

## **Medical benefits of Islamic Prayer (Salat)**

**Dr. Hassan Chamsi-Pasha FRCP, FACC**

Consultant cardiologist  
Department of cardiology  
King Fahd Armed Forces Hospital, Jeddah, Saudi Arabia  
[drhcpasha@hotmail.com](mailto:drhcpasha@hotmail.com)

**Dr. Majed Chamsi-Pasha MBBS**

Department of Medicine  
King Fahd Armed Forces Hospital, Jeddah, Saudi Arabia  
Majed.chamsi.pasha@hotmail.com

**Dr. Mohammed Ali Albar MD, FRCP (London)**

Director of Medical Ethics Center  
Department of Medical Ethics  
International Medical Center, Jeddah, Saudi Arabia  
malbar@imc.med.sa

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**Address for correspondence:**

Dr. Hassan Chamsi-Pasha FRCP, FACC  
Department of Cardiology, King Fahd Armed Forces Hospital  
P.O. Box: 9862, Jeddah 21159, Saudi Arabia.  
Fax: +966-12-6651868 Tel: +966-12-6651868  
E-mail:drhcpasha@hotmail.com

## **Abstract**

Modern studies explored the relationship between health and religiosity/spirituality. Most studies have shown that religious involvement and spirituality are associated with better health outcomes. Millions of Muslims perform salat (prayer) five times daily throughout the world. Salat is a physical activity that involves various Quran recitations and the performance of specific postural positions, namely standing, bowing, prostration, and sitting. Several studies performed on Muslim patients, demonstrated that salat does have positive effects on health. During salat, parasympathetic activity increased and sympathetic activity decreased. Therefore, salat may give more strength to human psychology alleviating the negative health effect of stress. It may reduce the likelihood of mild cognitive impairment at midlife. There is still little discussion on the salat's benefit from the scientific perspective and further studies on salat and health are necessary to understand its effects on Muslim patients. To our knowledge this is the first comprehensive review on the medical effects of Islamic prayer.

## Introduction

Over the last three decades there has been increasing medical interest in mind/body medicine.<sup>1</sup> Religion at large has always been at hand to lend useful guidance to approach both the physiological illnesses and psychological **maladies**. Researchers at the Mayo Clinic reviewed 350 studies examining the influence of religion on physical health and 850 studies investigating the impact of religion on mental health. Most studies have shown that religious involvement and spirituality are associated with better health outcomes, including greater longevity, coping skills, and health-related quality of life (even during terminal illness) and less anxiety, depression, and suicide. They concluded that religion enhances illness prevention, coping with illnesses, and recovery.<sup>2</sup>

High levels of spirituality and religiosity are correlated with lower morbidity and mortality, enhanced quality of life and well-being, and lower levels of depression and psychological stress.<sup>3</sup> Possible mechanisms by which spirituality/religiosity may affect health outcomes include healthier lifestyles (e.g., healthy diets, less smoking and alcoholism)<sup>4</sup>, lower rates of stress and depression<sup>5</sup>, optimism and hope, enhancement of social ties<sup>6</sup>, lower rates of suicide<sup>7</sup> and a more favorable immune profile.<sup>8</sup>

Modern studies endeavored to explore the health effects of prayer from a scientific standpoint. In a survey of 4404 individuals, the investigators found that participants who prayed achieved good health, exhibited more favorable health-related behaviors and preventive service use, and reported greater satisfaction with care.<sup>9</sup> However, Islamic prayer is different than the personal prayer or invocation associated with the Christian faith. In Islam, that is called the du`a, or supplication, formal and informal.

Islamic prayer, commonly represented by the Arabic term salat is the second pillar of Islam. As an obligatory requirement of ritual worship salat combines the essential tenets of Islam—worship of one God, remembrance of Allah, submission to the Allah’s will, supplication, as well as, a symbol of unity of the Muslim community (ummah).<sup>1</sup> Salat is performed at five appointed times during the day as commanded in the Holy Book “Verily, Salah is an obligation on the believers to be observed at its appointed time.”<sup>10</sup> and is preceded by ritual ablution (wudu<sup>^</sup>). Salat includes various postures (raq’aas) which involve standing, raising and lowering of arms, bowing, sitting on shins, prostration and head rotation. Voluntary prayers in excess of the above

are highly encouraged and are recommended as a means of turning to the divine help at times of personal grief and distress.<sup>11</sup>

