



PREVALENCE AND RISK FACTORS OF WORK-RELATED MUSCULOSKELETAL DISORDERS AMONG NURSES AND PHYSIOTHERAPISTS IN DOUALA: A DESCRIPTIVE CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Work-related musculoskeletal disorders (WRMSDs) are conditions in which the work environment and performance of work contribute significantly to the condition and/or the condition is made worse or persists longer due to work conditions. They are a major problem among Nurses and Physiotherapists (PTs). Although there is evidence that many Nurses and PTs suffer from WRMSDs, there is no sufficient data on its prevalence and risk factors in Cameroon.

Objective: To determine the prevalence and risk factors of WRMSDs among Nurses and PTs in four 4th category hospitals in Douala from the 21st of January to the 21st of February 2020.

Materials and methods: This was a cross-sectional study conducted in four 4th category health structures in Douala from the 21st January to 21st February 2020. A total of 150 questionnaires were distributed to PTs and Nurses who gave their consents to participate in the study, 121 returned, giving a response rate of 80.67%. 98 Nurses and 23 PTs (total 121) consented to participate in the study. Data on demographic characteristics, some physical parameters and risk factors were collected using a structured questionnaire while the modified Nordic questionnaire was used to collect data on the prevalence of WRMSDs. The data collected was analyzed using Epi info version 7.2.3.1, MS Excel.

Results: The prevalence of WRMSDs among Nurses and PTs was 77.89% and 78.26% respectively, repetitive task (88%) was the major risk factors for Nurses and manual therapy (96%) for PTs. The lower back (57% and 61%), neck (48% and 61%), wrist (34% and 57%), shoulder (32% and 57%), and elbow (31% and 57%) were the most affected body parts and the least was the ankle (20% and 35%) for Nurses and PTs respectively.

Conclusion: The prevalence of WRMSDs was relatively high among Nurses and Physiotherapists practicing in Douala, Cameroon and there is a need to step up preventive strategies and increase awareness on occupational safety.

Keywords: work-related musculoskeletal disorders, prevalence, risk factors, Nurses, Physiotherapists.

INTRODUCTION

Work-related musculoskeletal disorders (WRMSDs) are a frequent cause of morbidity among diverse professionals including health care workers worldwide (1,2). These disorders are collective and descriptive terms used for the symptoms caused or aggravated by work and characterized by discomfort, impairment, disability, or persistent pain (3). WRMSDs interfere with work performance and quality of life of professionals resulting in huge losses to individuals and organizations if unabated (3,4).

In the healthcare sector, physiotherapists (PTs) and nurses are reported to be hard hit by WRMSDs. Even though PTs are trained on ergonomic principles to reduce the incidence of injuries and improve performance at work, a high prevalence rate of WRMSDs similar to those of their nurse's counterparts are being reported (3). The reported prevalence of WRMSDs among nurses varies from 34% (5) to 52% (6) within 6 months and as high as 72.5% (7) to 91.9% (8) within 12 months. Similar trends are also observed among practicing PTs. One comprehensive narrative review on WRMSDs among physiotherapists revealed a 12-month prevalence ranging from 40% to 91.3% (9). The International Labour Organisation (ILO), and the World Health Organisation (WHO) refers to WRMSDs as a “new epidemic” that warrants more attention (4,10).

The causes of WRMSDs are usually multifactorial involving physical, ergonomic, and psychosocial factors (4). Nurses and PTs perform many physically demanding activities that are associated with increased risk of WRMSDs including transfers of patients, excessive repetitions movements, assuming and using wrong postures, lifting heavy objects (11,12).

In Cameroon, the occupational health sector is still developing and the prevention of occupational diseases is of increasing concern. Currently, there is little literature on WRMSDs in Cameroon in general and among allied health professionals in particular (13). Despite the associated burden of WRMSDs among health care professionals and the fact that data is present elsewhere on WRMSDs in nurses and to a lesser extent, PTs (1,2,14), there is lack of consistent data to characterize the risk factors among nurses and Physiotherapists in Cameroon (15). It is therefore important to determine the prevalence and the factors associated with WRMSDs among nurses and physiotherapists which will help in the development and implementation of strategies to limit the occurrence of WRMSDs. Thus the study was conducted to determine the prevalence and risk factors associated with WRMSDs among nurses and PTs in selected hospitals in Douala, Cameroon.

