Musculoskeletal disorders among first-year Ghanaian students in a nursing college

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Abstract:
Objective: To estimate the prevalence and extent of MSDs among a sample of freshmen in a nursing college in Ghana.
Methods: A semi-structured self-reported questionnaire including the Nordic Musculoskeletal Questionnaire (NMQ) was used to collect information on age, gender and musculoskeletal complaints among a random sample of 200 students at a nursing and midwifery college in the Eastern region of Ghana.
Results: Out of the 200 questionnaires administered, 160 were retrieved of which 3 were found to be incomplete and void, yielding a total of 157 evaluable questionnaires, a response rate of 78.5%. One hundred and ten (70.1%) students reported having MSDs in the previous 12 months, of which a total 88 (56.1%) suffered disabling effects, while 70(44.6%) students reported having MSDs in the past 7 days. The prevalence of MSDs in the different body regions was generally low with clustered distribution in the neck, upper back, wrists/hands and lower back.
Conclusion: Nursing students are at reasonably high risk of MSDs. Strategies to prevent this important public health problem amongst future generation of nursing students must be given utmost priority. This study provides the baseline data for more elaborative studies in the Ghanaian population.
Keywords: Musculoskeletal disorders, nursing students, functional impairment.

Introduction

Musculoskeletal disorders (MSDs) are extremely common and affect people of all ages, gender and socio-demographic background in society[1]. They are a major cause of severe long-term pain and disability[1,2], productivity loss[3] and reduced quality of life[4,5] which can lead to reduced educational attainment among students. In recent years, MSDs have emerged as a public health problem among college students, with the estimated prevalence rate varying between 32.9% and 89.3% in different parts of the world[6–19]. Factors such as computer usage[10–13,17], female sex[6,7,14,17], lack of regular exercise[13,18] and psychosocial stress and mental pressure[6,15]

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have been associated with increased prevalence of MSDs among this population.

Although MSDs represent an important health issue for college students and young adults, to date, there is a paucity of epidemiological studies in Africa[6] on the prevalence of MSDs among this population. Available and relevant information on MSDs in Ghana are from adult populations largely of mixed age-groups[20–25]. Projections made based on data from developed countries may not accurately reflect the reality in developing countries. The aim of this work, therefore, was to determine the prevalence and extent of MSDs in an apparently healthy cohort of Ghanaian young-adults at a nursing and midwifery training college in the Eastern region of Ghana.

Methods
Subjects and design of study

This school-based cross-sectional study involved first-year students (180 females and 20 males) at a nursing and midwifery training college (name withheld for the purpose of confidentiality) in the Eastern region of Ghana, between May and June 2014. All the participants were 18 years or older and had no history of traumatic injury affecting the musculoskeletal system. The purpose and contents of the questionnaire were explained to the subjects beforehand, and consent was obtained before participation in the study. Participation in the study was voluntary.

