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Neck pain among students of the faculty of medicine and pharmacy of Marrakech

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Abstract

Our objective was to investigate neck pain occurrence among students at the Faculty of Medicine and Pharmacy of Marrakech (FMPM), pinpoint its associated factors, and propose effective prevention strategies. Additionally, we aimed to evaluate its medical and psychological impact on physical activity and study quality. To achieve our goals, we conducted over three-month period a cross-sectional study among FMPM students from 2nd to 7th year, using a self-questionnaire with both descriptive and analytical purposes, from June 2022 to September 2022.We considered students with neck pain as those who had undergone an episode of neck pain within the previous year. Our research consisted of 206 students, with a gender ratio of 3.4 and an average age of 23 years. The results indicated that the vast majority of students (81.1%) had experienced neck pain within the past year, but for most, the pain lasted less than a week. During the survey, neck pain was reported by 18.4% of students. Our analysis discovered that there was a significant correlation between the occurrence of neck pain within the past year and age, family history of degenerative disc diseases, prior neck pain, amount of sleep, and computer use for studying. Through our research, we have confirmed that neck pain is a significant health issue for FMPM students. In order to address this problem and decrease its occurrence and impact, we have suggested preventative measures. To achieve this, we have put up posters in the faculty hall and shared a link online within student groups, which provides information on exercises and proper posture.

Keywords: Neck pain; Medical students; Prevention; Marrakech

1. Introduction

Neck pain has become a significant public health issue due to its increasing occurrence, causing negative socio-economic impacts on individuals, families, and communities. It is also a leading cause of morbidity and commonly leads to healthcare complaints and university absenteeism, both of which have an adverse effect on the overall healthcare system.

Neck pain includes all pain localised in the cervical area. It can be defined as: "pain perceived as emanating from any area bounded superiorly by the superior occipital curved line, inferiorly by an imaginary transverse line passing through the tip of the spinous process of the first thoracic vertebra, and laterally by the sagittal planes tangential to the lateral edges of the neck" [1].

Medical students have been found to have a high incidence of neck pain in previous studies. In 2019, a survey conducted at a medical college in Malaysia showed that 41.8% of students reported experiencing neck pain [2]

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Other studies carried out in various countries, such as Pakistan, Australia, the USA, China, and Brazil, have found a high incidence of neck pain among medical students. The respective percentages were 65%, 52.8%, 35%, 33.8%, and 8.23%. In Saudi Arabia, over half of medical students reported experiencing neck pain, with a prevalence rate of 56.5%. [3][4][5].

Throughout their extended medical education, students are exposed to high levels of stress, prolonged hours of reading, writing, and clinical practice, making them more susceptible to neck pain than the general population. Furthermore, frequent use of smartphones, computers, or tablets raises these risks.

Therefore, it is crucial for medical institutions to recognize changeable factors that contribute to neck pain and establish preventative measures to improve the quality of life of future physicians. Given this, it is critical to assess the issue among our faculty. Our research aims to determine the prevalence of neck pain, pinpoint associated factors, and recommend appropriate preventive strategies.

2. Materials and methods

This is a cross-sectional study, with descriptive and analytical aims, conducted among FMPM students over the period from June 2022 to September 2022. Our target population consisted of all volunteer FMPM students.

The exclusion criteria were applied to students in their first year of study, given that they have not yet acquired the necessary knowledge to assimilate the terminology used in the questionnaire, as well as to students from other faculties of medicine and pharmacy. As a result, the study population consisted of FMPM students in their second through seventh years of study.

An online survey was conducted through a self-administered questionnaire, ensuring the anonymity of participants. The questionnaire was originally written in French and created after a thorough review of relevant literature.

The questionnaire was divided into three sections. The first section aimed to outline the students' characteristics, including information such as age, gender, level of education, marital status, and history, as well as physical aspects such as height, weight, leisure activities, and possible physical activity. The second part sought to determine the prevalence of neck pain among students by investigating the onset, intensity, type of pain, and triggering factors. The third and final section focused on the medical consequences of neck pain, exploring various socioeconomic, psychological, and ergonomic factors linked to the condition. Before distribution, the questionnaire was pre-tested with six students in electronic form to ensure clarity of questions and estimate response time.

