ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 17, Issue, 10, pp.35094-35097, October, 2025
DOI: https://doi.org/10.24941/ijcr.49675.10.2025

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

THE CARDIOVASCULAR BENEFITS OF SALAH (ISLAMIC PRAYER) AS A FORM OF PHYSICAL ACTIVITY

[1]*Tamjeed Allam Bhat and [2]Dr. Shyamal Koley

[1]Assistant Professor, Department of Cardiovascular Technology USAHS, Lamrin Tech Skills University Punjab, India
[2]Professor and Dean, University School of Allied Health Sciences, Lamrin Tech Skills University, Punjab, India

ARTICLE INFO

Article History:
Received 20th July, 2025
Received in revised form
15th August, 2025
Accepted 07th September, 2025
Published online 30th October, 2025

Keywords:

Cardiovascular Benefits, Salah, Systolic Blood Pressure. Diastolic Blood Pressure, Resting Heart Rate, six-Minute Walk Test.

Corresponding author:
Tamjeed Allam Bhat

ABSTRACT

Cardiovascular diseases (CVDs) continue to be one of the world's leading causes of illness and death, with lack of physical activity identified as a key modifiable risk factor. Interestingly, Salah, the Islamic prayer performed five times a day, incorporates a series of gentle, rhythmic movements such as standing (qiyam), bowing (rukuʿ), prostration (sujud), and sitting (jalsa). These postures engage major muscle groups and encourage smooth, coordinated motion. Research has shown that performing Salah can lead to mild cardiovascular effects, including slight increases in heart rate and blood pressure, similar to those observed during light aerobic exercise. To assess the potential cardiovascular benefits of Salah, viewed as a form of physical activity, and to examine how regular practice might contribute to promoting cardiovascular health among Muslims who perform it consistently. A descriptive observational design was employed for the study. Data collection involved structured assessments of heart rate, blood pressure, and the six-minute walk test (6MWT) conducted before and after the Fajr prayer. The participants were adult Muslims, categorized based on their regularity of performing Salah into regular and non-regular practitioners. The participants who regularly performed Salah exhibited notable reductions in systolic and diastolic blood pressure, as well as in resting heart rate, following the Fajr prayer compared to their baseline measurements. Additionally, there was a significant improvement in their six-minute walk test (6MWT) distances. These outcomes suggest that engaging in Salah provides moderate cardiovascular benefits, reflecting its potential role as a light aerobic activity that supports heart health. Salah is more than an act of worship; it also functions as a gentle, consistent form of physical activity that supports cardiovascular well-being. The coordinated rhythm of its movements, combined with controlled breathing and focused mindfulness, contributes to improved heart function, enhanced blood circulation, and reduced stress levels, reflecting its holistic impact on both physical and mental health.

Citation: Tamjeed Allam Bhat, Dr. Shyamal Koley. 2025. "The Cardiovascular Benefits of Salah (Islamic Prayer) as a Form of Physical Activity.". *International Journal of Current Research, 17, (10), 35094-35097.*

INTRODUCTION

Cardiovascular diseases (CVDs) represent one of the leading causes of death worldwide, responsible for an estimated 17.9 million deaths annually, which accounts for nearly one-third of all global deaths (1). Many lifestyle choices we make every day can impact our heart health. Leading a sedentary life, eating unhealthy foods, and dealing with ongoing stress are some of the main factors that can contribute to heart disease. The good news is that these are things we can change. By becoming more active, choosing better foods, and managing stress effectively, we can lower our chances of developing heart problems. Taking control of these factors plays a big role in protecting our heart and overall well-being. (2).Regular physical activity, even at light to moderate levels, has been shown to bring important benefits to heart health. It can help lower blood pressure, improve how the heart rate varies naturally, and support the lining of the blood vessels to function better. These changes reduce the risk of heart disease and improve overall cardiovascular function, making regular movement a key part of maintaining a healthy heart (3). Salah, the obligatory Islamic prayer performed five times a day, holds great importance in a Muslim's daily routine by combining physical movement with spiritual focus. Each unit, called a rakʿah, involves a series of specific postures; standing (qiyam), bowing (rukuʿ), prostrating (sujud), and sitting (jalsa) that together create a flowing sequence of rhythmic movements, gentle stretching, and controlled breathing. This unique combination not only enhances mindfulness but also engages muscles and joints throughout the body, promoting flexibility and balance (4). The postures involved in Salah activate major muscle groups across the legs, trunk, and upper body. This engagement boosts blood flow back to the heart (venous return), enhances joint mobility, and improves muscle coordination. The intensity of these movements is comparable to that of light calisthenics or yoga, offering gentle yet effective physical exercise (5). From a physiological point of view, the repetitive movements during Salah gently influence the cardiovascular system by changing the pressure in the chest area and activating reflexes in the blood vessels that help regulate heart rate and blood pressure. These subtle shifts support the body's automatic balance, helping to maintain a healthy autonomic nervous system (6). This aligns with earlier findings showing that even short bursts of low-intensity, intermittent physical activity spread throughout the day can provide meaningful benefits for heart health and metabolism. Such frequent, moderate movements can help reduce the risk of cardiovascular disease and improve metabolic functions, emphasizing that staying active in small ways matters just as much as longer

