Journal of Medicine and Allied Health
Journal Homepage: www.jomah.org
ISSN: XXXXX-YYYYY
Email: editoric@jomah.org

Original Article

FOOT HEALTH STATUS AMONG OBESE AND NON-OBESE INDIVIDUALS OF KARACHI

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ARTICLE INFO

Article history:
Received 12 October 2024
Revised 23 November 2024
Accepted 12 December 2024
Available online 29 December 2024

Keywords:
Foot; Obesity; Pain; Body mass Index; Quality of life.

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DOI:
https://doi.org/10.5281/zenodo.15969036

ABSTRACT

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***Background**: Foot plays an important role in quality of life. During physical activity foot are continuously exposed to weight. Weight bearing on feet causes abnormal structure and functional changes. Foot problems are one of the most important factors to reduce QOL. Foot pain decrease the functional capacity of individuals. The objective of this study is to determine foot health status among obese and non-obese individuals of Karachi.*

***Subject and methods**: The cross-sectional study will be conducted on general population of Karachi with 276 sample size is calculated through open epi. This study is conducted through modified FHSQ Questionnaire. We will calculate BMI of individuals by using weighing machine and measuring tape as a tool to measure weight (kg) and height (m2). The software used for data analysis will be IBM SPSS version 21.*

***Results**: The study results shows that the level of foot pain in obese individuals was 17.4% and in non- obese was 4.3%. Obese individuals were facing difficulties in work were 9.4% and non-obese were 1.4%, Limitation in walking and climbing in obese individuals was 7.2% and 13.8% and in non-obese was 2.9% and 5.8%. (15.2%) obese individuals and (14.5%) non-obese individuals were limited a lot in moderate activities, (9.4%) obese individuals and (6.5%) non-obese were facing problems in finding comfortable shoes. (13.0%) obese individuals and (5.8%) non-obese individual's feet were excellent.*

***Conclusion**: This study showed that obese participants facing more foot problems as compared to non- obese; obesity have a huge influence on foot health and increased BMI reduced foot function.*

1. Introduction

The most strong, complicated, and mechanical structure is foot. But it is still the most neglected and understudied structure in literature. It has an essential role in posture, ambulation, and gait. The feet are the base of support of musculoskeletal system during weight-bearing, and certain physical activities [1 & 2]. The foot has 28 bones and approximately 33 articulations, allowing it to fulfill three main functions: shock absorption, weight bearing and support. The foot plays an important role in quality of life. It's a key component of general health [3].

The most crucial phases in development of a human being are between childhood and adulthood. In this period, several foot disorders are seen which includes infections or inflammatory conditions, abnormal nail disorders, structural bony abnormalities, circulatory disorders, and other conditions. Moreover, poor foot health leads to uneven planter pressure distribution, slow walking speed, postural problems, scoliosis, and increased risk of falling [4 & 5].

Foot pain is predominant in the general community, with prevalence estimates ranging from 17 to 30 percent based on population studies. Foot pain has been linked to a variety of factors including increasing age, female gender, higher Body mass Index (BMI), Foot pathologies, footwear habits, other musculoskeletal pain, and medical conditions such as mental health/depression, inflammatory rheumatoid arthritis (RA),

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Osteoarthritis (OA), gout and heart disease. Foot discomfort is linked to decrease foot function, disability and health-related quality of life, as well as a considerable use of health care resources [6].

Apart from these conditions, some other factors cause a greater impact on foot health. The list includes external stress which can be caused by numerous factors, but mainly obesity (increased Body Mass Index) plays a major role causing stress on foot [7].

Obesity is a complex, multifactorial disease which leads to certain medical conditions. The incidence of obesity is increasing on a large scale. The incidence is highly noticeable in all age groups. The World Health Organization (WHO) declares that above one billion adults have excessive weight (BMI >25) and at least 300 million of them are obese (BMI >30). Weight has a greater impact on foot. Contact surface areas of the feet primarily increase due to the excessive weight over the feet. This results in increased foot problems. This study helps to focus on foot health and gives an overview of level of awareness regarding foot health and aims to provide knowledge and awareness regarding foot problems. This study also be identifying whether the non-obese individuals were also facing the similar issues or not [8, 9, & 10].

Therefore, the purpose of this study is to investigate the state of foot health among obese and non-obese individuals and to determine the quality of life and general health. The Foot Health Status Questionnaire (FHSQ) will be used as a measuring tool of assessment of foot health and its impact on quality of life [11].

2. Materials and Method

Study Design: This study was Cross sectional Analytical study design.

