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RESEARCH ARTICLE

Effect of prolonged wearing high heeled shoes on occurrence of low back pain (LBP) and disability among females in ALJouf city.

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Abstract

Objectives: To study the effect of prolonged wearing high heeled shoes on occurrence of low back pain and disability among females in ALJouf city, Saudi Arabia.

Subjects and Methods: Visual Analogue Scale, Arabic Oswestry Low Back Pain Questionnaire and Arabic Quebec Back Pain Scale were distributed to 104 worker females (45 of participants were females who wear high heeled shoes regularly at least for six months, while 59 were females who wear flat shoes regularly and never wear high heeled shoes) at ALJouf city.

Results: wearing high heeled shoes is widely spreading among married women in with age group between 25-35 years while single females prefer wearing flat shoes particularly at age group 15-25 years. In addition, the mean of severity of low back pain among females wearing high heeled shoes regularly was ± 5.84 while women wearing flat shoes was ± 2.16 . Further fore, disability mean for high heel group was ± 11.33 , ± 25.35 whereas flat group was ± 5.32 , ± 9.89 depending on (OLBPQ) and (QBPQ).

Conclusion: The current study concluded that, low back pain and disability for women who are wearing high heeled shoes regularly are higher than that in women are wearing flat shoes.

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INTRODUCTION

During the early 21st century, women started to wear high-heeled shoes in order to satisfy their desire to be more beautiful and more fashionable. The use of high-heeled shoes is being a common habit increasing gradually among adults. Moreover, High heel shoes have been one of the essential part of a woman's fashion that reflects her personality. This footwear could change the women's posture and gait in order to make her appear "more attractive". Any footwear has heel over 4 cm is might consider as high heel shoe (Lee, et al., 2001, and Silva, et al., 2013).

Although millions of women wear high heeled shoes, little of them had information only about the negative side effects of high heel shoes. In fact, many women going crazy about high heeled shoes designs and colors but they ignore the postural effects that they can create (Kerrigan, et al., 1998).

Lee, et al.,(2001) and Russell, et al.,(2012) demonstrated that, there are many consequent negative side effects, such as lower back pain due to increased lumbar lordosis, leg pain as result of overweight placed on the toes , sprained ankles, shortened Achilles tendon and hyper pronation of the ankle joint, increased oxygen consumption and other changes in the gait pattern such as changes in walking speed and degenerative osteoarthritis of the knee. All of the above effects can significantly increase pain, discomfort, fatigue and disability levels especially at work while the

low back pain is a most common complaint. As a result , Some doctors and therapists advise women who are suffering from low back pain to avoid wearing high-heeled shoes.

Low back pain (LBP) is a significant public health problem in Western developed countries and has been reported to affect up to 80% of adults. In addition,it could be defined as perception of pain in the posterior aspect of the body between the inferior border of the rib cage and the inferior gluteal fold (Anema, et al., 2009, and Al-Eisa.,2010).

The prevalence and incidence of low back pain generally is high. It is predicted to be the second complaint of patients particularly during their second and fifth decades after upper respiratory tract infection and it is one of the most common causes that every occupational physician faces each day in his/her daily duty. In fact, LBP might exceed 50% of referrals to outpatient physiotherapy department. Moreover, low back pain is also considers as the most common reason for long-term disability and work disability in the United States of America and some of other industrialized countries (Chuter, et al., 2014, Al-Eisa.,2010, and Shabat, et al., 2005).

In addition, Mostafa, et al., (2010)and AlDajah, et al., (2013) estimated that, in the Kingdom of Saudi Arabia, 61.5% among health care staff are suffering from low back pain which could affect the quality of their life. This low back pain can be avoided by maintenance of good posture and good transferring techniques using good footwear.

Based on researcher view, there are lots of women fond of wearing high heel shoes in ALJouf city during working and general celebrations without asking about their harms on the body mechanism.

I that, the current study will help physiotherapist in assessing patients complaining of low back pain and disability, as well, it will help patients to be aware of the risks of wearing high heeled shoes and chose the correct foot wear.

Therefore, the aim of the current study is to investigate the relationship between prolonged wearing of high heeled shoes and its effect on occurrence low back pain which might lead to disability among females in ALJouf city.