The survey was made available on various online platforms, including Facebook groups for FMPM students in their second to seventh year of study, as well as the Facebook page for the FMPM student office.

The questionnaire was electronically created using Google Forms, with data entry and coding performed in Microsoft Office Excel software. Statistical analysis was conducted using SPSS 26 software. Descriptive analysis included calculating frequencies and percentages for qualitative variables, as well as determining measures of central tendency (means and medians) and dispersion (standard deviation) for quantitative variables. Qualitative findings were presented through graphs and tables in Microsoft Office Word software.

The univariate analysis employed the Pearson chi-square test to compare percentages and Student's t-test to compare quantitative variables. A significance level of $p < 0.05$ was considered statistically significant.

The questionnaire conformed to the ethical principles of the Declaration of Helsinki developed by the World Medical Association. It was optional and anonymous. Participants were informed of the survey's objectives and they were guaranteed the confidentiality of their responses.

3. Results

The study sample included 206 students, with a male-female sex ratio of 3.4 and an average age of 23 years. Most students were in their seventh year of studies, single, and had a normal BMI. A total of 22.3% had a family history, with 52.2% related to degenerative disc disorders.

The majority of participants were physically active and slept moderately well. It was discovered that 42.7% of students studied for more than 4 hours outside of the lecture hall, 76.7% used their computer, 67.5% used their mobile phone, and 89.8% sat for an extended period of time. Table 1 provides additional information on sociodemographic data.

Table 1 Demographic Characteristics of Participants**.**

Variable		**N=206**	**%**
Sex	Women	159	77.2
	Men	47	22.8
Level of education	2nd year	12	5.8
	3rd year	23	11.2
	4th year	37	18
	5th year	29	14.1
	6th year	39	18.9
	7th year	66	32
Normal BMI (18.5 and 24,9 Kg/m^2)		144	69.9
Family history of Degenerative disc diseases		24	52.2
Toxic habits	Tobacco	12	5.82
	Alcohol	08	3.88
Physical activity	NO	66	32
	Irregularly	105	51
	Regularly	35	17
Sleep quality	Good	122	59.2
	Intermediary	60	29.1
	Bad	24	11.7
Study time per day: in / outside lecture hall	<2 H	104/42	50.5/20.4
	2 à 4 H	89/76	43.2/36,9
	>4 H	13/88	6.3/42.7
Computer use	Yes	158	76.7
	No	48	23.3
Use of mobile phones	Yes	139	67.5
	No	67	32.5

In terms of prevalence, 81.1% of students reported experiencing neck pain within the last year, with most episodes lasting less than 7 days. Meanwhile, as indicated in Table 2, 18.4% of participants reported neck pain during the survey.

Table 2 The prevalence of neck pain in the previous year

Variable		**N=206**	**%**
Prevalence of neck pain in the past year	Yes	167	81
	No	39	19
Episode length	7 days	98	59.4
	1 month	41	24.8
	>1 month	26	15.8

Following our findings regarding the prevalence of neck pain, we investigated its characteristics and impact on students. 44.3% of students experienced episodes of depression, and 48.5% were concerned about experiencing another episode of neck pain. 17.3% consulted a doctor, primarily a rheumatologist. 16.5% had additional testing such as conventional X-rays and MRIs; and 36.1% received treatment for pain relief.

In our study, we observed that age exhibited a significant relationship with the presence of neck pain in the past year (P value=0.031). Being in the first cycle was also significantly associated (91.7%). However, BMI did not show any significant association with neck pain (P value =0.563). We also found a significant association between a familial history of degenerative disc diseases and neck pain (P value = 0.037). Physical activity did not exhibit a significant association with neck pain (P value = 0.221). The duration of sleep was significantly associated with neck pain (P value=0.029); however, the duration of cell phone use was not significantly associated with neck pain (P value=0.075). Interestingly, the duration of computer use was significantly associated with neck pain (P value=0.035), although tablet use was not (P value=0.455).

