Prevalence of Musculoskeletal Pain and Associated Factors among Undergraduate Medical Students of Merit University, Sohag, Egypt

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ABSTRACT:

Aim: This study aimed to explore the prevalence and determinants of musculoskeletal pain (MSP) among undergraduate medical students and compare the findings across physiotherapy, medicine, and pharmacy faculties.

Subject and Methods: A cross-sectional study was conducted from August 2023 to February 2024 among 252 female students at Merit University. A structured questionnaire was used, incorporating the Nordic Musculoskeletal Questionnaire (NMQ) and the Global Physical Activity Questionnaire (GPAQ), to evaluate the presence, location, and severity of MSP. Demographic data, body mass index (BMI), and study habits were also collected.

Results: The prevalence of MSP was notably high, particularly in the neck and lower back regions. Female students and physiotherapy students in years beyond the first year reported significantly higher rates of pain. A positive correlation was observed between higher BMI, prolonged poor postures during lectures and study sessions, and increased MSP. However, there was no statistically significant difference in MSP prevalence between physiotherapy and other medical students overall.

Conclusion: The high prevalence of musculoskeletal pain among female medical students calls for further ergonomic research and clinical evaluation. Medical schools should address MSP by improving seating arrangements and educating students on lifestyle modifications for MSP prevention.

Keywords: Musculoskeletal pain, Undergraduate, Physical therapy student, Other medical students, Neck pain

1. Introduction

Musculoskeletal pain (MSP) is a well-known side effect of repetitive strain, overuse, and occupational musculoskeletal problems. These injuries include a wide range of conditions that produce pain in the bones, muscles, joints, ligaments, tendons, and surrounding systems (International Association for the Study of Pain (IASP), n.d.-b). Recent studies have also shown a high prevalence of musculoskeletal pain among undergraduate health students, with significant associations with various risk factors (Morais et al., 2019). Cross-sectional studies have also reported a high prevalence of musculoskeletal pain among foreign medical students in Central Asia, highlighting the global nature of this health concern (Imamuzzaman et al., 2024). Current evidence suggests that the shift to distance learning during the COVID-19 pandemic has led to a marked increase in the incidence of musculoskeletal pain among medical students, likely due to prolonged screen time and reduced physical activity (Salameh et al., 2022). A medical school's aims are to create qualified, ethical physicians and advance public health. However, during their studying in medical school, students deal with stress, academic challenges, and long training shifts in clinics and hospitals (Dyrbye et al., 2006; Jagsi et al., 2005); also, from the growing usage of computers in learning and teaching

(Berolo et al., 2011). These situations are risk factors for musculoskeletal pain that could raise the frequency of MSP among medical students. MSP is a significant factor in the development of pain, injuries, illnesses, and worse educational performance that may have an impact on productivity. Which may affect students' career prospects in the future (Alshagga et al., 2013; Buckle, 2005). Musculoskeletal pain may be acute or chronic. Infections, fractures, sprains, and dislocations are the most common local causes of acute musculoskeletal pain, which can be intense, short-lived, and severe (International Association for the Study of Pain (IASP), n.d.-a). In contrast, chronic musculoskeletal pain lasts for a long time and is most likely related to cancer and arthritis (Grichnik & Ferrante, 1991).