The current study will discuss the following three questions:

- Is there a difference in pain score between females wearing high heeled shoes regularly and females wearing flat shoes?
- Is there a difference in low back pain score between females wearing high heeled shoes regularly and females wearing flat shoes?
- Is there a difference in disability score between females wearing high heeled shoes regularly and females wearing flat shoes?
- Is there a relationship prolonged wearing high heeled shoes and occurrence of low back pain and disability?

Methodology

1-Research design

The current study is descriptive comparative study.

2-Site of the study

Faculty of applied medical science – ALJouf University.

3-Participants

104 volunteer females were collected randomly from ALJouf city in the Kingdom of Saudi Arabia.

Period of data collection

from 5\11\2015 to 25\11\2015

Inclusion criteria

- 1- Worker females.
- 2- Age over 18 years.
- 3- Two groups: the first group consisted of females who wear high heeled shoes regularly at least for six months, while the other group were females who wear flat shoes regularly and never wear high heeled shoes .
- 4- Healthy females with no deformity or diseases.

exclusion criteria

- 1- Males.
- 2- Children.
- 3- Females wear both high heeled shoes and flat shoes alternatively.
- 4- Females with spinal deviations or deformities.
- 5- Females with osteoporosis.
- 6- Pregnant women.
- 7- Morbid obese women.

4-Instruments

- 1- Visual Analogue Scale (VAS): is a 10 cm line which is used to score intensity of the pain (Waddell,1987).
- 2- 2- Arabic Oswestry Questionnaire: is Arabic translated questionnaire which can detect effect of low back pain on ability to perform activities of daily living (Guermazi, et al., 2005).
- 3- 3-Arabic Quebec Back Pain Scale: is also Arabic translated questionnaire which can detect effect of low back pain on ability to perform activities of daily living (Alnahhal, et al., 2012).

5-Procedure

Data were collected from participants in their place of work after an approval letter from the director of the faculty. Study tools were distributed to (104) female workers and students after translating them to Arabic language and taking oral consent from each participants to share in the current study. The purpose and study design were explained to the study subjects. Each participant completed the three tools individually with helping by the researcher. Data analysis was done after gathering study tools from participants.

6-Results

A total number of 312 questionnaires were distributed to 104 worker females.

Table 1: Distribution of socioemographic characteristics for both groups (N = 104).

Items		high heeled shoes (N = 45)		flat shoes (N = 59)		Total (N = 104)	
		No	%	No	%	No	%
Age	15-25 year	11	24.4	42	71.2	53	51.0
	25--35 year	17	37.8	14	23.7	31	29.8
	35--45 year	13	28.9	2	3.4	15	14.4
	>45 year	4	8.9	1	1.7	5	4.8
	Total	45	100.0	59	100.0	104	100.0
	Mean ± SD	32.68	±8.04	24.89	±6.39	28.26	±8.10
Marital status	Single	6	13.3	30	50.8	36	34.6
	Married	39	86.7	29	49.2	68	65.4
	Total	45	100.0	59	100.0	104	100.0

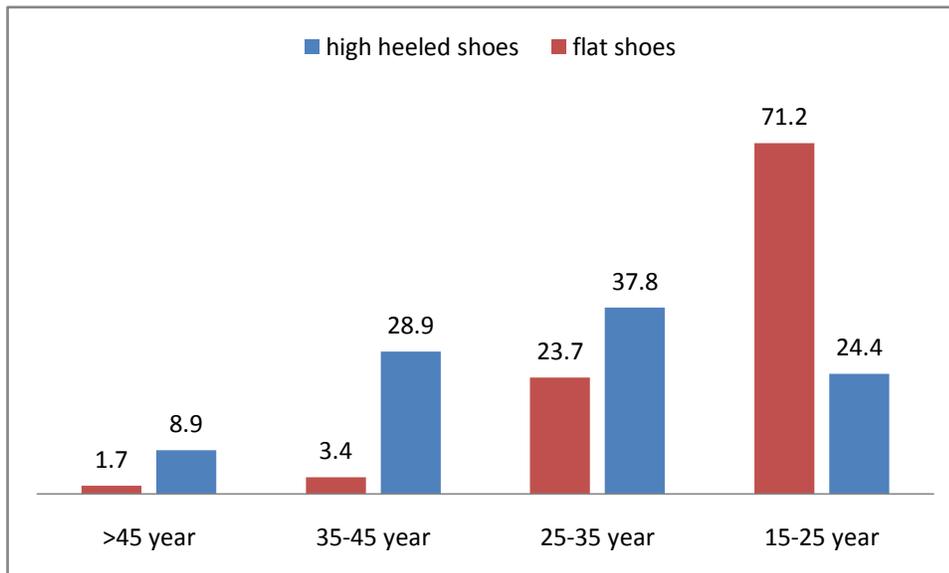


Fig. 1) Distribution of Age of The Studied Sample (N = 104).

