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Assessment of the Quality of Life in Patients with Lower Limb Amputations

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Abstract: ***Lower limb amputation is a life-altering event that significantly impacts an individual's physical, psychological, social, and environmental well-being. The present study aimed to assess the quality of life (QoL) among lower limb amputees using the WHOQOL-BREF questionnaire. This cross-sectional study was conducted at D.Y. Patil Hospital, Navi Mumbai, and included participants of varied age groups and educational backgrounds with unilateral or bilateral amputations. Data on demographics, causes of amputation, comorbidities, and levels of amputation were collected alongside QoL scores across four domains. Results indicated that the majority of amputations were due to diabetic foot complications (60%), with Ray's amputation being the most common surgical procedure performed. The physical health domain recorded the lowest mean score (48%), highlighting mobility limitations and dependence on medical care as key concerns. Psychological health (57%), social relationships (67%), and environmental well-being (62%) were comparatively better but still demonstrated areas of impairment. The findings suggest that while amputees can achieve moderate adaptation in psychosocial and environmental aspects, physical limitations remain a major determinant of reduced QoL. This study emphasizes the importance of holistic rehabilitation, encompassing physical, psychological, and social support strategies, to enhance the overall quality of life in lower limb amputees.***

Keywords: Lower limb amputation, Quality of Life, WHOQOL-BREF, Rehabilitation, Physical health, Psychological health, Social well-being, Emotional well-being, Diabetic foot

I. INTRODUCTION

Amputation is the intentional surgical removal of a body part, such as a finger, toe, hand, foot, arm, or leg. It represents a drastic impact on the patient's body, its perception, daily living and psychological well-being. India is home to many individuals with disabilities living in the community. [1] It has about half a million amputees, and 23,500 are added every year. Amputees in India are predominantly male, rural, poor, and in the working age group. [2] In India, traumatic accidents are one of the commonest causes of amputations. [3] A majority of amputations affect the lower limb.

A below-knee amputation, also known as a trans-tibial amputation, involves the surgical removal of the foot, ankle joint, distal tibia, and fibula, along with associated soft tissue structures. [4] It was found that above-knee amputations had a shorter survival than below-knee amputations. [5] Clinical reports indicate that many lower limb amputees experience problems with psychological adjustment. [6] Amputees are affected physically, psychologically, emotionally and socially. It is obvious that amputation of a limb, whatever its cause, has a strong repercussion on physical, functional and emotional aspects, affecting the QoL of the person living with the amputation. [7] Depression is estimated to affect 28% of amputees and 3.6-10.6% of the general population. Higher levels of pain and anxiety are common in amputees. [8]

The World Health Organization defines health as the "state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." [9]

Quality of life is defined by the WHO as "individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns." [10]

Lower limb amputations are becoming more common in older adults with several comorbidities as life expectancy rises. [11]

The WHOQOL-BREF quality of life assessment is an abridged version of the WHOQOL-100. WHO's initiative to develop a QoL assessment arises from a need for a genuinely international measure of QoL and a commitment to the continued promotion of a holistic approach to health and health care. The questionnaire allows a detailed assessment of each individual facet relating to quality of life. It is to be noted that the higher the score is, the higher is the quality of life. [10]

As physiotherapists, it is important for us to assess the quality of life of a patient who has undergone an amputation and is under our care and guidance. Assessing the patient's QoL at regular intervals can help guide us towards a possible barrier that may hinder the rehabilitative process.

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This comprehensive approach allows for a thorough evaluation of various aspects of life that may be influenced by the amputation. A patient-centred perspective is crucial when dealing with conditions like amputations, where the impact on daily functioning and well-being can vary greatly from one person to another.

Utilising a standardised instrument like the WHOQOL-BREF allows for comparisons of QoL between individuals with amputations and those without, as well as across different patient populations. This can provide us with significant insights into the unique challenges faced by individuals with amputations and help us identify areas where a change in intervention may be needed. It also helps us clinicians facilitate communication.

II. NEED OF THE STUDY

As physiotherapists, it is important for us to assess the QoL of a patient who has undergone an amputation and is under our care and guidance. Assessing the patient's QoL at regular intervals can help guide us towards a possible barrier that may hinder the rehabilitative process.

It can provide us with insights into the unique challenges faced by individuals with amputations and help us identify areas where a change in intervention may be needed.

Employing the WHOQOL-BREF questionnaire in patients with amputations offers a systematic and holistic approach to evaluating the QoL, which is essential for understanding the impact of amputation on a patient's life.

Physiotherapists can implement a well-tailored rehabilitation programme and various strategies so as to manage symptoms, improve QoL and increase activity levels in order to get the patient back to their life in a state as close to normal as possible.

III. AIMS AND OBJECTIVES

1) Aim: To assess the Quality of Life in patients with lower limb amputation using the WHOQOL-BREF questionnaire.

2) Objectives:

- To evaluate the physical, psychological, social, and environmental domains of QoL in patients with amputations using the WHOQOL-BREF questionnaire.
- To identify barriers and challenges that may hinder the rehabilitation process in patients with amputations.
- To determine the impact of amputation on activity levels and daily functioning.

