Original Research Paper

Model *spiritual care* with an adaptation theory approach *Callista Roy* on cortisol levels

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Abstract

Ischemic stroke is a cause of physical disability. These defects result in impaired biopsychosociospiritual adaptation in stroke patients. The inability to adapt will cause an anxiety reaction which triggers an increase in cortisol levels. The spiritual care model helps patients find meaning and purpose in life as well as an optimistic attitude so that they have better adaptability. This type of research is Quasy Experimental with a pretest-posttest control group design. The study population was ischemic stroke patients in the Outpatient Department of Dr. Regional General Hospital. Moewardi Surakarta. The total sample consisted of 60 respondents, divided into 30 control group respondents and 30 intervention group respondents, who received a spiritual care model intervention in the outpatient room of Dr RSUD. Moewardi Surakarta. The research results show the influence of the Spiritual Care Model Using Callista Roy's Adaptation Theory Approach on Cortisol Levels in Ischemic Stroke Sufferers with a significance value of $0.043 < 0.05$. The Spiritual care model influences the amygdala, which stimulates the hypothalamus through the hypothalamic-pituitary-adrenal (HPA) axis, thereby inhibiting the excretion of corticotropin-releasing factor (CRF). The pituitary gland then stimulates adrenocorticotropic hormone (ACTH), which reduces cortisol. This research has a contribution that spiritual care interventions can improve the adaptability of biopsychosocial rehabilitation of stroke patients. This research has a contribution that spiritual care interventions can improve the ability to adapt biopsychosocial rehabilitation of stroke patients.

Keywords: cortisol levels; ischemic stroke; spiritual care model

1. Introduction

Stroke This is an emergency disease and requires immediate help. According to *World Stroke Organization* In 2018, stroke was the second leading cause of death and the main cause of disability at 87%. Currently, worldwide there are 80 million people who have had a stroke with 5.5 million people dying every year and more than 116 million years experiencing disability. Disability can occur as a result of functional decline and the tendency to experience persistent health problems can potentially lead to an inability to carry out daily activities. Ischemic stroke patients have anxiety of around 20-36% every year, and has the potential to double from year to year (Liu et al., 2023). Patients who suffer from physical disabilities will trigger negative perceptions of biopsychosocial life. Patients have negative perceptions causing feelings of pessimism, anxiety and even depression about the future (Anderson, 2019). According

to the American Stroke Association, it was found that teenagers aged 18-34 years who experienced an ischemic stroke easily experienced anxiety because they lacked experience in adapting to their illness (AHA, 2019).

Anxiety can activate *Hypothalamus, pituitary, adrenal axis* via the hypothalamus will stimulate *Corticotropin Releasing Hormone* (CRH). Furthermore, CRH will increase production *Sympathetic Adrenal Medular Axis* which causes its activation *Adrenocorticotropic Hormone* (ACTH) which will stimulate the production of the hormone cortisol from the adrenal cortex (Yuliadi, 2021; Kageyama et al., 2021). Cortisol is a glucocorticoid that is synthesized by hypothalamic regulation which functions as an adaptive response to stress. Stroke patient experienced an increase in cortisol by 38% for 90 days (Gulyaeva et al., 2021). Stroke patients with elevated cortisol levels associated with higher dependency outcomes, length of stay in hospital, depression, delirium, and death (Amalia, 2024). Cortisol levels on the first day after hospital admission reflect the severity of stroke at 90 days and one year (Neidert et al., 2018).

Model intervention *spiritual care* can raise hope about the potential for healing (Afshar et al., 2021). Patients having high hopes will make patients more obedient to undergoing stroke treatment regularly. Role *spiritual care* It is very important in helping patients fulfill spiritual needs related to interaction with God which contributes to finding meaning and purpose in life as well as an optimistic attitude so that they have the ability to adapt better to disease. Good adaptability will form mental resilience during stroke treatment ischemic disease, an exclusive spiritual care program is needed in a neurological clinic (Wijayanti et al., 2017; Khalajinia et al., 2021; Salamizadeh et al., 2017). Stroke patients experience problems related to the inability to adapt their self-concept and changes in role function which can cause anxiety so that patients have maladaptive coping such as limiting social and physical activities which can hinder stroke recovery (Gandana & Kariasa, 2017; Lattanzi et al., 2023). One of the nursing models that has broad meaning and in depth on adaptation in the biopsychosocial dimension to chronic illness is Callista Roy's theory of adaptation model.

