

## FREQUENCY OF FOOT AND ANKLE PAIN AMONG NURSES OF HAYATABAD MEDICAL COMPLEX-PESHAWAR

Abdur Rehman Khan<sup>1</sup>, Tahir Nadeem<sup>1</sup>, Sajida Mazher<sup>1</sup>, Shams Ul Hadi<sup>1</sup>

### ABSTRACT

**Introduction:** Nursing is the backbone of healthcare system which is mentally and physically demanding job. Since nurses remain on their feet for the majority of time, due to which they are more likely to suffer from foot and ankle problems. Therefore, the objective of the study was to find out the frequency of foot and ankle pain among nurses in Peshawar.

**Material & Methods:** A cross sectional survey was conducted among the nurses of Hayatabad Medical Complex, Peshawar. A total of 197 participants were approached for this study on the basis of convenient sampling. They included both male and female participants. Data was collected from different wards of the hospital. Aboriginal Foot and Ankle Injury Questionnaire was used to collect data and to determine the frequency of foot and ankle pain. For determining association of foot and ankle pain, Pearson correlation ( $r$ ) and Spearman correlation ( $\rho$ ) were used and  $p$  value of  $\leq 0.05$  was considered significant.

**Results:** Out of 197 participants, 192 responded to our questionnaire (response rate 97%). Of these, 70 were male (36.45%) and 122 were female (63.54%). The number of participants having no problem at their feet and ankle were 6 (3.1%) and 8 (4.2%) respectively. Participants having minor foot and ankle problem were 72 (37.5%) and 71 (37%) and those having moderate problem were 95 (49.5%) and 77(40.1%). Those having major foot and ankle problems were 19 (9.9%) and 36 (18.8%) respectively. A statistically significant correlation of foot pain was found with age and years of service. Similarly, correlation of ankle injury with BMI and years of service was found to be statistically significant.

**Conclusion:** The results of our study concluded that the frequency of foot and ankle pain was common among the nurses. Majority of our nurses had moderate and major foot and ankle pain. Our study also determined the relationship between some risk factors such as age, gender, BMI, years of service and shoe wear with foot and ankle pain.

**Key Words:** ankle, foot, musculoskeletal disorders, nurses, pain

**Authors' Declaration:** The authors declared no conflict of interest and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All authors contributed substantially to the planning of research, question designing, data collection, data analysis and write-up of the article.

### Authors' Affiliation

<sup>1</sup>Institute of Physical Medicine and Rehabilitation

### Corresponding Author

Sajida Mazhar

Institute of Physical Medicine and Rehabilitation

Email: sajida\_mazher@yahoo.com

**This article may be cited as:** Khan AR, Nadeem T, Mazher S, Hadi S. Frequency of foot and ankle pain among nurses of Hayatabad Medical Complex-Peshawar. Rehman J Health Sci. 2022;4(1). 10-13

Submitted: December 31, 2020 Revisions Submitted: December 25, 2021 Accepted: January 28, 2022

### INTRODUCTION

Musculoskeletal disorders are referred to those conditions which are responsible for affecting the cartilaginous, ligamentous, tendinous, articular, and muscular tissues of the human body. They are responsible for affecting the normal anatomy, physiology and kinematics of the human body.<sup>1</sup> Foot and ankle pain is defined as any pain which damages the muscles, ligaments, nerves, vessels, tendons, joints, bones and is located distally to fibula or tibia and is responsible for causing unpleasant emotional and sensory experiences in the body.<sup>2</sup> This pain is experienced by many different professionals like surgeons, dentists, teachers, dancers, security guards, traffic wardens but in nurses musculoskeletal pain particularly foot and ankle pain is very common due to the high demands placed on them.<sup>3</sup> Nursing is the profession which is responsible for providing different healthcare facilities to the patients and is mentally and physically very demanding. They have to stand and walk for very long periods of time.<sup>4</sup> Some environmental, biomechanical and physiological factors

are also attributed to foot and ankle pain or discomfort in the working environment.<sup>5</sup> The increased risk of foot pain in general population is also associated with factors such as female gender, advancing age, obesity, high BMI, high physical workload, standing, the type of flooring or the type of shoes and plantar fasciitis.<sup>2</sup> Job strain, manual handling of patients and heavy workload were also responsible for many musculoskeletal disorders in nurses.<sup>6</sup> On the other hand, footwear may also cause foot pain in nurses. To reduce fatigue and discomfort in the feet, emphasis should be placed on providing comfortable footwear for nurses. The foot health of the human being is directly affected by the characteristics of the footwear which he uses like insole, outsole, midsole, arch supports and also depends upon adequate ventilation to the feet.<sup>4</sup> Shoes are very important as they cover our feet and protects them from a variety of unpleasant stimuli in the environment but if shoes are ill-fitting than they can cause majority of deformities in the feet.<sup>7</sup> There is also a biomechanical difference in structure of foot between males and

females like narrower heels in relation with the forefoot, overall narrower feet in length and small Achilles tendons in females so they mostly suffer more from foot and ankle problems as a result of improperly fitting shoe wear.<sup>8</sup> Improper footwear can cause problems in feet such as corns, calluses, lesser toe deformities, bunions and if length of shoes is incorrect then it can lead to ulceration and pain in the feet.<sup>9</sup>

