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Relationship Between Knowledge and Physical Activity with Nutritional Status Among High School Teachers in Surakarta

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Abstract

Overweight is a condition in which excess fat accumulates in the body, which can pose a risk to health. The prevalence of overweight in Surakarta City is 24.03%. Government employees have the highest weight of 20%, while the most public employees with teaching qualifications amounted to 69.23%. Teachers tend to feel that they have a lot of work to do and feel pressured at work. Stress, a lack of physical activity, and low nutritional knowledge lead to nutritional problems such as being overweight. Research is needed on the relationship between knowledge and physical activity and overweight among teachers in high schools in Surakarta. This study aims to obtain information related to the relationship between nutritional knowledge and physical activity and nutritional status among teachers in public high schools in Surakarta. The method used was a cross-sectional research design. The study population was teachers in SMA Negeri 1–8, Surakarta, with a sample of 96 respondents. Knowledge data was obtained from the Multiple Choice Questionnaire, physical activity data was collected using a Physical Activity Questionnaire with Global Physical Activity, and nutritional status was obtained based on anthropometric measurements. The statistical test used was the chi-square test. The results showed that most were in the good knowledge category. Most do light physical activity. There is no significant relationship between knowledge and nutritional status among teachers in public high schools in Surakarta. There is a significant relationship between physical activity and nutritional status among teachers in public high schools in Surakarta. In conclusion, there is no significant relationship between knowledge and nutritional status because knowledge has an indirect effect on nutritional status. There is a significant relationship between physical activity and nutritional status. High health awareness leads to health-related activities, including eating habits and physical activity

Keywords: Knowledge, Physical activity, Nutritional status, Teachers

Introduction

Overweight is a condition in which there is an accumulation of excess fat in the body that can pose a risk to health (WHO, 2020). The prevalence of overweight among adults in Indonesia itself has increased by 2.1% per year from 2013 to 2018. The province with the highest prevalence of obesity nationally is Central Java with 14.3%, while the highest prevalence by district or city in Central Java is Surakarta City with 24.03% (Riskesdas, 2018). In Riskesdas (2018), the highest number of overweight government officials was 20%. According to the Basic Education Data (2022), the number of civil servants with teacher status is 69.23%. According to the Central Bureau of Statistics (2022), the highest number of teachers is in Central Java Province, and the number of teachers in Surakarta City itself is 9,752 teachers, while the number of high school teachers in Surakarta City is 1,136 teachers. As for civil servant teachers in public high schools, there are 380 teachers, consisting of 8 schools (Ministry of Education and Culture, 2022).

High school teachers have a workload in terms of preparing their students for the next level, such as choosing to go on to university or work. Students are expected by teachers to be able to think critically and logically and to have the ability to solve the problems they encounter (Nurrahmawati, 2018). Teachers are also referred to as catalysts, people who are listened to and obeyed by their students (Fitrah et al., 2020). High school teachers tend to experience stress due to various factors such as working conditions, work performed, work pressure, and work environment. Teachers tend to feel that they have a lot of work to do and feel pressured at work (Waloni, 2022).

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According to Tomiyama (2019), a person may eat more than usual when under stress, choosing foods that are high in calories, sugar, and fat. A survey conducted by the APA (Association of Psychology America) reported that up to 39% of people overeat in response to stress. According to a study conducted by Isramilda (2019), there is a significant relationship between stress and obesity (p-value = 0.022). The higher the stress level, the greater the tendency to overeat. Overeating is one way to relieve stress (Syarofi & Muniroh, 2020).

Stress, overeating, an unbalanced diet, poor sleep, and low nutritional knowledge lead to nutritional problems such as overweight (Wulandari et al., 2021). The higher a person's nutritional knowledge, the more attention they pay to the type and quality of food they consume (Ni Wayan, 2018). In addition, those who are physically inactive have a three-fold higher risk of obesity than those who are physically active (Telisa et al., 2020). With this background, the researcher is interested in conducting a study on the relationship between nutrition knowledge and physical activity and the nutritional status of teachers at Surakarta State High School.

