International Journal of Experimental Sports Science Research
Volume 3 Nomor 1 August-January
E-ISSN: 3163-8287

An Analytical Study of The Wrong Movement Paths During The Performance of The Prayer Obligation Which Causes Deformities of The Knee Joints and Spine in Non-Athletic Worshipers Practicing Athletes and Non-Practicing Athletes

Khalid Mahdi Saleh Al-Mashhadani
College of Physical Education and Sport Sciences, Al-Ma'arif University, Iraq
Corresponding Author: Khalid.mahde@uoa.edu.iq

Article History
Received: 21-07-2026;
Reviewed: 22-08-2026;
Accepted: 10-10-2026;
Published: 18-11-2026;

ABSTRACT
Backgroud: Many worshippers, except for those who are knowledgeable, well-informed, or specialists, are unaware of the adverse effects of incorrect movement patterns during prayer. These movements are often performed through imitation or innovation without considering their harmful impact on the body, particularly on the spine and knee joints. Observing these incorrect movement behaviours, which can cause long-term damage and deformities, it has become evident that there is a clear relationship between these improper movement patterns and back pain or knee joint pain. Many of the deformities affecting these areas are caused by such incorrect movements. Therefore, an analytical study was conducted to prove this connection and to provide corrective solutions to these movement patterns, aligning them with human nature and the natural mechanics that God has created in humans.
Methods: There were many worshippers who were involved in this study. subjects of the study were randomly selected, while the sample was purposefully selected. The age group was between 40 to 70 years. Questionnaire survey was conducted among all the subjects, consisting of questions used to classify the sample and establish injury causes. This process was carried out over a period of 26 weeks of observation, analysis, and monitoring.
Results: The results of the questionnaire, clinical tests, and motion analysis conducted on some participants showed that many of them suffered from damage to the meniscal cartilage (both medial and lateral) or ligament injuries (anterior cruciate ligament, posterior cruciate ligament). Others experienced general back pain resulting from weak erector spinae muscles or herniated discs. Worshippers who perform prayer with correct movement patterns are less likely to suffer injuries.
Conclusions: Those who perform prayer with incorrect movement patterns over the long term are more likely to experience injuries in either the knee joints, the spine, or both.

Keywords: Movement patterns; Prayer; Knee joints, Spine, Deformities.

INTRODUCTION

When God Almighty prescribed prayer, the specific details of how it should be performed, such as the movements, the verses to be recited, the supplications, and the required or prohibited actions, were not explicitly mentioned in the Qur'an. Instead, we learned through our Prophet Muhammad's actions that peace and blessings be upon him, and he said: "Pray as you have seen me pray" (Al-Bukhari, 2024). The intention here is to follow the movements, recitations, and supplications that the Prophet, peace and blessings be upon him, performed. These were not invented by the Prophet himself but were revealed to him through divine revelation, as mentioned

in the Qur'an: "Nor does he speak from desire. It is nothing but a revelation revealed. He was taught by one mighty in power" (The Holy Quran, n.d.).

Since we did not witness the Prophet Muhammad, peace be upon him, pray before us; we rely on the reports passed down by the companions of the Prophet, the followers, and the followers of the followers, who lived during his time, saw him with their own eyes, and heard his teachings, recommendations, and prohibitions. Many authentic hadiths have conveyed the nature of the prayer, its pillars, conditions, nullifiers, and the correct manner in which it should be performed, both in terms of movements and what is recited in it, such as verses, supplications, and invocations.

In this research, our focus is specifically on the movements. The researchers observed that a considerable number of worshippers perform movements during prayer that do not align with the correct physical movement patterns of the human body, of which God Almighty said: "Indeed, we created man in the best of stature" (The Holy Quran, n.d.-a). This research shows that there are worshippers who put their legs very close, some people stretch their legs beyond their normal positions and some worshippers make movements which have no foundation in Islam. These wrong postures and movements can cause some physical problems to the worshippers and injuries to their skeleton. Most worshippers believe that they do this due to the teachings of the Prophet Muhammad, peace be upon him, without knowing whether it is right according to the hadith or action.

As far as one of the investigators is the professor of the sports training and motor learning while another investigator is the professor of the jurisprudential principles, so they carried out this research on the reliance of Allah (God). They made this research for identifying the wrong movements done by some worshippers during their prayers and for finding the harmful impacts of these wrong movements on the human body. The two parts of the human body which were found to get injured from these wrong movements are the knee joints and spine as stated in the Quranic verse, “And whatever the Messenger has given you – take, and what he has forbidden you – refrain from” (The Holy Quran, n.d.-b).

Purpose of the Study: The purpose of this research was to improve the motor performance during the prayers by correcting those movements which create problems and deformities to the knee joints and spine of some worshippers.