The United Nations and World Health Organization (WHO) attracted attention to this issue by identifying the prevalence of musculoskeletal conditions on individuals (Woolf & Pfleger, 2003). In research conducted by the WHO, Low back discomfort and neck pain were identified as the first and fourth leading causes of years lived with disability, respectively (Kamper et al., 2016). The burden of neck, shoulder, and low back pain is in continuous increasing, and millions of people all over the word today suffer from musculoskeletal pain (Jørgensen et al., 2013). Musculoskeletal illnesses are one of the main causes of disability in the United Arab Emirates (Al Saleh et al., 2016). Persistent musculoskeletal discomfort is a big issue for young adults, making their lives very hard and demanding (Slater et al., 2016). According to a Malaysian study, musculoskeletal pain was more common in medical students who had a family history of the condition, had experienced trauma (Alshagga et al., 2013). The prevalence of musculoskeletal discomfort among Australian medical students was significant; the neck, low back, and shoulders were the most often affected areas (D. Smith & Leggat, 2007). According to a study in Saudi Arabia Neck pain was shown to be very common among female undergraduate students (Gharib & Hamid, 2013). Similarly, a recent study at Taif University in Saudi Arabia found a high prevalence of musculoskeletal disorders among medical students, highlighting the significance of the problem in the region (Hendi et al., 2021). Also a recent study at Umm Al-Qura University in Saudi Arabia reported a high prevalence of neck, shoulder, and low-back pain among medical students, emphasizing the burden of musculoskeletal pain in this population (Abdulrahman et al., 2022). In Delhi, India, medical students with low back pain were more likely to experience severe mental anxiety, and constant workload (Aggarwal et al., 2013). Similarly, High prevalence of musculoskeletal pain among medical students reported in Pakistan, identifying risk factors such as smoking and prolonged computer use (Haroon et al., 2018). The demanding curriculum of medical schools leads medical students to a sedentary lifestyle and a significant risk of low back discomfort (Hafeez et al., 2013). Compared to first-year students, low back pain was much more common among medical students in their final year (Moroder et al., 2011). Also, Prevalence of Musculoskeletal Disorders among Kasr-Alainy Hospital Medical Students (Mohamed, 2021). Obesity, inadequate physical activity, and large back packs were also linked to an increased incidence of low back discomfort (Jones, G.T & Macfarlane, G.J, 2005). There are a variety of potential causes for the rise in musculoskeletal discomfort among medical students, but no single primary cause has been found. The prevalence of MSDs among university students is rising at an alarming rate. According to various studies, the range of prevalence in numerous nations was between 32.9% and 89.3%[19]. For example, a high prevalence of musculoskeletal pain among health students in Brazil, has been reported, supporting the global trend (Morais et al., 2019).

In Egypt there aren't enough statistics on MSP among undergraduate medical students. We must understand how certain risk factors, such as trauma, a family history of musculoskeletal pain, physical activity, and exercise, affect the development of musculoskeletal pain. This study also looked at the effects of long study times, computer use, smoking, and coffee consumption on the severity of musculoskeletal pain aggravation. Due to different factors, including

extended study hours, hospital rotations, etc., we expect to see an increase in the prevalence of musculoskeletal pain in this cross-sectional study of female medical students. This can help programmers and politicians to create supportive and preventive actions to improve the quality of life for future aspiring doctors.

2. Methodology

2.1. Study Design

A comparative cross-sectional study was conducted to analyze, investigate, and compare data from different groups at a single point in time.

2.2. Setting

For Physical Therapy and other Medical students: from Different colleges of Merit university (Private sector Medical college campuses; Medicine, Physical Therapy, and Pharmacy).

2.3. Duration

August 2023 to Feb 2024.

2.4. Sampling Technique

Probability Convenient sampling which selects participants based on their easy accessibility and willingness to participate in this study, rather than using random selection methods.

2.5. Sample Size

The sample size for this study was determined using Open Epi software. For the purpose of investigating the prevalence of musculoskeletal pain among female medical students, a sample size of 239 was calculated at a confidence interval of 95% with a margin of error of 5%. To reduce the margin of error, a total sample size of 252 was ultimately utilized.

2.6. Sample Selection

Inclusion Criteria:

Students in the first to fourth academic years of female medical, physiotherapy, and pharmacy programs.

2.7. Exclusion Criteria

Students with a deficiency in Vitamin D and those suffering from any form of joint disorder.

2.8. Study Variables

Dependent variables:

The prevalence of musculoskeletal pain and the Graded Chronic Pain Scale (GCPS) scores among students.

2.9. Independent Variables

Variables such as gender, age, student classification, academic standing, height, weight, handedness, primary location of pain, pain frequency over the past year and week, impact on sleep and sitting habits, familial medical history, previous medical conditions, study hours, duration of computer/laptop usage, sleep duration, and engagement in physical exercise were assessed in this research study.

