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Original Research Article

Association between BMI and plantar fasciitis among hospital staff in a selected hospital of Dhaka city

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ABSTRACT

Background: Plantar fasciitis described as the inflammation of planter fascia, particularly hampering an individual's daily living activities related to ankle and foot that impact on quality of life. The study aimed to identify the association between BMI and planter fasciitis among hospital staff in a selected hospital in Dhaka city.
Methods: A descriptive cross-sectional study.
Results: Mean±SD age of the respondents were 29.03±6.56 years. Among the hospital staff, the majority of the respondents were nurses 31.25%, 13.02% respondents were physician and 2.07% of respondents were physiotherapists, others were pharmacist, lab technician, administration staff, cleaner, security, information technologists and officers from the maintenance department of selected hospital. According to BMI scale the 65% were normal weight, 23% were overweight and only 12% were obese. In this study respondents who have only two family members, have strong relationships with BMI ($p<0.00$). Besides, the duration of work has a slightly significant relation with BMI ($p<0.03$) and BMI has a strong impact on level of pain ($p<0.01$) among respondents.
Conclusions: The recommendation for risk variables that have a strong correlation with plantar fasciitis is the working status, duration, and BMI.

Keywords: Body mass index, Planter fasciitis, Inflammation

INTRODUCTION

Plantar fasciitis (PF), is the most common musculoskeletal (MSK) complaint of the foot & referred to as heel spur syndrome or painful heel syndrome.[1] It is also described by pain or localised tenderness at the insertion of the plantar fascia on the calcaneus, which becomes worse on bearing weight in the morning or after periods of inactivity or with prolonged walking.[2] Beside this many synonyms have been used for PF such as jogger's heel, tennis heel, calcaneodynia in the past, and gonorrhoeal heel & which accounts for about 80% of cases of heel pain.[3,4] It attributed approximately 15% of all foot complaint visits to the health-care professionals having significant negative impacts on foot in particular and health-related quality of life. Though, the PF is one of the more typical soft-tissue conditions of the foot, but there is little understanding about its causes.[5] Majority of the study showed the factors as wearing inappropriate shoes, sedentary lifestyle, dancing and athletic activity.[6,7] A case-series reported that plantar fascia thickness (PFT), the presence of a heel spur and a higher body mass index (BMI) were associated with

PF.[8] There are a few types of research done in the field of PF and the associated factors but no study mentioned the Body Mass Index (BMI) as the factor and its association for hospital staff. In Bangladesh prevalence of PF and the relation with BMI as a causative factor has not been studied yet to the best of my knowledge. So, the purpose of the study was to find out the association between body mass index (BMI) and PF among health care professionals.

METHODS

Study design, location and population

It was a descriptive cross-sectional study where a total of 384 hospital staff has participated. A structured questionnaire was used to collect the necessary information from the participants and descriptive and inferential (Chi-square test) statistical analysis were used. Current study was carried out at BRB Hospital ltd., Panthopath, Dhaka, Bangladesh. Study population included the hospital staff who were working at BRB Hospital Limited, Panthopath, Dhaka, Bangladesh.

Inclusion criteria

Hospital staff with the age 18 years to above with the history of heel pain. Both male and female patients were included and those were willing to give consent.

Exclusion criteria

Hospital staff who were unwilling to participate in the study and suffering with any other serious pathological condition. Also, incomplete or unclear assessment were excluded.

Sampling technique

The purposive sampling technique was used for sample selection. Usually, the population is too large for the research to attempt to survey all of its members. A small, but carefully chosen sample was used to represent the population. The sample reflects the characteristics of the population from which it is drawn.

Instrument for data collection

Planter fasciitis pain scale (PFPS), a questionnaire was used to collect data for this study which was collected between January and February 2022. The checklist and medical records of all selected participants with PF were used.