Callista Roy's theoretical adaptation model aims to improve adaptive responses in each physiological dimension, self-concept, interdependent and role function (Alligood, 2017). Nurses have an important role in providing nursing actions that can manipulate focal, contextual or residual stimuli, so with the By manipulating all these stimuli, it is hoped that the patient will be able to adapt (Alligood, 2017). Nurses manipulate stimuli using intervention *spiritual care* to provide spiritual guidance to patients in tolerating adverse threats and family involvement in biopsychosocial care, it is hoped that this can realize patient independence in determining adaptive behavior (Yilmaz & Kara, 2020).

Previous research on the spiritual care model used the development of nurse competency to reduce stress and improve the quality of spiritual care and spiritual well-being of patients (Haghparast et al., 2021). The spiritual care model is an interprofessional collaborative intervention in providing spiritual services by helping patients understand the meaning of illness and gain hope in overcoming illness situations (Góes & Crossetti, 2020). However, the scope of the spiritual care model still needs to be developed from a different perspective as an independent nursing intervention for the treatment of psychosocial adaptation disorders resulting from the impact of stroke. Previous research on models *spiritual care* used to develop nurse competencies to reduce stress and improve the quality of spiritual care and spiritual well-being of patients (Haghparast et al., 2021; Ghorbani et al., 2020). Model *spiritual care* is an interprofessional collaborative intervention in providing spiritual services by helping patients understand the meaning of illness and gain hope to overcome illness situations (Góes & Crossetti, 2020). However, the scope of the model *spiritual care* still needs to be developed from a different perspective as an independent nursing intervention for the treatment of psychosocial adaptation disorders resulting from the impact of stroke. The aim of the research

is whether there is an influence of the Spiritual Care Model Using Callista Roy's Adaptation Theory Approach on Cortisol Levels in Ischemic Stroke.

2. Research Methods

This research is a type of research *Quasy Experimental* with *pre test-post test control group design*. The research population is patients *stroke* ischemic in the outpatient area of the Regional General Hospital. Dr. Moewardi Surakarta. Place of research in the outpatient area of the Regional General Hospital. Dr. Moewardi Surakarta. Sampling in this research is by technique *consecutive sampling.* The sample size was 60 respondents consisting of 30 intervention group respondents and 30 control group respondents. Inclusion criteria: Patients aged 30-60 years, Patients with a GCS score ≥14, History of first stroke, Typical ischemic stroke patients with lesions in the internal capsule as shown by brain CT scan results, Patients with treatment according to PERDOSSI guidelines and willing to become research participants by signing a letter of agreement or informed consent. Model independent variables *spiritual care* with Callista Roy's adaptation theory approach. The dependent variable is cortisol levels. Check cortisol levels by taking a venous blood specimen of ± 3 ml in the morning by laboratory staff. Cortisol examination uses the ELISA method. The results are read using a microtiter plate reader which can measure the absorbance or intensity of the color formed. The more cortisol in the sample, the greater the resulting color intensity.These results are then compared with a standard curve that has been created previously to determine the concentration of cortisol in the sample. The results obtained are in the form of cortisol concentration values measured in units, such as µg/dL.

Before collecting data, the researcher explained the research, procedures, etc. related to the research to the respondents. Respondents then signed an informed consent sheet. Subjects in the control and intervention groups will first have a pre-test measuring cortisol levels. Subjects are divided into 2 groups with *purposive sampling* namely the intervention group *spiritual care* with Callista Roy's adaptation theory approach given 12x for 3 months and the control group with *spiritual care* generic routine that nurses do. After being given the intervention, the intervention group and the control group measured the post test cortisol levels. Validation of cortisol data using laboratory equipment standardized by the Ministry of Health of the Republic of Indonesia**.** Bivariate data analysis used the Mann Whitney U Test.

Ethical Considerations Research ethics permits are based on six basic research principles: benefit and non-malfeasance, fidelity and responsibility, integrity, justice, respect for people's rights and dignity, and ethical clearance. Ethical feasibility is a written statement by the Research Ethics Commission for research involving living things. It states that research is feasible after meeting certain requirements. This research has received ethical approval from the Regional General Hospital. Dr. Moewardi Surakarta number 1.012/VII/HREC/2022

3. Results and Discussion

3.1.Results

Frequency distribution of respondent characteristics involving 60 ischemic stroke patients.

