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ASSOCIATION BETWEEN RUKUK PRAYER POSITION AND LOW BACK PAIN AMONG LECTURERS IN THE FACULTY OF MEDICINE, UNIVERSITAS MUSLIM INDONESIA.

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Abstract

Background: *Low back pain (LBP) is a common musculoskeletal disorder that limits daily activities and reduces productivity. Rukuk, a bowing position performed during Islamic prayer, requires correct spinal alignment. Incorrect posture can increase the risk of LBP, but empirical evidence is still limited.* ***Objective:*** *This study aims to examine the relationship between the rukuk position and the severity of low back pain among medical faculty lecturers.* ***Methods:*** *A cross-sectional study was conducted on 71 female lecturers at the Faculty of Medicine, Indonesian Muslim University, selected through simple random sampling. Data were collected using the Aberdeen Low Back Pain Scale questionnaire and structured interviews. Descriptive statistical analysis and Chi-square correlation tests were performed using SPSS software.* ***Results:*** *Most respondents were in the productive age category (83.1%). Proper bowing posture was observed in 91.5% of respondents. Mild low back pain was reported by 83.1%, 9.9% experienced moderate low back pain, while 7.0% experienced severe low back pain. Chi Square correlation analysis showed a significant relationship between bowing posture and the severity of low back pain (p = 0.02).* ***Conclusion:*** *Most lecturers performed rukuk correctly and only reported mild lower back pain. This study found a significant relationship between rukuk posture and back pain. Further research with a larger and more diverse population, as well as a longitudinal design, is recommended to better understand the potential relationship between religious practices, posture, and musculoskeletal health.*

Keywords: Low back pain, rukuk, Islamic prayer, posture, medical faculty.

Abstrak

Latar Belakang: Nyeri punggung bawah (NBB) merupakan gangguan muskuloskeletal umum yang membatasi aktivitas sehari-hari dan mengurangi produktivitas. Rukuk, posisi membungkuk yang dilakukan saat salat Islam, membutuhkan penyelarasan tulang belakang yang benar. Postur tubuh yang salah dapat meningkatkan risiko NBP, tetapi bukti empiris masih terbatas. **Tujuan:** Penelitian ini bertujuan untuk mengkaji hubungan antara posisi rukuk dengan tingkat keparahan nyeri punggung bawah pada dosen fakultas kedokteran. **Metode:** Penelitian potong lintang dilakukan terhadap 71 dosen wanita di Fakultas Kedokteran Universitas Muslim Indonesia, yang dipilih melalui simple random sampling. Data dikumpulkan dengan menggunakan kuesioner Aberdeen Low Back Pain Scale dan wawancara terstruktur. Analisis statistik deskriptif dan uji korelasi Chi-square dilakukan dengan menggunakan perangkat lunak SPSS. **Hasil:** Sebagian besar responden berada dalam kategori usia produktif (83,1%). Postur membungkuk yang benar diamati pada 91,5% responden. Nyeri punggung bawah ringan dilaporkan oleh 83,1%, 9,9% mengalami nyeri punggung bawah sedang, sedangkan 7,0% mengalami nyeri punggung bawah berat. Analisis korelasi Chi Square menunjukkan hubungan yang signifikan antara postur rukuk dan tingkat keparahan nyeri punggung bawah (p = 0,02). **Kesimpulan:** Sebagian besar dosen melakukan rukuk dengan benar dan hanya melaporkan nyeri punggung bawah ringan. Penelitian ini menemukan hubungan yang signifikan antara postur rukuk dan nyeri punggung. Penelitian lebih lanjut dengan populasi yang lebih besar dan beragam, serta desain longitudinal, direkomendasikan untuk lebih memahami potensi hubungan antara praktik keagamaan, postur, dan kesehatan muskuloskeletal.

Kata kunci: Nyeri punggung bawah, rukuk, salat, postur, fakultas kedokteran

INTRODUCTION

Low back pain is one of the musculoskeletal disorders caused by poor ergonomics. The main symptom of low back pain is pain in the lower back area. In general, this pain is caused by muscle strain and aging, which will cause a decrease in exercise intensity and movement. This will cause the back and abdominal muscles to weaken.[1]

Based on national data, it is estimated that 7.6% to 37% of the population in Indonesia suffers from lower back pain. [2] Low Back pain is widespread among adults. Research shows that up to 23% of adults worldwide suffer from chronic lower back pain, with a one-year recurrence rate of 24% to 80%. The lifetime prevalence of low back pain is as high as 84% in adults. Low back pain is less common in children than in adults. One Scandinavian study revealed that the prevalence of back pain is about 1% for 12-year-olds and 5% for 15-year-olds. By age 18 for girls and age 20 for boys, 50% of them have experienced at least one episode of back pain. The lifetime prevalence of back pain in adolescents increases gradually with age, approaching adult levels by age 18.[3]