Methods

This type of research is quantitative with a cross-sectional research design. This research was conducted in public high schools in Surakarta City in March 2023. There are 8 public high schools in Surakarta City, namely Public High School 1 Surakarta, Public High School 2 Surakarta, Public High School 3 Surakarta, Public High School 4 Surakarta, Public High School 5 Surakarta, Public High School 6 Surakarta, Public High School 7 Surakarta, and Public High School 8 Surakarta. There are 380 civil servant teachers teaching in public high schools in Surakarta City (DAPODIK, 2022). The sample size was calculated using the minimum sample formula (Sugiyono, 2017) for as many as 96 respondents. using the cluster random sampling technique. Data collection consists of data on age, gender, most recent education, nutritional status, nutrition knowledge, and physical activity.

The variables studied were the identity of respondent characteristics (age, gender, and most recent education), nutritional status, nutritional knowledge, and physical activity. The research instrument used for the nutritional knowledge variable was a multiple-choice questionnaire (MCQ) consisting of 15 questions. The knowledge classification was divided into three levels: poor knowledge < 56%, adequate knowledge 56-75%, and good knowledge 76-100%. Physical activity data were collected using the Global Physical Activity Questionnaire (GPAQ), with questions covering activities at work, travel to and from work, leisure activities, and habits. The classification of physical activity is divided into three levels: low-intensity physical activity > 3000, moderate-intensity physical activity 600–3000, and light-intensity physical activity ≤ 600. Nutritional status is obtained from the results of anthropometric measurements, namely body weight using a weighing scale, followed by body height using a microtoise device.

Data analysis is divided into univariate and bivariate analyses. In this analysis, frequency distribution tables and cross-tabulations (chi-square) with percentage or proportion measures are used.

Results and Discussions

Characteristics Of The Respondents

The sample used in the study consisted of 96 respondents from 8 public high schools in the city of Surakarta, namely Public High School 1 Surakarta, Public High School 2 Surakarta, Public High School 3 Surakarta, Public High School 4 Surakarta, Public High School 5 Surakarta, Public High School 6 Surakarta, Public High School 7 Surakarta, and Public High School 8 Surakarta. The distribution of respondents' characteristics is shown below.

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Table 1. Characteristics Of The Respondents

Characteristics Of The Respondents	n	%
Gender		
Male	19	19,8%
Female	77	80,2%
Total	96	100%
Highest level of education		
Bachelor's degree	64	66,7%
Master's degree	32	33,3%
Total	96	100%

In the following table, it is known that the characteristics of respondents in public high schools throughout Surakarta city show more female gender, namely 77 respondents (80.2%). There are 19 male respondents (19.8%). According to the characteristics of the last education, the last education of a bachelor's degree is more, namely 64 respondents (66.7%), and the last education of a master's degree is 32 respondents (33.3%).

Table 2. Distribution Of Respondents According To Their Nutritional Status, Knowledge Of Nutrition And Level Of Physical Activity

Variables	n	%
Nutritional Status		
Overweight	34	35,4 %
Pre-Obesity	46	47,9 %
Grade 1 Obesity	15	15,6 %
Grade 2 Obesity	1	1,1 %
Nutrition Knowledge		
Poor Knowledge	0	0 %
Adequate Knowledge	18	18,8 %
Good Knowledge	78	81,2 %
Physical Activity		
Low intensity physical activity	8	8,3 %
Moderate intensity physical activity	30	31,3 %
Light intensity physical activity	58	60,4 %

The World Health Organization's 2017 report provides information on sources of nutritional status.

Based on the table above, it is known that out of eight high school teachers in Surakarta city, the most nutritional status is pre-obesity, namely 46 respondents (47.9%), and the least is obesity level 2, namely 1 respondent (1.1%). Based on the table above, it is known that out of eight high school teachers in the city of Surakarta, none of them have insufficient nutrition knowledge. While those who have sufficient nutrition knowledge are 18 respondents (18.8%), those who have good nutrition knowledge are 78 respondents (81.2%). Based on the table above, it is known that among the eight high school teachers in the city of Surakarta, the lowest number of respondents engaged in low-intensity physical activity was 58 (31.3%). While the number of respondents with moderate-intensity physical activity was 30 (31.3%), the least number of respondents had heavy-intensity physical activity, as many as 8 (8.3%).