IV. METHODOLOGY

A. Study Design

A self-administered questionnaire was used to determine the quality of life among patients with lower limb amputations.

B. Study Setting

The study was conducted in D.Y. Patil Hospital, Navi Mumbai, Maharashtra, India.

C. Sampling

Convenient Sampling

D. Study Method

Data was collected using the WHOQOL-BREF questionnaire.

E. Data Collection

1) Demographic details were collected, including age, gender, educational background, occupation, time since limb loss, cause of amputation and presence of any comorbid factors.

2) The self-administered WHOQOL-BREF questionnaire was applied, comprising 26 questions based on the individual's perceptions of their health and well-being over the previous two weeks.

3) The WHOQOL-BREF was self-administered if the respondent has sufficient ability. Otherwise, interview administration was done. Responses were collected from patients via an in person interview in order to promote honest responses.

F. Data Analysis

1) The collected data was transferred to Microsoft Excel. Data was categorised based on age, gender, educational background and level of amputation.
2) Responses to questions are on a 1-5 Likert scale, where 1 represents "disagree" or "not at all" and 5 represents "completely agree" or "extremely".
3) Domain scores for the WHOQOL-BREF were calculated by taking the mean of all items included in each domain and multiplying by a factor of four. These scores were then transformed to a 0-100 scale.

G. Plan of the study

1) Amputees were approached in person for administration of the questionnaire in the form of self-administration or an interview structure.
2) Consent was obtained from the participants prior to the in-person interview.
3) Patients were included in the study based on the inclusion and exclusion criteria.

V. RESULTS

A. Demographic Data

1) Distribution of Gender

Out of the study population, 86.7% were males and 13.3% were females.

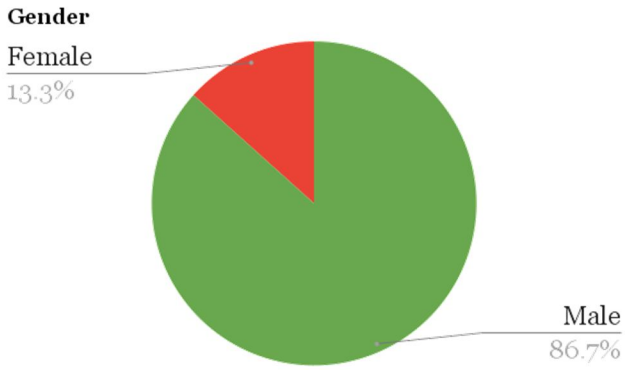


Fig. 1 Distribution of Gender

2) Distribution of Age

The ages ranged from 18 to 74 years with a mean value of 53.

40% of the population belonged to the age group of >61 years, followed by 33.3% in the age group of 46-60 years, 16.7% in the age group of 31-45 years and 10% of the population within the age group of 18-30 years.

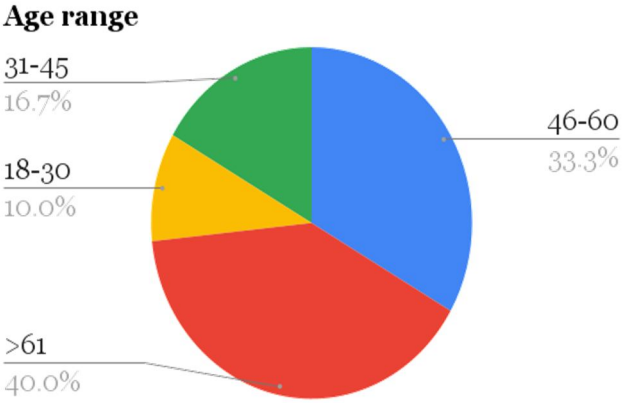


Fig. 2 Distribution of Age

3) Distribution of Level of Education

73.3% of the study population had an education of up to 10th grade, followed by 13.3% above 10th grade, and 13.3% were illiterate.

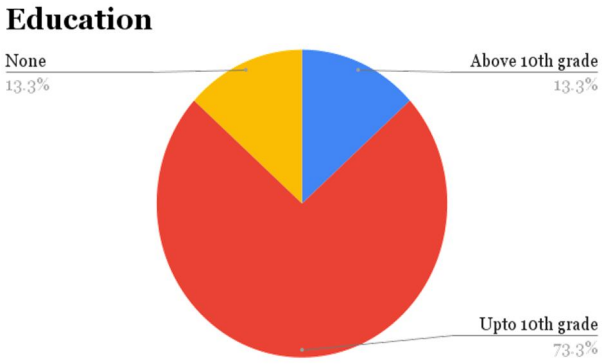


Fig. 3 Distribution of Level of Education

4) Distribution of Comorbidities

Diabetes Mellitus was seen to be the most prevalent in the study population at 43.3%, followed by Both Diabetes & Hypertension at 26.7%, No comorbidities at 13.3%, Hypertension at 6.7%, PVD at 3.3%, CAD at 3.3% and Others at 3.3%.

