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Original Article

Psychosocial Adaptation, Disability, and Resilience among Individuals with Amputations in an Indian setting

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Abstract

Background: Traumatic amputations significantly affect physical function, coping, and self-esteem, highlighting the need for comprehensive rehabilitation and holistic nursing care. The study aims to assess the functional disability, coping strategies, and self-esteem of patients with upper or lower limb amputation.
Methodology: Overall, 250 subjects were recruited from various departments and their services for this cross-sectional correlational study. Data was collected using standardized tools such as the WHODAS 2.0 – 36 Item questionnaire (α=0.98), Coping Inventory for Stressful Situations–SF21 (α=0.81), and Rosenberg's Self-esteem scale (α=0.88) by using a researcher-administered method. Descriptive and Inferential statistics were used for analysis.
Results: The findings revealed that 240 (96%) had a severe functional disability, 140 (56%) had a medium level of coping, and 200 (80%) had average self-esteem. Severe functional difficulty 180 (72%) was seen in participation. The majority had a medium level of avoidance coping 140 (56%). Correlation analysis showed a moderate negative association between functional disability and coping strategies ($r = -0.514$, $p < 0.001$), a weak negative association between functional disability and self-esteem ($r = -0.140$, $p = 0.027$), and a weak-to-moderate negative association between coping strategies and self-esteem ($r = -0.280$, $p < 0.001$). These findings indicate statistically significant associations among functional disability, coping strategies, and self-esteem.
Conclusion: The study reveals a deeper connection between functional disability, coping strategies, and self-esteem among amputated patients, pressing the critical need for targeted nursing assessments and strategic interventions.

Keywords: Amputation, Functional disability, self-esteem, coping strategies, Nursing care

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Introduction

According to the World Health Organization (WHO), musculoskeletal conditions such as amputation pose a major global health burden, leading to long-term limitations in mobility, daily functioning, and rehabilitation needs(1). Despite advancements in medical care, a striking 94% of amputees still view amputation as an unacceptable reality. This widespread perception stems from several factors, including poor self-esteem, ineffective coping strategies, inadequate social support, financial hardship, and stigma (2).

The Amputee Coalition of America recognizes limb loss as a widespread condition with significant implications for long-term rehabilitation and psychosocial well-being (3). In India, however, there is a lack of comprehensive, specific, and up-to-date data regarding the prevalence of amputations. Findings from the National Sample Survey Organization (NSSO) underscore the ongoing burden of locomotor impairments in India, highlighting the need for sustained rehabilitation and supportive care services (5, 6). Amputation profoundly affects daily living activities, social roles, and responsibilities, often leading to increased dependency and feelings of powerlessness (6). However, maintaining the ability to perform basic tasks such as eating, bathing, and moving around independently can contribute to a secure and fulfilling quality of life. (7) On the other hand, poor coping mechanisms and low self-esteem following amputation can lead to mental health challenges, including anxiety, depression, and post-traumatic stress disorder (8).

Despite recognition of these multifaceted challenges globally, research from India remains sparse, with limited empirical studies addressing psychosocial outcomes, coping mechanisms, or the role of structured nursing interventions in rehabilitation; existing Indian literature predominantly consists of heterogeneous observational reports that document psychological distress in amputees but do not systematically investigate tailored psychosocial nursing support models or longitudinal rehabilitation outcomes, indicating a significant gap in rehabilitation-focused nursing research that integrates psychosocial assessment, mental health support, and evidence-based psychosocial interventions into post-amputation care(9).

