ACUTE LOW BACK PAIN AMONG BOTH MEDICAL AND NON-MEDICAL STUDENTS DURING COVID-19: A CROSS SECTIONAL STUDY IN JORDAN

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ABSTRACT:

Aim of the work: *This study aimed to examine the prevalence and intensity of low back pain (LBP) among medical students compared to their non-medical peers at Jordanian universities. Additionally, it explored the influence of COVID-19 lockdowns on LBP frequency.*

Methodology: *A comparative cross-sectional study was conducted from March 2020 to August 2021. Data from 162 students were gathered via an online self-administered structured questionnaire. Pain characteristics were identified, and pain severity was assessed using a numeric scale of 0 to 10.*

Results: *The mean age for medical and non-medical students was 22.29 and 22.63 years, respectively. The majority of participants in both groups were female. The prevalence of LBP was 1.20% higher in the non-medical group compared to the medical group. The pain was intermittent and more pronounced during the daytime for both groups. Among medical students who engaged in online learning, 55.0% did not report LBP. Conversely, 55.6% of non-medical students who participated in distant learning experienced LBP. Both groups reported similar pain severity scores: 4.27 out of 10 for medical students and 4.40 out of 10 for non-medical students.*

Conclusion: *The prevalence of LBP among undergraduate students is notably high, especially among non-medical students. There was no observed correlation between prolonged studying hours or computer/laptop usage and the development of LBP among medical students compared to their non-medical counterparts.*

Keywords*: COVID-19, Low back pain, online learning, undergraduate students.*

INTRODUCTION:

A new coronavirus strain, SARS-CoV-2, emerged in late 2019 in Wuhan, China. This novel virus leads to acute respiratory symptoms and swiftly spreads to numerous countries across the globe. Measures were swiftly taken to curb the transmission of this highly contagious virus, now called. COVID-19.

Several countries implemented preventive actions, including social distancing, restricting indoor gatherings, and requiring

personal protective equipment such as masks and gloves. Additionally, various forms of lockdowns and quarantines were introduced. Both companies and educational institutions adopted remote work and online teaching policies to ensure the safety of their staff, faculty, and students.

In this technological era, remote work and online teaching have become the norm. Consequently, individuals started spending extended periods in front of computer screens, exposing themselves to potentially harmful effects on the body. Among these effects, musculoskeletal pain emerged as the most prevalent issue [(1)].

Public health authorities, particularly those in developed countries, harbour concerns regarding the complications of low back pain (LBP)[(2)]. Low back pain (LBP) is a debilitating multi-faceted condition encompassing many physical, psychological, and social influences, affecting individuals across various ages. LBP is the leading cause of work-related musculoskeletal disorders in certain regions [(3)]. A study conducted by the Division of Epidemiology and Health Sciences at The University of Manchester revealed that poor posture, obesity, inadequate physical activity, and the burden of heavy backpacks were correlated with an elevated risk of experiencing lower back pain[(4)].

Furthermore, the emergence of LBP is frequently linked to adopting improper posture during work, lifting heavy objects, and engaging in repetitive motions. These motions encompass activities like trunk flexion, rotation, hyperextension, and tasks involving pushing, pulling, and exposure to whole-body vibrations [(5)].

In Jordan, there has been a notable lack of statistical research regarding LBP among undergraduate students during the COVID-19 lockdown. Investigating the impact of the pandemic on the development of LBP holds significant importance. An article published in the International Journal of Environmental Research and Public Health in April 2021 revealed an 84% surge in back pain complaints reported on Twitter, a social media platform, in November 2020 compared to the prior year's corresponding period[(6)]. This study also explored the correlation between distance learning, extended study hours, computer usage, and the severity of LBP. Within this comparative cross-sectional study, it is anticipated that LBP among medical students will rise due to prolonged periods of online learning.

AIM OF THE WORK:

Consequently, this study aims to investigate the prevalence, intensity, and potential risk factors contributing to LBP development among medical and non-medical students across various universities in Jordan.

PATIENTS AND METHODS:

This comparative cross-sectional study was conducted with two study groups, comprising 106 medical students and 56 non-medical students from various universities in Jordan. The study was carried out between March 2020 and August 2021, and data collection was facilitated through an online self-administered structured questionnaire.

