

The Effect of Illness Representations on Health-Related Quality of Life (HRQoL) in Obesity: The Role of Coping Strategies as Mediator

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ABSTRACT

Obesity is a health problem with characteristics and symptoms that can be easily recognized. Nevertheless, awareness of obesity as a threat is far less, even if the risk factors can lead to more chronic diseases. This shows the importance of how people perceive obesity to minimize the impact of obesity itself. This study aims to examine the effect of illness representations on health-related quality of life and see the role of coping strategies as a mediator in the effect of illness representations on health-related quality of life (HRQoL) in obesity. This study uses a quantitative approach with non-experimental quantitative research. The sample of this study was 44 people with obesity. The instruments used in this study to measure illness representations were B-IPQ, to measure HRQoL was WHOQOL-BREF, and to measure coping strategies was BRIEF COPE. The data in this study were analyzed with simple regression and path analysis. The finding in this study shows a negative impact of illness representations on HRQoL in obesity with 22,8% impact values. This impact was not mediated by coping strategies, either approach or avoidant coping. Nevertheless, this study found that independently coping strategies impact HRQoL. Approach coping has a positive impact on HRQoL, while avoidant coping has a negative impact on HRQoL.

Keywords: *Illness representations, health-related quality of life, coping strategies, obesity*

1. INTRODUCTION

World Health Organization[1] states that in 2016 there were 39% of individuals were overweight, and 18% of them were obese. Based on the 2018 Basic Health Research Results, it was found that the prevalence of overweight and obesity increased from 14.8% (in 2017) to 21.8% and became the first non-communicable disease in Indonesia[2]. The increasing prevalence of obesity has become one of the important health problems to be considered in the future, especially in obese people themselves. In addition, overweight and obese individuals need to make their situation more seriously and anticipate various health threats associated with obesity conditions such as hypertension, dyslipidemia, diabetes, and other cardiovascular diseases[3]. This shows that obese people need to better understand and perceive their situation as a condition that can threaten their health to take appropriate treatment actions for their condition.

The implications of obesity are on physical health and have significant implications for the quality of life of individuals [4]. Broadly, this quality of life describes physical health, psychological state, level of independence, social relationships, personal beliefs, and individual relationships with their environment[5]—also known as health-related quality of life (HRQoL). Several conditions that affect the decrease in quality of life in obese people are bodyweight, health-related issues experienced, perceptions, and feelings of the stigma that individuals receive[6][7][8]. This condition can worsen if the underlying conditions cannot be immediately treated and the cause is not found. This should matter because it is found that individual perceptions and feelings regarding the obesity condition they suffer significantly affect the obesity condition experienced by the patient. These perceptions and feelings of illness individuals suffer known as illness representations[9].

Illness representations can be an important factor in predicting an individual's quality of life[9]. Based on the Common Sense Model of Self-Regulation, when individuals perceive a threat (either physical symptoms or changes in function), they will develop representations called illness representations that will direct them to perform coping strategies against the illness they are suffering from[10]. When individuals have implemented coping strategies, individuals will evaluate the coping strategies that have been carried out in various forms, including the individual's quality of life[11]. The way individuals perceive illness and how individuals deal with it (coping) can affect the quality of life of individuals both physically and mentally[12].

In obese patients, it was found that individual illness representations did not directly affect an individual's HRQoL. Before arriving at the HRQoL evaluation, the form of action or coping strategies applied—such as diet, physical activity, medication, emotional involvement—had a significant role in increasing and decreasing an individual's HRQoL. Obesity is a disease that is suffered due to an unhealthy lifestyle. Therefore, various forms of coping strategies that individuals can apply to overcome this situation can also be obtained through lifestyle changes such as diet or exercise and doing physical activity or shedding through emotional feelings[13][14][15]. This further strengthens that the individual's representation of the disease can influence the applied coping strategies to affect the individual's HRQoL changes. Therefore, this study aims to find a more in-depth explanation of the effect of illness representations on HRQoL in obese patients, using coping strategies as a mediator.

2. METHOD

2.1. Participant

This study was conducted on obese patients with BMI over 25.1 kg/m² (based on the obesity category in Indonesia) who have been obese for at least two weeks. The obese patients in this study were in adulthood in 20 to 40 years (n = 44). Each participant was given a questionnaire online and offline (following the health protocol) that measured illness representations, coping strategies, and individual HRQoL using the purposive sampling technique.

