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Lower Limb Amputation and Its Psychosocial Impact: A Review of Body Image, Mobility and Life Quality

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Abstract

Amputation is the surgical removal of all or part of a limb, often due to injury, disease, or medical procedures. The causes of limb amputation differ depending on the country or region. Amputation compromises the body's integrity and greatly reduces quality of life (QoL), leading to challenges such as limited mobility, pain, and a feeling of physical incompleteness. People affected by amputation also experience psychological and social repercussions, including mental health struggles like depression, anxiety, and in some cases, thoughts of suicide.

Study selection: This narrative review is conducted on databases from pub med, Google scholar, and ResearchGate. This review included 10 studies on the effect of lower limb amputation on body image, quality of life and functional mobility.

Conclusion: Lower-limb amputation impacts physical, emotional, and social well-being. Advanced prosthetics, CBT (Cognitive behavioural therapy), and effective pain management improve mobility, self-esteem, and quality of life, especially in transtibial and unilateral amputees.

Introduction

Amputation refers to the surgical removal of a part or an entire limb, resulting in limb loss, usually due to injury, illness, or surgery [1]. The main causes of limb amputation vary between countries and cities [2]. In affluent countries, peripheral vascular disease and complications related to diabetes mellitus are the leading causes; whereas in developing countries, trauma, infections, uncontrolled diabetes mellitus, and cancer remain the predominant reason. It is projected that these figures may potentially double by 2050. From 1990 to 2019, there was a significant rise in both the incidence and prevalence of traumatic amputations globally. Amputation leads to numerous challenges in engaging with professional, recreational, and social activities. It disrupts bodily integrity and significantly diminishes quality of life (QoL) due to impaired mobility, pain, and a sense of physical incompleteness. Individuals also face psychological and social consequences including mental health issues such as depression, anxiety, and in severe instances, suicidal thoughts. Losing a limb also alters how individuals perceive their bodies and appearance. Physical attractiveness is shaped by a combination of psychological and physical aspects and reflects how aesthetically pleasing one's features is considered to be. In today's globalized society, aesthetics is a prominent theme across media and public consciousness [3]. This perception of beauty significantly influences social relationships, psychological health, physical well-being, and overall QoL.

Two key components that shape how appearance is perceived are body image and self-esteem. Evaluating these aspects helps in understanding appearance perception, which also plays a role in assessing outcomes in aesthetic procedures. Body image refers to an individual's personal view of their own body and is a dynamic, multi-layered process influenced by internal factors such as age, gender, and health, as well as external elements like societal and environmental influences. Disturbances in body image often arise from societal emphasis on vitality, fitness, and physical appearance, which may cause amputation to be perceived as a deficiency or failure. Thus, amputees must undergo physical, psychological, and social adjustments to cope with changes in their body's form, function, and self-image.

Method

Author, Journal, year	Study design	Sample size	Materials and Methods	Outcome Measures	Results
Selim Akarsu et al., 2013[4]	Cross sectional observational study	The study included 30 lower extremity amputees (15 bilateral, 15 unilateral).	The investigation examined lower extremity amputees aged 21-43 who were receiving ongoing treatment at the Turkish Armed Forces Rehabilitation and Care Centre.	SF-36 (QoL), SAT-PRO (prosthesis satisfaction), ABIS (body image), HS, 6MWT, 10MWT (mobility).	Bilateral amputees show lower physical capacity than unilateral ones. Amputation level doesn't affect prosthesis satisfaction or body image. More prosthesis use improves life quality and satisfaction. .
Lukas A., Holzer et al., 2014[3]	Cross sectional observational study	298 participants (149 unilateral and bilateral lower limb amputees and 149 controls).	Lower-limb amputees were consecutively recruited within six months post-amputation from either specialized orthopedic	Multidimensional Body-Self relations questionnaire (MBSRQ), Rosenberg Self-esteem (RSE) scale, SF-36 Helth survey (QoL).	This study demonstrated that lower-limb amputations significant impact on patients' body image and QoL.