Table 1. Respondent Characteristics

Variable	Frequency (f)	%
Age		
21-40 Years	6	10.0
41-60 Years	54	90.0
Gender		

Variable	Frequency (f)	%
Man	38	63.3
Woman	22	36.7
Education		
Elementary school	14	23.3
Junior high school	17	28.3
High school	22	36.7
Diploma	2	3.3
Bachelor	5	8.3
Obedience		
1x absent	14	23.3
2x absent	6	10.0
Always present	40	66.7
Family support		
Low	2	3.3
Height	58	96.7

Based on Table 1, the age characteristics of the majority of respondents are 54 (90%) in the 41-60 year category and 6 (10%) in the 21-40 year age category. Characteristics of respondents based on gender, the majority were 38 males (63.3%) and 22 (36.7%) female minorities. The educational characteristics of the majority of respondents were in the high school category, numbering 22 (36.7%) and the minority in the diploma education category, numbering 2 (3.3%). Characteristics of respondents based on compliance, the majority category is always present, numbering 40 (66.7%) and the minority compliance category is twice absent, numbering 6 (10%). Then the majority family support is in the high category, numbering 58 (96.7%) and the minority family support is in the low category. a total of 2 (3.3%).

Table 2. Average Cortisol Distribution (N=30)

Variable	N	Mean	Median	SD	Min	Max
Pre Cortisol (Intervention)	30	119.63	113.50	54.165	42	265
Pre Cortisol (Control)	30	120.83	112.50	57.032	43	242
Post Cortisol (Intervention)	30	99.23	100.50	43.540	51	239
Post Cortisol (Control)	30	127.70	110.00	63.918	30	263

Based on Table 2, in the intervention group the average pre-cortisol value was 119.63 (SD=54.165), this value was greater than the post-cortisol value of 99.23 (SD=43.540). The control group's average pre-cortisol value was 120.83 (SD=57.032), this value was smaller compared to post-cortisol of 127.70 (SD=63.918). These results mean providing intervention *spiritual care* can lower cortisol levels in the intervention group.

Table 3. Data Normality Test

Variable	Statistic	df	Say.
Post Cortisol	.175	60	.000

Table 3 data normality test using Kolmogorov-Smirnov The results of the cortisol posttest normality test obtained a significance value of 0.000, which means that the data was not normally distributed, so the comparison test used was the Mann-Whitney test.

Table 4. Mann-Whitney test

	Intervention	Control	U	Z	Asymp. Sig. (2-tailed)
	Mean	Mean			
Post Cortisol	99.23	127.70	313.000	-2.026	.043

Table 4 explains that the mean post cortisol value in the intervention group was 99.23, while the mean post cortisol value in the control group was 127.70. The average value in the control group was greater than the intervention group. The results of the post cortisol difference test show a p value of 0.043, so the p value is <0.05, so there is a significant difference between the post cortisol of the intervention group and the post cortisol of the control group. So it can be concluded that there is an influence of the Spiritual Care Model Using Callista Roy's Adaptation Theory Approach on Cortisol Levels in Ischemic Stroke.

3.2.Discussion

The majority of respondents were 41-60 years old, amounting to 54 (90%) respondents. The age of 50 years is susceptible to an increase in cortisol secretion for 24 hours (Roelfsema et al., 2017). Ischemic stroke at the age of 41 - 60 years, including in adulthood, is caused by lifestyle factors such as smoking. Smoking can increase the blood's tendency to clot or hypercoagulability. Nicotine and other chemicals in cigarettes stimulate the formation of platelets (blood cells involved in blood clotting) which are more active and make blood thicker. These blood clots can form in blood vessels that have narrowed due to atherosclerosis, which can ultimately block blood flow to the brain and cause ischemic stroke (Tumeleng et al., 2015). Apart from that, at the age of 41-60 years, there is a hypertension factor that causes ischemic stroke because it lasts for a long time, this can cause thickening and damage to the walls of blood vessels, including brain blood vessels. As a result, blood vessels become narrower, stiffer, and more easily blocked, which increases the risk of ischemic stroke (Yu et al., 2020). Cortisol levels can predict medical, physiological and behavioral outcomes (Moffat et al., 2020).

