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The Relationship Backpack Weight with Musculoskeletal Pain in Students

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ABSTRACT

The majority of health problems among adolescents in Indonesia are related to nutritional status. Adolescents require higher nutrient intake to support their growth phase. One factor is breakfast. Sleep quality is also another factor that affects nutritional status. Accelerated classes are classes with a faster learning model. The busy study schedule can cause breakfast and sleep quality to be greatly neglected due to study activities. Research objective of this research is to analyze the relationship between breakfast and sleep quality with the nutritional status of accelerated class students at MAN Kota Surabaya. This research is an observational analytic study conducted using a cross-sectional approach with a sample of 75 people. Data collection methods were carried out through interviews, questionnaires, and anthropometric measurements, then analyzed using the Spearman Rank Correlation test. Relationship between breakfast and nutritional status showed a p-value = 0.029 (<0.05). The research results for the analysis of the relationship between sleep quality and nutritional status showed a p-value = 0.497 (>0.05). There is a relationship between breakfast and nutritional status among accelerated class students at MAN Kota Surabaya. Furthermore, there is no relationship between sleep quality and nutritional status among accelerated class students at MAN Kota Surabaya.

Keywords: Breakfast, Sleep Quality, Nutritional Status, Acceleration Class

BACKGROUND

Adolescents are the driving force that will compete with the developments of the future. Health is one of the supporting aspects for adolescents to have the strength to build abilities and grow. Health is a state where physical, mental, and social conditions are truly well-being, not just free from disease or disability. A common health problem among adolescents in Indonesia is nutritional status (Keats 2021; Neufeld 2022; Norris 2022). During this period, adolescents need more nutrient intake to provide resilience during their growth phase (Desbrow 2021; Kim 2021; Proia 2021; Savarino 2021). However, many adolescents still do not understand their body's nutritional needs. The prevalence of nutritional status among 16-18 years old in Indonesia is as follows: 4% are obese, 9.5% are overweight, 78.3%

have normal nutritional status, 6.7% are underweight, and 1.4% are severely thinness (Badan Penelitian Dan Pengembangan Kesehatan Republik Indonesia 2018).

Nutritional status can be considered as a measure of the success in meeting the nutritional needs, which will be expressed through the calculation of Body Mass Index (BMI). The balance between food intake and activity make a positive impression on an individual's nutritional status (Deschasaux-Tanguy 2021; Giuntella 2021; Hu 2021; Ibsen 2021). Adolescents with abnormal nutritional status may easily feel drowsy, lack enthusiasm, and experience decreased cognitive abilities. One factor that can cause this is skipping breakfast. Making breakfast a habit can enhance concentration and learning; it

provides the energy's needed for the body, prevents feelings of fatigue and drowsiness at school (Berryman 2021; Freitas 2022; Ochoa 2021). This energy helps improve focus and concentration, making it easier to grasp lessons at school (Marvelia, Kartika, and Dewi 2021). 26% of children only drink plain water, tea, or milk for breakfast (Huanchaire-Vega 2021; Sincovich 2022; Tornese 2022). Among schoolchildren, 66.7% often have breakfast, 33% rarely have breakfast, and 69.6% consume breakfast that is not in accordance with recommendations and is inappropriate (Badan Penelitian Dan Pengembangan Kesehatan Republik Indonesia 2018).

Sleep quality is also a factor that influences nutritional status (Godos 2021; Wang 2021). Sleep quality refers to the condition where an individual is able to fulfill their rest needs according to recommendations, thus feeling fresh and energetic upon waking up (Martínez-de-Quel 2021; Nelson 2022; Sejbuk 2022; Trabelsi 2021; Xu 2021). Schoolchildren who experience sleep deprivation tend to have unhealthy eating habits, such as consuming high-fat and high-carbohydrate foods (Sitoayu et al. 2021). Physical activity decreases with poor sleep quality and increases the desire to consume food, thus affecting nutritional status (Utomo Danang Wahyu and Dwiana Alya 2022). Moreover, having poor sleep quality but a busy schedule may cause someone to skip meals, leading to unmet nutritional needs. Therefore, both factors become important components, especially for adolescents in accelerated classes.