2.2. Measurements

2.2.1. Dependent Variable

WHOQOL-BREF was used to measure HRQoL as the dependent variable. This instrument was developed by WHO[16] and adapted into Indonesian by Renaldi[17]. This instrument contains 26 items, namely two items to measure the overall quality of life and the other 24 items measuring the four domains, which are physical health (7 items), psychological (6 items), social relationships (3 items), and environment (8 items). This instrument shows a CFI value of 0.640 and a reliability coefficient of Cronbach's alpha of 0.808 (strong reliability).

2.2.2. Independent Variable

The Brief Illness Perception Questionnaire (B-IPQ) was used to measure illness representations as an independent variable. This instrument was developed by Broadbent et al.,[18] from the Illness Perception Questionnaire (IPQ) by Moss-Morris et al.,[19] and has been adapted into Indonesian by Indrayana and Fang[20]. This instrument contains nine items, with eight items in the form of a Likert scale (which measures one aspect each) and one item, an open-ended question to measure causal or the cause of the disease. Every item is grouped into three groups, namely cognitive (consequence, timeline, personal control, and identity), emotional (illness concern and emotional representations), and comprehensibility (illness coherence). This instrument shows a CFI value of 0.826 and a reliability coefficient of Cronbach's alpha of 0.516 (moderate reliability).

2.2.3. Mediator

Brief Coping Orientation to Problem Experienced (Brief COPE) was used to measure coping strategies as a mediator variable. This instrument was developed by Carver [21]. This instrument contains 28 items which are divided into two groups, that are approach coping (active coping, planning, positive reframing, and acceptance) and avoidant coping (using emotional support, using instrumental support, self-distraction, denial, venting, substance use, behavioral disengagement, and self-blame). Two items measure each aspect. This instrument shows a CFI value of 0.685 (approach coping) and 0.569 (avoidant coping), and the reliability coefficient of Cronbach's alpha is 0.758 (reliable enough).

2.3. Statistical Analysis

The data in this study were analyzed using the Statistical Package for Social Sciences (SPSS) version 23 and AMOS version 25. As for measuring the effect between variables, path analysis methods were used using simple regression and multiple regression. In this analysis model, path coefficients are used to predict the process on the existing path[22]. The mediator variable analysis uses two independent variable roles: direct and indirect effects. The sum of the two lines of roles is called the total role[23]. The mediator variable plays an effective role when in the total role, the portion of the indirect role pathway is greater than the direct role pathway[24]. Therefore, in this study, the analysis will be carried out in two stages. The first is to see the direct influence between illness representations and HRQoL. The second is to see the effect of illness representations on HRQoL with coping strategies as a mediator.

3. RESULT

3.1. Descriptive Statistics

Table 1 shows that the participants of this study were dominated by women (61%), single (80%), and severely obese patients with BMI > 27.0 (82%) or Obese II. Based on Table 1, it was also found that the three most common causes of obesity perceived by participants were eating style (91%), sleep patterns (55%), and lifestyle (52%). In addition, it was found that half of the participants (50%) could not be described in the form of coping strategies used to deal with obesity, while 30% of other participants used approach coping and the other 20% used avoidant coping.

3.2. Simple Regression

Table 2 describes the results of the regression analysis of the influence of illness representations on HRQoL, which shows that there is an effect of illness representations on HRQoL ($p = 0.001$; $p < 0.05$) with a negative effect ($\beta = -0.85$). This shows that the higher the illness representations score, the lower the individual's HRQoL. These results explain that the more threatening obesity is perceived by individuals, the lower the individual's quality of life. The influence of illness representations on HRQoL is 22.8% ($R^2 = 0.228$).

In addition, it was found that the only dimension of illness representations that affect each HRQoL dimension is the comprehensibility dimension, while other dimensions of illness representations, cognitive and emotional, do not have any influence on each HRQoL dimension. The influence of the comprehensibility dimension on all HRQoL is negative. This shows that the higher comprehensibility, the lower HRQoL of the individuals.

3.3. Path Analysis with Multiple Regressions

Based on Table 3, it was found that almost all of the criteria were met to continue on the path analysis. The significance value of the correlation between illness representation and avoidant coping, approach coping and HRQoL, and avoidant coping and HRQoL respectively were 0.021 ($p < 0.05$), 0.003 ($p < 0.05$) and 0.016 ($p < 0.05$). The three significance values indicate that the criteria for continuing on the path analysis have been met. However, one of the criteria was not met in the correlation between illness representations and approach coping with a significance value of 0.823 ($p > 0.05$).