Regular prayer is emphasized more strongly in Islam than in Christianity and Judaism. There is no doctrine requiring Christian to pray, and so prayer is done spontaneously and out of devotion to God. As a result, while prayer is very important to devout Christian, it is usually performed less than the five times per day that is required in Islam. The five times are dawn prayer (Fajr), Noon (Duhar), Early Evening (Asr), after Sun set (Magrib) and Night Prayer (Isha). The form of prayer is also different between the two faiths, with Muslims becoming involved with their entire bodies by standing toward Makkah, reciting Quran, kneeling and bowing (Rokoo), bowing down to ground and touching it with forehead (prostration, Sujood).

The Orthodox Jews will also stand up during their prayers and face Jerusalem then they will bow and then stand up swaying their head forward and backward frequently and quickly. They don't prostrate to the ground, although it was mentioned in Daniel book that Daniel prostrated down to the ground during his prayers.

The orthodox Jews pray three times a day: early morning, afternoon and at night later on some Jews introduce dancing and clapping during their prayers.

There are multiple psychological, physiological and physical benefits of Salat. We will discuss the underlying evidence of these clinical effects.

### **Psychological effects**

Many patients encounter psychological and emotional distress in the face of illness and possible death, and high levels of anxiety may worsen their physical condition. Several reports on the application of prayers in psychotherapy illustrate the positive outcome in the individuals exhibiting pathological symptoms such as tension, anxiety, depression and anti-social tendencies.<sup>13</sup> Yu'cel<sup>14</sup> conducted a study, at Brigham and Women's Hospital, exploring the effects of Islamic prayer [salat and dua (supplicative prayer)], on sixty adult Muslims (18–85 y). He found that prayer (salat) reduced stress and depression while providing comfort and hope. Findings were consistent with prior studies on prayer-health relationship. The study also revealed that 75 % of the participants indicated that Islam was an important factor in their lives. The mind/body relationship in Muslim prayer provides a basis for overcoming life's exigencies, decreasing anxiety/depression while relying on Divine assistance and guidance.<sup>14</sup>

In a study of thirty healthy Muslim men, Doufesh<sup>15</sup> investigated the effect of Muslim prayer (salat) on the relative power (RPa) of electroencephalography (EEG) and autonomic nervous activity. During salat, a significant increase ( $p < .05$ ) was observed in the mean RPa in the

occipital and parietal regions and in the normalized unit of high-frequency (nuHF) power of **HRV** (as a parasympathetic index). Meanwhile, the normalized unit of low-frequency (nuLF) power and LF/HF of HRV (as sympathetic indices) decreased. The increased EEG occipital and parietal RPa during salat suggests that salat produces positive changes in brain function and human well-being. These changes are associated with an increase in the parasympathetic component and decrease sympathetic component in the ANS. Therefore, regular salat practices may help promote relaxation, minimize anxiety, and reduce cardiovascular risk.<sup>15</sup>

### **Prayer and Meditation**

Numerous studies have reported the benefits of meditation. Meditation practice may be a potential attractive cost-effective adjunct to more traditional medical therapies.<sup>16</sup> Almost all religions incorporate some form of meditation. Muslim prayer is the meditation of Islam. In the Islamic point of view the prayer is not the goal itself. The real goal is the remembrance of God and the training of attention during prayer to focus on God ("...and keep up prayer for my remembrance."<sup>17</sup>

The majority of the meditation studies reveal alpha rhythm slowing, and increased alpha rhythm coherence on EEG. Doufesh<sup>18</sup> investigated the proposition of relaxation offered by performing the Muslim prayers by measuring the alpha activity in the brain. Nine Muslim subjects were asked to perform the four required cycles of movements of Dhuha prayer, and the EEG were subsequently recorded. Findings were similar to other studies documenting increased alpha amplitude in parietal and occipital regions during meditation and mental concentration. The incidence of increased alpha amplitude suggested parasympathetic activation, thus indicating a state of relaxation. Subsequent studies are needed to delineate the role of mental concentration, and eye focus, on alpha wave amplitude while performing worshipping acts.<sup>18</sup>