2.10. Data Collection Procedure

Data was obtained utilizing an electronic questionnaire that was adapted from the standard Nordic questionnaire and Global Physical Activity Questionnaire(Kuorinka, I et al., 1987). The questionnaire included variables related to sociodemographic, pain, and potential pain-associated factors (Kuorinka, I et al., 1987). A total of 125 physiotherapy students and 127 other medical students (from faculties of medicine and pharmacy) were randomly selected after taking informed consent from them to participate in the study. A pilot study was carried out to evaluate the questionnaire's validity, which was developed based on relevant questions and modified with insights from previous studies. Participants were assured of confidentiality and informed that their test results would remain confidential and solely used for research purposes. Their identities would not be disclosed at any point during or after the study. The process of data collection was overseen by the principal investigator.

2.11. Scales Included

The Graded Chronic Pain Scale (GCPS) was used to evaluate the severity of pain in the study(Von Korff et al., 1992).

2.12. Data Analysis Plan

SPSS version 20 was used for statistical examination of the data. Frequencies and percentages were computed for all variables, with mean and standard deviation calculated for age, BMI, study hours, duration of computer/laptop usage, duration of sleep, and traveling time. Variables such as Gender, Academic Year, weight category based on BMI, study duration, computer/laptop usage duration, and sleep duration were analyzed in relation to the occurrence of musculoskeletal pain through crosstabulation. A significance level of $p<0.05$ was considered statistically significant.

2.13. Ethical consideration

The study was approved by Research Ethical Committee, Faculty of Physical Therapy, Cairo University.

Code (No: P.T.REC /012/005830). The study objectives, time taken for completion of the interview, and ensured the anonymity and confidentiality of the data were explained to every student by the researchers.

3. Result

A total of 252 medical students from various colleges affiliated with Merit University were included in the cross-sectional study. The average age of physiotherapy students was 21.256, while other medical students had an average age of 19.80. The socio-demographic characteristics of the participated students from different colleges are presented in **Table 1**.

Variable		N (252)		%
Gender	Female	292		100
Age	18 – 23	128		100
college	Medical students	95		37.4
	Physiotherapy students	125		49.6
	Pharmacy students	32		12.7
Academic year	1st Year	21		8.3
	2nd Year	85		33.7
	3rd Year	56		22.2
	4th Year	90		35.7
Exercise	Regularly	119		47.2
	Not regularly	133		52.8
Right Handed Or Left Handed	Right Handed	239		94.8
	Left Handed	13		5.2
History of trauma	Yes	86		34.1
	No	166		65.9
History of Vitamin D deficiency OR any joint disease **(Excluded)**	Yes	48		16
	No	252		84
Sitting In Correct Position	Yes	179		71

	No	73		29
Sleeping In correct Position	Yes	121		48
	No	131		52
Body Mass Index (BMI) (World Health Organization (WHO), n.d.)	Under Weight	15		6
	Normal Weight	97		38.5
	Overweight	83		32.5
	Obesity class |	40		16
	Obesity class ||	12		5
	Obesity class |||	5		2
			Mean (SD)	
Body Mass Index (BMI)			23.1 (4.9)	
Height			166.8 (9.7)	
Weight			71.0 (18.7)	
Hours of Computer/Mobile Use/day			6.5 (3.8)	
Hours of study/day			4.6 (2.9)	
Hours of sleep/day			7.9 (3.9)	

Table 1. Socio-Demographics.

Table 2 that appears below, illustrates that a significant proportion of female medical, pharmacy, and physiotherapy students experienced musculoskeletal disorders within the previous 12 months, with a prevalence rate of 87%. Among physiotherapy students specifically, the incidence of musculoskeletal pain was notably high at 88.8%, with the most common sites being the neck (21.0%), followed by the low back and legs. Similarly, other medical students also reported a high prevalence of musculoskeletal pain at 85.0%, with the neck (17.4%) being the most commonly affected area, followed by the low back and legs.

