

Obesity Affects the Ability to Memorize the Quran of Santriwati at Darul Aman Islamic Boarding School

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Abstract

Obesity has multifactorial impacts on memory and cognitive function in children and adolescents. Addressing this issue in an Islamic boarding school context is vital. The purpose of the study is to explore the influence of overweight on Quran memorization abilities among female students at Darul Aman Islamic Boarding School in Makassar. The methods of this study is observational with cross-sectional design. This study involved tenth and eleventh-grade female students, BMI was measured, and Quran memorization was assessed using the Muraja'ab method. Data were analyzed using SPSS, with univariate and bivariate analyses, and statistical tests including the independent two-sample t-test. The result of this study is out of 56 students, 31 had normal BMI, and 25 were overweight. Quran memorization ability was classified as good in 51.8% of students and less in 48.2%. Overweight students had a mean memorization score of 1224 ± 294.8 , significantly lower than the normal BMI group with 1719 ± 303.8 ($p < 0.05$). This indicates a notable negative impact of overweight on Quran memorization abilities. The suggestion is overweight negatively affects Quran memorization abilities in female students, highlighting the need for effective nutritional interventions in boarding school environments.

Keywords: Obesity, Ability to Memorize the Quran, Boarding School

INTRODUCTION

Obesity in adolescents is a growing health problem worldwide, including in Indonesia. Obesity is a condition where there is an excessive accumulation of fat in the body, which can negatively affect a person's physical and cognitive health. According to the World Health Organization (WHO), the prevalence of obesity in children and adolescents has significantly increased over the past few decades, largely due to changes in diet and unhealthy lifestyles (1). At Darul Aman Islamic Boarding School in Makassar, obesity is also found among female students, raising concerns about its impact on their ability to memorize the Quran (2)(3).

The ability to memorize the Quran is one of the main programs at Darul Aman Islamic Boarding School. The memorization process requires high concentration, good memory, and optimal physical and mental conditions. Several studies have shown that obesity can affect cognitive functions, including memory and concentration, which ultimately can affect learning and memorization abilities (4,5). Therefore, it is important to explore how overweight or obesity conditions can affect the ability to memorize the Quran among female students at the boarding school.

The main issue in this study is the high obesity rate among female students at Darul Aman Islamic Boarding School and its impact on their ability to memorize the Quran. Initial data indicates that more than 30% of the female students at this boarding school are overweight or obese, which potentially affects their academic performance and memorization abilities (Makassar City Health Office, 2021) (6). This study aims to analyze the relationship between overweight conditions and the ability to memorize the Quran among female students, as well as to find solutions that can be implemented to address this issue.

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Previous research shows that comprehensive and sustainable interventions can help address obesity issues and improve cognitive functions. A study by Hill et al. (2020) showed that integrated nutrition and exercise intervention programs can reduce the prevalence of obesity and improve cognitive abilities in adolescents (6). Another study by Davis et al. (2019) found that increasing physical activity can significantly improve memory and concentration functions in children and adolescents with obesity (7,8).

Obesity has been recognized as a factor that can affect cognitive functions, including memory, in children and adolescents. Research shows that children and adolescents who are obese tend to have lower cognitive performance compared to those with normal weight (9). One underlying mechanism for this influence is chronic inflammation that often accompanies obesity, which can damage brain structure and function (10). Other studies show that insulin resistance, which often occurs in obese individuals, can negatively impact hippocampal function, the area of the brain responsible for memory (11).

Additionally, obesity is also associated with sleep disorders such as sleep apnea, which can reduce sleep quality and impact cognitive abilities, including short-term and long-term memory. (12). Research by Davis et al. (2019) found that children with obesity who participated in an aerobic exercise program showed significant improvements in cognitive functions, including memory, compared to the control group (13).

Poor nutrition intake, which often accompanies obesity, can also affect brain function (14). Deficiency of essential nutrients such as omega-3 fatty acids, which are important for brain development, can negatively impact memory and other cognitive functions. Recent research also shows that children with obesity who receive nutritional interventions and increased physical activity show improvements in memory function and academic performance (15), (16,17).

Other related literature highlights the importance of a holistic approach in addressing obesity and its impact on cognition. For example, a study by Anderson et al. (2021) emphasized the importance of psychosocial support in addition to nutritional and physical interventions (18). This study also showed that an approach involving the entire school or boarding school community can be more effective in addressing obesity issues and improving academic performance. However, there is still a gap in research regarding the implementation of these programs in boarding school environments, particularly those focusing on the ability to memorize the Quran.

The purpose of this study is to explore the influence of overweight on the ability to memorize the Quran among female students at Darul Aman Islamic Boarding School in Makassar. This study is expected to contribute new insights into how physical conditions affect cognitive abilities in boarding school environments and provide a basis for developing more effective intervention programs. This study also aims to fill the gap in previous research by emphasizing the local and specific context at Darul Aman Islamic Boarding School in Makassar.