Doufesh<sup>19</sup> also investigated the difference of mean gamma EEG power between actual and mimic Salat practices in twenty healthy Muslim subjects. In the actual Salat practice, the participants were asked to recite and perform the physical steps of Salat; whereas in the mimic Salat practice, they were instructed to perform only the physical steps without recitation. The gamma power during actual Salat was statistically higher than during mimic Salat in the frontal and parietal regions in all stages. Increased gamma power during Salat, possibly related to an increase in cognitive and attentional processing, supports the concept of Salat as a focus attention

meditation.<sup>19</sup> Medical research into salat should be conducted with a view of educating Muslim physicians on salat as mind/body medicine.<sup>1</sup>

Meditation may be considered as an adjunct to guideline-directed cardiovascular risk reduction by those interested in this lifestyle modification. Neurophysiological and neuroanatomical studies demonstrate that meditation can have long-standing effects on the brain, which provide some biological plausibility for beneficial consequences on the physiological basal state and on cardiovascular risk.<sup>16</sup> Physicians need to incorporate more mind/body techniques due to the dramatic increase in chronic stress-related disorders throughout the world. This is a critical issue which needs short-term and long-term addressing.<sup>1</sup>

### **Neurological effects**

In addition to the spiritual and religious aspects of prayer, it is a repetitive and/or mentally enhancing activity whose ritual includes both cognitive and motor components. Prostration (Sujoud) is the only position in which the head is in a position lower than the heart and therefore, receives increased blood supply. This surge in blood supply has a positive effect on memory, concentration, psyche and other cognitive abilities.<sup>11</sup> Only one study has examined the relationship between religiosity and cognitive functioning in Muslims. Inzelberge et al<sup>20</sup> conducted a door-to-door survey of 935 Israeli Arabic men and woman over age 65 examining the relationship between number of hours praying per month during midlife. Result indicate that 87% of cognitively normal persons engaged in prayer at midlife compared to 71% of those with MCI and 69% of those with AD ( $p < 0.0001$ ). Inzelberg et al found that praying at midlife was associated with lower risk of mild cognitive impairment in women. In a door-to-door survey, residents aged  $\geq 65$  years were systematically evaluated. Of 935 individuals that were approached, 778 [normal controls ( $n=448$ ), Alzheimer's disease (AD) ( $n=92$ ) and MCI ( $n=238$ )] were evaluated. Prayer was significantly associated with reduced risk of mild cognitive impairment ( $p=0.027$ , OR=0.55, 95% CI 0.33-0.94), but not AD. Since 94% of males engaged in prayer, the effect on cognitive decline could not be assessed in men.<sup>16</sup> Praying was not significantly associated with risk of AD. The reason for this may be due to smaller sample of AD cases, or inherent to the nature of the distinction between MCI and AD. The study found that prayer during midlife significantly reduced the likelihood of mild cognitive impairment often age 65 in Arabic women in Israel.<sup>12, 20</sup>

## Cardiovascular effects

Religious involvement is associated with less cardiovascular disease.<sup>2</sup> The Islamic prayer is performed at least five times a day and consists of a series of movements entailing standing, prostrating and sitting. Salat maneuvers were equivalent to light exercise in terms of their physical exercise value. When performing prayer, the Qur'an discourages lazily performing prayer as performed by the Hypocrites;<sup>21</sup> thus, a lethargic and careless approach to prayer neither obtains any spiritual nor physical benefit to the state of health. The physical movements during prayer with repetitive standing-sitting actions throughout the day may also help in preventing deep vein thrombi.<sup>22</sup>

Doufesh<sup>23</sup> reported the effects of the Muslim prayer (Salat), on heart rate (HR) and blood pressure (BP) while performing and miming the actions of Salat: standing, bowing, prostrating and sitting. Thirty Muslim subjects were asked to perform the actual and mime Salat. HR was measured during actual and mimed Salat. However, BP was measured immediately before and 5 minutes after performance of both actual and mimed Salat. There was a significant difference in the HR of the subjects performing and miming Salat. The standing and prostration positions of Salat produced the highest and the lowest HR, respectively. The systolic and the diastolic BP decreased slightly after performance ( $118.0 \pm 5.6$  Vs  $115.0 \pm 4.7$ ,  $p < 0.05$ ) and mime of Salat ( $119.3 \pm 4.9$  Vs  $117.1 \pm 4.2$   $p < 0.05$ ).<sup>23</sup>

