

JOURNAL OF ISLAMIC ARCHITECTURE

P-ISSN: 2086-2636 E-ISSN: 2356-4644

Journal Home Page: http://ejournal.uin-malang.ac.id/index.php/JIA

ANALYZING THE COMMON FEATURES BETWEEN MOSQUE ARCHITECTURE. RITUAL MOVEMENTS OF PRAYER AND YOGA MOVEMENTS

Received July 15th, 2023 | Accepted September 12th, 2023 | Available online December 30th, 2023 | DOI http://dx.doi.org/10.18860/jia.v7i4.22903 |

Mahya Ghouchani

Department of Architecture and Urban Planning, Technical and Vocational University (TVU), Tehran,

Corresponding author:

m.ghouchani.arch@gmail.com

Arian Babaei

Department of Architecture, Faculty of Art & Architecture, University of Guilan, Rasht, Iran.

Fatemeh Kordafshari

Department of Architecture, Shahrood Branch, Islamic Azad University, Shahrood, Iran.

ABSTRACT

An architectural work contains wide aspects and is not limited only to the body made of materials. What adds value to the building is the spirit breathed into this body. Prayer (Namaz) and Yoga are mental and physical activities that cause peace in body and soul. The purpose of this research is to analyze the common features between mosque architecture, ritual movements of prayer and yoga movements in order to achieve human mental and physical health. Therefore, the relationship between the physical movements of prayer and mosque architecture was analyzed, and the amount of movement in prayer was evaluated using the OWAS method. Then, based on the previous step's results, the relationship between body ergonomics in prayer and yoga movements was descriptively analyzed. Finally, the common features between mosque architecture, ritual movements of prayer and yoga movements are presented visually. The results show that there are common features between the architecture of mosque spaces, the ritual movements of prayer and yoga movements, and the shape of the body in prayer and yoga is similar to the shape of the architectural components of the mosque.

Mosque Architecture; Prayer (Namaz); Yoga; Physical Health; Mental Health

INTRODUCTION

Health is one of the greatest graces of God to man [1]. The World Health Organization defines health as health is not just "not being sick" and "not being disabled". Health is complete comfort, mentally, physically, socially [2]. Today, the study of the effects of religion on health in medicine has been proposed [3]. There is a close relationship between human religious beliefs, health and behaviour [1]. Muslims comprise 23% of the world's population (about 1.6 billion people). Muslim prayer (Namaz) is the main practice in Islam, which is obligatory for Muslims in the Qur'an (the Bible for Muslims). Prayer is a combination of physical movements and reciting verses [4]. Every Muslim must pray five times a day (at different times). The physical movements of prayer are standing, raising the hand, raising the hand, bowing, kneeling and sitting, respectively [5].

The prayer begins with Takbir (raising the hands to the top of the face so that the thumb touches the edges of the ear) [6]. Then, standing (Qiyyam) for sixty to ninety seconds, bending (Ruku) for five to ten seconds, and standing again for two to five seconds. Then the person returns to prostration (Sajdeh) for five to

ten seconds, then sitting for two to five seconds, then to prostration, and then sitting (Salaam) for twenty to thirty seconds. All these activities lead to one Rak'at. Prayer (Namaz) can include two to four Rak'ats. Finally, the person turns his head to the right shoulder and then to the left shoulder. The physical movements of the prayer are shown in Table 1.

Table 1. The physical movements of the prayer [5]

Posture name (sequence)	Average Time (seconds)	Average heart rate (bpm)	Illustration
Qiyyam	60	85	f
Ruku	15	80	•
Qunut	60	85	Ť
Sajdeh	15	73	*
Tashahod and Salaam	30	78	1

Various components, such as socio-economic factors, lifestyle and religion, affect physical health [7]. There is also a significant relationship between prayer and consciousness [8]. The Prayer (Namaz) can act as a psychological treatment that calms the mind and reduces stress caused by different problems [9].