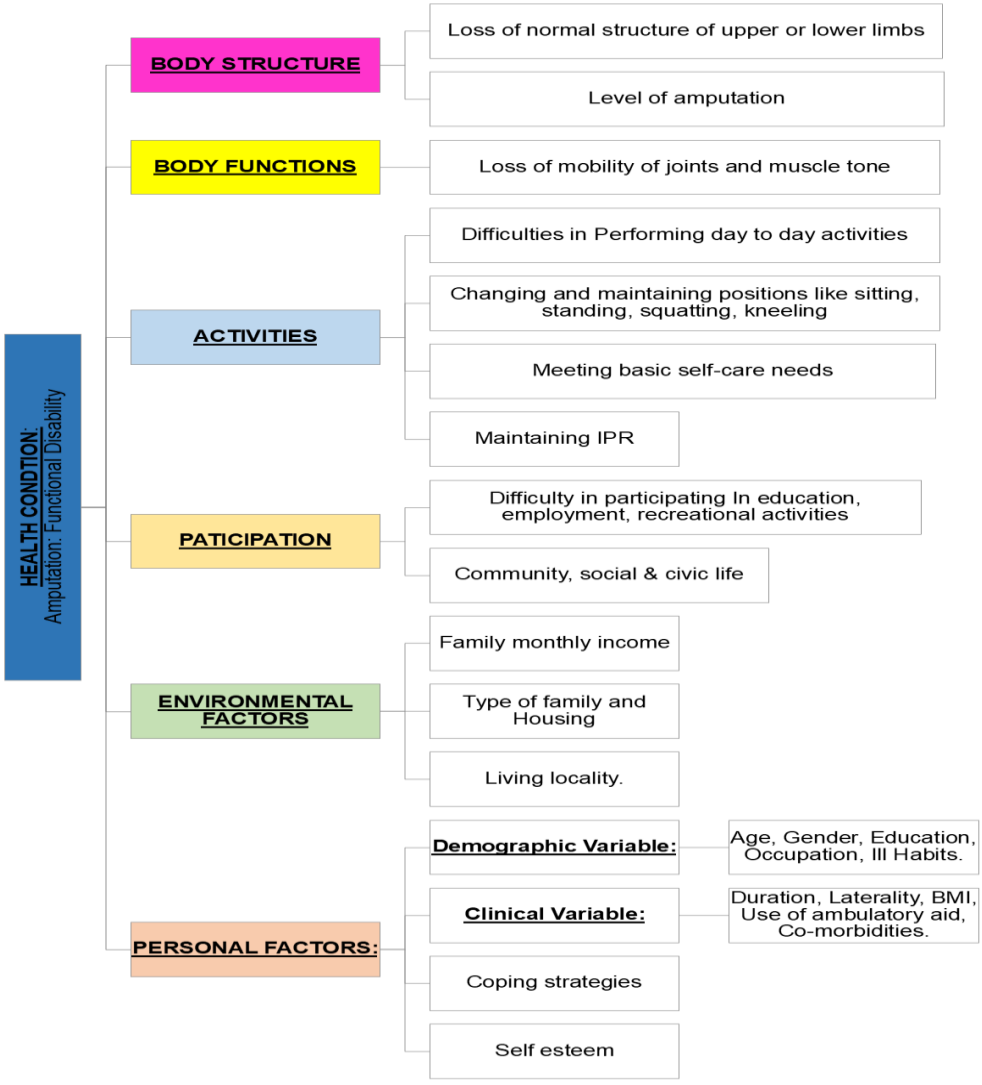
Nurses are typically the first to recognize a decline in functionality during follow-up hospital visits (10). The key challenge lies in understanding the factors that influence functional disability and in implementing effective coping strategies that can enhance amputees' self-esteem, thereby improving their overall quality of life.

Despite the high number of cases, research in this area remains limited, with only two studies conducted, focusing on the role of nurses in the care of amputees. With this in mind, our study aimed to evaluate the functional disability, coping strategies, and self-esteem of patients with upper or lower limb amputation, ultimately contributing to enhanced care and support for this underserved population.

