

Muslim Prayer (Salah), and Its Restorative Effect: Psychophysiological Explanation

*Bayu Suseno¹

¹Faculty of Psychology, Universitas Muhammadiyah Surakarta, Indonesia

*Corresponding email: bs324@ums.ac.id

ABSTRACT

Stress is the most common problem experienced by people across ages and is associated with poor psychological and physical health. Stress is related to emotional and mental states that can be seen psychologically, namely relaxed and focused, also physiologically through the central nervous system (CNS) and autonomic nervous system (ANS), both sympathetic (SNS) and parasympathetic nervous systems (PNS). Salah, as obligatory Muslim worship, is a coping strategy beneficial for psychological and other aspects, such as physical and neurological health. Salah has a restorative effect, such as reducing mental fatigue and stress, as explained by attention restorative theory (ART) and stress restorative theory (SRT). Salah can reduce stress, psychologically and physiologically, indicated by an increment in PNS [nuHF of heart rate variability (HRV), galvanic skin responses (GSR), heart rate (HR), and blood pressure (BP)] activity and a decrease in SNS (nuLF and LF/HF of HRV) also increase of alpha brainwave which part of the central nervous system (CNS). In terms of focus, concentration, and awareness, salah is perceived as giving the worshiper a better mental state. In addition, salah increases the gamma power, which is part of CNS and related to awareness. Interestingly, the relaxation effect of salah is higher in the prostration position; also, reciting the Holy Quran while doing salah has higher effects on focus and attention than mimic salah. Apart from the obligation of salah, the psychological and physiological benefits of salah should make a Muslim pray obediently, and the finding that reciting the Holy Quran ayah during salah and prostration has a higher effect shows that remembering Allah is vital.

ARTICLE HISTORY

Received 15 November 2023

Accepted 1 December 2023

KEYWORDS

Salah; Restorative effect;
Stress; Mental Fatigue;
Nervous systems

INTRODUCTION

Stress is the most common variable studied regarding psychological health. Stress is an attribute of modern life (Kupriyanov & Zhdanov, 2014). Stress experienced by primary school children (Valizadeh et al., 2012), secondary and higher education students (Pascoe et al., 2020), adulthood (Matud et al., 2020), and older adults (Seangpraw et al., 2020). Stress is related to insufficient physical and psychological health (Toussaint et al., 2016). Even in the worst case, stress causes various diseases, such as depression, anxiety, insomnia, gastritis, heart disease, and hypertension (Segerstrom & Miller, 2004). Therefore, stress is the most common problem experienced by people across ages and is associated with poor psychological and physical health.

Stress can be divided into psychological and physiological stress (American Psychological Association, 2015). Psychologically, people show responses such as fear, anger, anxiety, and depression. On the other hand, stress is also related to mental conditions that refer to mental stress. Physiologically, the stress responses are explained by the mechanism of the autonomic nervous system (ANS) and parasympathetic nervous system (PNS) (Kozier et al., 2017). In a stressful situation, the ANS activity

increases, which in turn increases the activity of heart rate, electrodermal responses, and respiratory rate.

Folkman et al. (1986) found that religious activities are positive coping and conducive to personal growth. Salah is one of the Islamic strategies to cope with stressors and is considered the most practical strategy to cope with stress in Muslim lives (Witruk, 2017). As a regular prayer of Muslims, Salah is also considered a constant psychological and emotional catalyst (Achour et al., 2016). Regarding the mechanism, A correlational study found that salah moderates Muslim nurses' job stress and life satisfaction (Achour et al., 2021). An experimental study concluded that salah could potentially prevent oxidative stress in older women (Boy et al., 2023). A study on individuals with schizophrenia found that salah positively impacts patients' physical and mental health status, mindfulness, and concentration (Irawati et al., 2023). Even a study considered Salah as a form of meditation (Alwasiti et al., 2010) that also affects a positive mental state. A review study also found that Salah has benefits not only on psychological health but also neurological and physical health (Chamsi-Pasha & Chamsi-Pasha, 2021). Thus, it can be concluded that salah is a coping strategy beneficial for psychological and other aspects, such as physical and neurological health.

