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Abstract

Purpose: Low back pain is not much prevalent among women wearing high heels but in certain cases it is the cause of disability, absence from work and also affects the quality of life. The objective of the study was to determine the prevalence of low back pain among the women of Khanewal wearing high heels.

Methodology: A cross sectional survey was used. Data was collected from Khanewal from 1st October to 31st December 2019. The sample size was 250 women ranging between 20 to 40 years. Inclusion criteria include age between 20 to 35 years, height of heel 2 – 10 cm, duration of wearing of high heel shoes > 3 hours per day, frequency of wearing high heel shoes > 3 times /week. Exclusion criteria consisted of previous history of any accident or injury to the back, fracture of the vertebrae, any spinal pathology, any systemic disease, women who left wearing heels, women wearing heels occasionally. Data was collected by convenient sampling technique, through the use of oswestry low back pain disability questionaire.Study was completed in 3 months after the approval of synopsis. Data entry and analysis were done using computer software SPSS 21.

Findings: Among 250 women with the mean age of 27 years, 208(83.2%) female lie in minimum disability sore and 42(16.8%) females lie in moderate disability score. The study concluded that there is relatively low prevalence of low back pain among the women wearing high heels.

Recommendations: The duration of study was short, so in future more time is required for this study. Sample was only conducted in Khanewal, therefore more cities should be selected for target population to collect sample in future.

Keywords: *Low back pain, high heels, disability, quality of life.*

INTRODUCTION

According to the European guidelines for the prevention of low back pain, the low back pain is defined as “pain and discomfort, localized below the costal margin and above the inferior gluteal folds, with leg pain or without leg pain"[1]. The lumbar spine consists of 5 movable lumbar vertebrae (L1-L5) relative to each other. They are the largest segments of the vertebral column, because it supports the greater weight of the body against gravity, as compared to the thoracic or cervical region. The integrity and the anatomy of the body of the lumbar vertebra are multifactorial [2]. Low back pain is a very common health problem worldwide and it is a major cause of disability - affecting performance at work and general well-being. Low back pain is the fifth most common reason for physician visits, which affects almost 60-80% of people throughout their lifetime [3]. The prevalence of low back pain is reported to be as high as 84% and the prevalence of chronic low back pain is about 23%, with 11-12% of the population being disabled by low back pain [4].

High heeled shoes greatly affect the lumbar curve, it increases loading on tibialis anterior muscle and also disturbs the center of mass of the body. High heeled shoes also cause increased weight bearing on toes, ankle sprains, and leg and back pain. It also affects the stride length, walking speed, and abnormal gait patterns. Wearing of high heels also causes an increase in lumbar lordosis and it also increases compressive forces on the lumbar vertebras that are leading towards the lumbar spondylitis [4]. Body mechanics are the key factors in current population health and wellness. During our clinical practice, it was observed that many of the women were having low back pain and they also have a history of using high heeled shoes during work stations. Many doctors and physiotherapists seem to think that the source of pain is that the high-heeled shoes that cause an increase in the lordotic curve of the lumbar spine and that the increased lumbar lordosis is the cause of the pain [5].

Types of shoes worn are Still toe, Platform. High heel more than 6” raises the wearer’s feet significantly higher than toes. High heel forces the body weight to be thrown forward and make legs, feet, hip, and spine work against the way they were designed to work causing Low Back Pain (LBP) [6]. This all creates more stress for the nerves of the lumbar spine and tightens your low back causing back pain. The complaints of back and leg pain are common among wearers of high-heeled shoes, and the possible role of high-heeled shoes in the development of degenerative joint disease has been noted [7]. Investigations driven by the concerns regarding the role of high-heeled shoes in the alteration of posture and the development of low-back pain have explored the effect of heel height on compensatory and adaptive changes in the lumbar region of the spine. This change of position places extra pressure and tension on the lower region of the lumbar spine which explains why the women complained of severe back pain at a higher heel length [8].