It can also relieve physical stress [10] and anxiety [9] due to changes in physical movements. Physical movements in prayer can be useful in treating neurological, muscular and skeletal dysfunction [11]. Prayer is also effective in controlling epilepsy [12]. Past researches have shown that religious beliefs are very important in developing human health. Physical movements in prayer and the spiritual effect of a person's relationship to the universe's origin also affect mental and physical health. The effect of the physical movements of prayer on brain waves and nervous system activity was analyzed on 30 Muslim men [13].

Also, studies of non-Muslim patients who have performed physical movements of prayer for their treatment have shown that these movements have been effective for treatment [14]. In prayer, most body muscles and joints are used and trained [15]. In particular, the back muscles are frequently used. The neck muscles are especially strengthened, and the worshipers who prostrate themselves 34 times a day do not develop spondylosis and myalgia [16]. Sajdeh is a situation in which the head is lower than the heart. Therefore, blood circulation to the head increases, positively affecting concentration and cognitive and psychological abilities [15].

Yoga is a physical exercise in concentration famous for its curved movements. Yoga involves several postures maintained for a long time while reciting 'Mantras' or breathing in rhythm [17]. The world's leading medical schools have studied the benefits of yoga and recommended it to their patients. Prayer can be called Islamic yoga because performing physical movements of prayer has the same benefits that doctors recommend for doing yoga movements. The position of prayer is similar to that of yoga. This common position activates all seven chakras (energy fields) in the human body [18]. Therefore, the correct and wise composition of both (i.e. prayer and yoga) can increase the benefits of recovery in mental and physical health.

An architectural work contains wide aspects and is not limited only to the body made of materials. What adds value to the building is the spirit breathed into this body. Architecture sometimes includes values that are tied to the identity and beliefs of a society, such as "mosques", which are a place for Muslims to communicate with God [19]. Meaning and form have a deep relationship in mosque architecture. Because in the Islamic worldview, monotheism is the basis of Islamic architecture [20]. Basic shapes have been used in examining the mosque's architectural morphology. But what matters is how these forms are used and combined, which must be consistent with performance [21]. This performance is based on the Islamic worldview.

On the other hand, prayer (Namaz), as the peak of worship in this place, cannot be a separate event from the mosque's interior. The research hypothesis is that meaning influences the mosque's architecture, consistent with prayer (Namaz). Prayer (Namaz) also has common components with yoga that help a person's physical health.

Therefore, it is assumed that there are common features between the architecture of mosque spaces, the ritual movements of prayer and yoga movements, and the shape of the body in prayer and yoga is similar to the shape of the architectural components of the mosque. The purpose of this research is to analyze the common features between mosque architecture, ritual movements of prayer and yoga movements in order to achieve human mental and physical health. Therefore, the current research seeks to answer the following

- Is the mosque's architecture related to the ritual movements of prayer and yoga?

METHODS

Descriptive-analytical methodology is based on examining the interrelationships of variables in three stages. First, the relationship between the physical movements of prayer and mosque architecture is analyzed. Jame Mosque of Yazd has been chosen as a case study of architectural analysis. The square plan of the mosque is derived from the architectural model of the Kaaba. It is a holy and sublime building in Islam used as a cosmic symbol in Muslim architectural patterns [22].

In the second step, the amount of load caused by movements in prayer is evaluated using the OWAS method. In the third stage, the relationship between body ergonomics in prayer and yoga movements is analyzed descriptively. Finally, the common features between mosque architecture, ritual movements of prayer and yoga movements are presented visually.

Karhu and Trapp recognized OWAS (Ovako Working Pose Investigation Framework) between 1977 and 1981. This model is a standard body posture classification with direct work performance and perception [23]. Using this model, the amount of loads on the musculoskeletal framework can be identified and categorized. In this method, body postures while working are based on a coding table. A 4-digit code identifies each body position, the first three of which are related to the waist, arms, and legs, and the last number is the amount of load or effort required to perform the activity. Different body postures to perform activities are shown in Table 2.