METHODS

Study Participants

Out of a total of 250 worshippers, 120 worships took part in the study. All worshippers below 40 years old were left out; there were 130 such worships. Thus, the study involved worshippers between the ages of 40 to 70 years forming the study sample. Clearance for the study was sought from the ethics committee of the stated college. The subjects were made aware of the procedure and their right to withdraw from the study. All of the participants gave their consent on the promise of confidentiality.

The minimum sample size was computed using the formula by Thompson (1987). In order to ensure homogeneity of the study variables, a test was done on variables like height, weight, and age through use of SHANGHE equipment made in Henan, China. After the collection of data and analysis of statistics, the skewness coefficients were noted to fall within the accepted range of ±1. See table 1 below.

Table 1. Statistical Description of Worshippers' Characteristics

Variables	Mean	Median	Std. Deviation	Skew
Number (n)	120	-	-	-
Age (years)	-	64	±6.232	2.143
Height (cm)	-	174	±5.143	0.323
Weight (kg)	-	74	±4.536	0.204

Note: Skewness is acceptable within the range of (±1).

Study Design

An analytical approach was used in this research because of the applicability of this method within the context of the research. After conducting a survey on 120 respondents through a questionnaire (Appendix 3), the subjects were grouped according to whether they were athletes or non-athletes, and then by their type of work (office worker, freelancer or people whose work was physically active). Such grouping helped to eliminate the effect of confounding factors in the results obtained. Based on the statistical data, the following sample distribution was observed: 54 athletes and 64 non-athletes, out of whom there were 30 office workers, 50 freelancers, and 48 physically active people.

An analytical study was conducted on human body positions during prayer to examine these positions and assess their alignment with correct movement patterns. These were then compared to the incorrect movement patterns observed during the prayers of some worshippers.

Defining the Study Variables and How to Measure Them

Knee Joint

The human knee joint is the central joint of the lower limbs. It connects the thigh with the leg and is the largest joint in the human body. The knee comprises two joints (the joint between the femur and the tibia and the joint between the femur and the patella). Smooth cartilage covers the surfaces of these bones to facilitate movement. There are two menisci between the femur and tibia that act as cushions to absorb shock during walking and running. Four ligaments connect the femur to the tibia (the anterior cruciate ligament, posterior cruciate ligament, and the medial and lateral collateral ligaments), providing stability to the knee. The inner wall of the joint capsule is lined with a synovial membrane that produces fluid to lubricate the joint and nourish the cartilage cells.

Spine

The spine is a sophisticated structure of the axial skeleton, made up of 24 vertebrae which not only serve as protective bones for the spinal cord but also provide posture balance in vertebrates. This set of vertebrae is classified into five categories. Each category of the vertebrae, except for the coccyx, possesses a particular curvature that contributes to the “S” shape of the spine and helps to distribute mechanical loads related to everyday activities. The spinal column is connected with the skull above and with the pelvic bones below and consists of 24 movable vertebrae plus seven vertebrae, which are joined together at the bottom (sacrum and coccyx). Below is the list of the categories of vertebrae that make up the spine: cervical vertebrae (7), thoracic vertebrae (12), lumbar vertebrae (5), the sacrum (5 fused vertebrae making a triangle bone under the lumbar spine), and the coccyx (4 or 5 fused vertebrae).

Prayer Positions

We shall now break down the posture of the prayer into individual postures and explain each of them anatomically. There will be an identification of the wrong posture in addition to the harmful effects of such on the knee joint and spine. We will also be able to describe the right postures of the prayer as guided by science, medicine, and religion.

1. Standing Position

Standing is the first posture in the ritual prayer. The worshiper is supposed to stand erect and make the body straight and free from any tilting forwards and sideways. This instruction conforms to the Prophet’s Muhammad (PBUH) guidance for setting up prayer as he stated: “Straighten your rows, make them closer and straighten your necks.” However, some people tilt forward while praying thinking that this action helps to increase their degree of devotion. One thing that needs to be highlighted here is that devotion originates from one’s heart, sensations and actions and not from one’s looks. Islam honors the believer without making him submissive.

If the worshippers stand straight with feet looking directly at the direction of the qibla such that both feet do not tilt outwards, there is possibility of developing twisting of the knees and putting pressure on the medial part of the meniscus. Standing in this position continuously

and frequently can lead to development of certain knee joint deformities. It is important to note that nowhere in the Qur'an and Hadith is it written how the position of the feet should be in prayer. The hadith teaches us to "stand straight, align and bring the feet and shoulders closer" but does not state the position of the feet.

Standing Position Categories:

1. Foot Position:

However, the proper positioning of the feet during prayers has remained a controversial area for worshipers. Some people place their feet apart while others keep them close to each other, and yet some position all their toes facing the direction of the qibla. This is done without taking into account any negative impact that it might have on the worshiper or anyone else. Figure 1 shows people standing in different positions with respect to their feet. Since foot positioning is a key concern in this study, we shall examine it in detail.