Daily prayer, or Salah in Arabic, is an act of worship for Muslims. Salah itself is the second pillar of Islam. As the Holy Book Quran commands, "Indeed, performing prayers is a duty on the believers at the appointed times." (Qur'an 4: 103); Muslims must perform salah five times daily. Salah differs from prayer in English words that refer to the general meaning of invocation or supplication. Salah is not only a form of human invocation and supplication in a broad sense but also an act of submission to Allah, the Supreme Creator, expressed by performing well-defined and specific physical activity embodying the spirit. Muslims who perform salah do Quran recitation and physical activity involving specific postural positions, namely standing, bowing, prostration, and sitting.

The explanation above implies that salah is a coping strategy that affects mental and emotional stress. This study aims to explore and explain the mechanism of the restorative effect of salah on mental and emotional stress. Thus, it could give the Muslim society an understanding of the effect, so it makes the Muslim society have better quality doing salah.

DISCUSSION

Salah And Restorative Effect

Restorative effects are classified as decreased cognitive fatigue, stress levels, negative affect, sympathetic nervous system activity, increased focus, and positive affect (Hartig et al., 1991). There are two restorative effect theories, namely, attention restorative theory (ART) (R. Kaplan & Kaplan, 1989; S. Kaplan, 1995) and stress restorative theory (SRT) (R. Ulrich, 1983; R. S. Ulrich et al., 1991). ART focuses more on mental fatigue, namely how the natural environment can decrease mental fatigue. SRT focuses more on emotional and physiological responses, namely how the environment can increase positive emotions and decrease the physiological responses related to stress. Even though both theories are much more commonly used to explain the effect of the environment, especially the natural environment, those concepts can describe the effect of any stimuli, even salah. Several studies about salah implied that salah has a restorative effect, such as the explanation of ART (Doufesh et al., 2016; Ridzwan et al., 2011) and SRT (Doufesh et al., 2012, 2013, 2014; Khanam et al., 2018; Legiran et al., 2022).

From the Islamic perspective, the real goal of prayer is the remembrance of Allah ("...and establish prayer for My remembrance.") (Qur'an 20: 14). In the interpretation of Maarif-Ul-Quran, the ayah tells us that the essence of prayer is the remembrance of Allah Ta`ala. More, from beginning to end, the Salah is nothing but remembering Allah with the tongue, the heart and other organs of the body. It is implied that one important quality while doing salah is related to awareness. In addition, remembering Allah has positive effects, as said in the Holy Book Quran, "...Surely in the remembrance of Allah do hearts

find comfort." (Qur'an 13: 28). In his interpretation, Ibn Kathir explained that Muslims' hearts become tranquil when they are remembered and pleased to have Him (Allah) as their Protector and Supporter. The one meaning of the term heart or "qalb" (قلب) in Arabic is the heart organ affected by the autonomic nervous system related to stress conditions. Thus, it is clear that the essence of salah is truly giving the ones who implement its restorative effects to stress conditions.

Salah and Restoration to Mental Fatigue

Salah is a unique way to worship, which can improve physical and mental state regarding alertness, concentration, and recreation (Syed, 2003). Another study found that the ones who regularly do salah show better mindfulness and mental health than those who do not (Ijaz et al., 2017). Mindfulness itself is awareness of one's internal states and surroundings (American Psychological Association, 2015). Certainly, mindfulness can be achieved by focusing our self on our internal state or surroundings of our focus interest. In line with the other study, Callender et al. (2022) did qualitative theme analytics and found that one of the themes was that Muslim prayer encourages intentional awareness. Those findings implied that salah was related to well mental state.

Various studies about salah and mental state have been conducted. Doufesh et al. (2016) investigated the effect of salah on EEG gamma activity. The study tried to find the difference between mimic salah, which only performed all four physical activity steps, and actual salah, which performing physical activity and reciting the Holy Book Quran. Compared to the mimic Salah, the actual Salah has a higher increase in gamma power in all cerebral regions and salah stages. According to the study, the increment of gamma power is related to increased cognitive and attentional processing. In addition, Ridzwan et al. (2011) investigated the difference between salah and hearing music on an EEG. First, the gamma bands showed higher activity than other bands, such as delta, theta, alpha, and beta bands. They found, in addition, that compared to hearing music, the gamma band after doing salah was higher. It was suggested that such brain wave activity implied that Muslims who do salah have more focus on Allah and tend to forget all worldly matters. As a result, it helps them to break their stress a few times. Thus, those studies concluded that actual Salah supports the conceptualization that salah improves concentration and attention.