Sample Size: In this research, a total of 276 randomly selected people were requested to join the study voluntarily and fill questionnaire. The sample size was calculated through open Epi with hypothesized disability foot pain frequency among overweight 23.4%., along with the confidence interval of 95%, the margin of error 5%, and a design effect of 1. We reached out to them and briefly explained the purpose of our study. And requested them to participate. Sample was collected by following

Inclusive criteria; age 25-45 years, gender: male and female and BMI greater than 18.5 [12].
Exclusive criteria; any fracture of lower limb, BMI less than 18.5, chronic diabetic patient and pregnant women.

Likert scale in Foot Health Status Questionnaire was used as a study parameter. It was Nonprobability purposive technique and convenient sampling technique. In this study we used weighing machine and measuring tape as our instrument to measure weight (kg) and height (m2) to calculated BMI of individuals.

Study Duration: The duration of topic selection was 1st November 2021 to 13 November 2021; Synopsis writing was 15 November 2021 to 11 December 2021; Data collection was 10 January 2022 to 5 March 2022 and Analysis and project writing was 7 March 2022 to 26 March 2022. The first and the foremost important ethical consideration which was followed in this study is respect towards the study participant. Another ethical consideration was before giving them permission of attending an interview, they had been asked to fill consent form, this form include regarding the motive of the study. The anonymity and confidentiality of the participate was preserved by not revealing their names and identity in the data collection, analysis and reporting of study findings.

Data Collection: Data was collected through Foot health status questionnaire (FHSQ) form questionnaire among general population. The questionnaire was filled by participants who fulfilled the requirements of inclusive criteria with given informed consent after explanation of the study purpose. The data of all participants were kept confidential. The questionnaire is highly reliable (ICC = 0.74–0.92) and valid (Cronbach α = 0.89–0.95) [13 & 14]

Data Analysis: Collected data was entered in software IBM SPSS base license version 21.0 for data analysis. The data was distributed into two categories: Obese and Non-obese. Chi-square test was applied to determine the significance association between variables, and to find the relationship between BMI and variables through frequency, were determined by crosstab. Shapiro-Wilk test showed P value less than 0.005, therefore our data followed non-normal distribution. Result of the study was shown by frequency tables, percentages, means and standard deviations.

3. Result

A sample of 276 participant were selected from general population, between 25-45 years of age. The sample analyzed included 98 men (35.5%) and 178 women (64.5%). Half participants were obese, and half participants were non-obese. Table 1 representing demographic details of the participant.

The level of pain in obese individuals was 17.4% and in non-obese individuals was 4.3%, pain experienced during past week in obese individuals is 12.3% and in non-obese individuals was 2.9%, feet ache in obese individuals was 9.4% and in non-obese individuals was 2.9%. Sharp pain in obese individuals was 2.9% and in non-obese individuals was 1.4%.

Table 2 shows that obese individuals were facing difficulties in work were 9.4% and non- obese individuals were 1.4%, limitation in work due to feet in obese individuals was 5.1% and in non-obese individuals, limitation was not seen. Limitation in walking due to feet health in obese individuals was 7.2% and in non-obese individuals was 2.9%, limitation in climbing due to feet health in obese individuals was 13.8% and in non-obese individuals it was 5.8%.

Also, (9.4%) obese individuals (6.5%) and non-obese individuals were facing problems finding shoes that didn't hurt. (6.5%) obese and (7.2%) non-obese individuals have difficulty in finding shoes that fit. (4.3%) obese and (5.8%) non-obese individuals were limited in number of shoes they can wear.

Table 3 shows (13.0%) obese individuals and (5.8%) non-obese individual's feet were excellent.

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before and after applying fibrinolysin, the z-value was -2.671 and the p-value was 0.007. Because the P-value is less than 0.05, so there is a significant difference exists between the two groups (Table 4).

4- Discussion

The main domain of our study lies to find out the foot health status of general population among obese and non-obese individuals because foot problems affect the quality of life.

Our study results showed (26.1%) obese individuals and (37.0%) non-obese individuals had feet pain. (34.1%) obese individuals and (39.1%) non-obese individuals had difficulty in work. (31.2%) obese individuals and (18.1%) non-obese individuals were facing difficulty in activities. (11.6%) obese individuals and (5.1%) non-obese felt tired. (15.2%) obese individuals and (22.5%) non-obese individuals felt full of life. (8.7%) obese individuals and (4.3%) non-obese individuals had difficulty in finding shoes.13.0%) obese individuals and (18.8%) non-obese individual's feet were in excellent condition.

