

# Meta-Analysis Study of Tahajud Prayer to Reduce Stress Respons

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## META-ANALYSIS STUDY OF TAHAJUD PRAYER TO REDUCE STRESS RESPONSE

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**Abstract:** Tahajud prayer gives a good influence on physical and mental health. Stress is mental stress that can interfere with one's health. The purpose of this study: to find a decrease in stress response due to midnight prayer, explain the mechanism of midnight prayer to stress response. The hypothesis in this meta-analysis study is: after someone performs tahajud prayer, the stress response will decrease. The research conducted is quantitative research with a systematic review, using secondary data, data from previous studies. Obtained 36 articles following the variables studied, and 6 articles that met the inclusion criteria. Data were analyzed by a dependent t-test. The results of the analysis found that the average stress score before the midnight prayer of 55,817 is different from the respondents after performing the midnight prayer for the stress score of 32,258, the dependent t-test results obtained p-value = 0.045 concluded that there was a significant difference in the average stress score between before the midnight prayer and after the midnight prayer. The stress score after the midnight prayer decreases, so it is concluded that after someone performs the tahajud prayer, the stress response will decrease.

**Keywords:** meta-analysis study, stress response, stress score, systematic review, tahajud-prayer

### I. INTRODUCTION

Stress is a pressure that can occur in all age groups. The cause of stress in young people is due to poor social relations, loss of loved ones, failure in education, loss of work, being in a new environment/situation and others. Islamic boarding schools in the Semarang area have 2,329 students consisting of 1,218 female students and 1,111 male students. The high density of residents in Islamic boarding schools, students are at risk of experiencing health problems such as infectious diseases; bacterial, fungal and viral skin diseases, reproductive health disorders, mental stress and stress to depression. Besides physical health problems, other health problems are also found, namely mental health problems, such as stress and depression. Previous research described that the problem found in santri was depression, found 4 santri had moderate depression and 1 santri had severe depression [1]. The results of previous studies on the depression of students at Pondok Pesantren X in Bogor City, from 50 students taken as research samples found 48 students who experienced mild depression, and 2 experienced moderate depression. Measurement of depression in samples using the Zung Self-Rating Depression Scale (ZSDS) rating scale [2].

Stress in young age groups, such as medical students found 71.44% felt stress, causes of stress such as academic assignments, separation from family, lack of rest time, difficulty understanding lessons, and poor assessment of academic assignments. Students use self-defense mechanisms against stress by doing meditation, praying or praying, playing games and sports, listening to music, using social networks, sleeping, and smoking (Kotwal et al., 2018). Tahajud prayer has a very special value for the practitioners. Allah promises that those who perform the midnight prayer will receive a high and noble degree. Many benefits are obtained for the practice of the midnight prayer apart from the reward, the glory, the high degree of the tahajud prayer gives a real influence on the physical and mental health. Previous research revealed that one of the practices carried out in a pesantren such as a midnight prayer had a positive effect on the santri depression [2].

Tahajud gives a good effect on health. The journal which states that prayer gives a good influence on health is reviewed in the review article Ghazal (2018). The physiological prayer movement gives goodness to the body, as a physical activity that is routinely performed in the prayer posture to keep the individual healthy because of the flexibility of the movement causing muscle strength because it is done regularly. Likewise, prayers performed during prayer, provide benefits to mental retardation so that prayer is a combination of mental and physical health [3]. Previous research discusses the difference in the intensity of the midnight prayer for students of class XI MTS MTA Surakarta in the dormitory and at home, stating that there is a difference between the intensity of the midnight prayer at home and in the dormitory. Students have higher intensity in carrying out midnight prayer in the dormitory than at home [4].

## II. Objective

Based on these data that the problem of stress is found in many previous studies, it is necessary to study through meta-analysis research using secondary data, so that it can be found tahajud prayers influence decreasing the stress response. Formulation of the research problem: whether tahajud prayer affects stress.

## III. METHODS

The research conducted is quantitative research with a systematic review that is writing articles by searching literature systematically, planned and using formal statistical analysis (meta-analysis). Meta-analysis is a study using secondary data, data from previous studies. The meta-analysis method research is a statistical technique that combines the same quantitative research results so that a causal relationship is obtained (Anwar, 2005). Various research findings can be combined by conducting a review so that they can summarize the results of previous studies and answer research questions appropriately. Requirements that are needed in the meta-analysis are to review the same research results [5].