Conceptual Framework

This Conceptual framework is based on the International Classification of Functioning, Disability and Health (ICF) model developed by the WHO in 2001 and modified by McDougall, J et al in the year 2010, incorporating quality of life into it (11). This model links data for patients undergoing amputation after a long term, aiming to more effectively and transparently reveal information as a “Gold standard” in health care (12). (Figure.1)

Figure 1 Conceptual Framework of the study



Objectives

The aim of this study is to assess the functional disability and its impact, coping strategies, and self-esteem among patients with upper or lower limb amputation, and to evaluate the correlation and association between the functional disability, coping strategies, and self-esteem of patients with upper or lower limb amputation.

Methodology

Study Design: A cross-sectional correlational study was conducted among 250 patients with upper or lower limb amputation recruited from a tertiary care hospital in South India.

Operational Definitions

Functional Disability: Denotes the limitations in performing daily activities by an individual after 6 months of amputation as measured by the WHO Disability Assessment Schedule 2.0 36-Item Questionnaire, using the researcher administration method (13).

Coping Strategy: Denotes the methods of thought or action utilized to manage everyday life following 6 months of amputation, as measured by the Coping Inventory for Stressful Situations -SF 21 using the researcher administration method (14).

Self-Esteem: Denotes the personal feelings of worth and how a person views themselves after 6 months of amputation as measured by Rosenberg's Self-Esteem Scale, using the researcher administration method (Rosenberg, 2022).

Patients with Upper or Lower Limb Amputation: Denotes a person who has undergone one or both of their upper or lower limb amputation, which includes shoulder, wrist, hip, and knee disarticulation; forequarter, above the elbow, below the elbow, above the knee, below the knee, and foot amputation (16).

Sample Size & Calculation

According to the referenced study, the average (standard deviation) of the WHODAS 2.0 Score was 38.22 (8.02). The sample size was determined based on the given estimate of standard deviation, with a desired precision of 1 and a 95% confidence interval. The study sample size was 247 (17).

Formula

$$n = \frac{z^2_{1-\alpha/2}\sigma^2}{d^2}$$

Where,

σ : Standard deviation

d : Precision

1- α/2 : Desired Confidence level

Inclusion Criteria

Participants who are:

- Patients who have undergone upper or lower limb amputation (Shoulder, wrist, hip, and knee disarticulation; forequarter, trans-humeral, trans-radial, transtibial, transfemoral, and foot amputations) after 6 months of amputation.
- Patients who are conscious and provide written consent to participate in the study
- Individuals above the age of 18 years

Exclusion Criteria

- Participants other than upper or lower limb amputation (finger/toe)
- Participants with cognitive impairment
- Subjects becoming sick during the study

Data Collection Tools

1. WHODAS 2.0 36-Item Questionnaire: measures functional disability and includes items focusing on six domains: Cognition, Mobility, Self-care, Getting along with people, Life activities, and Participation (13).

The WHODAS 2.0 (36-item) questionnaire was scored using the simple scoring method as recommended by the WHO manual. Each item was rated on a 5-point Likert scale (1 = none to 5 = extreme/cannot do), with higher scores indicating greater disability. Total scores were converted into percentage scores and categorized as moderate disability (25–49%) and severe disability (≥50%), consistent with prior published literature.

2. Coping inventory for stressful situations (CISS SF-21): a twenty-one-item scale focusing on how an individual tries to cope with a stressful situation (14).

3. Rosenberg's Self-Esteem Scale includes 10 items focusing on the subjective negative and positive feelings (15).

Demographic variable

The Demographic factors encompass age, gender, marital status, religion, education, occupation, family monthly income, type of family, housing, and substance use habits.

Clinical variable

The Clinical Variables include causes, level, and duration of amputation, laterality, body mass Index, Range of motion, and use of ambulatory aid, prosthesis, stump, and phantom limb pain.

Ethical Consideration

This study was conducted in accordance with the ethical principles that have been outlined in the Declaration of Helsinki in line with Good Clinical Practice (GCP) guidelines, and compliant with the applicable regulatory requirements. Ethical approval for the study was obtained from the Institutional Ethics Committee of Christian Medical College, Vellore (Approval No: 56/03/2023; Date: 07/07/2023). Written informed consent was obtained from all participants enrolled in the study.