Foot health is vital for general population, it enables to live an independent life and have command over their ways of life and perform physical activity. In previous studies, people at the age of 40 years or older facing a few podiatric disorders such as hallux valgus, hallux extensors, claw toes, flat foot and planter fasciitis [15]. Poorer performance on lower extremity function tests, such as walking, and standing was linked to increasing intensity of foot discomfort [16 & 17].

This study shows that obesity have an influence on foot. Obese individuals are more prone to foot problems and health issues. Our finding of an association among obese individuals and foot pain is according to the earlier studies. Foot pain is more closely related with increased BMI, and increased BMI is linked with reduced foot function. It should be noted that this study only looked at foot pain and did not evaluate musculoskeletal pain or abnormalities at other joints.

In the previous study it has been noted that increased in foot pain is directly related to the increased BMI of an individual. According to the results of this study both genders are equally prone to foot pain if their BMI is exceeding the normal range and lies in obesity [18].

This study demonstrated the necessity for more research in this area to learn more about many treatment interventions utilized by specialist in podiatry and medicine that may help patients, increase foot health and quality of life in general population as well as laborer.

There are some significant limitations to our research that must be noted. To begin this study was conducted with limited number of individuals in Karachi. Secondly, increasing data collection in different nations may aid in determining whether there is any culture in which this affiliation does not exist, as well as identifying the mechanisms involved in foot health and overall health. Finally, because of the miniscule sample size, the recruitment process revealed various flows.

5- Acknowledgement

We acknowledge all the participants that were involved in our study, without them the study couldn't be completed. Also, all the authors were acknowledged for their contributions.

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TABLE 1 Demographical Characteristics

	N	Minimum	Maximum	Mean	Std. Deviation
Age	276	24	48	32.13	7.114
Gender	276	1	2	1.64	.479
Height	276	2.0	6.2	5.360	.3434
Weight	276	45.0	126.0	73.318	15.7956
Valid N (listwise	276				

Table 2 Interference of activities by foot during last week

Variables	**scale**	**Obese N (%)**	**Non Obese N (%)**	**p-value**
Have your feet caused you to have difficulties in your work	Not at all	47 (34.1%)	54 (39.1%)	0.062
	Slightly	46 (33.3%)	45 (32.6%)	
	Moderately	16 (11.6%)	26 (18.8%)	
	Quite a bit	16 (11.6%)	7 (5.1%)	
	Extremely	13 (9.4%)	6 (4.3%)	
Were your feet limited in the kind of work	Not at all	61 (44.2%)	79 (57.2%)	0.004
	Slightly	32 (23.2%)	38 (27.5%)	
	Moderately	27 (19.6%)	17 (12.3%)	
	Quite a bit	11 (8.0%)	4 (2.9%)	
	Extremely	7 (5.1%)	0 (0%)	
How much does your feet health limit your walking	Not at all	44 (31.9 %)	59 (42.9 %)	0.146
	Slightly	41 (29.7%)	44 (31.9 %)	
	Moderately	26 (18.8 %)	19 (13.8 %)	
	Quite a bit	17 (12.3 %)	12 (8.7%)	
	Extremely	10 (7.2%)	4 (2.9%)	
How much does your feet health limit climbing stairs	Not at all	36 (26.1%)	43 (31.2 %)	0.221
	Slightly	47 (34.1 %)	54 (39.1 %)	
	Moderately	22 (15.9 %)	20 (14.5 %)	
	Quite a bit	14 (10.1 %)	13 (9.4 %)	
	Extremely	19 (13.8 %)	8 (5.8 %)	
How would you rate your overall foot health	Not at all	17 (12.3 %)	24 (17.4 %)	0.050
	Slightly	30 (21.7 %)	47 (34.1 %)	
	Moderately	47 (34.1 %)	36 (26.1 %)	
	Quite a bit	33 (23.9 %)	26 (18.8 %)	
	Extremely	11 (8.0 %)	5 (3.6 %)	

Table 3 General foot health				
Variables	**Scale**	**Obese**	**Non-Obese**	**p-value**
In general, what condition would you say your feet are in?	Excellent	18 (13.0 %)	26 (18.8 %)	0.019
	Very good	28 (20.3 %)	47 (34.1 %)	
	Good	49 (35.5 %)	39 (28.3 %)	
	Fair	33 (23.9 %)	21 (15.2 %)	
	Poor	10 (7.2 %)	5 (3.6 %)	