

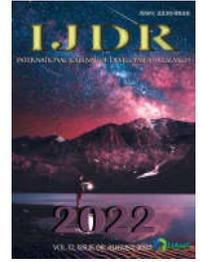


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RESEARCH ARTICLE

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FREQUENCY OF FOOT PAIN AND ITS INTERRELATION WITH FOOTWEAR AMONG FEMALE PARTICIPANTS IN SURAT DISTRICT

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ABSTRACT

Background: Foot pain can be acutely disabling for people of any age. There are multiple factors which are responsible for producing foot pain such as: ill-fitted footwear, chronic degenerative diseases, and increased age. **Aim:** This study was conducted to determine the frequency of foot pain and its association with footwear in females, and also to determine the activities that get compromised due to the foot pain. **Methods:** A cross sectional descriptive study was carried out among female. A self-administered questionnaire was distributed among 405 females aged 18 to 45 years. Google forms were sent through the internet participants in Surat. **Results:** More than half (54.20%) of the participants reported foot pain in the last one year using NRS (numeric rating scale). 62.80% of the participants thought that this pain is associated with footwear. Among the footwear choices, Chappal was the first choice chosen by female participants followed by shoes, sandal, mojdi, juti, flip flop and heels respectively. Statistically, an association was found between foot pain and foot wear with a p-value of less than 0.05. Also, it is statistically proven that most of the household activities get compromised due to the foot pain, while no significance was found between other activities such as studies, walk/jog, travelling with the foot pain. **Conclusion:** The study has shown that more than half of the participants experienced foot pain who chose the hard sole chappal, regular shoes, flat sandals, pointed mojdi and soft sole flip flops Along with it mostly the house hold activities get compromise due to foot pain in participants.

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INTRODUCTION

Foot pain is one of the most common musculoskeletal conditions. Foot pain refers to any pain and discomfort in one or more parts of the foot such as heel, arches, toes, soles. Faulty foot structure is the most common cause of planter fasciitis in women; it may result from wearing non-supportive shoes, such as flip-flops and ballet flats. Distribute the body weight to the weight bearing points of the sole. 2) Act as shock absorber during jumping by their spring like action.3) The medial longitudinal arch provides a propulsive force during locomotion.4) The lateral longitudinal arch functions as a static organ of support and weight transmission.5) The concavity of the arches protects the nerves and the vessels of the sole⁽¹⁾ Footwear has been used by humans for approximately 30,000 years⁽²⁾ A study held in Northwest Adelaide, Australia indicated that one in five people over age 18 years have reported foot pain with higher prevalence in females⁽³⁾ In Asian population, 50 percent of young urban working women reported recurrent non-traumatic foot pain and 68.4%

believed that the pain is associated with the footwear they wore at work⁽⁴⁾ Foot pain has been associated with reduced mobility⁽⁵⁾ and an increase in falls risk.⁽⁶⁾ Ill-fitting footwear can increase foot pain, reduce stability inhibit relevant rehabilitation and increase hyperkeratotic lesions.^(7, 8) Footwear characteristics such as heel height, toe box width, sole hardness and thickness have all been identified as elements that contribute to foot pain^(9, 10) The Cheshire Foot Pain and Disability Survey reported symptoms of disabling foot pain and that this condition is likely to be multi-factorial in origin⁽¹¹⁾.

METHODS

Participants: Females aged between 18 to 45 years.

Study design and setup: The study was carried out in surat district among female (n= 405) using self-administered questionnaire. A cross sectional survey was conducted through e- chat application over

a period of 6 months between December 2020 and May 2021. The consent of participants was taken prior to commencing of study.

Outcome measure:

- Self administered questionnaire (Google form)
- Numeric rating scale
- BMI calculator

Procedure: A self- administered questionnaire was made with the help of Google forms and was distributed among female participants between the age of 18 and 45 years. The Google form was made in two languages i.e., in English and Gujarati and the participants were required to fill the questionnaire, which included their demographic information and questions related to their foot pain, associated symptoms and quality of life. Confidentiality of data was maintained throughout and participants who voluntarily agreed were selected for the study.