Accelerated classes are those with a faster learning model. Acceleration indicates the presence of students with exceptional intelligence who can achieve competencies given more quickly and attain excellent grades (Mutia 2020). This makes students in accelerated classes have a greater study workload compared to regular students. Excessive studying can lead to

worrying about assignments and exams, resulting in a lot of pressure and academic stress. Therefore, breakfast and sleep quality are likely to be neglected due to the study workload. Madrasah Aliyah Negeri (MAN) Kota Surabaya is an Islamic high school in Surabaya.

This research is an analytical observational research with a cross-sectional design (Sugiyono 2007). The research begins with a preliminary study conducted at MAN Kota Surabaya for the proposal and report preparation. The population in the study consists of 75 accelerated class students, and the sample size is also 75 students using the total sampling method. In this research, the method used involves interviews assisted by questionnaires and anthropometric measurements, followed by univariate and bivariate analysis of variables.

RESULTS

The four characteristics of respondents to be examined in this study are age, gender, weight, and height. Based on the data collection results, respondents from the accelerated class of MAN Kota Surabaya are classified as follows.

Table 1. Frequency Distribution of Age among Students in the Acceleration Class of MAN Kota Surabaya in 2023

Age	Amount	
	n	%
15	11	14.6
16	35	46.7
17	29	38.7
Total	75	100

Source: 2023 Research.

Based on the data obtained, it can be known that 46.7% of the respondents are 16 years old, which is a total of 35 out of 75 respondents.

Table 2. Frequency Distribution of Gender among Students in the Acceleration Class of MAN Kota Surabaya in 2023.

Gender	Amount	
	n	%
Male	26	34.7
Female	49	65.3
Total	75	100

Source: 2023 Research.

Based on the data obtained, female respondents are more numerous, totaling 49 respondents (65.3%).

Table 1. Frequency Distribution of Weight among Students in the Acceleration Class of MAN Kota Surabaya in 2023.

Weight	Amount	
	n	%
40-50	21	28
51-60	36	48
61-70	10	13.3
71-80	6	8
81-90	2	2.7
Total	75	100

Based on the data obtained, the respondents mostly have a weight in the range of 51-60 kg, totaling 36 respondents with a percentage of 48%.

Table 2. Frequency Distribution of Height among Students in the Acceleration Class of MAN Kota Surabaya in 2023.

Height	Amount	
	n	%
140-150	10	13.3
151-160	37	49.4
161-170	24	32
171-180	4	5.3
Total	75	100

Based on the data obtained, the most respondents have a height in the range of 151-160 cm, totaling 37 respondents with a percentage of 49.4%.

Table 3. Frequency Distribution of Breakfast Questionnaire among Students in the Acceleration Class of MAN Kota Surabaya in 2023.

Breakfast	Amount	
	n	%
Good	39	52
Enough	36	48
Less	0	0
Total	75	100

The respondents mostly have a good breakfast category, totaling 43 respondents, which is 52%.

Table 4. Frequency Distribution of Recall among Students in the Acceleration Class of MAN Kota Surabaya in 2023.

Breakfast Recall	Amount	
	n	%
Good	33	44
Bad	42	56
Total	75	100

Based on the data obtained, there are 33 respondents (44%) with good recall results and 42 respondents (56%) with bad recall results.

Table 5. Frequency Distribution of Sleep Quality among Students in the Acceleration Class of MAN Kota Surabaya in 2023.

Sleep Quality	Amount	
	n	%
Good	8	10.7
Bad	67	89.3
Total	75	100

From the data obtained, respondents with bad sleep quality reach more than half of the respondents, totaling 67 respondents, or 89.3%.

Table 6. Frequency Distribution of Nutritional Status among Students in the Acceleration Class of MAN Kota Surabaya in 2023.

Nutritional Status	Amount	
	n	%
Severely Thinness	0	0
Thinness	2	2.7
Normal	64	85.3

Overweight	9	12
Obese	0	0
Total	75	100

The data illustrates that the most respondents have a normal nutritional

status, totaling 64 respondents, with a percentage of 85.3%, while 11 others have undernutrition or overnutrition status.

