# Associations Between Health-Related Quality of Life and Measures of Adiposity Among Filipino Adults[1]

## Policy Brief #4

Adult Filipinos whose adiposity levels place them at a higher disease risk are generally unaware of or unconcerned with possible deteriorations in their social, physical, mental, role functioning that adiposity can bring.

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## Introduction

Adiposity or obesity is an important health concern because it is associated with noncommunicable diseases (NCD). High prevalence of obesity can add, albeit with some lag, to the prevalence of hypertension, the second leading cause of Philippine morbidity in 2019. Prevention of obesity in younger years, therefore, is a critical public health intervention to avert or reduce NCD mortality and morbidity at a later age. But prevention can only be done if, at a younger age, overweight people who are at risk of these diseases are aware of these illnesses that could develop later in their lives, and if they keep their weight lower than the threshold for obesity. If the person is late in changing his behavior about his weight, the condition may no longer be prevented. A key question to ask then is: Do people whose weight puts them at increased risk of disease perceive themselves to be in worse health? This self-awareness could trigger change in their behavior. To answer this question, one needs to measure two things: a person's state of adiposity and his corresponding perception of his own Health Related Quality of Life (HRQoL), and then to explore the association between these two.

## Objectives of the Study

The objectives of the study are to estimate the associations between HRQoL and measures of adiposity among individuals aged 40-70 in a province of the Philippines, and to explore variations across respondents' sex, dimensions of HRQoL, and measures of adiposity.

The study uses three measures of adiposity, namely, body mass index (BMI), waist circumference (WC), and waist-to-hip ratio (WHR). It also uses HRQoL to measure an individual's perception of his health in multiple dimensions (explained below). Previous studies about the associations between HRQoL and adiposity have been found to be nonlinear, differ across dimensions of HRQoL and vary with the measure of adiposity. We verify the same in this study.

## Data and Method

The study used the baseline data collected in 2018 under the Nueva Ecija Cardiovascular Risk Experiment (NECVaRE) study which sought to understand the health-seeking behavior of people at risk of developing CVDs. Nueva Ecija is a predominantly rural-agricultural province in Central Luzon and was chosen because of its relatively high prevalence of obesity and CVD compared to the country as a whole. In 2015, for instance, the proportion of overweight or obese population in the province is 32.7 percent (against 31.1 percent nationally) while the proportion of high blood pressure in the population is 27.4 percent (against 23.9 percent nationally).

The baseline household survey was undertaken from January to May 2018. The survey respondents (N=3,796) were people who: (a) were aged 40-70 years old; (b) were not yet diagnosed with diabetes or heart disease; (c) have never had a heart attack or stroke; (d) were not taking medication for hypertension; and (5) faced no health condition preventing measurement of their height, weight, or blood pressure. The samples were randomly selected and representative of the target population for primary CVD prevention in Nueva Ecija.

Respondents answered the 20-item Short Form Health Survey (SF-20) that assesses six dimensions of HRQoL: physical functioning (6 items), role functioning (2 items), social functioning (1 item), mental health (5 items), current health perceptions (5 items), and pain (1 item). The items were scored using a validated algorithm. Scores were transformed into the 0 – 100 scale, with 0 indicating the worst and 100 the best HRQoL for each of the dimensions of health that were assessed.

NECVaRE measured respondents' adiposity using body mass index (BMI in kg/m2), waist circumference (WC in cm), and waist-hip ratio (WHR). Respondents were categorized using WHO thresholds for Asian populations:

- For BMI, for underweight (less than 18.5), acceptable risk (18.5 to 22.9), increased risk (23.0 to 27.4), and high risk (greater than or equal to 27.5).

- For WC, the respective low, borderline and high thresholds were less than 80 cm, 80-87.9 cm, and greater than or equal to 88 cm for females; and less than 90 cm, 90-101.9 cm, and greater than or equal to 102 for males.

- For WHR, the respective low, borderline and high thresholds were less than 0.8 cm, 0.8-0.84 cm, and greater than or equal to 0.85 for females; and less than 0.9 cm, 0.9-0.99 cm, and greater than or equal to 1.0 for males.

The study stratified the analyses by sex and used nonparametric regression to estimate and graph the conditional mean of each HRQoL dimension by BMI, WC, and WHR. It used ordinary least squares regression to estimate differences in each HRQoL dimension by categories of BMI, WC, and WHR adjusted for respondents' sociodemographic characteristics and smoking status.

## Results and Findings

**Prevalence of Adiposity** – Table 1 shows the characteristics of the male and female samples by the three adiposity measures.

- On average, males have lower BMI than females (22.1 versus 23.7), and also lower WC (84.8 cm versus 86.5 cm). Their average WHR, however, are the same (at 0.9).

- Based on BMI, about 64% of the males and 46% of the females are either underweight or have acceptable risk. A greater proportion of females than males have increased risk (36.7% versus 27.6%) or high risk (17.3% versus 8.6%).

