

# Activity Limitations and Life Satisfaction: a Cross-sectional Study among Amputees in an Orthopaedic Rehabilitation Centre in Ghana

Peter Bredu-Darkwa<sup>1\*</sup>, Isaac Owusu<sup>2</sup>

1. Faculty of Health Studies, School of Allied Health Professions and Midwifery, University of Bradford, Bradford, UK

2. Department of Health Promotion and Disability Study, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

## ABSTRACT

**Purpose:** This study aimed to examine the limitations experienced by amputees in the performance of Activities of Daily Living (ADLs) and Instrumental Activities of Daily Living (IADLs), and the impact on their life satisfaction.

**Method:** A quantitative cross-sectional study was conducted among 200 amputees at the Nsawam Orthopaedic Training Centre (OTC) in Ghana. The Groningen Activity Restriction Scale (GARS) and the Life Satisfaction Questionnaire-11 (LISAT-11) were used to collect data from the respondents. All statistical analyses were made using IBM Statistical Package for the Social Sciences (SPSS) software 23.0 and summarised in Tables. A multivariate analysis was used to establish the relationship between activity limitation and life satisfaction.

**Results:** The respondents experienced some limitations in carrying out Activities of Daily Living and Instrumental Activities of Daily Living, with an overall mean activity limitation score of  $(36.57 \pm 10.93)$ . They had moderate life satisfaction with a mean score of  $(3.86 \pm 1.15)$ . A multivariate analysis revealed that there was a strong negative statistically significant relationship between activity limitations and life satisfaction ( $\beta = -0.13, p = 0.000$ ).

**Conclusion:** The government of Ghana must explore these limitations through the Ministry of Health and its agencies who are involved in the management and rehabilitation of amputees. This would help inform decision-making in the planning and preparation of rehabilitation programmes, resource allocation, and policy formulation for amputees, in order to improve their overall satisfaction and well-being.

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\* **Corresponding Author:** Peter Bredu-Darkwa, Faculty of Health Studies, School of Allied Health Professions and Midwifery, University of Bradford, Bradford, UK. Email: p.bredu-darkwa@bradford.ac.uk

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## INTRODUCTION

Amputations are done for a multiplicity of reasons, including congenital limb deficiency, vascular insufficiency, burns, cancer, and traumatic injuries (Williamson & Walters, 2010). The prevalence of amputation worldwide is unknown and the little data existing shows a significant difference among countries (Bello et al, 2020). As many as 1.6 million people in the United States were projected to be without limbs by 2005, and this is estimated to increase to 3.6 million people by the year 2050 (Ziegler-Graham et al, 2008). Among these amputations, 90% are of the lower limbs and 75% of the amputees are over 65 years of age (Wetterhahn et al, 2002). The prevalence rates, between and within countries, for acquired amputations differ significantly. The occurrence of lower limb amputation is also greater than that of the upper limb (Ziegler-Graham et al, 2008). It is reported that the prevalence ranges from 1.2 per 10 000 women to 4.4 per 10 000 men in the Navajo nation in the USA (Burger & Marincek, 2007). In the United States, evidence suggests that 30,000-40,000 amputations were performed yearly (Ziegler-Graham et al, 2008). A record of commercially health-insured children under the age of 18, to estimate the rates of major lower extremity limb loss, found a prevalence of 38.5 cases per 100,000 per year from 2009-2015 (McLarney et al, 2020).

In low- and middle-income African countries, very little research has taken place to examine the prevalence and consequences of a limb amputation on clients (Walla et al, 2015). In Nigeria, the incidence of amputation is increasing (Bello et al, 2020) and accounts for 0.38% of all orthopaedic operations. Overall, the estimated incidence of lower limb amputation in Nigeria is 1.6 per 100,000 population (Thanni & Tade, 2007).

In Ghana, it is projected that approximately 145,299 individuals had an amputation and the country is experiencing significant increases in its amputee population (Chalya et al, 2012). At the KomfoAnokye Teaching Hospital in Ghana, the amputation of the lower limb comprised of amputation of the knee (n = 23; 22.1%), amputation of the toe using Rays (n = 15; 14.4%) and de-articulation of the hip (n = 2; 1.9%) (Kyei et al, 2015).