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Table 3. Relationship Between Nutrition Knowledge And Physical Activity With Nutrition Status Among High School Teacher

No	Variables	Nutrition Status								Total		*p value*
		Overweight		Pre-Obesity		Grade 1 Obesity		Grade 2 Obesity				
		n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	
Nutrition Knowledge												
1	Adequate Knowledge	10	29,4	7	15,2	1	6,7	0	0	18	18,8	0,205
2	Good Knowledge	24	70,6	39	84,8	14	93,3	1	100	78	81,2	
Physical Activity												
1	Low intensity physical activity	19	55,9	31	67,4	7	46,7	1	100	58	60,4	
2	Moderate intensity physical activity	8	23,5	14	30,4	8	53,3	0	0	30	31,2	0,029
3	Light intensity physical activity	7	20,6	1	2,2	0	0	0	0	8	8	

Note. There are 96 samples used. This result uses the chi square test as part of its statistical analysis. Physical activity and nutritional status are the variables that are correlated, with a p value of 0.029.

Based on the table above, it can be seen that most respondents have good knowledge of pre-obesity nutritional status, as many as 39 respondents (84.8%), and out of 96 respondents, there are no respondents who have adequate knowledge of level 2 obesity nutritional status, or as much as 0%. Based on statistical tests, a value of $p = 0.205$ ($p \geq 0.05$) was obtained. Based on the table above, it is stated that most respondents do low-intensity physical activity with pre-obesity nutritional status, as many as 31 (67.4%) respondents out of 96 respondents, and out of 96 respondents, there are no respondents doing moderate-intensity physical activity with level 2 obesity nutritional status, or as much as 0%. There are still respondents who do not do moderate-intensity physical activity with nutritional status level 1 obesity and level 2 obesity, or as many as 0 respondents. Based on statistical tests, a value of $p = 0.029$ ($p < 0.05$) was obtained.

The results of the study of the characteristics of the respondents showed that out of half of the respondents, 77 (80.2%) were female. This is because women are less physically active than men, so more energy is converted to fat. Women also have less muscle mass (Gustiranda et al. 2020). Because of gender differences in body composition, women are at higher risk of obesity. The percentage of body fat is higher in women than in men (Gifari, 2020). Another cause of obesity risk in women is hormonal factors. The effects of hormones on the female body are not limited to the menstrual cycle. According to Qoirinasari (2018), the influence of hormones also increases the risk of obesity in women. Gender affects nutritional status because men and women have different energy and iron needs, posture, and muscles (Pindobilowo, 2018).

According to the characteristics of the last degree, the proportion of respondents with the last degree was higher. According to Fajrin (2021), the higher the level of education, the easier it is to receive information. The higher the level of education, the better the nutritional status. However, according to research by Lubis (2020), there is no relationship between the respondent's level of education and nutritional status. This is because education is one of the factors that influences how a person shapes their own behavior. The behavior induced by education is based on knowledge and awareness formed through the learning process, and because the behavior is based on awareness, it is expected to last over time (Inaya, 2019).

Respondents with pre-obese nutritional status were higher because teachers as educators have more responsibilities and duties (Purwanto et al., 2020). The role of teachers in educating students is very important because it requires knowledge, skills, and experience. In addition, teachers motivate students to be enthusiastic about learning and help them achieve good grades (Muthmainnah, 2023).

The results of Wiranti's research (2022) showed that most of the teachers who experienced fatigue were female teachers over the age of 40. The cause of fatigue at work is due to meeting energy requirements that do not match the needs and nutritional status of central. The study revealed that 81.2% of respondents had good nutritional knowledge, because an educator must have good knowledge. Besides that, he also has

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the ability to make students interested in learning and be able to encourage students to be able to improve their mastery of various skills they have in the teaching and learning process in classroom activities that can create learning conditions for improving these skills (Pujianto et al., 2020).

According to Notoatmodjo (2010) in Fitriani Rika et al. (2020) nutritional knowledge is about food and nutrients, sources of nutrients in food, foods that are safe to eat without causing illness, and how to prepare food safely without losing nutrients in it. Healthy lifestyles and a lack of understanding of the contribution of nutrients in different types of food lead to problems with intelligence and daily physical activity (Khoiroh, 2022).

