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ORIGINAL ARTICLE

BODY MASS INDEX AND FITNESS LEVEL OF JAKARTA'S YOUNG ADULTS

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Weeke Budhyanti

Corresponding Author:

Physiotherapy Program, Faculty of Vocational Studies, Universitas Kristen Indonesia

Email id: weekeb@uki.ac.id

ABSTRACT

Background: Obesity is a health problem that leads to other problems. Controlling obesity among individuals requires their motivation so they may be engaged in programs created to control their lifestyle. Purposes of this study were to find a relation between body mass index and perceptual fitness level. **Methods:** This study is a quantitative descriptive research that used a quantitative approach with cross-sectional analytic design among Jakarta's young adults. Data collection used primary data of online-based-questionnaire that asks their physical profile, daily activity, sports participation, central fatigue levels, and prevalence of metabolic-related diseases. Data collected was tested by correlation test to find relations between these factors. **Results:** There are no significant relation between body mass indexed with daily activity levels ($r = 0.05$), sports participation ($r = -0.16$), subjective feeling of fatigue ($r = 0.00$) and prevalence of metabolic-related-diseases ($r = -0.19$). **Conclusion:** Body mass index did not related with daily activity levels (active or sedentary lifestyle), engagement in sports participation, subjective feeling of fatigue, and prevalence of metabolic-related-diseases (hypertension, diabetes mellitus).

Keywords: Body mass index; Physical activity; Fatigue

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INTRODUCTION

Increased prevalence of overweight and obesity poses a major threat to public health and WHO has declared obesity as a real but neglected health problem¹. Weight control in overweight and obese individuals has become a concern of several countries, as overweight and obesity has known as risk factors of chronic diseases, including heart disease, cancer, and metabolic diseases. Yet, obesity in lower-to-middle income countries was more difficult as obesity is associated with a large-scale nutritional transition over several decades.

This nutritional transition leads to the double-burden nutritional situation, where stunting and obesity simultaneously exist in individuals. Thus, body-weight control in lower-to-middle countries should focus on preventing the recurrence of nutritional deficiencies as well as education on the threat of obesity and obesity-related diseases².

Another factor that needs to considerate is individual involvement during their body weight control program. Low awareness of individuals towards obesity often reduces individual involvement in better lifestyle changes and diet². My question is how to motivate overweight people to hold a weight-control program consistently, without crushing their body image. One thing that may concern was their health. Facing their health status may become their motivation.

Thus, my research purpose was to find any actual health problem that exists on overweight and obese people. My previous research³ finds that no significant relations between Body Mass Index (BMI) and blood pressure. Now, we are trying to find other

health status indicators that may exist in overweight and obese people. Several previous studies have looked for the relationship between BMI and quality of life and indicated that higher BMI is associated with lower quality of life⁴. One of the factors related to the quality of life is fitness level. Fitness level consists of body mass index, flexibility, stability, and ability to perform daily and recreational tasks.

Ability to perform daily and recreational tasks is usually limited by fatigue. Fatigue is rarely used in daily conversation, as we usually mention it as tired. There is two kinds of fatigue, central fatigue and peripheral fatigue. Central fatigue is an individual's perception of tiredness level. Central fatigue comes before peripheral fatigue, which is characterized by muscle's inability to perform any contraction.

Several studies suggest that high BMI is positively related to fatigue, and affects physical activity by causing decreased motility and causing dependence²². Obese individuals tired more easily than leaner-weight people, and are more associated with peripheral factors.

Central fatigue causes obese individuals to stop their activities quicker, and this situation affects their daily activity, as they will tend to decrease their physical activity and/or increase their sedentary lifestyle^{5,6,7,8}. Thus, researchers tried to find if body mass indexes related to the fitness level of Jakarta's young adults.

METHODOLOGY

This study used a quantitative approach with cross-sectional analytic design. The sample of this research is 117 people range from 19-57 years old. Data collection used primary data

with online-based-questionnaire consist of height and body weight, daily activities, metabolic-related diseases, and Industrial Fatigue Rating Committee (IFRC) questions.