Specialised rehabilitation services for people with amputation in Ghana are insufficient. Lack of these services is among the difficulties associated with rehabilitation, especially in low- and middle-income countries like Ghana (Gallagher & MacLachlan, 2004). The provision of services including orthopaedic devices is mostly done at the national levels in the teaching hospitals and centres located in other regions at regional hospitals (Aduayom-Ahego & Ehara, 2016). There are eight centres providing specialised rehabilitation services for amputees in Ghana. There are four teaching hospitals in Accra, Cape Coast, Kumasi and Tamale offering such services. The Ministry of Health Orthopaedic centre in Accra, the St. Joseph Orthopaedic Hospital and the Nsawam Orthopaedic Rehabilitation Centre serve the Eastern region of Ghana. Duayaw Nkwata St. John of God Hospital serves the people of the Ahafo region. Due to the limited specialised resources, physiotherapy units in some local and primary care facilities also support the rehabilitation of people with amputation. However, there is no data available about the extent to which this is happening. The services available to people with amputation focus mainly on the diagnosis, correction, prevention, and treatment of clients with orthopaedic deformities, including the provision of assistive devices such as orthotics and prosthesis, and in most cases provide wheelchairs for the elderly (Aduayom-Ahego & Ehara, 2016). Wong (2005) stated that limb amputation is frequently done for a diversity of reasons such as removing ischemic, diseased necrotic tissue, or locally unresectable tumours. The World Health Organisation (WHO) has laid emphasis on this problem by designating that amputations are increasing but adds that more than half of these amputations could be prevented with adequate recognition and care (Day, 2011). Amputation conveys a disastrous change and alteration in an individual's life notwithstanding the cause, affecting the quality of life and well-being (Razak et al, 2016). Amputation limits a person's performance of personal, professional, leisure, social and marital activities, including expression of sexual feelings between partners (Geertzen et al, 2009).

The International Classification of Functioning, Disability, and Health (ICF, 2001) described activity limitations as the difficulties an individual may experience in executing activities. Disability in the amputee may arise due to activity limitations and constraints placed upon involvement that emerge due to the interaction between body structure, function limitations, and an unhelpful environment (Bello et al, 2020). People with amputation may face limitations in the performance of daily activities and their social life, such as in relationships, education, and community involvement (ICF, 2001). Bello et al (2020) further

assert that everyday skills to engage in activities of daily living tend to decrease with age for both males and females following amputation, but males generally have better physical function than females and this correlates to improved quality of life and satisfaction. The ICF framework states that many personal factors of individuals with impairments such as amputation, impacts the physical, psychological, and social functioning which are core domains of life satisfaction (WHO[ICF],2001). Participation in cherished activities of clients and satisfaction with life are impacted negatively by major limb amputation (Yilleng & Dapap, 2020). The body must adjust to amputation setbacks to be able to execute activities of daily living, return to work, and other activities concerning his or her roles, responsibilities, and expectations (Sinha et al, 2014). Activities of Daily Living (ADLs) and Instrumental Activities of Daily Living (IADLs) are the basic and essential routine of an individual's everyday life, which has direct impact on quality of life and life satisfaction (Fitzsimmons, 2011; Dyer & Ostwald, 2012; Hamilton, 2012). ADL and IADL are tasks of self-care, functional mobility, functional communication, home management, and community living that enable an individual to accomplish his or her freedom (Pousada et al, 2015). They are the elementary and indispensable routines of an individual for daily life (Fitzsimmons, 2011). IADL are more complex daily activities, cognitively influenced and emphasise community activities like shopping, cooking, transportation and housekeeping (Cahn-Weiner et al, 2007). According to Diego (2019) amputees could show some level of independence in their activities of daily living after rehabilitation which consequently affects their overall satisfaction and well-being. Ability to perform ADLs at discharge after amputation is a very significant reason in predicting future satisfaction and quality of life of clients (Hoshino et al, 2008). Individuals with no limitations in ADL are more likely to report high levels of life satisfaction than those with limitations in ADL or dependence on others in their ADLs. They showed that as clients progress from full ADL independence into ADL limitations to ADL dependence, the proportion of people with high levels of life satisfaction declines (Boccaccio et al, 2021). Several studies reported that as the dependence or limitations in ADLs increase, the quality of life and life satisfaction of individuals, especially the elderly, also decrease (Chokkanathan & Mohanty, 2017; Wang et al, 2017).