  About 71.3% of males and only 23.8% of females have low WC. But 44.7% of females and only 5.2% of males, on the other hand, have high WC

- Same pattern is observed in terms of WHR: while about 38.8% of males and only 3.6% of females have low WHR, only 7.6% of the former and 83.1% of the latter have high WHR. On all three adiposity measures, females appear to face greater risks than males in developing NCDs, including CVDs.

*Table 1. Characteristics of the male and female participants, by adiposity measures*

| ADIPOSITY MEASURES/ CATEGORIES | MALE (N=1298) | | | | FEMALE (N=2498) | | | |
|---|---|---|---|---|---|---|---|---|
| | Mean | Standard deviation | PREVALENCE | | Mean | Standard deviation | PREVALENCE | |
| | | | n | % | | | n | % |
| **Body mass index (kg/m2)** | **22.1** | **3.6** | | | **23.7** | **4.2** | | |
| Underweight | | | 176 | 13.6 | | | 227 | 9.1 |
| Acceptable risk | | | 653 | 50.3 | | | 922 | 36.9 |
| Increased risk | | | 358 | 27.6 | | | 918 | 36.7 |
| High risk | | | 111 | 8.6 | | | 431 | 17.3 |
| **Waist circumference (cm)** | **84.8** | **9.5** | | | **86.5** | **10.2** | | |
| Low | | | 925 | 71.3 | | | 595 | 23.8 |
| Borderline | | | 306 | 23.6 | | | 787 | 31.5 |
| High | | | 67 | 5.2 | | | 1,116 | 44.7 |
| **Waist-to-hip ratio** | **0.9** | **0.1** | | | **0.9** | **0.1** | | |
| Low | | | 503 | 38.8 | | | 91 | 3.6 |
| Borderline | | | 696 | 53.6 | | | 332 | 13.3 |
| High | | | 99 | 7.6 | | | 2,075 | 83.1 |

Health-Related Quality of Life – Table 2 shows the mean scores of the male and female participants in each of the six HRQoL dimensions. Mean HRQoL was highest in role functioning dimension (97.5 for males, 97.4 for females) and lowest in health perception dimension (67.5 for males, 66.7 for females). In each dimension, males have higher average scores than females.

*Table 2. Average scores of male and female participants in each dimension of health-related quality of life*

| FUNCTIONING | MALE (N=1,298) | | FEMALE (N=2,498) | |
|---|---|---|---|---|
| | Mean | Standard deviation | Mean | Standard deviation |
| Physical functioning | 93.5 | 14.7 | 92.8 | 15.3 |
| Role functioning | 97.5 | 12.9 | 97.4 | 13.3 |
| Social functioning | 82.8 | 28.4 | 82.5 | 28.3 |
| Mental health | 86.1 | 12.0 | 84.7 | 12.3 |
| Health perception | 67.5 | 15.9 | 66.7 | 15.8 |
| Pain | 85.7 | 20.8 | 84.3 | 21.6 |

**Adiposity and Health-Related Quality of Life** – The study further explored statistically the associations between the respondents' adiposity (BMI, WC, and WHR) and their perceptions of health-related quality of life in five dimensions (role functioning, social functioning, mental health, and health perception). The expectation is that more people (with high risk of BMI, high WC, or high WHR) would report lower scores in various HRQoL dimensions. Most of the results, however, were contrary to expectations and discordant. For instance, males with higher BMI (increased risk) reported better role functioning, social functioning and mental health than males in other BMI categories. Indeed, the health perception among males is highest for those with BMIs at increased risk category or those with borderline WC. No such significant differences in HRQoL dimensions are observed for males across WHR categories.

After controlling for covariates, underweight males continued to have significantly lower physical functioning. Role functioning is significantly higher for males at increased risk by BMI and borderline WC compared to those of acceptable BMI risk and low WC, respectively. Male social functioning and mental health remain higher in categories of high BMI and WC, while perceptions still peaked at increased risk by BMI and borderline WC, although these differences are no longer significant after adding controls. Meanwhile, females in higher categories of WC and WHR had significantly worse social functioning. Female mental health is significantly better in categories of higher BMI. These results hold even after adding controls in the regression analysis.

## Implications of the Results

Although the study's results of the association between adiposity and HRQoL were generally contrary to expectations, there are important implications that can be learned, especially for health promotion:

- Health promotion programs should convey the message that currently feeling good about one's health, despite one's obesity, does not mean absence of weight-related health problems in the future. Complacency is risky. This message should be stronger for less educated individuals who may have less capacity to interpret health risks.

- In a low-income setting, body size and shape could very well reflect people's enjoyment of life's pleasures and probably even signal wealth status (hence, its association with better social functioning). In this case, a more nuanced message should be crafted on the risks of over-eating or not doing enough physical activities.