

## Spiritual Meaning Impacts Psychological Distress and Control of Mean Arterial Pressure in Hypertension Patients

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### Abstract:

Hypertension is a disease that can cause various complications and is made worse by psychological distress, where cases are increasing at the Bangkalan Community Health Center. This research aims to analyze the correlation between spiritual meaning in regulating psychological distress and mean arterial pressure (MAP) in hypertension patients. This research method is correlation analytic with a cross-sectional approach with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guideline. population of 76 patients and a sample of 62 taken using simple random sampling. The independent variable is spiritual meaning, measured using the Daily Spiritual Experience Scale (DSES). Meanwhile, the dependent variable is distress, measured by the Kessler Psychological Distress Scale and the mean arterial pressure (MAP) value. The collected data was then subjected to statistical tests using Spearman ranks with an alpha value of 0.05. The research results show a relationship between spiritual meaning and psychological distress with a p-value of  $0.016 < 0.05$  and a correlation coefficient of  $-0.305$ . Spirituality is also significantly related to the mean arterial pressure (MAP) value with p value  $0.005 < 0.05$ , and the correlation coefficient is  $-0.351$ . Spirituality has an impact on reducing psychological distress, affecting the function of the Hypothalamus Pituitary Adrenal (HPA) Axis and Sympathetic Adrenal Medullary (SAM) Axis. The SAM Axis will balance the secretion of norepinephrine (NE) and epinephrine (E), which affects the balance of contraction of smooth cardiac muscle cells, vasoconstriction and vasodilation, heart rate, and normalizes sodium levels so that it can control blood pressure in hypertensive patients.

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## INTRODUCTION

Hypertension is a disease that is common in modern times which can cause various kinds of complications, especially cardiovascular. Hypertension is a chronic disease characterized by uncontrolled blood pressure and can trigger disability and premature death (Lamirault et al., 2020). Meanwhile, according to WHO, hypertension is defined as systolic blood pressure over 140 mmHg, diastolic blood pressure over 90 mmHg, or taking antihypertensive medicine (Yin et al., 2022). Hypertension can be exacerbated by the presence of distress which is involved in the etiology of clinical hypertension (Cozier et al., 2018) and is often a factor that is not directly visible.

Hypertension is a non-communicable disease, where this category of disease accounts for around three-quarters of all deaths (Egan et al., 2019). The World Health Organization (WHO) in 2021 estimates that the prevalence of hypertension will reach around 1.28 billion individuals with

an age range of 30-79 years. The death rate is around 7.1 million people, which occurs mainly in poor countries with inadequate health systems (Oktamianti et al., 2022; Belay et al., 2022). Hypertension sufferers, according to The Indonesian Basic Health Research 2018 report, are estimated to increase from 25.8% in 2013 to 34.1% in 2018 of the total population (Astutik et al., 2020; Kurnianto et al., 2020; Oktamianti et al., 2022). Preliminary studies in the Bangkalan Community Health Center Work Area, Bangkalan Regency, East Java Province - Indonesia, found a trend of increasing cases of hypertension. Data on patients who visited the Community Health Center in January 2023 recorded 56 patients in February 62 and in March 76. The data above confirms the problem of increasing cases of hypertension experienced by people in the Bangkalan Community Health Center working area, Bangkalan Regency.

Hypertension that is not treated properly and correctly will result in various disorders, especially cardiovascular ones. A study explains a significant relationship between hypertension and a high risk of cardiovascular disease (CVD) and the risk of death in sufferers (C. Wang et al., 2020). Other complications are cerebral circulation disorders, stroke, microvascular damage, ischemia, infarction, and Alzheimer's (Ungvari et al., 2021). Pharmacological management can use sodium-glucose co-transporter 2 inhibitors and Glucagon-like peptide-1 receptor agonists. Non-pharmacological management also involves limiting salt intake, lifestyle fields (Al Ghorani et al., 2022), and spirituality. Spirituality can control blood pressure because it has a positive effect on reducing distress, thereby improving physical and psychological well-being (Conversano et al., 2021), including being effective for hypertension. Spirituality influences improving quality of life, cognitive, physical, emotional, and social health (Connolly & Timmins, 2021). This research aims to analyze the correlation between spirituality in the regulation of psychological distress and mean arterial pressure in hypertension patients. This research is very important to improve non-pharmacological clinical management with transcendent therapeutic modalities that are safe, comfortable, and effective.