Life satisfaction is a multidimensional concept of quality of life (Tate & Forchheimer, 2002). Life satisfaction forms one of the subjective statements of a person's life quality (Rachmat et al, 2020). Life satisfaction is a mental appraisal of one's life according to selected principles and is considered one of the most

significant parts of individual well-being (Hamaideh, 2021). Life satisfaction is another important rehabilitation outcome and is examined as the perceived discrepancy between aspiration and achievement (Wang et al, 2018). Amputation can have a direct or indirect undesirable effect on individuals, resulting in a lower level of life satisfaction or being doubtful when reporting judgement on their life (Addabbo et al, 2015). Mollaoglu et al (2010) focused on the life satisfaction of the elderly with mobility disabilities including amputees and found that disability significantly affects life satisfaction.

Assessments of functional outcomes during the performance of ADLs and IADLs of amputees have gained growing prominence to support evidence-based practice (Frossard et al, 2011). Limitations in ADLs and IADLs can be described as needing help in at least one of the following activities: walking, taking a shower, toileting, getting out of bed, getting up from a chair, using the toilet, dressing, and eating (Zunzunegui et al, 2006). Hommel et al (2004) concluded in their work that clients' experiences of dependence may be lessened over time when executing activities of daily living that are perceived as important, and performance of such ADLs has been established to be a relevant gauge of client outcome and improvement in satisfaction. Dependence for activities of daily living is linked with poorer quality and satisfaction of life (Millán-Calenti et al, 2010). Arling and Williams (2003) reported that the more dependent clients may experience lower satisfaction and quality of life than those who are Activities of Daily Living independent. After six months of rehabilitation in persons with lower-extremity amputation, independence in ADLs/IADLs is significantly linked with higher satisfaction of life (De-Rosende Celeiro et al, 2017). In a study of the ADLs of middle-aged clients who suffered lower limb amputation from sarcoma, it was found that they could retain their quality of life and satisfaction of life (Pardasaney, 2006). The adverse consequence of amputation on life satisfaction can lead to a lower level of life satisfaction (Addabbo et al, 2015).

## **Objective**

Ghana is experiencing significant increases in its amputee population (Chalya et al, 2012), yet research on the limitations in daily living activities and its impact on their life satisfaction is limited. Adequate attention has not yet been given to these very important determinants of functional independence during rehabilitation (Kyei et al, 2016). The lack of data on the health and well-being of amputees makes it difficult to monitor their health status during rehabilitation and the

impact of social policies on their health and satisfaction. Since Ghana is a country which aspires to focus on implementing rehabilitation programmes, a study of this nature is needed to realise the full effect of amputations on the lives of the amputees and to provide essential data for policy formulation, rehabilitation programme implementation, evidence-based practice and to make adaptations to their needs and perspectives. This study aimed to examine the limitations experienced by amputees in the performance of Activities of Daily Living (ADLs) and Instrumental Activities of Daily Living.

## **METHOD**

### **Study Design**

The study utilised a quantitative approach and a cross-sectional study design.

### **Study Setting**

This study was conducted at the Nsawam Orthopaedic Training Centre (OTC) in the Nsawam-Adoagyiri Municipality of the Eastern region of Ghana. The primary purpose of the centre is the rehabilitation of persons with physical disability in Ghana and West Africa. This centre was chosen because a significant percentage of amputees live or visit the centre for rehabilitation and other interventions on a regular basis. A purposive sampling technique was used to select the study setting.

### **Study Sample**

Purposive and simple random sampling methods were used to recruit respondents. It provided an opportunity for each member of the population to have an equal chance of being selected. This not only enhanced the selection of suitable respondents for the study, but also facilitated data collection within a short duration of time. A total of 200 respondents were recruited for the study.

Inclusion criteria:

- All amputee men and women, with bilateral or unilateral limb amputation,
- Amputees who were 18 years of age or older,
- Those who were attending post-amputation rehabilitation programmes, with or without prosthesis,

- Those who were temporary residents of the Nsawam Orthopaedic Training Centre or had been visiting the centre at least for over 3 months for rehabilitation and treatment.