Data analysis

The questionnaire was collated and checked for completeness. The researchers rechecked all administered copies of the questionnaire one by one. A coding guide was developed and used to facilitate coding and data entry into the computer. Each questionnaire was coded and entered into the computer using Statistical Package for Social Sciences (SPSS) version 20. The information obtained was summarized and interpreted based on the computation of the outcome. Descriptive analysis for quantitative variables including mean, median, and standard deviation was computed and self-esteem was measured using dichotomous (yes/no) responses. The data were organized and presented in simple tables and charts as applicable. Inferential analysis using the Chi-square test at a 5% level of significance.

RESULTS

The mean age of the participants was 29.03±6.56 years. Where most of the participants (46.6%, n=179) was age between 25 to 30 years old and almost all of the participants (87.5%, n=336) work 8 hours every day and 82.0% (n=315) of them were from semi-urban areas (Table 1).

Table 1: Respondents' demographic characteristics.

Variables		N	%
Age (years) Mean=29.03±6.56	18-24	69	18
	25-30	179	46.6
	31-35	66	17.2
	>35	70	18.2
Duration of work of the hospital staff (hours)	8	336	87.5
	10	29	7.6
	11	6	1.6
	12	13	3.4
Living status	Urban	56	14.6
	Semi-Urban	315	82.0
	Rural	13	3.4

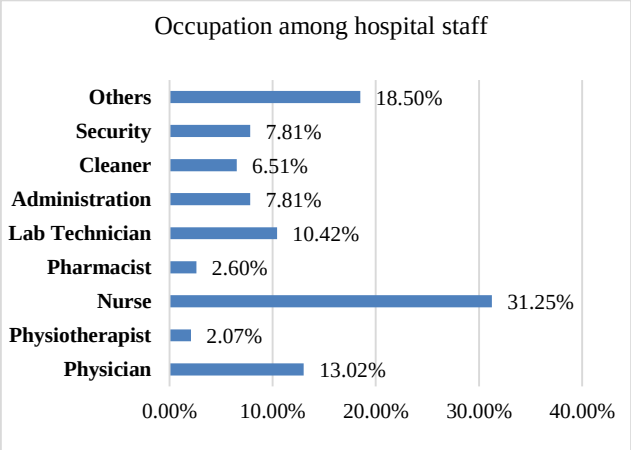

Figure 1: Distribution of occupation among hospital staff.

In case of occupation of the participants 31.25% (N=120) were nurse, 13.02% (N=50) were doctors, 10.42% (N=40) were health care technicians and 20.57% (N=80) were other staff (Figure 1). While measuring the distribution of BMI level among hospital staff, 65% (N=250) of them

were in normal weight, 23% (N=88) were overweight and rest of the 12% (N=46) were obese (Figure 2).

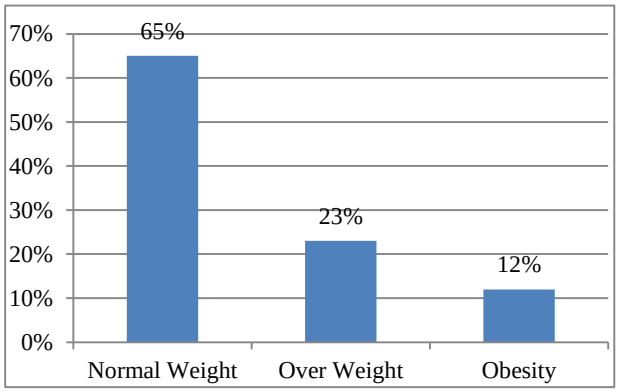

Figure 2: Distribution of BMI level among hospital staff.