The methods section describes the rationale for applying specific procedures or techniques to identify, select, and analyze information applied to understanding the research problem, thereby allowing the reader to critically evaluate a study's overall validity and reliability.

Table 2. Different body postures to perform activities [24]

Organ **Code of Different Body Postures** Waist EXAMPLE: Hand Back Posture:2 Arm Posture:1

Row and column overlap in the analysis table displays numbers that specify the type of activity classification in terms of desirability:

Number 1: The posture of the body during activity is normal. Hence, the muscle-skeletal framework is satisfactory and does not need to be modified.

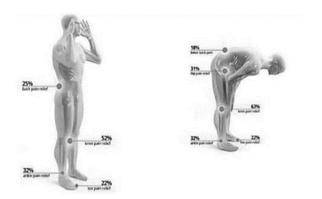
Number 2: Activity pressure slightly damages the body's muscle-skeletal system. Therefore, the type of activity in the long run must be modified.

Number 3: Activity pressure is harmful. Therefore, it must be corrected.

Number 4: Activity pressure severely damages the muscle-skeletal framework. So, it needs to be corrected quickly.

RESULTS AND DISCUSSION

The science that deals with human-based programming is called "Ergonomics". This knowledge is considered one of the most important issues in design. An issue can be understood in three ways. 1: By finding a creative goal. 2: with analysis; 3: with a personal answer [25]. Ergonomics is the knowledge that considers the needs, skills and physical and mental disabilities of human beings in design as a principle to find space efficiency through comfort, safety and health [26]. The results of Dutch research show that the physical movements performed in sports centres are comparable to the physical movements of prayer. Sports coaches say that the physical movements seen in prayer are good for health. Sporting movements recommended by Dutch researchers are shown in Figure 1.





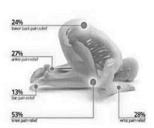


Figure 1. Sporting movements recommended by Dutch researchers [27]

In Dutch sports centres, people are asked to do these movements three times a day, each for 10 minutes, listening to soothing songs. These activities are the same physical movements that God has made obligatory on Muslims. According to what has been said, at this stage, the relationship between the physical movements of prayer and the architecture of mosques has been analyzed, and the load of the physical movements of prayer has been evaluated using the OWAS method.

The Courtyard in the Mosque, Qiyaam, and Qunut in

In fundamental architectural discussions, being confined can define the space, and this confinement can be seen with a focus on the centrality of the courtyard relative to the spirituality of the space and from the perspective of its mysteriousness. The history of Islamic architecture reveals that the plan forms in the courtyards of the mosques have been defined through square and rectangular shapes. When studied through visual literacy, these shapes reflect worldliness, consistency, steadiness, and continuity [28]. In the first ritualistic movement of the prayer, one can see what is called Qiyyam (the act of standing), a movement accompanied by a sense of steadiness. It is also the initial

point of saying words in praise of God or seeking the right path. Despite being static, this posture is full of movement (Figure 2).

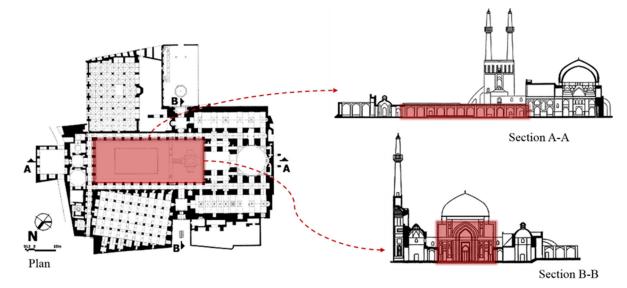


Figure 2. The Courtyard in the Jame Mosque of Yazd (The map and technical documents of the mosque, taken from [29])

The posture code for Qiyyam is 1123, due to the spine's position as right and stretched (1). The two arms are positioned lower than the height of the shoulders (1). The legs are in a straight and standing position (2), where the weight of the load is more than 20 Kg. According to the codes of the OWAS figure and table, the level of corrective efforts is equal to 1. This means that the body's posture during work is natural and usual. As a result, the pressure of activity in the body is acceptable and does not need to be corrected. OWAS analysis in prayer's Qiyyam is shown in Figure 3.