The aim was to obtain information about the variables under investigation from different gender perspectives. It was felt that those above 18 years of age would give appropriate responses to the variables under study. The clients visiting the centre for treatment for over three months were included on the basis that they had been stabilised and were gradually adjusting to life post-amputation.

### **Study Tools**

Standardised data collection tools were used. The questionnaires were self-administered, in-person in paper-and-pen formats, under the supervision and guidance of the researchers.

The Groningen Activity Restriction Scale (GARS) is a non-disease-specific instrument to measure limitations or difficulties in ADLs and IADLs. It has 18 items based on a 5-point Likert scale which measures the level of disability or limitation encountered in the performance of daily activities, ranging from '1' as independent to '5' as dependent or needing help to be able to perform that activity. The response is based on what the client can do with that activity. The scale provides a minimum score of 18 and a maximum score of 72. The higher the score, the greater the disability or limitation (Suurmeijer et al, 1994). The GARS was selected because the psychometric characteristics, which measures disability in ADL and IADL simultaneously, make this instrument very useful for comparative research. It can be administered by the researcher or by the clients if they are able to read and write. Details of the questionnaire were explained to the respondents.

The second questionnaire was the Life Satisfaction Questionnaire-11 (LISAT-11) for measuring the satisfaction with life. The Life Satisfaction Questionnaire-11 (LISAT -11), which can be client or researcher administered, assesses different aspects of life satisfaction rated on an ordinal scale ranging from '1' (very dissatisfying) to '6' (very satisfying). Summing of the scores is not recommended; it seems more appropriate to use mean domain scores rather than a total score to keep the information on each domain available for clinical interventions. The LISAT-11 was selected because it provides meaningful information on quality of life for clinical and research purposes (Fugl-Meyer et al, 2002).

A pre-test of the questionnaires was carried out at the orthopaedic unit of the Korle-bu Teaching Hospital (KBTH) among the amputees who had been visiting for rehabilitation. The orthopaedic unit of the Korle-bu Teaching Hospital (KBTH) was selected for the pre-test because the respondents have characteristics similar to those of the respondents of the study setting. It was done to check accuracy, to estimate time and any inconsistency, and corrections were made based on responses from pre-test. Feedback from the pre-test was incorporated into the final version of questionnaire design.

### **Data Collection**

Protocols and questionnaire instructions were explained in detail to the respondents and their written consent was obtained. The questionnaires were administered by the researchers to all those who consented to participate. When respondents had difficulties understanding an item on the questionnaire, they requested and received further clarification and explanations. A translator was hired to interpret and translate information on the questionnaires to respondents who had difficulty reading and understanding the English language. Since the researchers spent several days with the respondents to get the sample size of 200, those who enrolled in the study were given a unique number for easy identification on subsequent visits. The researchers checked and reviewed all the filled-out questionnaires to ensure completeness and consistency of the information collected. The complete data can be accessed from the research repository of the Department of Health Promotion and Disability Studies, at the Kwame Nkrumah University of Science and Technology.

### **Data Analysis**

Statistical analysis was performed using SPSS version 23.0 statistical software package to generate descriptive statistics such as frequency, mean, standard deviation (SD), and cross-tabulations. The results are presented in Tables. The measure of the impact of the activity limitations on the satisfaction of life was determined using logistic regression and correlation analysis.

### **Ethical Considerations**

Ethical approval (Approval number: CHRPE/AP/360/21; Date: 9<sup>th</sup> August 2021) was sought from the Committee on Human Research, Publication, and Ethics, Kwame Nkrumah University of Science and Technology (KNUST). All ethical issues regarding the study's population were adhered to.



An amputee was deemed eligible for this study if he/she provided signed informed consent. The respondents signed or, where necessary, thumb-printed consent forms indicating their willingness to participate. To avoid the invasion of privacy and possible recruitment against their will, they were given the assurance of adhering to routine study schedules, study procedures, and other recommendations throughout the study period. Those who communicated their unwillingness to proceed were allowed to withdraw from participation.