Each participant was assessed by using a two-section self-reporting questionnaire; section one was used to collect data on participants' demographic variables (i.e gender and age) while section two assessed participants' musculoskeletal complaints using the standardized Nordic Musculoskeletal Questionnaire (NMQ)[26]. Each participant was asked to indicate whether s/he had an episode of pain or discomfort in different anatomical regions of the body (Figure 1) during the previous 7days (point prevalence) and 12 months (period prevalence), and to indicate the severity of MSDs in the previous 12 months (i.e whether MSDs interrupted his/her normal daily activities and/or required treatment or medical consultation). The questionnaires were retrieved immediately after completion on the same day. The NMQ has been shown to be a valid and reliable instrument[26–28].
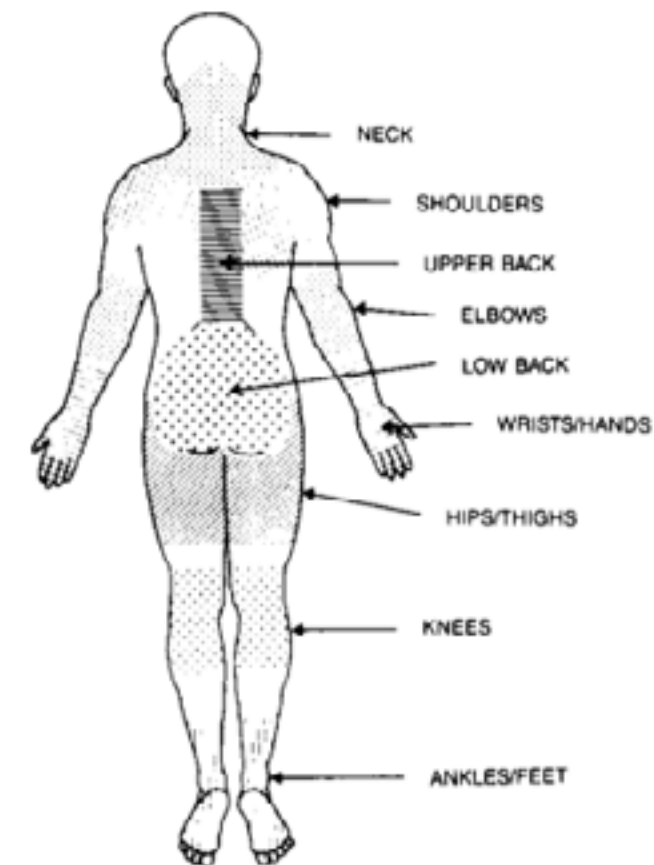
Figure 1. Regions of musculoskeletal pain/discomfort
Adapted from Kuorinka et al.[26]

Statistical analysis

Continuous data are presented as mean ± standard deviation, whereas categorical data are presented as frequencies and percentages. Continuous data were compared using unpaired t-test and categorical data by Chi-square test. All analyses were performed using MedCalc for Windows, Version 12.7 (MedCalc Software bvba, www.medcalc.org)[29]. In all statistical tests, a value of $p < 0.05$ was considered significant.

Results
Response rate and demographic characteristics of the respondents.

Out of the 200 random questionnaires administered, 160 were retrieved of which 3 were found to be incomplete and void, yielding a total of 157 evaluable questionnaires, a response rate of 78.5%. Females (n=143) and males (n=14) accounted for 91.1% and 8.9% of the total population respectively. The respondents' age ranged from 18-26 years with mean age being 20.9±1.8 years. The mean age of males (20.9±1.8) and females (20.9±1.8) were statistically comparable (p=0.7645).

Prevalence of MSDs and functional impairment

As shown in Table 1, the point prevalence (44.6%) among the respondents was sparsely distributed across most of the body regions and clustered around four MSD domains, namely wrist/hand pain (15.3%), lower back pain (15.3%), upper back pain (14.0%) and neck pain (13.4%). The 12-month prevalence was 70.1%, with a similar sparse-distribution across most body regions, but predominant in the neck (28.0%), upper back (27.4%), lower back (23.6%), wrists/hands (22.9%) and

hips/thighs (21.0%). Regarding the severity (i.e functional impairment) of MSDs, 88 (56.1%) participants indicated that they were prevented from carrying out their normal activities, with neck pain (23.6%), upper back pain (20.4%), wrist pain (18.5%) and lower back pain (17.8%) as the main contributory MSD. Overall, there was no significant gender differences in the period prevalence (p = 0.5703), point prevalence (p = 0.8661) and severity (p = 0.5096) of MSDs among the participants (Table 1).

Table 1 Prevalence of MSDs and functional impairment stratified by body region and gender

	Total MSD complaints		
	Point prevalence (n=70) 44.6%	12-month period prevalence (n=110) 70.1%	Functional impairment (n=88) 56.1%
Body region			
Neck	21(13.4)	44(28.0)	37(23.6)
Shoulder	9(5.7)	20(12.7)	16(10.2)
Elbows	7(4.5)	11(7.0)	12(7.6)
Wrists/Hands	24(15.3)	36(22.9)	29(18.5)
Upper Back	22(14.0)	43(27.4)	32(20.4)
Lower Back	24(15.3)	37(23.6)	28(17.8)
Hips/Thighs	14(8.9)	33(21.0)	25(15.9)
Knees	17(10.8)	27(17.2)	21(13.4)
Ankles/Feet	9(5.7)	23(14.6)	15(9.6)
Gender			
Female	64(44.8)≠	97(67.8)*	83(58.0)¥
Male	6(42.9)	13(92.9)	5(37.5)