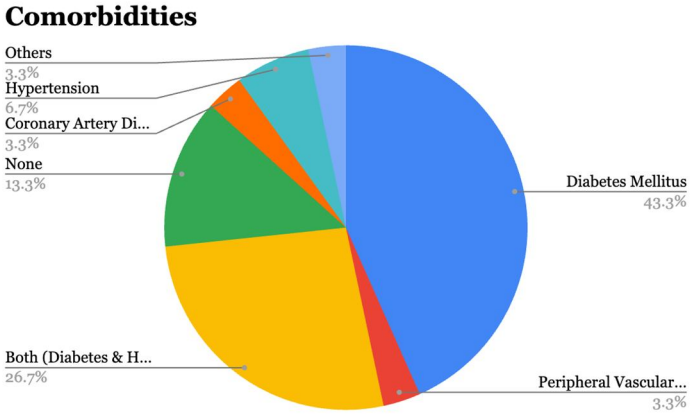


Fig. 4 Distribution of Comorbidities

5) Distribution of Unilateral and Bilateral Amputation

Among the study population, 83.3% were unilateral amputations whereas, 16.7% were bilateral amputations.

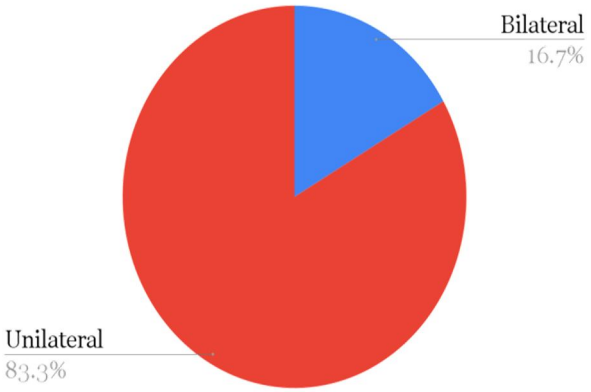


Fig. 5 Distribution of Unilateral and Bilateral Amputation

6) Distribution of Level of Amputation

In the study population, Ray's Amputation was the commonest at 43.3%, followed by Transtibial amputation at 26.7%, Transmetatarsal at 10.0%, B/L Ray's and Transtibial at 6.7%, Transfemoral at 3.3%, Chopart's at 3.3%, Ankle Disarticulation at 3.3% and B/L Transtibial and Chopart's at 3.3%.

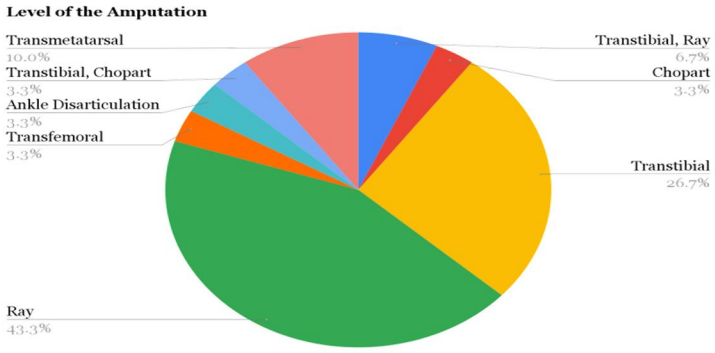


Fig. 6 Distribution of Level of Amputation

7) Distribution of Causes of Amputation

The commonest cause resulting in amputation was found to be Diabetic Foot (60.0%). Other causes included RTA (16.7%), Cellulitis (13.3%), and Ulcer (3.3%), PVD (3.3%) and Burn (3.3%).

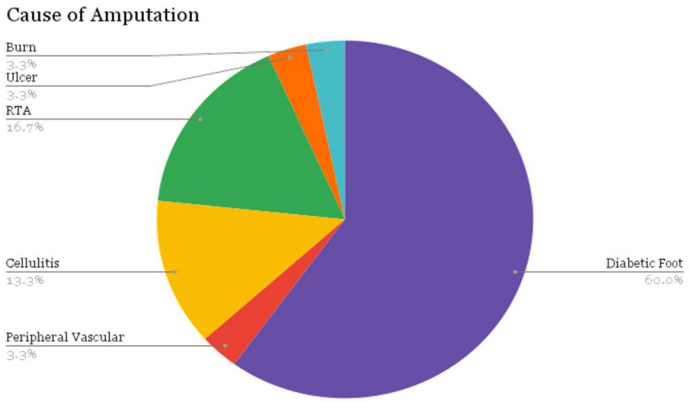


Fig. 7 Distribution of Causes of Amputation

B. Scores

1) Overall QoL & General Health score:

- When asked to rate their QoL, 50% were satisfied, whereas only 3.3% were very dissatisfied.
- When asked about their health satisfaction, 30% were satisfied and 6.6% were very dissatisfied.