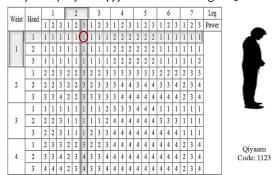


Figure 3. OWAS analysis in prayer's Qiyyam

The Qunut is static, like the Qiyyam. The Qunut on the horizon of the heavens, which is a symbol of the natural light of the essence of Allah, expresses an allegorical expression of the sense of ascension and spirituality. The posture code for Qunut is 1323, due to the spine's position as right and stretched (1). The hands are at shoulder height or higher (3), and the legs are in a straight and standing position (2), where the weight of the load is more than 20 Kg. According to the codes of the OWAS figure and table, the level of corrective

efforts is equal to 1. This means that the body's posture during work is natural and usual. As a result, the pressure of activity in the body is acceptable and does not need to be corrected. OWAS analysis in prayer's Qunut is shown in Figure 4.

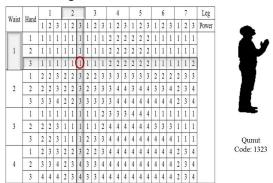


Figure 4. OWAS analysis in prayer's Qunut

When standing, the body's weight is equally divided so that the back does not withstand all the compression and the neck and shoulders slack. The useful effects are that the body and mind feel peace and equilibrium because the body's weight is equally divided on each foot. The spine is smooth, and breathing is natural and invigorating. It is easier to control thoughts in the mind due to the focus of the eyes to the point of prostration. This factor, along with more physical relaxation of the legs and lower back, increases concentration and creates a feeling of humility and virtue. This situation is similar to "Tadasana" in yoga, except that the worshiper does not enhance the arms straight upper the head. This state is necessary for both actions (yoga and prayer). (Figure 5)

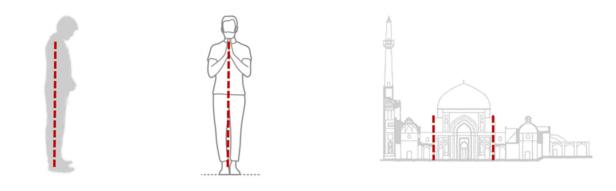


Figure 5. The same form between "The Courtyard", "Qiyyam" and "Tadasana"

Tadasana in Yoga

A freely structured discussion needs to make a clear argument, and using a sub-chapter to structure this argument can be very useful. You should draw on your own results, not just on other literature. A discussion is NOT a literature review, but your work must be central to the argument.

Qiyyam in Prayer

Content is the body of the paper and consists of a sub-title representing a paper discussion. Results should be clear and concise. The results should summarize (scientific) findings rather than provide data in great detail. The discussion should explore the significance of the results of the work, not repeat them. A combined Results and Discussion section is often appropriate. Avoid extensive citations and discussion of published literature.

Iwan in the Mosque, and Ruku in the Prayer

The importance of finding the right position for the mosque's spaces on the one hand and the existence of the courtyard as an open space on the other hand lead to the necessity of the existence of a semiclosed space in order to obey the hierarchy of movement and form. From the point of view of visual literacy, the concept of a linking joint adequately corresponds to the concepts of function and positioning. Making a connection between two continuous yet different spaces in a hierarchy, this linking joint strives to present a better understanding of the collision of two hierarchical forms [30].