Based on the results in Table 4, to find out more about the effect of the approach coping as a mediator, analysis was carried out using SPSS AMOS, and the direct effect values for illness representations and approach coping on HRQoL were 0.884 and 1.507 respectively, while the indirect effect values for both respectively are 0.029 and 0.000. As previously explained, to see the role of mediation, the value of the indirect effect needs to be greater than the direct effect. However, in this case, it is seen that the direct effect value of the coping approach is greater than the indirect effect value ($1.507 > 0.000$). This indicates that the coping approach has no mediating effect on illness representations on HRQoL.

Table 1. Socio-demography of participants and descriptive statistics of variables (n=44)

Variable	Mean (SD)	Range	Percentage
Gender			
Men			39
Women			61
Age	24.68 (5.533)	20-40	
Marital Status			
Single			80
Married			20
Duration of Obesity	63.27	1-180	
Criteria of Obesity			
Obese I			18
Obese II			82
Causal of Obesity*			
Eating Style			91
Sleep Patterns			55
Lifestyle			52
HRQoL	89.12 (13.789)		
Physical Health	24.68 (4.936)		
Psychological	20.39 (4.775)		
Social Relationship	9.89 (1.967)		
Environment	27.45 (3.879)		
Illness Representations			
Cognitive	28.09 (4.609)		
Emotional	10.68 (2.666)		
Comprehensibility	6.43 (2.627)		
Coping Strategies			
Approach Coping	37.52 (4.294)		30
Avoidant Coping	28.02 (4.762)		20
Unclassified			50

SD = standard deviation; age unit = years; obesity duration unit = months; HRQoL = the higher the score, the better the quality of life; illness representations = the higher the score, the more threatening the individual perceives his illness; unclassified = the participant cannot be described into the approach or avoidant coping through the grouping system.

* accumulation of the most frequent answers (each participant fills in a maximum of three causes)

Table 2. Analysis results of effect of illness representations on HRQoL

Dependent Variable	R ²	β	Sig.	Independent Variable
HRQoL	0.228	-0.85	0.001**	Illness Representations
Physical health	0.286	-0.534	0.000**	Comprehensibility
Psychological	0.276	-0.525	0.000**	
Social relationship	0.240	-0.490	0.001**	
Environment	0.114	-0.337	0.025*	

** = significance < 0.01; * = significance < 0.05; sign (-) = negative effect; on the independent variable only the comprehensibility dimension was included in the analysis because the other two variables (cognitive and emotional) had no effect on HRQoL

Table 3. Path analysis criteria fulfilment test results

Variable	ANOVA (Sig.)	Coefficients (Sig.)	Annotation
Illness Representations*Approach Coping	0.823	0.823	Not fulfilled
Illness Representations*Avoidant Coping	0.021	0.021	Fulfilled
Approach Coping*HRQoL	0.003	0.003	Fulfilled
Avoidant Coping*HRQoL	0.016	0.016	Fulfilled

Table 4. Value of direct, indirect, and total effect of illness representations and approach coping on HRQoL based on SPSS AMOS

Variable	Direct	Indirect	Total
Illness Representations	-0.884	0.029	-0.856
Approach Coping	1.507	0.000	1.507

the sign (-) indicates the effect is negative

Table 5. Multiple regression analysis results of illness representations, avoidant coping, and HRQoL

Variable	R ²	Sig.	β
Illness Representations*Avoidant Coping	0.121	0.021	0.248
Illness Representations*Avoidant Coping* HRQoL	0.272	0.007 (IR) 0.124 (AV)	-0.400 -0.223

IR = illness representations; AV = avoidant coping; sign (-) = negative effect

Path analysis using regression analysis yielded several results. Simple regression analysis between illness representations and avoidant coping significantly affected avoidant coping ($p = 0.021$; $p < 0.05$). Meanwhile, based on multiple regression analysis between illness representations, avoidant coping, and HRQoL, it was found that only the effect of illness representations on avoidant coping was significant ($p = 0.007$; $p < 0.05$), while the effect of avoidant coping on HRQoL was not significant ($p = 0.124$; $p > 0.05$). Although the effect of avoidant coping on HRQoL is not significant, a decision on whether or not there is a mediating effect can be obtained after processing the regression model from Table 5.