In general population the prevalence of foot and ankle pain is very high that is up to 30%. Foot and ankle pain is also common in young individuals and 50% of women between age 21 and 40 also experiences it during the past year.<sup>3</sup> In a study conducted across Pakistan to know the prevalence of musculoskeletal disorders among nurses, it was revealed that 78.5% nurses have some sort of musculoskeletal disorder and are suffering from pain of some kind.<sup>1</sup> A survey of 356 women aged between 20 and 60 showed that 88% of them wore improper or incorrect shoes and were responsible for causing the majority of foot pain in them.<sup>9</sup> Parker in his study conducted in 2009 has used foot function index (FFI) to determine how foot problems affect daily activities and other foot functions.<sup>10</sup> Tania Solange and co-workers in their study found a prevalence of musculoskeletal disorders to be 96.3% in the last year and a prevalence of 73.1% in the last week among nurses.<sup>11</sup> In Western and Asian populations, studies have shown a very high prevalence rate of work related musculoskeletal disorders in nurses.<sup>12</sup> Studies conducted in US showed that 239 nurses out of 10000 were affected from musculoskeletal disorders. Prevalence of musculoskeletal disorders among Turkey, China and Japan was found to be 77.1%, 70% and 37% respectively.<sup>13</sup> Musculoskeletal strains are continuously experienced by the nursing personnel so the frequency of work-related musculoskeletal disorders among them worldwide ranges between 40% to 90%.<sup>14</sup> Epidemiologic studies showed that foot and ankle pain in older women was twice more 56% compared with men 24%.<sup>15</sup> In a study conducted in England, 52% of 543 elderly subjects showed toenail, cutaneous and musculoskeletal conditions of the feet.<sup>16</sup>

In Pakistan the workload on nurses is many folds high and they have to go through various working environments. That is why this study is conducted to determine the frequency of foot and ankle pain among the nurses of Hayatabad Medical Complex, Peshawar.

#### **MATERIAL AND METHODS**

This study was conducted at Hayatabad Medical Complex, Peshawar. It was a cross sectional survey and duration of this study was 6 months. Total population of the nurses at the hospital was 400. Sample size for the given population was then calculated by using Raosoft. A total of 197 Nurses were recruited according to the inclusion and exclusion criteria from Hayatabad Medical Complex-Peshawar. Convenient sampling was used as sampling technique. Nurses who had at least one year of working experience, having age between 20-60 years and working at least 5 hours per day and 4 days per week were included in this study. Those nurses having recent trauma or fracture, any systematic disease leading to foot and ankle pain and those who were working in academic or administrative departments

were excluded. Data was collected by using Aboriginal Foot and Ankle Injury Questionnaire. Participants were assessed for foot and ankle pain using the Aboriginal Foot and Ankle Injury Questionnaire. Foot and ankle problems were categorized as having minor, moderate and major foot and /or ankle problems. Data was collected from 20 different wards from participants who were willing to take part in the process. Mean and standard deviation of the participant's age, height, weight, years of service, foot injury score and ankle injury scores were determined. Frequencies of some extra questions regarding footwear, treatment of foot and ankle pain, pain due to profession, fulfilment of the duty and change of duty due to pain were also mentioned. Association of foot and ankle injury score with BMI, age gender and years of service of the participants was established and correlation was also established among them for which Pearson correlation (*r*) and Spearman correlation (*ρ*) were used and a *p* value of  $\leq 0.05$  was considered significant.

#### **RESULTS**

Out of 197 participants, 192 responded to our questionnaire (response rate 97%). Of these, 70 were male (36.45%) and 122 were female (63.54%). The number of participants having no problem at their feet and ankle were 6 (3.1%) and 8 (4.2%) respectively. Participants having minor foot and ankle problem were 72 (37.5%) and 71 (37%) and those having moderate problem were 95 (49.5%) and 77(40.1%), respectively. Those having major foot and ankle problems were 19 (9.9%) and 36 (18.8%), respectively (Table 1). Majority of the nurses fell into moderate and major categories of foot and ankle pain. Thus 114 (59.4%) of our participants suffered moderate and major foot pain while 113 (58.9%) participants suffered moderate and major ankle problems.

A statistically significant correlation of foot pain was found with age and years of service whereas correlation of ankle injury with BMI and years of service was found to be statistically significant (Table 2).

