

ORIGINAL RESEARCH

Tahajjud Prayer and Its Association with Anthropometric and Blood Pressure Parameters in Young Adults: A Cross-Sectional Study



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Abstract

Background: The spiritual significance of *Tahajjud* (Islamic voluntary night prayer) is well established; however, its association with physiological markers, such as body weight (BW), body mass index (BMI), and blood pressure (BP), particularly in relation to gender, remains underexplored.

Purpose: This study aimed to assess the association between Tahajjud prayer and anthropometric and BP parameters in young adults by comparing Tahajjud and non-Tahajjud groups, as well as regular and irregular Tahajjud practice, with attention to gender differences.

Methods: A cross-sectional study was conducted among 462 Muslim participants (206 men, 256 women) aged 18–22 years. Data on demographics, religious practices, and Tahajjud frequency were collected through questionnaires. Participants were categorized into Tahajjud and non-Tahajjud groups; those who performed Tahajjud were further classified as regular (≥ 3 times/week) or irregular (< 3 times/week). BP was measured using a digital sphygmomanometer, BW with a digital scale, and height with a digital stadiometer. Comparisons of BW, BMI, and BP were made across Tahajjud and non-Tahajjud groups, regular and irregular Tahajjud practitioners, and by gender. Data were analyzed using Chi-square and t-tests at a 95% confidence level ($p < 0.05$).

Results: The prevalence of Tahajjud practice was higher among women than men, both overall (70.71% vs. 66.51%) and for regular practice (32.04% vs. 13.86%), with a significant gender difference in regular Tahajjud ($p = 0.001$). No significant gender-specific differences in BW or BMI were observed between Tahajjud and non-Tahajjud groups. Among women, systolic BP was significantly lower in the Tahajjud group ($p = 0.001$). Regular Tahajjud practice was associated with lower BW and BMI in both women ($p < 0.005$) and men ($p < 0.05$). Although systolic and diastolic BP were lower among regular Tahajjud practitioners, differences were not statistically significant. Irregular Tahajjud was associated with a higher prevalence of overweight and obesity ($p = 0.016$).

Conclusions: Regular Tahajjud practice was associated with lower BW, BMI, and modest reductions in BP, suggesting a potential role in obesity prevention and cardiovascular health. Nurses can incorporate culturally relevant practices, such as Tahajjud, into health education and lifestyle counseling programs.

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1. Introduction

Obesity, a complex public health issue, contributes to various comorbidities (Castro et al., 2020). It was officially classified as a disease in 2012 (Meouchy et al., 2022). Obesity elevates the risk of heart disease, type 2 diabetes, cancer, hyperlipidemia, infertility, and hypertension, thereby increasing mortality rates (Chin et al., 2016; Jiang et al., 2016; Wiklund, 2016). Over 60% of adults globally, including those in Indonesia, are classified as obese (World Health Organization [WHO], 2021). Data from the WHO indicate that obesity in Indonesia has doubled over the last two decades (WHO, 2021). The national prevalence has reached 23.1% (Harbuwono et al., 2018), while adolescent obesity in Aceh stands at 21.96% (Yusni & Meutia, 2019). Obesity

results from an imbalance between calorie intake and expenditure; thus, physical activity is an effective strategy for weight management (Chin et al., 2016). Globally, 39% of individuals engage in low physical activity, with rates reaching 33.5% in Indonesia (Dewi et al., 2020).

Preventing and managing obesity involves adopting a healthy lifestyle that includes a balanced diet and increased physical activity (Hamasaki, 2017; Petridou et al., 2019). Regular physical activity lowers the risk of cardiovascular disease, musculoskeletal conditions, and metabolic syndrome (type 2 diabetes, dyslipidemia, hypertension, and obesity) (Nazish & Kalra, 2018). A close link exists between obesity and hypertension through endocrine pathways (Meouchy et al., 2022). Moderate-intensity exercise effectively reduces both body weight and blood pressure (BP) (Jakicic et al., 2018).

Individuals with higher physical activity tend to have less visceral fat, reduced liver fat stores by around 50%, a lower fat percentage, and a lower BMI (Wiklund, 2016). Physical activity at moderate intensity, lasting 150 to 250 minutes per week, results in an energy expenditure of 1,200 to 2,000 kcal per week, which helps in preventing weight gain of more than 3% in adults (Orellana et al., 2020). Additionally, moderate-intensity physical activity leads to weight loss of about 2-3 kg, with a higher reduction of 5-7.5 kg if the activity is sustained for 225–420 minutes per week (Orellana et al., 2020). While these findings support the general impact of physical activity on weight control, a gap exists in the literature regarding the specific effects of religious practices, such as salat or Tahajjud prayer, on body weight regulation.

Salat (Islamic prayer) is a unique form of structured, repetitive physical movement that offers health benefits and potential therapeutic value (Nazish & Kalra, 2018). Studies have shown that salat promotes physical fitness, disease prevention, and overall well-being (Rufa'i et al., 2013). As a light-to-moderate intensity physical activity, salat can be performed safely for extended durations across age groups, offering benefits such as enhanced lipolysis and reduced fat stores (Kamran, 2018; Nazish & Kalra, 2018). It has also been linked to improved BP regulation (Fikri & Boy, 2019) and overall fitness (Wahab & Ahmad, 2016). Salat is spiritual medicine that can be a cure for various diseases (Chamsi-pasha, 2021). It is also a therapeutic exercise for stroke patients to maintain balance, prevent osteoarthritis, and reduce the risk of cardiovascular disease and obesity (Osama et al., 2019). The salat movement, as exemplified by Rasulullah Muhammad SAW at every change of position, has been recognized by sports medicine experts as a highly complex movement because, during prayer, almost all muscles and joints are trained (Nazish & Kalra, 2018). Salat reduces sympathetic nerve activity and increases parasympathetic activity, resulting in relaxation, reduced stress, reduced anxiety, reduced cardiovascular risk, and reduced obesity (Doufesh et al., 2014; Yusni & Rahman, 2024). Thus, salat plays a role in preventing and controlling weight (Iftikhar et al., 2016). Among various types of salat, Tahajjud holds particular significance due to its unique timing, spiritual depth, and potential benefits for physical health.