All of the respondents were adults; classification of nutritional status was using International Obesity Taskforce for Asian race that uses categorical describer as underweight, normal, overweight, obesity I and obesity II as shown on Table 1.

BMI	Category
< 18.5	Underweight
18.5 – 22.9 0	Normal
23 – 24.9	Overweight
25 -29.9	Obesity I
≥ 30	Obesity II

Table 1. Asia Classification of BMI⁹

The subjective feeling of fatigue measured by Subjective Self Rating Test from Industrial Fatigue Rating Committee classification, described as low, moderate, high, and very high level of fatigue. IFRC questions consist of 10 physical experiences, 10 mental experiences, and 10 physiological experiences questions. Respond to the questions were using Likert scale answers to be summarized to categorical describer as low, moderate, high, and very high level of fatigue as shown in Table 2.

Total Score	Category
50-52	Low
53-75	Moderate
67-98	High
99-120	Very High

Table 2. Subjective Feeling of Fatigue by SSRT IFRC Questionnaire

Correlation test used to assess if any correlation between BMI and other factors to identify if there are a correlation between BMI and subjective feeling of fatigue; BMI and involvement to sport; BMI and involvement to active lifestyle; and active lifestyle to subjective feeling of fatigue.

RESULTS

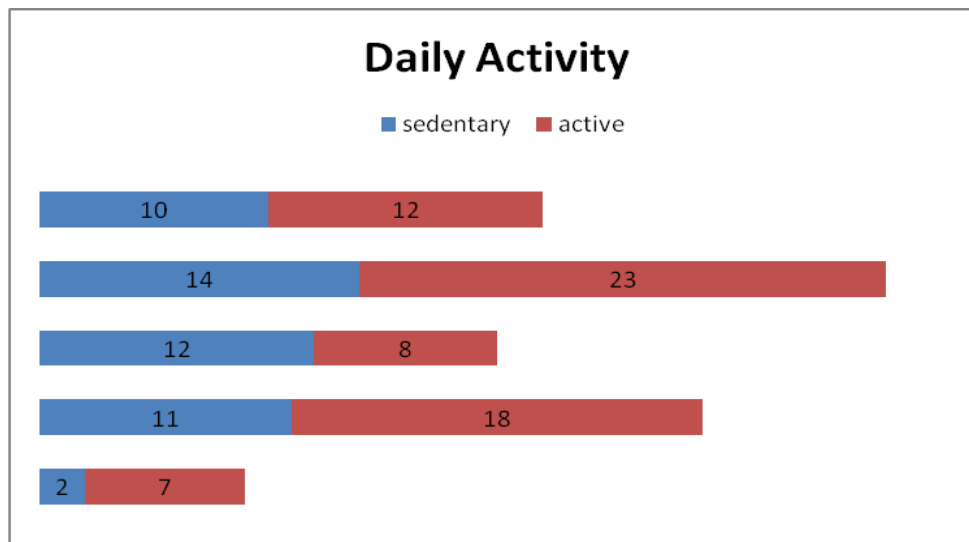
Respondents of this research consist of 46 male and 71 female that live and work in Jakarta. Prevalence of overweight and obese in this research (67%) was higher than shown at Riskesdas 2018¹ (21.8%), as researchers use BMI classification for Asian. Riskesdas 2018¹ use the international BMI classification, where 25-27 are classified as overweight, and ≥ 27 as obese. Asia Pacific BMI classification shows that 23-24.9 were overweight and ≥ 25 were obese.

Characters	Amount	Percentage
BMI		
Underweight	9	8
Normal	29	25
Overweight	20	17
Obese I	37	31
Obese II	22	19
Physical Activity		
Sedentary	49	41.88
Active	68	58.12
Involvement on Sports		
Once a week	30	25.65
Twice a week	40	34.19
3 times a week	38	32.47
5 times a week	9	7.69
Prevalence of metabolic diseases		
None at all	100	85.47
One disease (hypertension, diabetes, renal diseases, cardiac diseases)	16	13.67
Two diseases (hypertension & diabetes)	1	0.86
Subjective feeling of Fatigue		
Low	51	43.58
Moderate	61	52.13
High	5	4.28
Very High	0	0

Tabel 3. Characters of Respondents

As seen in Graph 1, overweight and obese respondents claim that they are living an active lifestyle, instead of sedentary.