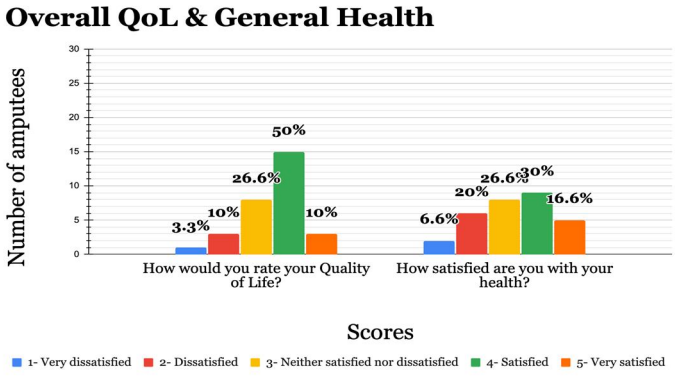


Fig. 8 Distribution of Overall QoL & General Health Score

2) Physical Health score:

- When asked to what extent physical pain prevented them from doing what they needed to do, 33.3% of the study population said, 'a moderate amount', 33.3% said, 'very much' and 3.3% said, 'not at all'.
- The whole of the study population felt like they needed medical treatment to some extent in order to function in their daily life. Out of this, 56.6% said that they needed it to an extreme amount.
- When asked if they have enough energy for everyday life, 30% of the study population said, mostly, and 10% said, completely.
- 96.5% of the study population didn't have full satisfaction when it comes to the ability to get around. Only 3.3% had full satisfaction.
- 33.3% were fully satisfied with their sleep, and no one reported being completely dissatisfied with their sleep.
- 73.3% said that they were either neutral or slightly satisfied with their ability to perform daily living activities.
- 76.6% of the study population were moderately to fully satisfied with their capacity to work while 23.4% were somewhat to fully dissatisfied.

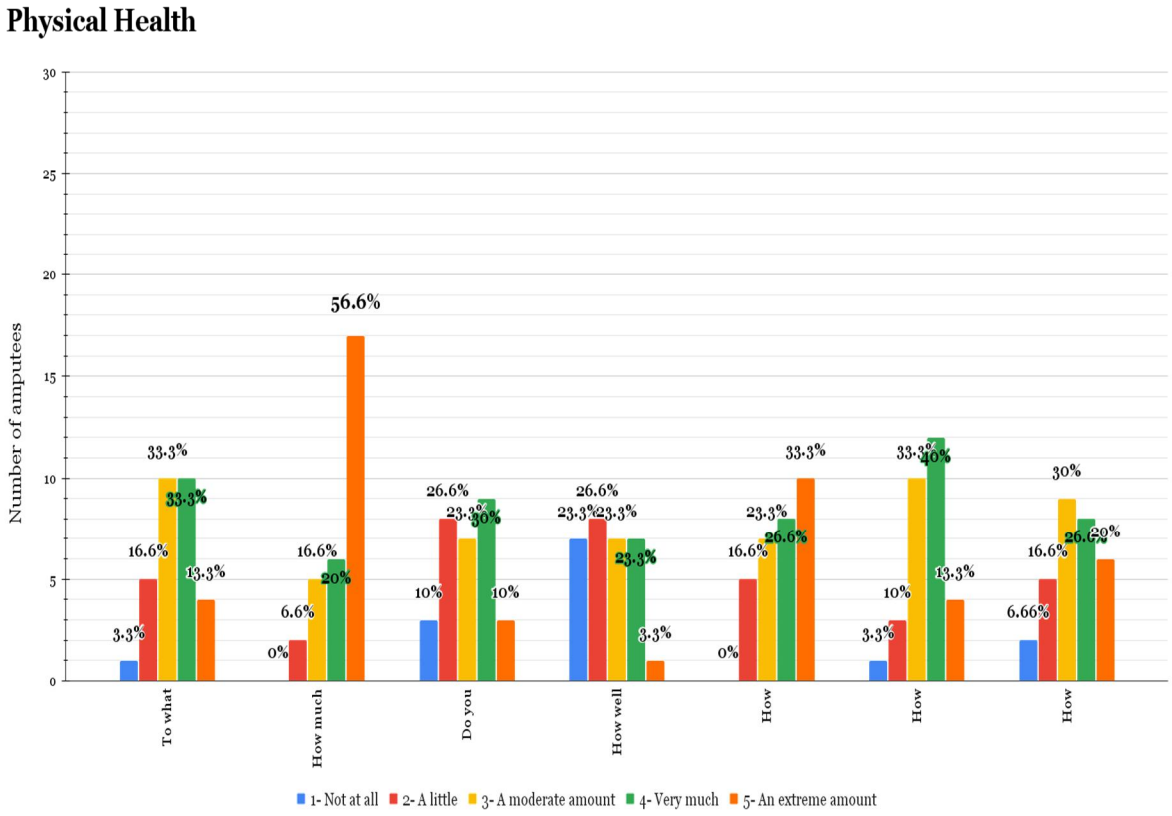


Fig. 9 Distribution of Physical Health Score

3) Psychological Health Score

- When asked how much they enjoy their life, 30% of the study population said, 'moderately', 16.6% said, 'completely', and 10% said, 'not at all'.
- 56.6% believed that their life was very to extremely meaningful, and 3.3% believed their life was not at all meaningful.
- 43.3% said they're able to concentrate very much, and 10% said they're able to concentrate only a little.
- 43.3% said they're able to mostly accept their bodily appearance, and 13.3% were not able to accept it at all.
- When asked how satisfied they are with themselves, 30% reported being neither satisfied nor dissatisfied, 23.3% reported being satisfied, 23.3% reported being very satisfied, 20% reported being dissatisfied and 3.3% reported being very dissatisfied.
- 50% reported that they have negative feelings sometimes or often. Nobody reported that they never experienced the same.