Wearing high heels puts extra stress on the discs. Spending hours with your body in this funky alignment can lead to muscle spasms and back pain. Tightness in the hamstring muscles, which attach to the backside of the pelvis and lower back, can also cause your backache [9]. Walking in this position makes the hip flexors and calf muscles short and tight. Back problems are incredibly common in women who don’t give up their high heels. When the sciatic nerve gets compressed it causes radiating pain, tingling, numbness, and muscle weakness down the leg and pain travels to the bottom of the foot [10].

The first aim of the examination for a patient presenting with low back pain is to classify the patient according to the diagnostic triage recommended in international back pain guidelines. Differentiating between different sources of radiating leg pain is important to make an appropriate diagnosis and identify the underlying cause. The doctor will begin by requesting a complete medical history and conducting a thorough physical exam to determine in which area of the back you're feeling the pain [11]. The doctor may also check your reflexes and your responses to certain sensations. This determines if your low back pain is affecting your nerves or not. Some symptoms which are red flags for low back pain include bowel and bladder incontinence and control, septic symptoms like fever, weight loss and weakness, all these symptoms needs to be rule out. Certain problems of back such as bone issues, disc disorders, ligamentous or tendinous problems are rule out by doctors via clinical imaging techniques such as ultrasound, X-rays and magnetic resonance imaging [12].

For the serious and severe cases of back disorders like disc herniation and bulging, surgery is the most neccessary and important procedure. Surgery is actually a useful and important option when all other treatment options such as conservative management of disorder fails to respond appropriately. Intadiscal electrothermal therapy (IDET) is a surgical procedure in which a needle is inserted via a cathetar into disc and it is then heated for approximately twenty minutes [13-14]. This technique gives results by thickening the disc wall and eventually cutting down on inner disc's bulging and irritating nerves. Another surgical technique known as nucleoplasty in which needle is inserted in disc by use of wand-like device. One of the procedure well known as spinal laminectomy or spinal decompression makes the size of spinal canal bigger by removing the lamina of vertebral body.The long-term effects of high heels contribute to back pain, deregulation in the digestive tract, neck pain, headaches, knee pain, and inflammation in the shortened tendons of legs and buttocks" [15-16]. The objective of the study was to determine the prevalence of low back pain in women wearing high heels.

MATERIALS AND METHODS

The study was cross-sectional survey conducted on females of Khanewal City. The study duration was 3 months after approval of the synopsis. 250 participants were included in the study. Convenient sampling was used to conduct a survey the Inclusion criteria was Age between 20 to 35 Years, Height of Heel 2 – 10 cm, Duration of Wearing Of High Heel Shoes > 3 Hrs / Day, Frequency of Wearing High Heel Shoes > 3 Times / Week and Exclusion criteria was Previous history of any, accident or injury to the back, Fracture of the vertebrae, Any spinal pathology, Any systemic disease, Women who left wearing heels, Women wearing heels occasionally. Oswestry Low Back Pain Disability Questionnaire was used for data collection [17]. It was distributed to the Total number of participants (n= 250) to evaluate the prevalence of low back pain in women wearing high heels.

Statistical Analysis

The study data was entered and analyzed by using SPSS 21 software and conveyed in the form of charts and tables. Association was checked between age and use of high heel and working hours. Chi square test was applied and check significant at p-value less than 0.05.

RESULTS

Mean ± S.D of patients was 29.312 ± 2.641 years. 87 patients were belongs to age group of 20-24 years, 118 patients were belongs to age group of 25-29 years and 45 patients were belongs to age group of 30-35 years (fig-1). 50 (20%) females have BMI >18.5, 100(40%) have a BMI between 18.5 to 24.9 and 100(40%) have BMI between 25 and 29 (figure 2). Shows that 160(64%) females wore heels of 2 inch height, 71(28.4%) wore heal of 3 inch height and 19(7.6%) female wore heels of 4 inch height (figure 3).