exercise sessions (7). Beyond its physical movements, Salah also has profound psychological and neuroendocrine effects. The meditative aspects of prayer, combined with steady breathing and rhythmic motions, work together to activate the body's parasympathetic nervous system. This activation can lower stress hormone levels like cortisol and promote a sense of calm and mental clarity (8).Chronic stress is widely recognized as a key contributor to hypertension, atherosclerosis, and endothelial dysfunction. Persistent stress triggers a cascade of physiological changes, including hormonal imbalances and inflammation, which damage blood vessels and increase blood pressure. These effects collectively accelerate the progression of cardiovascular disease, highlighting the importance of managing stress in cardiovascular health care (9), thus, Salah's stress-alleviating effect may indirectly contribute to cardiovascular protection through autonomic and hormonal mechanisms. In this context, Salah may be viewed as a divinely prescribed form of structured physical activity that harmonizes spiritual devotion with physiological well-being. Recognizing its potential cardioprotective benefits provides a culturally relevant, low-cost strategy for promoting cardiovascular health among Muslim populations, especially in regions where adherence to conventional exercise is limited. Since limited literature exists evaluating the acute cardiovascular effects of Salah as a structured form of physical activity, the present study was designed to assess its immediate impact on blood pressure, resting heart rate, and functional exercise capacity in healthy adult Muslims.

MATERIALS AND METHODS

Study Design: This study used a cross-sectional observational design to examine the cardiovascular impact of Salah, the Islamic prayer, as a regular, low-intensity physical activity. The research specifically assessed how regular performance of the five daily prayers influences heart rate, blood pressure, and overall cardiovascular endurance in adult Muslim participants.

Study Population

The study included 100 adult Muslim volunteers aged between 20 and 60 years. Participants were categorized into two groups:

- Regular performers of Salah (performing five daily prayers consistently for at least the past one year).
- Non-performers or irregular performers (performing Salah less than three times daily).

Individuals with known cardiovascular diseases, musculoskeletal disorders, or those involved in moderate-to-vigorous exercise routines were excluded.

Data Collection: Data were collected through structured questionnaires, physical assessments, and physiological measurements. The questionnaire included demographic details, lifestyle factors, and religious practices.

Physiological parameters measured included:

- Resting heart rate (HR)
- Systolic and diastolic blood pressure (SBP, DBP)
- Body mass index (BMI)
- Six-minute walk test (6MWT) to assess cardiovascular endurance

Measurements were recorded before and after the Fajr prayer to assess acute cardiovascular responses, and average weekly parameters were used for long-term assessment.

Procedure: Participants performed a complete cycle of Salah under supervision, which included the sequence of postures: standing (Qiyam), bowing (Ruku), prostration (Sujood), and sitting (Jalsa). Continuous heart rate monitoring was conducted throughout the prayer. Each prayer cycle was recorded to estimate average energy expenditure using a metabolic equivalent of task (MET) calculator.

Data Analysis: Data analysis was conducted using SPSS software, version 26. Descriptive statistics summarized demographic characteristics, while means and standard deviations were calculated for continuous variables. To evaluate differences between pre and post prayer measurements, paired T tests were performed, with statistical significance set at p values less than 0.05.