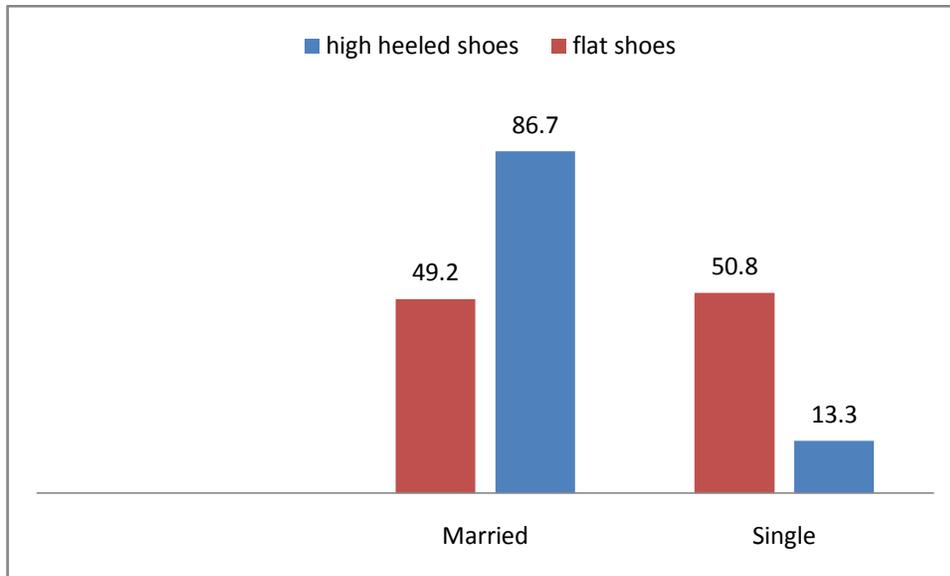


Fig. 2) Distribution of Marital status of The Studied Sample (N = 104).

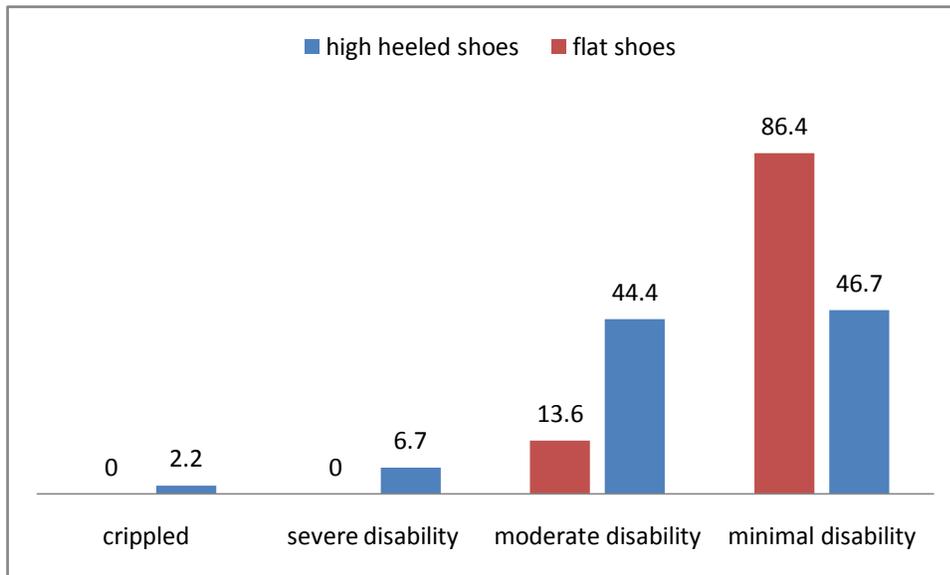


Fig. 3) Distribution of low back pain disability (oswestry questionnaire) among The Studied Sample (N = 104).