Tahajjud prayer is a sunnah prayer that is generally performed by Muslims to obtain rewards from Allah SWT (Utami & Usiono, 2020). Tahajjud, a voluntary night prayer in Islam, is performed during the last third of the night (Yusni et al., 2023). This prayer involves repeated physical movements such as standing, bowing, and prostrating, which may contribute to physical activation (Yusni et al., 2023). It also includes elements of mindfulness, self-reflection, and spiritual connection, all of which are considered valuable in nursing models that integrate bio-psycho-spiritual care. As a voluntary prayer performed in the last third of the night, Tahajjud may influence health indicators such as body weight (BW), body mass index (BMI), and BP.

In terms of health, BW, BMI, and BP are important indicators that contribute significantly to overall well-being (Yusni et al., 2024). These parameters are critical in assessing the risk of various health issues such as cardiovascular diseases, diabetes, and metabolic dysfunctions (Mendes et al., 2025). Monitoring BW, BMI, and BP can help identify individuals at risk and support early intervention. Additionally, the regulation plays a significant role in maintaining health, especially in young adults undergoing various physical, hormonal, and metabolic changes (Mendes et al., 2025; Yusni et al., 2024; Yusni & Yusuf, 2022). Examining the relationship between these indicators is crucial for predicting health outcomes across diverse populations.

Gender-specific studies frequently reveal differences in BW, BMI, and BP due to physiological and metabolic factors that differ between men and women (Sabatina et al., 2022). For instance, women typically have a higher body fat percentage and different hormonal profiles than men, which can influence body composition and BP regulation (Mahwati, 2019). These gender differences make it important to compare BW, BMI, and BP between men and women, as they

provide valuable insights into how these parameters affect their health. Such differences underscore the importance of gender-based comparisons, offering insights into health risks and informing tailored interventions, especially regarding cardiovascular health and weight management for preventing obesity (Lopez-Jimenez et al., 2022; Zouhal et al., 2020).

Research indicates that Tahajjud may enhance energy metabolism and reduce adipose tissue by increasing lipolysis, mediated by elevated lipase activity. These physiological effects may help improve dyslipidemia, increase muscle mass, and support weight loss (Kantanista & Osiński, 2014). This study offers a novel perspective by exploring the relationship between regular Tahajjud prayer and physiological indicators, including body weight, body mass index (BMI), and blood pressure, among young adults. While previous research has examined the psychological and spiritual benefits of night prayers (Suseno, 2023; Yusni & Rahman, 2024), empirical evidence concerning their influence on physical health parameters remains limited. Addressing this gap, the present cross-sectional study investigates whether the performance and regularity of Tahajjud prayer—which involves moderate-intensity physical movements—are associated with variations in body weight, BMI, and blood pressure among both genders. The study provides initial insights into the potential role of Tahajjud as a complementary, non-pharmacological approach to health promotion and nursing practice. Its findings are expected to inform future investigations, including clinical trials, to assess the long-term effects of Tahajjud on physical health outcomes and to support the development of spiritually sensitive, faith-integrated health promotion strategies for holistic patient care.

2. Methods

2.1. Research design

This study employed a cross-sectional study design to investigate the association between Tahajjud prayer and anthropometric parameters, as well as blood pressure, among young adults.

2.2. Setting and samples

This study was conducted in Banda Aceh, Indonesia, between August and September 2023. The research targeted young participants, specifically selecting students from a National Higher Education Institution residing in student dormitories. The choice of dormitory was made to standardize the subjects' characteristics and lifestyles, thereby minimizing potential confounding variables that could affect the research outcomes. Confounding variables such as differences in sleep and wake patterns, daily physical activity levels, and dietary intake were minimized by selecting participants who shared the same living environment, followed a similar daily routine, and received standardized meals provided by the dormitory. The inclusion criteria for the research subjects were being Muslim, aged 18-25, healthy, and either male or female. Exclusion criteria included participants with hypertension based on a doctor's diagnosis, those unwilling to participate, those with incomplete data, athletes (based on screening results by the research team), individuals currently undergoing hormonal therapy, and those following a diet program to reduce or increase weight. Participants with a known diagnosis of hypertension or those currently taking antihypertensive medication were also excluded. This information was obtained through a screening questionnaire administered prior to data collection. This exclusion criterion aimed to minimize confounding factors, as pre-existing hypertension could significantly affect blood pressure measurements.

Participants were selected using accidental (convenience) sampling, in which individuals were recruited based on their availability and willingness to participate at the time of data collection. This method was chosen due to time and resource constraints, enabling researchers to recruit an adequate number of eligible participants at natural settings such as community or campus health screening events. Although this non-probability sampling technique has limitations in terms of generalizability, it was considered appropriate given the study's exploratory nature. This study did not include a formal sample size estimation, as it used a total sampling approach. All 800 residents of the student dormitory at the National Higher Education Institution were invited to participate. A total of 462 students agreed to participate, consisting of 256 women and 206 men, yielding a response rate of 57.8%. All participants completed all research procedures and provided complete data; therefore, no samples were excluded from the study.