As suggested by Doufesh et al. (2016), compared to mimic salah, which only performed all four physical activity steps, and actual salah, which involves performing physical activity and reciting the Holy Book Quran, performing salah has a higher effect in gamma power. It showed there was a different quality we get when we perform salah while reciting the ayah. A study also found that reciting the Holy Quran is a process that controls the brain, so the result the whole body will receive relaxation/refreshment, and the exhaustion, boredom and tiredness will be finished (Khan et al., 2010). Thus, it can be concluded that reciting the ayah while salah gives us more focus.

Salah and Restoration to Stress

Psychologically, a correlational study found that salah moderates Muslim nurses' job stress and life satisfaction (Achour et al., 2021). A study found that compared to nineteen alternative transcendents, relating with God helps people have better relationships with themselves and others, expressing the slightest dissonance between ideals and life experience (Fisher, 2014). In humanistic theories, one of the explanations for why psychological problems are overcome is there is an incongruity between the ideal and real self. As said in his interpretation of Qur'an 13: 28), Ibn Kathir explained that Muslims' hearts become tranquil when they are remembered and pleased to have Him (Allah) as their Protector and Supporter. Thus, doing salah makes the ones get support and protection so they feel more calm with the incongruity.

Physiologically, the central nervous system (CNS) and peripheral nervous system (PNS) activity, especially the brain, which is part of the CNS, and autonomic nervous system (ANS), which is part of

the ANS [sympathetic nervous system (SNS) and parasympathetic nervous systems (PNS)], can explain how the restorative effect of salah reduces stress. Stress conditions can be explained by brain wave activity that can be described in four stages: beta, alpha, theta, delta, and gamma waves (Abhang et al., 2016). In contrast to the stress condition, the relaxed state can be indicated by the activity of the alpha wave. A study on mental stress used the EEG to measure brainwave activity as the stress indicator (Chandra et al., 2017). Regarding ANS, stress responses can be described by the mechanism of the autonomic nervous system (ANS) and parasympathetic nervous system (PNS) (Kozier et al., 2017). In stress conditions, SNS responds by increasing heart rate, respiration rate, blood pressure, and electrodermal activity. Conversely, the PNS will slow the reaction, and the body will return to balance.

Various studies about salah and its effect on the part of nervous systems by each indicator have been done. The studies on salah have shown how the salah affects the part of the CNS (brain), which is brainwave activity (Doufesh et al., 2012, 2014; Khanam et al., 2018). Other studies have found the effect of salah on ANS, such as heart rate variability (HRV), blood pressure and heart rate (Doufesh et al., 2013, 2014; Legiran et al., 2022). All of the studies found that the effect of salah implies that salah has a restorative effect.

Regarding the brainwave activity, Doufesh et al. (2012) investigated the difference of alpha relative power between three conditions, namely resting, performing cycles of salah while reciting the specific verses and supplications, and performing four cycles of acted salah without any recitations. Doufesh et al. (2014) investigated the effect of Salah on the alpha relative power of EEG. Also, Khanam et al. (2018) investigated the brain (EEG) human activity during psychophysiological activities in salah. Compared to relaxed conditions, where one was only asked to sit on the chair and close to open their eyes, salah has higher alpha relative power (Doufesh et al., 2012). Another study also found that salah could increase the alpha relative power significantly compared to other relaxed conditions, namely open and closed eyes. In addition, the alpha relative power was also higher during Salah than before and after Salah (Doufesh et al., 2014). All the studies stated that the increment of alpha relative power is related to the rise of parasympathetic activity and lessens sympathetic activity (Doufesh et al., 2012, 2014; Khanam et al., 2018). Thus, salah makes the practices feel more relaxed and less anxious.

Regarding the indicator of ANS, Doufesh et al. (2014) investigated the relationship between the alpha and autonomic nervous systems shown by heart rate variability (HRV) during salah. Doufesh et al. (2013) investigated the difference between performing and miming the salah effect on heart rate (HR) and blood pressure (BP). Legiran et al. (2022) investigated the effect of salah on blood pressure in individuals with hypertension. Binlath et al. (2017) investigated the difference in the salah effect in galvanic skin responses (GSR), which is the indicator of electrodermal activity. The correlation between the alpha relative power and nuHF was significantly positive, and the correlation with nuLF and LF/HF negatively correlated during Salah but not before and after Salah (Doufesh et al., 2014). The nuHF indicated the activity of PNS, while nuLF indicated the activity of SNS and LF/HF is the ratio between SNS and PNS (Burr, 2007; Shaffer & Ginsberg, 2017). Another study found that HR in individuals miming salah was higher than performing salah (Doufesh et al., 2013). In the BP, doing salah made the blood pressure lower (Legiran et al., 2022). Another study found that systole and diastole blood pressure were significantly reduced after performing and miming salah, but a greater reduction was observed in performing salah than miming salah (Doufesh et al., 2013). In addition, GSR after salah was lower than before salah (Binlath et al., 2017). Thus, it can be concluded that doing salah is related to the increment of PNS and the decrease of SNS.

