

COMPARATIVE ANALYSIS OF LOW BACK PAIN COMPLAINTS DURING AND AFTER THE COVID-19 PANDEMIC: [A REVIEW ARTICLE]

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ABSTRACT:

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Background: The coronavirus 2019 (COVID-19) pandemic brought about speculations on the impact of online teaching on lower back pain (LBP) complaints. This spurred comparisons and combinations of similar research objectives conducted pre- and post-pandemic.

Aims and Objectives: This assignment offers a comparative analysis of two published research papers. Specifically, these papers are cross-sectional studies investigating LBP among undergraduate university students at two different time points.

Methodology: This paper aims to identify similarities and differences in selected results from both articles. Advanced statistical analyses using SPSS were carried out to assess the significance of the results chosen from both studies. Data on the prevalence and intensity of LBP, the correlation between gender and LBP complaints, and the influence of physical activity on LBP complaints were all considered.

Conclusion: The study concluded that both articles reported a high prevalence of LBP, particularly among non-medical students. However, no significant correlation was found between the use of e-learning techniques and the development of LBP. Furthermore, low levels of physical activity were not identified as an independent risk factor for developing LBP. Significantly, both articles associated the female gender with a higher incidence of LBP complaints.

Keywords: Comparative study, Low Back Pain, COVID-19, Gender.

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INTRODUCTION:

The coronavirus 2019 (COVID-19) pandemic, a global outbreak of coronavirus, was declared on 11 March 2020. The virus, also known as novel coronavirus (nCoV), was first detected in China in December 2019 and quickly spread to other countries worldwide. To mitigate the spread of the virus, numerous countries and territories

implemented restrictions, including stay-at-home orders, curfews, and isolation requirements for those who are ill. In response to these restrictions, changes were necessary in work and school environments, as well as in daily life activities. Consequently, an increase in the frequency of lower back pain (LBP) was observed during the lockdown⁽¹⁾.

A return to normal life was observed in 2022 after the COVID-19 pandemic subsided due to awareness campaigns, vaccination drives, and appropriate lockdown guidelines complemented by travel restrictions.

For a comprehensive understanding of LBP in that period, we employed a comparative study method. This research approach aims to draw comparisons across various contexts or scenarios.

The article sought to examine two sequential research studies on the prevalence, intensity, and potential correlation of remote learning and LBP development during and after the COVID-19 lockdown from 2020–2023. The researchers focused on undergraduate students from various Jordanian universities.

In this comparative study, we aim to understand the variances and commonalities in our collected data, especially the prevalence and severity of LBP during and after the COVID-19 pandemic. We'll also examine potential risk factors such as the time spent on e-learning and the projected alterations in physical activity.

To better understand LBP during a specific era, we conducted two consecutive studies. Our first study investigated the prevalence and intensity of LBP and its possible connection with remote learning during the COVID-19 lockdown in 2020–2021. We focused on undergraduate students from various Jordanian universities. The second study conducted post-pandemic in 2022–2023, shared similar objectives to the first.

AIM OF THE WORK:

In this comparative study, we aim to understand the disparities and commonalities in the prevalence and intensity of LBP during and after the COVID-19 pandemic. We also examine the impact of potential risk factors

like the duration of e-learning and the anticipated alterations in physical activity.

METHODOLOGY:

This is a comparative study conducted in 2023 that examines two pieces of research. Both are comparative, cross-sectional studies assessing the prevalence, risk factors and characteristics of LBP among medical and non-medical students attending Jordanian universities during and after the COVID-19 pandemic. The studies included participants from various medical and non-medical colleges, adhering to the same inclusion and exclusion criteria. Eligible participants were either sex, aged 18 years or older, and had no history of orthopaedic-related surgeries or bone diseases. Students with pre-existing back pain, metabolic bone disease, bone tumours, and/or previous back surgeries were excluded from the study.