In this study, Tahajjud prayer habits were assessed based on participants' self-reported frequency over the past month. Participants were first categorized into two main groups: Tahajjud and Non-Tahajjud. Those who reported performing the Tahajjud prayer at least once a week were classified as the Tahajjud group, while those who did not perform it at all were classified as the Non-Tahajjud group. Further classification was applied within the Tahajjud group based on frequency of practice. Participants who performed Tahajjud three or more times per week were defined as Regular Tahajjud practitioners, while those who performed it fewer than three times per week were categorized as Irregular Tahajjud practitioners. Accordingly, two separate comparisons were conducted: (1) Tahajjud vs Non-Tahajjud, and (2) Regular vs Irregular among Tahajjud practitioners.

2.3. Measurement and data collection

To involve participants in this study, we employed a structured recruitment process. Initially, potential participants were informed about the study through announcements in university dormitories. The recruitment materials included detailed information about the study's objectives, procedures, and inclusion criteria. Participants who expressed interest were invited to an informational session, where the study was explained in further detail, including its voluntary nature and the measures taken to ensure confidentiality and ethical standards. During this session, participants were invited to ask questions and clarify any concerns about the study's procedures. After receiving verbal and written consent, participants who met the inclusion criteria were enrolled in the study, while those who did not meet the criteria were respectfully excluded. This recruitment process ensured that participants voluntarily agreed to take part and were fully informed of their rights throughout the study.

The research data were collected through questionnaires and health examinations. The questionnaire included items on age, gender, religion, whether the respondent practices Tahajjud prayer, and the frequency of its practice. The frequency with which the subject performed Tahajjud indicated whether it was a regular practice; it was considered routine if an individual performed it at least 3 times per week (3–7 times per week) (Yusni & Rahman, 2024). The questionnaire was developed by the researcher and underwent a pilot test involving 10 participants with similar characteristics to the study population. All items were clearly understood and answered without the need for clarification, indicating satisfactory face and content validity. Therefore, formal statistical reliability testing, such as Cronbach's alpha, was not conducted at this stage due to the limited number of pilot respondents.

All participants underwent a single health examination, including measurements of weight, height, and blood pressure. The examinations were conducted in the morning before participants began their daily activities. All assessments were conducted at the dormitory by a physician who was part of the research team. Blood pressure (BP) was measured using a digital automatic sphygmomanometer (Omron JPN600, Omron Healthcare Co., Ltd., Kyoto, Japan). All participants were instructed to sit quietly for at least 5 minutes in a seated position, with their back supported and feet flat on the floor, in a quiet room at ambient temperature. Measurements were taken on the left arm, at heart level, using an appropriately sized cuff.

To minimize physiological variability and enhance consistency across participants, all measurements were conducted in the morning between 8:00 and 10:00 a.m. This time frame was selected based on evidence that key physiological parameters, such as blood pressure and circadian rhythms, are more stable during the early morning hours. Studies have shown that morning assessments reduce diurnal variation and improve the reliability of cardiovascular measurements (Head & Lukoshkova, 2008; Kario, 2005; Kumar et al., 2021). It is important to note that this study employed a cross-sectional design; therefore, measurements were not taken immediately after the Tahajjud prayer. Instead, participants were examined during a standardized morning window, regardless of their prayer schedule. This approach ensured uniformity in data collection and avoided procedural complexity typically associated with clinical trials. As a preliminary or exploratory investigation, this study serves as a foundational step toward future clinical trials that may explore the acute physiological effects of Tahajjud prayer in a more controlled setting.

Participants were also advised to avoid caffeine, strenuous physical activity, and heavy meals for at least two hours prior to the measurement to reduce external influences on BP values. BMI was calculated using the standard formula: weight in kilograms divided by height in meters

squared (kg/m^2). Body weight was measured with a manual weight scale (GEA ZT-120, GEA Medical, Jakarta, Indonesia), and height was measured with a digital wall-mounted stadiometer (GEA Stature Meter Digital HT 721, GEA Medical, Jakarta, Indonesia). Participants stood barefoot with heels, backs, and heads against the wall, looking straight ahead. The measurement arm was adjusted to touch the crown of the head without pressure, and height was recorded at eye level. Each participant's height was measured twice, and the final value was the average. A third measurement was taken if discrepancies occurred. The stadiometer accuracy was ± 0.5 cm, and measurements were cross-validated using an alternative calibrated device in a controlled environment. The Asia-Pacific BMI classification was applied, as follows: $\text{BMI} < 18.80$ = underweight, 18.50 – 22.90 = normal weight, 23.00 – 24.90 = overweight, and > 25 = obesity (Yusni & Meutia, 2019). Blood pressure was categorized according to the guidelines of the American College of Cardiology/American Heart Association, including: normal = $< 120 / < 80$ mmHg, elevated = 120 – $129 / < 80$, hypertension stage 1 = 130 – $139 / 80$ – 89 , and hypertension stage 2 = $\geq 140 / \geq 90$ (Muntner et al., 2019).

2.4. Data analysis

The data were analyzed using an independent sample t-test and a Chi-square test, with a significance level of 95% ($p < 0.05$). Given that the sample size exceeded 100 participants ($n = 462$), normality and homogeneity of variances were not formally tested, as per the central limit theorem (Kwak & Kim, 2017; Sawada, 2021). With large sample sizes (typically > 30), the sampling distribution of the mean tends to approximate a normal distribution, which justifies the use of parametric tests without explicitly testing for normality or homogeneity of variances (Sawada, 2021). Hypothesis testing was conducted using Chi-square tests for categorical data and independent t-tests for continuous data. The results are presented with p-values and 95% confidence intervals to indicate the statistical significance and precision of the estimates.