Low back pain is a major contributor to global disability, limiting daily activities. Although most people recover quickly, recurrence and persistent pain are still common. Women have a higher risk of experiencing low back pain than men due to physiological and hormonal factors. A decrease in estrogen levels during menopause can reduce bone density and the elasticity of muscle and ligament tissue, making them vulnerable. the occurrence of lower back pain. In addition, physiologically, women's muscle strength is lower than men's by a ratio of 3:1, which means that LBP is more common in women than in men, at around 70-80%.[4]

Rukuk, as one of the important movements in the five daily prayers, requires the spine to be aligned and stable. If the rukuk movement is performed with an incorrect posture, such as an unaligned back or tense back muscles, this can increase the risk of muscle tension and lower back pain. Muslims believe that prayer is a physical manifestation of their religion, so they are required to pray five times a day at specified times. Prayer is a type of religious practice that involves reciting verses from the Qur'an aloud while assuming various positions, such as sitting, standing, bowing, and prostrating.[3]

The Prophet Muhammad SAW said: “The worst thief is the one who steals from his prayers.” The companions asked, “O Messenger of Allah, how does

one steal from his prayers?" He replied, "By not perfecting his bowing and prostration," or he said, "By not straightening his back when bowing and prostrating." (Reported by Ahmad, Thabrani, Ibn Majah, Ibn Khuzaimah, and Hakim from Abu Qatadah).[5]

Rukuk is one of the important movements in prayer and should not be omitted. In addition, rukuk can also maintain the flexibility of the spine. The spine forms the main axis that supports body weight and supports the head, as well as transferring body weight and the abdomen to the legs.[6] It also facilitates blood flow and can align the position of the heart with the brain so that blood can flow maximally to the central part of the body. Rukuk can also train the bladder to prevent prostate problems.[4] Similarly, the flexibility of the neck bones, nape, and memory nerve channels can be maintained through rukuk. The flexibility of the memory nerves can be maintained by lifting the head as high as possible, with the eyes facing the place of prostration.[5]

Lower back pain is a symptom that can be caused by various abnormalities, both known and unknown, located between the XII ribs and the buttocks. This pain is often accompanied by pain in one or both legs and is associated with neurological symptoms in the lower extremities. This condition is often comorbid with other conditions such as psychological, social, and biophysical conditions, which affect the pain transmission process and individual pain experience.[7]

Rukuk is one of the movements in prayer that is prformed by bending the body at an angle of approximatel 90 degrees, where the spine must remain straight and the hands rest on the knees. When performed correctly, rukuk can stretch the back muscles, increase the flexibility of the spine and improve postre. The relationship between bowing and low back pain arises because the flexed position of the spine during bowing can put pressure on the muscles and joints of the lower back. If performed with poor posture or in individuals with muscle weakness, this movement can trigger pain. however, when performed correctly, bowing also has the potential to increase flexibility and reduce stiffness.

However, for some individuals, especially those with weak back muscles or a history of musculoskeletal disorders, the rukuk position can cause discomfort and trigger lower back pain. Lower back pain is one of the most common musculoskeletal complaints, with high prevalence in both productive and elderly age groups, and is often associated with daily activities involving bending and

crouching movements. Risk factors for lower back pain include prolonged excessive physical activity, stress and anxiety, the habit of lifting heavy loads, overweight or obesity, and the habit of sitting for long periods.[7]

The correlation between rukuk and lower back pain can be examined from a biomechanical perspective. Non spesific lower back pain typically resolves within a few days to weeks, even without treatment. However, this pain often recurs in approximately one-third of patients within a year.[8] The bent position during rukuk causes load distribution on the lumbar segments of the spine. If the rukuk posture is performed with incorrect technique, such as an uneven back, overly bent knees, or excessive stretching of the lower back muscles, the risk of pain complaints increases. Conversely, if rukuk is performed correctly with the back remaining straight, the body weight is distributed evenly, which can help train the stability of the back muscles. Thus, the relationship between rukuk and lower back pain can be bidirectional, the rukuk movement can be a protective factor if performed correctly, but also a risk factor if performed with improper posture or in individuals with a predisposition to back disorders.

The uniqueness of this study lies in linking religious activities, namely bowing in prayer, with musculoskeletal health, particularly low back pain. This study highlights medical lecturers in Indonesia, a group that is rarely studied in the context of worship and health, thus offering a new perspective that combines spiritual, cultural, and medical aspects.

METHODS

This study is a quantitative study with a cross-sectional design. The study was conducted at the Faculty of Medicine, Universitas Muslim Indonesia, from February 2024 to May 2025. The population in this study were female lecturers at the UMI Faculty of Medicine. The sample consisted of 71 sample selected using simple random sampling. The inclusion criteria for sample selection were female lecturers at the Faculty of Medicine, UMI, who were willing to be sampled and were aged 28–70 years. Meanwhile, the exclusion criteria were having a history of spinal injury and spinal abnormalities. Data were collected through the Aberdeen Low Back Pain Scale questionnaire and interviews, then analyzed univariately and bivariately (Chi Square) using the SPSS application.

