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A study to assess the knowledge, perspectives and compliance regarding orthotic devices among patients with orthotics in a selected hospital, at Mangaluru

Divya Telis[1], Dr. G Prathiba[2], Dr. R Kanagavalli[3]
[1] Zulekha Nursing College, Mangaluru, Karnataka, India
[2] Principal and Professor, Zulekha Nursing College, Mangaluru, Karnataka, India
[3] Director for Research and Professor, Zulekha Nursing College, Mangaluru, Karnataka, India

Abstract
Background: Neuromusculoskeletal disorders are conditions affecting the nervous system, muscles, bones, and joints, leading to pain, weakness, deformity, and impaired mobility. These disorders are a major cause of disability and often require long-term rehabilitation to improve functional ability and quality of life. Orthotic devices are commonly used to support weakened body parts, maintain proper alignment, correct deformities, reduce pain, and enhance mobility and independence. The successful use of orthotic devices depends on appropriate understanding and proper utilization by patients. Therefore, assessing patients' knowledge regarding orthotic devices is important to identify existing knowledge levels and gaps, which may influence their effective use and rehabilitation outcomes.
Objectives
1. To assess the knowledge, perspectives and compliance regarding orthotic devices among patients with orthotics.
2. To find association between the knowledge, perspectives and compliance regarding orthotic devices with sociodemographic variables such as age, gender, religion, marital status, educational qualification, occupation, family income, type of family, place of residence, social habits, co-morbid illness, type of orthotic device used, duration of orthotic use, reason for orthotic use, previous exposure to orthotic devices, source of information regarding orthotic devices.

Methodology: 30 participants were selected by using purposive sampling technique.
Results: The study findings revealed that among 30 samples, the majority of 18(60%) had inadequate knowledge, 10(33%) had moderate knowledge and only 2(7%) had adequate knowledge regarding orthotic devices. The overall mean score and standard deviation was 11±5.1 and the mean score percentage was 36.66%, which was inadequate regarding knowledge, perspectives and compliance on orthotic devices. The chi-square test revealed a significant association between knowledge, perspectives and compliance regarding orthotic devices with the type of family ($p<0.05$) and no significant association was found with other sociodemographic variables, hence the research hypothesis H_1 was accepted.
Conclusion: The present study revealed that the majority of 18(60%) had inadequate regarding knowledge, perspectives and compliance regarding orthotic devices.

Keywords: Assess, knowledge, perspectives, compliance, orthotic devices

Introduction

The musculoskeletal system provides structural support, enables movement, and protects vital organs. Bones continuously remodel through osteoblasts, osteoclasts, and osteocytes, influenced by neuronal innervation. With aging or disease, neuronal dysfunction impairs remodeling, decreases repair capacity, and leads to bone fragility. Reduced neural input further weakens muscle strength, exacerbating bone loss [1].

Physical disabilities encompass long-term limitations affecting mobility, physical functioning, stamina, or agility, arising from congenital conditions, injuries, illnesses, or degenerative diseases. Beyond physical limitations, disabilities significantly impact mental well-being, with disabled adults being nearly five times more likely to experience frequent mental health challenges compared to non-disabled individuals [2].

According to WHO 2023, an estimated 1.3 billion individuals worldwide live with significant disability, representing nearly 16% of the global population. Individuals with disabilities face a reduced life expectancy of up to 20 years and nearly double the risk of chronic conditions such as depression, asthma, diabetes mellitus, stroke, and obesity [3].

According to WHO data 2021, assistive devices are designed to maintain or improve individual functioning and independence, enhancing overall well-being and quality of life. WHO estimates that approximately 2.5 billion people may require assistive devices by 2050. Despite the growing need, access remains highly unequal, with availability as low as 3% in some settings, highlighting a significant global gap in service provision [4].

