

## Risk Factors of Sitting Cross-Legged on Low Back Pain of Students at Islamic Boarding School

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**Abstract:** This study aimed to analyze the correct cross-legged sitting position to prevent low back pain in students at Islamic boarding schools. This study used an analytical design with a cross-sectional design. The study was conducted 30 males on Students at the Durrotu Aswaja Islamic Boarding School in Semarang. Participants also agreed to the procedure by filling out and signing the informed. The instrument in this study used a questionnaire and pain measurement of low back pain using the Visual Analog Scale. The results of this study indicate that 20 out of 30 Islamic boarding school students have experienced low back pain due to the cross-legged position. From test data A to C found the average results show 13% of respondents experiencing very severe pain, 9% of respondents experiencing severe pain, 73% of respondents experiencing moderate pain, and 6% of respondents experiencing mild pain. In conclusion, many things cause low back pain, one of which is the effect that sitting in one position for a long time has on low back pain. Some of the pain results in complaints such as low back pain, knee pain, and tingling. Due to the COVID-19 pandemic's social isolation, only students who signed informed consent were willing to engage in the study until it was finished, which resulted in a insignificant number of respondents. Many respondents were still in their homes or local communities at the time, which poses a limitation for this study.

**Keywords:** sitting cross-legged, low back pain, students, Islamic boarding school.

## 伊斯蘭寄宿學校學生盤坐腰痛的危險因素

**摘要：**本研究旨在分析正確的盤腿坐姿以預防伊斯蘭寄宿學校學生的腰痛。本研究採用分析設計和橫斷面設計。這項研究是在三寶壟的杜羅圖·阿斯瓦哈伊斯蘭寄宿學校對 30 名男性學生進行的。參與者還通過填寫和簽署知情同意程序。本研究中的儀器使用問卷調查和使用視覺模擬量表對腰痛進行疼痛測量。這項研究的結果表明，30 名伊斯蘭寄宿學校的學生中有 20 名因盤腿而出現腰痛。從測試數據 A 到 C 發現，平均結果顯示，13% 的受訪者經歷了非常嚴重的疼痛，9% 的受訪者經歷了重度疼痛，73% 的受訪者經歷了中度疼痛，6% 的受訪者經歷了輕度疼痛。綜上所述，導致腰痛的原因很多，其中之一就是久坐對腰痛的影響。一些疼痛會導致諸如腰痛、膝痛和刺痛等主訴。由於新冠肺炎大流行的社會隔離，只有簽署知情同意書的學生才願意參與研究，直到研究完成，這導致受訪者人數微不足道。許多受訪者當時仍在他們的家中或當地社區，這對本研究構成了限制。

**关键词：**盤腿坐著，腰痛，學生，伊斯蘭寄宿學校。

## 1. Introduction

Everywhere, all the time, there are learning

activities occurring in both official and informal settings. Islamic boarding schools offer a flexible educational approach that upholds the discipline of

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religious instruction [3]. Both boarding and public schools provide engaging and intriguing learning activities. Like other institutions, Islamic boarding schools provide math, science, and other topics. Their comprehension of religious science is what distinguishes them from one another [2].

Enhancements in religious knowledge, field experience, and practice make students more independent and creative in their cottage life. Because we know that the activities in Islamic boarding schools do not have much free time, this indirectly demand the body be in shape because it is more active in moving. Side effects from activities that are often carried out repeatedly can cause students to experience injuries or pain, such as low back pain. Sitting is a movement done repeatedly and continuously always by everyone, such as writing, reading, watching television, and so on. His sitting position can be seen from his posture, whether it looks right or wrong. A sitting position is an activity that includes a lordotic posture, swayback posture, flat back, and anterior stage tilt [12]. When doing activities, a person must use several body positions, such as an upright sitting position, a bent sitting position, and a half-seated position [21]. A position that has become routine in the activities of students in Islamic boarding schools is sitting cross-legged while reading the Koran. This position is often taken because it feels comfortable sitting directly on the floor when reading the Koran, reading the Koran, relaxing, or discussing [2]. The sitting position of the cross-legged generally causes pain due to sitting for too long while bending and indirectly affects the spine.