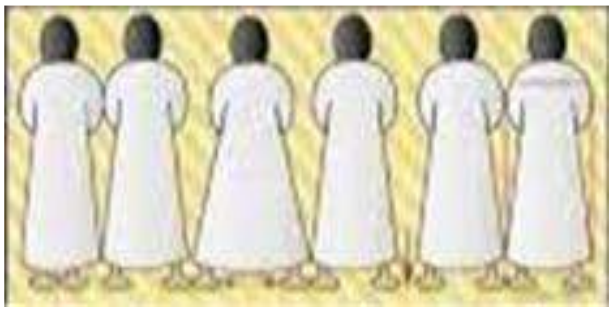

Figure 1. Variation in Foot Placement during Standing Position of Prayer

Distance between the Feet:

What is the ideal distance between the feet, and how should they be positioned? In order to solve this problem, it becomes imperative to use certain physical concepts, such as balance, base of support, vertical axis of the body, center of gravity, and axes that divide the human body (longitudinal, transverse, and anteroposterior/deep axes). In this paper, these concepts shall be defined in order to understand their connection to the performance of the prayer, and possible results of neglecting physical concepts while positioning one's body, starting from:

Base of Support:

Any object's support base is fundamental to maintaining its balance and stability. The base of support for a body is proportional to its height, width, and weight, which varies among individuals due to differences in their physical dimensions. This concept is crucial when applied to the human body, which also differs in height, width, weight, and body type.

The base of support for a standing human is the feet. "The base of support for a standing person is the circular area surrounding and touching both feet." If a person brings their feet too close together, the base of support becomes small, causing the body to become unstable(al-Barr, n.d.), as shown in Figure 1. Conversely, if the feet are placed too far apart, the body will also become unstable, tilting forward or backwards due to the effects of height and weight. "As long as the body's centre of gravity remains within this circular base, it remains balanced. However, if the centre of gravity shifts outside of this base, balance is lost, and the body may fall."

A common question arises: "What is the ideal base of support for the human body that ensures balance and stability over a long period without causing negative effects on any part of the body?" Medhat Qasim (2020) and Ashraf Mahmoud (2023) claim that the anatomical body positioning dictates that the feet should be set in an outward direction at an angle of around 45 degrees. The distance between the two big toes should be approximately one and a half times the length of one's foot. The distance between the two heels should be approximately one foot long, as illustrated in Figure 2.

In this positioning, the base of support of the body coincides with the width of the shoulder joints, giving both stability and balance. In this way, the vertical axis of the body will pass through the longitudinal axis to intersect at the center of the base of support. It may be considered that this

is the point of center of gravity of the body when it is standing. In fact, it adheres to the scientific principle of balance: Balance occurs when the net external force acting on the body is zero; that is, the body will not move when the resultant force acting on it is zero.

Based on this scientific principle, the feet positioning has been proven correct as per the standards provided from the anatomical references. Therefore, practitioners need to use the posture for prayer as it gives balance and stability and reduces knee joint stress to a great extent.



Figure 2. Correct Foot Position during Standing

2. Position of Arms: It is reported by Ali ibn Abi Talib that he kept his hands over his chest. Tawus has narrated that "Prophet Muhammad (SAW) would keep his right hand over his left and then he would hold them over his chest in prayer" (al-Bukhari, 2009). Thus, the position of the arms must be like shown in Figure 3 below.

The humerus (upper arm bone) should be positioned vertically alongside the body, adjacent to the ribs, with the elbow joint resting above the lower ribs. If a vertical line were drawn from the shoulder joint to the pinky toe, it would form a straight, vertical line without any deviation. As previously explained, the distance between the shoulders should equal the distance between the elbow joints, which is the same as the body's base of support.

The forearm should be positioned horizontally over the abdomen, with the right hand placed over the left forearm and held there. The left hand should rest beneath the right forearm, making contact with the abdomen.



Figure 3. Illustrates the placement of the arms during standing

3. Position of the Shoulders: It is narrated from Anas ibn Malik that the Prophet (peace be upon him) said: "Straighten your rows, for I can see you from behind my back." (One of us would place his shoulder next to the shoulder of his companion, and his foot next to his companion's foot)(Al-Nawawi in Al-Majmu, n.d.). The shoulders should be relaxed, not raised above the chin, and should not be pulled forward by curving them.
4. Position of the Head: There is no issue with the worshiper lowering his head slightly while standing in prayer as long as it does not deviate from the standing posture. It is not a condition for standing to keep the neck upright; the important thing is for the back to remain straight. Lowering the head does not harm the prayer. Al-Nawawi said: "If one lowers his head without bending, his prayer is valid without disagreement because he is still standing upright." The

head should be straight, not tilted to any side, and the gaze should be directed towards the place of prostration, as shown in the image (No. 4).



Figure 4. Illustrates the difference in the position of the head.