Orthotics are externally applied devices used to support, align, control, or enhance body movement, helping individuals improve mobility, stability, and overall function. Unlike prosthetics, which replace a missing limb, orthotics assist existing body segments by providing structural support or correcting alignment. Orthotic devices are commonly prescribed for musculoskeletal, neurological, or developmental conditions and include spinal orthoses, ankle-foot orthoses (AFOs), knee-ankle-foot orthoses (KAFOs), and advanced microprocessor-controlled devices such as the C-Brace. Device selection depends on the patient's clinical condition, age, activity level, comfort, and skin integrity, and successful outcomes require accurate fitting, consistent use, regular follow-up, and patient education [5].

Orthotic devices are viewed as important interventions for individuals with long-term conditions, assisting mobility, promoting independence, reducing pain, and decreasing the need for invasive treatments such as surgery. Economically, orthoses are considered cost-effective, as investment in orthotic services is believed to reduce the overall burden on healthcare. However, concerns remain regarding inconclusive evidence of effectiveness, poor patient adherence, and lack of routinely collected outcome data, making it difficult to clearly demonstrate their overall impact on patient health and healthcare costs [6].

Orthoses provide many beneficial effects, but some users report dissatisfaction, reducing compliance. Non-compliance is particularly common when inappropriate orthoses are prescribed. Problems associated with orthotic use include pressure ulcers, difficulty climbing stairs, challenges in activities of daily living, prolonged time to wear and remove the device, increased energy expenditure, feelings of instability, worsening muscle spasms, fractures, and shoulder discomfort. Inappropriate orthoses can lead to complications such as pressure sores, nerve injury, pain, deformities, and unnecessary financial burden. Compliance and adherence are critical factors determining the success of any orthotic treatment [7].

Methodology

Aim

The aim of the present study was to assess the knowledge, perspectives and compliance regarding orthotic devices among patients with orthotics.

Participants

- The sample size was 30, aged above 18 years of age were included in the study.

Inclusion criteria

The patients who were:

- Using orthotic devices
- Above 18 years of age
- Both males and females
- Willing to participate in the study
- Able to read and understand Kannada and English.

Exclusion criteria

The patients who were:

- Unconscious
- Not willing to give consent for participation in the study
- Critically ill or medically unstable
- With cognitive or communication difficulties.
- Not present at the time of data collection

Data collection procedure

The researcher selected non probability purposive sampling technique to select patients with orthotics in a selected hospital at Mangaluru. Prior permission was obtained from the authority and informed consent was obtained from the participants. The investigator collected data through the interview method for socio-demographic variables was about 10 minutes and for 20 minutes from each sample followed by the distribution of an information booklet.

Statistical analysis

The collected data were analysed by using,

Descriptive statistics: frequency, mean, standard deviation and percentage.

Inferential statistics: chi square test

Results and discussion

Table 1: Distribution of patients with selected socio-demographic variable N=30

Socio-Demographic Variables	Frequency	Percentage %
1. Age		
a. 18-30 years	**7**	23
b. 31-40 years	8	27
c. 41-50 years	6	20
d. >51 years	9	30
2. Gender		
a. Male	23	77
b. Female	7	23
c. Transgender	-	-
3. Religion		
a. Hindu	10	33
b. Muslim	11	37
c. Christians	8	27
d. Any other	1	3
4. Marital status		
a. Married	22	73
b. Unmarried	6	20
c. Widow/widower	2	7
d. Separated/divorced	-	-
5. Educational qualifications		
a. No formal education	2	7
b. Primary	3	10
c. Secondary	3	10
d. Higher secondary	10	33
e. Graduate/postgraduate	12	40
6. Occupation		
a. Private job	5	17
b. Government job	1	3