Low back pain (LBP) is a symptom and not a diagnosis [8]. Low back pain is a common health problem that almost everyone has experienced. Pain can appear at any time and then vanish or reappear [9]. Previous research [3] supported this. We discuss the relationship between sitting position and the incidence of low back pain. Regarding the general causes of back pain, which is caused by muscle movement and an uncomfortable sitting position, it is also a risk of low back pain. Low back pain is pain that is felt in the lower back area. It can be local pain or radicular pain or both [16]. This pain is felt between the corners of the lower ribs and the folds of the buttocks, namely in the lumbar or lumbosacral area. Low back pain that lasts more than 6 months is called a chronic [12], [13]. Low back pain often occurs at a productive age. The position and length of sitting in activities are often ignored, even more so if it becomes a habit [11]. The living environment influences a person's sitting habits [15], closely related to observations made by researchers that students conducting activities in the cottage feel comfortable sitting on the floor [19]. Sitting in cross-legged postures that are carried out continuously will cause changes to the spine that is experiencing pain and may limit a person's range of motion.

The incidence of low back pain is 1 of the 10 most common diseases in the United States and is ranked 5th on the list of reasons someone visits a doctor [14]. Other work-related factors such as workload, work position, repetition, and duration, as well as the physical environment such as vibration and noise, are other causes of the pain [7]. Based on the results of previous research carried out by the author, it was found that the students of the Durrotu Aswaja Islamic Boarding School Semarang felt pain and had low back pain symptoms. Pain and errors in this position are likely to affect habits and excess joint pain, such as low back pain. Therefore, the authors are interested in studying the sitting position against low back pain in students at Pondok Pesantren Durrotu Aswaja Semarang. This study analyzes the correct cross-legged sitting position to prevent low back pain in Islamic boarding school students.

## 2. Research Methods

This research is an analytic study with a cross-sectional design. This research was conducted at the Durrotu Aswaja Islamic Boarding School in Semarang in 2021 using a questionnaire and measure low back pain using the Visual Analog Scale (VAS) [4], [18]. The sampling technique used in this research was total sampling. The sample of participants in this study was all students at the Durrotu Aswaja Islamic Boarding School in Semarang, with a population of 150 people. The criteria for the students are that they are male, stay full time in the cottage, and every morning adopt the sitting position in the hut, either when sitting, reading the Koran, or during other activities. The sample is in good health and is following health protocols to prevent the spread of COVID-19. As well as the ability to be a sample and accept all risks when the research is carried out.

## 3. Results

The description of the research in analyzing the sitting positions of the students related to low back pain possessed by each student is presented and explained in Table 1.

Table 1 Student respondent data

<b>N = 30</b>	<b>Mean ± SD</b>	<b>Minimal</b>	<b>Maximal</b>
Age (Year)	21.3 ± 1.417	19	25
Weight (Kg)	56.47 ± 8.30	49	73
Height (Cm)	167.67 ± 5.02	150	175
BMI (Kg/m <sup>2</sup> )	20.04 ± 2.34	29.4	16.8
Intensity of recitation per day (times)	2.73 ± 1.14	1	4
Duration of recitation 1 day (h)	2.35 ± 1.45	0.5	6.6

Based on the results of data from the respondents of the students of the Durrotu Aswaja Islamic boarding school in Semarang, it was found that the average age of the students was 21.3 ± 1,417 years. Then for the

body weight of  $56.5 \pm 9,040$  Kg, with a height of  $161.63 \pm 9,051$  cm. Meanwhile, on average, the students recited  $2.73 \pm 1.14$  times in one day, with the duration of reciting in one day of  $2.35 \pm 1.45$  h (Table 1).

The data obtained in this study used the Visual Analogue Scale (VAS) to take the value of the pain felt in the lower back. The Visual Analogue Scale (VAS) is considered the most efficient pain intensity measurement tool used in research and clinical settings. VAS is generally presented in the form of a horizontal line. VAS is generally presented in the form of a horizontal line [6]. Results were obtained by asking the respondent to indicate the level of pain felt on the provided VAS. Previously, the respondent had to sit cross-legged or after the activity, use the cross-legged position for at least 60 min.

This research has passed the Ethical Clearance number 114/KEPK/EC/2021. The number of samples that could participate in this study was 30 people from 520 students at the Durrotu Aswaja Islamic boarding school. Because the data collection was carried out during the COVID-19 pandemic, many students stayed at home. Because the learning process is still from home, which has resulted in many students choosing to stay at home, 30 respondents are willing to attend and follow the research procedure and have filled out the availability sheet to become research respondents.