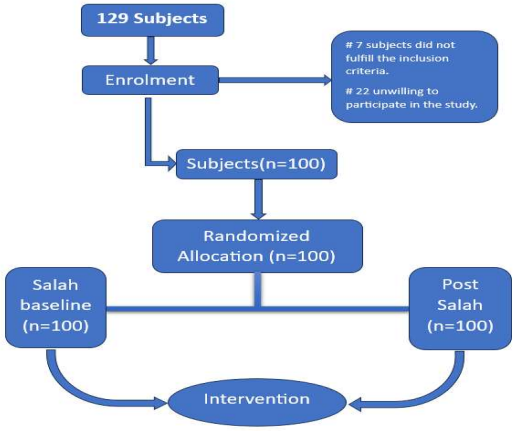

Fig. 1. (Flow chart of participants included)

RESULTS

Table 1 presents the (acute cardiovascular changes before and after Fajr Salah)baseline (pre-Fajr) cardiovascular measures were similar between groups. Mean SBP was 130.8±8.8 mmHg in controls and 129.7±9.8 mmHg in the Salah group (p=0.56). DBP was 80.5±6.4 vs. 81.5±7.0 mmHg (p=0.42), resting HR was 73.4±11.1 vs. 71.7±11.1 bpm (p=0.45), and 6MWT distance was 507.2±55.0 vs. 499.7±48.5 m (p=0.47). No parameter differed significantly at baseline. After the Fajr prayer, the Salah group exhibited significant cardiovascular improvements. Systolic blood pressure decreased from 129.7±9.8 mmHg to 125.3±7.1 mmHg (p=0.014), while diastolic blood pressure fell from 81.5±7.0 mmHg to 74.7±7.7 mmHg (p<0.001). Resting heart rate also dropped significantly from 71.7±11.1 bpm to 64.9±9.3 bpm (p=0.001). Additionally, the six-minute walk test distance improved from 499.7±48.5 meters to 540.4±49.5 meters (p<0.001), indicating enhanced cardiovascular endurance.

DISCUSSION

This study investigated the immediate cardiovascular effects of Salah in adult Muslim participants, showing statistically significant reductions after the Fajr prayer: systolic blood pressure decreased by 3.39%, diastolic blood pressure by 8.34%, resting heart rate by 9.48%, and the six-minute walk test distance improved by 8.14% relative to baseline values ($p < 0.05$). These results support the view that Salah functions as a low-intensity physical activity that confers measurable acute cardiovascular benefits (4). Mechanistically, several physiological processes may underlie the immediate cardiovascular changes observed after Salah. The sequence of movements is standing, bowing, prostrating, and sitting engages large postural muscles and intermittently enhances venous return through the muscle pump effect, which temporarily modifies cardiac preload and afterload, thereby influencing heart function (4). These rhythmic changes in body position during Salah activate arterial and cardiopulmonary baroreceptors, enhancing cardiovascular reflexes that improve the body's responsiveness to changes in posture, such as standing up, thereby supporting better blood pressure regulation and heart rate control (6). The cyclical orthostatic stress experienced during Salah may improve vascular flexibility and enhance baroreflex

Table 1. Acute cardiovascular changes before and after Fajr Salah

Parameters	Control (baseline)	Salah (baseline)	Salah (post-Fajr)	p (baseline)	p (pre vs post)
SBP (mmHg)	130.8 ± 8.8	129.7 ± 9.8	125.3 ± 7.1	0.56	0.014
DBP (mmHg)	80.5 ± 6.4	81.5 ± 7.0	74.7 ± 7.7	0.42	<0.001
Resting HR (bpm)	73.4 ± 11.1	71.7 ± 11.1	64.9 ± 9.3	0.45	0.001
6MWT distance (m)	507.2 ± 55.0	499.7 ± 48.5	540.4 ± 49.5	0.47	<0.001

Key findings: At baseline, all variables were comparable between groups (no significant differences). After the Fajr prayer, the Salah group had significantly lower SBP, DBP, and HR and a higher 6MWT distance compared to their own baseline values (all $p<0.05$). These changes suggest a moderate cardiovascular benefit of regular Salah.

