficient [45], and 0.87 for the finances and people sub-scales, approaching excellent reliability coefficients [41–45]. Inspection of the final column of SPSS output (Cronbach’s alpha if item deleted) revealed that 4 items in the activities sub-scale would reduce alpha to 0.94, suggesting that an overall reliability coefficient of 0.95 for this scale does not imply item redundancy. All

corrected item-total correlation coefficients met the criterion for item convergent validity ($r > 0.40$) [41] and ranged between 0.54 and 0.87 (activities), 0.52 and 0.72 (finances) and 0.52 and 0.71 (people). The largest of the factor loadings for each sub-scale (Table 2) was compared with its alpha coefficient to ascertain item discriminant validity: satisfaction with activities ($z = 7.52$, $P < 0.001$); satisfaction with finances ($z = 4.91$, $P < 0.001$); and satisfaction with people ($z = 3.83$, $P < 0.001$). All were significantly lower than each sub-scale’s alpha coefficient, providing some evidence of item discriminant validity [49]. As was found previously [48], the activities sub-scale was modestly related to the finances ($r = 0.16$, $P < 0.001$) and people ($r = 0.19$, $P < 0.001$), indicative of the relative independence of these measures. In addition, these analyses provided some evidence on content and construct validity [41, 42, 50–53].

Racial differences on the seven quality of life domains, overall quality of life, satisfaction with activities, finances and people and happiness

Blacks were less satisfied with their friends, their time to do things and social life ($P < 0.01$) than Indians (Table 3). They were also slightly less satisfied with their overall quality of life ($P < 0.05$) than Indians. Whites were less satisfied with their social life ($P < 0.05$) than Indians (Table 3). There were no differences between Indians, Whites and Coloureds on the other six domains or overall quality of life, suggesting that the racial gap in quality of life has decreased [25]. In all four groups, respondents with a chronic disease/disability were significantly less satisfied with their health than respondents without a chronic disease/disability ($P < 0.001$), revealing that subjective perceptions tend to mirror reality.

Average scores on satisfaction with financial situation tended to be much lower than those found for satisfaction with activities and associations with people. Black respondents were the least satisfied with their financial situation than the other three groups. Age, gender,

Table 2 Factor analysis of the 31-item satisfaction with work and activities, people and finances sub-scales

Items	Factors		
	I	II	III*
<i>Work and activities</i>			
Tiresome activities	0.69	-0.02	0.15
Discouraging activities	0.74	-0.04	0.10
Exciting activities	0.89	0.10	0.04
Good activities	0.79	0.06	0.09
Fascinating activities	0.61	0.01	-0.01
Hard activities	0.74	-0.04	0.14
Boring activities	0.83	0.07	0.01
Interesting activities	0.89	0.05	0.05
Useless activities	0.73	0.01	0.05
Same thing everyday	0.71	0.10	-0.02
Creative activities	0.89	0.12	-0.03
Nothing to do	0.58	0.13	-0.00
Nothing to look forward to	0.81	0.13	0.01
Relaxing activities	0.56	0.18	0.20
New things to do	0.83	0.12	-0.01
Activities give sense of accomplishment	0.72	0.13	0.09
<i>People</i>			
Boring people	0.02	0.81	0.01
Active people	0.03	0.72	-0.02
Sympathetic people	0.03	0.77	0.01
Confident people	0.09	0.67	0.04
Good people	0.08	0.59	0.07
Intelligent people	0.19	0.69	-0.02
Interesting people	0.10	0.78	-0.01
Interested in doing things	0.03	0.72	-0.01
<i>Finances</i>			
Income insecure	-0.04	0.04	0.67
Income satisfactory	0.20	0.05	0.76
Income bad	0.15	0.04	0.79
Need outside help	0.06	0.03	0.73
Worry about it	0.10	0.02	0.78
Serious financial problems	0.11	-0.03	0.75
No money to meet emergencies	-0.09	-0.06	0.65

* Significant loadings in bold

education and marital status were not related to the seven quality of life domains, overall quality of life or the satisfaction with activities, finances and people sub-scales for any group ($P > 0.05$), providing support for the low amount of variance explained by socio-demographic factors in quality of life [11, 12, 26, 27].