METHODS

This study utilized an observational approach with a cross-sectional study design. The measurement of overweight and Quran memorization abilities of overweight and obese female students was conducted simultaneously. Data collection was carried out in February 2023 at Darul Aman Gombara Islamic Boarding School in Makassar City.

The sample consisted of female students in the tenth and eleventh grades at Darul Aman Gombara Islamic Boarding School in Makassar City. The selection of these grades was based on the consideration that these students had not memorized a significant portion of the Quran. Inclusive criteria were as follows: willingness to participate, normal or overweight/obese nutritional status, physical and mental health, no previous memorization of Surah At-Tur, and presence during the study. Exclusive criteria included unwillingness to participate in research activities, underweight or severely underweight nutritional status, health problems, previous memorization of Surah At-Tur, and absence during the study. Sampling in this study was determined using total sampling. Total sampling was chosen because the population size was less than 100 individuals, making it feasible to include the entire population as the research sample.

Data on obesity status were collected through anthropometric measurements and determined using the Body Mass Index (BMI). Weight measurements were taken using a digital scale with a precision of 0.1 kg, and height measurements were conducted using a microtoise with a precision of 0.1 cm. Weight and height measurements were performed by the research team.

The measurement of Quran memorization ability was conducted using the Muraja'ah (review) method, with the following procedure: 1) The teacher/ustadz selected the Surah to be read and memorized, in this case, Surah At-Tur. 2) Female students were given 30 minutes to read the selected Surah. 3) Female students performed the Muraja'ah session in front of the teacher (ustadz). 4) The teacher (ustadz) assessed the memorization results based on three aspects: the quantity of memorization, Tajweed (rules of Quranic recitation), and fluency. The assessment of the quantity of memorization was based on the number of verses memorized within the specified time frame. Tajweed and fluency were assessed using a scoring system ranging from 0-3, with scores assigned as follows: maqbul = 0, jayyid = 1, jayyid jiddan = 2, mumtaz = 3.

Data processing and analysis were conducted using the SPSS computer program. Obesity data were categorized into two groups: obese/overweight (BMI > 25 kg/m²) and normal (BMI 18.5 - 25 kg/m²). Univariate and bivariate analyses were performed. Univariate analysis included proportions or percentages (%), mean, and standard deviation (SD). Bivariate analysis used statistical tests, specifically the independent two-sample t-test, to analyze the influence of overweight on the Quran memorization ability of female students. The statistical analysis used an alpha level of 0.05.

This research was conducted after obtaining ethical clearance from the Health Research Ethics Commission (KEPK) of the Ministry of Health Politechnic in Makassar, with reference number 007/M/KEPK-PTKMS/III/2023. Informed consent was obtained from each participant after providing explanations (PSP) regarding their willingness to participate in the research.

RESULTS

Table 1 Characteristics of Female Student Samples at Darul Aman Islamic Boarding School

Variables	n	%
Age		
14 Year	3	5,4
15 Year	31	54,4
16 Year	22	39,2
Father's Occupation		
Government Officials, police, militari	28	50
Private Employee	11	19,6
Trader	6	10,7
Entrepreneur	3	5,4
Agriculturist	1	1,8
Pension	1	1,8
Contract Employee	1	1,8
Others	5	8,9
Mother's occupation		
Government Officials, police, militari	27	48,2
Private Employee	3	5,4
Trader	3	5,4
Entrepreneur	4	7,1
homemaker	19	33,9
Total	56	100

Table 1 shows that the majority of female student participants in this study are 15 years old (55.5%). The most common occupation of the fathers is as civil servants (including civil, police, and military personnel), accounting for 50%. Similarly, the most common occupation of mothers is civil servants (48.2%), followed by homemakers (33.9%).

Table 2. Nutritional Status and Quran Memorization Ability of Female Students at Darul Aman Islamic Boarding School

Variables	n	%
Nutrition status:		
Normal	31	55.4
Overweight	25	44.6
Quranic memorization skill:		
Good	29	51.8
Less	27	48.2
Total	56	100

Based on Table 2 above, the percentage of female students who are overweight is 44.6%, and those who have good Quranic memorization abilities is 51.8%.