Eligible participants for this study were enrolled in colleges including Medicine, Dentistry, Pharmacy, Engineering, Languages, Arts, and Sciences. Respondents represent both sexes and were aged 18 years and above. Exclusion criteria encompassed individuals who had undergone orthopaedic-related surgeries, had a history of bone disease, or suffered from pre-existing back pain, metabolic bone disease, bone tumours, and/or previous back surgery. Data was collected through an online self-administered structured questionnaire designed by the

researchers and distributed across various social media platforms.

The questionnaire is divided into five distinct sections. Section one comprises a consent statement to which each participant must agree before answering the subsequent questions. Section two encompasses demographic information, including sex, age, height, weight, university, field of study, current year, smoking habits, and baseline activity level. In section three, the focus shifts to the participant's lifestyle during quarantine. Participants are required to describe their activity levels, types of activities undertaken, as well as their frequency and duration. Additionally, this section includes a question about the typical posture adopted during online lecture sessions and the average time spent attending these sessions.

Moving to section four, participants are asked whether they experienced any form of low back pain during the quarantine period in Jordan. Finally, section five is dedicated to analysing complaints of lower back pain. It delves into the specifics of the pain, including duration, frequency, nature, radiation, and intensity. This section incorporates a pain scale ranging from 0 to 10, allowing participants to self-report the severity of their pain, with 0 signifying no pain and 10 corresponding to the most severe imaginable pain.

A pilot study was undertaken to validate the questionnaire. Participants were assured that no personal information would be collected, and the gathered data would solely serve the purpose of this research.

Statistical analyses were performed using the Statistical Package for Social Sciences (IBM®SPSS® Statistics) Version 28.

Ethical consideration:

In adherence to ethical standards, a comprehensive informed consent process was meticulously conducted, ensuring that each participant fully understood the nature and purpose of the study before providing responses to the questionnaire. Institutional Review Board (IRB) approval was secured in June 2021 (reference number 1878).

RESULTS:

A total of 106 medical and 56 non-medical students from various universities in Jordan took part in this comparative cross-sectional study. The average age of both medical and non-medical students is 22 years old. Table (1) presents the socio-demographic data for both groups, highlighting that females comprise 66.0% and 53.4% of medical and non-medical students, respectively. Among medical students, the majority (47.2%) were in their sixth year, whereas among non-medical students, 42.9% were in their third year. Regarding smoking habits, 78.3% of medical students and 62.5% of non-medical students identified as non-smokers. The mean body mass index (BMI) for medical and non-medical students was 23.4 and 24.5, respectively.

Based on Table (2), a notably higher incidence of LBP was observed among non-medical students, with 58.9% reporting experiencing such pain compared to medical students, among whom 44.3% reported back pain. The Pearson chi-square value is 3.120, yielding a p-value of 0.077, indicating a lack of statistical significance. Furthermore, examining the data related to non-medical students reveals that 55.6% of those who engaged in online learning developed LBP, while 44.6% did not report such discomfort. Conversely, among medical students who participated in online learning, 45.0% experienced LBP, while the remainder did not report any such pain.

Table (3) provides a comprehensive overview of pain characteristics and strategies to alleviate discomfort. Specifically, 17.0% of medical students reported experiencing pain between March

and May of 2020, while a higher percentage of non-medical students (28.6%) reported the same occurrence between June and November 2020. Among medical students, 19.8% noted experiencing intermittent pain that peaked during the day, while a slightly larger percentage of non-medical students (21.4%) reported a more gradual pain pattern. Dull pain was reported by 19.8% of medical students, while soreness was indicated by 26.8% of non-medical students. The mean pain severity score was also 4.40 ± 2.061 for medical students and 4.27 ± 1.859 for non-medical students.

Regarding pain management approaches, a substantial portion of students in both cohorts did not resort to painkillers and refrained from seeking medical advice, constituting 57.5% and 90.0–91.5% of the medical and non-medical groups, respectively. As detailed in Table (4), the prevailing posture adopted during studying was sitting down, favoured by 86.0% of medical students. Of those, 42.0% typically studied for 3–4 h on average. Similarly, among non-medical students, the predominant posture was sitting down (71.1%), and a comparable percentage of students (37.8%) reported studying for 1–2 and 3–4 h on average.