			rehabilitation centres and an academic Orthopaedic Rehabilitation and Prosthetic Limb Outpatient clinic (Austria).		
Richa Sinha, Wim JA van den Heuvel, Perianayagam Arokiasamy,2017[5]	Cross sectional observational study	622 participants	The study included lower limb amputees aged 18+ attending the All India Institute of Physical Medicine and Rehabilitation, Bhagwan Mahaveer Viklang Sahayata Samiti, and four limb-fitting camps in and around Mumbai.	SF-36 (Short-Form Health Survey) to measure quality of life.	Lower limb amputees had lower QoL than the general population.
Gökşen G. et al., 2019[6]	Cross sectional observational study.	62 participants	A total of 62 lower limb prosthesis users aged 18-65 who had used their prosthesis for at least 6 months were recruited form Istanbul Physical medicine and	Mobility was assessed using LCI-5, body image with ABIS, and depression symptoms with BDI.	Knee disarticulation patients showed lower mobility and body image scores compared with other amputation levels, but depression and body

			Rehabilitation Training and Research Hospital, Istanbul, Turkey . Patients were categorized into four groups based on amputation level.		image perception did not differ significantly.
Ozlem Kazan et al., 2020[7]	Cross sectional observational study	65 participants who underwent amputation due to diabetic foot ulcer.	Over 6 months, 65 diabetic foot ulcer amputees were consecutively recruited from prosthesis clinics (Turkey). Psychiatrists and orthopedic specialists conducted face-to-face interviews 1-8 years post-prosthesis fitting (median: 3 years).	SF-36, TAPES, Coping attitudes evaluating scale, Multidimensional scale of Perceived Social Support, Rosenberg Self-esteem Scale, ABIS.	Impaired body image, low self-esteem, frequent use of dysfunctional coping, and low prosthesis satisfaction were key predictors of poor quality of life.
Aydın et al.,2021[8]	Cross sectional observational study	57 participants	This study conducted on lower-limb amputees using prosthesis for at least 3 months at	Pain (PLS, PLP, RLP) was assessed using the Prosthesis Evaluation Questionnaire (PEQ). Prosthesis use in daily life	The presence of phantom limb pain (PLP) and phantom limb sensations (PLS) reduces prosthesis

			Istanbul. Demographic data, amputation level, aetiology, prosthesis type and duration of use were recorded.	was measured with the Houghton Scale, and locomotor skills with the Locomotor Capabilities Index (LCI). Body image was evaluated using the Amputee Body Image Scale (ABIS), and quality of life with the Short Form-36 (SF-36).	usage and negatively affects body image and quality of life in individuals using prosthetic limbs.
B. Burçak et al., 2021[9]	Single subject design clinical trial	57 lower limb amputees.	Conducted in an outpatient clinic at Ankara Physical Medicine and Rehabilitation Training and Research Hospital, Turkey (Jan 2015-Jan 2016); patients assessed while using mechanical prosthesis, than after rehab and 3.9±1.6 weeks of MPK/VASS use; same participants served as their own controls.	TAPES (psychosocial adjustment, activity restriction, prosthesis satisfaction); SF-36 (QoL); SATPRO (prosthesis satisfaction); ABIS-R (body image); 6MWT (functional mobility).	MPK/VASS prostheses improved QoL, functional performance, prosthesis satisfaction and reduced body image disturbance vs. Mechanical prostheses.

Nuria S. et al.,2021[10]	Cross sectional observational study	25 participants	Patients aged 18–70 who had lived with an amputation for at least one year were recruited from Chiropody Clinics and Orthopaedics Centres (Spain) between 2015 and 2017.	HRQoL (SF-36), body image (MBSRQ), self-esteem (RSE).	This study concluded that lower limb amputation significantly affects QoL and body image, with less impact on self-esteem.
Z Kar & A Kutlu 2023[11]	Cross sectional observational study	Quantitative patients : 30 Qualitative patients: 20	This Study was conducted in the orthopaedics and cardiovascular surgery unit of Manisa Celal Bayar university, Turkey between May 2013 and November 2014.	SF-36 QoL scale to measure overall quality of life, the ABIS to assess body image, and semi-structured interviews to capture the personal experiences of the patients.	The study found that patients' quality of life was below average, with significant challenges in mobility and body image perception.
Neha Mukkamala, Shivani Vala, 2024[12]	Cross sectional observational study	54 participants	Adults (18+) with unilateral or bilateral lower limb amputation, at least six weeks post-amputation, attending a prosthetic clinic in Vadodara were included in the study.	Functional mobility, assessed using the Timed "Up and Go" (TUG) test with prosthesis and any assistive device used by the individual.	Reduced mobility in amputees was linked to older age, non-traumatic amputations, higher-level amputations, shorter prosthesis use, and use of assistive devices. TUG

					times improved with longer amputation duration.