Both papers gathered data using structured questionnaires that were self-administered and posted on various social media platforms. The questionnaire was divided into five sections. The first section contained a content statement, while the second covered the participants' demographic information. The third section explored the participants' lifestyles during and after quarantine, including questions about the average time spent attending online lectures and the dominant posture assumed during these sessions. The fourth section specifically inquired about the development of any low back pain (LBP) among the participants. The final section focused on analysing the occurrence of LBP, asking about its duration, frequency, form, radiation, and intensity. It incorporated a pain scale ranging from 0 to 10 to measure the self-reported severity of pain, with 0 implying no pain and 10 denoting the worst possible pain.

This article contains relevant data, including participants' sociodemographic information, characteristics of pain like

frequency, intensity, timing, and type, the correlation between pain and online learning during the COVID-19 lockdown, average study time and usual posture, and finally, the impact of physical activity on pain.

The data was further analysed using the IBM® SPSS® Statistics (Version 28) for Social Sciences.

A pilot study was carried out to evaluate the validity of the questionnaires. Ethical approvals were secured from the University of Jordan's Research Ethics Committee for both papers.

Ethical consideration:

The informed consent process was thoroughly executed to comply with ethical standards. This ensured every participant knew the study's aim before answering the questionnaire. Approval from the Institutional Review Board (IRB) was obtained in June 2021, with the reference number 1878.

RESULTS:

A total of 162 students from Jordanian universities participated in the study during the COVID-19 period, while 475 students participated post-COVID-19. Table (1) presents the sociodemographic data for both groups. The average age of participants during COVID-19 was 22 years old. Post-COVID-19, the average ages were 21.6 years for the medical group and 20.7 years for the non-medical group. In terms of gender distribution, during COVID-19, 66.0% of the medical group and 53.4% of the non-medical group were females. Similarly, post-COVID-19 data revealed a female majority, with 55.3% in the medical group and 75.2% in the non-medical group.

Table (2) and Figure (1) illustrate the prevalence of LBP within the two groups. During the COVID-19 period, non-medical students reported a higher incidence of LBP at 58.9%, compared to 44.3% of medical

students. Similarly, after the COVID-19 period, 73.9% of non-medical students reported experiencing LBP compared to 58.4% of medical students.

Table (3) contains an analysis of the relationship between LBP and online learning, both during and after the COVID-19 period. We found that 45.0% of medical students who participated in online learning during COVID-19 experienced LBP, while the remaining 55.0% did not (Table 3 and Figures 2 and 3). In contrast, the data for the non-medical group suggests that 55.6% of those participating in online learning experienced LBP, with the remaining 44.4% being unaffected. Post-COVID-19 data reveals that 85.6% of medical students who reported LBP had engaged in online learning. A similar percentage (89.3%) was observed among non-medical participants.

The average pain severity score, as indicated by the Numeric Rating Scale (NRS) scale of 0 to 10, during COVID-19 was 4.40 ± 2.06 for medical staff and 4.27 ± 1.86 for non-medical individuals, as detailed in Table (4). Regarding the post-COVID-19 period, the mean severity was 4.32 ± 1.60 for medical staff and 4.64 ± 1.70 for non-medical individuals.

Table (5) illustrates the participants' management of pain. During COVID-19, most students in both groups refrained from taking painkillers or seeking medical advice, with 75.5% and 90.8% respectively abstaining from these actions. Post-COVID-19, most medical students (83.5%) and non-medical participants (76.1%) also did not seek medical advice for their pain. The majority, 56.9% of medical and 54.9% of non-medical participants avoided painkiller use. A key finding highlighted in this paper is related to exercise, as shown in Figure (4). This figure presents the frequency of participants' physical activity during and post-COVID-19. It reveals that 52.8% of medical students did not exercise during COVID-19, although this decreased to 38.8%

post-pandemic. Conversely, the non-medical group's exercise habits showed little change; 33.9% did not exercise during the pandemic,

and this decreased marginally to 29.4% post-pandemic.