Data Collection Procedure

The study was conducted at the Amputation Clinic, PMR-OPD, and Community outreach clinic within a 100-kilometer radius of a tertiary hospital in South India. Patients who met the inclusion and exclusion criteria were selected through a convenience sampling method from the medical records office, based on their registered serial numbers. Informed consent was obtained from the patients after introducing the study to them and their family members. The investigator collected demographic and clinical data through interviews. The researcher administered the questionnaires, including the WHODAS, CISS SF-21, and Rosenberg's Self-esteem scale, in the patient's preferred language using a researcher-led administration method. All collected data were kept confidential with password protection, and the anonymity of the subjects was maintained. A pilot study was conducted to assess its feasibility.

Data Analysis

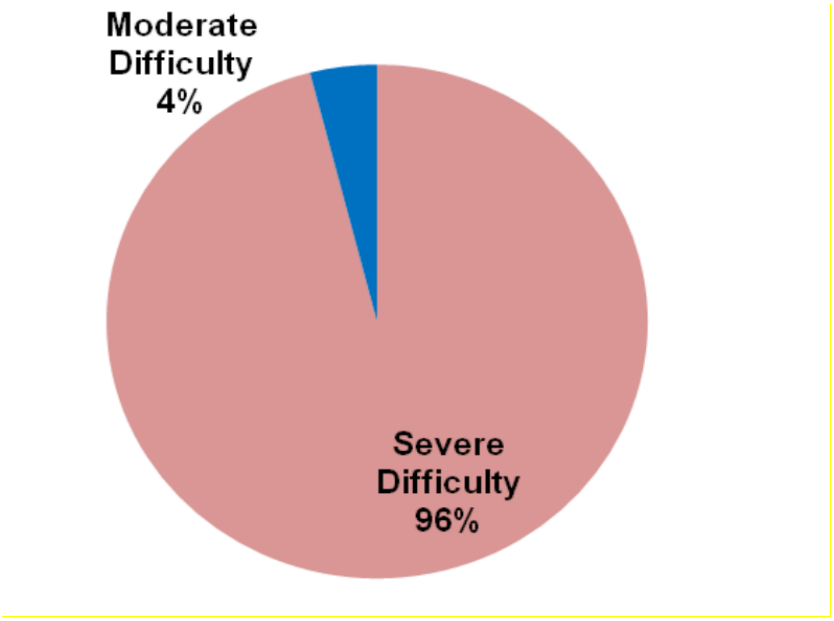
Data were entered using MS Excel. Descriptive statistics were employed to report demographic and clinical characteristics of the participants. Inferential statistics were analyzed using the chi-square test for cells with counts greater than 5, while Fisher's exact test was applied for cells with counts less than 5.Pearson's correlation coefficient was used to analyze the relationship between continuous variables. A p-value of less than 0.05 was considered statistically significant. All statistical analyses were performed using SPSS version 21.

Results

A total of 250 participants were enrolled in the study. Most participants were aged 41–60 years (40%, n = 100), and 68.4% (n = 171) were male. Regarding occupation, 37.6% (n = 94) were unskilled workers. A family monthly income of ₹5,000–₹10,000 was reported by 43.6% (n = 109) of participants. The majority belonged to nuclear families (94%, n = 235), lived in basic housing conditions (66%, n = 165), and were from urban areas (78.4%, n = 196). Substance use was reported by 43.2% (n = 102) of participants.

The most common cause of amputation was road traffic accidents (39.6%, n = 99). Nearly half of the participants (47.2%, n = 118) had undergone amputation 6 months to 1 year prior to the study, and 97.2% (n = 243) had unilateral amputations. Pressure over the stump was reported by 36% (n = 90), and 77.2% (n = 193) reported phantom limb pain.