A total of 60 participant, out of the total 197 nurses, thought that their foot and ankle pain was due to their footwear. Participants who had taken treatment for their foot and ankle pain prior to this study were 62 (32.3%) in number. Those participants that thought that their foot and ankle pain was because of their profession or duty were 99 (51.6%) in number. Furthermore 94 (49%) of the participants were of the opinion that they cannot fulfil their duty properly and participants who changed their place of duty due to their foot and ankle pain were 60 (31.3%) in number (Table 3).

#### **DISCUSSION**

In our study we used Aboriginal Foot and Ankle Injury Questionnaire which classifies foot and ankle pain into five categories. These categories include not a problem (<10), minor problem (10-22), moderate problem (23-35), major problem (36-47) and extreme problem (48-59). According to these criteria 3.1% participants were not having any problem in their foot, 37.5% had minor problem, 49.5% had moderate problem and 9.9% had major foot problem. Similarly, 4.2% participants didn't have any problem at their ankles, 37% had minor problem, 40.1% had moderate problem and 18.8% had major ankle problems. In order to compare our results

effectively with other studies, we have used moderate and major categories of foot and ankle pain. There is an increase work demand on nurses due to which majority of the nurses fell into moderate and major categories of foot and ankle pain. Thus 114 (59.4%) of our participants suffered moderate and major foot pain while 113 (58.9%) participants suffered moderate and major ankle problems.

In a cross-sectional survey done by Maki Tojo in a university hospital in Japan on nurses, the prevalence of foot and ankle pain was 23% using Nordic Musculoskeletal Questionnaire (NMQ) and 51% using Manchester Foot Pain and Disability Index (MFPDI). The results of the above-mentioned study using the latter questionnaire supports the results of our study while the results using the former questionnaire differs substantially from our studies. As discussed by Tojo, these differences in results of NMQ and MFPDI are probably due to the format of the questionnaire and how these questionnaires define foot and ankle pain.<sup>3</sup> Another identical study done in the hospitals of Lahore, Pakistan demonstrated that the prevalence of foot and ankle pain among nurses was 47.2%. This was considerably lower as compared to our own findings of foot pain (59.4%) and ankle pain (58.9%).<sup>1</sup> It is important to mention that the above-mentioned study was only conducted in females in five government hospitals of Lahore whereas our study included both male and female nurses but was conducted in only one hospital of Peshawar. A survey done in Brisbane, Australia in a paediatric hospital showed a prevalence of foot and ankle musculoskeletal disorders during the past year to be 55.3%.<sup>17</sup> This supports the findings of our study in which the prevalence of foot and ankle pain was 59.4% and 58.9% respectively.

We found that 31.3% participants in our study thought that their foot and ankle pain was due to their footwear while another study done in young urban working women showed that 68.5% of the participants accused footwear as the main cause of foot pain which is quite higher than the results of our study.<sup>18</sup> Our study involves both males and females while the above-mentioned study is only females were included.

A study done by Garrow *et al* shows that the prevalence of foot pain increases with advancing age reaching a peak up to 55-64 years and then declining in older adults.<sup>19</sup> This is in accordance with our study which also shows a significant correlation among age and foot pain demonstrating that as age advances, the foot pain also increases.

An association between foot and ankle pain and gender was determined in one more study in general population exhibiting that female had foot and ankle pain more prevalent in them while no association between foot and ankle pain and gender was found in our study.<sup>20</sup>

Those participants having foot pain also had a high BMI.<sup>21</sup> On the other hand, we found no significant association (0.197) between BMI and foot pain in our own study.

## CONCLUSION

The frequency of foot and ankle pain was common among the nurses. Majority of the nurses had moderate and major foot and ankle pain. Our study also determined that there is an association between some

risk factors such as age, gender, BMI, years of service and shoe wear with foot and ankle pain

