



Association of foot health, foot function and quality of life in rural primary school teachers

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Abstract

Background: Foot-related problems may affect physical functioning and health-related quality of life. Primary school teachers may experience occupational demands involving prolonged standing and walking, while rural teachers may have additional work-related and environmental challenges.

Objective: To determine the association between foot function and health-related quality of life among rural primary school teachers in the Pen region.

Methods: An observational cross-sectional study was conducted among 49 rural primary school teachers aged 24–40 years. Participants were recruited using convenience sampling. Foot function was assessed using the Foot Function Index (FFI), and health-related quality of life was assessed using the 12-Item Short-Form Health Survey (SF-12), including Physical Component Summary (PCS) and Mental Component Summary (MCS) scores. Spearman's rank-order correlation was used to assess associations.

Results: The mean FFI score was 9.22 ± 8.37 . The mean SF-12 PCS and MCS scores were 50.89 ± 5.41 and 58.12 ± 5.58 , respectively. FFI showed a strong negative correlation with SF-12 PCS ($\rho = -0.618$, $p < 0.001$), while no statistically significant correlation was observed with SF-12 MCS ($\rho = -0.060$, $p = 0.680$).

Conclusion: Higher FFI scores were associated with lower physical health-related quality of life in rural primary school teachers, whereas no significant association was observed with the mental component. These findings highlight the relevance of foot function to physical well-being in this occupational group.

Keywords: Foot function, Foot health, quality of life, primary school teachers, Foot Function Index, SF-12

Introduction

Foot pain is an unpleasant sensory and emotional experience affecting the region distal to the tibia and fibula and may arise from trauma, musculoskeletal overload, infection, or systemic and proximal conditions. Foot-related problems can interfere with walking and daily activities and may negatively influence overall well-being and health-related quality of life [1].

Teaching is an occupation that may require prolonged standing, walking, classroom supervision and other weight-bearing activities [2]. Teachers working in rural settings may also experience environmental and occupational challenges, including limited resources and physically demanding work conditions. Prolonged standing, walking and awkward postures are recognized contributors to musculoskeletal problems [3]. Foot problems may consequently affect functional ability and quality of life [4].

The Foot Function Index (FFI) is a self-reported questionnaire introduced to assess the impact of foot problems from the patient's perspective. It contains 23 items covering pain, disability and activity limitation and has been widely used in clinical and research settings [5, 6].

The 12-Item Short-Form Health Survey (SF-12) is a generic health-related quality-of-life measure that summarizes perceived physical and mental health status into Physical Component Summary and Mental Component Summary scores [7].

Previous research has examined foot problems and health-related quality of life in older adults, rural populations and

school teachers [1, 3, 4, 8]. However, limited evidence is available regarding the relationship between foot function and health-related quality of life specifically among rural primary school teachers in the Pen region. Therefore, the present study was conducted to determine this association.

Materials and Methods

Study Design and Setting

An observational cross-sectional study was conducted among primary school teachers working in rural schools in the Pen region of Maharashtra, India. Study period: 09/04/2026, 24/04/2026, 20/06/2026.

Participants and Sampling

A total of 49 participants were included. The sample size was calculated using OpenEpi version 3. Convenience sampling was used for participant recruitment.

Eligibility Criteria

Inclusion criteria were: teachers currently working in primary schools for at least 1 year; age 24–40 years; ability to walk independently and perform daily teaching activities without assistance; and willingness to participate and provide informed consent.

Exclusion criteria were: rheumatoid arthritis involving the ankle or foot; diabetes mellitus; congenital foot deformities; traumatic lower-limb injuries such as fractures, sprains, strains or dislocations; inability to understand or answer the questionnaire because of health or language-related reasons; and unwillingness to participate.

Outcome Measures

Foot Function Index (FFI): The FFI is a self-reported measure used to assess the impact of foot-related problems on pain, disability and activity limitation [5, 6]. The total FFI score was used for analysis according to the scoring procedure of the instrument.

12-Item Short-Form Health Survey (SF-12): Health-related quality of life was assessed using the SF-12. Physical Component Summary (PCS) and Mental Component Summary (MCS) scores were obtained and analysed.

Data Collection Procedure

Eligible teachers were approached in the selected rural primary schools and were informed about the purpose and procedure of the study. Written informed consent was obtained before participation. Participants completed the demographic information form, FFI and SF-12. Completed forms were checked for completeness and the data were entered into a master sheet for statistical analysis.

Ethical Considerations

Ethical approval was obtained from the Institutional Ethics Committee of TMV's Lokmanya Tilak College of Physiotherapy, Kharghar. Permission to conduct data collection was obtained from the relevant authorities. Written informed consent was obtained from all participants, and confidentiality of participant information was maintained.

Statistical Analysis

Data were analysed using IBM SPSS Statistics, version 26.0. Descriptive statistics were used to summarize participant characteristics and study variables. Because the data did not meet assumptions for parametric correlation analysis, Spearman's rank-order correlation was used to examine the relationship between FFI and SF-12 PCS and MCS scores. Statistical significance was set at $p < 0.05$.

Results

A total of 49 rural primary school teachers from the Pen region were included in the final analysis.

Sociodemographic and Anthropometric Characteristics

Table 1: Sociodemographic and anthropometric characteristics of the participants

Characteristic	Mean $\pm$ SD	Median (IQR)
Age (years)	35.88 $\pm$ 3.05	36 (34.5–38.0)
Height (cm)	158.57 $\pm$ 6.59	157 (153–164)
Body weight (kg)	60.41 $\pm$ 10.06	59 (53.5–66.5)
BMI (kg/m ²)	23.96 $\pm$ 3.85	23.2 (21.6–25.9)

The sample included 38 female participants (77.6%) and 11 male participants (22.4%). The mean age was 35.88 $\pm$ 3.05 years.