Figure.2 Distribution of subjects based on their level of functional disability among upper or lower limb amputation (n=250)



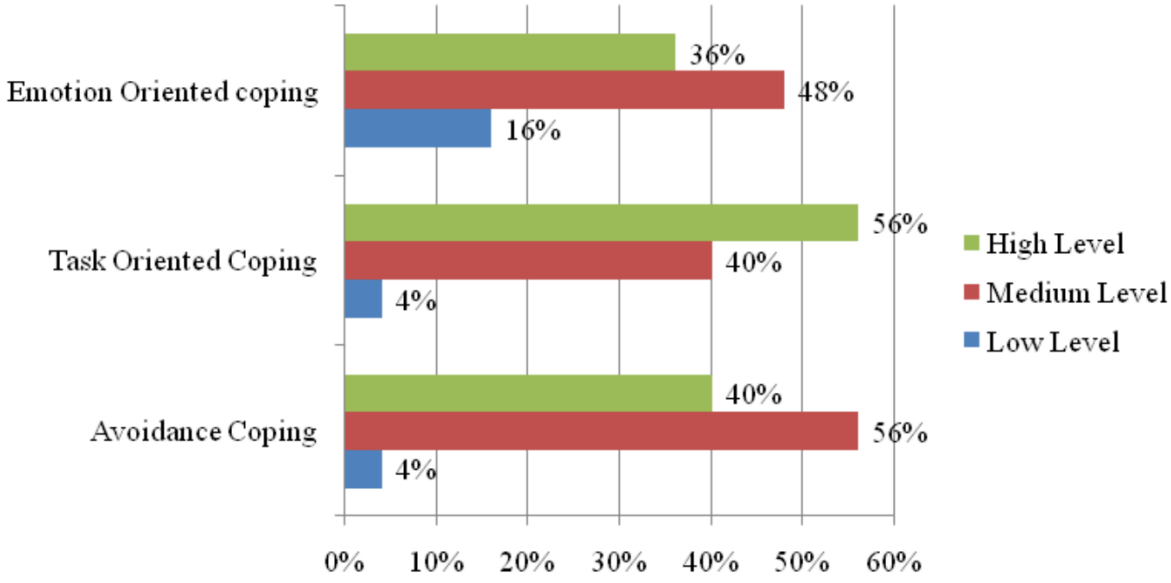
Functional Disability

Based on WHODAS 2.0 scores, 96% (n = 240) of participants were categorized as having severe functional disability, while 4% (n = 10) had moderate functional disability (Figure 2). Domain-wise analysis showed that participants reported moderate difficulty in cognition (72%, n = 180) and severe difficulty in mobility (60%, n = 150), self-care (65.2%, n = 163), getting along with people (49%, n = 122), and participation (80%, n = 200). Extreme difficulty was reported in household activities (52%, n = 130) and work activities (72%, n = 180) (Figure 5).

Coping Strategies

Regarding overall coping strategies, 56% (n = 140) of participants demonstrated medium-level coping, while 44% (n = 110) demonstrated high-level coping (Figure 3).

Figure.3 Analysis of subjects based on each aspect of coping strategies (n=250)