MATERIALS AND METHODS

Study design, setting, and participants

This was a cross-sectional descriptive study conducted for one month (from the 21st of January to the 21st of February 2020).

This study was conducted in 4 selected hospitals of Douala Cameroon (Nylon District Hospital, Laquintinie Hospital Douala, CEBEC Hospital Bonaberie, and Bonassama District Hospital Bonaberie Douala). All these hospitals are 4th Category hospitals in the Cameroon's health system. These hospitals have well-functioning physiotherapy departments and admit patients that

require nursing care in different services. Study participants included nurses and PTs aged at least 20 years providing care in these hospitals. The nurses were recruited irrespective of the various areas of work in these hospitals. Nurses and PTs practicing in these facilities for less than 12 months were excluded as working for it is from 12 months that a WRMSD can be put to evidence. Participants with an established history of musculoskeletal disorders from other known causes not related to work such as surgery, road traffic accidents, and chronic pains before the commencement of nursing and physiotherapy duties were also excluded.

Eligible participants were approached, the study procedure was explained to them and they were given time to ask questions to know more or clear their doubts. Those who accepted to be part of the study signed a consent form. They were also informed that participation was voluntary and that they could drop out from the study if they desired to.

Informed consent was therefore obtained from all the participants since all those who participated in the study were at least 20 years old.

Data collection instruments and procedure

The study adhered to the ethical principles and conduct of health research under the declaration of Helsinki (WHO, 2001). Administrative authorizations were obtained from all the study sites or facilities upon presentation of the ethical clearance of the study from the Scientific Committee of St. LOUIS UNIVERSITY INSTITUTE, DOUALA. All potential participants were verbally informed of the study and only those who read the information sheet and signed the consent form were enrolled and participated in the study. Before the self-administered questionnaire was handed over to participants, their weight and height were measured and recorded (in meters and kilograms respectively) using the equipment used in the respective hospitals. The method of answering the questionnaire was explained and the questionnaire was collected according to the convenience of the practitioners over a maximum duration of 3 working days. They were reminded a day before the collection of the questionnaire. Participants were also called upon to contact the investigators in case of any difficulty in completing the self-administered questionnaire. The semi-structured questionnaires used for data collection comprised 2 sections which included the demographic data and some physical parameters (Height and weight), and the risk factors. The modified Nordic questionnaire which is made up of questions on the pain felt on 9 different body areas is a standard questionnaire and was applied as recommended. This questionnaire assesses the prevalence of musculoskeletal disorders in terms of musculoskeletal symptoms (ache, pain, discomfort) in the preceding 12 months. It consists of two parts general questions and a section with more specific questions focusing on the neck, shoulders, and low back regions. The general questionnaire evaluates whether musculoskeletal symptoms are present and if so in which area are they localized and whether they are ongoing (presence of musculoskeletal symptoms during the last seven days). The modified Nordic questionnaire used in this study included a diagram of the human body viewed from the back, subdivided into anatomical parts (9). The prevalence was calculated by dividing the number of affected nurses or PTs with WRMSDs by the total number who completed the questionnaire and by multiplying this value by 100.

Data management and analysis

After participants had completed the questionnaires. They were collected and checked for missing data or unanswered questions. Data were safeguarded and later entered into a computer

through MS Excel and was secured by a password to ensure confidentiality. Data were analyzed using EPI Info and SPSS version 20 and results were represented using charts and frequency distribution tables.

Ethical issues

Ethical clearance for the study was obtained from the Scientific Committee of the St. LOUIS University Institute, Douala and administrative authorizations were obtained from the 4 health structures in which the study was carried out. The purpose of the study was explained to the participants who were at least 20 years old and written informed consent was obtained.

4. RESULTS AND DISCUSSION

Results

A total of 150 questionnaires were distributed to PTs and Nurses, 121 returned, giving a response rate of 80.67%.