Table 1 The pain test in students

n = 30	Test A	Test B	Test C
No pain	1	1	0
Mild pain	5	3	3
Moderate pain	22	20	13
Severe pain	1	5	12
Very heavy pain	1	1	2

Notes: Test A: Measurement of VAS in an upright sitting position; Test B: Measurement with sitting position 45; Test C: VAS measurement with maximum bending position

### 4. Discussion

The results of the pain test in this study were obtained using the measurement technique with the VAS method by going through three stages of measurement. Test A found that 1 person felt no pain, 5 people had mild pain, 22 people experienced moderate pain, 1 person experienced severe pain, and 1 person felt very severe pain. The results of the B test in this study showed that 1 person felt no pain, 3 people felt mild pain, 20 people felt moderate pain, 5 people felt severe pain, and 1 person felt very severe pain. While in Test C, it was found that in the VAS measurement, 3 people felt mild pain, 13 people felt moderate pain, 12 people felt severe pain, and 2 people felt very severe pain. The results of the study showed that participants did three pain tests. The pain test is divided into VAS measurements in a sitting position, VAS measurements in a sitting position of 45, and VAS measurements in a maximally bent position. This study focuses on measuring back pain experienced by students at the

Durrotu Aswaja Islamic boarding school. Pain is an unpleasant sensory and emotional experience resulting from actual or potential tissue damage or described in terms of the damage [5].

The purpose of pain is mainly protection. Pain acts as a warning signal from the body to the tissue damaged and asks the individual to relieve or eliminate pain from the source [10]. Pain intensity is a way to describe how severe the pain is felt by the client. Pain measurement is very subjective and individual, so the perceived pain intensity will be different from other individuals [17], [20]. The statements of several studies above support the statement that low back pain can occur in students by experiencing a decrease in pain. Likewise, some students experience increased pain. The following research results are presented in the pain test diagram of A, B, and C tests.

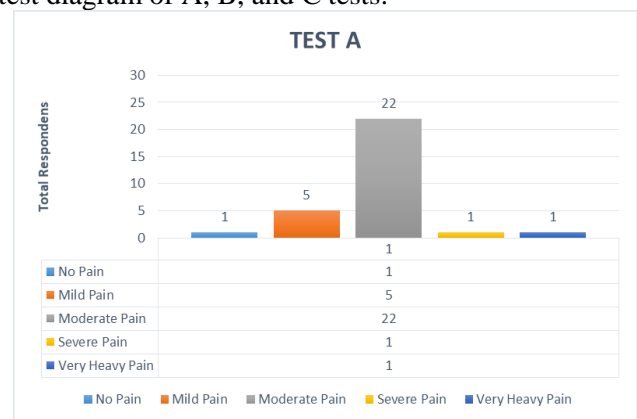


Fig. 1 The pain test for VAS measurement in an upright sitting position

Fig. 1 shows 1 person among the 30 male students who reported having severe pain, 1 person – moderate pain, 22 people who reported mild pain, and 1 person among those who reported none at all.

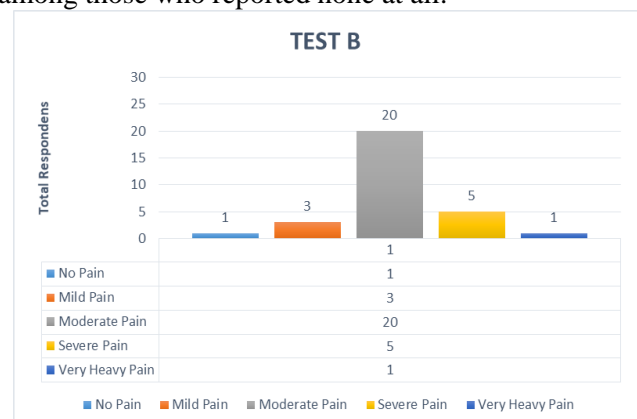


Fig. 1 The pain test on VAS measurement with a sitting position of 45°

Based on the 30 responders, one male student claimed extremely severe pain, whereas five others reported severe pain, twenty others reported moderate pain, three reported mild pain, and one said he felt no pain at all.