Statistical analysis: Counts and percentages were reported for categories such as BMI, type of footwear, severity of pain and the activities being compromised. Pearson chi-square test was applied to find out the association between the variables. Data was entered and analyzed using IBM-SPSS version 20. A p-value less than 0.05 were considered statistically significant.

RESULTS

A survey study was carried out in surat district among female (n=405) using self- administered questionnaire. Table 1 shows the categories of participants according to their BMI scores.

Table 1. Classification of participants according to BMI

Category	Frequency	Percentage
Under weight	67	16.5
Normal weight	228	56.3
Over weight	85	21.0
Obese	25	6.2
Total	405	100

Table 2. Association of type of footwear and foot pain

Type of Footwear	Characteristics	Foot Pain				P-Value
		Yes		No		
		N	%	N	%	
Chappal	Soft	66	40.7	96	59.3	0.00
	Hard	95	73.6	34	26.4	
	No	59	51.8	55	48.2	
Shoes	Sports	29	35.4	53	64.6	0.00
	Regular	41	35	76	65	
	No	150	72.8	56	27.2	
Sandals	Flat	47	42.3	64	57.7	0.00
	Heel	14	38.9	22	61.1	
	No	159	61.6	99	38.4	
Mojdi	Pointed	14	48.3	15	51.7	0.00
	Rounded	34	31.8	73	68.2	
	No	172	63.9	97	36.1	
Flip-Flop	Soft	36	38.7	57	61.3	0.00
	Hard	10	37	17	63	
	No	174	61.1	111	38.9	
Heels	<2 inch	39	39.4	60	60.6	0.002
	>2 inch	12	50.0	12	50.0	
	No	169	59.9	113	40.1	

Table 2 & Table 3 reveals the association of footwear type, severity of foot pain and activities which get compromised due to that. The results revealed that 22.2% participants complained of mild pain which affects their studies, 55.5% found with moderate pain and 22.2% participants found with severe pain, 62.4% participant of moderate pain were affected with household chores, 25.3% participants of severe pain complained their walking, jogging and exercise activities were affected, 11.8% of mild pain participants said that it effects on travelling, however there was no significant association found between severity of pain and activities that get

compromised by the participants except household chores activity. Foot pain is one of the most common musculoskeletal conditions. Foot pain refers to any pain and discomfort in one or more parts of the foot such as heel, arches, toes, soles. Faulty foot structure is the most common cause of planter fasciitis in women; it may result from wearing non-supportive shoes, such as flip-flops and ballet flats. Distribute the body weight to the weight bearing points of the sole. 2) Act as shock absorber during jumping by their spring like action. 3) The medial longitudinal arch provides a propulsive force during locomotion. 4) The lateral longitudinal arch functions as a static organ of support and weight transmission. 5) The concavity of the arches protects the nerves and the vessels of the sole⁽¹⁾ Footwear has been used by humans for approximately 30,000 years⁽²⁾ A study held in Northwest Adelaide, Australia indicated that one in five people over age 18 years have reported foot pain with higher prevalence in females⁽³⁾. In Asian population, 50 percent of young urban working women reported recurrent non- traumatic foot pain and 68.4% believed that the pain is associated with the footwear they wore at work⁽⁴⁾ Foot pain has been associated with reduced mobility⁽⁵⁾ and an increase in falls risk⁽⁶⁾ Ill-fitting footwear can increase foot pain, reduce stability inhibit relevant rehabilitation and increase hyperkeratotic lesions.^(7, 8) Footwear characteristics such as heel height, toe box width, sole hardness and thickness have all been identified as elements that contribute to foot pain^(9, 10). The Cheshire Foot Pain and Disability Survey reported symptoms of disabling foot pain and that this condition is likely to be multi-factorial in origin⁽¹¹⁾.