The average score for happiness was 86.5 (sd = 19.1) percentage points, similar to the scores on six out of the seven quality of life domains, but higher than that of 81.6 (sd = 15.3) for Australians [17]. It is noteworthy that the current study's score is more variable than that of Australians. Black respondents were slightly less happy than Indian respondents

($P = 0.02$). There were no differences between Indian, Coloured and White respondents on happiness ($P > 0.05$), revealing a narrowing of the racial gap in happiness [25]. For all four groups, the seven quality of life domains were significantly related to happiness ($P < 0.01$), and explained between 12 and 67 percent of the variance in happiness. More modest, or non-significant relationships, were found between happiness and satisfaction with activities, finances and people, suggesting that the seven personal quality of life domains were more important for happiness than satisfaction with activities, finances and people. Age, gender, education and marital status were not related to happiness for any group

Table 3 Percentage mean scores (*m*) and standard deviations (*sd*) on the seven quality of life (QoL) domains, overall QoL, satisfaction with activities, people and finances, and happiness by race

QoL Domains	Blacks		Indians		Whites		Coloureds		
	<i>m</i>	<i>sd</i>	<i>m</i>	<i>sd</i>	<i>m</i>	<i>sd</i>	<i>m</i>	<i>sd</i>	<i>sd</i>
Oneself	87.6	19.2	92.1	16.6	89.0	16.9	90.4	14.1	0.95
Family life	86.8	18.1	91.6	16.7	91.6	14.5	89.0	16.7	0.92
Friends	82.9	20.8	90.6	14.9	87.6	21.0	89.2	17.8	1.05*
Time to do things	83.6	22.5	91.1	16.8	89.3	15.0	87.5	13.5	1.04*
Neighbours	83.0	20.9	87.9	20.5	85.3	22.8	86.5	18.5	1.11
Social life	82.1	23.2	90.1	17.3	81.1	26.6	86.5	17.8	1.19*
Health	72.5	29.2	71.0	29.7	69.6	28.7	76.2	21.8	1.50
Overall QoL	82.6	18.4	87.8	13.7	84.8	15.5	86.5	12.9	0.89*
Activities	70.4	27.9	85.8	21.3	82.4	17.0	77.9	24.5	1.38*
People	93.1	14.5	95.5	14.1	88.1	19.0	84.3	22.5	0.88*
Finances	42.7	22.8	53.6	24.4	71.3	24.6	56.5	26.2	1.28*
Happiness	84.2	20.7	90.3	16.9	88.1	18.0	89.7	14.2	1.01*

* $P \leq 0.05$

($P > 0.05$), providing support for the low amount of variance explained by socio-demographic factors in happiness [11, 12, 26, 27].

The effects of care-giving on the seven quality of life domains, overall quality of life, satisfaction with activities, people and finances and happiness

Only one White respondent took care of a grandchild, in comparison with 17 Indians, 17 Coloureds and 181 Blacks. Therefore, the effects of care-giving were restricted to the Black sample only. Care-givers were significantly less satisfied with themselves, their family life, friends, their time to do things, overall quality of life and their activities than respondents without these responsibilities

($P < 0.001$). They were also less satisfied with their financial situation and were less happy ($P < 0.05$) than those without this responsibility (Table 4). These findings suggested that care-giving, rather than race, accounted for differences in quality of life and happiness.

Predictors of happiness

The seven single item quality of life domains (self, family life, friends, time to do things, neighbours, social life and health), satisfaction with activities, people and financial situation were regressed on happiness, in two steps, for each group separately. The first step included the 7 single items and the second step consisted of satisfaction with activities, people and finances (Table 5). The final model for Blacks

Table 4 Percentage mean scores (*m*) and standard deviations (*sd*) on the seven quality of life (QoL) domains, overall QoL, satisfaction with activities, people and finances, and happiness by care-giving status: Black respondents

