



Original Article

Association between Foot Pain and High Heeled Shoes in Working Women

Saba Fatima^{1*}, Usman Riaz¹, Ayma Sadia², Maham Khalid³, Ahmed Jamal⁴ and Tamkhat Ilyas⁵¹Physiotherapy Department, Fatima Memorial Hospital, Lahore, Pakistan²Department of Physical Therapy, Government College University, Faisalabad, Pakistan³Afro-Asian Institute, Lahore, Pakistan⁴NUR International University, Lahore, Pakistan⁵Department of Physical Medicine and Rehabilitation, School of Health Sciences, University of Management and Technology, Lahore, Pakistan

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*Corresponding Author:

Saba Fatima
Physiotherapy Department, Fatima Memorial Hospital, Lahore, Pakistan
sabaf651@gmail.com

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ABSTRACT

Women have been wearing high heels for decades and they remain a must-have for females going out on the town or to the workplace every day. It causes prolonged pressure on the muscles, bones, and tissues of the feet and ankles, on the other hand, may cause chronic foot discomfort or abrupt injuries that need surgical intervention in the feet and ankle. **Objective:** To determine an association between foot pain and high-heeled shoes in working women. **Methods:** A cross-sectional study was conducted to measure the prevalence of foot pain among females wearing heeled footwear, focusing only working women. A sample size of 285 was taken. Foot Health Status Questionnaire was used to collect data from the respondents from different areas of Lahore. The data was collected from office workers and school teachers. Considering inclusion and exclusion criteria, females were requested to participate. The questionnaire consisted of 13 questions that were used in this survey. The questionnaire had multiple options out of which only one option was to be selected which was nearest to representing their condition of foot. All the data was analyzed on SPSS (version 25) software. A scoring of 0-100 was used to calculate the results. **Results:** According to this study, a majority of 162 females had mild to moderate foot pain, 84.4% of females had foot pain and 15.6% of females had no pain. Foot pain had a statistically significant association with walking, climbing stairs, and doing work or activities, (P-value 0.000). Respondents having foot pain couldn't do all the above activities normally. Restrictions and limitations were found among the respondents with foot pain. A P-value of less than 0.05 indicates that there is a significant association between the severity of foot pain and difficulties during work or activities of daily life. **Conclusions:** The study concluded that there is very high prevalence of foot pain (96%) among females wearing high heels. Long term use of high heels significantly affects the foot health and activities of respondents

INTRODUCTION

Fashion pressures and modern lifestyles have encouraged women to wear high-heeled shoes and have become a dominant choice of these women among all footwear. High heel shoes on one side enhance attractiveness [1]. On the other hand, the long term use can cause severe harm to the lower limb and many other parts of the body. Despite of knowing their harm, females still use high heels. According to much research, 37%-69% of females wear high-heeled shoes on daily basis. Once the humankind felt need of something that would protect them from ground, hot and

cold soil and help them to cover their feet and protect them from sharp objects and thus shoes were formed for protection purposes [2,3]. A high heel consists of three components a heel, a sole and an upper. The heel lifts the body and foot in an upward direction and on the other hand supports the heel of foot, while the sole is present between foot and floor, and the upper holds the foot and remain it in the shoe so that walking must be done conveniently [4]. Wearing heels also cause forced change in the distribution of pressure on foot and lower extremities. The planter