RESULTS

Based on the results of a study of 71 respondents, the characteristics of age and severity of low back pain among female lecturers at the Faculty of

Medicine, Universitas Muslim Indonesia, are as follows.

Table 1. Age Characteristics of Respondents

Age Category	n (71)	%
Productive Age (14 – 44 years)	59	83,1
Eldearly Age (> 45 years)	12	16,9
Total	71	100%

Source : Primary Data, 2025

Table 1 shows that most respondents were in the productive age category (14–44 years), totaling 59 people (83.1%), while the remaining 12 people (16.9%) were in the elderly age category > 45 years.

Table 2. Distribution of Respondents According to the Correctness of Rukuk Posture among Female Lecturers at the Faculty of Medicine, Muslim University of Indonesia

Rukuk Position	n (71)	%
Ergonomic	65	91,5
Non Ergonomic	6	8,5
Total	71	100%

Source : Primary Data, 2025

Table 2 shows that most respondents had the correct ruku position, namely 65 people (91.5%), while 6 respondents (8.5%) had an incorrect ruku position. This shows that the majority of respondents performed the ruku movement in accordance with the correct body position.

Table 3. Distribution of Lower Back Pain Categories Among Respondents

Kategori *Low Back Pain*	n (71)	%
Mild	59	83,1
Moderate	7	9,9
Severe	5	7,0
Total	71	100%

Source : Primary Data, 2025

Table 3 shows that most respondents experienced mild lower back pain, namely 59 people (83.1%). Meanwhile, respondents with moderate pain numbered 7 people (9.9%) and severe pain numbered 5 people (7.0%).

The following are the results of data analysis of the relationship between the position of rukuk during prayer and low back pain in female lecturers at the Faculty of Medicine, Universitas Muslim Indonesia.

Table 4. Association between the Level of Low Back Pain and the Accuracy of Bowing Posture among Female Lecturers of the Faculty of Medicine, Muslim University of Indonesia

LBP Category	Bowing				Total		*P-value*
	Ergonomic		Non Ergonomic				
	n	%	n	%	n	%	
Mild	55	54,0	4	5,0	59	59,0	0,02
Moderate	7	6,4	0	0,6	7	7,0	
Severe	3	4,6	2	0,4	5	5.0	

Source : Primary Data, 2025

Based on Table 4, it shows that most respondents who had the correct rukuk position experienced mild lower back pain, namely 55 people (54.0%), while respondents with an incorrect rukuk position and mild pain were only 4 people (5.0%).

Additionally, there were 2 respondents (0.4%) with an improper rukuk position who experienced severe pain. Statistical test results showed a p-value of 0.02 < 0.05, indicating a significant association between the rukuk position and the occurrence of low back pain among respondent.

DISCUSSION

Back pain is pain in the thoracic, lumbar, and lumbosacral regions. Back pain is usually felt as pain, tension, stiffness, and discomfort in the back. At work, people are faced with a static work cycle that requires long periods of time in front of a computer, sitting and often not paying attention to their working posture, such as lecturers.[9]

Based on the results of research conducted on female lecturers at the UMI Faculty of Medicine, it was found that most respondents experienced mild low back pain, which was caused by the majority of respondents in the productive age group, amounting to 83.1% (59) people.

Table 4.2 shows that most respondents experienced mild low back pain, amounting to 59 people (83.1%). Meanwhile, 7 respondents (9.9%) experienced moderate pain and 5 respondents (7.0%) experienced severe pain. According to the WHO, the prevalence increases with age up to 80 years, while the highest number of LBP

cases occurs in the elderly aged 50–55 years.[10]

As a person ages, a process of bone degeneration begins at the age of 30. This process is characterized by the degeneration of the human intervertebral disc structure, which can lead to tears and replacement of tissue with scar tissue, a reduction in bone fluid, permanent shortening of the disc space, and loss of bone segmentation stability. This can cause a reduction in fluid in the nucleus. A reduction in fluid in the nucleus accompanied by static movement will result in a decrease in load-bearing and pressure capabilities. If this occurs in people aged ≥ 45 years, there is certainly a higher chance of developing severe LBP.[11]

Many factors can cause low back pain. Risk factors for low back pain usually include tense posture, obesity, pregnancy, psychological factors, and improper activities when lifting heavy loads. Improper sitting and sitting too long in an uncomfortable position can also cause low back pain. Someone who works in an upright sitting position is five times more likely to experience low back pain than someone who works in an upright position. The ideal sitting time is less than three hours a day, while sitting for 3-6 hours a day can increase the risk of low back pain.[12]