Studies have found that religious involvement is associated with lower blood pressure and less hypertension. In a related study on Islamic prayer and blood pressure, Al-Kandari<sup>24</sup> tested 223 Kuwaitis' blood pressure and compared the blood pressure of those who pray to those who do not. He concluded that those who pray were generally found with lower-blood pressure. Al-Kandari also documented the cultural and religious backgrounds of the participants and noted that involvement in religious activities seemed to be a factor in lowering blood pressure as it provided a social support network.<sup>24</sup>

Byrne and Price<sup>25</sup> pointed out that two of the most important functions of religion for human health are providing sense of security and a source of strength from social support from the religious community. Steffen<sup>26</sup> also found that African Americans who engage in prayer and religious activities demonstrated lower blood pressure. Among African Americans higher levels of religious coping were associated with lower awake ( $p < .05$ ) and sleep ( $p < .01$ ) ambulatory

blood pressure ABP. Lower 24-hour BP load may be a pathway through which religiosity and cardiovascular health are related.<sup>26</sup> Further studies to explore the benefits of salat maneuvers for patients with cardiovascular diseases are warranted.

### **Musculoskeletal benefits**

During the performance of salat, most of the muscles and joints of the body are involved. This activity is convenient for all kinds of patients, including the elderly. Prayer can be regarded as a type of stretching exercise; the physical acts performed during Prayer are gentle, simple exercises suitable for all ages and conditions. During Prayer, continuous gentle muscle contraction and relaxation are performed with perfect harmony and balance, inducing flexibility without over-exhaustion.

Salat consists of rakaats, each rakaat being a series of 7 postures. For example, before sunrise, 2 rakaats or 14 postures must be performed. Thus each Muslim is under obligation to perform 119 postures per day that is 3570 postures per month and 42,840 postures per year. Salat is being obligatory from puberty and if someone lives up to an average of 60 years, a Muslim would have performed 1,927,800 postures compulsorily in this lifetime.<sup>27</sup>

Various authors have examined the therapeutic aspects of salat in relation to promoting psycho-physical well-being. Reza et al.<sup>28</sup> and Al-Barzinjy et al.<sup>29</sup> focused on the musculoskeletal benefits of salat which include maintenance of postural equilibrium, providing muscle tone, improving circulation, and has a protective role in reducing osteoarthritis (OA) of the weight bearing joints. Yilmaz et al.<sup>30</sup> explored the role of this repetitive action on knee and hip osteoarthritis and osteoporosis. Forty-six patients who had been performing the prayer at least for 10 years, and 40 patients who had not performed the prayer, were included in this prospective study. The authors concluded that the Prayer has no negative effect on knee and hip osteoarthritis.<sup>30</sup>

In a study evaluating the effect of salat on the prevalence and severity of knee osteoarthritis (OA) in a Thai elderly population with the same ethnicity and culture but different religions, 153 Buddhists and 150 Muslims aged over 50 years were enrolled. The prevalence of knee pain and ROA was significantly higher in Buddhists than in Muslims (67.1 vs. 55.8,  $p = 0.02$  for knee pain; 85.6 vs. 70.6,  $p = 0.02$  for ROA). Muslims had a lower prevalence of OA than their Buddhists counterparts with the same ethnicity but different religious practice. The Muslim way



of praying since childhood, forcing the knees into deep flexion, may stretch the soft tissue surrounding the knee and decrease stiffness and contact pressure of the articular cartilage.<sup>31</sup>

### **Salat and Rehabilitation**

Scientific evidence supports the notion that even moderate intensity activities, when performed daily, can have some long-term health benefits. Salat, along with its various postures, can play a role in increasing psychological well-being including self-reliance and self-esteem, improving musculo-skeletal fitness, motor behavior and cerebral blood flow that may be beneficial in the rehabilitation of geriatric and disabled persons.<sup>28</sup>

Salat activity helps in the rehabilitation process in patients with neurological deficits and musculoskeletal impairments as it imparts minimum effort and is proficient for mental and physical health. Different postures of salat (standing, bowing, prostration and sitting), are against the synergistic patterns which diseased patient adopt after neurological insult.<sup>32</sup>

Salat is concluded by looking over one's right and left shoulder, during which, neck rotational movements take place, which further contributes to neuromuscular fitness. These documented therapeutic efficacies of salat may suggest incorporating it in rehabilitation as an activity.<sup>28</sup> More studies are needed to determine the full beneficial effects of the salat prayer on the rehabilitative process of disabled persons.