The findings illustrated in Diagram 1 reveal that 10.3% of medical students ceased all forms of physical activity during the COVID-19 lockdown compared to their pre-pandemic routines. Analysing the activity trends among non-medical students Diagram 2, an uptick of 3.5% is observed in students who discontinued physical activities. Additionally, there was a notable shift of 10.7% from engaging in daily physical activity to a combined total of 1–2 times per week and 3–4 times per week.

Table 1: Socio-demographic data.

	Medical students (N=106)		Non-medical students (N=56)	
	Count	Percentage %	Count	Percentage %
Age	Mean 22.29		Mean 22.63	
Gender				
Female	70	66.0%	30	53.4%
Male	36	34.0%	26	46.4%
Academic year				
first	0	0.0%	5	8.9%
second	1	0.9%	0	0.0%
Third	2	1.9%	24	42.9%
Fourth	29	27.4%	6	10.7%
Fifth	24	22.6%	15	26.8%
Sixth	50	47.2%	6	10.7%
Smoking				
Yes	23	21.7%	21	37.5%
No	83	78.3%	35	62.5%
BMI	Mean 23.4		Mean 24.5	
Household status				
Owned house	78	73.6%	36	64.3%
Rented house	26	24.5%	18	32.1%

Table 2: Relationship between LBP and online learning for medical and non-medical students.

		Experienced LBP		Didn't experience LBP	
		Count	Percentage %	Count	Percentage %
Medical students	Online learning				
	Yes	45	45.0%	55	55.0%
	No	2	33.3%	4	66.7%
Non-medical students	Online learning				
	Yes	25	55.6%	20	44.4%
	No	8	72.7%	3	27.3%

Table 3: Characteristics of LBP and certain methods to relive the pain for medical and non-medical students.

	Medical students		non-medical students	
	Count	Percentage %	Count	Percentage %
Timing of pain				
December–February 2020/2021	6	5.7%	4	7.1%
June–August 2020	8	7.5%	8	14.3%
June 2021	2	1.9%	2	3.6%
March–May 2021	4	3.8%	1	1.8%
March–May 2020	18	17.0%	5	8.9%
Other, or before quarantine	4	3.8%	3	5.4%
September–November 2020	1	0.9%	8	14.3%
Course of pain				
Gradual	6	5.7%	12	21.4%
Intermittent, more intense during the day	21	19.8%	11	19.6%
Intermittent, more intense during the night	11	10.4%	6	10.7%
Steady and continuous	9	8.5%	4	7.1%
Type of pain				
Dull pain	21	19.8%	12	21.4%
Shooting pain	9	8.5%	6	10.7%
Soreness	17	16.0%	15	26.8%
Severity of pain	4.40 ± 2.06		4.27 ± 1.859	
Frequency of consuming pain killers				
Didn't take any painkillers	27	57.4%	19	57.6%
Took painkillers randomly upon need	18	38.3%	12	36.4%
Took pain killers daily	2	4.3%	2	6.0%
Seek medical advice				
Yes, I did	4	8.5%	3	9.1%
No, I didn't	43	91.5%	30	90.9%

Table 4: Studying average time and regular posture for medical students and non-medical students.

	Online learning	
	Count	Percentage %
Average time spent studying for medical students		
Less than one hour	3	3.0%
1–2 h	19	19.0%
3–4 h	42	42.0%

5–6 h	22	22.0%
More than 7 h	14	14.0%
Regular posture during studying for medical students		
Laying down	12	12.0%
Sitting	86	86.0%
Standing/walking	2	2.0%
Average time spent studying For non-medical students		
Less than one hour	1	2.2%
1–2 h	17	37.8%
3–4 h	17	37.8%
5–6 h	2	4.4%
More than 7 h	8	17.8%
Regular posture during studying for non-medical students		
Laying down	8	17.8%
Sitting	32	71.1%
Standing/walking	5	11.1%