4.1. Demographic Characteristics of Participants

As seen in Table 1, out of the 121 participants, 98 of them were Nurses and 23 were PTs. The sex ratio Male/Female was 1:2 (43 males and 78 females). The mean age of participants was 30 ± 6.96 years. A majority (96% and 84%) of PTs and nurses had an average BMI of 24.0 kg/m^2 and 24.6 kg/m^2 respectively. Table 1 shows details of the demographic characteristics of the study participants.

4.2. Prevalence of WRMSDs among Nurses and Physiotherapists for the past 12 months and 7 days

Seventy-four (74) out of 98 Nurses (78.12%) and 18 Physiotherapists of 23 (78.26%) were affected by work-related musculoskeletal disorders for the past 12 months, as seen in (figure 1 respectively). As seen in Table 2, among the different body parts affected, a higher prevalence of lower back pain was noted for both nurses (57%) and Physiotherapists (61%). Like low back pain, neck pain was also prevalent in Physiotherapists (61%). The ankle registered the lowest prevalence for both Nurses and Physiotherapists (20% and 35%, respectively). The prevalence of WRMSDs among Physiotherapists considering the 7 days that preceded data collection was registered to be 74.0% against 66.0% for Nurses (figure 1).

4.3. Risk factors of WRMSDs among Nurses and Physiotherapists.

Table 3 shows that the most common of the risk factors for Nurses reported were repetitive tasks (87.75%), followed by transfer of patient and overwork (73.47%). While among PTs, the major risk factors were manual therapy (95.65%), followed by a repetitive task (91.30%). According to PTs, adopting a seating posture constituted the least causal mechanism (66.0%) for WRMSD. Manual therapy was the least associated risk factor for Nurses (25.51%).

4.4. Longevity in service and WRMSDs among study participants

Among the 121 study participants, forty-five percent (45%) of nurses and PTs (57%) with a longevity of service 1-5 years were the most affected by WRMSDs (Figure 2).

DISCUSSION

Musculoskeletal disorders are particularly common in healthcare professionals like PTs and Nurses who are in direct contact with patients all through the day. Though more is known about WRMSDs elsewhere, data remain relatively scarce in African countries particularly Cameroon. The study aimed to determine the prevalence and risk factors associated with WRMSDs among PTs and Nurses practicing in some 4th Category health facilities in Douala city, Cameroon. In Cameroon Physiotherapy is male-driven which is different from the Nursing Profession which is dominated by females. Among the 23 Physiotherapists who took part in the study, 14 (60.9%) were males, and of the 98 Nurses, 66 (67.3%) were females.

WRMSDs were confirmed in 78.26% of Physiotherapists which fall into the range of the 12 months prevalence (40-91.3%) and lifetime prevalence (55-91%) of WRMSDs reported Milhem and collaborators, (9) in their systematic review. Contrarily to the findings of Narsiganand collaborators,(16) in Taiwan who reported a slightly higher prevalence of WRMSDs among Physiotherapist, 82.8%. This difference could be due to the sample size difference where he had 120 physiotherapists and also the fact that they worked only on Physiotherapists. Also, another reason could be the difference in the practice of Physiotherapy in Asiatic countries where it is more demanding physically, since it involves more manipulations, when compared to Cameroon. Contrarily to this study and that of Narsiganand collaborators, (17) in Pakistan reported a lower prevalence (46%) and Khairy and collaborators,(18) a prevalence of 54% in Egypt of WRMSDs among Physiotherapists. Differences in the approaches of identification of WRMSDs and sample sizes could account for this lower prevalence observed in their studies. The 12-months prevalence of WRMSDs in Nurses was 77.89%. It is similar to the prevalence (78%) reported by Timubu and collaborators,(2) in Ibadan South Nigeria. But lower than the 12-months prevalence obtained by Khairy and collaborators,(18) in India (89.1%) and that reported by Zayed and collaborators, (19) in Egypt (92.3%). The higher prevalence obtained in the former and the latter may be due to the higher sample sizes (923 and 212) respectively. Contrarily, Reed, and collaborators,(20) in Nigeria recorded a lower prevalence of 74.7% on Nurses. According to them, the prevalence was low due to the good ergonomics the hospitals provided them.