4. Discussion

4.1. Characteristics of the population:

The 2017 Global Burden of Disease (GBD) report highlights that musculoskeletal conditions (MSDs) are the second leading cause of disability worldwide [6]. However, there have been few investigations regarding this topic among older people and medical students. Some research has examined the prevalence of these disorders among medical students in Malaysia, China, Australia, Saudi Arabia, and Ethiopia [2,5,7,8,9].Neck pain was identified as the most common MSD among Australian students [9], the second most common among Chinese [8], Saudis [5], and Malaysians [2]. In our context, there has been no reported research on the prevalence of neck pain.

4.2. The prevalence of neck pain

Table 3 Prevalence of neck pain among medical students worldwide.

Author	**Country**	**Prevalence of neck pain in the past year**
Our study	Morocco	81.1%
Behera et al. 2020 [10]	India	58.3 %
Algarni et al. 2017 [5]	Saudi Arabia	56.5%
Weleslassie et al. 2020 [6]	Ethiopia	49.2 %
Alshagga et al. 2013 [2]	Malaysia	41.8%
Smith et al.2005 [8]	China	33.8%

This study primarily examined neck pain, with 81.1% of medical students reporting experiencing neck pain in the previous year (95% CI: 75.75-86.45%), indicating that it is a common health concern among this student population. Notably, the incidence of neck pain in this study surpasses that reported in research conducted in India (58.3%), Saudi Arabia (56.5%), Ethiopia (49.2%), Malaysia (41.8%), and China (33.8%).The discrepancies in neck pain could be attributed to social and economic differences between Morocco and the countries in the referenced studies, along with

fluctuations in the size and method of the sample selection. The organization of lecture halls, practical work rooms, and libraries, as well as the availability of measures for prevention, may explain the discrepancies observed in comparison to the current study.

Given the similarities between medical and dental schoolingn, it was judged valuable to compare the prevalence of neck pain between these two fields. However, no research on this topic in Morocco was found in the literature. A study conducted in Germany revealed that 92% of dental professionals had experienced musculoskeletal pain in the previous twelve months, with the neck being the most commonly affected body region among dentists and dental students, with a prevalence of 70.9% [11]. Another study conducted in Saudi Arabia reported that the incidence of musculoskeletal disorders (MSDs) among dentistry students in the preceding year was 91.2%, with the neck being the most common area affected (69.2%) [12]. This suggests that neck pain is prevalent among both medical and dental students. However, the prevalence seems to be higher among dental students, potentially attributed to the increased physical demands of their clinical training compared to medical education.

4.3. Factors associated with neck pain

Our research revealed that age is a contributing factor to neck pain, consistent with findings from a study conducted in Brazil [13]. However, the Brazilian study identified that individuals in the age group of 18 to 20 years old had a higher risk of experiencing neck pain ($p<0.001$). In contrast, several other studies [5, 10,13, 14] found no relationship between age and neck pain. Our study population revealed that females reported more neck pain, although this difference did not reach statistical significance. These results are similar to the findings of previous studies by Alshagga et al. [2] and Algarni et al. [5]. According to Morais et al [13], women are up to six times more likely to experience MSDs than men due to differences in musculature, bone density, height, and joint fragility. Our study found that BMI was not a significant factor in relation to neck pain, which aligns with the findings of Algarni et al. [5] and Behera et al. [10]. However, a study conducted in Malaysia [2] suggests that a normal BMI might offer some protection against MSDs. The prevalence of neck pain was more common among undergraduate students (91.7%) in the preclinical years, although statistical significance was not observed. This finding aligns with a study conducted in Pakistan [15], which indicated that educational level is not associated with neck pain. In our study, a significant correlation was found between neck pain and a familial history of degenerative disc disease. This is supported by a Malaysian study that revealed a correlation between a familial history of musculoskeletal disorders and an increased prevalence of neck pain. Our study identified a correlation between using computers for studying and an increased risk of neck pain. This observation is consistent with the results of a study by Alshagga et al. [16], which aligns with findings from other literature reviews [16]. Additionally, Smith et al. [8] reported that prolonged computer use was associated with musculoskeletal pain, further supporting our findings.