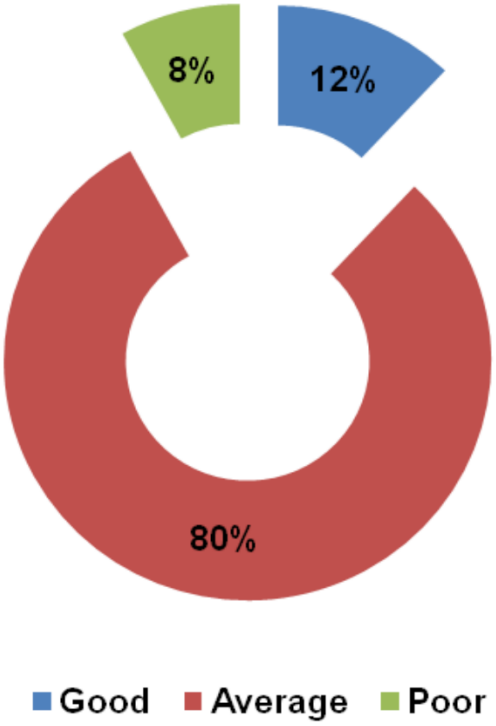


In subscale analysis, task-oriented coping was reported at medium and high levels by 40% (n = 100) and 56% (n = 140) of participants, respectively. Emotion-oriented coping was reported at a medium level by 48% (n = 120) and at a high level by 36% (n = 90). Avoidance coping was predominantly at a medium level (56%, n = 140), followed by high (40%, n = 100) and low levels (4%, n = 10) (Figure 6).

Self-Esteem

Most participants (80%, n = 200) reported average self-esteem, while 12% (n = 30) reported good self-esteem, and 8% (n = 20) reported poor self-esteem (Figure 4).

Figure 4 Distribution of subjects based on their level of self-esteem (n=250)



Correlation Analysis

Table 1 Correlation between functional disability and coping strategies, Self-esteem; the relationship between Coping strategies and self-esteem(n=250)

	R	P
Functional Disability and Coping Strategies	-0.514**	<0.001
Functional Disability and Self-Esteem	-0.140*	0.027
Coping Strategies and Self-Esteem	-0.280 **	<0.001

Pearson's correlation analysis demonstrated a statistically significant negative correlation between functional disability and coping strategies ($r = -0.514$, $p < 0.001$). A weak but statistically significant negative correlation was observed between functional disability and self-esteem ($r = -0.140$, $p = 0.027$). A statistically significant negative correlation was also observed between coping strategies and self-esteem ($r = -0.280$, $p < 0.001$) (Table 1).

Association Analysis

A statistically significant association was found between functional disability and type of family ($p < 0.05$). No significant associations were observed between functional disability and clinical variables ($p > 0.05$). Moreover, a statistically significant association was observed between coping strategies and substance use habits ($p < 0.05$), while no significant association was found between coping strategies and clinical variables ($p > 0.05$). In addition, self-esteem showed statistically significant associations with occupation and family monthly income ($p < 0.05$). No significant associations were observed between self-esteem and clinical variables ($p > 0.05$).

