

Correlation of Foot Posture Index and Years of Experience in Nurses with Ankle and Foot Pain

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ABSTRACT

BACKGROUND: This study aims to determine the correlation between the foot posture index and the years of experience of nurses having foot and ankle pain. Nurses spend a great deal of time on their feet. Due to long standing and unequal weight shifting on the foot the plantar arches become stiff or less flexible. This leads to have deformed or abnormal foot posture. Therefore, by using foot posture index we're going to assess the foot posture of the nurses and then correlate them with their years of experience.

MEHTODS: The study was conducted among 80 nurses from the different hospitals. Their consents were taken. Years of experience was recorded of each subject. And their foot posture was assessed by using foot posture index.

RESULTS: We enlisted 80 nurses from various hospitals, with 49 females (61%) and 31 being male (39%). Out of 80 nurses, 32.5% had normal foot, 42.5% had pronated foot, 20% had highly pronated foot and 05% had supinated foot. The correlation coefficient r - value for years of experience score and foot posture index of both feet has been recorded as 0.417 which is statistically significant at 5% level with linear association. It shows direct relationship between the years of experience and foot posture index. As the years of experience increases, the foot goes into pronation.

CONCLUSION: To conclude the present study, pronated foot posture was the most common foot deviation with increasing years of experience. The study also concludes that there is moderate correlation between years of experience and Foot Posture Index stating that as the years of experience increases, the foot posture is altered to pronation.

KEYWORDS: Foot posture index, foot pain, years of experience, nurses.

INTRODUCTION

Nursing is an essential component of healthcare delivery system. It has tremendously expanded in India over the years. Nursing care is essential for promoting, maintaining, and restoring health and providing end-of-life care. Nurses are the strongest pillars in the health care system and play a significant role in the hospital setting. In India, two thirds of the health workforce consist of nurses. In terms of promotion, prevention, treatment, care, and rehabilitation, they play crucial roles in the delivery of health care. In nursing, the physical and emotional well-being of patients is of highest importance as they are receiving treatment.^[2]

Therefore, extended work hours have an impact on the nurses' physical, emotional, and social well-being as well as the safety of patients.^[6] Due to their demanding physical jobs, which include heavy lifting and

extended standing, nurses are particularly vulnerable to musculoskeletal pain. Due to the continuous and long working hours nurses experience different musculoskeletal problems. Nurses complain of cramps in the lower limb due to prolonged standing, fatigue, burning sensation of feet etc. According to the study, the nurses have shown the prevalence of low back pain, shoulder, hip and feet and ankle. Studies showed that the prevalence of foot and ankle pain to be 7.6%.^[13] The employment of qualified nurses contributes to both clinical and financial gains in patient care, such as increased patient satisfaction, decreased medication errors, fewer falls, pressure ulcers, and infections linked to healthcare. The ideal nurse-to-patient ratio for a given unit is determined by a number of variables, including the severity of the patients' needs, the volume of admissions and discharges, and the amount of experience. The recommended ratio of nurses to patients is 1:6.^[10] But the ideal ratio of nurses to patient has not been followed in India. Therefore, they tend to walk and stand for extended period of time which leads to ankle and foot pain.

It is anticipated that nurses will have more stress on their feet and ankles than the general population due to their regular 12-hour shifts, which involve walking up to 8 to 9.6 km. Many other factors, including obesity, inappropriate footwear, poor foot and ankle posture, incorrect weight bearing, and weight shifting, can cause foot and ankle pain in nurses.

The prevalence of foot and ankle discomfort among nurses can be utilized to highlight preventive measures for these conditions, improving staff health in the process. Nurses spend a great deal of time on their feet. With every step we take, our feet have the power to support three times our own weight. Shock absorption is not greatly aided by the weight being carried on concrete surfaces.^[7]

Due to long standing and unequal weight shifting on the foot the plantar arches become stiff or less flexible. This leads to have deformed or abnormal foot posture. The purpose of this study is to correlate the foot posture index and years of experience in nurses to find out any foot posture abnormality and pain to prevent further repercussions.

MATERIALS AND METHODS

Inclusion criteria: The inclusion criteria for this study includes both female and male nurses. We included nurses who have work experience of at least 10-15 years of work. The participants should work at least for 45 hours per week. The study includes nurses of both genders. The participants should be willing to participate in the study.