Based on Table 5, the magnitude of the influence of the variable can be seen based on the value of β . Therefore, it is found that the effect of illness representations on avoidant coping is 0.248. The magnitude of the effect of illness representations on HRQoL can be obtained at 0.400, and the magnitude of the effect of avoidant coping on HRQoL is 0.223. To find the value of e in the modeling, it can be obtained from the results of R². There are two values of e in this model, namely e_1 (influence of illness representations on avoidant coping) and e_2 (influence of illness representations and avoidant coping on HRQoL). The values of e_1 and e_2 , respectively, are 0.937 and 0.853. Based on these

results, the path modeling form in Figure I is obtained.

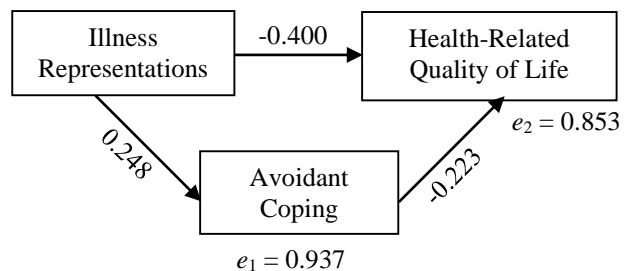


Figure 1. Path analysis with avoidant coping as mediator.

Based on Figure I, it can be seen that the direct role of illness representations on HRQoL is 0.400. The indirect role is obtained by multiplying the value of β of illness representations on avoidant coping and the value of β of avoidant coping on HRQoL. Based on the multiplication values of 0.248 and 0.223, a value of 0.05 was obtained, so it can be seen that the indirect role in this model is 0.05. The total role in this model can be seen from the sum of the direct and indirect role values so that the total role value is 0.450. These results indicate that the direct role is more significant than the indirect role, which indicates that there is no mediating role of avoidant coping on the effect of illness representations on HRQoL in obese patients.

4. DISCUSSION

This study found a negative effect of illness representations on HRQoL; when an individual's illness representations increase, the individual's HRQoL will decrease. This shows that the more threatening disease the individual perceives, the lower their HRQoL. This finding is consistent with several previous studies. Cheng et al. [12] stated that the way individuals perceive disease can affect the quality of life of individuals both physically and mentally and can be associated negatively or positively. Meanwhile, Minshall et al. [25] stated that illness representations were negatively correlated with quality of life. This shows the consistency with the study results that the more threatening obesity is perceived, the lower the patient's HRQoL.

In general, illness representations were found to affect HRQoL. However, based on the analysis of the effect per dimension, it was found that only the comprehensibility dimension on illness representations had a significant effect on the decrease in HRQoL of obese patients. The cognitive and emotional dimensions do not significantly affect the decrease in HRQoL.

The comprehensibility dimension contains the illness coherence aspect, which describes how reasonable the illness is. It is also related to the individual's evaluation of how useful the illness representations made with the illness are [19]. This shows that the more obese people believe their obesity is happening or, the more reasonable the perceived illness representations are, the lower the HRQoL of the patient will be. The findings of this study are different from previous findings, which stated that illness coherence of disease has a positive relationship to the quality of life of individuals mentally [12], but is in line with the findings that illness coherence is negatively related to one aspect of HRQoL, that is mobility in Cushing's syndrome patients [26].

Another finding of this study shows no mediating effect of coping strategies on the effect of illness representations on HRQoL. This means that although illness representations affect HRQoL, this influence is not mediated by coping strategies; both approaches coping and avoidant coping. This shows a difference with the theoretical concept presented by Leventhal et al. [27] that the effect of illness representations on HRQoL is mediated by coping strategies. When individuals develop illness representations, this will lead individuals to perform coping strategies for the illness they suffered. After the individual implements the coping strategies, the individual will evaluate the

strategic coping that has been carried out in various forms, including the individual's quality of life [11].

Based on the results of this study, it was found that neither approach coping nor avoidant coping mediates the effect of illness representations on HRQoL. This can be influenced by several things. The first is the individual's belief in illness representations that are developed. Leventhal et al. [28] stated that the success of illness representations in developing efforts to reduce the impact of the illness suffered depends on how well the individual's belief in illness representations has been developed. The second thing that might influence this result occurs because there is a tendency for individuals to think about the availability of coping resources before the individual has finished developing illness representations so that the responses given when measuring illness representations are mixed with coping evaluation [29].