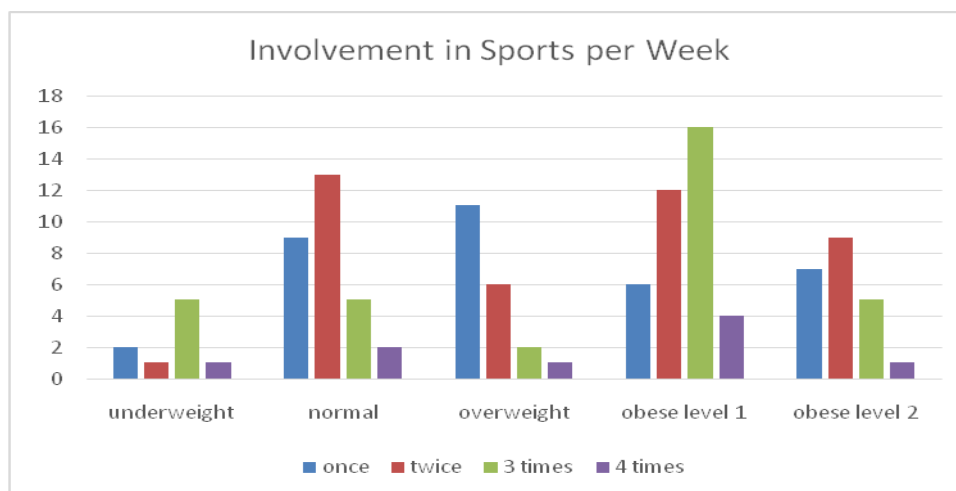
Correlation test between BMI and daily activity lifestyle has shown r-value were 0.05, thus almost no relation between BMI and lifestyle between respondents.



Graph 1. Respondents' sedentary and active life style in daily life

As comparable between active daily activities claimed by respondents, involvement in sports per week test with BMI, with r-value -0.16, so

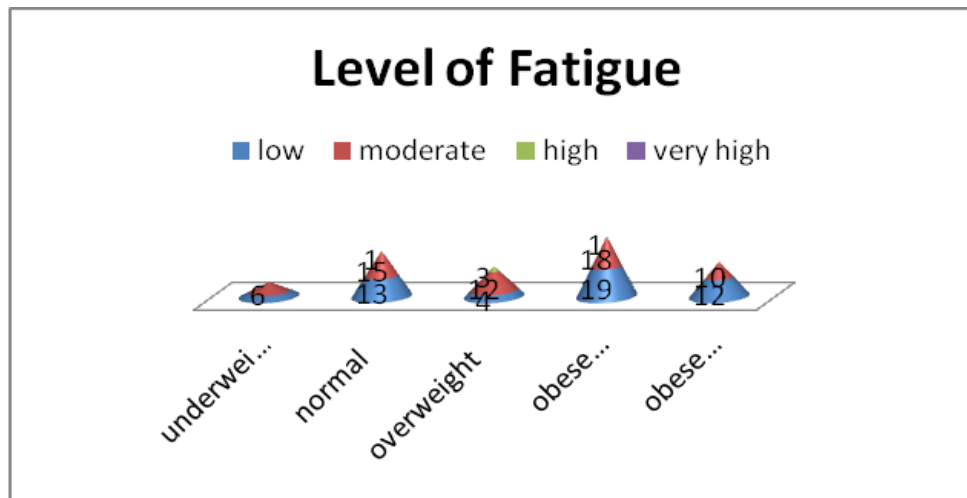
there is weak negative relationship between participation in sport with respondent's BMI.



Graph 2. Respondent's involvement in sports per week.

As shown in Graph 3, high and very high levels of fatigue were complained by normal, overweight, and obese level 1 respondents. Correlation test between BMI and subjective feeling of fatigue showing 0.00 r-value, so there is no relation between those indicators. To

make sure if fatigue complained were caused by their active lifestyle, correlation test between subjective feeling of fatigue with active daily activity (r-value 0.01) and involvement in sports (r-value 0.00).