Exclusion criteria: The exclusion criteria of this study include any congenital deformity of lower extremities. Subjects who had past history of traumas to the ankle complex and those who have taken any treatment for ankle and foot pain in past 6 months were excluded. These criteria aim to ensure that the study focuses on participants who do not have pre-existing conditions that could potentially confound the results.

Study design:

Type of study: Cross-sectional correlational study

Duration of study: 6 months

Study setting: Pune

Sampling design:

Sample size: 80

Sampling method: Convenient sampling

Outcome measure:

Foot posture index

Reliability: 73.9% [15]

Procedure: In this study, total 80 nurses from different hospitals were recruited, including both female and male nurses after obtaining ethical clearance and written informed consent. Once the consent was done the researcher observed the subject’s foot and score it according to the foot posture index. The standardized procedure involved nurses standing in a relaxed stance position with double limb support, arms at their sides, and looking straight ahead. The data was collected including their hours of work and years of working experience. The data was recorded for further analysis.

RESULTS

The study was conducted to find out the correlation between the Foot Posture Index and years of experiences in nurses having ankle and foot pain. We enlisted 80 nurses from various hospitals, with 49 females (61%) and 31 being male (39%). We included the nurses having years of experience between 10-15 years.

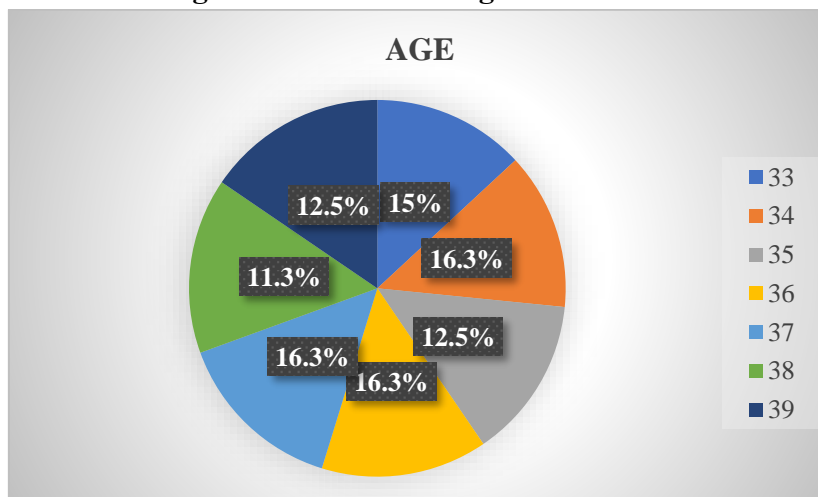
AGE DISTRIBUTION

Interpretation: The below table shows the age distribution among the sample respondents and it is observed that patients with age of 34, 36 & 37 years respectively more in number as compared to the other age categories.

Table 1: Age distribution

Age	Frequency	Percent
33	12	15
34	13	16.3
35	10	12.5
36	13	16.3
37	13	16.3
38	9	11.3
39	10	12.5
Total	80	100