Specifically, various studies found a difference in the salah restorative effect in its cycle. Doufesh et al. (2012) found that the magnitude of alpha relative power was higher in the prostration position. In line, the standing position produced the highest HR, and prostration produced the lowest HR (Doufesh et al., 2013). Another study also found that the HR was lowered from the standing to the bowing position and dropped further when the subjects were in the prostration position (Ibrahim & Ahmad, 2008). Those

finding implied that salah positions have a different effect, which prostration gives Muslims a higher effect on relaxation conditions.

CONCLUSION

Salah, as an obligatory Muslim prayer, has restorative effects such as reducing stress and decreasing mental fatigue by increasing focus, concentration, and awareness. Psychologically, stress reduction happens because the worshiper gets protection and support from Allah by incongruity between ideal and real things. Physiologically, salah makes the PNS activity higher and SNS activity lower, and the brainwave, namely alpha, which is part of CNS and related to relaxed conditions, is higher. Regarding focus, concentration, and awareness, salah is perceived as giving the worshiper a better mental state. In addition, salah increases the gamma power that is related to awareness. Interestingly, the relaxation effect of salah is higher in the prostration position. Also, reciting the Holy Quran while doing salah has higher effects on focus and attention.

Ethics statement

This study was conducted based on ethical standard.

Authors contribution

BS contributes in the whole process of the study.

Conflict of interest

There is no conflict of interest in this study.

ORCID

Bayu Suseno <https://orcid.org/0000-0002-8801-5391>

REFERENCES

- Abhang, P. A., Gawali, B. W., & Mehrotra, S. C. (2016). Chapter 1—Introduction to Emotion, Electroencephalography, and Speech Processing. In P. A. Abhang, B. W. Gawali, & S. C. Mehrotra (Eds.), *Introduction to EEG- and Speech-Based Emotion Recognition* (pp. 1–17). Academic Press. <https://doi.org/10.1016/B978-0-12-804490-2.00001-4>
- Achour, M., Bensaid, B., & Nor, M. R. B. M. (2016). An islamic perspective on coping with life stressors. *Applied Research in Quality of Life*, 11(3), 663–685. <https://doi.org/10.1007/s11482-015-9389-8>
- Achour, M., Muhamad, A., Syihab, A. H., Mohd Nor, M. R., & Mohd Yusoff, M. Y. Z. (2021). Prayer Moderating Job Stress Among Muslim Nursing Staff at the University of Malaya Medical Centre (UMMC). *Journal of Religion and Health*, 60(1), 202–220. <https://doi.org/10.1007/s10943-019-00834-6>
- Alwasiti, H. H., Aris, I., & Jantan, A. (2010). EEG activity in Muslim prayer: A pilot study. *Maejo International Journal of Science and Technology*, 4(03), 496–511.
- American Psychological Association. (2015). *APA Dictionary of Psychology* (2nd ed.). American Psychological Association.
- Binlatah, T., Tohma, H., & Wichitsa-Nguan, K. (2017). Effect of muslims praying (salat) on electroencephalograph (eeg), galvanic skin response (gsr), blood pressure (bp) and pulse | journal of applied statistics and information technology. *Journal of Applied Statistics and Information Technology*, 2(1). <https://ph02.tcithaijo.org/index.php/asit-journal/article/view/164890>
- Boy, E., Lelo, A., & Sagiran. (2023). Salat dhuha effect on oxidative stress in elderly women: A randomized controlled trial. *Saudi Journal of Biological Sciences*, 30(4), 103603. <https://doi.org/10.1016/j.sjbs.2023.103603>
- Burr, R. L. (2007). Interpretation of normalized spectral heart rate variability indices in sleep research: A critical review. *Sleep*, 30(7), 913–919.
- Callender, K. A., Ong, L. Z., & Othman, E. H. (2022). Prayers and mindfulness in relation to mental health among first-generation immigrant and refugee muslim women in the USA: An exploratory study. *Journal of Religion and Health*, 61(5), 3637–3654. <https://doi.org/10.1007/s10943-022-01600-x>
- Chamsi-Pasha, M., & Chamsi-Pasha, H. (2021). A review of the literature on the health benefits of Salat (Islamic prayer). *The Medical Journal of Malaysia*, 76, 93–97.