**Graph 3.** Subjective feeling of fatigue on each category of BMI

For the main purpose of this study, we find no correlation between subjective levels of fatigue with BMI with r-value 0.00. Surprisingly, the correlation test between BMI and metabolic-related diseases was shown r value -0.19, so there is very weak negative relation between them.

DISCUSSION

First, we need to put our perspective that the incidence of overweight and obese people becomes higher if we use BMI categorization for Asia. 17% of 117 respondents classified as overweight and 50% classified as obese, is dramatic. This data show almost three times

incidence of overweight and obesity compared with Riskesdas 2018 for DKI Jakarta that only shows 21.8% incidence of obesity in Jakarta's adult¹. As we believe that increased BMI leads to the increased risk factor of metabolic-related diseases, functional limitation and decreased well-being, this data that shows us that 67% respondents are facing increased risk factors. Riskesdas 2018¹, as other research in Asia, still using WHO 2005 category of nutritional status, despite this categorical did not suitable for Asian race people. If we neglecting Asia's standard of nutritional status, we may do not meet overweight and obesity incidences as big as the reality.

Data in this research was higher than several studies, as usually range of overweight and obesity in a population were about 20-31%. This situation may be caused that this research held in Jakarta. Prevalence of overweight and obesity was higher in urban residents compared with rural residents¹¹. Several studies indicating that living in urban areas led to an increased correlation with overweight/obesity. It may be due to environmental factors that influence their diet, mental activities, and expend less energy in daily life¹¹.

The paradox in this research was faced by other research^{12,13,14,15}, where only a weak relationship between BMI with the prevalence of metabolic-related diseases and experience of fatigue indicates that obesity within respondents of this research did not yet cause actual problems in their daily living. Based on Edmonton Obesity Staging Scale², their obesity is mainly at stage 0 (no apparent obesity-related risk factor, no physical sign, no psychopathology, no functional limitations or decreases well-being) and stage 1 (presence of subclinical risk factor related to obesity, mild physical symptoms, mild psychopathology, mild functional limitations, or mild impairment of well-being).

It seems like this data shows that not all obese individuals are at increased health risk. In fact, obese individuals with or without metabolic-related diseases are similarly elevated of mortality risk factors. We need to take any action so the respondent will not going to stage 2 and 3 (moderate and severe conditions), or to eliminate comorbidities factors in several situations such as cancer, systematic lupus erythematosus, which put overweight and obesity as their comorbidity.

The situation in this research, which shown no relation (r-value 0.00) between BMI and fatigue may be caused as we are using a subjective state of feeling, so the result is slightly different with other research that using objective measurement of fitness level. With the battery of field tests, overweight and obese women exhibit lower levels of aerobic fitness compared to women with normal BMI¹⁶. Their weight history, weight cycling, history of diet, and physical activity, too, maybe causing different their experience of metabolic aberrations¹².

CONCLUSION

By following the objectives of the study, based on the results and discussion, we may take a conclusion that there is no significant relationship between BMI and fitness level of the respondents, their willingness to hold an active daily lifestyle, and incidence of metabolic-related diseases.

The limitation of this study is that we did not conduct questions to our overweight and obese respondents about their level of urgency to lose weight. Thus, we did not understand if their willingness to control their body weight, if their active lifestyle purposely happened to weight control, or if their active lifestyle helps them to control their body weight.

We conduct a subjective level of fatigue, without comparing their perception with an objective measurement of fatigue and other limitation. Yet, author tend to agree that controlling body weight requires external assistance to help identify contributing factors to individual body weight, motivational encouragement, and handling assistance from professionals. Further research needs to be

held, to find out ways to help overweight and obese people to control their body weight.

Conflict of interest:

The author has no conflict of interest to declare.

Funding of study:

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Compliance with Ethics:

This study was obtained ethical form University with reference number 458/UKI.F8.D/PPM.1.6/2019.

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