

**Title:**

Body Mass Index and Health Related Quality of Life Among Urban Adults in South Africa

**SUMMARY****Background**

The relationship between body mass index (BMI) and health related quality of life (HRQoL) has not been investigated in South Africa and to a limited extent in Africa. While obesity is on the rise in South Africa as in other developing countries, South Africa also has a high prevalence of HIV, a disease associated with lower than normal BMI. How BMI relates to HRQoL and whether diseases related to high and low BMI mediate this relationship is an under-researched area.

**Methods**

Using data from 2,500 respondents in a large urban municipality in South Africa, we examined the relationship between the respondent's BMI and HRQoL and factors intermediating this relationship. BMI was calculated from the respondent's weight and height, and HRQoL was measured from the SF12v2 that used twelve questions to measure physical (PCS12) and mental (MCS12) health. The data also included the respondent's history of chronic illnesses and sociodemographic variables. The respondent's BMI was categorized into underweight (BMI < 18.50), normal (18.5 to < 25), overweight (25 to < 30), class I obese (30 to < 35), and class II/III obese (35 or higher). Using regression analysis, we first examined the determinants of BMI, and how BMI relates to the respondent's chronic illnesses and sociodemographic variables. We next examined how BMI relates to HRQoL. We then examined whether chronic illnesses and sociodemographic variables intermediated the relationship between BMI and HRQoL.

**Findings**

The mean BMI was 27.7 and the means for PCS12 and for MCS12 were both around 50. High BMI was associated with hypertension, diabetes, arthritis, and low back pain, female gender, higher income and wealth, and older age; low BMI was associated with tuberculosis, HIV, and frequent smoking. The relationship between BMI and physical health (PCS12) had an inverted U-shape, with both higher and lower than normal BMI strongly associated with lower PCS12 compared to normal BMI. Other than the association between low BMI and low PCS12, the BMI's association with PCS12 is mostly mediated by diseases related to obesity. The relationship between BMI and mental health (MCS12) was significant only for the low BMI group, which had a lower mental health than those with normal BMI. This mental health effect was also partially mediated by obesity-related diagnoses, but mostly by an HIV diagnosis.

**Interpretation**

Abnormal BMI is associated with lower physical and mental HRQoL. High BMI is related to lower physical HRQoL, and this effect is mostly mediated by the obesity related illnesses. Low BMI is related to lower mental HRQoL, and this effect is partially mediated by HIV in this population.

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