- Chandra, S., Jaiswal, A. K., Singh, R., Jha, D., & Mittal, A. P. (2017). Mental Stress: Neurophysiology and Its Regulation by Sudarshan Kriya Yoga. *International Journal of Yoga*, 10(2), 67–72. <https://doi.org/10.4103/0973-6131.205508>
- Doufesh, H., Faisal, T., Lim, K.-S., & Ibrahim, F. (2012). Eeg spectral analysis on Muslim prayers. *Applied Psychophysiology and Biofeedback*, 37(1), 11–18. <https://doi.org/10.1007/s10484-011-9170-1>
- Doufesh, H., Ibrahim, F., Ismail, N. A., & Wan Ahmad, W. A. (2013). Assessment of heart rates and blood pressure in different Salat positions. *Journal of Physical Therapy Science*, 25(2), Article 2.
- Doufesh, H., Ibrahim, F., Ismail, N. A., & Wan Ahmad, W. A. (2014). Effect of Muslim prayer (Salat) on α electroencephalography and its relationship with autonomic nervous system activity. *Journal of Alternative and Complementary Medicine*, 20(7), 558–562. <https://doi.org/10.1089/acm.2013.0426>
- Doufesh, H., Ibrahim, F., & Safari, M. (2016). Effects of Muslims praying (salat) on EEG gamma activity. *Complementary Therapies in Clinical Practice*, 24, 6–10. <https://doi.org/10.1016/j.ctcp.2016.04.004>
- Fisher, J. W. (2014). Comparing the influence of God and other transcendents on spiritual well-being. *Religious Education Journal of Australia*, 30(2), 9–15. <https://doi.org/10.3316/aeipt.203821>
- Folkman, S., Lazarus, R. S., Dunkel-Schetter, C., DeLongis, A., & Gruen, R. J. (1986). Dynamics of a stressful encounter: Cognitive appraisal, coping, and encounter outcomes. *Journal of Personality and Social Psychology*, 50(5), 992–1003. <https://doi.org/10.1037/0022-3514.50.5.992>
- Hartig, T., Mang, M., & Evans, G. W. (1991). Restorative effects of natural environment experiences. *Environment and Behavior*, 23(1), 3–26. <https://doi.org/10.1177/0013916591231001>
- Ibrahim, F., & Ahmad, W. A. W. (2008). Study of Heart Rate Changes in Different Salat's Positions. In N. A. Abu Osman, F. Ibrahim, W. A. B. Wan Abas, H. S. Abdul Rahman, & H.-N. Ting (Eds.), *4th Kuala Lumpur International Conference on Biomedical Engineering 2008* (pp. 687–690). Springer. https://doi.org/10.1007/978-3-540-69139-6_171
- Ijaz, S., Khalily, M. T., & Ahmad, I. (2017). Mindfulness in Salah prayer and its association with mental health. *Journal of Religion and Health*, 56(6), 2297–2307. <https://doi.org/10.1007/s10943-017-0413-1>
- Irawati, K., Indarwati, F., Haris, F., Lu, J.-Y., & Shih, Y.-H. (2023). Religious practices and spiritual well-being of schizophrenia: Muslim perspective. *Psychology Research and Behavior Management*, 16, 739–748. <https://doi.org/10.2147/PRBM.S402582>
- Kaplan, R., & Kaplan, S. (1989). *The experience of nature: A psychological perspective* (1 edition). Cambridge University Press.
- Kaplan, S. (1995). The restorative benefits of nature: Toward an integrative framework. *Journal of Environmental Psychology*, 15(3), 169–182. [https://doi.org/10.1016/0272-4944\(95\)90001-2](https://doi.org/10.1016/0272-4944(95)90001-2)
- Khan, N., Ahmad, N. bt, Beg, A. H., Fakheraldin, M. A. I., Alla, A. N. A., & Nubli, M. (2010). Mental and spiritual relaxation by recitation of the holy quran. *2010 Second International Conference on Computer Research and Development*, 863–867. <https://doi.org/10.1109/ICCRD.2010.62>
- Khanam, F., Rahman, Md. A., & Ahmad, M. (2018). Evaluating alpha relative power of EEG signal during psychophysiological activities in salat. *2018 International Conference on Innovations in Science, Engineering and Technology (ICISSET)*, 195–200. <https://doi.org/10.1109/ICISSET.2018.8745614>