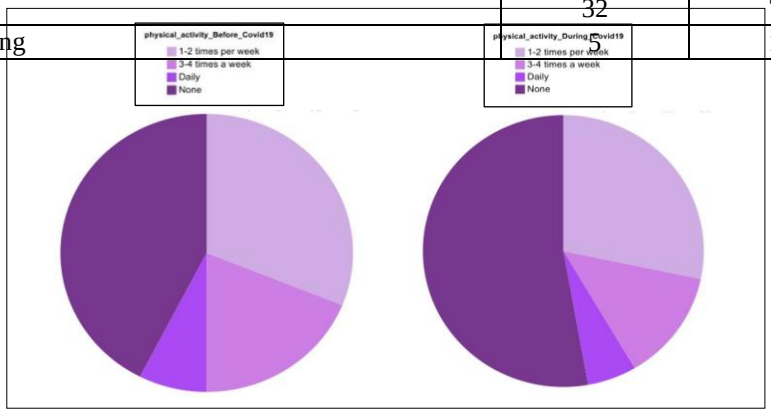

Diagram 1: Levels of physical activity for medical students.

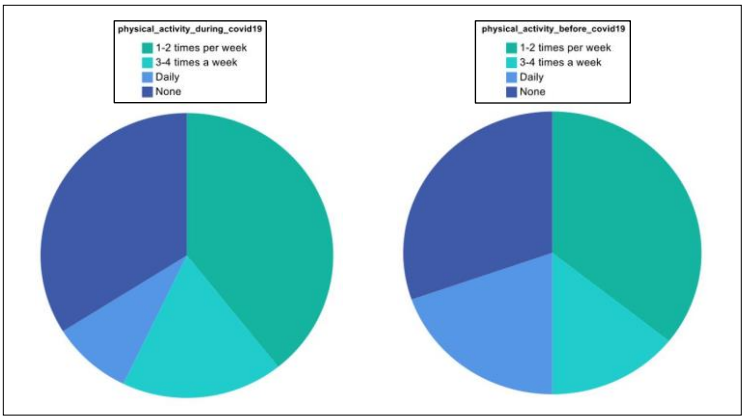

Diagram 2: Levels of physical activity for non-medical students.

DISCUSSION:

This comparative cross-sectional study investigates the prevalence and intensity of LBP during the COVID-19 pandemic among medical and non-medical students. While various risk factors can be associated with low back pain, this research data analysis for the non-medical group indicated a higher incidence of LBP in those who practiced

online learning and spent 1–4 h studying sitting. However, these findings did not reach statistical significance (p = 0.299, 0.627, and 0.096, respectively). Similarly, a study conducted in Malaysia demonstrated no significant statistical correlation between musculoskeletal pain, hours spent on computer use in a day, and the type of computer use [(7)].

Furthermore, a lower percentage of medical students who participated in E-learning experienced the development of LBP. This difference exhibited statistical significance within this group (p = 0.572), possibly owing to their engagement in hospital volunteering and lab work during the pandemic. A study in Portland aimed to delineate the profile of volunteers amid the COVID-19 pandemic revealed that the surveyed volunteers primarily consisted of medical students, accounting for 62.1% of the total [(8)].

Our study focuses on undergraduate students, with a mean age range of 22 to 23 years. Consequently, the anticipated prevalence of LBP is expected to be lower than that observed in older adults. This expectation is supported by our analysis, which found no significant association between age and LBP (p = 0.14). Existing research indicates a gradual rise in LBP prevalence from adolescence[(9)] up to 60, followed by a decline[(9&11)].

No significant correlation emerged between being overweight (BMI ≥ 25) and the occurrence of LBP. Our data indicated a 50% likelihood of developing LBP. A study has highlighted the absence of a distinct dose-response relationship between BMI and LBP [(12)]. In contrast, contrary findings were reported by a different cross-sectional, population-based study, demonstrating a noteworthy association between a high BMI and an elevated prevalence of LBP [(13)]. This study assessed pain severity using a 0-10 scale. Both medical and non-medical students reported an average pain level of 4 ± 2 for their typical experiences. Based on the Numeric Rating Scale for pain, the computed mean pain intensity falls within mild pain.

According to our data, most participants did not use painkillers for pain management and refrained from seeking medical advice. A Dow University study investigating the frequency and related factors of musculoskeletal pain among undergraduate students revealed that a significant proportion of students experiencing LBP had not consulted a doctor or a physiotherapist [(13)].