Lazarus and Folkman [30] also explain that a strategy does not need to be wholly adaptive or maladaptive, but it depends on the circumstances and results from implementing this strategy. Obesity is a condition that is still rarely anticipated and considered threatening by individuals. Even so, individuals sometimes make various efforts to overcome this situation, but as a result, not all efforts have a satisfactory impact on the individual. One example is the diet effort. Even though individuals did diet or controlled eating, it was found that the obesity condition did not improve, even though the individual's weight decreased, usually it would increase again after dieting (weight cycling) [31]. It is necessary to show that the circumstances and the results obtained can affect the individual's coping process. Although this was not explored further in this study, it could be a clue for further exploration of individual perceptions of the success of coping strategies before arriving at the HRQoL evaluation.

Although no mediating effect was found, it was found that coping strategies, both approach coping and avoidant coping affected HRQoL. The approach coping affects HRQoL positively, in the sense that the more the use of the coping approach, the HRQoL will also increase. This is consistent with the findings that approach coping mechanisms are associated with positive outcomes [32]. This is also in line with the finding that state when individuals apply active coping and acceptance (type of approach coping), there is a tendency that individuals have a better quality of life [33][34].

If the coping approach positively impacts HRQoL, this is different from avoidant coping. Avoidant coping was found to negatively affect HRQoL because

the higher the use of avoidant coping, the lower the individual's HRQoL. Various previous findings have proven that avoidant coping types tend to provide worse health outcomes[35]. In addition, it was found that the more individuals use avoidant coping to cope with their illness, the worse the individual's assessment of their health will be.

Avoidant coping is an individual's action to minimize the importance of the illness, including by not making any effort to his/her condition[36]. Obese patients are often faced with the stigma that exists in society to put individuals in a state of emotional distress so that this can influence individuals to respond to their situation with inappropriate coping strategies[37]. Obese patients found using this technique tend to have high levels of distress. This is because individuals tend to isolate themselves, do not express the emotions they feel, and lack social support, so that it can impact individuals avoiding social situations to have an impact on the individual's psychological state[38][39]. This situation then makes individuals look back at their quality of life, which in turn has an impact on a worse quality of life.

5. CONCLUSION

Based on the results obtained in this study, it can be concluded that there is a negative effect of illness representations on HRQoL in obese patients. When an individual's illness representations increase, the individual's HRQoL will decrease. This shows that the more threatening obesity is perceived by the individual, the lower the individual's HRQoL. This situation can occur due to several things, namely the condition of obesity experienced and the beliefs held by individuals about the disease they suffered. The percentage of the effect of illness representations on HRQoL in this study was 22.8%, while the other 77.2% was influenced by other factors not explored in this study.

This research also found that the effect of illness representations on HRQoL was not mediated by coping strategies. This means that coping strategies are not appropriate mediators on the effect of illness representations on HRQoL. This can be influenced by the individual's belief in the illness representations that are developed. In addition, individual beliefs about the results obtained from the application of the applied coping strategies also play a role in determining whether or not there is a mediating effect of these coping strategies.

6. LIMITATION

This study explores the effect of illness representations on HRQoL in obese patients and the effect of mediating coping strategies on this effect. However, there are some limitations to this research, namely:

1. Screening of obese people is limited to BMI, which is measured directly by participants and then confirmed by researchers so that BMI calculations can be less accurate. In addition, only obese people, in general, can be explored, for other types of obesity (such as central obesity) based on a doctor's diagnosis are difficult to explore in this study.
2. The coping strategies measuring instrument used is still measuring the types of coping strategies in general and there is a possibility that obese people do not use all types of coping strategies described (while the measurement of coping strategies is based on an assessment of each aspect of coping strategies). Measurement of coping strategies that are more specific and often applied by individuals, such as the effectiveness of diet or exercise carried out, may provide a better picture of the coping strategies used by individuals.
3. This study explores more specifically the broader dimensions of illness representations (cognitive, emotional, and comprehensibility) so that it does not get a detailed explanation for the description of each aspect of these dimensions.

AUTHORS' CONTRIBUTIONS

Author 1 is conceived the idea of the research's topic and designed the analysis, collected data, contributed analysis tools, and performed the analysis. While author two and author three are supervising in all the research progress, they also conceived the idea of the research's topic and design analysis. All authors discussed the results and contributed to the final manuscript.

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