## RESULTS

### Demographic Characteristics of Respondents

A total of 200 upper and lower limb amputees were recruited for the study. Among them, 107 (54%) were males, 102 (51%) were married, and about 49 (24%) were between 31-40 years of age. The majority of the respondents - a total of 78 (39%) - had completed high school. One hundred and twenty people (60%) had prosthesis as part of their rehabilitation programme. Furthermore, a high proportion of the study respondents - 174 (87%) - were lower limb amputees and the majority - 179 (89%) - had unilateral amputation. The findings are summarised in Table 1.

**Table 1: Demographic Characteristics of the Respondents**

Variable	Frequency [n=200]	Percentage (100%)
<b>Age (years)</b>		
18-30	28	14
31-40	49	24
41-50	45	23
51-60	47	24
60+	31	15
<b>Sex</b>		
Male	107	54
Female	93	46
<b>Marital status</b>		
Single/divorced	82	41
Married	102	51
Widow/widower	16	8
<b>Education</b>		
No formal education	25	13
Basic	48	24
Second cycle	78	39

Tertiary	49	24
<b>Type of amputation</b>		
Upper limb amputation	26	13
Lower limb amputation	174	87
<b>Form of amputation</b>		
Unilateral	179	89
Bilateral	21	11
<b>Prosthesis Status</b>		
Prosthesis Non-User	80	40
Prosthesis User	120	60

Source: Author's fieldwork, 2022

### Activity Limitations experienced by Amputees in the Performance of ADLs and IADLs

Generally, the respondents could perform ADLs and IADLs with some difficulty, with an overall mean activity limitation score of  $36.57 \pm 10.93$ . For ADLs, the respondents indicated they could get around in the house ( $2.07 \pm 0.89$ ) and walk outdoors ( $2.28 \pm 0.91$ ) with some difficulty. However, they were able to go up and down the stairs ( $2.69 \pm 0.98$ ) with great difficulty. On IADLs, the respondents revealed that they had some difficulty in preparing breakfast or lunch ( $2.24 \pm 0.93$ ), washing and ironing clothes ( $2.24 \pm 0.94$ ), and doing shopping ( $2.05 \pm 1.18$ ). They also had great difficulty in preparing dinner ( $2.58 \pm 0.92$ ) and doing "light" household activities ( $2.71 \pm 0.76$ ). It is significant to note that most of the respondents said they could not do "heavy" household activities and then only with someone's help ( $3.53 \pm 0.57$ ). Activity limitation scores for the respondents are summarised in Table 2.

**Table 2: Activity Limitation Scores of Respondents**

Groningen Scale	Mean $\pm$ SD	Range (Min-Max)
Overall score	$36.57 \pm 10.93$	18-72
<b>Activity of Daily Living (ADL)</b>		
Dress yourself	$1.29 \pm 0.86$	1-4
Get in and out of bed	$1.61 \pm 0.86$	1-4
Stand up from sitting in a chair	$1.72 \pm 0.96$	1-4
Wash your face and hands	$1.38 \pm 0.78$	1-4
Wash and dry your whole body	$1.63 \pm 0.78$	1-4
Get on and off the toilet	$1.81 \pm 0.84$	1-4

Feed yourself	1.11±0.46	1-4
Get around in the house	2.07±0.89	1-4
Go up and down the stairs	2.69±0.98	1-4
Walk outdoors	2.28±0.91	1-4
Take care of your feet and toenails	1.73±1.01	1-4
<b>Instrumental Activity of Daily Living (IADL)</b>		
Prepare breakfast or lunch	2.24±0.93	1-4
Prepare dinner	2.58±0.92	1-4
Do "light" household activities	2.71±0.76	1-4
Do "heavy" household activities	3.53±0.57	1-4
Wash and iron your clothes	2.24±0.94	1-4
Make the beds	1.96±1.10	1-4
Do the shopping	2.05±1.18	1-4

Source: Author's fieldwork, 2021

### Life satisfaction among Respondents

The respondents indicated moderate life satisfaction with a mean score of  $3.86 \pm 1.15$ . However, vocational situation ( $2.87 \pm 0.96$ ), sexual life ( $2.87 \pm 1.11$ ), financial situation ( $3.31 \pm 1.06$ ), and psychological health ( $2.97 \pm 1.09$ ) of the respondents were shown to be rather dissatisfying. Ability to manage self-care ( $3.75 \pm 0.90$ ), partner relationship ( $3.76 \pm 1.47$ ), physical health ( $3.74 \pm 0.94$ ), and family life ( $4.21 \pm 1.0$ ) were moderately satisfying among the respondents. The level of life satisfaction among the respondents is illustrated in Table 3.