Our study revealed a proclivity towards a sedentary lifestyle among both groups during the pandemic, as evidenced by the rise in students discontinuing regular physical activities. Likewise, a global study examining the impact of home confinement on mental health and lifestyle behaviours through online surveys indicated a decrease in participants' physical activity levels and increased screen time [(14)].

This study is subject to several limitations. Firstly, the study's population is confined to undergraduate students, potentially limiting the generalizability of the findings. Additionally, the sample size is relatively small, possibly not fully capturing the diversity of the wider population. The reliance on self-reported questionnaires introduces the possibility of recall bias. Participants also retained the option to omit answers, resulting in missing data. Some students might encounter linguistic challenges with the questionnaire, given its primary language of English; complete English proficiency cannot be assumed.

Moreover, the pain intensity assessment, conducted on a 0 to 10 scale, may entail variations from actual severity. A more accurate gauge of pain severity could have been attained through daily pain intensity records maintained by the students. Lastly, the potential association between musculoskeletal pain and psychological stress remains unexplored in this study.

Conclusion:

In conclusion, the incidence of LBP is notably greater among the non-medical group, with a margin of 17.8%. Within the medical student cohort, a majority did not encounter pain. This study did not identify a statistically significant connection between remote learning and the likelihood of developing LBP. Despite a notable uptick in adopting sedentary behaviours during lockdown, this change did not correspondingly result in an increased prevalence of back pain.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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آلام أسفل الظهر الحادة بين طلاب الطب وغير الطب خلال فترة كوفيد-19 (دراسة مقطعية في الأردن)

هبة بيباي[1] و أحمد الروسان[1] و فادي حديدي[1] و طارق كنعان[1] و قصي صباغ[1] ومحمود عبدالات[1] و يزن حماد[2] و لين الساحلي[1] و روتانا أبو عبيدة [1]و وداد الورافي[1] وزين أبو عامرية[1] و عبدالله مدني[3] وبشر الغلاييني[3] و سعد عواملة[4]

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الخلفية: هدفت هذه الدراسة إلى فحص مدى انتشار وشدة آلام أسفل الظهر بين طلاب الطب مقارنة بأقرانهم بالتخصصات الاخرى في مختلف الجامعات الأردنية، بالإضافة إلى ذلك، درست تأثير الاغلاقات الي حدثت خلال فترة COVID-19 على حدوث وشدة آلام أسفل الظهر.

المنهجية: أجريت دراسة مقطعية مقارِنة في الفترة من مارس 2020 إلى أغسطس 2021. تم جمع البيانات من 162 طالبًا عبر استبيان منظم ذاتي الإدارة عبر الإنترنت، وتم تحديد خصائص الألم، وتم تقييم شدة الألم باستخدام مقياس رقمي من 0 إلى 10.

النتائج: كان متوسط العمر لطلاب الطب وطلاب غير الطب 22.29 و 22.63 عامًا على التوالي، و كان أغلب المشاركين في كلا المجموعتين من الإناث، وكان معدل انتشار آلام أسفل الظهر أعلى بنسبةً 1.2% في المجموعة غير الطبية مقارنة بالمجموعة الطبية. كان الألم متقطعاً وأكثر وضوحاً خلال النهار لكلا المجموعتين. بين طلاب الطب الذين شاركوا في التعلم عبر الإنترنت، 55.0% لم يبلغوا عن آلام أسفل الظهر، على العكس من ذلك، 55.6% من الطلاب غير الطبيين الذين شاركوا في التعلم عن بعد عانوا من آلام أسفل الظهر. كلتا المجموعتين ابلغت عن درجات مماثلة لشدة الألم: 4.27 من أصل 10 لطلاب الطب و 4.40 من أصل 10 للطلاب غير الطب.

الخلاصة: انتشار آلام أسفل الظهر بين طلبة الجامعين مرتفع بشكل ملحوظ، وخاصة بين الطلاب التخصصات الاخر غير الطب. لكن، لم يكن هناك ارتباط ملحوظ بين ساعات الدراسة المطولة أو استخدام الكمبيوتر وتطور آلام أسفل الظهر بين طلاب الطب مقارنة بنظرائهم من التخصصات الأخرى.