Table 7. Cross-Tabulation of Breakfast with Nutritional Status among Acceleration Class Students at MAN Kota Surabaya

Breakfast	Nutritional Status										P Value		
	Severely Thinness		Thinness		Normal		Overweight		Obese			Total	
	n	%	n	%	n	%	n	%	n	%		n	%
Good	0	0	2	2.7	28	37.3	9	12	0	0	39	52	0.029
Enough	0	0	0	0	36	48	0	0	0	0	36	48	
Less	0	0	0	0	0	0	0	0	0	0	0	0	
Total	0	0	2	2.7	64	85.3	9	11.9	0	0	75	100	

Based on the cross-tabulation table above, 2 respondents (2.7%) have a good breakfast category but are thinness. 28 respondents (37.3%) have a good breakfast category and normal nutritional status. And, those with a good breakfast category but with overweight status are 9 respondents (12%). Meanwhile, those with an enough

breakfast category all have normal nutritional status, totaling 36 respondents (48%). Additionally, in the data, the p-value of 0.029 (<0.05) indicates a significant relationship between breakfast consumption and nutritional status among Acceleration Class students at MAN Kota Surabaya.

Table 8. Cross-Tabulation of Sleep Quality with Nutritional Status among Acceleration Class Students at MAN Kota Surabaya

Sleep Quality	Nutritional Status										P Value		
	Severely Thinness		Thinness		Normal		Overweight		Obese			Total	
	n	%	n	%	n	%	n	%	n	%		n	%
Good	0	0	1	1.3	6	8	1	1.3	0	0	8	10.7	0.497
Bad	0	0	1	1.3	58	77.3	8	10.7	0	0	67	89.3	
Total	0	0	2	2.6	64	85.3	9	12	0	0	75	100	

Based on the cross-tabulation table above, respondents categorized with good sleep quality but thinness account for 1.3% or 1 person. Respondents with good sleep quality and normal nutritional status are 6 people (8%). 1 person (1.3%) has moderate sleep quality but overweight status. Similarly, there is 1 person (1.3%) categorized with bad sleep quality and thinness status. Respondents with bad sleep quality but normal nutritional status are 58 people (77.3%), while those with overweight status are 8 people (10.7%). In

this data, the p-value of 0.497 (>0.05) indicates that there is no significant relationship between sleep quality and nutritional status among Acceleration Class students at MAN Kota Surabaya.

DISCUSSION

a75 samples are students from the Acceleration Class of MAN Kota Surabaya. Based on the research results above, of the 75 student respondents, it was found that 46.7% were 16 years old, and the majority were female, totaling 49 respondents

(65.3%). Additionally, most respondents had a body weight in the range of 51-60 kg, with 36 respondents (48%). The height range of 151-160 cm was represented by 37 respondents (49.4%).

The breakfast assessment of respondents was measured using a breakfast questionnaire derived from previous research and had been tested for validity and reliability. From the research conducted, the majority of respondents fell into the good breakfast category, with 39 respondents (52%). From the questionnaire interviews conducted, it was found that the majority of respondents had breakfast 4-6 times a week. Although they often had breakfast, there were still respondents with poor recall results, totaling 42 respondents. This was because the food consumed by respondents did not meet the minimum of 20% of the total daily needs. Some respondents only consumed carbohydrates and animal protein. Some also only had a minimal breakfast, such as consuming bread, sachet drinks, and milk. This situation was also influenced by respondents' food preferences and infrequent consumption of vegetables. Some respondents' parents had not finished cooking in the morning, so respondents only consumed practical and quick food to avoid being late for school. Some also mentioned that working parents determined the available breakfast menu, leading to certain days without breakfast food. This finding is similar study, where people skipped breakfast due to limited time for preparing breakfast because of early departures and working mothers' busy schedules (Rahmah Maulidya 2018). Parents lacked the time to prepare breakfast as they had to work, which became a reason for children skipping breakfast (Khomsan Ali 2010). Some research also found a relationship between breakfast and nutritional status in adolescents, with 0.016 p-value (Purwanti and Shoufiah 2017). Another study conducted on junior high school students in Bandar Lampung yielded

a 0.004 p-value (Salsabila Puteri Sahara 2023).

Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI) questionnaire. From the interviews conducted, it was concluded that 67 respondents or 89.3% had poor sleep quality. This result was similar to the research where 84.7% of respondents had poor sleep quality (Utomo Danang Wahyu and Dwiana Alya 2022). At MAN Kota Surabaya's Acceleration Class, most respondents slept very late or woke up too early, resulting in very short sleep hours because most respondents had to attend additional lessons at night and could only start doing school assignments after 9 PM, or they continued their tasks in the early morning, causing them to wake up earlier and have very short sleep hours. Additionally, other disturbances such as difficulty falling asleep after lying down, waking up in the middle of the night, frequent urination, snoring, feeling hot or cold, and nightmares affected sleep quality. This result is consistent with study (Utomo Danang Wahyu and Dwiana Alya 2022), where 84.7% of respondents did not show good sleep quality, and no relationship was found between sleep quality and nutritional status. This is because nutritional status can be influenced by other factors such as intake and activity.