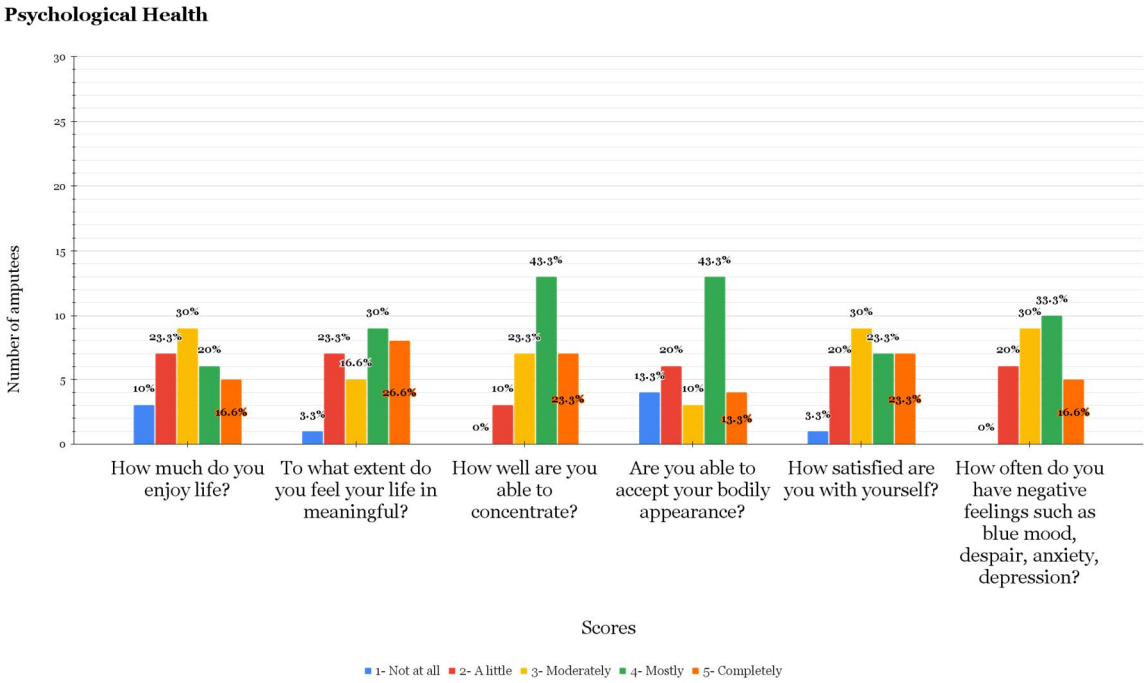


Fig. 10 Distribution of Psychological Health Score

4) Social Health Score

- When asked about their personal relationships, 46.6% reported being very satisfied, followed by 26.6% who reported being neither satisfied nor dissatisfied, and 3.3% reported being very dissatisfied.
- 63.3% were neither satisfied nor dissatisfied with their sexual relations, 3.3% were very satisfied, 3.3% were dissatisfied, and 13.3% were very dissatisfied.
- 50% were satisfied with the support they get from their friends. 3.3% reported being very dissatisfied.