## METHOD

The method in this research is correlation analysis with a cross sectional approach through the Strengthening the Reporting of Observational studies in Epidemiology (STROBE) guidelines. Correlation Analytics is used to determine the closeness of the relationship between variables (Senthilnathan, 2019) which relates changes in the magnitude of one variable to another (Schober et al., 2018). Meanwhile, cross-sectional studies are observational studies that analyze data from a population over a certain period of time (X. Wang & Cheng, 2020) following STROBE guidelines. The research passed the ethical feasibility test with certificate number 1244/KEPK/STIKES-NHM/EC/IV/2022. Data was collected in May 2023 in the Bangkalan Community Health Center Working Area, Bangkalan Regency - Indonesia. The population was 76 patients who came for examination to the Community Health Center with a sample size of 62 respondents taken using simple random sampling. The independent variable of this research is spiritual meaning, measured using the Daily Spiritual Experience Scale (DSES). Meanwhile, the dependent variable is distress, measured by the Kessler Psychological Distress Scale. Meanwhile, the next independent variable is the mean arterial pressure (MAP) of hypertensive patients, which is measured observationally using a sphygmomanometer and stethoscope. Mean arterial pressure (MAP) is the average arterial pressure throughout one cardiac cycle, systole, and diastole (DeMers & Wachs, 2023). The collected data was then subjected to univariate and bivariate statistical tests. The bivariate test in this study used the Spearman ranks test with an alpha ( $\alpha$ ) significance level of 0.05 to conclude the relationship between variables.

## RESULT

The research results are presented in two categories: general data descriptions and statistical tests displayed in tabular form. General data contains the respondents' gender, age, education level, and occupation. Meanwhile, special data consists of cross-tabulations and statistical test results between spiritual and psychological distress and spiritual and mean arterial pressure.

Table 1. Frequency Distribution of Respondents Based on Gender in the Bangkalan Community Health Center Work Area, Bangkalan Regency

Gender	Frequency	Percentage
Woman	42	67.7%
Man	20	32.3%
Amount	62	100%

Table 1 above shows that the majority of research respondents were women with 42 respondents or around 67.7% of the total respondents.

Table 2. Frequency Distribution of Respondents Based on Current Age in the Bangkalan Community Health Center Working Area, Bangkalan Regency

Age	Frequency	Percentage
40 – 50 Years	17	27.4%
51 – 56 Years	16	25.8%
57 – 65 Years	22	35.5%
>> 66 Years	7	11.3%
Amount	60	100%

Table 2 above shows that the age range of the largest respondents in this study was 57 – 65 years with a total of 22 respondents or almost half, namely 35.5%.

Table 3. Frequency Distribution of Respondents Based on Education Level in the Bangkalan Community Health Center Work Area, Bangkalan Regency

Parental Education	Frequency	Percentage
No School	0	0%
Elementary (Elementary/ Middle School)	23	37.1%
Intermediate (SMA/SMK)	27	43.5%
Higher Education (D3 – S3)	12	19.4%
Amount	62	100%

Table 3 above shows that the highest level of education of respondents in this study was secondary education, amounting to 27 respondents or almost half, namely 43.5%.

Table 4. Frequency Distribution of Respondents Based on Daily Work in the Bangkalan Community Health Center Work Area, Bangkalan Regency

Daily Work	Frequency	Percentage
Housewife	22	35.5%
Civil Servants /Police/Army	10	16.1%
Self-employed	15	24.2%
Farmers/Fishermen	15	24.2%
Amount	62	100%

Table 4 above shows that almost half of the respondents are housewives with a total of 22 respondents or around 35.5% of the total respondents.