Differences in age, weight, height, BMI, and blood pressure between men and women were analyzed using independent sample t-tests. Additionally, the impact of Tahajjud on weight, BMI, and blood pressure in men and women was examined, along with the frequency of Tahajjud prayers. A Chi-square analysis was performed to examine the association between gender and the practice of Tahajjud, as well as the relationship between regular Tahajjud practice, BW, BMI, and BP among men and women.

2.5. Ethical considerations

All willing participants were asked to sign written informed consent prior to data collection and health examinations. This research was conducted after obtaining ethical approval from the Ethics Committee of the Faculty of Medicine, Universitas Syiah Kuala, with approval number 110/EA/FK/2023.

3. Results

3.1. Characteristics of participants

Participant characteristics assessed in this study, as presented in Table 1, included age, weight, height, body mass index, and blood pressure (systolic and diastolic). The total number of participants in this study was 462, consisting of 256 females and 206 males. These results indicate that the number of female participants was slightly higher than that of males. The mean age, systolic blood pressure (SBP), and diastolic blood pressure (DBP) did not differ significantly between male and female participants ($p = 0.094$, $p = 0.056$, and $p = 0.159$, respectively).

All participants were under 22, with ages ranging from 18 to 22. Significant differences were observed in body weight ($p = 0.001$), height ($p = 0.001$), and BMI ($p = 0.044$) between males and females, which may be attributed to anatomical differences between the sexes. In contrast, there were no significant differences in the mean values of age, SBP, and DBP between males and females. The mean systolic blood pressure in men was slightly higher than in women, suggesting that blood pressure was slightly above normal.

3.2. The relationship between gender and performing Tahajjud

Table 2 shows the association between Tahajjud and Non-Tahajjud participants among men and women. The results show that most participants generally performed Tahajjud. Specifically,

70.71% of women and 66.51% of men reported performing Tahajjud, whereas approximately 29.29% of women and 33.49% of men did not.

Table 1. Characteristics of the participants

Characteristics	Gender	f	Mean±SD	Minimum	Maximum	p-value
Age (year)	Female	256	18.30±0.69	18	22	0.094
	Male	206	18.41±0.67	18	22	
BW (kg)	Female	256	50.87±9.98	35.50	94.40	0.001*
	Male	206	56.21±11.41	34.00	122	
Height (cm)	Female	256	154.13±5.18	142	168	0.001*
	Male	206	164.47±13.4	146	184	
BMI (kg/m ²)	Female	256	21.38±3.88	15.52	38.67	0.044*
	Male	206	20.61±4.24	13.81	47.17	
Systolic BP (mmHg)	Female	256	117.71±10.38	69	141	0.056
	Male	206	121.26±10.97	91	154	
Diastolic BP (mmHg)	Female	256	76.65±10.17	60	94	0.159
	Male	206	77.84±9.56	62	95	

Notes: *The level of significance ($p < 0.05$)

Participants were also analyzed based on their habit of performing the Tahajjud prayer, even if it was only once a week. The results indicated an association between the practice of Tahajjud and gender; however, this association was not statistically significant ($p = 0.33$) (Table 2).

Table 2. The relationship between gender and the habit of performing Tahajjud

Gender	Tahajjud				Total f(%)	p-value
	Yes		No			
	f	%	f	%		
Female	181	70.71	75	29.29	256(100)	0.33
Male	137	66.51	69	33.49	206(100)	
Total	318	68.61	144	31.39	462(100)	

Notes: f = Frequency

3.3. The relationship between gender and the regularity of performing Tahajjud

As shown in Table 3, the number of participants who performed Tahajjud regularly was considerably lower than that of those who performed it irregularly. Specifically, 32.04% of women and 13.86% of men reported performing Tahajjud regularly. The data showed that, in general, both women and men performed Tahajjud prayers incidentally and irregularly (67.96% and 86.14%, respectively). This study also showed a significant relationship between gender and the regularity of performing Tahajjud, with women engaging in routine Tahajjud more frequently than men ($p = 0.001$). In this study, routine Tahajjud was defined as performing the prayer three to seven times per week, consistent with the WHO's (2020) criteria for regular physical activity.

3.4. Association between Tahajjud prayer and body weight, body mass index, and blood pressure among young women and men

Table 4 shows the differences in the mean values of BW, BMI, systolic, and diastolic blood pressure among women and men, categorized by Tahajjud and non-Tahajjud groups. The results indicate that, in both women and men in the non-Tahajjud group, the mean BW and BMI were slightly higher (BW: 1.63 kg and 1.96 kg; BMI: 0.34 kg/m² and 0.11 kg/m²) than in those who performed Tahajjud. However, these differences were not statistically significant for either BW and BMI between Tahajjud and non-Tahajjud women and men (BW: $p = 0.22$ and $p = 0.44$; BMI: $p = 0.52$ and $p = 0.25$). This result suggests that there is no relationship between Tahajjud and BW or BMI in young men and women. In a similar vein, Tahajjud was not significantly associated with DBP in either gender ($p = 0.10$ and $p = 0.27$, respectively). However, the mean SBP among women who performed Tahajjud was considerably lower ($p = 0.001$) than in the non-Tahajjud group, whereas no significant difference was observed in men ($p = 0.88$). These findings indicate that performing Tahajjud may be associated with lower SBP among women.