Our study found no significant association between additional physical and clinical variables such as physical activity, cell phone use, and tablet use and neck pain, which contradicts other research connecting these factors to the existence of neck pain [10,17]. In our study, 86.4% of students who slept for fewer than 7 hours reported neck pain, whereas 13.6% did not. This difference was determined to be statistically significant (p-value=0.029). This finding is consistent with a study carried out in New York, USA, which suggested that an increase in sleep duration is associated with a decrease in musculoskeletal pain [18].

4.4. COVID-19 and neck pain

The worldwide COVID-19 pandemic has caused significant disruptions in people's daily lives, with medical students particularly affected. The implementation of lockdown measures has had a major negative impact on students' academic pursuits, daily habits, and mental well-being, creating an environment conducive to the emergence or exacerbation of neck pain [19]. There have been significant changes in the worldwide education system. Traditional in-person teaching has been replaced by online learning. Research indicates that the postural habits individuals develop while seated can have notable negative effects on the musculoskeletal system and potentially contribute to musculoskeletal pain [20, 21]. In our research, 37.79% of students indicated that participating in online classes during the COVID-19 pandemic influenced their neck pain, either by initiating a new episode (60%), or exacerbating existing pain (40%). These findings align with existing literature. A recent study conducted in Jordan found that the adoption and continued use of remote learning resulted in an increase in the daily time students spend in front of a laptop or desk for class attendance. The study revealed that three-quarters of students (75.9%) experienced musculoskeletal pain for the first-time during distance learning in the lockdown, especially in the shoulders and neck (65%), with equivalent frequencies of back pain (62.1%) and eye strain (61.7%) [20]. Approximately two-thirds of the subjects in the study by Isha et al. had new musculoskeletal pain during the pandemic, affecting diverse body regions among college students, with the highest prevalence observed in the lumbar spine (33.3%) and cervical spine (32%) roughly equally [21].

4.5. The strong points of the study

Our study is distinguished as one of the limited investigations focusing on medical students. Its significance is further emphasised by being the inaugural study to be carried out in Morocco. This research not only revealed a high prevalence of neck pain among students but also assessed various factors associated with this neck pain. The self-administered questionnaire used in our study, conducted online, has the advantage of being easier to complete and is devoid of any potential answer bias that might exist with an examiner-administered questionnaire. This strategy also protects students' confidentiality, allowing them to react honestly and openly. This type of system makes it easier to obtain authentic data and encourages people to express their experiences openly and honestly.

A pivotal aspect of our study is our dedication to its outcomes, with the goal of making a substantial impact on reducing the prevalence of neck pain among students. We have strived to identify the modifiable factors that may contribute in the onset and exacerbation of neck pain, intending to establish the most efficient preventive strategies. Our approach goes beyond simply evaluating the problem at hand; we look to deliver realistic and specific solutions that will improve students' quality of life by reducing the consequences of neck pain.

4.6. Limitations of the study

It is important to note that the study's findings are subject to limitations due to the diminished response rate, which may have been impacted by the online survey methodology. The use of self-reported data is also a factor to consider, since it may result in an overestimation or underestimation of the true incidence of neck pain. Furthermore, self-reported characteristics like height and weight may introduce inaccuracies into the data. Given that student involvement in the study was voluntary, we hypothesised that those who were highly concerned about the subject would be more likely to complete the questionnaire. Furthermore, the study is susceptible to response and recall biases, since individuals may struggle to reliably recall incidents of neck pain spanning a year. Additionally, the absence of an objective means to evaluate the location of pain represents another limitation of the study.

4.7. Prevention

Figure 1 A summary poster outlining the corrective measures and self-program, displayed in the hall of the Faculty of Medicine of Marrakech.

Neck pain is a common health problem worldwide, ranking as the fourth biggest cause of disability, according to the Global Burden of Disease . Several modifiable factors have been identified as possible influences in the onset of this pain.