Table 5. Frequency Distribution of Respondents Based on the Relationship Between the Meaning of Spirituality and the Level of Psychological Distress in the Bangkalan Community Health Center Work Area, Bangkalan Regency

		Psychological Distress					Amount
		Normal	Low	Currently	Heavy	Very Heavy	
Meaning of Spirituality	Low	1 (1.6%)	1 (1.6%)	0 (0%)	3 (4.8%)	1 (1.6%)	6 (9.6%)
	Currently	4 (6.5%)	6 (9.7%)	7 (11.3%)	6 (9.7%)	2 (3.2%)	25 (40.3%)
	High	4 (6.5%)	6 (9.7%)	6 (9.7%)	5 (8.1%)	1 (1.6%)	22 (35.4%)
	Very High	6 (9.7%)	1 (1.6%)	11 (17.7%)	1 (1.6%)	0 (0%)	9 (14.5%)
	Amount	15 (24.2%)	14 (22.6%)	14 (22.6%)	15 (24.2%)	4 (6.5%)	62 (100%)

Spearman Ranks Test

Alpha : 0.05

p Value : 0.16

Correlation Coefficient : - 0.305

Table 5 above shows the results of statistical tests using Spearman Ranks where the p value obtained is 0.016 which is smaller than alpha or 0.05. This means that in this case there is a relationship between the meaning of spirituality and the level of psychological distress of hypertensive patients in the Bangkalan Community Health Center Working Area, Bangkalan Regency. The level of closeness of the relationship is shown by the correlation coefficient value, namely -0.305, which means the level of closeness is quite strong with a negative correlation. Negative correlation means that the higher a person's meaning of spirituality, the lower the psychological distress felt by respondents in this study.

Table 6. Frequency Distribution of Respondents Based on the Relationship Between the Meaning of Spirituality and the Mean Arterial Pressure (MAP) Value in the Bangkalan Community Health Center Working Area, Bangkalan Regency

		Mean Arterial Pressure (MAP)				Amount
		Pre-Hypertension	Hypertension Stage 1	Hypertension Stage 2	Crisis Hypertension	
Meaning of Spirituality	Low	1 (1.6%)	2 (3.2%)	3 (11.3%)	0 (0%)	6 (9.7%)
	Currently	3 (4.8%)	12 (19.4%)	9 (14.5%)	1 (1.6%)	25 (40.3%)
	High	7 (11.3%)	7 (11.3%)	5 (8.1%)	3 (4.8%)	22 (35.5%)
	Very	7 (11.3%)	2 (3.2%)	0 (0%)	0 (0%)	9 (14.5%)
	High					
Total		18 (29%)	23 (37.1%)	17 (27.4%)	4 (6.5%)	62 (100%)

Spearman Ranks Test

Alpha : 0.05

p Value : 0.005

Correlation Coefficient : - 0.351

Table 6 above shows the results of statistical tests using Spearman Ranks where the p value obtained is 0.005, which is smaller than alpha or 0.05. This means that there is a significant relationship between the meaning of spirituality and the value of Mean Arterial Pressure (MAP) in hypertensive patients in the Bangkalan Community Health Center Working Area, Bangkalan Regency. The correlation coefficient value obtained is -0.351, which means the level of closeness is quite strong with a negative correlation. Negative correlation means that the higher a person's sense of spirituality, the lower the mean arterial pressure or the more controlled the blood pressure of hypertensive patients in this study.