pressure of the foot is also severely disturbed [5]. Use of high heels on daily bases has a negative effect to foot structure and morphology leading to forefoot and first metatarsal being affected the most [6]. The feet are the only body part that connects the body to the ground while bearing all the body weight and ground reaction forces during standing and walking positions. According to the past studies high heels alter pressure distribution on front of the feet and could transfer third, fourth and fifth metatarsals toward the first and second metatarsal heads [7]. In short, the females who wear high heels on regular basis are at risk of having foot pain, several musculoskeletal problems of foot and changed gait patterns [8]. The intensity of foot pain may depend upon the frequency and duration of use of heels. This may change the foot function and biomechanics of lower extremities [9]. When wearing heels foot discomfort may be felt anywhere in the foot, especially in toes, arches and sole are affected the most. The sub-tallar joint is also affected which is responsible for eversion and inversion [10]. For instance, the long arch of the foot is elevated in vertical direction and uneven pressure distribution is observed all the weight is forwarded towards the forefoot and toes [11]. Pointed-toe box shoes cause hallus valgus (bunion formation) [12] as it produces high peak pressure on medial heel area as well as hyperkeratosis skin around the fifth digit due to its style [13]. Similarly, many other types of high heel shoes cause different deformities. Other than foot problems include ankle sprain, back pain, knee pain, poor posture and gait, Achilles tendonitis, planter fascia becoming tight and many others. But still high heel footwears are one of the top choices of females in every society [14]. But sometimes in some professions, high heel is not a choice, women have to wear high heels to meet the professional demands as in corporate professional customer-facing office roles and many others. Sometimes, to meet leg length discrepancy, some people also use heels to keep both legs equal. In this case, males are also affected due to heel wearing [15]. High heels will shift the force of each footstep so that the most pressure ends up on the ball of the foot and on the neighboring bones at the base of the toes. When wearing flats, the entire foot would absorb this impact [16]. Foot pain has been highly prevalent among females wearing high-heeled footwear [17]. Most of the females wear high heels and this increases the chance of foot pain [18]. Foot biomechanics and structural disturbances also occur causing pain [19].

METHODS

This was cross-sectional survey study. The data was collected from different areas of Lahore including Thokar

Niaz Baig (Pride school, Quaid-e-Azam Public School, Oxford Grammar School, Allied School,) and Shahdra (Railway Station Office) Sample size of 285 was calculated by using Rao Software. Population size: 20,000, Confidence interval: 95%, Margin of error: 5%. The study was performed in working women including school teachers and office workers. Convenient sampling technique was used to collect data for prevalence of foot pain among females wearing high heels. The sample was collected by the following criteria, females, age above 15 years, wearing high heels for minimum 4-5 hours/day for 6 months for 2 years. Having a history of diabetes, musculoskeletal problems, rheumatoid arthritis, osteoarthritis, previous foot trauma, foot surgery or any other disease related to the foot, Abnormal gait etc were excluded. Data was analyzed using SPSS excel (version 25). The measuring tool for this study was Foot Health Status Questionnaire (FHSQ) which was a standard questionnaire. The questionnaire consists of 13 questions. Questions provide information about the respondent's intensity of foot pain, activities limited by foot pain; difficulties were choosing footwear and foot health. The questionnaire do not provide a global score and the data was analyzed by using a scoring method ranging from 0-100 [20,21]. The questionnaire requires a single response from the respondents. Each question gave several options out of which respondents must choose a single option. Different responses were received from different people and then the results were analyzed. The reliability of the scale used is 0.82 and its validity is 0.86

RESULTS

The demographic information of the participants is given in Figure 1 as shown.

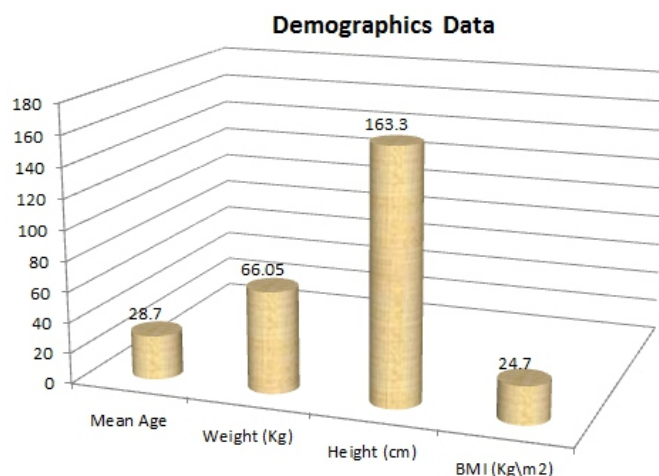


Figure 1: Demographic Data of the Participants
Table 1 shows that out of 39 respondents having no foot

pain during the past week, 16 faced no difficulties in work or activities, 20 had slight, 3 moderate and no one had severe difficulties. Out of 36 respondents having very mild pain, 6 had no difficulties, 16 slight, 7 moderately, 7 quite a bit and no one had extreme difficulties. Out of 90 respondents having mild pain 7 had not at all, 28 had slight, 33 moderate, 15 quite a bit and 7 had extreme difficulties. Out of 63 respondents having moderate foot pain, 2 had no difficulties, 14 slightly, 25 moderately, 19 quite a bit and 3 were extremely disturbed. Out of 22 respondents having severe pain no one had no difficulties, 2 had slight difficulties, 3 moderate, no one had quite a bit of difficulties and 17 faced extreme difficulties during work or activities due to foot pain. Proved from the crosstab majority of the respondents i.e. 33 have mild pain and moderate difficulties. The calculated value of chi-square (178.753) and p-value of less than 0.05 indicate that there is a significant association between the severity of foot pain and difficulties during work or activities of daily life.