	Physical therapy Students		**Other Medical Students (Faculties of Medicine and Pharmacy)**	
	N	**%**	**N**	**%**
In the last 7 days				
Yes	74	59.2	79	62.2
No	51	40.8	48	37.8
In the Last 12 months				
Yes	111	88.8	108	85

No	14	11.2	19	15
Usual Site				
Neck	24	21	24	22.2
Left shoulder	10	9	10	9.3
Right Sholder	8	7	8	7.4
Upper Back	11	10	11	10.1
Low Back	21	20	21	19.4
Elbow	2	2	2	1.9
Wrist/Hand	9	8	9	8.3
Thigh/Hip	6	5	6	5.6
Legs	11	10	11	10.1
Ankle/Feet	9	8	9	8.3

Table 2. Musculoskeletal pain

A significant proportion of physiotherapy students, approximately 65.76%, who indicated experiencing musculoskeletal pain within the previous 12 months also reported experiencing such pain within the past 7 days, as shown in (Table 3). Like wise, a comparable percentage of other medical students, around 71.55%, also reported experiencing pain within the last 7 days.

Pain In the last 7 days	**Physical therapy Students**		**Other Medical Students (Faculties of Medicine and Pharmacy)**	
	N	**%**	**N**	**%**
Yes	73	65.8	77	71.6
No	38	34.2	31	28.4

Table 3. Pain during the Last 7 days.

The results depicted in **Figure 1** and **Figure 2** indicate that pain levels were assessed utilizing the graded chronic pain scale. A significant proportion of physiotherapy students experienced grade 3 pain, with a prevalence rate of 35.2%, while a similar prevalence rate of 35.4% was observed among other medical students reporting grade 3 pain as well.

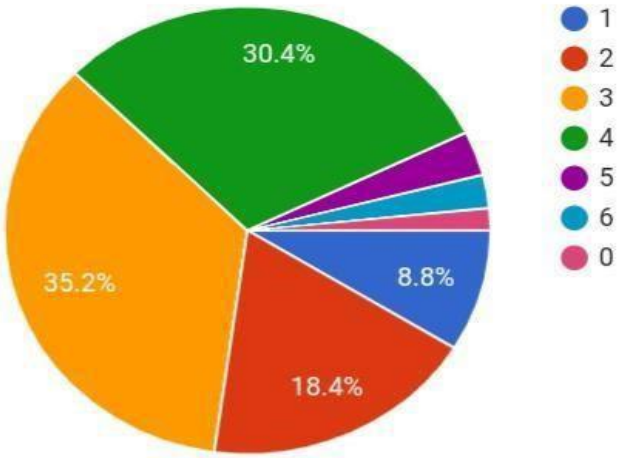

Figure 1. GCPS Grading (physiotherapy Students).

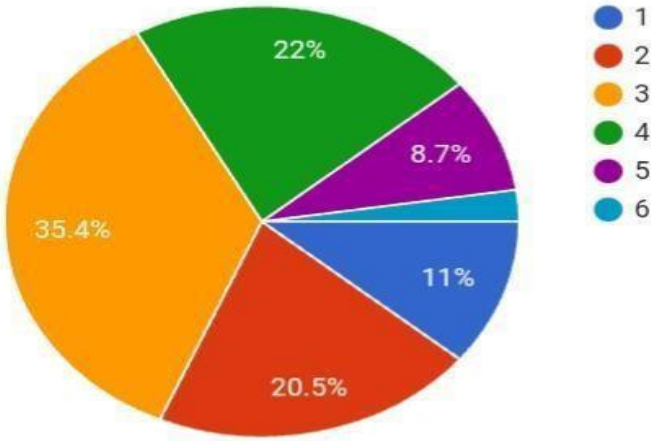

Figure 2. GCPS grading (Other Medical Students).