Table 2: frequency Distribution of low back pain disability (oswestry questionnaire) of The Studied Sample (N = 104).

items			high heeled shoes (N = 45)		flat shoes (N = 59)		Total (N = 104)	
			No	%	No	%	No	%
oswestry back pain disability questionnaire	low pain	minimal disability(0-	21	46.7	51	86.4	72	69.2
		moderate disability	20	44.4	8	13.6	28	26.9
		severe disability	3	6.7	0	0	3	2.9
		crippled	1	2.2	0	0	1	1.0

	Total	45	100.0	59	100.0	104	100.0
	Mean ± SD	11.33	±7.26	5.32	±4.38	7.92	±6.50
Visualanaloguesca (VAS)	Mean ± SD	5.84	±2.66	2.16	±2.26	3.75	±3.04

Table 3: differences between high heeled shoes and flat shoes subjects in relation to the Quebec back pain disability scale

Items		high heeled shoes (N = 45)		flat shoes (N = 59)		Total (N = 104)	
		Mean	± SD	Mean	± SD	Mean	± SD
the quebec back pain disability scale	Mean ± SD	25.35	±16.13	9.89	±8.05	16.58	±14.38

Table 4: Differences Between oswestry low back pain disability questionnaire and the quebec back pain disability scale for high heeled shoes group.

	oswestry low back pain disability questionnaire		the quebec back pain disability scale		T- value
	Mean	± SD	Mean	± SD	
high heeled shoes (N = 45)	11.3333	7.26135	25.3556	16.13882	10.470**

** = significant at the 0.01 level (2-tailed).

Table 5: Differences Between oswestry low back pain disability questionnaire and the quebec back pain disability scale in flat shoes group.

	oswestry low back pain disability questionnaire		the quebec back pain disability scale		T- value
	Mean	± SD	Mean	± SD	
flat shoes (N = 59)	5.3220	4.38823	9.8983	8.05090	9.316**

** = significant at the 0.01 level (2-tailed).

Table 6: comparison among the three tools Between High Heeled Shoes group and Flat Shoes group

Items	high heeled shoes (N = 45)		flat shoes (N = 59)		T- value
	Mean	± SD	Mean	± SD	
visual analoge scale (vas)	5.8444	2.66250	2.1695	2.26786	7.591**
oswestry low back pain disability questionnaire	11.3333	7.26135	5.3220	4.38823	7.591**
the quebec back pain disability scale	25.3556	16.13882	9.8983	8.05090	6.394**

** = significant at the 0.01 level (2-tailed).

Table 7: Differences Between Oswestry low back pain disability questionnaire and the Quebec back pain disability scale in high heeled shoes group in relation to age.

Items	Age								F- value
	15-25 year		25-35 year		35-45 year		>45 year		
	Mean	± SD	Mean	± SD	Mean	± SD	Mean	± SD	
visual analogue scale (vas)	6.00	2.607	5.94	3.24	5.69	2.17	5.50	2.38	.05
Oswestry low back pain disability questionnaire	11.45	7.73	11.64	7.114	11.23	7.25	10.00	9.48	.05
the Quebec back pain disability scale	18.09	13.38	28.05	15.59	28.53	16.83	23.50	22.57	1.09

Table 8: Differences Between Oswestry low back pain disability questionnaire and the Quebec back pain disability scale in Flat Shoes group in relation to age.

Items	Age								F- value
	15-25 year		25-35 year		35-45 year		>45 year		
	Mean	± SD	Mean	± SD	Mean	± SD	Mean	± SD	
visual analogue scale (vas)	2.21	2.42	1.57	.646	6.50	2.12	.00	.00	3.455*
Oswestry low back pain disability questionnaire	4.76	3.74	6.50	4.48	11.50	12.02	.00	.00	2.569
the Quebec back pain disability scale	8.59	6.28	11.71	9.31	29.50	4.94	.00	.00	6.499**

** = significant at the 0.01 level (2-tailed).

* = significant at the 0.05 level (2-tailed).