sensitivity. These rhythmic changes in body position activate arterial and cardiopulmonary baroreceptors, which boost cardiovascular reflexes, helping the body better manage blood pressure and heart rate during positional changes such as standing, thereby contributing to mild blood pressure reductions following prayer (10). Secondly, the respiratory and meditative aspects of Salah characterized by slow, controlled breathing during bowing and prostration alongside focused mental attention enhance parasympathetic nervous system activity while reducing sympathetic nervous system drive. These factors collectively improve autonomic balance, complementing the stimulation of arterial and cardiopulmonary baroreflexes during positional changes, thereby enhancing cardiovascular adaptability to orthostatic stress (10). Controlled slow breathing, typically around six breaths per minute, has been demonstrated to enhance baroreflex sensitivity, increase heart rate variability (HRV), and improve overall autonomic nervous system balance and stability (11). Third, neuroendocrine and molecular pathways likely play a role in the observed effects. Islamic prayer and other similar meditative practices have been linked with immediate decreases in salivary cortisol and α-amylase levels, markers that reflect reduced activation of the hypothalamic–pituitary–adrenal (HPA) axis, thereby indicating lower stress responses (11). This down-regulation of sympathetic nervous system activity and reduction in vascular resistance promote short term cardiovascular relaxation. With repeated exposure, these autonomic adjustments may enhance endothelial function and decrease oxidative stress, contributing to long-term cardiovascular health benefits (12). The observed increase of approximately 40 meters (8.14%) in the six-minute walk test (6MWT) distance is clinically relevant. The minimal clinically important difference (MCID) for the 6MWT varies between 14 and 30 meters, depending on the population studied, indicating that the improvements noted in this study exceed thresholds considered meaningful for patient outcomes (13). Therefore, the observed improvement represents a clinically meaningful enhancement in functional capacity. Comparable gains have been documented following low-intensity yoga and breathing-based interventions, indicating that Salah may offer similar benefits in functional cardiovascular conditioning (15).

Methodological note (identity / age verification): To ensure participant validity, age and identity were confirmed using government-issued or institutional identification (Aadhaar/e-Aadhaar or college ID). Dates of birth were verified from these documents and copies retained under Institutional Ethics Committee oversight, consistent with Indian biomedical-research standards *(Unique Identification Authority of India, n.d.; Indian Council of Medical Research (ICMR), 2017).* Secondary documentation such as birth certificates or institutional records was used when necessary.

Limitations: This study assessed only acute (single-session) effects; long-term adaptations of regular *Salah* cannot be inferred. The modest, single-center sample limited subgroup analyses, and self-reported control of confounders (sleep, caffeine, fasting) may introduce bias. While Aadhaar and institutional IDs provide feasible verification, future studies should employ multiple corroborating documents when precise age determination is required.

Recommendations and future directions: Future work should adopt randomized, longitudinal designs; include continuous physiological monitoring (ambulatory BP, HRV, salivary cortisol, inflammatory markers); and compare prayer times to explore chronobiological variation. Multicenter sampling, preregistration, and standardized verification protocols will improve reproducibility and external validity.

CONCLUSION

This study demonstrates that a single session of Salah (Fajr prayer) produces immediate beneficial cardiovascular effects in adult Muslim participants. Specifically, there were significant decreases in both systolic and diastolic blood pressure, a reduction in resting heart rate, and an approximately 40-meter improvement in the six-minute walk test (6MWT) distance. This magnitude of increase, representing an 8.14% gain, is significant because the minimal clinically important difference (MCID) for the 6MWT ranges between 14 and 30 meters depending on the population studied. These findings support the idea that Salah can serve as a low-intensity, widely accessible form of physical activity with meaningful short-term cardiovascular benefits (14). The effects observed are likely mediated by a combination of biomechanical and orthostatic challenges, autonomic modulation through slow, controlled breathing and meditative focus, and rapid neuroendocrine shifts, which together contribute to the acute cardiovascular benefits associated with Salah (4). The magnitude of change observed in the six-minute walk test (6MWT) aligns with commonly reported minimal clinically important difference (MCID) ranges, indicating a clinically relevant improvement in functional capacity (14). However, because this was an acute, single-session, single-center study with a modest sample and potential residual confounding, results should be interpreted cautiously. Larger, randomized, longitudinal studies with continuous physiological monitoring and diverse populations are required to establish long-term cardiovascular benefits and to inform public-health recommendations

ACKNOWLEDGEMENTS

The authors are thankful to all the University Authorities for their support in the study.