Table 4 that appears below, indicates that there is a higher prevalence of musculoskeletal pain among female individuals in both the Physical Therapy and other medical student groups. Specifically, when analyzing gender differences, it was found that 23.26% of male Physical Therapy students experienced musculoskeletal pain compared to 76.74% of female students. In contrast, for other medical students, the percentages were

44.88% for males and 54.12% for females. Daily study hours did not show significant differences between Physical Therapy and other medical students with musculoskeletal pain, except for those studying less than 4 hours per day where the percentages were 46.51% and 29.07%, respectively.

Furthermore, the use of laptops/computers was more prevalent among Physical Therapy students but was not significantly associated with pain, whereas a significant association was found in other medical students (p-Value < 0.001). Additionally, it was observed that Physical Therapy students had longer daily travel times compared to other medical students from the Faculty of Medicine and Pharmacy, with those traveling more than one hour showing a significant increase in musculoskeletal pain.

Moreover, a higher percentage of students with musculoskeletal pain in both groups were either normal weight or underweight (45.01% and 28.75%, respectively), while a larger percentage were overweight or obese (54.99% and 71.25%, respectively). This suggests a significant correlation between increased BMI and the prevalence of musculoskeletal pain.

Another contributing factor to the increased prevalence of musculoskeletal pain, particularly neck and low back pain, was the use of backpacks among these students. Additionally, slightly higher levels of musculoskeletal pain were reported by Physical Therapy students on clinical rotation; however, this difference was not statistically significant (p-Value 0.346).

	In Physiotherapy Students		**p-Value**	**In Other Medical Students (Faculties of Medicine and Pharmacy)**		**p-Value**
	Yes	**No**		**Yes**	**No**	
Gender						
Female	86	39	0.923	85	42	0.084
Weight According To BMI						
Underweight	4	1	0.816	7	3	0.952
Normal Weight	42	20		16	19	
Overweight	32	8		36	7	
Obesity class |	16	7		12	5	
Obesity class ||	5	0		7	0	
Obesity class |||	3	0		2	0	
Academic Year						
1st	2	1	0.346	8	10	0.1
2nd	11	4		20	50	
3rd	17	7		23	9	
4th	76	12		5	2	
Duration of Study						
<4 Hours/day	40	17	0.575	25	20	<0.001
4 - 7 Hours/day	29	12		38	16	
8 - 11 Hours/day	9	8		11	3	
>11 Hours/day	8	2		11	4	
Duration of Sleep						

<4 Hours/day	5	9	0.003	7	11	0.001
4 - 7 Hours/day	17	13		20	22	
8 - 11 Hours/day	24	21		29	27	
>11 Hours/day	24	12		6	5	
Duration of Computer/Laptop Use						
<4 Hours/day	11	19	0.06	21	16	<0.001
4 - 7 Hours/day	29	20		27	12	
8 - 11 Hours/day	15	10		23	8	
>11 Hours/day	13	8		13	7	

Table 4. Comparison of musculoskeletal pain in Physiotherapy and other medical students.

The research examined various daily activities such as exercise, outdoor sports, weight lifting, household chores, coffee consumption, smoking habits, and study techniques. However, no significant correlation was identified between these activities and the observed levels. Additionally, a high prevalence of family history and past medical history was noted among the participants.

4. Discussion

In this cross-sectional study, we investigated the occurrence of musculoskeletal pain and its associated factors among undergraduate students. Our data revealed that over half of the physical therapy (88.8%) and other medical (85.0%) students experienced musculoskeletal pain within the previous 12 months. The prevalence of musculoskeletal pain among our all students (87% in the past 12 months) is consistent with findings from previous studies, which reported similarly high rates among undergraduate health students (Hendi et al., 2021; Morais et al., 2019). Notably, the prevalence of musculoskeletal pain among medical students was significantly higher compared to Malaysian medical students (65.1%) (Alshagga et al., 2013). Additionally, our study findings indicated that 59.2% of physical therapy students and 62.2% of other medical students reported pain at some point during the last 7 days. The prevalence observed in our study aligns with findings from Bishkek, Kyrgyzstan, where foreign medical students also reported high rates of musculoskeletal pain and similar associated risk factors (Imamuzzaman et al., 2024).