Concerning risk factors, the main risk factors registered in the study were manual therapy, repetitive tasks, and prolonged positions among Physiotherapists. Consistent with the findings of Milhem and collaborators in 2016 (9). But contrary to that of a study carried out by Adwgoke and collaborators, (21) in Turkey who reported the main risk factor among Physiotherapists was lifting heavy loads. This difference in our results could be justified by the fact that the Therapists mostly worked alone and hence no assistance provided when they help patients to change positions dissimilar to our study in which Physiotherapists were at least 2 in the hospitals. On the other hand, the Nurse reported repetitive task, overwork, and patient transfer to be the main of the risk factors which aggravate their pain. This result is similar to a study carried by Campo and collaborators,(22) who showed that overwork and patient transfer were the major risk factors of WRMSDs in Nurses. Contrarily, Zayed and collaborators, (19) reported maintaining prolonged positions, continuing to work after injured or hurt, and twisting movements to be the major risk factors of WRMSDs among Nurses. This difference could be due to differences in the organization of the healthcare structures since they worked in University teaching hospitals where the personnel. It is further explained by the fact that overwork did not constitute a major risk factor in their study contrarily to the study sites used in our study which were mostly 4th

category hospitals, where due to lack of sufficient nurses, the work is always greater than the human resource disposed. Though in literature, the longevity of service has not been linked to WRMSDs, we found that most of the health professionals (Nurses and Physiotherapists between 1 and 5 years of practice were the most affected by WRMSDs. This finding is in line with the finding of Chiwaridzo and collaborators,(1) where they reported that the first episodes of WRMSDs among nurses were observed within the first 5 years of practice. Also, Mondal and Mehedi (23) reported that the majority of the Physiotherapists who registered a 12 months WRMSD were below the age of 30 years. This possibility for WRMSDs to be frequent in health personnel within the first five years of practice may be explained by the fact that during this period most health care providers are less aware of or do not implement roles of body and workspace ergonomics which are skills that are learned and become automatic with more years of experience.

For the most affected body parts, the lower back (57%), neck (48%), wrist (34%) were the most affected body parts in the Nurses. This follows that of (24) who reported lower back, neck, shoulder, and wrist as the most affected body parts. On the side of the physiotherapists, the lower back (61%) and neck (61%), followed by the wrist (57%) and shoulder (57%) were the most affected body parts. These results are similar to those of a study conducted by Nardin and Thy (25) on the prevalence and associated risk factors of work-related musculoskeletal disorders among physiotherapists in Ghana and Narsigan and collaborators, (17) in Pakistan who reported the neck, shoulder, lower back and wrist as the most affected body parts.

Limitations

- The study had a low response rate compared to similar studies. Non-participation bias could have influenced the observed results. This may have been due to a lack of interest on the part of the health personnel and the short time of the study.
- The study was purposively conducted in 4 hospitals in Douala Cameroon. These were moderate hospitals in terms of size and so did not have many personnel as compared to reference hospitals used in several other studies. Also the different units of the nurses who participated in the study was not recorded, some units may be more exposing to WRMSDs than others,
- This study only investigated the prevalence and work-related factors associated with WRMSDs. We expect further studies to take into consideration the influence of space ergonomics in the development of WRMSDs. Also, associations between sociodemographic characteristics like age and sex and WRMSDs would have added more insights to the study
- Furthermore, the fact that the study didn't concentrate on a given health profession like Nurses or Physiotherapy may also constitute a limitation

CONCLUSION

Results obtained from this study indicated that the prevalence of WRMSDs among Nurses and PTs in selected hospitals of Douala was high (77.89% and 78.26% respectively). The repetitive task, patient transfer, overwork, and maintaining a prolonged posture were the major risk factors of work-related musculoskeletal disorder for both nurses and physiotherapists. The lower back, neck, wrist, shoulder, and elbow were the most affected body parts for both Nurses and Physiotherapists with the ankle being the least affected region of the body.

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Declarations

Compliance with ethical guidelines

The study design and Methodology were approved by the Scientific Committee of the University of Buea, the Tutor of the St. LOUIS University Institute, Douala Cameroon. To conduct this study, we had an clearance from the Scientific Committee of the St. LOUIS university Institute, and administrative authorizations from all four health structures in which the study was conducted.

Consent for publication

All for authors consented and accepted for this article to be submitted for publication

Availability of data and materials

Most data generated or analyzed during this study are included in this article. Also, all findings that support the result of this study are included below.