The data was collected by searching the previous articles and research following the research variables of the tajaud prayer and stress variables, the research objectives and the hypotheses set. Obtained 36 previous research articles by the variables studied. Then the research articles are selected based on the type of research. A systematic review uses 6 articles that meet the predetermined inclusion criteria, namely: 1) have the same research variables, midnight prayer, and stress. 2) experimental research design. 3) relevant to the purpose of meta-analysis. 4) minimum sample size 15. 5) research articles have been published nationally or internationally, written in Indonesian or English. After the requirements are met, then each article is reviewed, sorted by variables and delta values are calculated. Data were analyzed in 2 ways namely; 1) univariate analysis, carried out to obtain the frequency distribution of stress variable scores before and after the midnight prayer. 2) Bivariate analysis using a dependent t-test. But before the dependent t-test is performed first, the data normality test is done by calculating the skewness value divided by the standard error.

## IV. RESULTS

Literature was traced for 6 months and obtained 36 research articles about the midnight prayer and stress. Articles used for analysis from 2013 - 2019. Before the dependent t-test is performed, it must first be fulfilled with the assumption of normally distributed data, so it is necessary to analyze the normality of the data using univariate frequency distribution analysis. Based on the three calculations above, what is used to determine the normality of data [4](#) this meta-analysis study is the skewness value divided by the standard error. The distribution of data [normality test results can be seen in the following table:](#)

[Table 1.](#) Test Normality of Research Data

Score	Skewness	Std. Error of Skewness	The Results
Pre Intervensi	1.239	0.845	1,46
Post Intervensi	1.073	0.845	1,26

Based on table 1 it can be seen that the results of normality test data, obtained values of less than 2 so that the data meet the requirements for parametric test analysis (t-dependent). According to Hastono (2016), the dependent parametric t-test must meet the following conditions: 1). Data is normally distributed. 2) The group tested has paired data (derived from the same source of observation or measurement). 3) the type of data tested has a scale of numerical variables (ratio or ordinal) and categories (nominal or ordinal) [6]. The next step is to analyze the difference test, to determine the effect of tahajud prayer on stress, the parametric test analysis results are presented in the table below using the dependent t-test.

Table 2. Analysis of t-dependent Test Mean Stress Score Before and After Tahajud Prayer

Measurement	Mean	SD	SE	P-value	N
Stress Score before the Midnight Prayer	55.817	41,707	17.027	0,045	6
Stress Score after Tahajud Prayer	32.258	29.544	12.061		6

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The results of the analysis found that the average stress score before the midnight prayer was 55,817 with a standard deviation of 41,7078. In contrast to respondents after performing the midnight prayer, the stress score was 32,258 and the standard deviation was 29,544. The mean difference before and after the midnight prayer is 23,558 and the standard deviation is 21.74. Dependent t-test results obtained p-value = 0.045 can be concluded that there are significant differences in the mean stress score between before the midnight prayer and after midnight prayer. Stress score after the midnight prayer decreases, so the hypothesis set in the study: after someone performs tahajud prayer, then the stress response will decrease can be proven.

## V. Discussion

Health is a condition of balance in the body (hemostasis). The body has a defense system or immune system to avoid and fight various diseases. If the body's defense system is unable to maintain balance, the individual experiences pain. Stress on the individual due to an imbalance between the pressure around the individual with the ability of individuals to accept the pressure. Body balance is regulated by the hormone system. Stress, anxiety, and depression are physiologically demonstrated by increased levels of the hormone cortisol. Cortisol secretion is regulated by Adreno Cortico Tropic Hormone (ACTH). Besides, brain stimulation due to stress responses can trigger an increase in cortisol levels.

Hormone balance as the immune system is influenced by positive and negative emotional reactions. Changes in hormones, cortisol, and catecholamines contribute to the immune system to be optimal (Rizaldy, 2013). According to Soleh (2006), tahajud prayer gives a positive perception, sending information to the locus corelus (LC) thereby activating the autonomic nerve. Through the hypothalamus (brain) the hormone adrenocorticotrophic secretion will be stable, this reaction causes alpha and beta receptors to move stably so that it impacts the positive immune system [7].