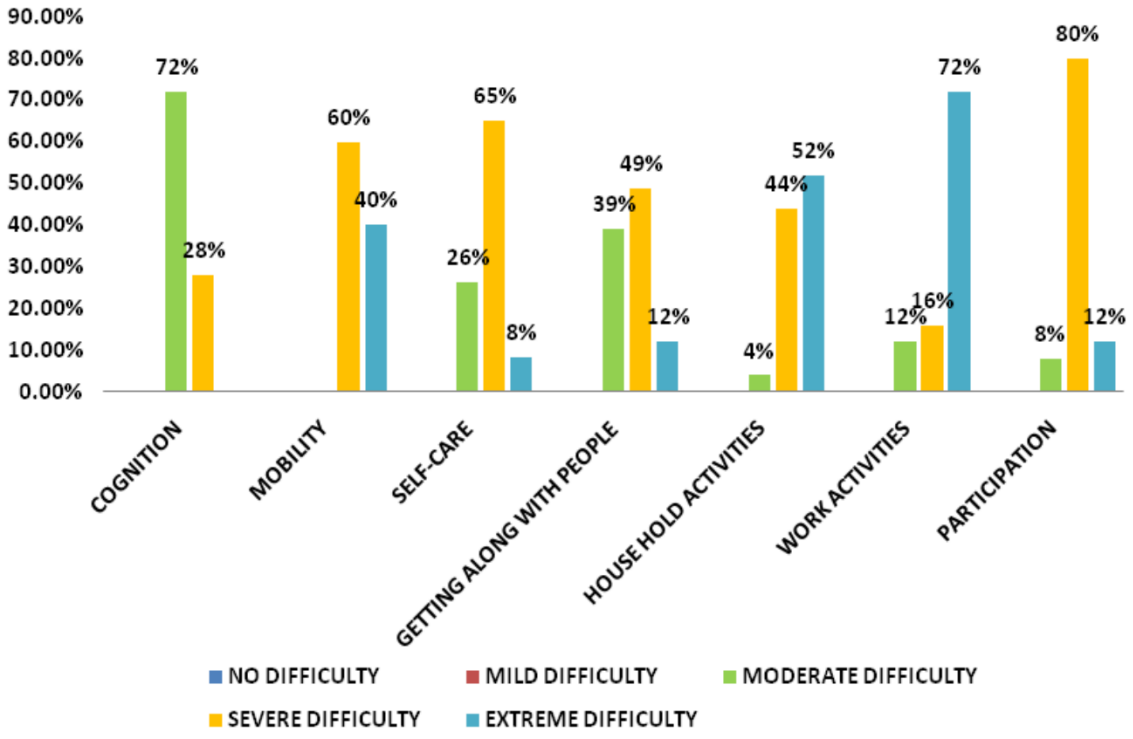


Figure.5 Distribution of Functional Disability Across WHODAS 2.0 Domains Among Patients with Upper or Lower Limb Amputation (n = 250). This figure illustrates the distribution of difficulty levels (no, mild, moderate, severe, and extreme) across WHODAS 2.0 domains, including cognition, mobility, self-care, getting along with people, household activities, work activities, and participation among patients with upper or lower limb amputation.

Discussion

Participants were categorized into standard age groups for analysis, with most individuals classified as adults aged 19–59 years, and a smaller proportion as senior adults. A higher proportion of males had undergone amputation compared to females, a pattern consistent with previous studies reporting greater amputation prevalence among older age groups and males. The majority of participants were married, highlighting the relevance of spousal involvement during recovery, as supported by earlier research (18). These demographic patterns align with existing Indian and international literature on amputation profiles (18–20).

Regarding socio-economic characteristics, a substantial proportion of participants had low educational attainment and were engaged in unskilled occupations. Most belonged to nuclear families and lived in basic housing conditions. Compared with studies from high-income countries, differences were observed in housing accessibility and place of residence, with a higher proportion of participants originating from rural areas (21). Alcohol consumption emerged as the most common substance use habit, followed by tobacco-related practices, consistent with findings from previous multi-center studies (22,23). These characteristics collectively reflect the socio-economic context of the study population and are comparable with trends reported in similar settings.

Road traffic accidents emerged as the most common cause of amputation in the present study, followed by diabetes mellitus, while tumors, sepsis, and crush injuries were less frequent, and congenital conditions and Hansen's disease were rare. This pattern differs from several retrospective studies in which diabetes-related vascular causes predominated, reflecting differences in study settings and population characteristics (24). Transtibial and transfemoral amputations were the most common levels observed, consistent with previous cross-sectional studies (25). Nearly half of the participants had undergone amputation within the previous year, indicating a cohort largely in the early phase of rehabilitation. The predominance of unilateral amputations aligns with earlier quality-of-life studies (26). Variations in body mass index distribution compared with previous reports may reflect heterogeneity in clinical profiles and population characteristics across settings (23).

With respect to rehabilitation-related characteristics, crutches were the most frequently used mobility aid, although a substantial proportion of participants did not use any assistive device. This pattern is comparable with earlier studies reporting high reliance on crutches among amputees (27). Stump-related complications such as pressure, redness, and ulcers were reported by a subset of participants, and phantom limb pain was prevalent in the majority. The higher prevalence of phantom limb pain compared with some international studies is consistent with literature suggesting a greater symptom burden in resource-limited healthcare settings (28,29). Collectively, these findings reflect the rehabilitation challenges commonly encountered among amputees in similar clinical contexts.