Table 3. The relationship between gender and performing Tahajjud (regular and irregular)

Gender	Tahajjud				Total	p-value
	Regular		Irregular			
	f	%	f	%		
Female	58	32.04	123	67.96	181	0.001*
Male	19	13.86	118	86.14	137	
Total	77	22.95	241	77.05	318	

Table 4. Differences in the mean values of weight, BMI, systolic, and diastolic blood pressure in men and women who performed Tahajjud and non-Tahajjud

Variable	Gender	Group	f	Mean±SD	CI 95%	p-value
Weight (kg)	Female	Non-Tahajjud	75	51.35±10.12	-1.06-4.33	0.22
		Tahajjud	181	49.72±9.61		
	Male	Non-Tahajjud	69	56.87±10.83	1.36-5.27	0.44
		Tahajjud	137	54.91±12.45		
BMI (kg/m ²)	Female	Non-Tahajjud	75	21.49±5.12	-0.71-1.38	0.52
		Tahajjud	181	21.15±5.25		
	Male	Non-Tahajjud	69	20.65±3.55	1.13-1.38	0.25
		Tahajjud	137	20.54±5.38		
Systolic (mmHg)	Female	Non-Tahajjud	75	111.13±12.66	2.29-3.79	0.001*
		Tahajjud	181	108.70±9.22		
	Male	Non-Tahajjud	69	122.33±10.89	2.91-4.02	0.88
		Tahajjud	137	122.88±11.04		
Diastolic (mmHg)	Female	Non-Tahajjud	75	77.94±11.07	1.97-3.34	0.10
		Tahajjud	181	74.76±9.66		
	Male	Non-Tahajjud	69	77.47±8.77	1-25-6.77	0.27
		Tahajjud	137	75.99±10.97		

Notes. *The level of significance ($p < 0.05$)

Table 5 presents the independent-samples t-test of the association between performing Tahajjud (regularly or not) and BW, BMI, and BP in men and women. The results showed significant differences in the mean BW and BMI values between women and men in the regular and non-regular Tahajjud groups (women: $p=0.003$ and $p=0.001$; men: $p=0.019$ and $p=0.032$). These findings suggest that regular Tahajjud prayer is associated with lower BW by approximately 3.52 kg in young men and 3.79 kg in young women, as well as lower BMI, by about 1.9 kg/m² and 1.8 kg/m², respectively. Although the regular Tahajjud group showed lower mean SBP and DBP compared to the non-regular group in women and men, these differences were not statistically significant ($p=0.171$ and $p=0.200$ vs. $p=0.071$ and $p=0.125$; $p > 0.05$). These results indicate that regular Tahajjud prayer is slightly associated with lower systolic and diastolic blood pressure.

Furthermore, Table 6 describes the relationship between regular Tahajjud practice and BMI categories (overweight and obesity) in men and women. The findings suggest that overweight or obesity is more prevalent among men and women who did not perform Tahajjud regularly, although most participants in the study were not classified as obese. A statistically significant association was observed only in women, where regular Tahajjud practice (3–7 times per week) was inversely associated with overweight or obesity ($p=0.016$). In both sexes, a higher prevalence of overweight or obesity was descriptively observed among participants who did not engage in regular Tahajjud compared to those who did. However, these results reflect correlational rather than causal relationships. The findings suggest a potential protective association between regular Tahajjud and weight status in women, warranting further investigation through longitudinal or interventional studies. It is also noteworthy that the number of participants who performed Tahajjud regularly is less than that of men, even though this may be due to the small sample size, which affects the significance of the relationship between regular Tahajjud and overweight or obesity. Identifying such a relationship could provide preliminary evidence for the potential role of regular Tahajjud as a complementary behavioral factor in obesity prevention strategies.

Table 5. Differences in mean values of weight, BMI, systolic, and diastolic blood pressure in men and women who perform regular and irregular Tahajjud

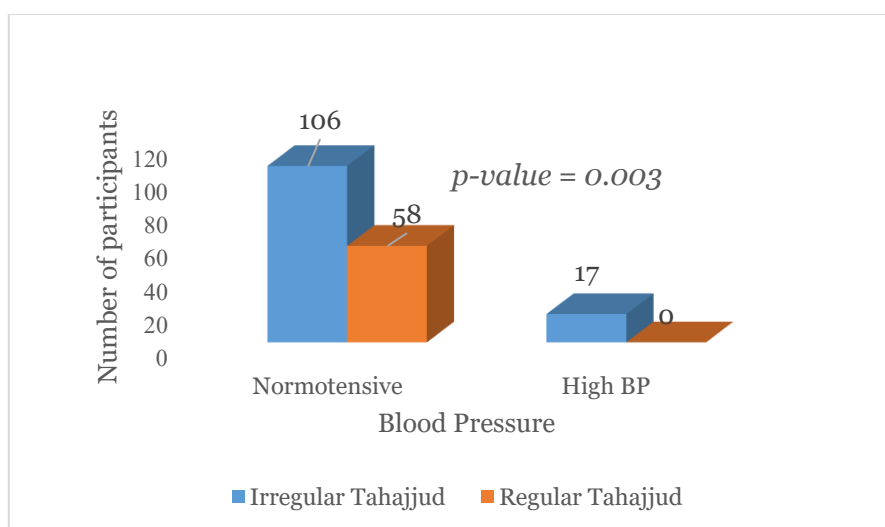
Variable	Data	Tahajjud	f	Mean±SD	CI 95%	p-value
Weight (kg)	Female	Irregular	123	52.48±11.04	0.04 –5.25	0.003*
		Regular	58	48.96±7.34		
	Male	Irregular	118	60.13±11.51	9.05-1.49	0.019*
		Regular	19	56.34±10.68		
BMI (Kg/m ²)	Female	Irregular	123	21.98±4.43	0.44-1.21	0.001*
		Regular	58	20.71±2.70		
	Male	Irregular	118	21.38±3.39	2.59-0.88	0.032*
		Regular	19	20.53±3.58		
Systolic (mmHg)	Female	Irregular	123	109.31±9.55	1.23-8.05	0.171
		Regular	58	107.41±8.42		
	Male	Irregular	118	126.21±10.05	7.96-4.35	0.200
		Regular	19	124.41±12.95		
Diastolic (mmHg)	Female	Irregular	123	74.93±10.96	0.16-4.42	0.071
		Regular	58	74.39±6.48		
	Male	Irregular	118	78.89±10.59	1.35-8.83	0.125
		Regular	19	75.15±9.24		