Research findings: Tahajud prayer gives a significant effect on stress response as evidenced by the reduction in stress after carrying out the midnight prayer. Because stress is an indicator of mental health. Then the explanation of the related mechanism of the midnight prayer to stress follows:

First: the brain's response pathway, which is prostration at night, flows oxygen-rich blood to the brain which gives an effect on the secretion of adrenocorticotrophic hormone (ACTH) to be stable. Furthermore, the secretion of ACTH affects the level of the hormone cortisol in physiological conditions so that the immune system increases. Cortisol is a hormone produced by the adrenal cortex and its presence is influenced by 3 receptors namely ACTH, diurnal rhythm and stress. Cortisol hormone functions as carbohydrate metabolism, therefore cortisol levels at night decreases due to no burning process of carbohydrates, gastric emptying occurs at night. Cortisol can suppress protein synthesis, thereby reducing the number of eosinophils, lymphocytes, and macrophages that can cause decreased lymphoid tissue, thymus, and lymph node. This is supported by previous research tahajud prayer gives effect to the activity of the autonomic nervous system. Measurements using EEG (Electro Encephalo Grafi), the results of EEG values increase during the midnight prayer, meaning that prayer produces positive changes in brain function. Interaction between the central nervous system and ANS (auto nerve system) during prayer increases relaxation thereby reducing stress for people who perform regular midnight prayer [8].

Second: cell lines, mood conditions such as prolonged and chronic stress can trigger enlargement of the adrenal calendar causing maladaptive changes. The adrenal medulla will stimulate norepinephrine and epinephrine as determinants of the sympathomimetic nervous system. Norepinephrine and epinephrine act as chemicals and determine the metabolic response in the body, oxygen levels in the muscles, narrowing or dilation of blood vessels so that associated with increased blood pressure. Therefore, it can be explained that blood pressure can be influenced by performing a midnight prayer. The presence of norepinephrine and epinephrine levels results in changes in cell movement. Normal conditions, cells move regularly and calmly. However, in abnormal circumstances, the cell movement becomes irregular and random so that the body's balance cannot be maintained. Thus that the balance of the hormone system in the body can be maintained by carrying out the midnight prayer. Some studies explain that prayer is carried out properly and correctly, following religious guidance, so it not only provides merit and closeness to God but also affects overall health both physically and mentally [9].

The results of the analysis with the different test (t dependent) anxiety and depression showed that the value of p-value is smaller than the value of p-value at the 5% level of confidence, which means that there are differences in anxiety and depression before and after the midnight prayer. Riyandanie Research (2016) anxiety can be reduced by tahajud prayer interventions. The frequency of prayer is done for 40 days. The initial stage of the respondent is sleepy, not particular 'and feels tired, but on the implementation, until the 40th day, the respondent feels calmer and more comfortable [10]. This significant difference proves that the midnight prayer can affect physical and mental health. The results of this study are under previous studies, tahajud prayer contains aspects of relaxation to the body that is very large and affects the mental strength needed by humans as

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a self-adaptation strategy to prevent stress. Previous studies describe that the prayer movement is medically reviewed to give an excellent effect on health. Positive and healthy emotional feelings are indicators of mental health, oriented to peace of mind and peace of heart [11].

These positive feelings can be built by carrying out the midnight prayer. The night is a time to rest, so for some people performing midnight prayer at night is certainly hard, because at that time it is time to rest and let go of fatigue. Prompts to get up at night and perform prayers, of course, have special features in addition to a calm atmosphere so that concentration and worship become more solemn 'compared to daytime, it turns out that scientifically praying at night can be explained to have its privileges. The body system which is ideally rested obtains fresh oxygen intake at night. Even though it is night time to rest, for those who believe in Allah, it is not difficult for them to fulfill the wake-up call at night to perform the midnight prayer even though they must reduce their rest time.

Waking up at night makes the body healthy and fresh, avoiding various diseases such as back pain in the elderly. Medical research has found that the habit of tahajud prayer will continuously prevent the performers of the midnight prayer from an attack on the backbone [11]. Cells need oxygen for metabolism, especially the brain. The midnight prayer, listening to the brain because when performing prostrations, blood carries fresh oxygen to the brain. Stress reduction showed significant results in the treatment group (who performed the midnight prayer) and the control group (who did not perform the midnight prayer). The difference in mean stress scores concluded that the midnight prayer effectively reduces stress [12].