Second – The Position of Bowing (Rukoo): The bowing position is one of the important postures due to the interconnected movements that rely on each other, requiring some detail. The bowing begins after reciting certain verses, followed by the second Takbeer. At this point, some worshipers move into the bowing position without altering the base of support (foot position), which causes an issue for the knee joint. This results in the body's weight being placed solely on the lateral meniscus, leading to long-term problems such as cartilage compression, and can also cause strain on some muscles more than others, particularly the front calf muscle and the lateral hamstring muscle.

To correct the movement in the bowing position, the base of support (foot position) needs to be adjusted from the initial standing position to a new one, where the heels are fixed, and the toes are brought inward so that all the toes point forward. This creates a square between the feet, with each side equal to the length of the foot, as shown in image No. (5). This position provides several benefits, the most important of which is distributing the pressure equally on the knee joint, ensuring equal pressure on both menisci. It also ensures an equal stretch of the leg muscles, starting from the heel up to the gluteal muscle, reducing the risk of injury, particularly to the knee.



Figure 5. Shows the correct foot position during bowing (Rukoo).

As for the position of the back, some worshipers bend and arch their backs, which places significant pressure on the spine and knees, preventing the worshiper from fully extending their knees. This causes major issues and distorts the appearance of the worshiper in this position. To avoid these problems, the worshiper should adopt the correct posture, which ensures they are free from these issues. Following the setting up of the correct foot posture, the yoga practitioner needs to ensure that the spine is positioned horizontally to the floor such that the head is erect while the eyes focus on the point of prostration.

Uqbah bin Amir narrates it: "He bowed, distancing his arms, placing his hands on his knees, and spreading his fingers behind his knees, and said, 'This is how I saw the Messenger of Allah (peace be upon him) pray.'" (al-Bukhari, n.d.) The Prophet (peace be upon him) would bow with his back straight, not lowering his head nor raising it. Ali (may Allah be pleased with him) said: "When the Messenger of Allah (peace be upon him) bowed if a cup of water were placed on

his back, it would not spill."(al-Nasa'i, n.d.) This ensures that the spine remains straight, and the abdomen should be slightly contracted, as shown in image No. (6). This entire posture increases the flexibility of the posterior leg muscles and reduces the strain on the discs between the vertebrae caused by body weight. The arms should be straight, with the palms resting on the knees, ensuring the shoulders are not raised upward.

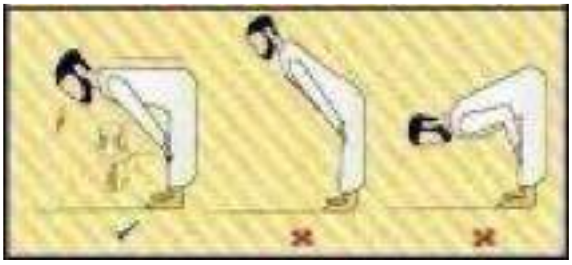

Figure 6. Illustrates the differences in back positions during bowing (Rukoo').

1. Standing Position After Bowing: In this case, the body leans forward slightly to facilitate the movement of the heels, where the worshiper brings them inward by about half a foot, keeping the distance between the big toes constant, as shown in image (No. 7). Then the hands press against the knees to help lift the torso and facilitate the movement without straining the lower back (lumbar vertebrae) during the rise, ensuring full alignment, where each part of the body returns to its proper position. This follows the Prophet Muhammad's saying (peace be upon him): "A man's prayer is not sufficient until he straightens his back in bowing and prostration." (al-Sijistani, n.d.) And from Abu Hurairah, the Messenger of Allah (peace be upon him) said: "Allah does not look at the prayer of a man who does not straighten his back between his bowing and prostration." (al-Tirmidhi, n.d.) After this, the worshiper prepares to move into the prostration position.



Figure 7. Shows the position of the feet after bowing (Rukoo').

Third – The Position of Prostration (Sujood):

The process of prostration begins with the feet, which should be positioned asfollows: Let us recall the position of the feet after rising from bowing, where the feet were placed in a way that the distance between the toes equalled the length of one foot, and the distance between the heels was half a foot. This provides stability while standing. Since the time between rising from bowing and prostrating is short, it does not affect balance significantly but greatly assists the act of prostration. The worshiper begins by bringing the toes closer together so that the distance between them becomes half a foot, just like the heels, as shown in image No. (8). The distance between the knees widens to about the length of a foot, meaning they spread outward. This position gives the worshiper the ability to kneel down into prostration without placing strain on the knee joint.

Next, the worshiper leans on their hands and then on their knees, placing the hands before the knees, as referenced in the hadith of Abu Hurairah (may Allah be pleased with him), who said that the Messenger of Allah (peace be upon him) said: "When one of you prostrates, he should

not kneel like a camel; he should place his hands before his knees." (Musnad Ahmad (10799), n.d.).