**Table 3: Life Satisfaction among Respondents**

	Mean ±SD	Range (Min-Max)
Life as a whole	3.86±1.15	1-6
My vocational situation	2.87±0.96	1-5
My financial situation	3.31±1.06	1-6
My leisure situation	3.31±1.03	1-6
Contacts with friends and acquaintances	3.57±0.98	1-6
My sexual life	2.87±1.11	1-6
My ability to manage self-care	3.75±0.90	1-6
My family life	4.21±1.0	1-6
My partner relationship	3.76±1.47	1-6
My physical health	3.74±0.94	1-6
My psychological health	2.97±1.09	1-5
Overall	38.22±6.82	23-61

Source: Author's fieldwork, 2021

## Relationship between Activity Limitation and Life Satisfaction among Amputees

A multivariate analysis was used to establish the relationship between activity limitation and life satisfaction. The multivariate analysis revealed that there was a strong negative statistically significant relationship between activity limitations and life satisfaction ( $\beta = -0.13$ ,  $p=0.000$ ) when all variables were held constant. The findings are summarised in Table 4.

**Table 4: Crude and Adjusted Linear Regression Model for the Effects of Activity Limitation on Life Satisfaction (adjusting for essential cofounding variables)**

Variable	N	Univariate Analysis			Multivariate Analysis		
		Crude $\beta$	95% CI	p-value	Adjusted $\beta$	95% CI	p-value
<b>Age (years)</b>							
18-30	28	Ref.					
31-40	49	-2.45	-5.1-0.61	0.116	-2.66	-5.43-0.11	0.06
41-50	45	1.05	-2.05-4.17	0.505	-0.32	-3.22-2.57	0.825
51-60	47	-1.12	-4.21-1.96	0.473	-3.32	-6.26-(-0.37)	<b>0.027*</b>
60+	31	-5.39	-8.7-(-2.02)	<b>0.002*</b>	-5.37	-8.84-(-1.92)	<b>0.003*</b>
<b>Sex</b>							
Male	107	Ref.					
Female	93	.72	-1.19-2.63	0.456			
<b>Marital status</b>							
Single/divorced	82	Ref.					
Married	102	4.18	2.28-6.1	<b>0.000*</b>	4.82	2.99-6.66	<b>0.000*</b>
Widow/widower	16	-0.09	-3.60-3.43	0.962	1.9	-1.54-5.52	0.268
<b>Education</b>							
No formal education	25	Ref.					
Basic	48	2.91	-0.38-6.20	0.083			
Second cycle	78	0.34	-2.72-3.41	0.828			
Tertiary	49	2.22	-1.06-5.50	0.183			
<b>Location</b>							
Upper Limb Amputation	26	Ref.					
Lower Limb Amputation	174	0.11	-2.72-2.95	0.08			
<b>Form</b>							
Unilateral	179	Ref.					
Bilateral	21	-8.91	-11.76-(-6.06)	<b>0.000*</b>	-5.97	-9.05-(-2.90)	<b>0.000*</b>
<b>Groningen score</b>							
Activity limitation	200	-0.21	-0.29-(-0.13)	<b>0.000*</b>	-0.13	-0.211-(-0.04)	<b>0.003*</b>