## DISCUSSION

The research results show that a high level of spirituality will correlate with a decrease in the level of psychological distress in this study. Spirituality is a dimension in human life that is transcendent and allows a person to have the energy to survive holistically. Spirituality is the deepest and most personal aspect that helps individuals feel connected to themselves, the environment, and the sacred meaning of God's presence (Alrukban et al., 2023). Spirituality frames various positive hopes about life, especially when someone is in a crisis condition both physically and mentally (Villas Boas, 2020). Good spirituality will be perceived as a positive stimulus that will change distress into eustress. Distress according to Cassel (1999) is an unpleasant experience for a person due to life pressure from the outside or internal perception which causes feelings of discomfort that trigger physical disorders, the development of disease, pain and psychological chaos (Braga et al., 2020). Meanwhile, Eustress is a state of homeostasis where the individual is in the best balance psychologically and biologically. Psychologically, the condition of eustress makes a person free from various pressures, depression, anxiety and can accept themselves well. Meanwhile, biologically, various physical and biochemical elements in the body are in physiological, homeostasis and physiological phases so that a person will be healthy and fit.

The main factor that must be immediately neutralized in this study is the level of psychological distress which has been explained at the beginning that this can worsen the level of

hypertension. A study shows that distress can cause various psychological imbalances that can reduce quality of life, interfere with daily activities (Subramaniam et al., 2018), worsen therapy regimens, increase mortality (Ng et al., 2017), risk of hopelessness and attempted suicide. self (Bulotiene & Pociute, 2019). Meanwhile, spirituality in several studies can improve psychological well-being (Božek et al., 2020), reduce pain (Keivan et al., 2019), healing process in patients with refractory or incurable diseases (Rafii et al., 2020). One of the spiritual applications, namely *dhikir*, is reported to be able to regulate imbalances due to distress becoming a condition of homeostasis or eustress in patients with type 2 diabetes mellitus (Amir et al., 2018). In fact, Amir et al (2018) proved that not only perceived stress is experiencing regulation, but the stress response hormone marker, cortisol, is also experiencing changes towards balance. This means that in this case good spirituality will have a positive impact on an individual's internal mental events thereby reducing psychological distress.

Psychological distress that decreases physiologically will be able to control blood pressure in hypertensive patients. Although this does not exclude other factors such as the patient's gender and age. Gender, for example, does influence both physiologically in hormone regulation and personality, so the pathogenesis and treatment will be different. Different guidelines for the management of hypertension have constantly acknowledged that the prevalence of hypertension is different between men and women across the lifespan (Williams et al., 2018 ; Whelton et al., 2018). In this study, the number of respondents was more women, which may be correlated with psychological and hormonal factors. Meanwhile, the age factor also influences the incidence of hypertension, where in this study the data shows that almost half of the respondents were in the age range of 57 - 65 years. A study reported that an individual's age has a strong correlation with the incidence of hypertension (Suvila et al., 2020). This may be related to degenerative processes in organs, especially blood vessels and nerves in adults approaching old age. Degenerative blood vessels are at risk of causing functional imbalances, one of which is progressive vasoconstriction which leads to pathological conditions.

Good spiritual meaning affects a person's health and adaptive mechanisms so that it has an impact on physical and psychological health. Physically, it may also have an impact on hormonal function according to gender and can slow down the aging process. Psychologically, spiritually, it influences reducing the level of distress as a form of interaction between various dimensions of life in a holistic manner. Distress as a mentally disturbing condition in the perception space will be responded to by other neuro-endocrine mechanisms. When distress is felt, it will at least respond through the Hypothalamus Pituitary Adrenal (HPA) Axis and Sympathetic Adrenal Medullary (SAM) Axis systems (Jayasinghe et al., 2022). The HPA Axis will activate the release of cortisol to increase metabolism during distress, while the SAM Axis releases various alpha-amylase hormones, affects heart rate and is also related to behavior during distress (Sobhani et al., 2022). The pathological thing that can occur in conditions of uncontrolled distress is dysregulation in various systems, especially the neuroendocrine, autonomic and immune systems (Cozier et al., 2018). The autonomic nervous system is physiologically related to blood pressure.

So distress will be related to changes in the balance of the hemodynamic system, including in this case the regulation of blood pressure. In hypertensive sufferers, distress is a trigger for increased blood pressure and cardiovascular disorders. Distress causes activation of the sympathetic nervous system which has an impact as increases in body temperature, pulse rate, and blood pressure, and increases stress hormones (Nakamura & Morrison, 2022). If these various compensations are excessive, they can have a bad impact, so they must be immediately neutralized with the meaning of spirituality. Spirituality in religion is a substance of intrinsic religiosity that is able to influence stress levels and have a positive impact on a person's coping



(Pirutinsky et al., 2020). If individual coping is adaptive in responding to various stressors, then various holistic system mechanisms will take place physiologically.