c. Self-employed	9	30
d. Unemployed	10	33
e. Retired	5	17
7. Monthly family income		
a. < Rs. 10,000/-	10	33
b. Rs. 10,001-20,000/-	3	10
c. Rs. 20,001-30,000/-	5	17
d. >Rs. 30,001/-	12	40
8. Type of family		
a. Nuclear family	19	67
b. Joint family	10	30
c. Extended family	1	3
9. Place of residence		
a. Urban	15	50
b. Rural	11	37
c. Semi-urban	4	13
10. Social habits		
a. Smoking	-	-
b. Alcohol consumption	2	7
c. Betel-chewing habit	27	90
d. No bad habits	1	3
e. Any other	-	-
11. Comorbid illness		
a. Yes	18	60
b. No	12	40
12. Type of orthotic device used		
a. Lower limb orthotics	9	30
b. Upper limb orthotics	17	57
c. Spinal orthotics	4	13
d. Any other	-	-
13. Duration orthotic use		
a. First time users	16	53
b. < 6 months	11	37
c. 6 months – 2 years	3	10
d. >2 years.	-	-
14. Reason for orthotic use		
a. Trauma/injury	15	50
b. Neurological disorder	4	13
c. Post-surgical rehabilitation	11	37
d. Other specified reason	-	-
15. Previous exposure to orthotic devices		
a. Yes	4	13
b. No	30	87
16. Source of information regarding orthotic devices		
a. Media	1	3
b. Newspaper	2	7
c. Health care professionals	25	83
d. Family/neighbours	2	7
e. Any Other	-	-

Fig 1: Distribution of patients according to the level of knowledge, perspectives and compliance regarding orthotic devices.

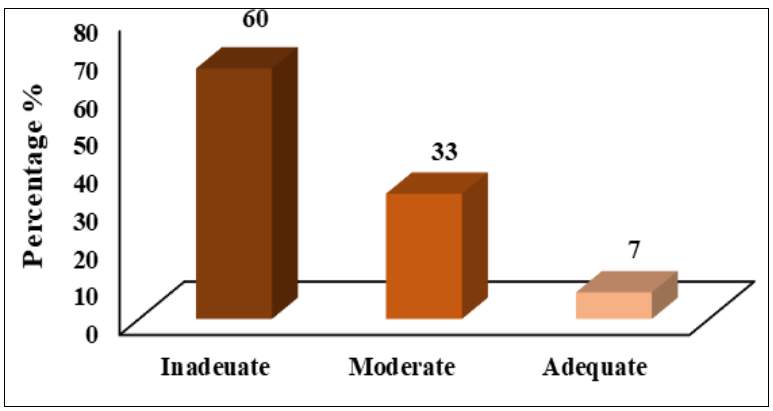

Fig 1: Distribution of overall knowledge score

Fig 1 reveals that the the majority of the patients 18(60%) had inadequate knowledge, perspectives and compliance regarding orthotic devices.

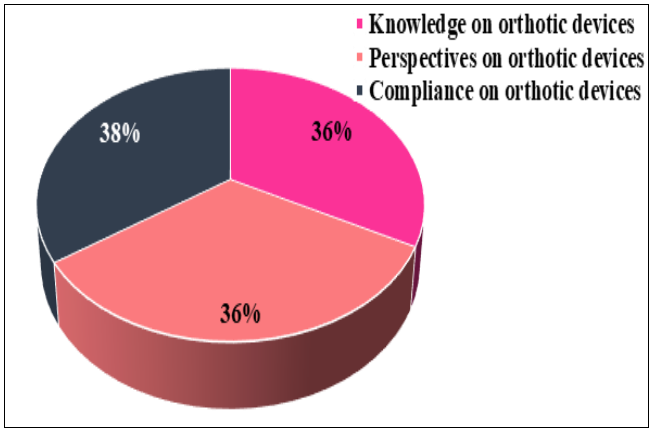

Fig 2: Area wise mean and mean percentage of knowledge, perspectives and compliance regarding orthotic devices among patients with orthotics

Fig 2 represents that area wise overall mean score and standard deviation was 11±5.1 and mean score percentage was 36.66%

Table 1: Distribution of patients according to the item wise knowledge, perspectives and compliance level regarding orthotic devices

Item wise analysis shows that the knowledge score among 30 samples revealed that equal number of participants 15(50%) were aware and unaware about external devices that supports and correct body parts, 11(37%) were didn't know about the function of orthotic devices, whereas 16(53%) were unaware about the dependency of selection of materials for orthotic devices. Equal number of participants 15(50%) were aware and unaware regarding proper usage of orthotic devices. Majority 23(77%) were unaware about cleanliness of orthotic devices, 25(83%) were unaware about reassessment at regular intervals of orthotic devices, and 24(80%) were unaware about the primary use of foot orthoses (FO). About 25(83%) were unaware regarding the effectiveness of lumbo-sacral orthoses (LSO), while 22(73%) were unaware about immobilization braces used in the post-operative period.