Physiological indicators are shown by the presence of the hormone cortisol above the normal (increased) value. Previous studies used blood cortisol to assess anxiety in respondents in the control and treatment groups. Respondents who were given Emotional Freedom Techniques (EFT) treatment tended to be stable in the cortisol hormone level compared to the untreated (control) group. It shows that cortisol levels are a measure of a person's anxiety [13]. Ideally, normal cortisol levels should not affect the function of other organs. High cortisol can cause hyperglycemia (increased blood sugar levels), whereas low cortisol levels can cause hypoglycemia (low sugar levels). Cortisol levels in the body can fluctuate and decrease depending on the stimulation of the adrenal glands that produce adrenocorticotropic hormones. The normal cycle of the cortisol hormone will decrease at night, thereby reducing the level of glucose in the blood. Someone who wakes up at night and performs the midnight prayer will be responded to by the brain, at the prostration of the brain gets a new supply of oxygen. Blood that carries oxygen will have flowed back to the heart and the cleaning process so that oxygen demand in the brain is maximally fulfilled. When the brain gets sufficient oxygen supply, it connects to another body system, the hypothalamus pituitary adrenal (HPA axis) to respond properly and maintain body balance (homeostasis). This balance is subsequently responded biologically in the form of normal vital signs, heart rate, body temperature, respiratory rate, and blood pressure which are manifested physically healthy.

The midnight prayer, which takes place one-third of the night, gives a lot of specialties, even physical ailments can also be cured by the midnight prayer. Previous research, that the midnight prayer can be used as a therapy for hypertension sufferers. Diyono (2018) explained that through the midnight prayer, there was a change in the blood pressure of hypertension sufferers who practice the midnight prayer. Measurement of physical health based on the measurement of blood pressure, the average blood pressure of respondents before the midnight prayer 17 people with moderate hypertension and 3 people with severe hypertension. After performing the midnight prayer, 11 respondents were normal blood pressure and 17 respondents were classified as mild hypertension. The results of the dependent t statistical test were at a value of  $0.001 < 0.05$ . Practitioners of tahajud prayer have an impact on changes in blood pressure [14]. The same study was proven by Cahyani (2014), systolic blood pressure of hypertensive patients in the integrated service post environment Anggrek Cempaka Putih Village, East Ciputat District, from 45 elderly found mild hypertension classification 51.1%, moderate hypertension 26.7%, severe hypertension by 13.3% and normal blood pressure 8.9%. The study also analyzed the relationship between prayer and blood pressure. The hypothesis is accepted at a significant level of  $0.000 < 0.05$  meaning that there is a significant relationship between tahajud prayer with blood pressure systole and diastole [15].

The results of this study prove that tahajud prayer provides a good effect on physical health. Tahajud prayer can stabilize blood pressure. Patients with hypertension who practice tahajud prayer experience changes in blood pressure that was previously high to normal, as in Diyono's study. The same thing was explained by Suparman (2015) there is the meaning of learning in the practice of prayer, through his writing the process of performing prayers that begins with ablution and prayer movements ranging from takbir, ruku', takbir, prostration, sitting between two prostrations, sitting late until greeting giving good health benefits. The implementation of prayer that is carried out correctly based on religious guidance, will have an impact on overall physical and mental health [9]. The midnight prayer is performed sincerely, solemnly 'with full confidence and hope in Allah to get the pleasure of Allah, in addition to getting closer to God and achieving piety provides benefits for healing illness. Psychic benefits are feeling calm and comfortable. Physically cure stroke. The method of treatment

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carried out at Avicenna Kediri hospital clinic underlies the treatment of patients with midnight prayer in healing stroke patients [16].

## VI. CONCLUSION

Tahajud prayer significantly reduces the stress response. The body's response is the influence of the midnight prayer through cell lines and the brain's response. Prostration at night drains oxygen-rich blood to the brain which gives effect to the secretion of the stable hormone adrenocorticotrophic (ACTH) and the cortisol hormone in physiological conditions so that the immune system increases. Prolonged stress triggers an increase in the hormone Adrenocorticotropin (ACTH) which secretes the hormone cortisol. High levels of the hormone cortisol result in pathological conditions, thereby suppressing the immune system (defense of the body) and reducing health.

Prayer movements support both physical health, prayer movements ranging from takbir, ruku', takbir, prostration, sitting between two prostrations, sitting late until greeting provides good ergonomic benefits to the organ systems of the body, heart, bones, muscles and nerves skin and hormone balance. This prayer movement is the process of relaxing the body after 12 hours of activity in a static position. The spine that supports the body permanently causes heavy pressure and burdens the nerves, causing fatigue. It should be able to carry out the midnight prayer consistently and continuously and try to be sincere and patient so that it responds positively to the balance of the body. Individuals who always have emotional balance will avoid physical and mental illness.

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