Discussion

Selim Akarsu et al., study compared unilateral and bilateral lower-limb amputees in terms of prosthesis use, quality of life (QoL), mobility, and gait. Although prosthesis use was similar, unilateral amputees showed significantly better QoL, walking speed, and distance. Both groups reported high satisfaction and body image scores, but bilateral amputees, especially those with above-knee amputations, required more assistive devices for ambulation. The better outcomes in the unilateral group may be attributed to higher activity levels and motivation. Lukas A., Holzer et al., study showed that lower-limb amputation negatively affects various aspects of quality of life, including physical functioning, mental health, vitality, and emotional role limitations, though patients reported better scores in bodily pain and general health. Compared to controls, amputees had poorer body image and lower quality of life, while self-esteem levels remained similar. However, there was little correlation between body image, QoL, and self-esteem, suggesting these are distinct dimensions. Phantom limb pain, present in 63% of patients, was linked to significantly worse outcomes in physical and mental health, body image, and self-esteem. Additionally, female amputees showed lower appearance orientation than males. Richa Sinha, Wim JA van den Heuvel, Perianayagam Arokiasamy study found that phantom-limb pain reduced physical health and mobility, affecting QoL. Co morbidities and unemployment further lowered QoL. Use of prostheses and job reintegration help improve outcomes. Ozlem Kazan et al., study examined QoL in diabetic patients after lower-limb amputation. QoL was significantly reduced, especially in those with stump/phantom pain, higher-level amputations, low prosthesis satisfaction, poor body image, and low self-esteem. Problem-focused coping improved QoL, while dysfunctional coping worsened it. Emotion-focused coping showed no impact. Transtibial amputees had better outcomes due to greater mobility. Prosthesis satisfaction (function, appearance, weight) was linked to higher physical QoL. CBT (cognitive behavioural therapy) may help improve body image and self-esteem. Aydın et al.,study results showed that PLS, PLP, and RLP are common in lower-limb amputees and reduce prosthesis use and quality of life. Higher PLP and PLS were linked to poorer mobility, body image, and daily function. RLP had no major impact. No link was found between pain and time since amputation, possibly due to the long average duration since amputation. Pain management is crucial to improve function and quality of life. Burçak et al. found that lower-limb amputees using MPK/VASS prostheses had better quality of life, functional performance, prosthesis satisfaction, and body image compared to those with mechanical prostheses. MPK/VASS especially benefited high-level amputees, improving walking ability, energy efficiency, and psychological well-being. Nuria S. et al., study showed that amputees had lower quality of life across all SF-36 subscales, especially in physical functioning. Body image scores were significantly reduced in amputees, with lower results in all subscales. Physical activity was linked to better body image. Self-esteem levels were similar between amputees and controls, with no significant differences. Prosthetic use may help maintain body awareness. Z Kar, A Kutlu study results showed that while emotional, physical, and social role domains of QoL were below average, other domains such as mental health, pain, and vitality were above the intermediate level, also found higher body image

disturbance in individuals with lower limb amputations. Neha Mukkamala, Shivani Vala, study used the TUG test to measure mobility in lower-limb amputees. Most amputations were due to trauma, with transtibial being the most common level. Older age, higher amputation level, and shorter time since amputation were linked to slower TUG times. Prosthesis use improved mobility, and longer prosthesis use led to better performance. Non-traumatic amputees (mainly elderly) and those using assistive devices had slower TUG scores, likely due to age and less training. Overall, mobility improved with time and prosthesis experience.

Conclusion

Lower-limb amputation affects physical, emotional, and social aspects of life. Pain (PLP, PLS, RLP), poor body image, and low prosthesis satisfaction reduce mobility and quality of life. Advanced prosthetics (MPK/VASS) improve function, body image, and psychological well-being, especially in high-level and unilateral amputees. Transtibial amputees show better outcomes due to greater mobility. Coping strategies and cognitive behavioural therapy (CBT) help boost self-esteem and QoL. Pain management, prosthesis use, and employment reintegration are key to improving daily function and overall well-being.

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