Item wise analysis shows that among 30 samples, 16 (53%) were unaware about the common belief regarding orthotics. Majority 23 (77%) were unaware that perseverance of wearing visible assistive devices is considered as a sign of disability. About 18 (60%) were unaware regarding social stigma related to use of orthotic devices, while 17 (57%) were unaware about the perception related to unattractive or visibly different orthotics. Majority 21 (70%) were unaware about coping and positive adaptation to orthotic use. About 16 (53%) were aware regarding the important benefits of orthotic use. Majority 21 (70%) were unaware regarding positive outcomes and consistent use of orthotic devices. About 20 (67%) were unaware regarding prolonged use of orthotic devices, while 24 (80%) were unaware that limitation in participation occurs due to the perception of using an orthotic device.

Item wise analysis shows that among 30 samples, equal number of participants 15 (50%) were aware and unaware regarding the primary importance of timely orthotic use in post-surgical patients. Majority 19 (63%) were unaware about the effects of poorly fitting orthotics or those made of rough materials. About 21 (70%) were unaware regarding the assurance of high compliance with orthotic use. Nearly 16 (53%) were unaware about the incorporation of custom fitting, padding, and breathable materials used in orthotics. Majority 19 (63%) were unaware regarding orthotic device follow-up visits and maintenance of cleanliness of orthotic devices. About 20 (67%) were unaware regarding indications such as sharp pain and visible skin damage while using an orthotic device. Nearly 16 (53%) were unaware regarding the contribution of consistent use of orthotic devices. Majority 19 (63%) were unaware about functional improvement from orthotic devices and small achievements to celebrate while using orthotic devices.

Overall, patient did not had adequate knowledge, perspectives and compliance level regarding orthotic devices.

Discussion

The study aimed to assess the knowledge, perspectives and compliance regarding orthotic devices among patients with orthotics in a selected hospital, at Mangaluru. The study findings had been discussed according to the objectives and hypothesis along with the result of other studies.

- **Distribution of samples according to socio-demographic variables**

In the present study, the distribution of 30 samples, according to sociodemographic variables of patients with orthotics depicts that were 9(30%) were >51 years of age, 23(77%) were males, 11(37%) were Muslims, 22(73%) were married, 12(40%) were educated up to graduate/post graduate level, 10(33%) were unemployed, 12(40%) were earning more than Rs. 30,001/-, 19(67%) were nuclear family, 15(50%) were urban, 27(90%) had no bad habits, 18(60%) had a history of comorbid illness, 17(57%) using upper limb orthotic devices, 16 (53%) were first time users of orthotic devices, 15(50%) were using orthotic for trauma/injury, 26(87%) had no previous exposure to orthotic devices, 25(83%) obtained information through health care professionals.

The present study supports a cross-sectional study conducted to assess patient use and satisfaction with ankle foot orthoses (AFOs) and related services among patients attending the PMR department of a tertiary care hospital, AIIMS, at New Delhi. 100 participants were enrolled by convenience sampling technique. The sample mainly consisting of males (71%) and urban residents (82%), with 89% of participants below 18 years of age (21% under 5 years and 68% between 5 and 18 years) and only 11% above 18 years. Based on Kuppuswamy's socio-economic scale, the majority belonged to the lower middle (37%) and upper lower (34%) classes, followed by upper middle (23%) and lower (6%) classes. The result found that 98% of subjects were under advice from healthcare providers to use an AFO, but only 59% were using an AFO at present. The majority (87%) paid for their AFOs, and common complaints included pain, fitting-related issues, and social stigma. 59% strongly agreed that they disliked the appearance of their AFO, and 37% were completely dissatisfied with the accessibility of their home and surroundings while using it. The majority of subjects were "more or less satisfied" with the device. The data analysis was descriptive in nature, and no significant association was found between socio-