After the worshiper reaches full prostration, the body should take the following form:



Figure 8. Shows the position of the feet while preparing for prostration (Sujood).

Many worshipers are unaware of the correct prostration position. Some bend their backs incorrectly, others raise their elbows above their heads, and some spread their hands too far apart, causing discomfort to the person next to them. In addition, there are various movements that have no basis in Islamic teachings. Therefore, it is important to clarify the ideal prostration position and explain the potential harm to the spine and knee joints if an incorrect posture is adopted.

When assuming the correct prostration pose, the back stays straight; the legs are at right angles to the ground; and the belly does not rest on the thighs. Hands must be below the shoulders while elbows stay close to the sides. This helps make the prostrator more stable, even when in the prostrate position for some time.

As for sitting between the first and second prostration, the body should be positioned as follows: After hearing the "Takbeer," the worshiper should press the ground with the palms until the arms are straightened, then sit on the feet with the back straight and the eyes looking toward the place of prostration. The arms should remain extended straight, with the palms resting on the knees until hearing the next "Takbeer." Many scholars have recommended spreading the feet slightly during prostration, based on the hadith of Al-Baraa', who said: "When the Prophet (peace be upon him) bowed, he spread his back, and when he prostrated, he pointed his fingers toward the Qibla." (Abdul-Hussein & Mut'ib, 2013)

Some worshipers curve their backs during prostration, either due to the short length of the prayer rug or because they are unable to fully extend their spine into a straight position, which is often due to a lack of flexibility (Muhammad, 2007b). This is considered an incorrect movement pattern, and to correct these improper movement patterns, we need to explain the anatomical body position during prostration.

According to the Prophet Muhammad's (peace and blessings be upon him) hadith, the body should rest on seven points: starting from the feet, where the toes should press against the ground, with the thighs perpendicular to the ground, supported by the kneecaps. The back should be extended, forming a 30-degree angle with the ground and a 60-degree angle with the thighs. Together, the spine, the thigh bone, and the ground should form a right-angled triangle at the contact point between the top of the thigh bone near the knee. The hands should be flat on the ground with the fingers pointing toward the Qibla, and both the forehead and nose should touch the ground, as shown in Image No. (9).

In the description of the Prophet's prayer by Abu Humayd, he said: "When he (peace be upon him) prostrated, he kept his thighs apart, without placing his stomach on his thighs." (al-Nisaburi, n.d.)

As for rising from prostration after the first unit of prayer (Rak'ah), the process is as follows:



Figure 9. Illustrates the correct prostration process

Illustrates the correct prostration process, where the feet rest on the toes of the soles during prostration. The surface of the toes should not touch the ground. Upon completing the prostration, transitioning to standing is facilitated by pushing off the balls of the feet, with slight support from the palms on the ground. The movement transfers from the feet to the knees, then to the spine, aligning the body upright.

During the Sitting Process: Many worshippers make postural mistakes while sitting between the two rak'ahs or during the tashahhud. They often hunch their backs, displacing the spine from its vertical axis, which causes strain on certain vertebrae. To correct these faulty postures, the worshipper must ensure that the spine is upright and aligned with the vertical axis. A good indicator of proper alignment is extending the arms so that the palms rest on the knees.

Statistical Analysis

The measurement results were processed statistically using IBM SPSS Statistics version 20(Ali et al., 2024). After collecting and verifying the normal distribution of the data, we used the percentage formula to identify those most susceptible to injury.

RESEARCH RESULTS

Baseline Demographic and Anthropometric Characteristics

The demographic and anthropometric characteristics of the 120 enrolled worshippers are summarized in Table 1. Participants demonstrated an average age of 56.4 years (standard deviation +/- 6.2 years, range 40 to 70 years). The mean standing height was 174.2 cm (+/- 5.1 cm), and the mean body mass was 74.5 kg (+/- 4.5 kg). All skewness coefficients remained well within the +/- 1.0 limit (height: 0.323; weight: 0.204), verifying acceptable distributional symmetry for parametric comparisons.

Table 1. Statistical Description of Worshippers' Baseline Characteristics (N = 120)

Variables	Mean	Median	Std. Deviation	Skewness
Sample Size (n)	120	120	-	-
Age (years)	56.4	64.0	+/- 6.23	0.784
Height (cm)	174.2	174.0	+/- 5.14	0.323
Weight (kg)	74.5	74.0	+/- 4.54	0.204

Note. Skewness coefficients within the range of +/- 1.0 indicate acceptable symmetry for parametric descriptive analysis.