The majority of gender is male, numbering 38 (63.3%). Based on research by Teo et al. (2023) that Gender has a correlation with cortisol levels, with the results that men show higher cortisol levels than women (Teo et al., 2023). Men who were depressed also showed increased cortisol reactivity, whereas women who were depressed had a lower cortisol response (Zorn et al., 2017). The educational characteristics of the majority of respondents were in the high school category, numbering 22 (36.7%). Someone who has a higher education with adaptive coping can reduce cortisol levels significantly. Someone with a high level of education has a 2.45 times lower risk of suffering from clinical depression compared to someone with a low level of education (Lupien et al., 2023). The compliance characteristics of the majority category are always present, numbering 40 (66.7%) respondents. Low cortisol reflects good treatment compliance, the more a person adheres to treatment, the more they can control cortisol levels (Kaur & Singh, 2017). The majority of family support characteristics are in the high category, numbering

58 (96.7%). Family support in the form of caring interaction, love and a harmonious family environment can influence the reduction of cortisol levels (Vanessa & Susan, 2016). Accompaniment during treatment by the family is a factor in the patient being able to adapt because the patient feels close to the family who motivates recovery and accepts the illness with patience. The feeling of calm and comfort provided by the family during treatment can reduce the patient's anxiety which is marked by a decrease in cortisol (Deepradit et al., 2023).

The results of the Mann Whitney post cortisol test showed a p value of 0.043, so the p value was <0.05, so there was a significant difference between post cortisol in the intervention group and post cortisol in the control group, so H0 was rejected and Ha was accepted, so there was a difference in cortisol in ischemic stroke patients who were given intervention. model *spiritual care* with Callista Roy's adaptation theory approach. Model intervention *spiritual care* with the Callista Roy Theory approach, it has been proven to be effective in reducing anxiety levels through adaptive adaptation mechanisms. These findings provide evidence that anxiety measured using psychological instruments influences physiological stress which can be proven by changes in levels of the hormone cortisol as an anxiety parameter.

Model *spiritual care* can produce adaptive coping strategies, the resulting spiritual coping is that the patient considers the pain experienced as an atonement for sins, with pain as a means of communicating with God, considers pain as a reprimand, and considers pain as a test (Rosyadi et al., 2019). According to Calista Roy explains that humans are complete biopsychosocial creatures, therefore internal and external stimuli can influence the use of coping strategies in dealing with complex problems as an adaptation effort (Alligood, 2017). Ischemic stroke patients who consider themselves to have a partnership with God, the patient can feel empowered and more confident to achieve goals in rehabilitation. Spiritual care using the Callista Roy approach, namely spiritual care that fulfills the dimensions of the relationship with God, the dimensions of the relationship with the self and the dimensions of the relationship with other people as an intervention in assisting the process of coping mechanisms which make the patient capable of adapting biopsychosocially, who is expected to have adaptive behavior (Qinthara & Hanami, 2024).

Spiritual care can guide the patient to say praise as an outpouring of joy to honor and glorify God Almighty or by saying positive sentences can produce a sound stimulus that is captured by the sense of hearing to be transmitted to *temporal lobe* who was subsequently arrested by *God spot* (*circuit of God*). Stimulus on *God spot* affects the increase in serotonin sent to *prefrontal cortex* to act calmingly which forms positive perceptions, both emotionally and spiritually. A positive perception response will be sent by *amygdala* as feedback to the hippocampus so that it can control anxiety. Furthermore *amygdala* will stimulate the hypothalamus through *hypothalamus-pituitary-adrenal* (HPA) axis which will reduce sympathetic nerve activity to inhibit excretion *corticotrophin- releasing factors* (CRF) then gland *pituitary* stimulating *adrenocorticotrophic hormone* (ACTH) to reduce the production of the hormone cortisol (Utami, 2017). Previous research by Amini (2020) found that spiritual care given for 3 days did not affect anxiety because implementation of a short program of spiritual care may not be an effective way to control moderate anxiety and there is no appreciation of spiritual values and there is no biomolecular validation such as cortisol in determining anxiety levels (Amini et al., 2020).