demographic variables and satisfaction outcomes. The study concluded that improving the design and fit of the orthosis is essential to enhance acceptance and satisfaction, and that user education regarding the AFO's role in improving function rather than providing a cure should accompany technology provision [8].

- **Distribution of samples according to the level of knowledge**

In the present study revealed that among 30 samples, 18(60%) had inadequate knowledge, 10(33%) had moderate knowledge and 2(7%) of patient had adequate knowledge, perspectives and compliance regarding orthotic devices. The data showed that, the mean score with standard deviation regarding level of knowledge about orthotic devices was 3.6±1.76, with a mean percentage of 36%. The area wise mean score and standard deviation regarding perspectives of orthotic devices was 3.6±1.67, with a mean percentage of 36%. The area wise mean score and standard deviation regarding compliance with orthotic devices was 3.8±1.8, with a mean percentage of 38%.

The present study supports a prospective study conducted to assess baseline psychosocial factors associated with future compliance with scoliosis brace wear and to identify the psychosocial factors influencing adherence to scoliosis brace treatment in Hospital of Philadelphia, at Pennsylvania. The consecutive sampling technique was used to select 33 samples. The study results revealed that participants with a BFF score greater than 5 (n = 15/15; compliance >75%) demonstrated better brace adherence, whereas those with a BFF score of 5 or less (n = 18/33; 55%; median compliance 50%) had less consistent brace wear, with 9 of 18 participants showing compliance below 50%. The study concluded that several baseline psychosocial factors are associated with future compliance with scoliosis brace wear. Suggested that the BFF scale has the potential to identify patients who are likely to be noncompliant, enabling targeted interventions such as supportive counselling, peer-support groups, and additional provider-based education to improve adherence [9].

- **Association between the knowledge, perspectives and compliance regarding orthotic devices among patients with orthotics and selected sociodemographic variables.**

The chi square test was used to assess the association between knowledge, perspectives and compliance regarding orthotic devices among patients with orthotics and socio-demographic variable. There was significant association found with a selected socio-demographic variables such as with the type of family. But there was no association found with other variables. Hence the research hypothesis H_1 was accepted.

Summary and conclusion

A study aimed to assess the knowledge, perspectives and compliance regarding orthotic devices among patients with orthotics. An information booklet was distributed to the patients to improve their knowledge, perspectives and compliance on orthotic devices; the data was presented using descriptive statistics and inferential statistics.

The following conclusion was drawn based on the findings of the study

The present study revealed that the majority of 18(60%) had inadequate knowledge, 10(33%) had moderate knowledge and only 2(7%) had adequate knowledge regarding orthotic devices. The overall mean score and standard deviation was 11±5.1 and the mean score percentage was 36.66%, which was inadequate regarding knowledge, perspectives and compliance on orthotic devices.

Limitation

The study was limited to the patients:

- With orthotic devices
- Above 18 years of age
- Both males and females
- Willing to participate in the study
- Able to read and understand Kannada and English

Recommendations

- A study to assess the effectiveness of structured teaching programme on knowledge, perspectives and compliance regarding orthotic devices among patients with orthotics in a selected hospital.
- A study to assess knowledge, perspectives and compliance regarding orthotic devices among patients with orthotics with a larger sample size in a selected hospital.
- A study to assess knowledge, perspectives and compliance regarding orthotic devices among patients with orthotics in selected rural settings.
- A comparative study to assess knowledge, perspectives and compliance regarding orthotic devices among patients using different types of orthotic devices in a selected hospital.
- A longitudinal study to assess long-term compliance regarding orthotic devices among patients with orthotics in a selected hospital.

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