The walls around the Courtyard in Mosque

Ruku (bowing down with hands on knees) is a bodily posture between the two movements of Qiyaam and Sajdeh (placing your forehead and knees on the ground). Ruku, which connotes yielding to the greater truth, is the highest point of practising worship. Iwan in a mosque and Ruku in a prayer have semiotic relations. Both serve the purpose of linking and connecting in one way or another. In Ruku, there is no time for seeking knowledge from the Almighty; however, it is a readiness and preparation for treading the path of truth. As mentioned earlier, this can also be vividly seen in the form of Iwan. (Figure 6)

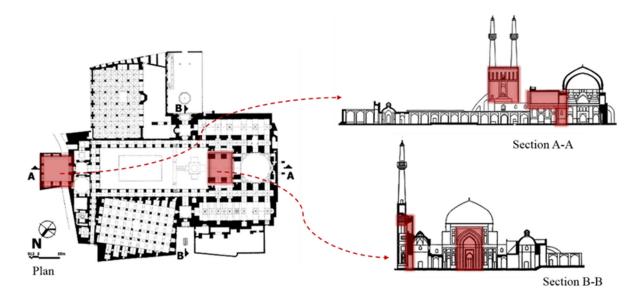


Figure 6. The Iwan in the Jame Mosque of Yazd (The map and technical documents of the mosque, taken from [29])

The posture code of an individual in the form of Ruku in the prayer is 2122, whose cause is the curved shape of the spine in this posture (2), where both arms are lower than the shoulders (1), the legs are straight, and standing (2), and the weight of the load is 10-20 Kg. According to the codes of the OWAS figure and table, the level of corrective attempts is equal to 2. This suggests that the pressure caused by the body posture during the work would damage the skeletal-muscular system and should be corrected. OWAS analysis in prayer's Ruku is shown in Figure 7.

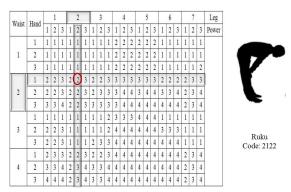


Figure 7. OWAS analysis in prayer's Ruku

This is a position in which forward flexion occurs in the pectoral and lumbar backbone. When bowing, the muscles of the body, back, pelvis, hip and legs, as well as the muscles of the scapulas, arms and neck, are

stretched. This situation is similar to "Trikonasana" in yoga. After a few seconds, the worshiper gently returns to the past situation until the spine becomes vertical. This situation is similar to "Paschim Uttanasana" and "Trikonasana" corrected in yoga. Bowing is a very beneficial practice for a weak waist with orderly stretching of the back muscles. These muscles are called "Erector Spinae". They cover the all duration of the spine and provide a resistor that helps control bending at the waist. If not practiced suitable, these muscles will spasm and reason back pain. This situation can move the backbone, clavicle and pelvis. (Figure 8)

The Dome in the Mosque, Sajdeh in the Prayer

A change of nature should also occur in the hierarchical process and the change of perspective from pluralism to unity. The movement that has begun in the courtyard and has passed through the Iwan should end in the dome. In this process of change in architecture, the body of the mosque considers the virtual as the link to the real and the material as the manifestation of the spiritual. The mysterious figure in this stage is the link to presence and intimacy with the Almighty, and the spiritual world free of time and space should be understood in this regard [31]. As the last positioned form in the mosque's architecture, the dome is an initial four-sided shape that is transformed into a circular shape (infinite) in the process of changing. The circle is a heavenly symbol of the nature of life and is the initial point of the departure of the heart.

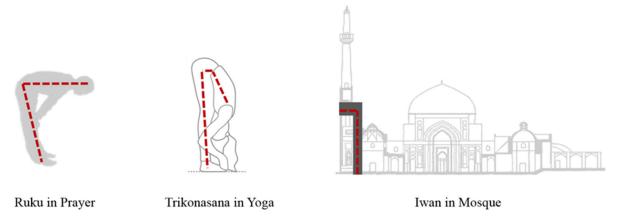


Figure 8. The same form between "The Iwan", "Ruku" and "Trikonasana"