Conflict of Interest

The authors certify there is no conflict of interest.

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Authors's contributions

Conceptualization: Franklin C. Buh &Kuate-Takam Armel-Brice

Methodology: Franklin C. Buh, Kuate-Takam Armel-Brice, Vera Vusheng

Field work: Franklin C. Buh &Kuate-Takam Armel-Brice

Analysis and interpretation of results: Kuate-Takam Armel-Brice, Franklin C. Buh, Etienne Ngeh

Discussion:Etienne Ngeh, Kuate-Takam Armel-Brice, Vera Vusheng

Writing-original draft and editing: All four Authors fully participated in the writing and correction of this manuscript.

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Table 1: Sociodemographic characteristics of participants in the selected hospitals of Douala Cameroon (Nylon District Hospital, Laquintinie Hospital Douala, CEBEC Hospital Bonaberie, and Bonassama District Hospital Bonaberie Douala) from the 21st of January to the 21stFebruary 2020.

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Figure 2. Longevity in service and WRMSDs amongst study participants in the selected hospitals of Douala Cameroon from the 21st of January to the 21stof February 2020.

Table 1: Sociodemographic characteristics of participants

Variable	Frequency (%)	
	Physiotherapists(N=23)	Nurses (N=98)
Gender		
Male	14 (11.60)	29 (24.00)
Female	09 (7.40)	69 (57.02)
Age group (Years)		
20-30	13 (10.40)	65 (53.72)
31-40	07 (5.80)	22 (18.20)
41-50	03 (2.50)	11 (9.10)
Marital status		
Married	07 (5.80)	42 (34.70)
Single	16 (13.22)	55 (45.50)
Divorced		01 (0.83)
Body mass index (kg/m2)		
Normal (18.5 – 24.9)	22 (96.00)	82 (84.00)
Ovrweight (25.0 – 29.9)	01 (4.35)	16 (16.00)

Table 2. Body parts affected by Work-related musculoskeletal disorders

Body parts affected	Frequency (%) Nurses (N=98)	Frequency (%) Physiotherapists (N=23)
Lower back	56 (57.14)	14 (60.87)
Neck	47 (47.96)	14 (60.87)
Wrists	33 (33.67)	13 (56.52)
Shoulders	31 (31.63)	13 (56.52)
Elbows	30 (30.61)	13 (56.52)
Hips	28 (28.57)	10 (43.48)
Knees	25 (25.51)	10 (43.48)
Ankles	20 (20.41)	8 (34.78)

Table 3: Risk factors of work-related musculoskeletal disorders among Nurses and Physiotherapists.

Work-related tasks	Frequency (%) Nurses (N=98)	Frequency (%) Physiotherapists (N=23)
Patient transfer	72 (73.47)	18 (78.26)
Manual therapy	25 (25.51)	22 (95.65)
Repetitive task	86 (87.75)	21 (91.30)
Lifting heavy loads	57 (38.16)	16 (69.57)
Overwork	72 (73.47)	18 (78.26)
Maintaining position prolong	71 (72.45)	20 (86.95)
Standing	76 (78.00%)	16 (70.00%)
Seating	47 (48.00%)	15 (66.00%)
Bending	73 (74.00%)	16 (70.00%)