Table 1: Sociodemographic data during and post COVID-19

		Medical		Non-medical	
		N=106		N=56	
During covid-19	Age	Count	Percentage %	Count	Percentage %
		Mean 22.29		Mean 22.63	
	Gender				
	Female	70	66.0%	30	53.4%
	Male	36	34.0%	26	46.6%
Post covid-19	Age	N= 322		N= 153	
		Count	Percentage %	Count	Percentage %
		Mean 21.66		Mean 20.75	
	Gender				
	Female	178	55.3%	115	75.2
	Male	144	44.7%	38	24.8%

Table 2: Incidence of LBP during and post COVID-19

		Medical		Non-medical	
		N=106		N=56	
During covid-19	Experienced LBP	Count	Percentage %	Count	Percentage %
		47	44.3%	33	58.9%
	Did not experience LBP	59	55.7%	23	41.1%
Post covid-19	Experienced LBP	N=322		N=153	
		Count	Percentage %	Count	Percentage %
		188	58.4%	113	73.9%
	Did not experience LBP	134	41.6%	40	26.1%

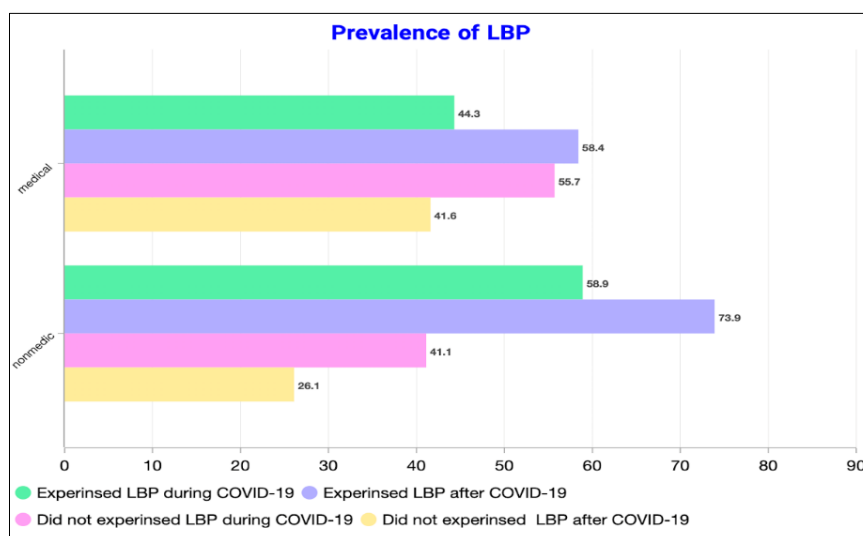


Figure 1: Prevalence of LBP

Low Back Pain

Table 3: Relationship between LBP and online learning during and post COVID-19

		Medical				Non-medical			
		Experienced LBP		Did not experience LBP		Experienced LBP		Did not experience LBP	
During covid-19	With Online learning	N	%	N	%	N	%	N	%
			45	45.0%	55	55.0%	25	55.6%	20
	Without online learning	2	33.3%	4	66.7%	8	72.7%	3	27.3%
Post covid-19	With Online learning	Experienced LBP		Did not experience LBP		Experienced LBP		Did not experience LBP	
		N	%	N	%	N	%	N	%
		161	85.6%	106	79.1%	101	89.3%	31	79.1%
	Without online learning	27	14.3%	28	20.9%	12	10.7%	9	22.5%