Table 3. The Influence of Overweight on the Quran Memorization Ability of Female Students at Darul Aman Islamic Boarding School

Nutrition status	n	memorization score		Sig*
		Mean	standard deviation	
Overweighth	25	12,24	2,948	0,001
Normal	31	17,19	3,038	

* $p < 0.05$, independent *t* test

DISCUSSION

Data in Table 2 shows the distribution of nutritional status and Quran memorization ability among female students at Darul Aman Islamic Boarding School in Makassar. Of the 56 female students, 31 (55.4%) have normal nutritional status and 25 (44.6%) are overweight. This distribution indicates that nearly half of the students are overweight. Quran memorization ability is almost evenly distributed, with 29 (51.8%) students having good ability and 27 (48.2%) having less good ability. Previous research has shown that obesity is closely related to decreased cognitive function, including memory and attention. Smith et al. (2021) found that insulin resistance in obese individuals can disrupt the hippocampus function, which is important for memory formation (21). Reichelt and Rank (2020) stated that chronic inflammation induced by obesity can affect brain function and memory (22).

The analysis results show the influence of obesity on the ability to memorize the Quran with significant values. Students with overweight nutritional status have a lower average memorization score (12.24) compared to students with normal nutritional status (17.19). The nearly identical standard deviations indicate that the variation in memorization ability in these two groups is not very large, but the significant mean difference ($p < 0.05$) shows a negative relationship between overweight and memorization ability. Research by Miller et al. (2019) shows that chronic inflammation induced by obesity can affect brain function and memory (23). In addition, Davis et al. (2019) found that increasing physical activity can improve cognitive function in children with obesity, including memory (24).

Research conducted by Gomez-Pinilla (2020) shows the importance of good nutritional intake, especially omega-3 fatty acids, for brain health and memory function (25). Research by Nguyen et al. (2020) supports these findings, adding that nutritional interventions that improve diet quality can enhance academic performance and cognitive function in children with obesity (26). These findings are consistent with previous research showing that aerobic exercise can improve memory capacity and cognitive function (21).

However, there is research that contradicts these results. For example, research by Anderson et al. (2020) found no significant relationship between obesity and cognitive function in children (27). This may be due to other factors such as learning environment and social support that can influence children's learning outcomes. Research by Larson et al. (2020) shows that dietary intervention alone without physical exercise is not sufficient to improve cognitive function in children with obesity (28).

Research by Kheirandish-Gozal and Gozal (2020) shows that sleep disorders such as sleep apnea, which are more common in obese individuals, can reduce sleep quality and affect cognitive abilities (29). Therefore, it is important to consider sleep disorders as a factor that can affect Quran memorization ability in overweight

students. Research by Voss et al. (2019) shows that interventions including increased physical activity and stress management can help improve sleep quality and cognitive function in children with obesity (30).

Overall, the results of this study indicate that obesity has a significant negative impact on the ability to memorize the Quran among female students at Darul Aman Islamic Boarding School. However, these results also indicate the need for a comprehensive and holistic approach in dealing with obesity, including increasing physical activity, improving diet quality, and managing sleep disorders. In other side to memorize quran needs the assisting of the parents (34). Further research is needed to explore the mechanisms underlying the relationship between obesity and cognitive function, as well as to develop more effective interventions to improve cognitive and memory abilities in children and adolescents with obesity.

The implementation of these research findings can improve the quality of education in boarding schools, especially in Quran memorization programs, through several strategic steps. First, the implementation of a balanced nutrition program rich in essential nutrients for cognitive function, such as omega-3 and antioxidants, is highly recommended. A study by Wahl et al. (2019) shows that good nutrition can improve cognitive function and protect the brain from functional decline associated with obesity and aging (31). Additionally, research by Hendrie et al. (2023) emphasizes the importance of nutrition for cognitive health throughout life (32). By providing nutritious foods and supplements that support brain health, boarding schools can help students improve their memorization abilities.

In addition, integrating regular physical activity programs into the boarding school curriculum is crucial. Research shows that physical activity can increase blood flow to the brain and strengthen neuronal connectivity essential for memory and learning. For instance, research by Guure et al. (2024) found that regular physical activity can prevent cognitive decline and improve memory function in individuals at high risk of dementia (33). By incorporating routine exercise sessions and physical games into daily activities, boarding schools can help students reduce obesity and improve their cognitive capacity, which in turn will enhance their ability to memorize the Quran.

Limitation of the study, iron and Folic Acid tablet adherence was decided by the pregnant women's nod of taking medication which might not be the actual adherence in pregnant women. This study was conducted among relatively smaller sample size which limits us to generalize the results. Health education was given but pursuance of that education was not monitored

CONCLUSION

Overall, the results of this study indicate that obesity has a significant negative impact on the ability to memorize the Quran among female students at Darul Aman Islamic Boarding School. However, these results also indicate the need for a comprehensive and holistic approach in dealing with obesity, including increasing physical activity, improving diet quality, and managing sleep disorders. Further research is needed to explore the mechanisms underlying the relationship between obesity and cognitive function, as well as to develop more effective interventions to improve cognitive and memory abilities in children and adolescents with obesity.

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