Out of 250 patients 190 were job holders, 143 were doing work 6-8 hours per day, 206 (82.4%) females tolerated pain without medicine, 25(10%) females were having bad pain nut they managed without medicine and 19(7.6%) females got moderate relief with medicine (table-1).

158(63.2%) females lift heavy weights without extra pain, 48(19.2%) females lift heavy weights with the extra pain, 25(10%) female lift heavy weights if they are conveniently positioned and 19(7.6%) females could lift very light weights. 158(63.2%) females told that pain does not prevent them from walking any distance, 92(36.8%) females told that pain prevents them from walking >1/2 mile. 183(73.2%) females could sit in any chair as long as they like and 67(26.8%) females could sit in their favorite chair as long as they like(table 2).

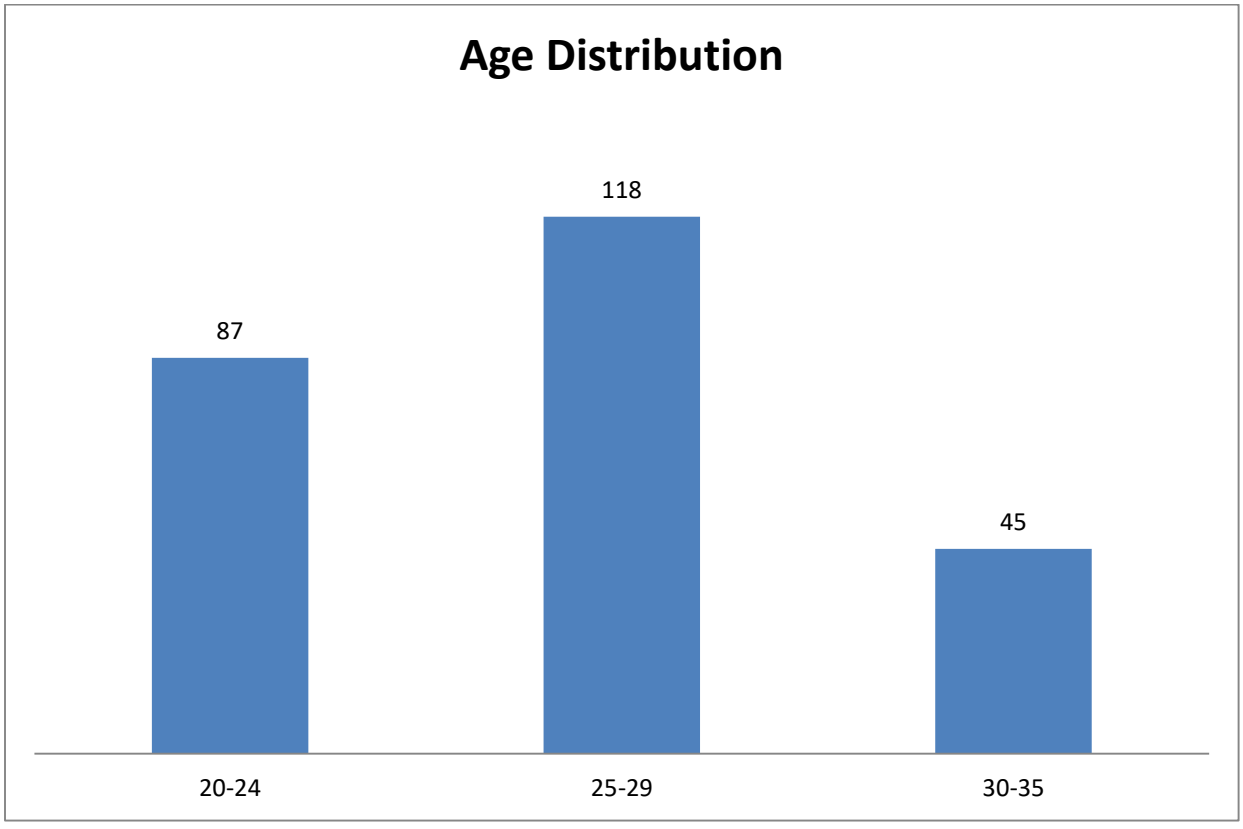