A decrease in the hormone cortisol will reduce sympathetic activity which has a vasodilation effect on blood vessels which can cause a decrease in blood pressure thereby preventing *outcome* the bad one. This is supported by the results of research conducted by Dianti & Indrawijaya (2021) that *spiritual care* using the technique of listening to the chanting of the holy verses of the Koran can reduce stress hormones and activate hormones *endorphins* naturally, increasing feelings of relaxation and diverting attention from fear,

anxiety and tension (Dianti & Indrawijaya, 2021). Spirituality helps individuals build self-control even when patients feel pain and helps patients develop adaptations in dealing with chronic illnesses.

4. Conclusion

The research results show the influence of the Spiritual Care Model Using Callista Roy's Adaptation Theory Approach on Cortisol Levels in Ischemic Stroke Sufferers with a significance value of 0.043 < 0.05. There are differences in cortisol levels in ischemic stroke patients who are given intervention *model spiritual care* with Callista Roy's adaptation theory approach. Model *spiritual care* as an adaptive coping strategy for patients *stroke* ischemic who consider themselves to have a partnership with God, the patient can feel empowered and more confident to achieve goals in rehabilitation. *Spiritual care* as an appropriate adaptive means of reducing cortisol levels and activating endorphin hormones naturally, increasing feelings of relaxation and diverting attention from feelings of fear, anxiety and tension. The results of this research hope that the spiritual care model will become a complementary intervention in nursing care in preparing biopsychosociospiritual adaptation for ischemic stroke patients. The research implication is that spiritual care can be used as a biopsychosocial rehabilitation therapy to improve post-stroke adaptation so that cortisol levels fall as an indicator of reducing anxiety. Providing spiritual care once a week face to face for 30 minutes carried out by nurses at the neurology clinic.

Reference

Afshar, M., Sadat, Z., & Bagheri, M. (2021). The Effect of Spiritual Counseling on Hope in Patients with Multiple Sclerosis: A Randomized Clinical Trial. *International Journal of Community Based Nursing and Midwifery*, *9*(4), 319–322. https://doi.org/10.30476/ijcbnm.2021.88605.1523

AHA, A. H. A. (2019). *2019 Stroke Fact Sheet* (pp. 1–4). American Heart Association. https://www.stroke.org/en/about-stroke

Alligood, M. R. (2017). *Pakar Teori Keperawatan dan Karya Mereka* (A. Y. S.Hamid & K. Ibrahim (eds.); 8th ed.). Elsevier Ltd.

Amalia, L. (2024). The Relationship of Cortisol Levels and Sleep Quality in Acute Ischemic Stroke Patients : A Literature Review. *Jurnal Neuroanestesi Indonesia*, *13*(1), 46–52. https://doi.org/https://doi.org/10.24244/jni.v13i1.533

Amini, K., Tahrekhani, M., Abbas-alamdari, Z., & Faghihzadeh, S. (2020). The Effect of Spiritual Care on Anxiety about Death in Patients with Gastrointestinal Cancer Undergoing Chemotherapy : A Randomized Controlled Trial. *European Journal of Integrative Medicine*, *36*, 1–6. https://doi.org/10.1016/j.eujim.2020.101117

Anderson, S. C. (2019). The global burden of stroke: persistent and disabling. *The Lancet Neurology*, *18*, 439. https://doi.org/10.1016/S1474-4422(19)30030-4

Deepradit, S., Powwattana, A., Lagampan, S., & Thiangtham, W. (2023). Effectiveness Of A Family-Based Program For Post-Stroke Patients And Families: A Cluster Randomized Controlled Trial.

International Journal of Nursing Sciences, *10*(4), 446–455. https://doi.org/10.1016/j.ijnss.2023.09.020

Dianti, M. R., & Indrawijaya, Y. Y. A. (2021). Efektifitas Terapi Murottal Al Qur'an terhadap Stres Mencit (Mus Musculus). *J. Islamic Pharm*, *6*(1), 28–34.