If the square is considered the symbol of ground, material, and boundary, the circle can be regarded as the symbol of sky, infinity, perfection, and wholeness. The opposition between the two shapes is similar to the synthesis of space and time; one is confined to 4 sides and the definition of space, while the other is immersed in infinity and the definition of time. The

position of Sajdeh (placing your forehead and knees on the ground), as the most meaningful mode in the prayer, can be considered the height of the act of worship. This is a posture in which placing one's head on the ground is the starting point of the heart's movement. (Figure 9)

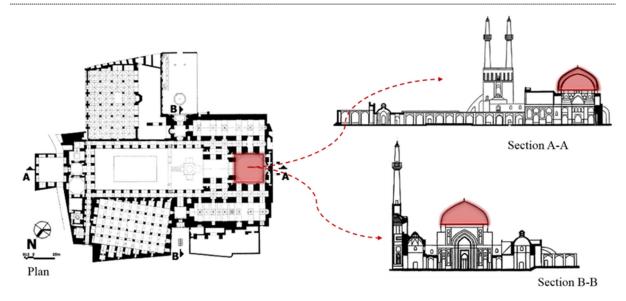


Figure 9. The Dome in the Jame Mosque of Yazd (The map and technical documents of the mosque, taken from [29])

he posture code of an individual in the form of Sajdeh in the prayer is 2162, whose cause is the curved shape of the spine in this posture (2), where both arms are lower than the shoulders (1), the individual kneels on one or both knees (6), with the weight of the load being 10-20 Kg. According to the codes of the OWAS figure and table, the level of corrective attempts is equal to 2. This means that the pressure caused by the body posture during the work would damage the skeletal-muscular system and should be corrected. OWAS analysis in prayer's Sajdeh is shown in Figure 10.

Figure 10. OWAS analysis in prayer's Sajdeh

This bend happens in the pectoral and lumbar backbone with flexion of the pelvis. The knees are bent in the middle, the ankles are in the neutral position, and the toes are stretched. The elbows are bent in the middle, and the wrists are stretched with the hands parallel to the ears. This status is similar to "Shashtangasana" in yoga. In prostration, the head is placed lower than the heart. As a result, the heart receives more blood, which positively affects the human mind, concentration, mood and other cognitive abilities. When prostrating, electromagnetic energy is collected from the atmosphere in the head, leading to relaxation. A recent study examining alpha brain activity in Muslims reported increased amplitude in the parietal and occipital regions, indicating a parasympathetic progression and consequent relaxation [32]. (Figure 11)

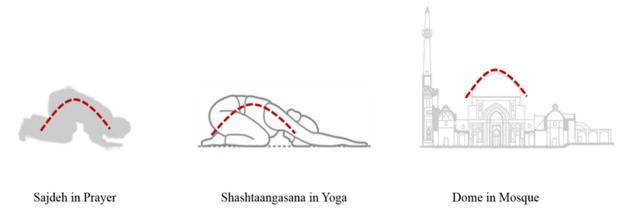


Figure 11. The same form between "The Dome", "Sajdeh" and "Shashtaangasana."

The Mihrab in the Mosque, Tashahod, and Salaam in the Praver

The altar, the center facing the Kaaba, has special visual and semantic values. The dimensions of this space are small, but the hidden meaning behind it is as vast as the entire universe [33]. Mihrab is a gate through which a person enters heaven. Entering the spiritual world requires a transition from non-existence to existence - from external to internal - and this issue is clearly manifested in the form and geometry of the

altar [34]. Therefore, thinking in its highest form has been used in its creation. The mihrab form in mosques is a niche-like depression in the wall that shows the direction of Qiblah or Mecca [35]. The mihrab acts as a direction. For the worshiper, the altar is a place, a residence, and a residence of intuition and enlightenment. Mihrab is the closest place to God and the manifestation of His actions, attributes and essence. Therefore, the worshiper stops moving and sits. (Figure 12)