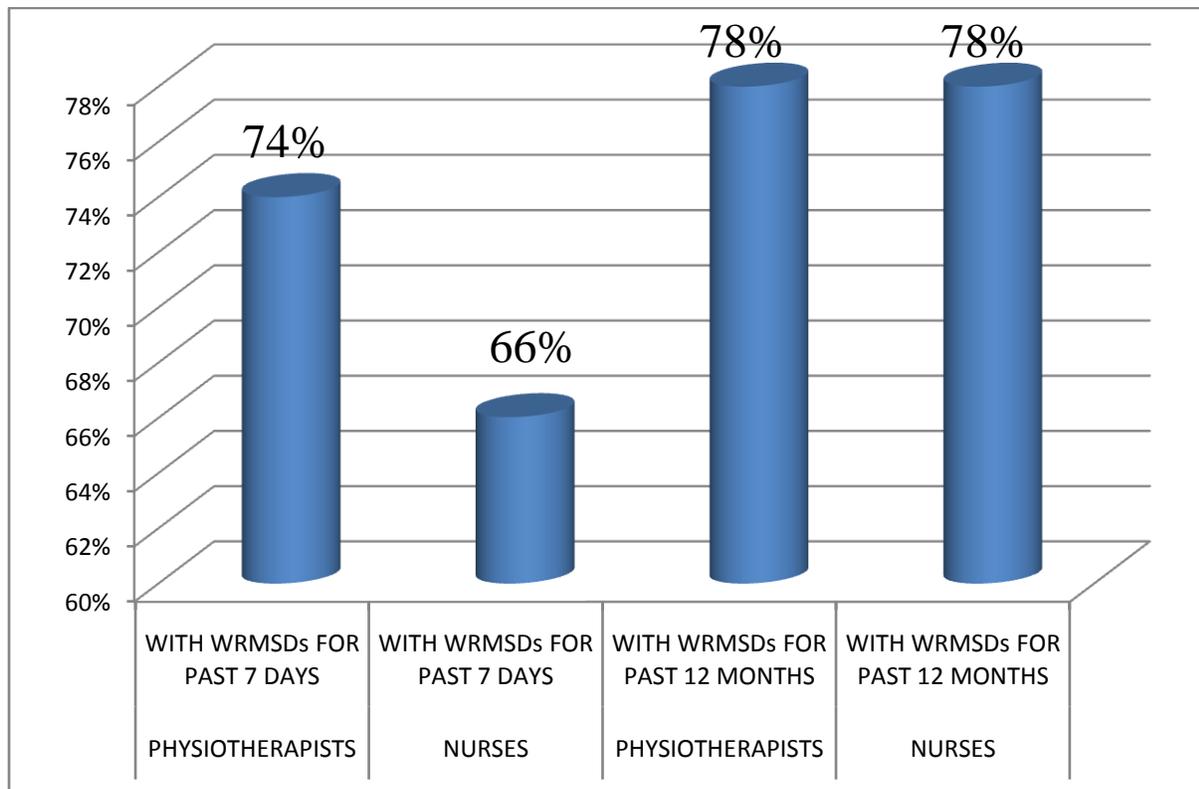


Fig 1: The prevalence of WRMSDs among Nurses and Physiotherapists for the past 12 months and 7 days