QoL Domains	Caregivers		Non-caregivers	
	<i>m</i>	<i>Sd</i>	<i>m</i>	<i>sd</i>
Self	85.1	17.7	90.6	20.5**
Family life	83.7	17.9	90.6	17.8**
Friends	80.5	20.0	85.7	21.3**
Time to do things	80.8	21.7	86.9	23.1**
Neighbours	81.2	20.3	85.1	21.4
Social life	80.6	22.1	83.9	24.5
Health	70.1	28.0	75.4	30.3
Overall QoL	80.3	17.3	85.5	19.4**
Activities	62.6	26.7	79.6	26.6**
People	92.1	14.7	94.4	14.3
Finances	40.5	20.0	45.5	25.6*
Happiness	82.0	19.0	86.9	22.3*

* ≤ 0.05 , ** ≤ 0.01

Table 5 Predictors of happiness by race

Predictors	Adj. R^2	Std B	t	Predictors	Adj. R^2	Std B	t
<i>Blacks</i>				<i>Indians</i>			
Social life	0.67	0.37	7.64***	Social life	0.40	0.39	4.10***
Oneself	0.72	0.17	4.41***	Oneself	0.48	0.32	3.87***
Health	0.74	0.16	3.89***	Health	0.50	0.19	2.19*
Neighbours	0.75	0.14	4.07***				
Time	0.75	0.16	3.30**				
Total	0.75			Total	0.50		
$F(5,375) = 233.51, P < 0.001$				$F(3,88) = 30.87, P < 0.001$			
<i>Whites</i>				<i>Coloureds</i>			
Oneself	0.34	0.35	3.59***	Time	0.42	0.41	4.77***
Health	0.42	0.34	4.02***	Family life	0.50	0.20	2.15*
Neighbours	0.45	0.22	2.45*	Health	0.53	0.21	2.75**
				People	0.58	0.24	3.38***
Total	0.45			Total	0.58		
$F(3,86) = 24.94, P < 0.001$				$F(4,89) = 33.17, P < 0.001$			

* ≤ 0.05 , ** ≤ 0.01 , *** ≤ 0.001

explained 75 percent of the variance in happiness (5 out of 7 single item quality of life domains). The final model for Indians explained 50 percent of the variance in happiness (3 out of 7 seven single item quality of life domains). The final model for Whites explained 45 percent of the variance in happiness (3 out of 7 seven single item quality of life domains). The final model for Coloureds explained 58 percent of the variance in happiness (3 out of 7 single item quality of life domains and satisfaction with people).

Satisfaction with social life explained 67 percent of the variance in happiness for Black ($\beta = 0.49$) and 40 percent for Indian ($\beta = 0.39$) respondents. Satisfaction with oneself or self-esteem explained 34 percent of the variance in happiness for White ($\beta = 0.35$) respondents, whereas satisfaction with one's time to do things explained 42 percent of the variance in happiness for Coloured ($\beta = 0.41$) respondents. Satisfaction with oneself predicted an additional 5 percent for Blacks ($\beta = 0.17$) and 8 percent for Indians ($\beta = 0.32$). Although satisfaction with health predicted a modest amount of the variance in happiness (between 2 and 8 percent), with standardised beta coefficients ranging between 0.16 and 0.34, findings were similar to those reported for the UK [11, 12], but considerably higher for White South Africans than those reported for Australia (Table 5) [19].

For Black respondents, an additional 1 percent of the variance was contributed by satisfaction with neighbours and one's time to do things, with standardised beta coefficients ranging between 0.14 and 0.16. For white respondents, an additional 3 percent of the variance in happiness was contributed by satisfaction with neighbours ($\beta = 0.22$). Eight percent of the variance in happiness was contributed by satisfaction with family life ($\beta = 0.20$), and 5 percent by

satisfaction with people ($\beta = 0.24$) for Coloured respondents.

Discussion

Limitations to the study included: different recruitment methods for the four samples, but non-response bias was small due to the high level of unemployment in this Black township; social desirability bias from non-matched interviewer/interviewee, controlled for in the analyses; Blacks were older than Indians, which is not reflective of South Africa's demographic profile, but could have introduced bias; 98 percent of Whites were Afrikaans-speaking, reflective of Pretoria's population but not South Africa as a whole; and different participation rates, over time and by race, could have biased the results. The Pretoria-Witwatersrand-Vereeniging (PWV) region (now Gauteng Province) is the economic hub of South Africa and has the highest population density (365 persons per km²), with enormous economic and social contrasts [54]. Average monthly White household incomes are over four times higher than Black households, and Black townships represent degraded living environments, with poor infrastructure and social/recreational facilities [54].