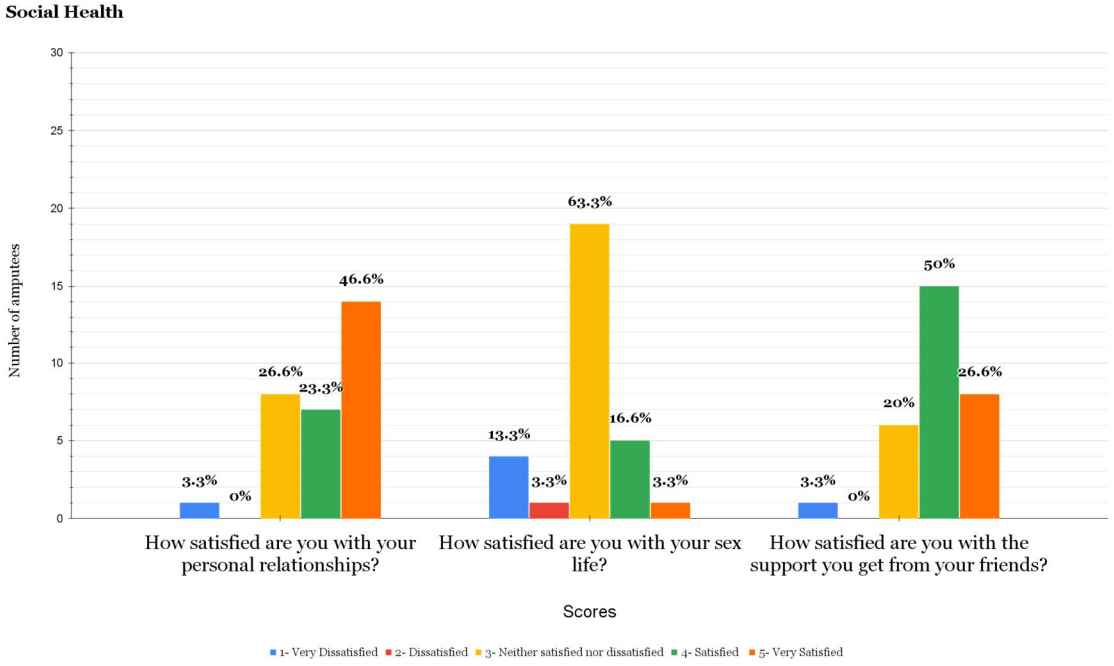


Fig. 11 Distribution of Social Health Score

5) Environmental Health Score

- 70% felt very to extremely safe in their daily life.
- 46.6% said their physical environment is very healthy, and 10% said it's only a little healthy.
- 46.6% were dissatisfied with the ability to meet their financial needs.
- When it came to having the availability of information in their day-to-day life, 50% said they mostly have it.
- 43.3% reported that they have no opportunity at all for leisure activities.
- 70% were satisfied to very satisfied with the conditions of their living place.
- Regarding their access to health services, 53.3% reported being satisfied, and none of them were very dissatisfied.
- Regarding satisfaction with their preferred mode of transportation, 40% were satisfied, and 6.6% were very dissatisfied.

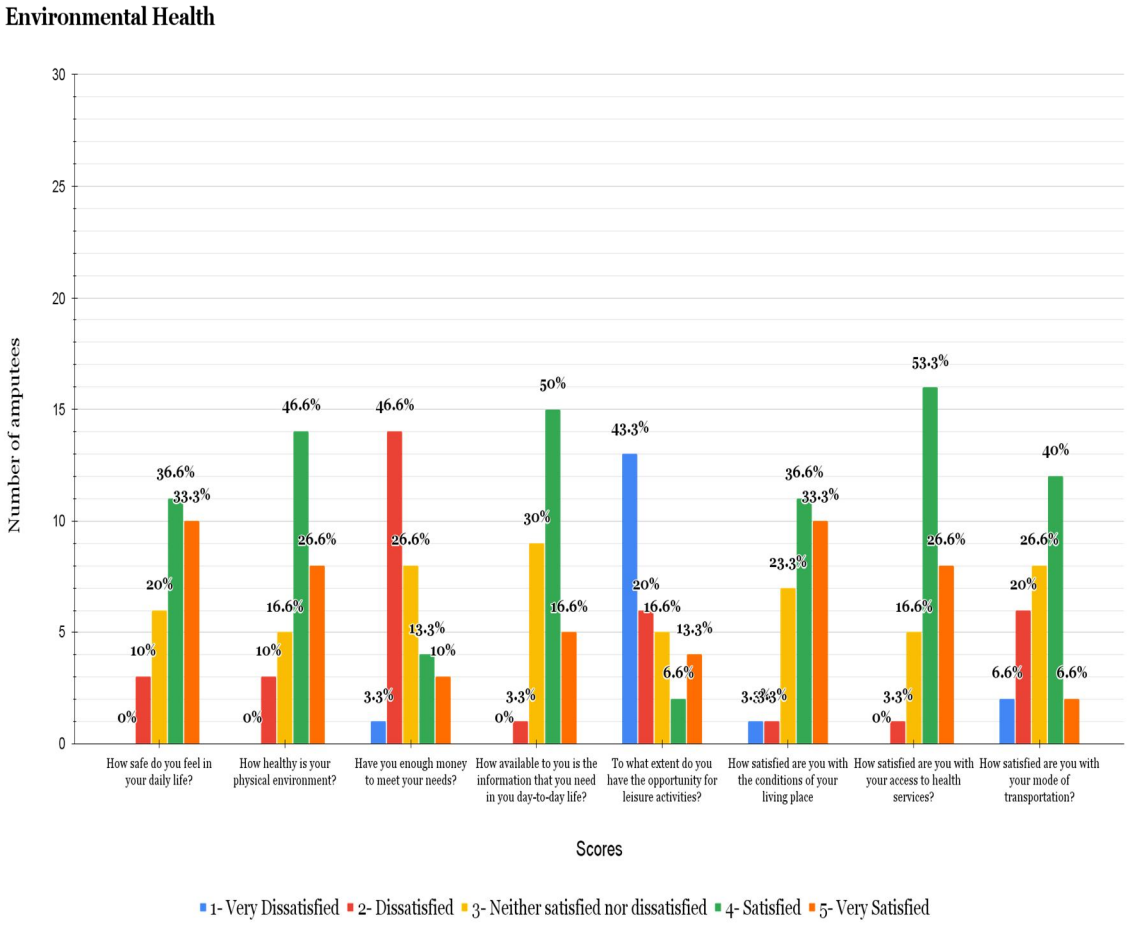


Fig. 12 Distribution of Environmental Health Score

6) Mean Domain Scores

- Physical Health score: The physical score had a minimum and maximum value of 25% and 75% respectively, and the mean score was 48%.
- Psychological score: The psychological score had a minimum and maximum value of 13% and 94% respectively, and the mean score was 57%.
- Social Relations score: The social relations score had a minimum and maximum value of 0% and 94% respectively, and the mean score was 67%.
- Environmental score: The environmental score had a minimum and maximum value of 31% and 94% respectively, and the mean score was 62%.