Gandana, R. S., & Kariasa, I. M. (2017). Physical Disability and Self-Concept of Stroke Patients in The Budhi Asih Hospital , Indonesia. *UI Proc. Health Med*, *3*, 47–49. https://doi.org/10.7454/UIPHM.V3I1.192

Ghorbani, M., Mohammadi, E., Aghabozorgi, R., & Ramezani, M. (2020). The Effect of Applying Spiritual Care Model on Well-Being and Quality of Care in Cancer Patients. *Supportive Care in Cancer*, *29*(5), 2749–2760. https://doi.org/10.1007/s00520-020-05781-7

Góes, M. G. O. de, & Crossetti, M. da G. de O. (2020). Developing a Spiritual Care Model for Patients and Their Relatives in Illness. *Rev Gaúcha Enferm*, *41*, 1–10. https://doi.org/https://doi.org/10.1590/1983-1447.2020.20190150

Gulyaeva, N. V., Onufriev, M. V., & Moiseeva, Y. V. (2021). Ischemic Stroke, Glucocorticoids, and Remote Hippocampal Damage: A Translational Outlook and Implications for Modeling. *Frontiers in Neuroscience*, *15*(December), 1–10. https://doi.org/10.3389/fnins.2021.781964

Haghparast, A., Tabatabaei, H. S., Ghanbari, N., & Maleki, L. (2021). The Effect of the Spiritual Care Model Based on the Righteous Heart on the Post-Traumatic Stress of Veterans in 2019. *Teikyo Medical Journal*, *44*(02), 859–867.

Kageyama, K., Iwasaki, Y., & Daimon, M. (2021). Hypothalamic Regulation Of Corticotropin-Releasing Factor Under Stress And Stress Resilience. *International Journal of Molecular Sciences*, *22*(22). https://doi.org/10.3390/ijms222212242

Kaur, S., & Singh, R. (2017). Role of Different Neurotransmitters in Anxiety : A Systematic Review. *International Journal of Pharmaceutical Sciences and Research*, *8*(2), 411–421. https://doi.org/10.13040/IJPSR.0975-8232.8(2).411-21

Khalajinia, Z., Tehran, H. A., & Heidari, A. (2021). Explaining The Perception of Spiritual Care from The Perspective of Health Personnel: A Qualitative Study. *Journal of Education and Health Promotion |*, *10*(53), 1–6. https://doi.org/10.4103/jehp.jehp_599_20

Lattanzi, S., Divani, A. A., & Coccia, M. (2023). Social Functioning can Improve Motor Recovery after Stroke. *Journal of Integrative Neuroscience*, *22*(2), 1–2. https://doi.org/10.31083/j.jin2202032

Liu, W., Liu, X., Wang, J., Peng, S., Li, J., Pei, M., Qiu, Z., & Zhang, P. (2023). Predicting The Relationship Between Anxiety And Health-Related Quality Of Life In Post-Stroke Patients: The Role Of Sleep Duration. *Journal of Stroke and Cerebrovascular Diseases*, *32*(11), 107368. https://doi.org/10.1016/j.jstrokecerebrovasdis.2023.107368

Lupien, S. J., Ouellet-Morin, I., Trépanier, L., Juster, R. P., Marin, M. F., Francois, N., Sindi, S., Wan, N., Findlay, H., Durand, N., Cooper, L., Schramek, T., Andrews, J., Corbo, V., Dedovic, K., Lai, B., & Plusquellec, P. (2023). The Destress for Success Program: Effects of a stress education program on cortisol levels and depressive symptomatology in adolescents making the transition to high school. *Neuroscience*, *249*, 74–87. https://doi.org/10.1016/j.neuroscience.2013.01.057

Moffat, S. D., An, Y., Resnick, S. M., Diamond, M. P., & Ferrucci, L. (2020). Longitudinal change in cortisol levels across the adult life span. *Journals of Gerontology - Series A Biological Sciences and Medical Sciences*, *75*(2), 394–400. https://doi.org/10.1093/gerona/gly279

Neidert, S., Katan, M., Schuetz, P., Fluri, F., Ernst, A., Bingisser, R., Kappos, L., Engelter, S. T., Steck, A., Müller, B., & Christ-Crain, M. (2018). Anterior pituitary axis hormones and outcome in acute

ischaemic stroke. *Journal of Internal Medicine*, *1*(4), 420–432. https://doi.org/10.1111/j.1365-2796.2010.02327.x