The current study confirmed that the Black sample were the most disadvantaged in employment status, receipt of a government grant and the provision of financial support for their families. For example, 89 percent in the near old age category (50–63 years) were unemployed, but only 40 percent had a government pension, disability or child support grant. Only one Black respondent was in receipt of

a child support grant, and no respondents received a foster care grant. Of these 60 percent, 30 percent supported themselves through casual labour, 21 percent had relatives to support them and 9 percent were in receipt of a private pension. In comparison with Blacks, 78 percent of Indians, 70 percent of Whites and 100 percent of Coloureds, in the near old age category, had a government pension or disability grant. The extremely high unemployment rate combined with the lack of a social security net indicated that considerations about retirement are impossible for Black South Africans in the near old age category [37]. In addition to this lack of a social security net, 55 percent of the Black sample financially supported their families, confirming the need for poverty alleviation programmes for these families.

The reliability (internal consistency) coefficients for the 7 item quality of life scale, and satisfaction with activities, financial situation and people sub-scales were excellent [41–45] and satisfied Sitzia's [53] requirement for credible research. The loadings for each of the seven single item quality of life domains on the first alpha factor, ranging between 0.65 and 0.86, were slightly higher than those of 0.58–0.77 found previously in a middle class Johannesburg suburb [20]. However, these findings reflected a common higher order quality of life factor [50] and provided support for construction of an overall quality of life index [41] for Pretoria and Johannesburg. Content validity for the quality of life scale and the satisfaction with activities, financial situation and people sub-scales was established through the Kaiser–Meyer–Olkin measure of item sampling adequacy [53]. Preliminary evidence for construct validity was provided by the relationship between each item and a summation of the other items in each subscale [41], the significantly lower correlation between sub-scale items and that sub-scale's alpha coefficient [50], the lower level of satisfaction with health for respondents with a chronic disease/disability, the lack of satisfaction with financial situation for Black respondents [37, 38], the low amount of variance explained by socio-demographic factors [11, 12, 26, 27], and the one and three factor structures for personal quality of life and satisfaction with activities, financial situation and people [50–53].

Racial differences on seven of the quality of life domains and happiness appear to be minimal and no longer seem to follow a racial hierarchy [25], suggesting that the upward trend in quality of life and happiness, found in 1999 for South Africa as a whole [25], has continued into the 21st century. Møller [25] reported that happiness for all South Africans decreased from 80 percentage points to approximately 60 percentage points from 1995 to 1997. Yet, Haller and Hadler found that happiness, on a scale from 1 (very happy) to 4 (not at all happy), for South Africa during this same period, lay between quite happy

and very happy, and South Africa ranked twelfth on happiness out of 41 nations [21]. Although there was an upward turn in happiness by 1999 [25, 40], only 57 percent of Black South Africans were happy in comparison with 75 percent of Whites [40]. It is possible that these conflicting findings were due to differences in methodologies, but more recent South African research [13, 20] has shown that quality of life ranges between 60 and 86 percentage points. The minimal racial differences on quality of life and happiness in the current study could be attributed to a more optimistic future outlook (South Africa's 2010 World Cup); a booming economy; increased tax revenues; greater freedom of movement; and an improved self-image and confidence over the last 12 years of democratic governance.

Care-giving activities compromised six out of the 10 quality of life domains, overall quality of life and happiness. These findings provided support for the substantial body of literature on the negative effects of care-giving [e.g., 55–57]. There is a long tradition among Black South Africans of living in multi-generational households, substantiated in the current study, and of older Black South Africans acting as childminders [58–60]. However, the HIV/AIDS pandemic has placed an increasing burden on older Black South Africans, which is reflected in the current study in lower self-esteem, and less satisfaction with family life, friends, time to do things, activities, financial situation, overall quality of life and less happiness. These findings indicate that intervention strategies are essential for improving the quality of life and happiness of older caregivers, especially in Black communities, who are facing the major burden of unemployment, the lack of a social security net, and the social, psychological and economic impact of HIV/AIDS [37, 38].