Figure 1: Pie chart of age distribution



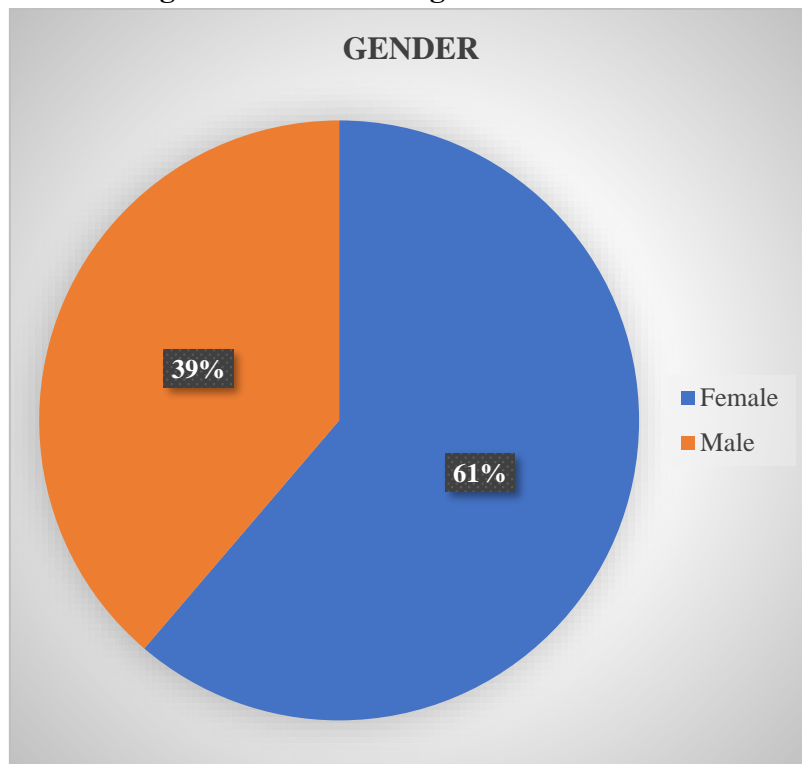
GENDER DISTRIBUTION

Interpretation: The below table shows the gender distribution among the sample respondents and it is observed that female patients out numbers male patients with 49 is to 31 respectively.

Table 2: Gender distribution

Gender	Frequency	Percent
Female	49	61
Male	31	39
Total	80	100.0

Figure 2: Pie chart of gender distribution



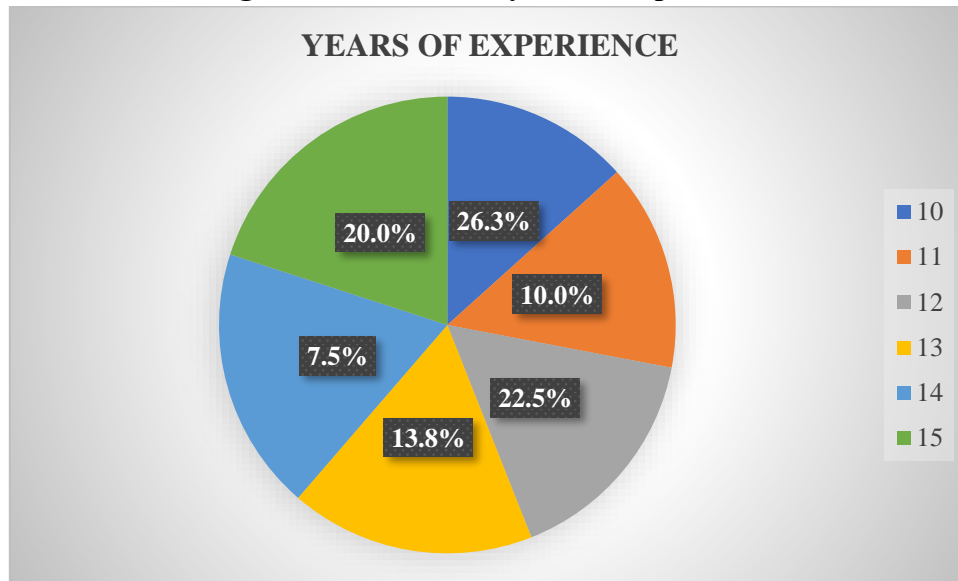
DISTRIBUTION OF YEARS OF EXPERIENCE

Interpretation: The below table shows the Years of Experience distribution among the sample respondents and it is observed that patients with 10 years of are more in number as compared to the other Years of Experience categories.

Table 3: Distribution of years of experience

Years of Experience	Frequency	Percent
10.00	21	26.3
11.00	8	10.0
12.00	18	22.5
13.00	11	13.8
14.00	6	7.5
15.00	16	20.0
Total	80	100.0