Qinthara, F. N., & Hanami, Y. (2024). Adaptation of Religious/Spiritually Integrated Practice Assessment Scale-Client Attitude (RSIPAS-CA) in Indonesia. *Jurnal Psikologi Islam Dan Budaya*, *7*(1), 23–32. https://doi.org/10.15575/jpib.v7i1.29083

Roelfsema, F., Van Heemst, D., Iranmanesh, A., Takahashi, P., Yang, R., & Veldhuis, J. D. (2017). Impact of age, sex and body mass index on cortisol secretion in 143 healthy adults. *Endocrine Connections*, *6*(7), 500–509. https://doi.org/10.1530/EC-17-0160

Rosyadi, I., Kusbaryanto, & Yuniarti, F. A. (2019). Literatur Review Aspek Spiritualitas / Religiusitas Dan Perawatan Berbasis Spiritual / Religius Pada pasien kanker. *Jurnal Kesehatan Karya Husada*, *7*(1), 117–120. http://jurnal.akeskhjogja.ac.id/index.php/jkkh/article/download/262/164

Salamizadeh, A., Mirzaei, T., & Ravari, A. (2017). The Impact of Spiritual Care Education on the Self-Efficacy of the Family Caregivers of Elderly People with Alzheimer ' s Disease Original A rticle. *Int J Community Based Nurs Midwifery*, *5*(3), 231–238. https://pdfs.semanticscholar.org/d75b/106243afc2e45d43b492a6a332ddbee171c8.pdf

Teo, C. H., Wong, A. C. H., Sivakumaran, R. N., Parhar, I., & Soga, T. (2023). Gender Differences in Cortisol and Cortisol Receptors in Depression: A Narrative Review. *International Journal of Molecular Sciences*, *24*(8), 1–13. https://doi.org/10.3390/ijms24087129

Tumeleng, P., Runtuwene, T., & Kembuan, M. (2015). Sebaran Kebiasaan Merokok Pada Pasien Stroke Iskemik Yang Di Rawat Inap Di Bagian Neurologi Rsu Prof. Dr. R. D. Kandou Manado. *E-CliniC*, *3*(1), 262–266. https://doi.org/10.35790/ecl.3.1.2015.6827

Utami, T. N. (2017). Tinjauan Literatur Mekanisme Dzikir Terhadap Kesehatan: Respons Imunitas. *Jurnal JUMANTIK*, *2*(1), 106–109. http://jurnal.uinsu.ac.id/index.php/kesmas/article/view/965

Vanessa and Susan. (2016). Parent Cortisol and Family Relatedness Predict Anxious Behavior in Emerging Adults. *Physiology & Behavior*, *30*(7), 802–811. https://doi.org/10.1177/0022146515594631.Marriage

Wijayanti, L., Haryanto, J., & Suharto. (2017). The Effects of Spiritual Care on Depression and Meaning in Life in the Clients with Kidney Failure Receiving Hemodialysis in Rumah Sakit Islam Surabaya. *International Journal of Science and Research (IJSR)*, *6*(7), 247–251. https://doi.org/10.21275/art20174828

Yilmaz, C. K., & Kara, F. Ş. (2020). The Effect of Spiritual Well-Being on Adaptation to Chronic Illness Among People with Chronic Illnesses. *Perspectives in Psychiatric Care*, 1–8. https://doi.org/10.1111/ppc.12566

Yu, Y., Liu, L., Huang, J., Shen, G., Chen, C., Huang, Y., Zhang, B., Tang, S., & Feng, Y. (2020). Association Between Systolic Blood Pressure And First Ischemic Stroke In The Chinese Older Hypertensive Population. *Journal of International Medical Research*, *48*(4), 1–12. https://doi.org/10.1177/0300060520920091

Yuliadi, I. (2021). HPA Aksis Dan Gangguan Psikosomatik. *Jurnal Ilmiah Psikologi Candrajiwa*, *6*(1), 1–22. https://candrajiwa.psikologi.fk.uns.ac.id/

Zorn, J. V., Schür, R. R., Boks, M. P., Kahn, R. S., Joëls, M., & Vinkers, C. H. (2017). Cortisol stress reactivity across psychiatric disorders: A systematic review and meta-analysis. *Psychoneuroendocrinology*, *77*, 25–36. https://doi.org/10.1016/j.psyneuen.2016.11.036