Physical activity burns calories in the body. Therefore, if calorie intake is too high and not balanced by physical activity, the body becomes obese (Fitri et al., 2018). Activities that involve physical activity are work, domestic work (e.g., caring for children, housework), mobility (e.g., walking or cycling to work), and leisure physical activity (e.g., dancing or swimming) (WHO, 2018).

In the results of the study, the highest number of respondents with low-intensity physical activity was 31.3%. This means that low physical activity tends to be associated with high obesity and nutritional status, and physical activity is associated with body fat percentage. Light physical activity causes fat accumulation (Wahyuningsi, 2019).

Based on data analysis using the Chi-Square test on the relationship between nutritional knowledge and nutritional status, it shows that there is no relationship between nutritional knowledge and nutritional status in teachers at SMA Negeri Kota Surakarta obtained a p value of 0.205 or p value ≥ 0.05. This is consistent with Pantaleon's (2019) statistical finding that there is no significant relationship between nutrition knowledge and nutritional status. This is because knowledge has an indirect effect on nutritional status, while the direct effect on nutritional status is nutritional food intake and infectious diseases. Again, Saleky's research (2022) explains that there is no relationship between knowledge of a balanced diet and nutritional status. The results of research conducted in Ghana also showed no statistically significant relationship between nutritional knowledge and nutritional status (p = 0.253) (Issahaku, 2021).

The role of nutritional knowledge in influencing food intake can affect nutritional status, as consuming the right foods also affects nutritional status (Lestari, 2020). However, health concern is needed as a form of individual willingness to take health actions (Destianty and Caninsti, 2021). A person with higher health concerns is more likely to engage in health-related activities, including those related to eating habits and physical activity (Janetius & Krithika, 2020). For example, in order to stay healthy, individuals may engage in preventive health behaviors such as healthy eating, dieting, and increasing physical activity (regular exercise) (Destianty and Caninsti, 2021).

Physical activity is any movement of the body produced by skeletal muscles that requires energy. Low physical activity is an independent risk factor for chronic diseases and is estimated to cause all-cause mortality worldwide (WHO, 2018). The results showed that out of 96 respondents, 31 respondents (67.4%) had low physical activity in pre-obese nutritional status and 19 respondents (55.9%) had obese nutritional status. Meanwhile, out of 96 respondents, there were no or 0 respondents (0%) who performed moderate intensity physical activity in nutritional status level 2 obesity and heavy intensity physical activity in nutritional status level 1 obesity and level 2 obesity.

Based on data analysis using the Chi-Square test to test the relationship between physical activity and nutritional status, it shows that there is a relationship between physical activity and nutritional status among teachers at SMA Negeri Kota Surakarta, obtained a p value of 0.029 or p value <0.05. The results of this study are consistent with Izhar's research (2020), which states that there is a significant relationship between physical activity and the incidence of overnutrition in Jambi 1 State High School students. 68.9% of students who have moderate activity have an overnutrition status. The results of this study are supported by research by Sumael (2020), where respondents with low levels of physical activity obtained 75% results for obesity. The chi-square results obtained a p value of 0.02 or p value < 0.05. Therefore, it can be concluded

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that there is an association between obesity and physical activity. Physical inactivity and sedentary behavior are the main causes of obesity. Physical activity affects the degree of obesity.

The low level of physical activity among the respondents is due to a lack of time for physical activities such as exercise because they are busy taking care of the family, preparing meals for the family, and most of them are busy going to work. They also tend to use motorbikes rather than walking or cycling when doing activities around them (Basri, 2020). The lower the level of physical activity, the higher the risk of obesity. An overweight body has difficulty supporting its body when actively moving, so an obese person will have limited mobility and relatively reduced activity (Ibrahim, 2018).

Conclusions

Based on the results of the research conducted, it can be concluded that most teachers' nutritional knowledge is in the good knowledge category (70.6%). Most teachers engage in low physical activity (67.4%). There is no significant relationship between nutritional knowledge and the nutritional status of teachers in public high schools in Surakarta City (p-value = 0.205), because knowledge has an indirect effect on nutritional status. There is a significant relationship between physical activity and the nutritional status of teachers in public high schools in Surakarta City (p value = 0.029). High health awareness leads to health-related activities, including eating habits and physical activity.

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