## REFERENCES

1. Tariq S. Prevalence of Foot and Ankle Musculoskeletal Disorders in Nurses of Lahore Pakistan. *Global Journal of Medical Research*. 2018;18(1):18-22.
2. Wahlström J, Östman C, Leijon O. The effect of flooring on musculoskeletal symptoms in the lower extremities and low back among female nursing assistants. *Ergonomics*. 2012;55(2):248-55.
3. Tojo M, Yamaguchi S, Amano N, Ito A, Futono M, Sato Y, et al. Prevalence and associated factors of foot and ankle pain among nurses at a university hospital in Japan: A cross-sectional study. *Journal of occupational health*. 2017:17-0174-OA.
4. Chiu M-C, Wang M-JJ. Professional footwear evaluation for clinical nurses. *Applied Ergonomics*. 2007;38(2):133-41.
5. Reed LF. An investigation of foot and ankle problems experienced by nurses: Queensland University of Technology; 2007.
6. Stolt M, Suhonen R, Virolainen P, Leino-Kilpi H. Lower extremity musculoskeletal disorders in nurses: A narrative literature review. *Scandinavian journal of public health*. 2016;44(1):106-15.
7. Frey C, Thompson F, Smith J, Sanders M, Horstman H. American Orthopaedic Foot and Ankle Society women's shoe survey. *Foot & ankle*. 1993;14(2):78-81.
8. Frey C. Foot health and footwear for women. *Clinical Orthopaedics and Related Research (1976-2007)*. 2000;372:32-44.
9. Menz HB, Morris ME. Footwear characteristics and foot problems in older people. *Gerontology*. 2005;51(5):346-51.
10. Parker G, McEver M, Fanning L, Siefke A, Dobbs N. Do shoes matter? a story of shoes in the neonatal intensive care unit. *JONA: The Journal of Nursing Administration*. 2009;39(1):1-3.
11. Magnago TSBdS, Lisboa MTL, Griep RH, Kirchhof ALC, Camponogara S, Nonnenmacher CdQ, et al. Nursing workers: work conditions, social-demographic characteristics and skeletal muscle disturbances. *Acta Paulista de Enfermagem*. 2010;23(2):187-93.
12. Nur Azma B, Rusli B, Oxley J, Quek K. Work related musculoskeletal disorders in female nursing personnel: prevalence and impact. *International Journal of Collaborative Research on Internal Medicine and Public Health*. 2016;8(3):294-98.
13. Taghinejad H, Azadi A, Suhrabi Z, Sayedinia M. Musculoskeletal disorders and their related risk factors among Iranian nurses. *Biotechnology and Health Sciences*. 2015;3(1).

14. Attar SM. Frequency and risk factors of musculoskeletal pain in nurses at a tertiary centre in Jeddah, Saudi Arabia: a cross sectional study. BMC research notes. 2014;7(1):61.
15. Leveille SG, Guralnik JM, Ferrucci L, Hirsch R, Simonsick E, Hochberg MC. Foot pain and disability in older women. American journal of epidemiology. 1998;148(7):657-65.
16. Badlissi F, Dunn JE, Link CL, Keysor JJ, McKinlay JB, Felson DT. Foot musculoskeletal disorders, pain, and foot-related functional limitation in older persons. Journal of the American Geriatrics Society. 2005;53(6):1029-33.
17. Reed LF, Battistutta D, Young J, Newman B. Prevalence and risk factors for foot and ankle musculoskeletal disorders experienced by nurses. BMC musculoskeletal disorders. 2014;15(1):196.
18. Chua YP, Tan WJ, Yahya T, Saw A. Prevalence of nontraumatic foot pain among urban young working women and its contributing factors. Singapore Med J. 2013;54(11):630-3.
19. Garrow AP, Silman AJ, Macfarlane GJ. The Cheshire Foot Pain and Disability Survey: a population survey assessing prevalence and associations. Pain. 2004;110(1-2):378-84.
20. Thomas MJ, Roddy E, Zhang W, Menz HB, Hannan MT, Peat GM. The population prevalence of foot and ankle pain in middle and old age: a systematic review. Pain. 2011;152(12):2870-80.
21. Mølgaard C, Lundbye-Christensen S, Simonsen O. High prevalence of foot problems in the Danish population: a survey of causes and associations. The foot. 2010;20(1):7-11.

Table 1. Foot Injury Categories and Ankle Injury Categories

Severity Categories	Foot	Ankle
Not a problem (>10)	6 (3.1%)	8(4.2%)
Minor (10- 22)	72(37.5%)	71(37.0%)
Moderate ( 23- 35)	95(49.5%)	77(40.1%)
Major (36- 47)	19(9.9%)	36(18.8%)
Total	192(100%)	192(100%)

Table 2. Correlation of Age, BMI and Years of Service with Foot & Ankle Injury Score

Variables	Foot injury score		Ankle injury score	
	Sig.	Correlation	Sig	Correlation
Age	0.03	0.216	0.065	0.134
BMI	0.197	0.094	0.032	0.155
Year of service	0.001	0.240	0.007	0.195

Table 3 Extra Questions

Questions	Yes	NO
Do you think your foot/ ankle pain is due to your footwear?	60 (31.3%)	132 (68.8%)
Over the last 6 months, have you had treatment for your foot/feet injury?	62 (32.3%)	130 (67.7%)
Do you think your foot/ ankle pain is because of your profession/duty?	99(51.6%)	93(48.4%)
Do you think you can fulfil your duty properly due to foot/ ankle pain?	94(49%)	98(51%)
Have you ever been made to change your place of duty/ ward because of your ankle / foot pain?	60 (31.3%)	132(68.8%)