Figure 3: Pie chart of years of experience



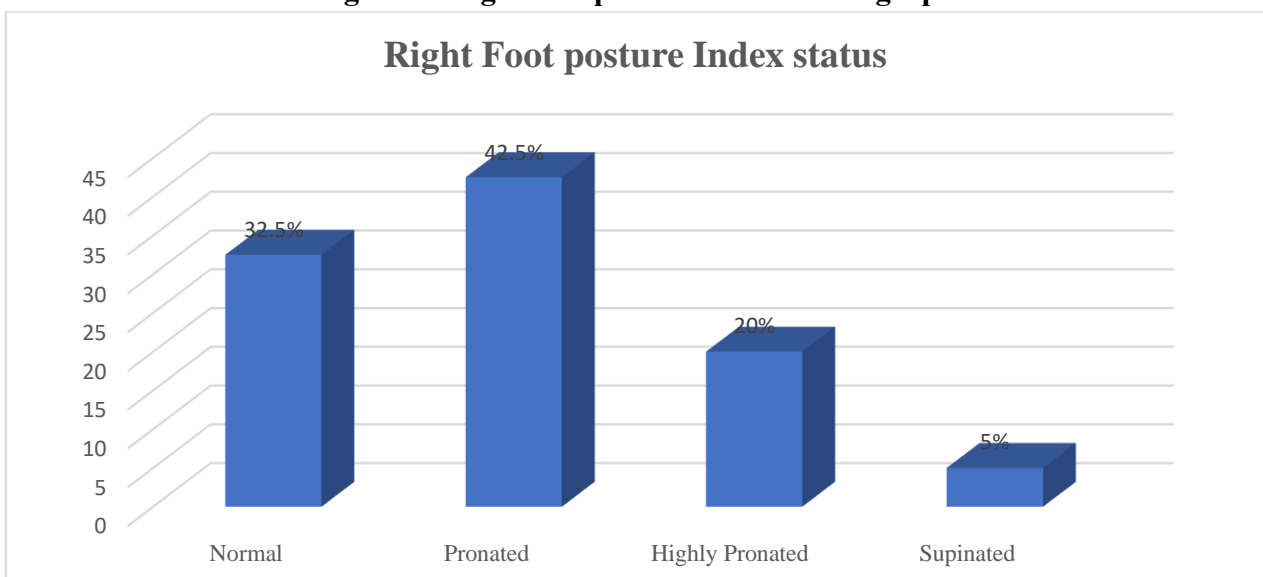
ANALYSIS OF RIGHT FOOT POSTURE INDEX STATUS

Interpretation: The below table shows the prevalence of Right Foot posture Index status in which Pronated category has recorded highest prevalence rate at 42.5% which is followed by Normal category at 32.5%. Highly pronated at 20% and supinated at 05% respectively.

Table 4: Analysis of right foot posture index status

Right Foot posture Index status	Frequency	Prevalence
Normal	26	32.5%
Pronated	34	42.5%
Highly Pronated	16	20%
Supinated	04	05%

Figure 4: Right foot posture index status graph



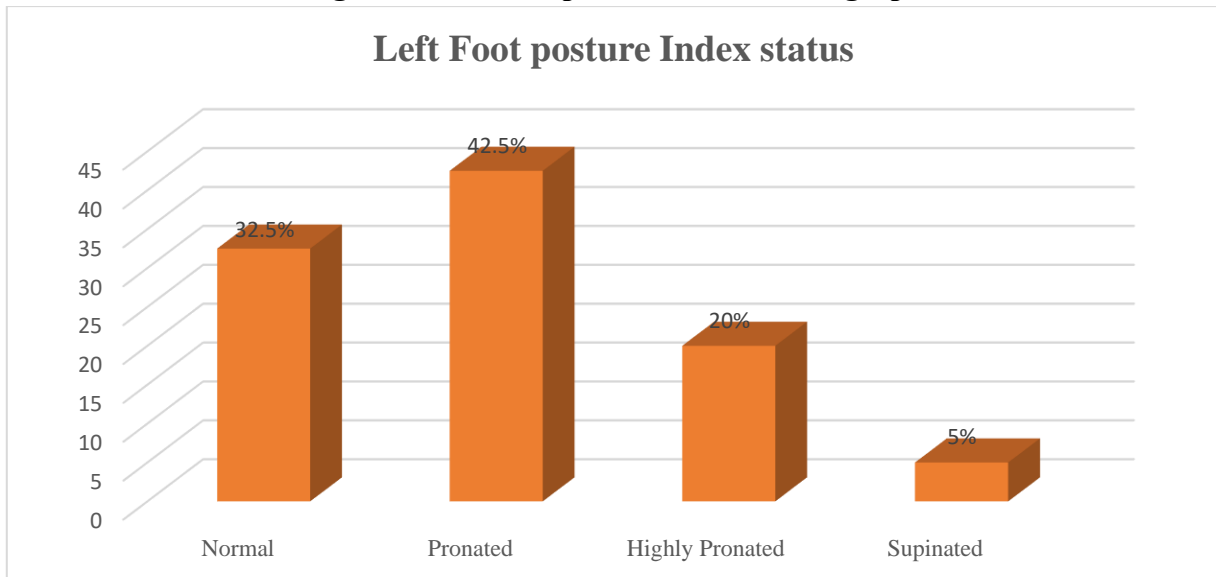
ANALYSIS OF LEFT FOOT POSTURE INDEX STATUS

Interpretation: The below table shows the prevalence of Left Foot posture Index status in which Pronated category has recorded highest prevalence rate at 42.5% which is followed by Normal category at 32.5%. Highly pronated at 20% and supinated at 05% respectively.