Functional assessment revealed that most participants experienced severe difficulty in performing daily activities, with fewer individuals reporting moderate difficulty. This distribution differs from some international studies that have reported a wider range of functional limitations among amputees (30). Domain-specific analysis demonstrated moderate-to-severe difficulty across cognition, mobility, and self-care domains, with mobility-related limitations particularly prominent. These findings are consistent with previous studies indicating restricted functional mobility following lower-limb amputation and its association with clinical and prosthesis-related factors (31).

Social functioning and participation were also substantially affected. Many participants reported moderate-to-severe difficulty in social interactions, household responsibilities, and work-related roles. Extreme difficulty was frequently reported in household and work activities, while participation restrictions were predominantly severe. These findings align with earlier research documenting significant limitations in

social engagement, domestic activities, and community participation among individuals with amputation, underscoring the broad functional impact of limb loss across multiple life domains (32).

In terms of psychosocial adaptation, avoidance coping at a medium level was most commonly reported, followed by high-level avoidance coping, a pattern consistent with findings reported by Kakooza et al. (33). Task-oriented coping was predominantly reported at high and medium levels, while emotion-oriented coping was largely reported at medium and high levels. These patterns are comparable to previous studies describing diverse coping responses among amputees following limb loss (33). Self-esteem assessment indicated that most participants had average self-esteem, with smaller proportions reporting good or poor self-esteem. Similar distributions have been reported in previous studies, although variations exist across cultural and clinical contexts (34,35).

Correlation analysis demonstrated a moderate negative association between functional disability and coping strategies and a weak but statistically significant negative association between functional disability and self-esteem, suggesting that higher disability levels are associated with lower coping capacity and self-esteem. A statistically significant negative association was also observed between coping strategies and self-esteem, highlighting the complex interplay between functional limitations, coping patterns, and psychological adjustment. These findings are consistent with earlier studies reporting reduced psychological well-being and life satisfaction among amputees, with acceptance and active coping identified as commonly used strategies (35–37).

Finally, significant associations were observed between family type and functional disability, with individuals from nuclear families more frequently classified as having severe disability, consistent with previous reports linking family structure to functional outcomes (38). Substance use habits were significantly associated with coping strategies, and emotion-oriented coping showed a significant association with family type, findings supported by earlier research highlighting the influence of family support and substance use on coping among amputees (39,40). Socio-economic factors, including occupation and family income, were significantly associated with self-esteem, emphasizing their role in psychological adjustment following amputation. Additionally, a significant association was observed between the type of amputation and social difficulties, with unilateral amputees reporting greater challenges than bilateral amputees, consistent with literature suggesting that functional demands and social adjustment vary according to amputation characteristics (32,41).

Implications

The findings emphasize the need for nursing-led functional assessment, psychosocial screening, and individualized rehabilitation planning for amputees. Integrating coping strategy evaluation and self-esteem support into routine nursing care may improve rehabilitation outcomes.

Limitations

This study employed convenience sampling, which may introduce selection bias and limit generalizability. As participants were recruited from a tertiary care hospital and outreach clinics, findings may overrepresent individuals with greater functional impairment. The cross-sectional design precludes causal inference, and multiple statistical comparisons increase the risk of Type I error.

Conclusion

This study highlights the importance of providing holistic care to amputee patients, focusing on functional assessment, coping strategies, prosthesis use, and self-esteem for complete recovery. It guides nurses, managers, and educators in enhancing knowledge, skills, and collaboration through training, workshops,

and curriculum improvements. The study also proposes developing a patient education pamphlet, care protocol, posters, and counseling modules to strengthen nursing competence. By identifying gaps and barriers in current systems, it offers insights for improving service quality. Overall, the findings promote evidence-based, patient-centered care, ensuring better rehabilitation and well-being for amputated patients.

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