In our cross-sectional study, the predominant location of musculoskeletal pain reported by both Physical therapy and other medical (Medicine and Pharmacy) student groups was observed, including the neck, followed by the lower back and legs. Interestingly, a separate study conducted in Australia found that medical undergraduates also experienced a high prevalence of musculoskeletal pain in the neck region (D. Smith & Leggat, 2007). In a study conducted in Thailand, researchers found that neck pain was prevalent among undergraduate students, with 46% reporting experiencing it. Additionally, the study highlighted several risk factors associated with persistent neck pain (Kanchanomai et al., 2011). Nonetheless, an investigation conducted in Malaysia revealed that the predominant location of musculoskeletal discomfort among medical students was lower back , succeeded by neck (Alshagga et al., 2013). Cervical discomfort is typically more prevalent in females and in nations with a higher income bracket (Hoy et al., 2010). This study revealed that the incidence of neck discomfort is notably higher in female undergraduate students, regardless of their registration in any of the different medical specialties, when compared to their male counterparts. This observation aligns with numerous studies that report a more frequent manifestation of symptoms associated with neck pain among female undergraduates (S. Niemi et al.,

1996; S. M. Niemi et al., 1997). Contrarily, an Australian research indicated a significant incidence of discomfort among male undergraduate students (D. R. Smith & Leggat, 2004).

Redcliff's findings indicate that medical students experience a heightened workload, particularly during exam preparation and the acquisition of professional expertise. This timeframe was underscored as the most tension-filled stage of medical education (Radcliffe & Lester, 2003). The prevalence of neck discomfort among university students is high (Gharib & Hamid, 2013). A study conducted in Nigeria indicated that a considerable proportion of students experienced instances of neck discomfort subsequent to their university enrollment, compared to prior instances (Ayanniyi et al., 2010). A recent investigation indicated that sustained postures, such as those maintained during extended periods of computer usage, reading, and writing, amplified the likelihood of neck discomfort among undergraduate students (Rose, 2000). There are many factors that can contribute to musculoskeletal discomfort. However, statistical analysis of our research revealed that use of computers/laptops/mobile and extended study periods had relatively equal prevalence among Physical therapy students compared to other medical students, with these factors being significantly associated with pain. Haroon et al. found that prolonged computer use and smoking were significant risk factors for musculoskeletal pain among medical students, which is consistent with our findings (Haroon et al., 2018).This aligns with another study which suggested that medical students are at a higher risk of developing musculoskeletal pain due to increased computer screen usage for their work (Hafeez et al., 2013). Research conducted in Saudi Arabia deduced that medical students, for their scholastic pursuits, tend to occupy a seated posture for extended periods while engaging in activities such as reading, writing, and computer usage (Gharib & Hamid, 2013). In a Malaysian research investigation, it was found that the duration of daily computer usage and the nature of such usage did not exhibit a substantial correlation with the occurrence of musculoskeletal discomfort (Rajagopal et al., 2012). A research conducted in Uttar identified that the primary source of neck discomfort among medical students was extended periods of reading, succeeded by computer usage and lengthy writing sessions (Yunn et al., 2013). Our investigation revealed a notable correlation between studying in bed and the incidence of musculoskeletal discomfort in undergraduate students. It has been documented in a separate study that improper sitting posture is linked to neck pain in this same demographic (Kanchanomai et al., 2011). The study at Umm Al-Qura University also identified several associated factors, including prolonged sitting and academic workload, which align with the risk factors observed in our student population (Abdulrahman et al., 2022). In the conducted research, a pain grading questionnaire was utilized. The results from the CPGS scale indicated that physical therapy students predominantly experienced pain of intensity at grade 3 pain, with a prevalence rate of 35.2%, whereas the majority of other medical students reported a pain intensity of grade 3 pain with a prevalence rate of 35.4%.