DISCUSSION

The study was carried out among randomly selected females with Foot pain refers to any pain and discomfort in one or more parts of

the foot such as heel, arches, toes, soles. Foot pain is one of the most common musculoskeletal conditions. Our targeted population was female participants aged between 18 to 45 years belonging to different professions. taranjit kauret concluded The numerical results indicate the middle age group subjects have statistically significant higher tendencies towards the foot problems in contrast to the lower and the higher age group subjects Also, the prevalence of the foot problems and their related associations in women are higher compared to men.⁽¹²⁾ The main aims of our study; first to determine frequency of foot pain among female participants in Surat district.

Table 3. Association of severity of pain and the activities compromised

Compromised Activity		Mild Pain (0-3)		Moderate Pain (4-6)		Severe Pain (7-10)		P- Value
		n	%	n	%	n	%	
Studies	No	34	16.1	122	57.8	55	26.1	0.881
	Yes	2	22.2	5	55.5	2	22.2	
Household chores	No	25	28.7	44	50.6	18	20.7	0.00
	Yes	11	8.3	83	62.4	39	29.3	
Walk /Jog /Exercise	No	26	19.5	72	54.1	35	26.3	0.240
	Yes	10	11.5	55	63.8	22	25.3	
Travelling	No	34	16.7	117	57.6	52	25.6	0.848
	Yes	2	11.8	10	58.8	5	27.4	
Others	No	33	15.8	120	57.4	56	26.8	0.337
	Yes	3	27.3	7	63.6	1	9.1	
None	No	21	11.1	116	61.4	52	27.5	0.00
	Yes	15	48.4	11	35.5	5	16.1	

Second, the association between the foot pain and footwear worn commonly in day to day life. Third, the association between the activities that get compromised due to the foot pain. In our study we found that out of 405 participants, 175 female participants had foot pain ranging in age group from 36 to 45. Similarly with the North West Adelaide health study in which strong linear relationship between the foot pain and increased age was observed⁽³⁾ A strong association has been found between the foot pain and foot wear types in our study statistically, with a p-value of less than 0.05. Those who chose hard sole chappal (73.6%), regular shoes (35%), flat sanddal (42.3%), pointed mojdi (48.3%) and soft sole - flip flops (38.7%) have higher incidence of getting foot pain. we found that due to foot pain the most compromised activity was household chores with a p-value of 0.00, while in other activities such as studies, travelling, walk/jog, exercise no association was found between them and foot pain. It has been evidently proved in our research that different types of footwear affect the foot's health. Other research profiled the types of outdoor footwear worn most in a large diverse inpatient population and the factors associated with wearing them. Sex was the most consistent factor associated with outdoor footwear type. Females were more likely to wear thongs and sandals⁽¹³⁾. People who wear ill-fitted footwear can have constriction of structure as well as can also have an effect on function of foot and thus increasing the prevalence of foot pain. In addition, it has been found in our research that individuals who wore hard sole footwear were at greater risk for having foot pain. Andrew k concluded a large proportion of the population wear incorrectly sized footwear, which is associated with foot pain and foot disorders. Greater emphasis should be placed on both footwear fitting education and the provision of an appropriately large selection of shoes that can accommodate the variation in foot morphology among the population; particularly in relation to foot width.⁽¹⁴⁾ it is also observed that among the different choices available for choosing the footwear, the most common reason was comfort and support. In Roma people wear flip flops and slippers and non-Roma people running shoes and walking shoes. These findings reveal cultural differences that make it easier for the Roma population to experience a greater burden of foot health problems⁽¹⁵⁾ We also found that foot pain has a significant impact on health related quality of life. Due to foot pain the most common activity which gets compromised is household chores that have been proved in our research. There is a need to create awareness and knowledge among the population to make appropriate footwear choices that can fit properly and accommodate biomechanically. Also, the footwear designers need to produce footwear which is ergonomically and biomechanically correct.

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