### **Cervical spondylosis**

Salat practice assists in strengthening neck muscles. Sala'm, at the end of salat is turning the head towards shoulders and this complete movement is a good neck exercise in which the cervical vertebrae rotate one on the other and neck muscles (Sterno-Cleido-Mastoid/Trapezius) are stretched. A pilot study investigating the muscle activity of the neck extensors (NE), sternocleidomastoides (SCM) and biceps brachii (BB) muscles was carried out in 14 healthy subjects during salat and specified exercises using surface electromyography (EMG). The study showed that there was no significant difference between salat and exercise for NE ( $p = 0.482$ ) and SCM ( $p=0.161$ ) and salat may be useful in warm up exercise or in the rehabilitation programs.<sup>33</sup>

Pandey et al<sup>34</sup> propose that prayers could also be beneficial in improving the overall health and wellbeing of patients with cervical spondylosis. In a cross-sectional study, two hundred

participants were divided into two groups, group A: Muslim males between the age group 40-60 years who performed salat four times a day or more, and group B: Muslim males between the age group 40-60 years who performed salat infrequently (<3/wk). They were followed up for a period of one and half years. Out of the 118 males who performed regular salat, only 17 had cervical spondylosis, while among the 82 males who performed irregular salat, 30 had cervical spondylosis ( $P < 0.05$ ). They concluded that performing regular salat may assist in preventing cervical spondylosis.<sup>34</sup>

### **Erectile dysfunction ( ED)**

The leading cause of erectile dysfunction (ED) is arterial dysfunction, with cardiovascular disease as the most common comorbidity. Physical activity (PA) has proved to be a protective factor against erectile problems, and it has been shown to improve erectile function for men affected by vascular ED.<sup>35</sup> Physical exercise therapy, particularly involving pelvic floor muscles, has been shown to provide beneficial effects on ED, boosting blood circulation and reducing ED symptoms, thus providing complementary noninvasive methods that are easy to perform, painless and inexpensive. Salat movements result in activation of the pelvic floor muscles and were proven to be an effective form of pelvic floor exercise. A small pilot study including ten volunteers were divided into two groups. Subjects who were Muslims (Group I) were asked to perform their daily salat and a new intervention of an additional 12 movement cycles of salat three sessions a week for a duration of 4 months. Non-Muslim subjects (Group II) were taught to mimic salat movements, and were asked to perform a total of 12 movement cycles without reading the recitation for three sessions a week. A nocturnal electrobioimpedance volume assessment (NEVA) device was used to measure the nocturnal penile tumescence (NPT) parameters. All measured parameters improved significantly, with the largest change observed in the maximum percent volumetric change over the baseline (from 138 to 222%). This preliminary study suggests that salat and mimicking salat movements, may have beneficial effects for ED patients.<sup>36</sup> A larger study, however, is required in the future to validate these findings, particularly in their usage as an adjunct to PDE5 inhibitors.

### **Conclusion**

Salat is spiritual and physical act in where, nearly all muscles of human body become more

active than any kind of exercise without muscle fatigue, and induces serenity on body and soul. The interaction between the central nervous system and autonomic nervous system (ANS) during salat promotes relaxation and minimizes anxiety for individuals who regularly practice salat. Mind/body medicine as offered in the practice of salat may assist in the prevention of chronic illness and alleviate the symptoms of chronic disease. The physical activities involved in the performance of salat helps in the rehabilitation process in disabled geriatric patients by improving blood flow and increasing musculoskeletal fitness. More quantitative and qualitative research is needed in further examining the medical aspects of salat. Long-term studies that use a larger participant groups should provide more accurate data.

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