Notes. *The level of significance ($p < 0.05$)

Table 6. Relationship between regular Tahajjud and obesity in men and women

Gender	Tahajjud	BMI Category		Total	p-value
		Non-obese	Overweight/Obese		
Female	Irregular	83	40	123	0.016*
	Regular	49	9	58	
Male	Irregular	89	29	118	0.870
	Regular	13	6	19	

As shown in Figures 1 and 2, the number of both male and female participants with normal blood pressure (normotensive) was higher than that of those with elevated blood pressure. Among female participants, 100% of those who performed regular Tahajjud had normal blood pressure, compared to 86.18% in the irregular group, and this association was statistically significant ($p = 0.003$) (Figure 1).

**Figure 1.** Relationship between regular Tahajjud and blood pressure in women

In contrast, among male participants, 78.95% of those who performed regular Tahajjud had normal blood pressure, compared to 72.03% in the irregular group. However, this difference was

not statistically significant ($p=0.529$). The lack of statistical significance among men may be attributed to the smaller number of male participants who performed regular Tahajjud ($n=19$), compared to female participants ($n=58$) (Figure 2).

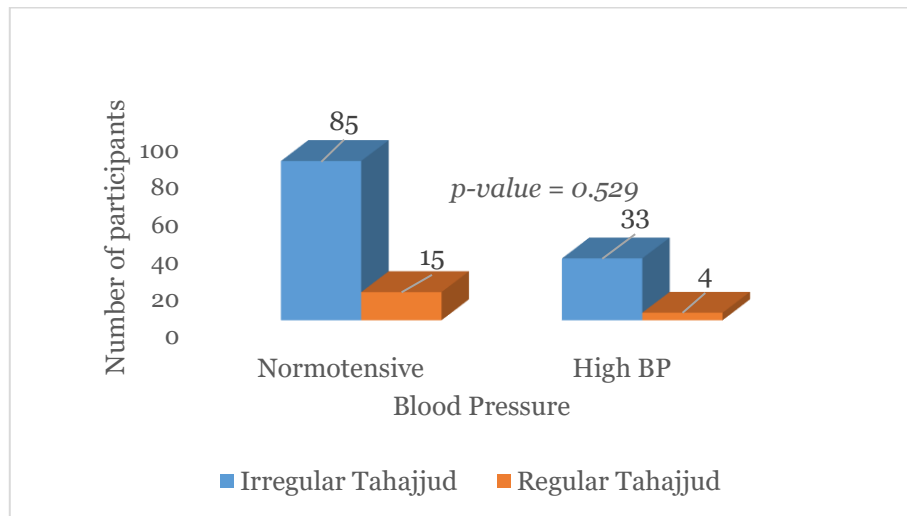


Figure 2. Relationship between regular Tahajjud and blood pressure in men

4. Discussion

This study aimed to assess the association between Tahajjud prayer and anthropometric measures (body weight and BMI), as well as blood pressure, in young adults by comparing Tahajjud and non-Tahajjud groups, including differences between regular and irregular Tahajjud practitioners, with attention to gender differences. The major findings revealed that regular Tahajjud practice was associated with reductions in body weight, BMI, and both systolic and diastolic blood pressure, with variations observed between men and women.

This study showed that regular Tahajjud prayer is associated with a reduction in body weight of approximately 3.52 kg in young men and 3.79 kg in young women, compared to those who performed irregular Tahajjud. These results are consistent with the existing literature, which shows that night prayers (Tahajjud), which involve physical movement and extended wakefulness, may increase energy expenditure. Moreover, spiritual routines can foster self-discipline and healthier behavioral patterns, such as better eating habits and sleep hygiene, which could contribute to weight reduction. Regarding BMI, regular Tahajjud practitioners exhibited lower BMI values by about 1.9 kg/m² in men and 1.8 kg/m² in women.

Body weight, body mass index, and blood pressure are critical indicators of an individual's physiological status, as they reflect overall health (Mendes et al., 2025). These parameters are shaped by a variety of factors, including lifestyle choices such as sleep patterns, mental well-being, and physical activity levels (van Baak et al., 2021). In young adults, maintaining balanced values for these indicators is not only essential for optimal daily functioning but also contributes significantly to long-term health outcomes. The present study supports the hypothesis that lifestyle modifications, particularly consistent engagement in spiritual practices such as Muslim prayer, including Tahajjud, may have a positive impact on physical health parameters, particularly body weight and blood pressure regulation.