FUNDING: Nil

CONFLICTS OF INTEREST: Here are no conflicts of interest.

REFERENCES

1. World Health Organization. (2019). Cardiovascular diseases (CVDs).
2. WangM., Ballantyne CM, Nagareddy P. R. (2020). Modifiable cardiovascular risk, hematopoiesis, and atherosclerosis. *Circulation Research*, 126(8): 1082-1101. https://doi.org/10.1161/CIRCRESAHA.120.315936.
3. Grossman E, Liu W, Goldman L, Grill, S. (2018). Cardiovascular effects and benefits of exercise. *Journal of ClinicalMedicine,*7(10): 371. https://doi.org/10.3390/jcm7100371.
4. Al-Abdulwahab SS, Kachanathu SJ, Oluseye K. (2014). Physical activity associated with prayer regimes improves standing dynamic balance of healthy people. *Journal of Physical Therapy Science*, 26(12); 1849-1852. https://doi.org/10.1589/jpts.26.1849.
5. Jalal AH, Alghadir AH, Anwer S. (2024). Selected morphological, cardiovascular and neuromuscular profiles among asymptomatic sedentary men performing the Islamic

prayer (Salaah). *Journal of Physical Therapy Science*, 36(4): 267-276.

6. Olayinka OO, Akinrinde AS, Adeniran ET, Fatoye FO. (2012). Cardiovascular responses during dead-down crooked kneeling posture in Muslimprayers. *International Journal of Physiological Sciences*, 7(3): 410-415.
7. Mi Y.M, Perry A.S, Kishnan V., Nayor M. (2025). Epidemiology and Cardiovascular Benefits of Physical Activity: A Review. Circulation Research, 126(8), 1082-1101. https://doi.org/10.1161/CIRCRESAHA.125.325526.
8. Doufesh H, Ibrahim F, Ismail NA, Wan-Ahmad WA. (2014). Effect of Muslim prayer (Salat) on α electroencephalography and its relationship with autonomic nervous system activity. *Journal of Alternative & Complementary Medicine*, 20(7): 558-562. https://doi.org/10.1089/acm.2013.0426
9. Satyjeet FN, Naz S, Kumar V, Aung NH, Bansari K, Irfan S, Rizwan A. (2020). Psychological stress as a risk factor for cardiovascular disease: A case-control study. *Cureus*, 12(10): e10757. https://doi.org/10.7759/cureus.10757.
10. Bernardi L, Sleight P, Bandinelli G, Cencetti S, Fattorini L, Wdowczyc-Szulc J, Lagi A. (2001). Effect of rosary prayer and yoga mantras on autonomic cardiovascular rhythms: comparative study. *BMJ*, 323(7327), 1446-1449. https://doi.org/10.1136/bmj.323.7327.1446.
11. Lehrer P, Eddie D, Shaffer F. (2020). Biofeedback for the treatment of anxiety and stress-related disorders: A review. *Applied Psychophysiology and Biofeedback*, 45(1): 1-14. *https://doi.org/10.1007/s10484-019-09427-w*
12. Miller L, Smith TW, Turner CW, Guijarro ML, Hallet AL. (2022). A meta-analytic review of research on human experimental stress. *Psychological Bulletin*, 128(3): 275-303. https://doi.org/10.1037/0033-2909.128.3.275.
13. Esler M, Lambert G, Schlaich M. (2019). Point: Chronic activation of the sympathetic nervous system is a cause of cardiovascular disease. *Journal of Applied Physiology*, 126(4): 1139-1143. https://doi.org/10.1152/japplphysiol.00877.2018.
14. Singh SJ, Puhan MA, Andrianopoulos V, Hernandes NA, Mitchell K, Hill CJ, Troosters T. (2014). An official systematic review of the European respiratory society/American Thoracic Society: Measurement properties of field walking tests in chronic respiratory disease. *European Respiratory Journal*, 44(6): 1447-1478. https://doi.org/10.1183/09031936.00150414.
15. Patel NK, Newstead AH, Ferrer RL. (2018). The effects of yoga on physical functioning and health related quality of life in older adults: A systematic review and meta-analysis. *Journal of Alternative and Complementary Medicine*, 24(10): 909-922. https://doi.org/10.1089/acm.2018.0209.

****