The result showed that, wearing high heeled shoes is widely spreading among married women in ALJouf city with age group between 25-35 years while single females prefer wearing flat shoes particularly at age group 15-25 years. In addition, the current result showed that, there is a positive relationship between prolonged wearing high heeled shoes and severity of low back pain. Moreover, according to Visual Analogue Scale (VAS), pain severity mean for females wearing high heeled shoes is ± 5.84 whereas the pain mean for women wearing flat shoes is ± 2.16 . The result also showed that, with prolonged wearing high heeled shoes, the low back pain increase and this is leading to increase disability and functional limitations. In details, Oswestry Low Back Pain Questionnaire (OLBPQ) reported that, prolonged wearing high heeled shoes might cause disability with a mean of ± 11.33 while wearing flat shoes might lead to disability with a mean of ± 5.32 and this difference can be considered as a significant variation. In addition, there is a significant variation between disability mean of wearing high heeled shoes ± 25.35 and wearing flat shoes ± 9.89 depending on the Quebec back pain disability scale. As well, the current study revealed that, in relation to age, women who are wearing flat shoes, pain and disability scores are increasing with age growing. In details, a higher low back pain score and disability score were within age group 35-45 years. Unexpectedly, women who are wearing high heeled shoes who aged between 15-25 years had a higher mean of pain score while disability degree was a high in age group between 25-35 years according to Oswestry low back pain disability questionnaire.

Discussion

Literature review cited that, there were a relationship between prolonged wearing high heeled shoes and occurrence of Low back pain and disability

The current study answered the all three questions which stated that “Is there a difference in low back pain score between females wearing high heeled shoes regularly and females wearing flat shoes?, Is there a difference in disability score between females wearing high heeled shoes regularly and females wearing flat shoes? And Is there a relationship prolonged wearing high heeled shoes and occurrence of low back pain and disability?”.

As the study findings revealed that, mean score of pain and disability for women who are wearing high heeled shoes regularly were higher than that of women who are wearing flat shoes.

As well, there is a positive relationship between prolonged wearing high heeled shoes and rising severity of low back pain. In addition, this study reported that, there is a strong relationship between severity of low back pain and score of disability or functional limitations. That’s mean, with increasing score of low back pain, disability score might increase to be sever. These results may reflect unawareness of these women about negative side effects of high heel shoes on the body mechanics and might related to other factors such as malnutrition, deficiency of Vitamin D, lack of physical exercises and fitness and transferring or carry objects with wrong posture.

In consistent to the current study, Chuter, et al., (2014) found in their study that, foot insoles might is considered as a etiological mechanism for the development of Low Back Pain. Excessive foot pronation which resulted from wearing high heeled shoes is producing prolonged internal rotation of the lower limb and disrupting sagittal plane forward progression of the body during gait which causes significant strain at the sacroiliac and lumbosacral joints that leads to the development of low back pain.

As well, Shabat, et al., (2005) illustrated that, there is a direct relationship between foot wear and low back pain during walking. Also there is a physiological connection between the lower limbs especially feet and the back muscles. The thoracolumbar fascia is a vital link between these structures, and it transmits the loads from the upper limbs, to the back, and from the back to the lower limbs and the ground. Therefore, the unbalanced pressure over the feet will cause low back pain due to a compensatory technique on the quadratuslumborum muscles.

In addition, Brian and Subach., (2004) stated that,, although walking and standing on high heel shoes give an impression of a stronger back, it might lead to severe lower back pain due to low back muscles spasm.

In contrast, Shabat, et al., (2005) illustrated that, there is no relation between improvement of low back pain with other measured criteria such as age, sex and marital status, , number of offspring, work seniority and smoking. On the other hand, greater reduction in the low back pain was shown when patient used true insoles.

Moreover, Iunes, et al., (2008) analyzed gait in two groups of women. The first group who wore high-heeled shoes every day and while the other one wore high-heeled shoes occasionally to social celebrations. They found that, there was no relationship between frequent wearing high heel shoes and any modification or changing in posture and gait pattern so they did not document any modifications in lumbar lordosis. However, usually high heel wearers suffer from low back pain especially when wearing low heel shoes.

Conclusion

The current study concluded that, low back pain and disability for women who are wearing high heeled shoes regularly are higher than that in women are wearing flat shoes.

Recommendations

- 1- Publish brochures ,lectures and advisements in which females could be aware about negative side effects of wearing high heeled shoes.
- 2- Establish regular awareness program by qualified physiotherapists to educate people about correct postures during walking, standing, transferring and carrying objects.
- 3- Advising people about role of physical exercises, fitness and good nutrition in helping the body to be healthy and prevent functional limitations during the youth.
- 4- Study role of prolonged wearing high heeled shoes on occurrence of lower limbs muscles cramping during pregnancy period.
- 5- Measure alternative angles of lumber lordosis in patient wearing high heeled shoes regularly by radiologist to be more accurate in education program.
- 6- Educate people about good properties of foot shoes which can maintain the good posture and healthy body in general.

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