Physiological stress will be responded to quickly in a short time by the SAM Axis which will secrete norepinephrine (NE) and epinephrine (E) which will bind to G-protein receptors to initiate an intracellular cAMP signaling pathway. This signaling effect is related to vasoconstriction, contraction of smooth and cardiac muscle cells, increased blood pressure, heart rate, cardiac output, and increased sodium retention, dilation of the pupils and sweat release (Chu et al., 2023 ; Udhayakumar et al., 2023). All of these changes lead to an increase in blood pressure which, if progressive, will worsen the control of hypertension. Spirituality contains aspects of connectedness and surrender to God which calm the soul and give birth to hope (Alrukban et al., 2023). Hope that relies on spirituality will balance the stress response to avoid falling into a state of distress. If the distress condition can be suppressed and regulated to eustress, then the neuroendocrine response through the sympathetic and parasympathetic nerves as autonomic nerves will be homeostatic. An autonomic nervous system that works in homeostasis will be optimal in regulating visceral functions such as respiratory rate, HR, digestion, and maintenance of internal homeostasis (Amadawala et al., 2023). Then, because distress triggers the activation of adrenergic hormones, nitric oxide (NO) will be activated, thereby risking vasoconstriction and endothelial dysfunction (Motta E Motta et al., 2021).

Spirituality regulates stress adaptively, so adrenergic levels including NE and E levels will be secreted physiologically. Balanced adrenergic levels positively impact the regulation of nitric oxide (NO), which functions in maintaining a healthy endothelial condition and preventing vasoconstriction. If the condition of the endothelium is well maintained and the blood vessels do not experience pathological vasoconstriction, then blood pressure in hypertensive sufferers can be controlled. It has also been explained in a study that spirituality is effective in overcoming various illnesses diseases, increasing adaptation from serious diagnoses Field (Del Castillo, 2021) and, regulating blood pressure control, and improving the pathogenesis of hypertension (Johnson & Xue, 2018). According to researchers, spirituality originates from a person's highest awareness of God's greater strength or existence, so a person will easily learn lessons from various conditions. When successful in taking himak, a person will be free from serious distress, both psychosocial and biological. When it is free from disturbances, the mechanisms of the cardiovascular system and blood vessels will work optimally and in homeostasis so that blood pressure will always be normal. In hypertensive sufferers where various triggering and influencing factors have interacted pathophysiologic ally, then at least the spirituality that gives birth to eustress will control blood pressure so that they will not fall into a hypertensive crisis or other complications. In the future, health and nursing practices must also accommodate spiritually-based healing management more systematically. Deep and high spiritual awareness will influence positive perceptions of psychological stress. Positive stress will be able to normalize physiological activities in the neuroendocrine such as the balance of cortisol, adrenaline, epinephrine, norepinephrine, and the sympathetic and parasympathetic systems. If all the above mechanisms are homeostatic, blood pressure will be able to be controlled in hypertensive patients.

## CONCLUSION

Spirituality is a transcendent aspect related to the meaning of life and the presence of God within oneself. Every interpretation of spirituality will have an impact on reducing psychological distress. Reducing psychological distress will increase comfort and calm the soul so that it has implications for the homeostasis of the Hypothalamus Pituitary Adrenal (HPA) Axis and

Sympathetic Adrenal Medullary (SAM) Axis. The SAM Axis will balance the secretion of norepinephrine (NE) and epinephrine (E), which affects the balance of contraction of smooth cardiac muscle cells, vasoconstriction and vasodilation, heart rate, and normalizes sodium levels. If all of these things are in good condition and balanced, then blood pressure can be controlled so that complications do not occur and there is hope of recovering from hypertension.

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