Based on the results of the study, it was found that most respondents in this study had the correct rukuk position, namely 91.5% (65 people). The correct rukuk position illustrates the respondents' understanding of the proper way to perform salat in accordance with ergonomic body movements. The ruku movement, which is performed with the back straight and without bending or stooping excessively, plays an important role in maintaining body balance and preventing tension in the lower back muscles.[8]

These results indicate that the respondents had good postural awareness during worship. The correct bowing position not only serves as a form of obedience in worship but also provides benefits to the musculoskeletal system, especially the lumbar spine. Correct bowing movements can help maintain joint flexibility and back muscles, thereby reducing the risk of low back pain.[13]

Meanwhile, an incorrect bowing position, such as an overly arched back or a head that is bent too far forward, can cause uneven distribution of body weight. Over time, this condition has the potential to increase pressure on the lumbar spine and cause musculoskeletal complaints. Therefore, education on the correct rukuk position is important to prevent disorders

in the musculoskeletal system due to incorrect posture during rukuk.[8]

This bowing movement can maintain the integrity and function of the spine. It can also align the position of the heart with the brain so that blood can flow optimally to the center of the body. In addition, bowing can also train the bladder to prevent prostate disorders.[14]

Conclusions from global health experts state that prayer is an effective way to alleviate back and bone pain caused by muscle imbalance. The movements performed during prayer, which are done five times a day, serve as an excellent free therapeutic treatment for those suffering from bone diseases or osteoporosis.[14]

The relationship between the level of low back pain and the position of bowing during prayer among female lecturers at the Faculty of Medicine, Indonesian Muslim University.

The results of the study show that most respondents with the correct bowing position experienced mild lower back pain, namely 55 people (54.0%), while only 4 respondents (5.0%) with an incorrect bowing position experienced mild pain. This shows that body position during bowing plays an important role in reducing pressure on the lower spine. Proper rukuk movement allows for balanced weight distribution and maintains the natural curvature of the spine, thereby preventing muscle tension and back pain.[14]

Based on the results of the Chi Square test, a p-value of 0.02 was obtained, indicating that there is a significant relationship between the position of rukuk and the incidence of low back pain in female lecturers at the Faculty of Medicine, Universitas Muslim Indonesia. This is due to various factors, including the research sample consisting of medical lecturers. Medical lecturers have academic workloads such as teaching and working in hospitals that require them to sit, stand, and walk for long periods of time and perform medical procedures in certain postures, which can put pressure on the spine and increase the risk of low back pain (LBP).[15]

In addition, the sample in this study was dominated by the productive group with 59 respondents. A study conducted by Saidu (2011) comparing young and old age groups explained that spinal mobility decreases significantly with age. The older a person is, the less elasticity their spinal muscles and joints have, making them more prone to stiffness and low back pain (LBP).[16]

These findings also indicate that an improper rukuk position can be a risk factor for lower back pain. Incorrect rukuk posture, such as bending too deeply or

positioning the back out of alignment with the head, can increase the load on the facet joints and lumbar muscles, which in the long term can cause chronic pain.[17]

The results of this study are in line with research conducted by Dedi Ardiansyah (2023), which states that the rukuk movement is beneficial for maintaining the perfect position and function of the spine (corpus vertebrae) as the body's support and nerve center, as well as maintaining the spine, which is always compressed.

The movement of bowing, when performed in the correct position, is essentially similar to light stretching exercises that can strengthen the lower back muscles and increase muscle tissue elasticity. Therefore, proper bowing is not only valuable for worship but also provides physiological benefits in maintaining the health of the musculoskeletal system. Similar studies also explain that performing prayer with ergonomic movements can improve spinal stability and posture. These findings emphasize the importance of educating the public on the proper way to perform rukuk. Applying the bowing position in accordance with the rules of body anatomy can contribute to the prevention of low back pain, especially in individuals who pray five times a day. These results are in line with previous studies which state that the practice of prayer performed with the correct movement techniques can serve as a preventive therapy for musculoskeletal disorders.[18]

ETHICAL APPROVAL

This study was approved by the Health Research Ethics Committee, Universitas Muslim Indonesia, Approval No. 343/A.1/KEP-UMI/VI/2025, on June 4, 2025. All participants were informed about the objectives and procedures of the study and provided written informed consent.

CONCLUSION

Based on the results of the research and discussion, it can be concluded that most female lecturers at the UMI Faculty of Medicine have the correct rukuk position and experience mild low back pain. Statistical test results show a significant relationship between the rukuk position and low back pain with a p-value = 0.02. Therefore, for further research, it is recommended to use a more analytical design and select other variables such as BMI and prayer duration to obtain more comprehensive results. The results of this study are expected to add new knowledge and information about the rukuk position an the incidence of low back pain.

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