Table 5: Analysis of left foot posture index status

Left Foot posture Index status	Frequency	Prevalence
Normal	26	32.5%
Pronated	34	42.5%
Highly Pronated	16	20%
Supinated	04	05%

Figure 5: Left foot posture index status graph



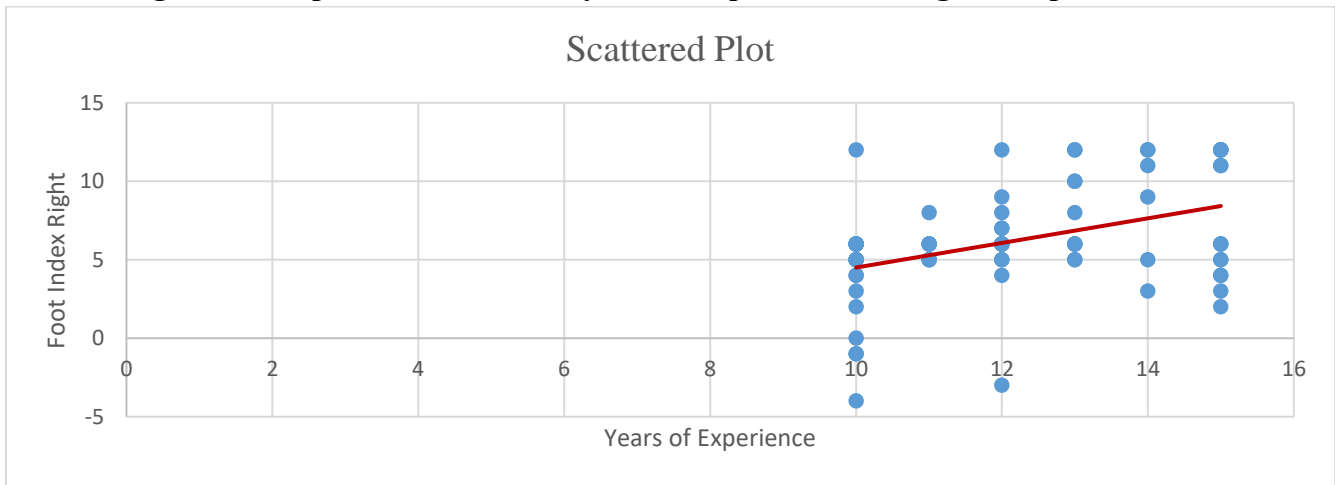
CORRELATION OF YEARS OF EXPERIENCE AND FOOT POSTURE INDEX

Table 6: Correlation of years of experience and foot posture index

Variable X	Variable Y	r- value	p-value	Results
Years of Experience	Foot Index Right	0.417	0.001	Significant at 5% Linear association
	Foot Index Left	0.417	0.001	Significant at 5% Linear association