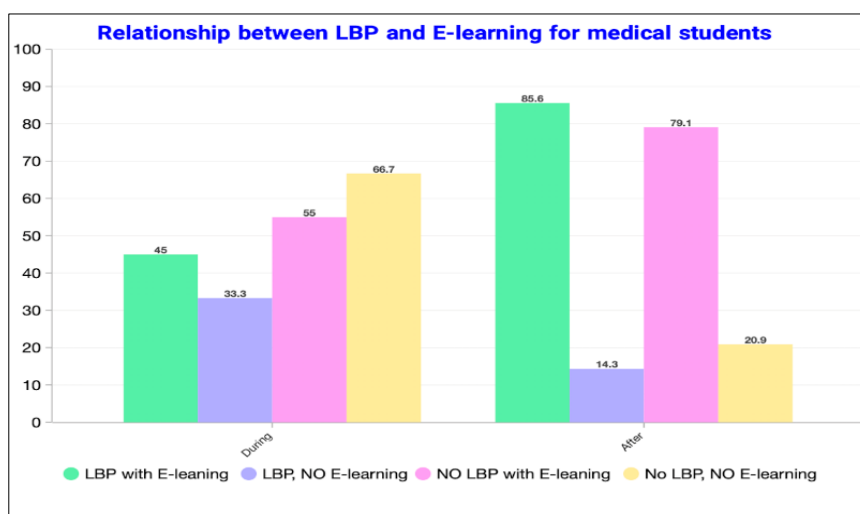


Figure 2: Relationship between LBP and E-learning for medical students

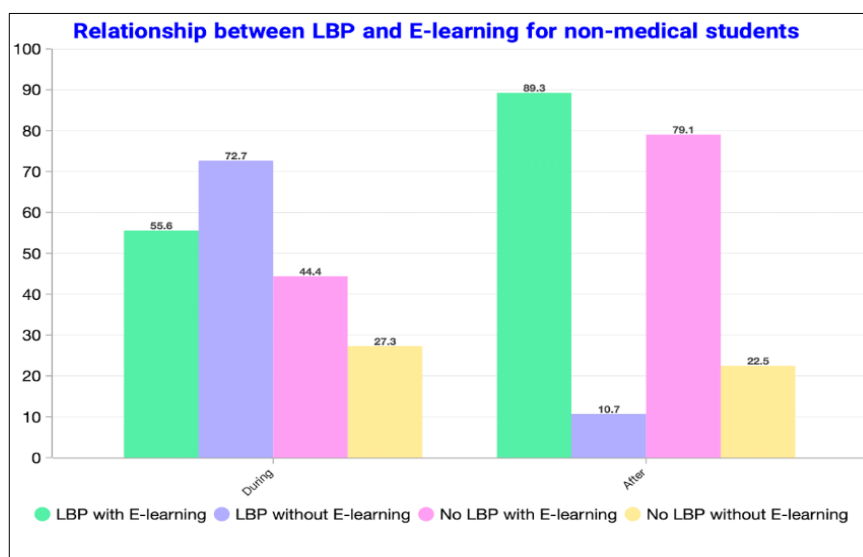


Figure 3: Relationship between LBP and E-learning for non-medical students

Table 4: Severity of pain during and post COVID-19

		Medical	Non-medical
During covid-19	N	Severity of pain 47	Severity of pain 33
	Mean	4.40	4.27
	Std. Deviation	2.06	1.85
Post covid-19	N	Severity of pain 188	Severity of pain 113
	Mean	4.32	4.64
	Std. Deviation	1.60	1.76

Table 5: Painkillers and medical advice during and post COVID-19

		Medical		Non-medical		
		N=47		N=33		
		count	Percentage %	Count	Percentage %	
During covid-19	Consuming pain killers					
	Yes, daily	2	4.3%	2	6.10%	
	Randomly, upon need	18	38.3%	12	36.4%	
	None	27	57.4%	19	57.6%	
	Seek medical advice					
	Yes	4	8.5%	3	9.1%	
No	43	91.5%	30	90.9%		
Post covid-19			N=106		N=56	
			Count	Percentage %	Count	Percentage %
	Consuming pain killers					
	Yes, daily	10	5.3%	8	7.1%	
	Randomly, upon need	71	37.8%	43	38.1%	
	None	107	56.9%	62	54.9%	
	Seek medical advice					
	Yes	31	16.5%	27	23.9%	
	No	157	83.5%	86	76.1%	