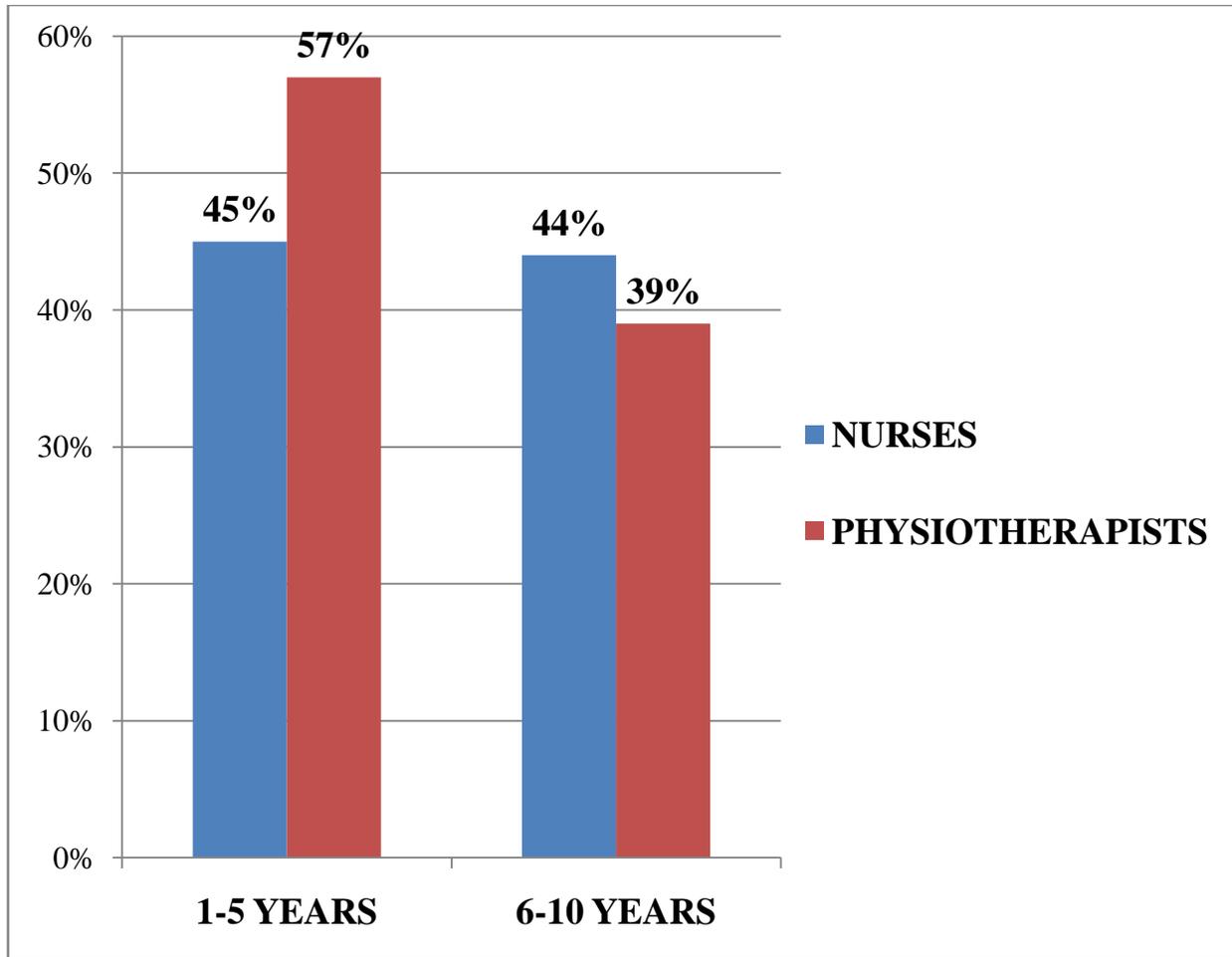


Figure 2: Longevity in service and WRMSDs amongst study participants

What is known about this topic?

- The commonest instrument used in the collection of data is the Nordic musculoskeletal disorders questionnaire.
- Many studies have demonstrated the prevalence and risk factors of this condition among Nurses and PTs individually

What this study adds

- This is the first data generated from Cameroon among Nurses and PTs collectively
- This study examined the longevity of service as a core risk factor of WRMSDs as reported by the participants.

Supporting Data

Citation	Place and country	Link
(Milhem <i>et al.</i> , 2016)	Israel	https://pubmed.ncbi.nlm.nih.gov/27518884/
(Narsigan 2015)	Taiwan	https://doi.org/10.4172/2165-7556.S4-003
(Asish <i>et al.</i> , 2019)	Dhaka City	http://sciaeon.org/articles/Work-Related-Musculoskeletal-Disorders-among-Physiotherapists-in-Dhaka-City.pdf
(Khairy <i>et al.</i> , 2019)	Egypt	https://www.id-press.eu/mjms/index
(Tinubu <i>et al.</i> , 2010)	Ibadan South Nigeria	https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/1471-2474-11-12
(Zayed <i>et al.</i> , 2019)	Egypt	https://www.researchgate.net/publication/330729010_Work-Related_Musculoskeletal_Disorders_among_nursing_staff_of_Tanta_University_Hospitals_pattern_risk_factors_and_coping_strategies
(Reed <i>et al.</i> , 2014)	Nigeria	https://doi.org/10.1186/1471-2474-15-196
(Adwgoke <i>et al.</i> , 2008)	Turkey	https://doi.org/10.1186/1471-2474-9-112
(Campo <i>et al.</i> 2008)	New York	https://doi.org/10.2522/ptj.20070127
(Chiwariidzo <i>et al.</i> , 2018)	Zimbabwe	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5960155
(Dhanya <i>et al.</i> , 2013)	India	https://doi.org/10.1155/2013/716897
(Yan <i>et al.</i> , 2018)	Xinjiang	https://doi.org/10.1155/2017/5757108
(Nordin <i>et al.</i> , 2011)	Ghana	https://doi.org/10.1590/S180759322011000300002