Spiritual practices and religiosity among Muslims are associated with body weight (Bharmala et al., 2018). Muslim prayer, particularly Tahajjud, may play a beneficial role in maintaining physical fitness and reducing obesity (Fatima et al., 2022). The Islamic prayer movements involve repeated muscle engagement that can enhance blood circulation and support metabolic processes. Additionally, tahajjud performed at night may positively influence hormonal balance and sleep quality, both of which are linked to body weight regulation and blood pressure (Fatima et al., 2022; Yusni & Rahman, 2024). These factors suggest that regular prayer may contribute not only to spiritual but also to physical health. Salat (Islamic prayer or muslim prayer) has many benefits for body health, so it can be used as a non-pharmacological therapy to improve patient health (Chamsi-pasha & Chamsi-pasha, 2021). Regular salat reduces sympathetic nerve activity

and increases parasympathetic nerve activity, thereby providing a relaxing effect and reducing the risk of cardiovascular disease (Doufesh et al., 2014). A study of 30 overweight individuals found that after 4 weeks, performing the obligatory salat routine significantly reduced body weight and body fat percentage (Alam et al., 2022). Salat can be categorized as Islamic yoga because some of the postures in salat activities are similar to movements in yoga (Nazish & Kalra, 2018). Yoga is a form of physical activity that combines physical movement, meditation, breathing, and mindfulness, and is currently becoming popular worldwide (Watts et al., 2018). Numerous studies have demonstrated the effectiveness of yoga in promoting weight loss and reducing obesity (Rani, 2017).

The findings of this study are consistent with Islamic health principles, which advocate for preventive and mindful approaches to eating and overall well-being. Practices such as initiating meals before intense hunger, ceasing intake before full satiety, and prioritizing nutrient-dense foods are embedded in Islamic tradition and may serve as effective behavioral strategies for maintaining metabolic balance and preventing lifestyle-related disorders. In addition to dietary discipline, Islam encourages regular physical activity through daily prayers (salat), which involve repetitive movements engaging major muscle groups (Fatima et al., 2022; Iftikhar et al., 2016). Although salat is not classified as structured exercise, it fulfills the criteria of physical activity due to the energy expenditure and skeletal muscle involvement it entails (Naureen et al., 2022). Specifically, the Tahajjud prayer, performed voluntarily at night and typically longer than obligatory prayers, may have additional physiological effects due to its physical and spiritual dimensions. These behavioral and physical aspects align with this study's findings, which show associations between regular Tahajjud practice and favorable anthropometric and blood pressure parameters in young adults. Tahajjud prayer can be considered both an exercise and a physical activity, according to the concept of physical activity, because every prayer position requires deliberate, regulated, repetitive, and measured movements (Yusni et al., 2023). Thirty overweight adults participated in a study that revealed a significant reduction in body fat percentage and BW after four weeks of frequent, forced prayer (Alam et al., 2022). Hyperglycemia and insulin sensitivity are two cardiometabolic risk variables that improve in adults who are overweight or obese and regularly exercise (Boulé & Prud'homme, 2020).

Obesity is a risk factor for hypertension, and the link between being overweight or obese and hypertension has long been established (Mahwati, 2019). According to Kotchen (2010), obesity disrupts endothelial function, which throws off the balance of vasodilators and vasoconstrictors' production, leading to hypertension. Vascular endothelial dysfunction results in a lack of nitric oxide as a potent vasodilator, resulting in peripheral resistance and increasing blood pressure (Kotchen, 2010). Overweight and obesity are closely related to low physical activity (Nantel et al., 2011). Moderate-intensity exercise lasting 30–60 minutes every day or at least twice a week can help inhibit increases in BW (Boulé & Prud'homme, 2020). Obesity is caused by a decline in cardiorespiratory fitness and physical activity, which in turn sets off the development of hypertension (Pedrianes-Martin et al., 2021). Research has shown that hypertension affects 35.7% of obese people (Ersoy & Ersoy, 2019). Both a cause and a risk factor for hypertension are obesity (Aronow, 2017). There is a significant positive association between BMI and BP; in mice, a 1 g/cm increase in BMI is associated with a 2.75 mmHg increase in BP (Yusni & Yusuf, 2022). Pre-hypertension and hypertension are associated with a high BMI (Mahiroh et al., 2019; Shavela & Mariani, 2020).

We found that hypertension was more common in men who did not perform regular Tahajjud; thus, regular physical activity such as Tahajjud can help control blood pressure within normal limits. Physical activity and gender are risk factors for hypertension in adults in Indonesia (Peltzer & Pengpid, 2018). Younger men are more susceptible to suffering from undiagnosed and uncontrolled hypertension (Hussain et al., 2016). Studies have demonstrated the advantages of regular physical activity in preventing obesity, hypertension, and premature mortality, both primary and secondary prevention (Naureen et al., 2022). In Indonesia, adults as well as those between the ages of 18 and 21 are at risk for hypertension due to low levels of physical activity (Khasanah, 2022; Sembiring & Utari, 2019). Exercise lowers blood pressure by -3 mmHg and SBP by -5 mmHg (Boulé & Prud'homme, 2020). Research indicates that obese persons can lower their blood pressure from 133/76 mmHg to 100/65 mmHg and lose weight by practicing yoga five times a week for three months (Kaul, 2018).