The results for 11 Canadian surveys were able to explain, on average, 38 percent of the variance in happiness from some subset of predictor variables [3]. The current study showed that five domains were able to explain 75 percent of the variance in happiness for Blacks; three domains explained 50 percent of the variance for Indians and 45 percent for Whites; and four domains explained 58 percent of the variance for Coloureds. For British Columbia southerners and northerners, and Prince George residents, self-esteem was the most important predictor of happiness, with beta coefficients ranging between 0.29 and 0.38, very similar to the beta coefficients of 0.32 (Indians) and 0.35 (Whites), but higher than that of 0.17 (Blacks) found in the present study. Previous longitudinal South African research in a Black disadvantaged community reported that the standardised beta coefficients for self-esteem ranged between 0.10 and 0.25 [13], suggesting that self-esteem is equally important for the happiness of Canadians as it is for White and Indian, but not Black or Coloured South Africans.

Satisfaction with social life, time to do things, associations with people, family life and neighbours, all part of social contact [1–4, 10–14], were important predictors of happiness, with standardised beta coefficients ranging between 0.14 and 0.41. In contrast, standardised beta coefficients for satisfaction with social life ranged between 0.09 and 0.22 in a disadvantaged, informal settlement community [13], much lower than that of 0.37 for the current Black sample. It is highly likely that the differences between the two Black samples were due to residential area. The current Black sample came from a well-established township, had lived there most of their lives and established close, personal relationships. In contrast, informal settlement residents are transient and dominated by physiological and safety and security needs [24], or the liveability factor [2, 10].

In contrast with these findings, standardised beta coefficients for personal relationships in 9 Australian surveys ranged between 0.20 and 0.25 [19]. It is possible that these differences were due to material resources, as was found for satisfaction with standard of living [19], being more strongly associated with life satisfaction than happiness [21]. However, it can be argued that there is a more collectivistic culture among Black and Coloured South Africans and a more individualistic culture among Australians and White South Africans [61, 62]. Notably, the Indian sample appear to combine collectivism with individualism better than the Black, White or Coloured samples, indicating more equal emphasis of these constructs for this group [62].

The current study found that satisfaction with health explained between 2 percent and 8 percent of the variance in happiness, with standardised beta coefficients ranging between 0.19 and 0.34, similar to UK findings [11, 12]. In contrast, satisfaction with health explained between 24 percent and 46 percent of the variance in life satisfaction/happiness, with standardised beta coefficients ranging between 0.27 and 0.53, in a Black informal settlement in Soweto [13]. The differences between these two Black samples on the importance of health were most likely due to lack of access to health services and the economic necessity for good health in the informal settlement. The standardised beta coefficient for satisfaction with health was 0.34 for the White sample, compared with that of 0.39 for White residents of a Johannesburg suburb [20], 0.12 for rural Canadian seniors [3] and between 0.08 and 0.13 in 9 Australian surveys [19]. This emphasis on health for White South Africans could be due to age, since older people are more concerned with their health than younger people [12, 20]; or difficulties in affording health care [48], as medical insurance is required for access to private health care in South Africa, and this may be overspent due to treatment of chronic diseases.

It was concluded that: (1) the measures were reliable; (2) preliminary evidence of content and construct validity was established; (3) the racial differences on quality of life domains and happiness were of less importance than the effects of care-giving for Black respondents; (4) collectivism-individualism was more closely aligned with happiness for Indian than Black, Coloured and White respondents; and (5) health was a more important determinant of happiness for White than Black, Indian and Coloured respondents.

Future research is required to ascertain whether: these results are replicable longitudinally, and with different samples of older South Africans; the determinants of happiness change under different life circumstances; and whether quality of life and happiness are affected by changes in policy for older South Africans and interventions, such as better co-ordination, integration and use of local resources.

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