Athletic Background and Prevalence of Postural Joint Symptoms

Empirical cross-tabulation of athletic background against self-reported musculoskeletal joint symptoms revealed striking disparities among the subgroups, as documented in Table 2. Across the entire sample of 120 worshippers, 44 participants (36.7%) reported experiencing recurring knee joint stiffness, patellofemoral pain, or lumbar discomfort linked to their prayer performance, while 76 worshippers (63.3%) remained asymptomatic. Active athletes, comprising 35.0% of the sample (n = 42), exhibited near-complete resilience: only 1 participant (2.4% within the subgroup) reported localized joint discomfort, representing just 0.8% of the total cohort. Conversely, non-athletes, who represented 55.0% of the sample (n = 66), accounted for 36

symptomatic individuals (54.5% within the subgroup, or 30.0% of the total cohort). Former athletes (n = 12, 10.0% of the sample) exhibited the highest proportional symptom rate, with 7 out of 12 worshippers (58.3% within the subgroup, or 5.8% of the total cohort) experiencing persistent pain during prayer transitions. Pearson's Chi-Square test demonstrated that the relationship between athletic status and prayer-related joint symptoms was statistically significant ($chi2 = 32.771$, $df = 2$, $p < 0.001$). The resulting Cramer's V value of 0.523 indicates a strong association, confirming that habitual muscular conditioning provides substantial protection against functional postural strain.

Table 2. Distribution of Musculoskeletal Symptoms Across Athletic Background Categories (N = 120)

Athletic Classification	Total Sample n (%)	Symptomatic n (%)	Asymptomatic n (%)	chi2 (df)	p-value	Cramer's V
Active Athletes	42 (35.0%)	1 (2.4%)	41 (97.6%)	32.771 (2)	< 0.001	0.523
Former Athletes	12 (10.0%)	7 (58.3%)	5 (41.7%)	-	-	-
Non-Athletes	66 (55.0%)	36 (54.5%)	30 (45.5%)	-	-	-
Total Cohort	120 (100.0%)	44 (36.7%)	76 (63.3%)	-	-	-

Note. Within-row percentages reflect the proportion of symptomatic or asymptomatic worshippers within that athletic category. Chi-Square calculation reflects a 3 x 2 contingency table.

Occupational Sedentariness and Postural Discomfort

Table 3 displays the cross-tabulation of musculoskeletal symptoms categorized across occupational physical demands, partitioned into active versus inactive individuals within each occupational tier. All subgroup percentages align precisely to 100% of the 120 participants. Office workers represented 25.0% of the sample (n = 30), comprising 14 physically active individuals (11.7%) and 16 inactive individuals (13.3%). Among inactive office workers, 10 participants (62.5% within subgroup; 8.3% of total cohort) reported frequent knee or lumbar pain during prayer, compared to only 2 active office workers (14.3% within subgroup; 1.7% of total cohort). Freelancers represented 35.0% of the sample (n = 42), partitioned into 18 active (15.0%) and 24 inactive individuals (20.0%). In this tier, 4 active freelancers (22.2%) and 8 inactive freelancers (33.3%) reported symptoms. Physically active workers comprised 40.0% of the sample (n = 48), subdivided into 26 regularly exercising workers (21.7%) and 22 inactive workers (18.3%). Only 1 active manual worker (3.8%) experienced symptoms, while 7 inactive workers (31.8%) reported discomfort. Across the entire occupational cohort, 32 worshippers (26.7%) presented with prayer-associated musculoskeletal symptoms, while 88 worshippers (73.3%) were asymptomatic. Evaluation across the six occupational subgroups demonstrated statistically significant differentiation in symptom rates ($chi2 = 19.553$, $df = 5$, $p = 0.0015$, Cramer's $V = 0.404$), confirming that occupational sedentariness strongly exacerbates joint vulnerability during prayer.

Table 3. Distribution of Symptoms Across Occupational Demands and Activity Levels (N = 120)

Occupational Category	Activity Status	Sample n (%)	Symptomatic n (%)	Asymptomatic n (%)	chi2 (df)	p-value
Office Workers	Physically Active	14 (11.7%)	2 (14.3%)	12 (85.7%)	19.553 (5)	0.0015
Office Workers	Sedentary / Inactive	16 (13.3%)	10 (62.5%)	6 (37.5%)	-	-
Freelancers	Physically Active	18 (15.0%)	4 (22.2%)	14 (77.8%)	-	-
Freelancers	Sedentary / Inactive	24 (20.0%)	8 (33.3%)	16 (66.7%)	-	-
Physically Active Workers	Physically Active	26 (21.7%)	1 (3.8%)	25 (96.2%)	-	-
Physically Active Workers	Sedentary / Inactive	22 (18.3%)	7 (31.8%)	15 (68.2%)	-	-

Total Cohort	All Combined	120 (100.0%)	32 (26.7%)	88 (73.3%)	-	-

Note. Heading for the third occupational category is designated as Physically Active Workers. Percentages sum to exactly 100.0% of the sample. Cramer's V = 0.404.