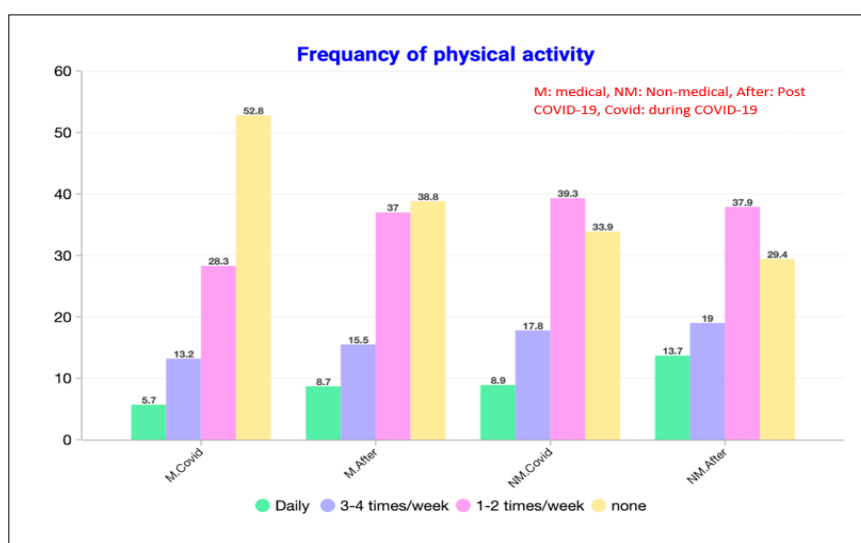


Figure 4: Frequency of physical activity

DISCUSSION:

The prevalence of LBP was high for both medical and non-medical students during and after the pandemic. The incidence of LBP among medical students increased from 44.3% during the pandemic to 58.4% post-pandemic. However, a larger percentage of non-medical students reported developing LBP than their medical counterparts. This finding aligns with a retrospective study that found no higher prevalence of LBP among medical students than among more physically active students despite the sedentary lifestyle of the former⁽²⁾. For non-medical students who reported LBP, the incidence increased from 58.9% during the pandemic to 73.9% after.

In Jordan, medical faculties were the first to transition to blended learning. In contrast, non-medical faculties continued with remote education for a longer duration. Prolonged computer use was significantly associated with musculoskeletal pain, according to a cross-sectional study⁽³⁾. Furthermore, the majority of the volunteers during the pandemic were from medical fields, leading to more working hours and less sedentary time. A study in Portland corroborated these findings, demonstrating that medical students volunteered more frequently and for longer periods⁽⁴⁾.

It was observed that the frequency of LBP in females surpassed that of their male counterparts across both medical and non-medical groups in the two studies, with 61.7% in the COVID-era study and 61.7% in the post-COVID study. This disparity could be attributed to the larger number of female participants in both groups. During the pandemic research, 52.9% of medical and 63.3% of non-medical female students reported LBP. In contrast, the post-pandemic study revealed that 64.5% of medical and 52.9% of non-medical female students suffered from LBP. A cross-sectional study

among undergraduates⁽⁵⁾ and another on LBP prevalence in Saudi Arabia both identified female gender as a risk factor for LBP. A similar study from Taiwan also agreed with this correlation⁽⁶⁾. However, a study from Dammam, Saudi Arabia, suggested that age and gender had a minimal correlation with disorders affecting the lumbar spine, with LBP being the most common at 75.3%⁽⁷⁾.

During and after the pandemic, a significant number of medical and non-medical participants reported experiencing a moderate intensity of pain, with a score of 4±2 on the NRS. A majority of students from both groups did not seek medical advice for their pain. Specifically, during the pandemic, 57.5% of medical students and 57.6% of non-medical students abstained from seeking medical help. Similarly, in the post-pandemic period, the rates remained high at 56.9% for medical students and 54.9% for non-medical students.

Furthermore, an overwhelming majority of students in both groups did not seek any medical advice during the pandemic, with 91.5% of medical students and 90.9% of non-medical students refraining from seeking medical help. Among students who endured the pandemic, the figures were similarly high, with 83.5% of medical students and 76.1% of non-medical students opting not to seek medical advice.

Research conducted in Saudi Arabia revealed that out of 213 students suffering from LBP, only a modest percentage sought medical assistance: 4.2% were hospitalized, 7.5% changed their working duties, and 8.5% actively sought out medical advice⁽⁸⁾. Similarly, another study reported that only a mere 11.3% of the participants visited hospitals for LBP treatment, and 10% consulted doctors, physiotherapists, or chiropractors for their affliction⁽⁹⁾.