*Data are presented as frequencies (outside parentheses) and percentages (in parentheses). ≠ p = 0.8661, *p = 0.5703, ¥ p = 0.5096 when males and females were compared using chi-square test.*

Discussion

Musculoskeletal disorders are extremely common worldwide and affect people of all ages, gender and socio-demographic background in society[1]. College students in particular might be at high risk of developing MSDs due to habitual and prolonged sitting hours through lessons, awkward study postures and increasing use of computers in learning. To the best of our knowledge, this is the first epidemiological study to estimate the prevalence of MSDs among a student population in Ghana.

More than half (70.1%) of the students reported having MSDs in at least one anatomical region during the previous 12 months. This prevalence rate is in general agreement with the prevalence rates reported in the literature for college students which vary between 32.9% and 89.3%[6–11,13–16,18,19]. It is however higher than the 32.9%[8] and 36.9%[9] reported among nursing students in Japan, and lower than the 73.3%[18] and 80.0%[19] reported among nursing students in Korea and Australia respectively, as well as the reported prevalence among nurses at the workplace (i.e 78-84.4%)[30–33].

Despite an elevated prevalence of MSDs in this population, the prevalence of MSDs in the different body regions is lower than that reported in previous studies with similarly high prevalence rates of MSDs among college students[7,11,13–15,18,19]. Besides that, the clustering pattern of MSDs particularly in the neck (28.0%), upper back (27.4%), lower back (23.6%), wrists/hand (22.9%) and hip/thigh (21.0%) observed from this study is somewhat different compared with findings in previous studies among nursing students[18,19]. Among Korean nursing students, the reported prevalence pattern was mostly in the shoulder (46.0%), lower back (39.1%), neck (35.6%), feet (25.2%) and leg (23.8%)[18] whereas in Australian nursing students, it was mostly in the lower back (59.2%), neck (34.6%), knee (25.0%) and shoulder (23.8%) regions[19]. The observed variations could, in part, be due to differences in population (race and ethnicity), study design and sample size, comorbidities and predisposing factors.

The observed point prevalence (44.6%) of MSDs from this study is high and could be attributed to several factors. Worth noting is the study period- this study was conducted during the final examination period-thus, high academic stress/workload, habitual long sitting hours and poor study posture during this period might have increased the incidence of MSDs among the students. Heightened academic stress, especially during examinations, has been hypothesized as a risk factor for MSDs among undergraduates[6]. In their study among students in a Nigerian University, Ekpenyong et al[6] found that students' stress level were higher during the examination period than the pre-examination periods, and were significantly associated with MSDs. The point prevalence of MSDs in the current study is higher than the 21.5% reported among nursing students in Japan[8]. It is however comparable to the estimated 46.9%[15] and 45.7%[16] prevalence rates among medical

students in China and Malaysia respectively. There is a paucity of epidemiological studies that have explored the period-prevalence, point-prevalence and functional impairment of MSDs as triadic entities in college students. However, the functional impairment rate (56.1%) of MSDs in this study is comparable to the 41% prevalence reported in a study of upper extremity MSDs among a sample of college students[12].

The prevalence of MSDs would vary between sexes due to gender differences in exposure and biological and anthropometric variables[21]. Several studies among college students have noted a female preponderance in the prevalence of MSDs[6,7,14,17]. However, no significant sexual differences were observed in all three domains of this study (i.e point-, period-prevalence and severity). A previous study among medical students in Malaysia also found no gender differences in the prevalence of MSDs[16].

Limitations

This study is limited by its cross-sectional design and the use of self-reporting questionnaires, which might suffer from recall bias. Nevertheless, the results are alarming and it is hoped that this study will provide the groundwork for more elaborated and elucidative studies in the future.

Conclusion

This study suggests that Nursing students are at reasonably high risk of MSDs. Thus, strategies to prevent this important public health problem amongst future generation of nursing students must be given utmost priority. Further studies are recommended to elucidate the contributory factors of MSDs among students in Ghana, as elsewhere.

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