Foot Pain	Foot health status					Total	P-value
	Not At All	Slightly	Moderately	Quite a bit	Extremely		
None	16	20	3	0	0	39	0.000
Very Mild	6	16	7	7	0	36	
Mild	7	28	33	15	7	90	
Moderate	2	14	25	19	3	63	
Severe	0	2	3	0	17	22	
Total	31	80	71	41	27	250	

Table 1: Cross Table Between Respondents Level of Foot Pain Vs Foot Health Status

DISCUSSION

This study mainly focused on the prevalence of foot pain among females who were long-term users of heels [22]. This study provides knowledge about foot pain, reasons of foot pain, frequency of footwear and effect of foot pain upon their normal activities, work, walking, climbing stairs, type of footwear either they are limited in selecting footwear or not and what type of footwear comfortable for them during foot pain [23]. Moreover, foot health and frequency of foot pain is also discussed in the survey. Responses of the respondents show their level of foot pain and condition of foot health. The selected questionnaire gives information to be collected about foot health, foot pain, footwear and activities that are restricted due to foot pain. According to this survey, 36% (n=90) respondents had mild foot pain and 25.2% (n=63) had moderate foot pain.

The overall prevalence rate of foot pain in high heel users in this study is 84% which is higher than that conducted by CL Hill et al., in Australia which was 17.4% [24]. It was nearest to a study conducted by Jill Dawson et al., 83% [25]. According to this study, 84% (n=211) females out of 250 had foot pain and 15.6% (n=39) had no pain which contradicts

the study conducted by N Venkatesh Kuma et al., according to which 44% (n=44) females out of 100 had heel pain and 56% (n=56) had no pain due to wearing heels [23,26]. The study conducted by Yeok Pin Chua et al., gathered information from 400 females out of which 50% females had foot pain which contradicts this study [27]. According to a study conducted by Saima Jabbar et al., 77.5% of the population in their study was affected by heels that is closer to our study [28]. A study conducted by Max Barmish et al., also shows that wearing high heels is detrimental to female's health that shows similarity with the result of this study [29]. This study also gives knowledge about females' shoe wear selection with foot pain. 26.9% (n=74) females strongly agreed to have difficulties in finding shoes that do not hurt their feet, 25.2% (n=63) females had a few difficulties in finding shoes that fit in their feet and 24.8% (n=62) had severe limitations in wearing number of shoes. These results negate the study carried out by Moira McRitchie et al. In 2018 upon 67 females who received podiatric treatment due to wearing narrower and such shoes that do not fit in their feet, a high prevalence of 91% (n=61) was observed [30]. A large ratio of females having no difficulties in foot wear and selection was observed. This study also negates a study conducted by Yeok Pin Chua in 2013 which gives a percentage of 68.4% females that had foot pain due to foot wear and these were mostly working women [27]. Many females use high heeled foot wears in their routine. This study was conducted to improve the foot health of women; the study was undertaken because a few population based studies have examined the association of foot pain and high heeled shoe wear. Foot pain related to shoe wear is common yet only few studies were found which examined this condition. To give awareness of problems originating from the use of high heeled shoes among females. The study emphasizes to give awareness to the females about the side effects of using heels e.g. long term use of heels leads to chronic foot pain and other dysfunctions. Females should be guided either to wear flat shoes or lessen the use of heels in order to avoid further discomforts. For shoe industry this is recommended to make shoes of good quality having a good sole and if high heels, and then maintain the quality of shoe as well as heel. Medicated shoes must be promoted on a larger level and awareness must be created to wear medicated shoes especially in females.

CONCLUSION

The study concluded that very high prevalence of foot pain among females wearing high heels. Long term use of high heels significantly affects foot health and activities of respondents.

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