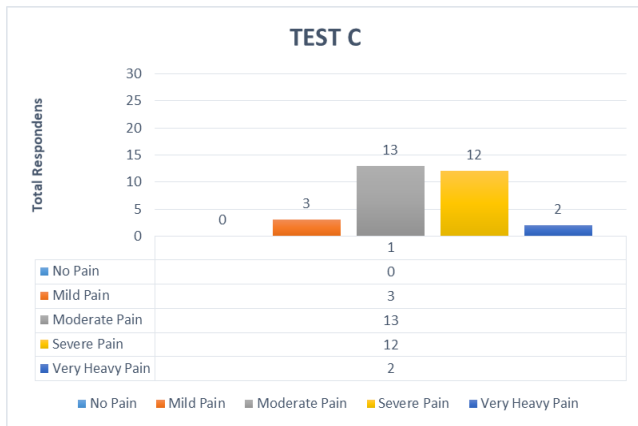


Fig. 2 Pain test for VAS measurement with maximum bending position

According to the 30 responses from male students, 2 reported extremely severe pain, 12 reported severe pain, 13 reported moderate pain, 3 reported mild pain, and none of the students claimed to be pain-free.

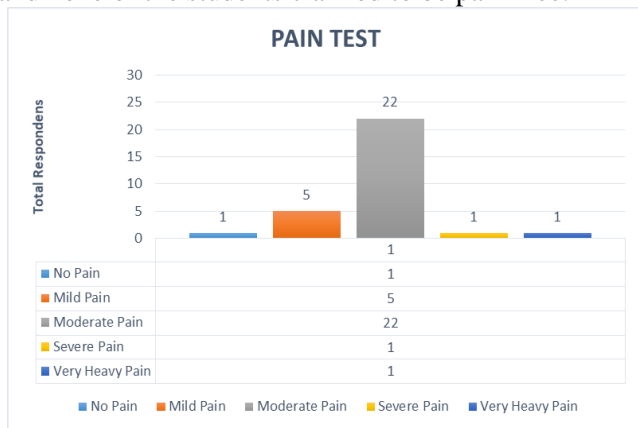


Fig. 3 Comparison of test A, test B, and test C in the VAS measurement scale

Findings in Fig. 4 showed that in test C, VAS measurements using the maximal bending position yielded data on severe pain for 12 students and students who had very severe pain for a total of two individuals.

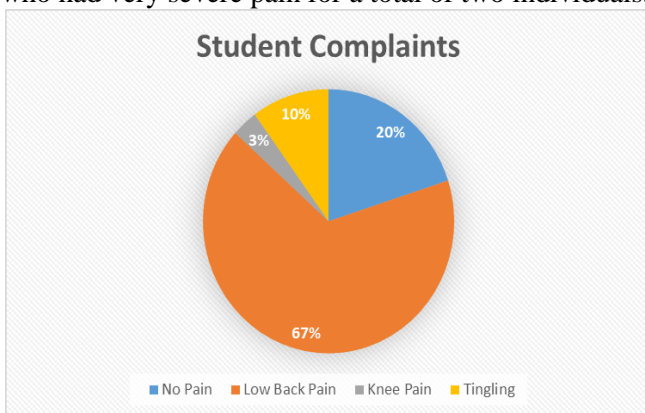


Fig. 4 Complaints by students when sitting cross-legged

Students' complaints when sitting cross-legged (Fig. 5) can be represented through data in which 1 person feels knee pain from sitting cross-legged for a long time. Three people experienced tingling in their legs while performing precepts while sitting, especially when reading the Koran and discussing. Six students

experienced no complaints of pain or anything when sitting cross-legged and 20 students experienced low back pain to varying degrees of pain. Indirectly, 66% of students experience low back pain while sitting cross-legged in the cottage. This requires knowledge and information related to LBP [1], [4] to be treated immediately and evaluated as quickly as possible to avoid complications of the disease.

The advantage of this study can determine in detail the risks of the cross-legged sitting position on lower back pain in students at the Durrotu Aswaja Islamic Boarding School. This study also provides recommendations on how to prevent injury to low back pain and how to sit in good standing as a student. Limitations of this study when the research occurred the research location was still under social distance due to the COVID 19 procedure so that only a few students were in the Islamic boarding school while the other students were still at home. Further study is expected to expand the scope of research, which includes several Islamic boarding schools that have the same problems in sitting cross-legged, so that they can provide recommendations in preventing pain and injury in low back pain.

## 5. Conclusion

The findings of this study revealed that the cross-legged seating position caused low back pain in 20 of 30 children who attended Islamic boarding schools. The influence of the incorrect cross-legged sitting position and the amount of time spent sitting has an impact on low back discomfort. Numerous symptoms, including knee discomfort, tingling in the legs, and lower back pain, were caused by some of these problems. A limitation of this study was that the number of respondents who participated in this study was insignificant because many respondents were still at home or in their area of origin due to regulations related to the spread of COVID-19. Only 30 students who attended and signed an informed concern agreed to take part in the research to completion.

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