Figure 1: Age distribution

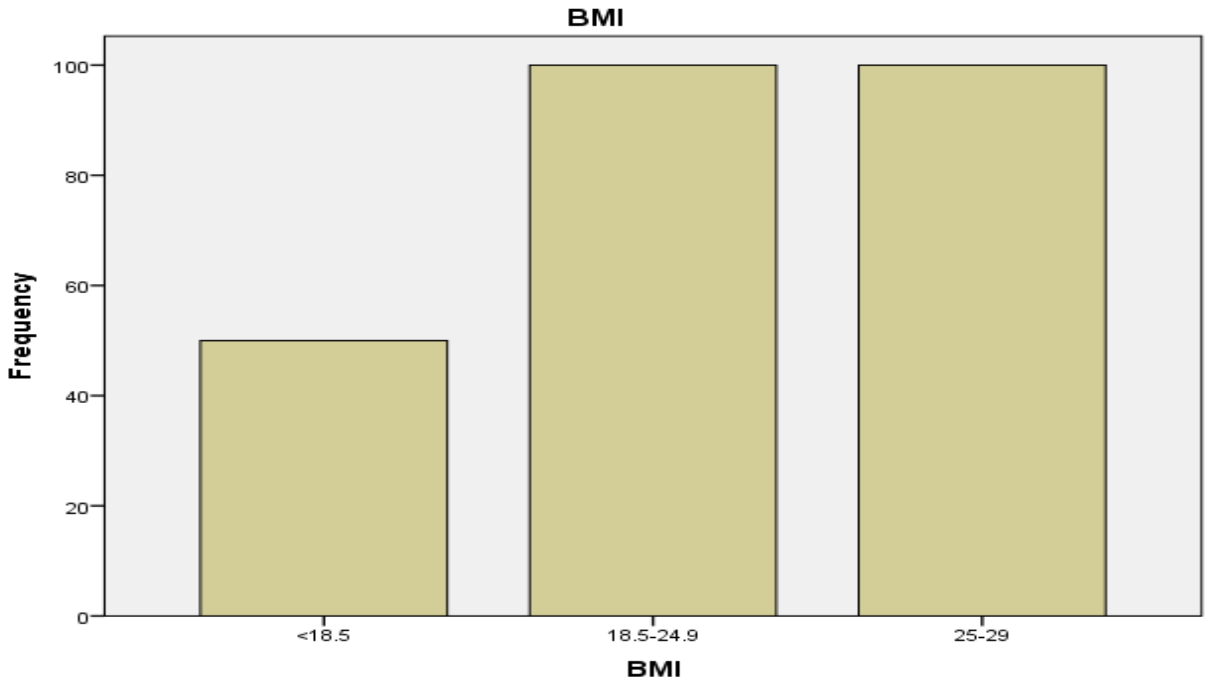

Figure 2: BMI of patients

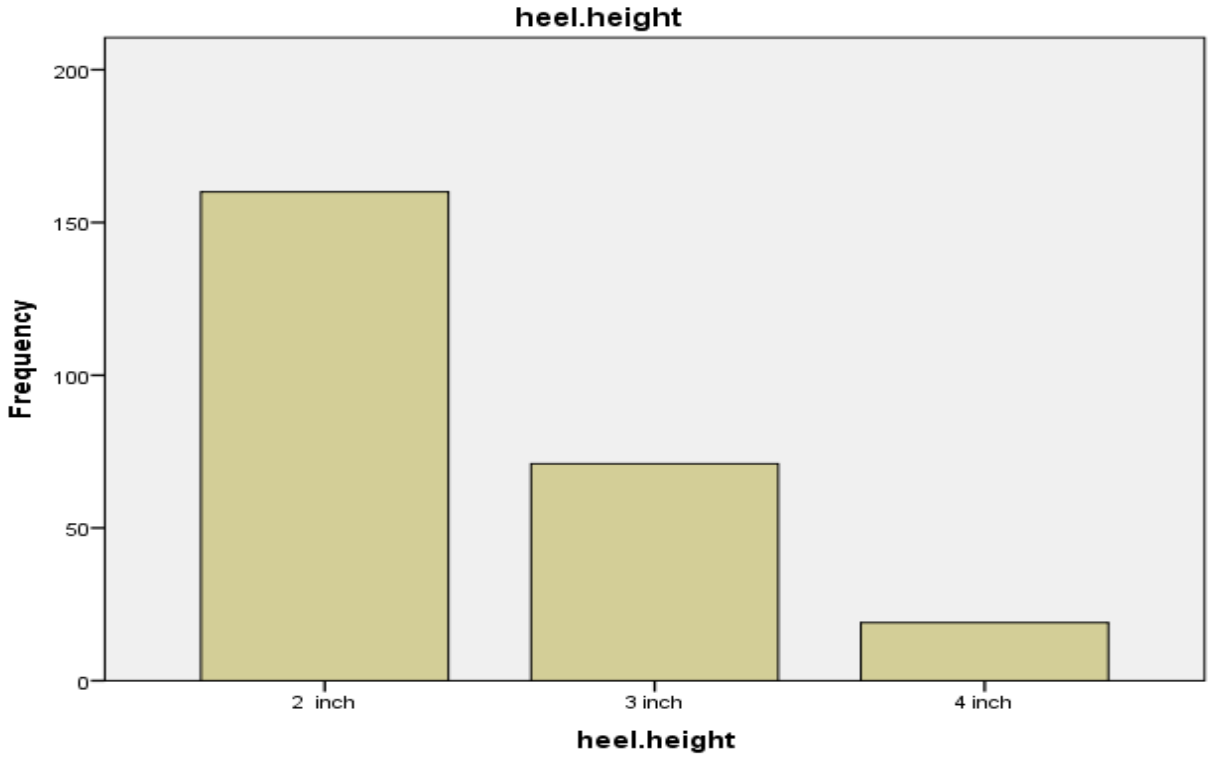

Figure 3: Height of heels

Table 1: Demographic about participants

		Frequency (%)
Job holders	Yes	190(76%)
	No	60(24%)
Working hours	2-4	47(18.8%)
	4-6	60(24%)
	6-8	143(57.2%)
Pain intensity	Tolerate pain without medicine	206(82.4%)
	Bad pain managed without medicine	25(10.0%)
	Moderate relief with medicine	19(7.6%)

Table 2: During different activities pain intensity

	Frequency	Percent
Lift heavy weights without extra pain	158(63.2%)	
Lift heavy weights with extra pain	48(%)	19.2
Lift heavy weights with positioning	25(%)	10
Lift light weights	19(%)	7.6
Don't prevent me walking any distance	158(%)	63.2
Prevent me from walking >1/2 mile	92	36.8
Sit in any chair	183	73.2
Sit in my favorite chair	67	26.8

DISCUSSION

This research has reported the prevalence of low back pain in women of Khanewal wearing high heels A survey was conducted by ASHWINI S KALSAIT to see the musculoskeletal problems in middle aged women wearing high heels >3 inch with the duration of wearing heels > 3hrs per day and reported 10% prevalence [18]. Similarly in the current study the heel height was >3inch and the duration was >3 hrs / day and 83.2% women lies in minimum disability and 16.8% lies in moderate disability. A study was conducted by Kendall[1] et al in 2014 which reported a moderate prevalence of low back pain due to high heels [19]. KISU PARK et al, conducted another study in 2016 and reported the effects of different height of high heels on muscle activation of the paraspinal cervicis and erector spine in healthy young women.