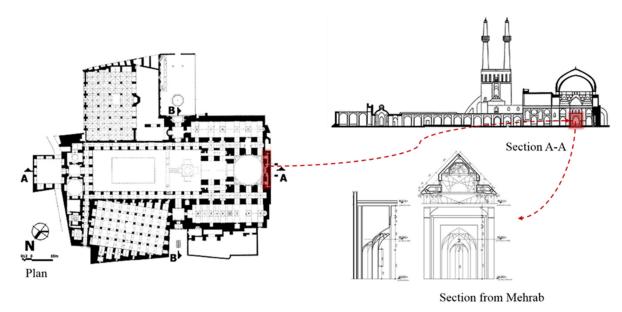


Figure 12. The Mihrab in the Jame Mosque of Yazd (The map and technical documents of the mosque, taken from [29])

The significant issue regarding Tashahod and Salaam (i.e. testification and hailing) is the emphasis on the concept of God's space. Due to the existence of infinite space, the mosque's dome paves the way to the stage of intuition and understanding through the act of Salaam in prayer. The posture code of an individual in the form of Tashahod and Salaam in the prayer is 1162, whose cause is the straight shape of the spine in this posture (1), where both arms are lower than the shoulders (1), the individual kneels on one or both knees (6), and the weight of the load is 10-20 Kg. According to the codes of the OWAS figure and table, the level of corrective attempts is equal to 1. This means that the body's posture during work is natural and usual. As a result, the pressure of activity in the body is acceptable and does not need to be corrected. OWAS analysis in prayer's Tashahod and Salaam is shown in Figure 13.

This position includes sitting with the spine and chest in a neutral position the hip joint, and the knee joint in a bent position. This leads to stretching of the quadriceps muscle. The hands are located in the distal anterior part of the thigh, the shoulders are bent, and the elbows are stretched through the full expansion, with a little expansion in the wrist. This status is similar to "Virasanine" in yoga. This condition aids digestion by pushing the contents of the tummy down. It helps treat varicose veins and joint aches, enhances flexibility and reinforces pelvic muscles. It relieves sciatica. This status is similar to a long walking practice. (Figure 14)

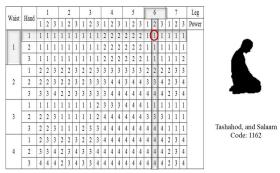
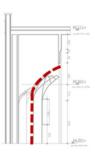


Figure 13. OWAS analysis in prayer's Tashahod and Salaam







Tashahod and Salaam in Prayer

Virasanaine in Yoga

Mihrab in Mosque

Figure 14. The same form between "The Mihrab", "Tashahod and Salam" and "Virasanaine."

CONCLUSION

The investigations carried out from the analysis of each of the spaces of the mosque (Courtyard, Iwan, Dome and Mihrab) in addition to the totality of the separated ritual movements of prayer (Qiyyam and Qunut, Ruku, Sajdeh, Tashahod and Salam), show the existence of relationships and semantic connections. It has a form in the architecture of the mosque and prayer. In fact, rather than reflecting itself, the environment paves the way for a more intimate relationship between the worshiper and God. Therefore, the architecture of the mosque helps to strengthen concentration in prayer.

On the other hand, strengthening concentration is the most important principle of yoga. Hence, prayer (Namaz), while performed as a religious obligation, can give the worshiper all the benefits of yoga. Due to the similarity of the body shape in prayer and yoga movements, they can often be considered a type of stretching and flexibility exercise. Prayer (Namaz) and yoga create inner energy, vitality and flexibility.

Therefore, in response to the research question (Is the architecture of the mosque related to the ritual movements of prayer and yoga?), it can be said that the hypothesis of the research is correct, and there are common features between the architecture of mosque spaces, ritual movements of prayer and yoga movements. (Figure 15)

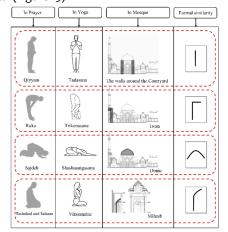


Figure 15. Comparison diagram of prayer movements with yoga movements and mosque architecture

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