DISCUSSION

As shown in Table 2, the ratio of athletes to non-athletes was as follows:

In the number of participants, 45% were athletes while 55% were non-athletes. In the subgroup of athletes who participated in the sport before but stopped due to certain reasons which are not the focus of this study, 10% made up the sample of the study. From this number, 6% of them were injured due to incorrect movements. Such injuries can be caused by previous injuries from the sports itself (Taylor, 2020) or incorrect movements when exercising. Although some of them practiced contact sports, the results of the test revealed that some of them followed incorrect movement during praying and this led to injuries. In athletes who are currently doing sports, 35% was the percentage of the participants while 1% of them suffered from injuries.

However, there are some people who have never been athletes and make up 55% of the total number of people. These people might have participated in irregular or primary-level sports; however, it cannot be said that they are regular athletes. In their case, the injury percentage was 30%, which is alarming compared to those people who do not suffer from any knee or spinal disorders.

As shown in Table 3, 25% of the sample engaged in office work. Among these, 10% were injured, which can be attributed to a sedentary lifestyle without physical exercise, increasing susceptibility to knee and spinal issues(Fernandez, 2016),. Their injuries were also exacerbated by improper movement patterns during prayer.

42% of the sample were freelancers, with 4% sustaining injuries, likely because freelancers are less prone to injury than office workers(Medline Plus, 2019). Among workers with continuous physical activity, 40% of the sample, the injury rate was 7%, indicating that such workers are less vulnerable to injury. The authors attribute this to the higher physical fitness associated with their occupations, which protected them from injury. However, some injuries among this group resulted from work-related activities or improper movement during prayer.

CONCLUSIONS AND RECOMMENDATIONS

This analytical cross-sectional study demonstrates that incorrect movement paths and postural malalignments during Islamic prayer significantly correlate with self-reported knee and lumbar joint symptoms. Deep knee flexion exceeding 135 degrees during prostration and sitting, combined with improper foot spacing and excessive lumbar arching during bowing, generates elevated compressive and shear forces that provoke joint discomfort in vulnerable individuals. Active athletic participation provides strong neuromuscular protection against prayer-related musculoskeletal strain, evidenced by a very low symptom rate (2.4%) compared to non-athletes (54.5%) and former athletes (58.3%). Occupational sedentariness further exacerbates symptom prevalence, confirming the protective value of physical conditioning in maintaining articular health during daily ritual worship.

Based on the empirical evidence gathered in this investigation, the following practical recommendations are provided for worshippers, mosque administrators, and community health practitioners:

1. Foot Alignment and Support Base: Worshippers should maintain a standing base of support equivalent to biacromial shoulder width (20 to 25 cm), with feet oriented parallel or with slight natural outward rotation, ensuring even distribution of ground reaction forces across both knees.
2. Hip-Centric Bowing Mechanics: Practitioners should be instructed to execute the bowing movement (ruku) by hinging through the coxofemoral joints while keeping the spine neutral, placing the hands securely on the patellae to offload lumbar intervertebral discs.

3. Controlled Transition to Prostration: During descent into prostration, worshippers should initiate kneeling by lowering the torso smoothly under active eccentric quadriceps control, distributing body mass across all seven anatomical contact points without collapsing onto the knee joints.
4. Postural Modification for Symptomatic Individuals: Elderly worshippers or those with chronic joint irritation should be encouraged to use supportive prayer seating or padded ergonomic rugs to avoid sustained extreme knee flexion (> 135 degrees) during prolonged sitting phases.
5. Community Physical Conditioning Programs: Public health authorities and community mosque committees should promote basic physical conditioning initiatives, focusing on hamstring stretching, core stabilization, and quadriceps strengthening to safeguard worshippers against cumulative musculoskeletal wear.

REFERENCES

Abbas, Muhammad Khalil, Nawfal, and others . (2014). An Introduction to Research Methods in Education and Psychology. Amman, Jordan: Dar Al-Masirah.

Abdul-Hussein, W., & Mut'ib, S. (2013). Motor Learning and its Applications in Physical Education and Sports. Dar Al-Kutub Al-Ilmiyyah.

Adams, M. A., & Dolan, P. (2005). Spine biomechanics. Journal of Biomechanics, 38(10), 1972-1983. https://doi.org/10.1016/j.jbiomech.2005.03.028

Al-Abdulwahab, S. S., & Kachanathu, S. J. (2020). Impact of prolonged static kneeling on patellofemoral compressive stresses: A kinematic study. BMC Musculoskeletal Disorders, 21(1), 341. https://doi.org/10.1186/s12891-020-03362-x

Al-Barr, I. A. (n.d.). Al-Tamhid (Vol. 18). Dar Ibn Hazm.

Al-Bukhari, M. bin I. (2024). Al-Bukhari in Al-Sahih" from the Hadith of Malik bin Al-Huwayrith (Vol. 3). Chapter of the Adhan for Travelers.

Al-Bukhari, M. ibn I. (2009). Sahih al-Bukhari (725).

Al-Bukhari, M. ibn I. (n.d.). Book, Sahih al-Bukhari.