FFI and SF-12 Scores

Table 2: Descriptive statistics of FFI and SF-12 scores

Variable	Mean $\pm$ SD	Median (IQR)
FFI	9.22 $\pm$ 8.37	6.47 (3.82–11.76)
SF-12 PCS	50.89 $\pm$ 5.41	51.46 (48.73–54.53)
SF-12 MCS	58.12 $\pm$ 5.58	60.74 (55.93–61.60)

Correlation Between FFI and SF-12

Table 3: Spearman's correlation between FFI and SF-12 component scores

Comparison	Spearman's ρ	p-value	Interpretation
FFI vs SF-12 PCS	-0.618	<0.001	Strong negative correlation
FFI vs SF-12 MCS	-0.060	0.680	Not statistically significant

Spearman's rank-order correlation showed a strong negative correlation between FFI and SF-12 PCS ($\rho = -0.618$, $p < 0.001$). No statistically significant correlation was observed between FFI and SF-12 MCS ($\rho = -0.060$, $p = 0.680$).

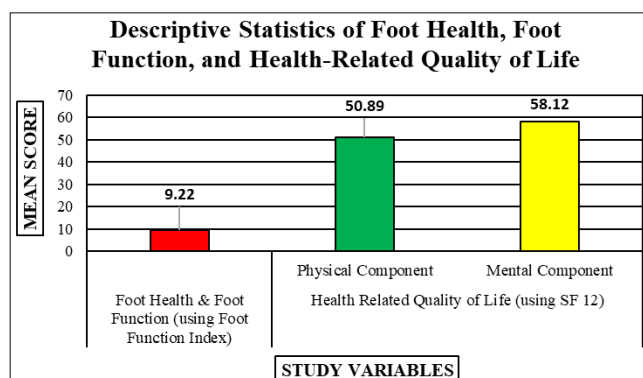


Fig 1: Mean scores of FFI, SF-12 PCS and SF-12 MCS among rural primary school teachers

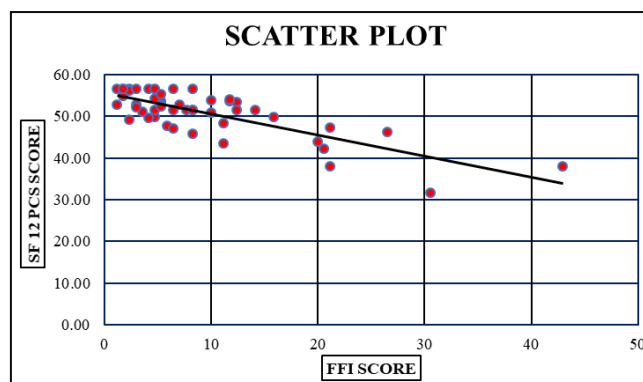


Fig 2: Scatter plot showing the relationship between FFI and SF-12 PCS scores.

Discussion

The present study examined the association between foot function and health-related quality of life among rural primary school teachers in the Pen region. The principal finding was a strong negative correlation between FFI and SF-12 PCS ($\rho = -0.618$, $p < 0.001$), whereas no statistically significant correlation was found between FFI and SF-12 MCS ($\rho = -0.060$, $p = 0.680$).

The negative relationship between FFI and SF-12 PCS indicates that higher FFI scores were associated with lower physical health-related quality of life in the study population. Foot-related pain and functional limitations can interfere with standing, walking, balance and other physical activities. These activities are directly relevant to the physical component of health-related quality of life. The present findings are consistent with the broader literature indicating an association between disabling foot

problems, functional limitations and poorer health-related quality of life. Mickle *et al.* reported that older adults with disabling foot pain demonstrated poorer functional ability and health-related quality of life ^[1]. Research in rural populations has also reported poorer health-related quality of life among people with foot disorders ^[8].

The occupational demands of teaching may be relevant to these findings. Primary school teachers may spend substantial periods standing, walking within classrooms and supervising students. Previous research has documented musculoskeletal problems among school teachers from both urban and rural settings ^[3]. A study among primary school teachers also examined plantar fasciitis and quality of life using the FFI ^[2], while research among school teachers in Saudi Arabia has reported plantar heel pain ^[4]. These findings support the relevance of foot-related assessment in this occupational group.

The absence of a statistically significant relationship between FFI and SF-12 MCS may reflect the multidimensional nature of mental health-related quality of life. Mental health can be influenced by emotional, social, occupational and personal factors in addition to physical symptoms. Therefore, the relationship between foot function and mental health may be less direct than the relationship with physical health.

The findings should be interpreted cautiously. The cross-sectional design identifies associations but does not establish causality. In addition, the relatively small sample and convenience sampling may affect the generalizability of the findings.

Conclusion

Among rural primary school teachers in the Pen region, higher FFI scores were associated with lower SF-12 physical health-related quality of life. A strong negative correlation was observed between FFI and SF-12 PCS, whereas no statistically significant correlation was observed between FFI and SF-12 MCS. The findings indicate that foot function is relevant to the physical aspect of health-related quality of life in this occupational group.

Limitations

- The sample size was small (n = 49), which may limit generalizability.
- Convenience sampling may have introduced sampling bias.
- The cross-sectional design does not allow determination of cause-and-effect relationships.
- The study was restricted to rural primary school teachers in the Pen region.
- FFI and SF-12 are self-reported questionnaires and responses may be influenced by individual perception.

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