Our study indicates that there is a general trend of escalating musculoskeletal pain frequency among physical therapy students, particularly noticeable in the final and third years as compared to the first year. This escalation could potentially be attributed to the cumulative burden of academic work and stress that intensifies with each advancing year. Interestingly, such a correlation between academic year and musculoskeletal pain was not observed among other medical students. A particular study has found that, when compared to first-year students, medical students from all subsequent years demonstrated a heightened susceptibility to musculoskeletal pain (Falavigna et al., 2011).

Our findings identified a correlation between the occurrence of musculoskeletal discomfort and, the use of backpacks in both physical therapy and other medical student populations. The burden of heavy academic bags, often carried on the back, can lead to improper posture and strain, particularly affecting the neck and lower back regions. The act of standing or traveling with the weight of these backpacks can precipitate

musculoskeletal pain complaints among students. This observation agrees with Heuscher's study, which established a connection between the habitual weight of a backpack and an increased incidence of lower back pain (Heuscher et al., 2010). Also our findings regarding the most commonly affected sites as neck, low back, and Shoulder are consistent with studies conducted among Saudi medical students (Abdulrahman et al., 2022).

Our findings reveal that a significant proportion of undergraduate students suffering from musculoskeletal discomfort had not sought consultation from a doctor or physiotherapist. This observation is in line with the research conducted by Ayanniah (Ayanniyi et al., 2010). Our findings indicate that students experiencing musculoskeletal discomfort typically alleviated their symptoms through rest and the use of analgesics. A positive familial history of musculoskeletal pain was observed in 44.06% of physical therapy students and 37.44% of other medical students. These results agrees with a previously conducted study (Frymoyer et al., 1983).

Our statistical analysis on commuting revealed that medical students who spent between 60 to 180 minutes traveling each day reported a higher incidence of musculoskeletal pain on a daily basis. This agrees with a separate study that found dentists who commuted daily by car were more prone to frequent bouts of neck pain (Ijaz et al., 2016). Activities such as heavy lifting and driving are often linked with the occurrence of back pain (Al-Otaibi, 2015). However, numerous studies have been unable to establish a definitive correlation between musculoskeletal discomfort and travelling.

Our findings in this study suggest that a rise in Body Mass Index (BMI) contribute to the risk of musculoskeletal discomfort. Additionally, factors such as a history of smoking, trauma, and coffee consumption were not identified as being linked with an increased incidence of musculoskeletal pain.

Our investigation revealed positive correlation between physical activities and the incidence of musculoskeletal discomfort in both physical therapy and other medical students. This is in line with an earlier American research indicated a lower propensity for upper body musculoskeletal discomfort among individuals engaged in sports activities (Katz et al., 2000).

In our study, there is a strong correlation was found between the prevalence of musculoskeletal pain and the way of sleeping and sitting, whether while attending lessons or while studying, as well as the design of seats in the university and the home. The increased prevalence of musculoskeletal pain observed in our study may be partially explained by the transition to online learning, a trend also documented during the COVID-19 pandemic (Salameh et al., 2022). The risk of MSP increased significantly for physiotherapy students once they completed first year. Compared to the youngest students, being between the ages of 20 and 21 was substantially related with all MSP indicators among physiotherapy students but no significant association was found in other medical students. Numerous everyday activities, including exercise and outdoor sports were studied as part of the study, it was found that there is a correlation, but it is not Significant.

Research has indicated a rising incidence of musculoskeletal discomfort, particularly neck discomfort, among undergraduate students. This high prevalence necessitates the implementation of serious preventative measures for all medical students. Additionally, students should be properly instructed on appropriate sleeping, sitting and standing postures. For those already experiencing musculoskeletal discomfort, protective steps should be implemented to prevent them from becoming disabled. These findings highlight the need for ergonomic interventions and physical activity promotion, especially in the context of distance learning (Salameh et al., 2022). Koldas' study presented various treatment methods for back pain, with exercises proving effective in reducing pain intensity (Koldaş Doğan et al., 2008). Student health programs should include awareness of the potential negative impacts of computer usage. Nevertheless, further research is needed to understand the development pathway of pain

among undergraduate students and the factors contributing to it.