Nonetheless, we encourage effective preventative interventions to reduce the risk and extent of neck pain among students.

In partnership with the physical medicine and rehabilitation department of Mohammed 6 University Hospital in Marrakech, we have taken measures to address students' negative behaviours that are predicted to raise the risk of neck pain. In addition, we created a self-program of specific exercises to strengthen the cervical muscles in order to improve the prevention and management of this pain. All of this information was clearly provided in a presentation, which will be broadcast on both the faculty's official website and the students' Facebook pages. A summary poster (Fig. 1) has also been created to summarise the corrective measures and self-program, which will be displayed in the faculty hall. This multimodal dissemination aims to provide global visibility of the advice and activities taken to address neck pain issues among students, consequently increasing awareness and potential adherence to the delivered preventive measures.

4.8. Means of prevention

Prevention is an important human, societal, and economic imperative. Its objectives include preventing the onset of neck pain (primary prevention), identifying and addressing it early to avoid progression to chronicity (secondary prevention), and reducing the prevalence of chronic disabilities or recurrences (tertiary prevention). Primary prevention involves decreasing stress on the cervical muscles and recognising abnormalities of spinal stability such as straightness or cervical scoliosis, both of which are risk factors for neck pain. In our study, 90% of students with scoliosis reported neck pain. Even if the finding was not statistically significant, the proportion of 90% remains significantly high, emphasising the importance of early scoliosis treatment to prevent the onset or occurrence of neck pain. To mitigate neck pain, it is crucial to minimise excessive cell phone usage. When using a computer, adopt the correct posture by positioning the screen so that the top edge aligns with eye level. A screen positioned too low can lead to continuous flexion of the neck, resulting in discomfort. To alleviate shoulder tension, adjust the desk height to allow the arms to rest comfortably on its surface or on the chair's armrests. kipping feet flat on the ground and back level with the back of the chair. The head should be held in a neutral position, with the ears exactly above the shoulders. Adjust the chair posture so that the knees are bent at a 90-degree angle.

To enhance sleep quality and reduce the risk of neck pain, aim for a minimum of 7 hours of sleep per night and avoid sleeping on the stomach,as this position can strain the spine due to excessive head rotation and neck arching. Choose pillows that effectively support the natural cervical curves, promoting optimal spinal alignment while minimising pressure points on the neck and shoulders. Avoid pillows that are too rigid and cause neck pressure, or those are too soft and do not provide adequate support. Furthermore, pillows that are overly thick or too thin can cause abnormal neck spine angles and cervical structure injury.

To maintain neck health and overall well-being, it is recommended to incorporate regular breaks for stretching the neck and shoulder muscles at least once an hour. Engage in moderate rocking movements to the sides of the head during these breaks. Additionally, prioritise regular exercise and implement stress management techniques to support neck health and promote general wellness

Secondary prevention, or screening for neck pain in students, should be done early so that it can be treated properly before it becomes chronic. If we want to be more effective, the school health doctor must conduct tests before students begin university studies. Regular physical activity aimed at strengthening the cervical muscles helps reduce pain and prevent a recurrence of neck pain. Stretch and perform self-program exercises. Treat the acute episode to avoid the onset of persistent pain.

5. Conclusion

Our study is pioneering in investigating neck pain among medical students at the Faculty of Medicine and Pharmacy in Marrakech, with a focus on prioritising student health.The findings of this study revealed that neck pain is a prevalent health issue among medical students in Marrakech, with 81.1% of participants reporting neck pain within the past 12 months. Factors such as age, prior history of neck pain, family history of degenerative disc disease, and computer usage were identified as associated with neck pain in this population.Therefore, it is critical for medical college managers to provide facilities to improve students' physical activity and early prevention measures for a better quality of life for future doctors, and students are advised to raise awareness of associated health risks and encourage regular physical activity. We looked to help students change their unhealthy habits by discussing the various exercises and correct postures that can help reduce the prevalence of neck pain.

Compliance with ethical standards

Disclosure of conflict of interest

Authors declare no conflict of interest.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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