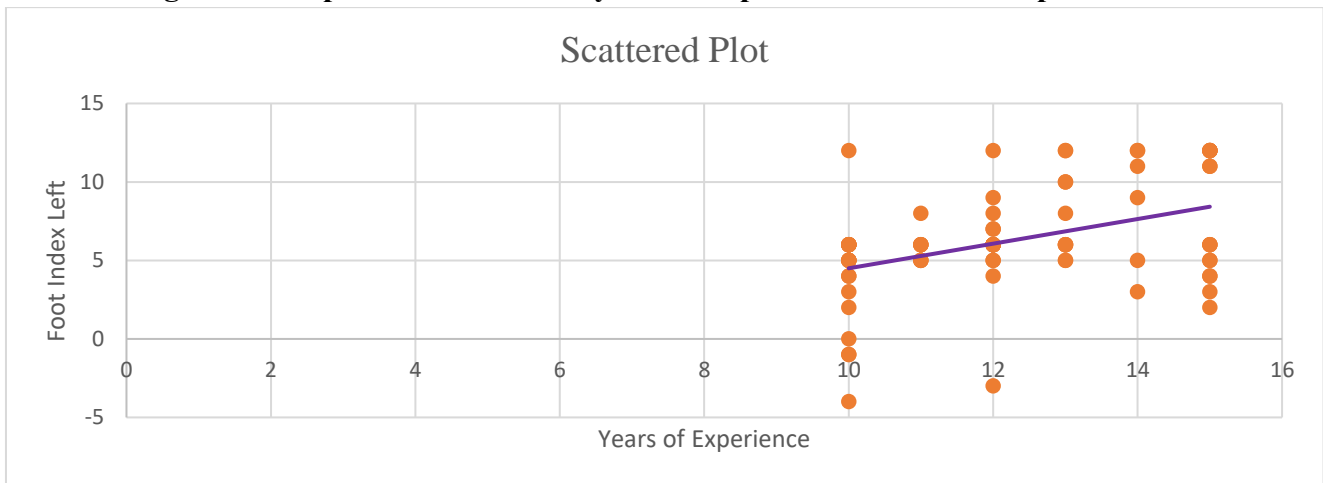
Interpretation: Correlation coefficient r- value for Years of Experience score and Foot Index Right has been recorded as 0.417 which is statistically significant at 5% level with linear association. It means both the variables are moving in the same directions at the time association with each other which shows the direct relationship between the variables. As the years of experience increases, the foot goes into pronation.

Figure 6: Graph of correlation of years of experience and right foot posture index



Interpretation: Correlation coefficient r - value for Years of Experience score and Foot Index Left has been recorded as 0.417 which is statistically significant at 5% level with linear association. It means both the variables are moving in the same directions at the time association with each other which shows the direct relationship between the variables. As the years of experience increases, the foot goes into pronation.

Figure 7: Graph of correlation of years of experience and left foot posture index



DISCUSSION

In the present study, we established a link between foot posture index and years of experience of nurses suffering from foot and ankle pain. 80 nurses from various hospitals were evaluated and the nurses evaluated in the study had working experience from 10-15 years with minimum 45 hours of working per week. In the present study, it showed that the prevalence of Right Foot Posture Index status and Left Foot Posture Index status in which Pronated category has recorded prevalence rate at 42.5% where as Highly pronated is 20%, summed up it showed 62.5% of foot pronation, with 32.5% of normal foot, and supinated at 5%. On analysis this study showed that correlation coefficient r - value for Years of Experience score and Foot Posture Index has been recorded as 0.417 which is statistically significant at 5% level with linear association. The study showed that as the years of experience increases, the foot posture alters in pronation. Thus, it shows that as the years of experience increases, there are higher chances of foot alteration. Due to prolonged standing and increasing years of experience, it can lead to pronated foot. Nurses spend a great

deal of time on their feet. With every step we take, our feet have the power to support three times our own weight.^[7] The foot should be equidistant to each other, and the weight is equally distributed. In flat foot, there is failure of a dynamic supporting structure or the medial longitudinal arch with long standing. Specifically, there is an attenuation and eventual rupture of the tendon of the tibialis posterior muscle. The unlocked midtarsal joint succumbs to the constant deforming force of body weight and triceps surae, and the supportive structures begin to attenuate and finally rupture.^[16] Due to this the foot goes into further pronation. A study conducted by Aditi R. Sawant, Aishwarya Akash, titled prevalence of foot posture deformities using foot posture index in various intensive care unit nurses. This study states that extended standing leads to excessive weight bearing on the medial aspect of the foot, putting strain on the ligaments and tendons that sustain a proper foot arch.^[17] As the years of experience increases, the working hours of nurses also increases. Because of which they tend to work for longer periods and stand or walk for prolonged periods. While long standing or walking nurses apply improper weight shifts on the feet, which put excessive stress on the ankle and feet ligaments which leads to pain. Due to improper weight shift the muscles become tight which leads to foot posture alteration in nurses. Improper footwear also does not contribute equal weight while walking or standing. Pronated feet are also often caused by improper footwear. Poor footwear cannot appropriately sustain body's weight. It can also damage the foot arch, causing foot pain to the person. Improper foot wear has less shock absorbing ability which makes the foot more prone to trauma leading to pronated foot.

CONCLUSION

The study concludes that the prevalence of pronated foot is 62.5% whereas supinated foot is 05%. The study also concludes moderate positive correlation between foot posture index and years of experience in nurses having foot and ankle pain, which states that as the years of experience increases there are higher chances of foot going into pronation.

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