This research study is subject to several limitations. The sample population consisted solely of undergraduate students, thus the findings may not be generalizable to all students in educational institutions. Due to the nature of this cross-sectional study, follow-up data was not obtained to investigate causation and risk factors of musculoskeletal pain. There is a possibility of recall bias as participants self-reported their responses on a questionnaire. Pain intensity was assessed using a scale from 0 to 6, which may not precisely reflect the actual severity experienced by participants. Keeping daily records of pain intensity could have enhanced the accuracy of pain assessment. Furthermore, the potential association between musculoskeletal pain and psychological stress was not explored in this study. But there is previous researches have been highlighted a significant association between musculoskeletal disorders and psychological stress with low sleeping quality in medical students (Alsaadi, 2022; Hendi et al., 2021). Similar risk factors, including prolonged study hours and psychosocial stress, have been identified among foreign medical students in Kyrgyzstan, further supporting the importance of studying, analyzing and finding solutions to such factors that may be among the main reasons (Imamuzzaman et al., 2024).

5. Conclusion

The study concluded that the prevalence of musculoskeletal pain among undergraduate students is actually high. The risk of musculoskeletal pain appeared to be equal among therapy and, other medical (Medicine and Pharmacy) students. On the contrary female physical therapy students have shown less association of studying for long hours and use of computer/laptop with musculoskeletal pain when compared to other physical medical students. This might be due to the fact that physical therapy students are more aware and conscious about their health and sitting postures due to their studies. This study has given a useful insight into the matter of musculoskeletal pain among undergraduate students. Thinking about the risk factors and avoiding them may lead to lower incidence of this pain. More studies should be done to know contributing factors of musculoskeletal pain among undergraduate students.

Declarations

Funding: This research received no external funding.

Conflicts of interest / Competing interests: The authors declare no conflict of interest.

Ethics approval: The study was approved by the Research Ethics Committee at Cairo University, Faculty of Physical Therapy (Approval No. P.T.REC/012/005830). The study was conducted in accordance with the Declaration of Helsinki and institutional ethical standards.

Clinical trial number: Not applicable.

Consent to participate: Electronic informed consent was obtained from all participants prior to the online questionnaire (participants confirmed their consent by selecting the agreement checkbox). Participation was voluntary, and collected data were anonymized for analysis.

Consent for publication: Not applicable.

Data Availability: The datasets generated and/or analyzed during the current study are available from the corresponding author on reasonable request.

Country affiliations: Authors are affiliated with institutions in Egypt and Jordan.

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Authers contribution

Ahmed Abd-Elatty Ali Ahmed: Main contributor to the study concept, trial design, manuscript drafting, and overall coordination of the paper.

Mohamed A. Elkady: Assisted in data collection, intervention delivery, and manuscript review.

Yousef Salah Salem Abu Elkheir: Assisted in study planning, pediatric rehabilitation input, and revision of the manuscript.

Ahmed Mohamed Ahmed Mostafa: Contributed to clinical oversight, patient recruitment, and pediatric surgical support.

Fathia Mostafa: Assisted in data collection, intervention delivery, and manuscript review.

Soad S. Ali: Contributed to data analysis, interpretation of results, and critical revision.

Ahmed Abdatty Ali Ahmed: Helped with clinical assessment, treatment monitoring, and manuscript editing.

Mohamed A. Elkady: Contributed to participant management, data recording, writing the discussion section, and review of the final draft.

Nourhan Nagy Elshehry: Contributed to participant management, data recording, writing the discussion section and review of the final draft.

Samah Mohamed Abd El Azem El Sadany: Assisted in study planning, pediatric rehabilitation input, and revision of the manuscript.

Sahar Mahmoud Hassan: Helped with clinical assessment, treatment monitoring, and manuscript editing.

Doaa Said Mohamed Ibrahim: Contributed to the study design, supervision of the research process, and manuscript preparation.

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