Salat has been shown in studies to dramatically lower DBP and SBP in individuals with normotension (Doufesh et al., 2014). Not only that, salat has also been proven to reduce blood pressure in people with grade 1 hypertension (Legiran et al., 2022). As part of Salat, Tahajjud prayer involves a series of physical movements that qualify as moderate-intensity aerobic activity (Doufesh et al., 2013). Tahajjud is a Muslim prayer performed in the last third of the night that, if done regularly, provides health benefits; we found that it reduces BW, BMI, and BP in young women and men. A previous study conducted in the working area of Puskesmas Kedai Durian supports the present findings by demonstrating a significant relationship between the regular practice of Tahajjud prayer and reduced prevalence of hypertension among the elderly. Specifically, elderly individuals who consistently performed the Tahajjud prayer (classified as Very Routine and Routine) were found to have better blood pressure profiles and a greater proportion of normal blood pressure readings than those who performed it less frequently (Boy et al., 2020). Our previous research has found that carrying out a single dose of Tahajjud can reduce systolic and diastolic blood pressure in normotensive subjects (Yusni et al., 2023). Similar to yoga and Tai Chi, which have demonstrated benefits in reducing blood pressure through both physical and meditative components, Tahajjud prayer is hypothesized to contribute to blood pressure regulation due to its spiritual and physiological aspects (Yusni et al., 2023).

The positive effects of Tahajjud on physiological parameters such as body weight, BMI, and blood pressure may be attributed not only to its physical components but also to its meditative aspects. Tahajjud also contains elements of mindfulness and relaxation that can reduce stress, support mental well-being, improve glucose regulation, and contribute to overall physical health (Chodijah, 2017; Yusni & Rahman, 2024). From a nursing perspective, these parameters are frequently monitored to assess health status, provide lifestyle counseling, and evaluate the effectiveness of health promotion programs. Nurses are integral to educating and supporting individuals in adopting healthy behaviors aligned with holistic health principles. In this context, identifying culturally relevant practices, especially those with spiritual significance, becomes crucial. Furthermore, Tahajjud not only provides physical benefits but also enhances individuals' overall well-being, thereby complementing the nursing role in promoting holistic health care. Our findings suggest that regular Tahajjud may be a viable practice for supporting physical balance, particularly by improving body weight, BMI, and blood pressure, especially among young adults. These results align with the nursing model of holistic care, which considers physical, mental, and spiritual health as interconnected. Nurses can incorporate such practices into their health promotion strategies to further enhance individuals' health and well-being, providing a culturally sensitive approach to care (Jasemi et al., 2017; Shin et al., 2020).

The findings in this study are consistent with previous studies suggesting that religious or spiritual practices, particularly Tahajjud and other meditation-like routines, may positively influence physiological parameters, including weight, BMI, and BP. For example, Yusni et al. (2023, 2024) reported that individuals who performed regular Tahajjud prayers experienced lower stress levels and improved autonomic regulation, both of which are known to affect blood pressure and metabolic outcomes. Several physiological and behavioral mechanisms may explain these associations. First, Tahajjud involves physical movements and sustained postures similar to light-intensity exercise, which may lead to modest increases in energy expenditure over time and have the potential to reduce weight. Second, the meditative and introspective aspects of Tahajjud are associated with reduced psychological stress, potentially through modulation of the hypothalamic-pituitary-adrenal (HPA) axis and reductions in cortisol levels, which are closely related to weight gain and hypertension. Finally, the spiritual discipline required for regular Tahajjud may encourage healthier lifestyle behaviors, such as improved sleep hygiene, mindful eating, and emotional regulation, all of which support cardiometabolic health.

5. Implications and limitations

The findings of this study suggest that regular engagement in spiritual practices, such as Tahajjud, may have beneficial effects on BW, BMI, and BP. These results may have important implications for nursing practice, particularly in promoting holistic health and preventive care. Nurses, as key members of the healthcare team, can incorporate culturally relevant practices like Tahajjud into health education and lifestyle counseling programs, particularly for patients who value spirituality. By fostering discussions about the role of spiritual practices in maintaining or

improving physical health, nurses can help patients integrate these practices into their daily routines, potentially enhancing their overall well-being and promoting health maintenance.

Several limitations of this study should be considered when interpreting the findings. As an observational study, it can only establish associations rather than causal relationships. Therefore, while Tahajjud may be associated with BW, BMI, and BP, further research, particularly longitudinal and interventional studies, is necessary to explore its causal impact on physical health parameters. A follow-up experimental study has been conducted and published separately, providing initial insights into this issue (Yusni et al., 2023). Additionally, the study's cross-sectional design limits the ability to conclude the long-term effects of regular Tahajjud practice. To address this, future research should consider using longitudinal designs to observe changes over time. Furthermore, this study relied on self-reported data regarding Tahajjud engagement, which may be subject to recall or social desirability bias. Therefore, it is recommended that future studies consider complementing self-report measures with additional objective or behavioral assessments of religious practice. Lastly, the sample size and characteristics of the study population may limit the generalizability of the findings. Future studies should involve larger, more diverse populations across diverse demographic and geographic contexts to improve external validity and applicability.

6. Conclusion

The study found that women reported performing Tahajjud slightly more often than men, although the difference was not statistically significant overall. Among regular performers, however, a significant gender difference was observed, with women being more likely to perform it than men. Globally, Tahajjud has no effect on BW, BMI, or SBP in men or women; however, it does affect SBP in women. Women who regularly perform Tahajjud have a lower incidence of obesity. Regular Tahajjud reduces BW and BMI in young men and women; regular Tahajjud slightly decreases SBP and DBP in men and women. Regular Tahajjud reduces the risk of obesity in women. Performing regular Tahajjud with a frequency of 3–7 times per week is necessary for losing weight and preventing obesity in women. Additionally, regular Tahajjud can help keep blood pressure within normal range.

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Author Contributions

The research's implementation and publishing were made possible by the efforts of all authors. It was YN who came up with the idea and planned the study, gathered and examined the information, and composed the final draft. SR collected data, created ethical feasibility tests for research, and edited and proofread publications. This work has been read and approved by all authors.

Conflict of Interest

No conflict of interest exists in this study, according to the author.

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