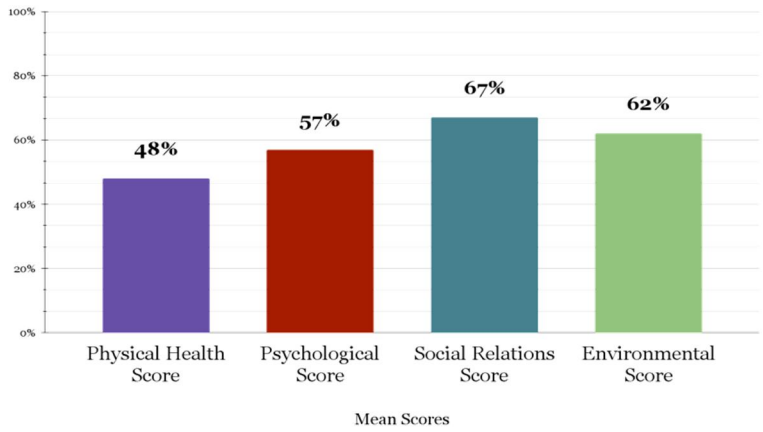


Fig. 13 Mean Domain Scores

VI. DISCUSSION

The main purpose of this study was to assess the QoL in patients with lower limb amputations using the WHOQoL-BREF questionnaire.

The study was conducted on patients meeting the inclusion and exclusion criteria.

As per Fig. 1, the study included 86.7% of males and 13.3% of females. According to a study by Monica E Peek, some of the independent predictors of lower extremity amputations, including peripheral neuropathy, cigarette smoking, diabetic foot ulceration, and PAD, are more common in men. Hormonal considerations may also be involved since women, especially those of reproductive age, may benefit from extra neural protection because of improved endothelial function in the microvasculature and macrovasculature. According to available evidence, women are more likely to die during the intraoperative phase of diabetes-related LE amputations. [12]

Fig. 2 suggests that the ages ranged from 18 to 74 years with 40% of the population belonging to the age group of >61 years. This could be due to the fact that the elderly population is more prone to comorbidities like long standing Diabetes Mellitus. Furthermore, Koivunen V, Dabravolskaite V, Nikulainen V, Juonala M, Helmiö P, Hakovirta H. suggest that elderly and diabetic patients, who are not thought to benefit from vascular treatments, account for a large percentage of major LE amputations in an ageing population. [13] 10% of the population were within the age group of 18 to 30 years. Lower limb amputations are less common in young people primarily because the leading causes of amputations, like peripheral vascular disease and severe diabetes complications, are more prevalent in older individuals.

Fig. 3 demonstrates that 73.3% of the study population had an education of up to 10th grade, followed by 13.3% above 10th grade, and 13.3% were illiterate. The fact that only one hospital setting, a charitable hospital, was used for the responses may be the cause of the low educational attainment.

Fig. 4 shows that Diabetes Mellitus was seen to be the most prevalent comorbidity in the study population. This may be due to the fact that when diabetes is not well controlled, chronic hyperglycemia damages many organs and systems and leads to complications from the disease. [14]

As per Fig. 5, 83.3% were unilateral amputations whereas, 16.7% were bilateral amputations. This may be because most causes of amputation, like diabetes-related complications, peripheral vascular disease and trauma typically affect one leg more severely than the other.

Fig. 6 suggests that Ray's Amputation was the commonest at 43.3%, as when it comes to limb salvage rates and preserving foot and ankle biomechanics, Ray's amputations have been shown to be the most advantageous. [15] Additionally, this amputation technique offers the possibility of guaranteeing sufficient surgical debridement of the infected margins. [16] This was followed by Transtibial amputation at 26.7%. According to Curtis T. Adams; Akshay Lakra., these are often performed in situations where preservation of the limb is less crucial than controlling the necrotising infections and haemorrhagic injuries. [4]

According to Fig. 7, the commonest cause leading to a lower limb amputation was found to be Diabetic Foot at 60.0%. Multiple studies support this finding, as patients with Diabetes Mellitus can present with a wide range of illnesses, ranging from a foot wound that does not heal with underlying osteomyelitis to a severely infected wound that results in septic shock.

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According to our study's QoL analysis using the WHOQOL-BREF questionnaire, amputees' score levels are noticeably low across all four domains.

When compared to other domains, the Physical Health score had the lowest mean value. This illustrates how lower limb amputees' everyday physical functioning is impacted by limb loss. One major factor influencing the QoL after LLA seems to be mobility (Pell, Donnan, Fowkes & Ruckley confirm) [17]. This suggests that physical rehabilitation should primarily focus on the mobility aspect.

The second most impacted score was Psychological Health. This indicates the insufficient psychological adaptation and recovery following amputation. In addition to functional limitations, patients appear to struggle with their altered physical appearance. They also appear unsure about the limitations placed on their future prospects and activities. Overwhelming distress can cause depression and severely hinder the recovery process. Additionally, the loss of the sense of control leaves the amputees feeling exposed and vulnerable.