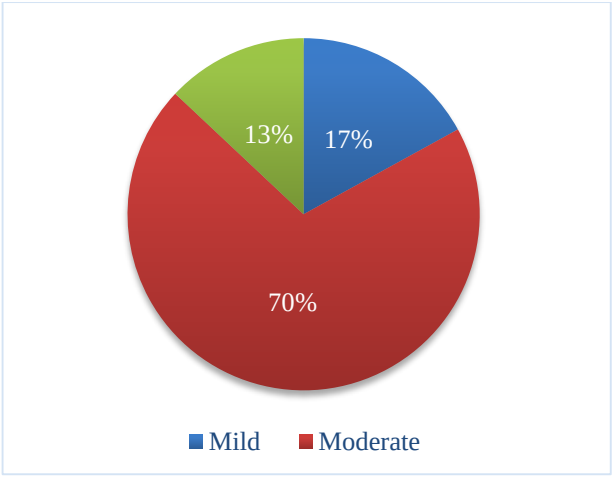

Figure 3: Distribution of severity level of pain among hospital staff.

Table 2: Association of BMI with PF pain among hospital staff.

BMI (N %)					
PFPS	**Normal Weight**	**Over Weight**	**Obese**	**Chi Square**	**P value**
Normal Pain	24 (72.7)	9 (27.3)	1 (4.8)		
Average Pain	40 (56.3)	21 (29.6)	10 (14.1)	21.48	0.001
Severe	2 (14.3)	12 (85.7)	2 (22.2)		

The level of heel pain among the hospital staff was measured using PFPS which described the level of severity of pain among the participants. 70% (n=269) of the participants responded that they feel moderate level of pain in their heel where 17% (n=65) had described that they had mild pain in heel area and 13% (n=50) had complained severe pain in the heel (Figure 3). The BMI of the participants with PFPS has shown a significant association where Chi-square value was 21.48 and p value 0.01 which is less than the value of 5% level of confidence ($p<0.05$) (Table 2).

DISCUSSION

In this study, a total of 384 respondents were interviewed working in this hospital. The mean age and standard deviation of the respondents was 29.03±6.56 years which coincides with results done by Crawford, Atkins and Edwards reported the ages of 25 and 65 years old.[3] Another two studies reported that PF affects 1 in 10 people at some point during their lifetime and most commonly affects people between 40-60 years of age.[9,10]

Among the total participants, 82% of respondents were living in semi-urban others in rural or urban areas. Though a cross-sectional study found that PF is common among rural people as they are not aware of the shoe or sole of the shoe.[11] A systematic review found low-quality evidence of an association between PF and weight-bearing tasks such as walking and standing on hard surfaces.[12] Figure 1 showed that the majority of the respondents (31.25%) were nurses 20.57% were Physiotherapists, and 13% were physicians other office assistants, Technologists, or pharmacists. The figure also shows that at least 13% of respondents were doctors in a cross-sectional study it was found that the prevalence of ankle and foot pain such as PF among nurses is 41.5% due to long-duration standing and walking.[13,14]

The researcher found that the duration of work has a slightly significant relation with BMI ($p<0.01$) which was categorized as <8 hours, 8-9 hours, and 10 or more hours in a day. Different studies suggested that prolong standing and frequent walking pose a risk factor for the development of plantar fasciitis.[15,16] In this study, the researcher found that obesity has a strong association with severe pain in both VAS and PFPS ($p<0.00$). Riddle, Pulisic, Pidcoe and Johnson reported on a matched case-control study regarding the association between BMI and PF that compared 50 patients with unilateral PF who attended a physical therapy clinic with 100 controls from the community or the clinic that concluded as BMI the risk of Planter fasciitis.[17] A systemic review also recommended the strong association between BMI and chronic heel pain.[18,19] In this study, the authors also found a consistent clinical association between higher BMI and plantar fasciopathy. A cohort study also reported as higher BMI was strongly associated with a higher prevalence of Planter Fasciitis.[20] However, the limitation of the study were small sample size and a selected hospital setting for data collection. Only the BMI was identified as a causal factor in this study. Subsequent research should focus on the other characteristics, preferably with a large sample size from numerous hospital settings in Bangladesh.

CONCLUSION

Male are predominantly more affected than females because the higher number of study participants were male. The working status, duration, and BMI are recommended as the risk factors which have a strong association with plantar fasciitis. It was also shown as important to develop research-based evidence of awareness among healthcare professionals in this area.

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