The frequency of exercise rose noticeably among the medical group during lockdown compared to the post-pandemic

period. Over half of medical students, about 52.8%, led a sedentary lifestyle during COVID-19, which reduced to 38.8% afterward. In contrast, there was a minor change seen among non-medical students: from 33.9% during the pandemic to 29.4% after it. However, no correlation was found between different physical activity levels and the development of LBP in both groups. A systematic review and meta-analysis suggested that individuals with acute or subacute LBP display variations in physical activity levels⁽¹⁰⁾. Still, studies suggest physical activity might have protective effects against future pain occurrences⁽¹¹⁾. Besides, a significant decrease in back pain post aerobic exercise, muscular strength, or stabilization exercises was reported by 32% in the home-exercise group, with a further reduction to 47% after a 6-month follow-up.

This study does have a few limitations. Firstly, the chosen sample is restricted to undergraduate students who participated in the two research studies being compared, potentially limiting the generalizability of the findings to the larger population. Secondly, the sample size is relatively small, which may further restrict the representation of the broader population. Thirdly, as the study occurred over a long period and relied on self-reported questionnaires, recall bias could be a factor, influencing the accuracy of the reported data. Additionally, participants had the option to leave some questions unanswered, leading to incomplete data. Furthermore, the severity of pain was measured using a 0-10 scale, which is a subjective assessment and may not accurately reflect the actual intensity of pain experienced by participants.

Conclusion:

Undergraduate students, particularly non-medical ones, demonstrate a high prevalence of LBP. However, research does not associate prolonged study hours or the use of e-learning techniques with developing LBP. Likewise, there's no evident relation between reduced

physical activity and an increased risk of LBP complaints among this demographic. Nonetheless, female students have been significantly associated with LBP complaints during and after the COVID-19 pandemic. Further studies could enhance our understanding of the potential risk factors for developing LBP among undergraduate students and provide insights into preventive measures and interventions.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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تحليل مقارن لشكاوى آلام أسفل الظهر أثناء وبعد جائحة كوفيد-19:

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الخلفية: أثار جائحة فيروس كورونا 2019 (COVID-19) تكهنات حول تأثير التدريس عبر الإنترنت على شكاوى آلام أسفل الظهر. وقد أدى هذا إلى إجراء مقارنات بين مجموعة من الأهداف البحثية المماثلة التي تم إجراؤها قبل الوباء وبعده.

الأهداف والغايات: تقدم هذه المهمة تحليلاً مقارناً لورقتين بحثيتين منشورتين. على وجه التحديد، هذه الأوراق عبارة عن دراسات مقطعية تبحث في آلام أسفل الظهر بين طلاب الجامعة الجامعيين في نقطتين زمنيتين مختلفتين.

المنهجية: تهدف هذه الورقة إلى تحديد أوجه التشابه والاختلاف في النتائج المختارة من كلا المقالين. تم إجراء تحليلات إحصائية متقدمة باستخدام برنامج IBM SPSS للإحصاء الرقمي لتقييم أهمية النتائج المختارة من كلتا الدراستين. تم تحليل البيانات المتعلقة بانتشار وشدة آلام أسفل الظهر، والعلاقة بين الجنس وشكاوى أسفل الظهر، وبالإضافة الي تأثير النشاط البدني على شكاوى آلام أسفل الظهر.

الاستنتاج: خلصت الدراسة إلى أن كلا المقالين أفادا بارتفاع معدل انتشار آلام أسفل الظهر بين طلبة الجامعات، خاصة بين طلاب التخصصات غيز الطبية. ومع ذلك، لم يتم العثور على علاقة ذات دلالة إحصائية بين استخدام تقنيات التعلم الإلكتروني وتطور آلام أسفل الظهر. علاوة على ذلك، لم يتم تحديد المستويات المنخفضة من النشاط البدني كعامل خطر مستقل للإصابة بآلام أسفل الظهر. وبشكل ملحوظ، ربطت كلتا المقاليتين الجنس الأنثوي بارتفاع معدل شكاوى آلام أسفل الظهر مقارنة بالجنس الآخر.