The Social domain was moderately affected. It earned better scores in comparison to the physical domain. According to a study in 2023, some had physical and emotional suffering as a result of chronic and complicated health issues brought on by their injuries, which further restricted their ability to participate in social and communal activities. [18] Lack of social and familial support may cause the patient to react in ways that are not adaptive. [19]

According to the environmental domain, a sizable portion of the population lacks opportunities for leisure activities. Potential causes for the same could be due to the presence of residual pain, limited mobility, independence, poor psychological adjustment, fear of injury, lack of accessibility and adaptation.

These domains of physical, psychological, social and environmental well-being serve as a pathway to a holistic treatment approach.

The results of LL Amputations can be affected by surgical methods, pain control, patient education, goal-setting, and environmental and societal factors. These components should be thoroughly looked into during the length of the rehabilitation.

VII. CONCLUSIONS

This study shows that lower limb amputations significantly influence the QoL and the physical domain was most affected at a mean of 48% followed by the psychological domain at 57%.

VIII. ACKNOWLEDGMENT

I want to express my sincere gratitude to everyone who contributed to making this research feasible.

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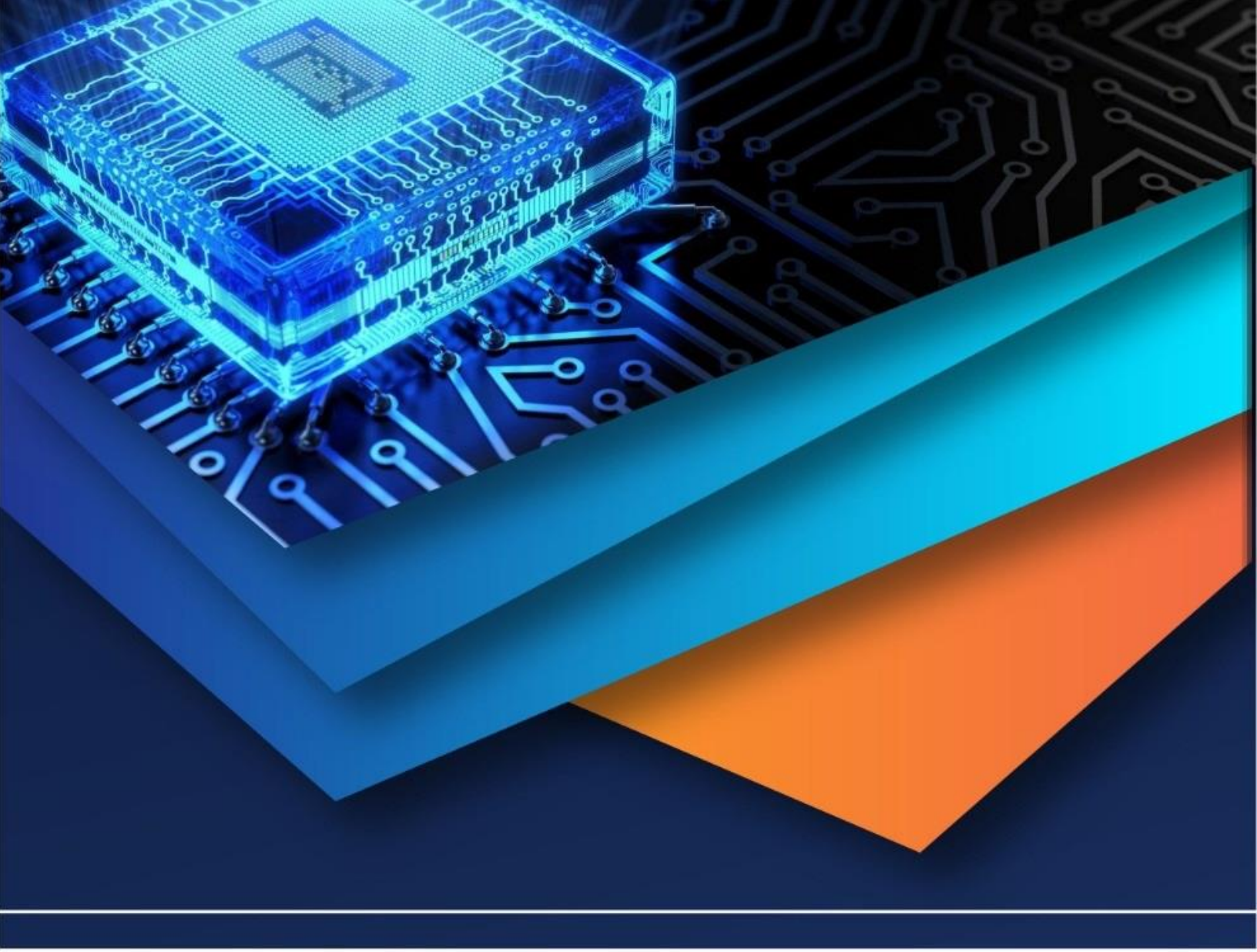
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