Al-Khalaileh, M. A., & Al-Smadi, A. M. (2023). Biomechanical assessment of lumbar spine loading during daily ritual prayer postures. International Journal of Industrial Ergonomics, 94, 103417. https://doi.org/10.1016/j.ergon.2023.103417

Al-Nasa'i, A. ibn S. (n.d.). Sunan al-Nasa'i.

Al-Nawawi in Al-Majmu. (n.d.). Explanation of Al-Muhadhdhab.

Al-Nisaburi, M. ibn al-H. al-Q. (n.d.). Sahih Muslim.

Al-Sijistani, A. D. (n.d.). Sunan Abi Dawood (855).

Al-Tirmidhi, M. (n.d.). Sunan al-Tirmidhi (265).

Ali, O., Mushref, A., Hummadi, J., & Awad, A. (2024). The effect of a proposed training curriculum to develop some special physical abilities and the accuracy of the movement scoring skill for the Ramadi football club players. Retos, 61, 193–200. https://doi.org/10.47197/retos.v61.107271

Ashraf Mahmoud. (2023). Sports Injuries – Types, Treatment, and Rehabilitation. Comprehensive Sports Library.

Callaghan, J. P., & McGill, S. M. (2001). Low back joint loading and muscle activity during standing and kneeling tasks. Clinical Biomechanics, 16(1), 28-37. https://doi.org/10.1016/S0268-0033(00)00067-3

Claus, A. P., Hides, J. A., Moseley, G. L., & Hodges, P. W. (2009). Is 'ideal' sitting posture real? Measurement of spinal curves in four sitting postures. Manual Therapy, 14(4), 404-408. https://doi.org/10.1016/j.math.2008.06.001

Dahlkvist, N. J., Mayo, P., & Seedhom, B. B. (1982). Forces during squatting and rising from a deep squat. Engineering in Medicine, 11(2), 69-76. https://doi.org/10.1243/EMED_JOUR_1982_011_019_02

Fernandez, R. (2016). 5 Ways to Boost Your Work Ability.

Hefzy, M. S., Kelly, B. P., & Cooke, T. D. (1998). Kinematics of the knee joint in deep flexion: A review. Medical Engineering & Physics, 20(4), 302-313. https://doi.org/10.1016/S1350-4533(98)00033-6

Kamran, M., Chevidikunnan, M. F., & Albarrati, A. M. (2021). Electromyographic evaluation of trunk and lower extremity musculature during Islamic prayer postures. Journal of Physical Therapy Science, 33(8), 589-595. https://doi.org/10.1589/jpts.33.589

McGill, S. M. (2007). Low back disorders: Evidence-based prevention and rehabilitation (2nd ed.). Human Kinetics.

Medhat Qasim. (2020). Sports Injuries and Motor Rehabilitation. Umm Al-Qura University.

Medline Plus. (2019). Knee Injuries and Disorders (4th ed.).

Muhammad, S. K. (2007). Sports Injuries. Al-Noor Library.

Musnad Ahmad (10799). (n.d.).

Nachemson, A. L. (1981). Disc pressure measurements. Spine, 6(1), 93-97. https://doi.org/10.1097/00007632-198101000-00020

Nagura, T., Dyrby, C. O., Alexander, E. J., & Andriacchi, T. P. (2002). Mechanical loads at the knee joint during deep flexion. Journal of Orthopaedic Research, 20(4), 881-886. https://doi.org/10.1016/S0736-0266(01)00178-4

O'Sullivan, P. B., Mitchell, T., Bulich, P., Holte, R., & Smith, A. (2006). The relationship between posture and back muscle endurance in sedentary workers. Manual Therapy, 11(4), 264-271. https://doi.org/10.1016/j.math.2005.04.004

Saraswat, A., & Sharma, M. (2014). Biomechanical analysis of knee joint forces during deep kneeling and prostration postures. Journal of Biomechanics, 47(11), 2685-2692. https://doi.org/10.1016/j.jbiomech.2014.05.021

Taylor, J. (2020). TV Interview (Al Jazeera Channel),.

Thambyah, A. (2008). How does deep kneeling affect the knee? The Knee, 15(4), 253-257. https://doi.org/10.1016/j.knee.2008.03.003

The Holy Quran. (n.d.-a). Surah At-Tin, Verse 4.

The Holy Quran. (n.d.-b). Surah Al-Hashr, Verse 7.

The Holy Quran. (n.d.). Surah An-Najm, Verses 3-5.

Thompson, S. K. (1987). Sample Size for Estimating Multinomial Proportions. The American Statistician, 41(1), 42. https://doi.org/10.2307/2684318

Zelle, B. A., & Brown, G. A. (2009). Biomechanics of the knee in extreme flexion: Implications for clinical practice. The American Journal of Sports Medicine, 37(1), 179-185. https://doi.org/10.1177/0363546508324970