Respondents' nutritional status was assessed using body weight (BW) and height (HT), then calculating BMI and comparing it to the BMI/Age standard (Permenkes 2020). Based on the data collection results, most respondents had normal nutritional status, totaling 64 respondents, with a percentage of 85.3%. However, there were still 2 respondents (2.7%) with undernutrition and 9 respondents (12%) with overnutrition. This result is in line with Basic Health Research 2018, which states that 78.3% of children in Indonesia have normal nutritional status, although 4% are obese, 9.5% are

overweight, 6.7% are thin, and 1.4% are very thin.

From the statistical cross-tabulation test of breakfast with nutritional status, a p-value of 0.029 (<0.05) was obtained, indicating a relationship between breakfast and nutritional status in the Acceleration Class students of MAN Kota Surabaya. Similar research conducted on Nutrition Department students of Poltekkes Kemenkes Maluku resulted in 0.002 p-value, indicating a relationship between breakfast and nutritional status (Sammeng and Soumokil 2023). In this study, respondents categorized as having a good breakfast but having undernutrition or overnutrition can occur because an individual's nutritional status can be influenced by various factors such as intake during other meals, snacks, and infectious diseases within them. Malnutrition causes children to feel tired, unable to perform long-term activities, and unable to think clearly. The risk of exposure to infectious diseases also increases (Lasidi, Umboh, and Ismanto 2018). Likewise, respondents with a sufficient breakfast category and normal nutritional status likely have good intake during other meals and snacks. Additionally, factors supporting nutritional status include the balance between intake and activity. High physical activity can balance the energy intake and expenditure, preventing BMI changes. There is study similar to this research, yielding 0.039 p-value, indicating a relationship between breakfast and nutritional status (Dewi Noviyanti and Pertiwi Dyah Kusudaryati 2018). A study on SMPN 5 Banyuwangi students also found a similar result, with 0.049 p-value, where 91.9% of respondents had a good breakfast category (Amalia and Adriani 2019).

From the data collection results and subsequent tests, a p-value of 0.497 (>0.05) was obtained, indicating no relationship between sleep quality and nutritional status in the Acceleration Class students of MAN Kota Surabaya. In this study, 58

respondents (77.3%) had poor sleep quality but normal nutritional status. During the interview process, most respondents mentioned often sleeping for a short duration and experiencing sleep disturbances due to fatigue from activities and learning. Activity can be a major reason most respondents have normal nutritional status. At a productive age like the respondents, individuals usually have high activity levels, which can help maintain BMI balance due to the balance between intake and activities. Additionally, respondents did not consume food at night, despite the possibility of increased ghrelin hormone, as respondents used the night to continue tasks and study. This result is similar to Fibriana's study on Medical Faculty students at Brawijaya University, which found 0.270 p-value indicating no relationship between sleep quality and nutritional status due to short sleep time and increased BMI in children. The same result was found in Nur's (2012) study on high school students, with 0.263 p-value, indicating no relationship between sleep duration and nutritional status. There's study also provided consistent results, with 0.411 p-value, indicating no relationship between sleep quality and nutritional status (Amalia and Adriani 2019).

CONCLUSION

The majority of respondents from the accelerated classes at MAN Kota Surabaya are 16 years old and female. Respondents have the highest Body Weight in the range of 51-60 kg and Height in the range of 151-160 cm. Most respondents from the accelerated classes at MAN Kota Surabaya have a good breakfast category, while the majority have a bad quality of sleep category. Most respondents from the accelerated classes at MAN Kota Surabaya have normal nutritional status. From the Spear-man Rank Correlation test results, it is concluded that there is a relationship between breakfast and nutritional status among the Accelerated Class Students at

MAN Kota Surabaya with a p-value of 0.029. From the Spearman Rank Correlation test results, it is concluded that there is no relationship between sleep quality and nutritional status among the Accelerated Class Students at MAN Kota Surabaya with a p-value of 0.497.

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