- Kozier, B., Erb, G., Berman, A., Snyder, S., Frandsen, G., Buck, M., Ferguson, L., Yiu, L., & Stamler, L. L. (2017). *Fundamentals of Canadian Nursing: Concepts, Process, and Practice* (4th ed.). Pearson Canada.
- Kupriyanov, R., & Zhdanov, R. (2014). The eustress concept: Problems and outlooks. *World Journal of Medical Sciences*, 11(2), 179–185. <https://doi.org/10.5829/idosi.wjms.2014.11.2.8433>
- Legiran, L., Febriani, R., Mubarak, M. R., & Pakpahan, S. (2022). Effect of salat on blood pressure and pulse rate in stage one primary hypertension patients. *JKKI: Jurnal Kedokteran Dan Kesehatan Indonesia*, 178–185. <https://doi.org/10.20885/JKKI.Vol13.Iss2art10>
- Matud, M. P., Díaz, A., Bethencourt, J. M., & Ibáñez, I. (2020). Stress and psychological distress in emerging adulthood: A gender analysis. *Journal of Clinical Medicine*, 9(9), 2859. <https://doi.org/10.3390/jcm9092859>
- Pascoe, M. C., Hetrick, S. E., & Parker, A. G. (2020). The impact of stress on students in secondary school and higher education. *International Journal of Adolescence and Youth*, 25(1), 104–112. <https://doi.org/10.1080/02673843.2019.1596823>
- Ridzwan, W. M. F. W. M., Mahmood, N. H., Zakaria, N. A., & Ali, E. A. (2011). Salat and brainwave signal analysis. *Jurnal Teknologi*, 181â€192-181â€192. <https://doi.org/10.11113/jt.v54.809>
- Seangpraw, K., Auttama, N., Kumar, R., Somrongthong, R., Tonchoy, P., & Panta, P. (2020). Stress and associated risk factors among the elderly: A cross-sectional study from rural area of Thailand. *F1000Research*, 8, 655. <https://doi.org/10.12688/f1000research.17903.2>
- Segerstrom, S. C., & Miller, G. E. (2004). Psychological stress and the human immune system: A meta-analytic study of 30 years of inquiry. *Psychological Bulletin*, 130(4), 601–630. <https://doi.org/10.1037/0033-2909.130.4.601>
- Shaffer, F., & Ginsberg, J. P. (2017). An overview of heart rate variability metrics and norms. *Frontiers in Public Health*, 5, 258. <https://doi.org/10.3389/fpubh.2017.00258>
- Syed, I. B. (2003). *Spiritual medicine in the history of islamic medicine*.
- Toussaint, L., Shields, G. S., Dorn, G., & Slavich, G. M. (2016). Effects of lifetime stress exposure on mental and physical health in young adulthood: How stress degrades and forgiveness protects health. *Journal of Health Psychology*, 21(6), 1004–1014. <https://doi.org/10.1177/1359105314544132>
- Ulrich, R. (1983). Aesthetic and affective response to natural environment. *Human Behavior & Environment: Advances in Theory & Research*, 6, 85–125. https://doi.org/10.1007/978-1-4613-3539-9_4
- Ulrich, R. S., Simons, R. F., Losito, B. D., Fiorito, E., Miles, M. A., & Zelson, M. (1991). Stress recovery during exposure to natural and urban environments. *Journal of Environmental Psychology*, 11(3), 201–230. [https://doi.org/10.1016/S0272-4944\(05\)80184-7](https://doi.org/10.1016/S0272-4944(05)80184-7)

- Valizadeh, L., Farnam, A., & Rahkar Farshi, M. (2012). Investigation of stress symptoms among primary school children. *Journal of Caring Sciences*, 1(1), 25–30. <https://doi.org/10.5681/jcs.2012.004>
- Witruk, Q. U., Evelin. (2017). The effectiveness of sabr (patience) and salat (prayer) in reducing psychopathological symptoms after the 2010 Merapi eruption in the region of Yogyakarta, Indonesia. In *Trends and Issues in Interdisciplinary Behavior and Social Science*. CRC Press.