Another study by Mika et al, conducted a study in 2013 in only 31 young and 15 middle aged women, which suggested that wearing high-heel shoes increases the risk of developing certain musculoskeletal pain conditions [20] while the current study has 250 participants. Due to large sample size in the present study, the results seems to be more reliable than the previous study discussed earlier. Similarly, A 2001 survey conducted by researchers from Pennsylvania State

University using 200 women found that 58% of women complained of lower back pain when wearing heels and 55% of women said they felt the worst overall back pain when wearing the highest heel [21].

The current study was done among 250 women to find the prevalence of low back pain problems women wearing high heels 4 to 5 days in a week in Khanewal City. The Oswestry Disability Index was used to find the prevalence of low back pain. The mean scores found in the study indicate that low back pain due to high heels ranges from mild to moderate severity. The prevalence of low back can be attributed to the fact that the women who wear high heels are routinely exposed to awkward postures, difficulties in walking, sitting, standing, sleeping, traveling which all are activities straining the low back [22].

There was still conflicting evidence about the effect of high-heeled footwear on posture and low back pain, especially if we consider methodological confounders. The purpose of this study was to investigate the occurrence of musculoskeletal disorder i.e low back pain in women using high-heeled footwear. While one of the randomized cross over studies conducted in Germany shows that high heels have small to moderate effect on lumbopelvic parameters in experienced younger and middle-aged women while standing and walking [23].

A study conducted by Indian authors in Hyderabad revealed that frequent use of high heels by young females have adverse effects in term of the architecture of foot and even leading to the severe pain pain. This study aimed to document the prevalance of low back pain and foot pain in females with prolonged use of high heels. The study take into account the body mass index, type of shoes and the height of heels. This study concluded that high heels should be reserved for occasional use and this is the best choice as high heels transfer strain to foot particularly medial arch that can lead to biomechanical changes in body straining lower limb and lower back [24].

Another study which was conducted by Turkish authors on physical activity level , incident of low back pain and foot pain in middle aged women (age between 20 and 40years) wearing high heeled foot wear. There study took place according to the Declaration of Helsinki following ethical principles of medical research involving human subjects and minimizes the possible harm to human rights. Data was collected via face to face interview and VAS was used to examined the foot and low back pain. There study showed that 67.5% female had low back pain at rest and 50% female reported pain in lower back during movement. Similarly 60% and 75% women reported pain in foot during period of rest and motion. The study results also revealed that there is effect of wearing high heals on low back pain which is parallel to many studies conducted recently and present in literature [25].

CONCLUSION

The results of the study concluded that the prevalence of low back pain in women wearing high heels is relatively low. But wearing of high heels causes several deleterious effects. The lumbar flexion angle decreases significantly as heel height increases. This not only creates a more unstable posture because of the increase in the height of the center of body mass but also creates additional compressive forces in the lower lumbar spine because of the change in the lumbar lordosis. All these aspects can significantly increase discomfort and fatigue levels in those wearing high heels. Although only middle aged females were tested, these results can be expected to hold in older subjects as well. Thus, in conclusion, workers wearing high heels for workers should be discouraged.

Limitations

1. The study has some limitations including convenient sampling technique.
2. It was a cross sectional study without any follow up.
3. In adequate time due to ongoing studies.
4. Lack of resources.

RECOMMENDATIONS

This study was conducted to find out the prevalence of low back pain among women of Khanewal City wearing high heels. Though due to shortage of time and for ease of work convenient sampling was used it should be conducted with other sampling technique including random sampling technique. The duration of study was short, so in future more time is required for this study. Sample was only conducted in Khanewal, in future more cities should be selected for target population to collect sample. For further study results can be compared or prevalence can be taken from a large sample.

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