$\beta$ =beta coefficient, \*Significant, CI=Confidence Interval

## DISCUSSION

A total of 200 upper and lower limb amputees participated in the study. Most of them - 120(60%) - had a prosthesis and most of them were using their device. There were 93 (46.5%) female amputees as compared to 107 (53.5%) male amputees. Most of the respondents were in the age bracket of 31-40 years (24.5%). A similar study conducted in Ghana reported that more males were part of the study as compared to females, but reported an older amputee population group of 41–60 years (60%) (Amoah et al, 2018), as compared to the findings in the current study. Also, a recent study conducted in Nigeria showed that males constitute the greatest percentage of amputees in Kano (Bello et al, 2020). Furthermore, a similar finding in a study of Asians showed that the incidence of amputation is 1.2 per 10, 000 women to 4.4 per 10 000 men in the Navajo nation in the USA (Burger & Marincek, 2007). A higher proportion of the study respondents were lower limb amputees (87.0%), and the majority (89.5%) had unilateral amputation. This means that lower limb amputees in this study were more than upper limb amputees, with majority of the amputations affecting a single limb. A study among amputee population in Nigeria reported similar findings; that about 90% of all amputations were lower limb amputations and involved only one of the lower limbs (Bello et al, 2020). This finding is also reported in the work by Rachmat et al (2019), that amputation more often happens in men than in women and that amputation in the lower limbs comprises the majority (85-90%) of all amputations.

On activity limitations, generally, the respondents could perform ADLs and IADLS with some difficulty and limitations. A similar study conducted among older amputees in Nigeria, within the age group of 40-60 and >60 years, revealed higher levels of activity limitations (Bello et al, 2020). This suggests that higher age and amputation reinforce the level of activity limitation and difficulty. For Activities of Daily Living (ADLs), it was evident that the respondents experienced limitations in mobility-related activities. The respondents indicated they could manage getting around in the house and walking outdoors with some difficulty, while they could go up and down the stairs with great difficulty. This limitation was expected, since lower limb amputation impacts negatively on physical activity and function, and general health, compared to the general population. Several studies have postulated that compared to the population without disability, amputees walk slower and with a larger energetic penalty (Paysant et al, 2006; Gates et al, 2012), with about 60% of the affected population citing an inability to walk on uneven terrain as a major limitation (Hagberg &

Branemark, 2001). Also, it is reported in the literature that amputation has a great influence on many activities and has resulted in participation restriction in various activities that people used to do (Kakooza et al, 2020). The respondents experienced limitations in almost all the Instrumental Activities of Daily Living (IADLs). They revealed that they experience limitations in preparing breakfast or lunch, washing and ironing clothes, and doing shopping. They however experienced great difficulty in preparing dinner and doing "light" household activities respectively. It is worth mentioning that the respondents indicated that doing "heavy" household activities was almost impossible and required help or assistance. This can be attributed to the fact that the activities listed above require higher physical energy and exertion to complete, as the literature reports that amputation leads to threefold loss of function in the individual (Razak et al, 2016). A similar study reported that major limb amputees typically have reduced mobility which affects their ability to perform daily tasks and to successfully reintegrate into community life (Cox et al, 2011). This finding further agrees with a study conducted among upper limb amputees which reported that the simple task of cutting a tomato to make a sandwich becomes difficult as there is no way to keep the tomato stable to cut it. Pouring a glass of water can also be difficult as the other hand is not able to stabilise the cup to stop the water from spilling (Sproats et al, 2013). The respondents reported a moderate life satisfaction score. This finding agrees with the findings of Dias (2006) who, in a Portuguese sample, found that amputees were moderately satisfied with life, but it contradicts the work of Pereira et al (2018) which revealed that individuals were dissatisfied with their life. The respondents in the current study generally showed moderate satisfaction in the areas of management of self-care, relationship with partners, physical health, and family life. This could be attributed to the fact that most of the respondents were receiving caregiving support from their relatives (family) who help with self-care management most of the time. The satisfaction with physical health could also be attributed to the fact that the respondents were receiving rehabilitation from the facility. The services they were receiving were medical, physical, and occupational therapy services, which focus primarily on the diagnosis, correction, and treatment including the provision of assistive devices such as orthotics and prosthesis as well as wheelchairs, and training on the use of these devices. Majority of the amputees recruited for the study were back at the facility for a review of previous rehabilitation interventions they had already received. These findings agree with the views and experiences that were reported by Rachmat et al (2019) wherein it was stated that the most affected

attributes of amputees are their reduced physical capacity, poor general health, and pain, for which rehabilitation services are sought. The findings of the current study concerning the moderate satisfaction of lower limb amputees on partner relationships and family life, complements the findings by Geertzen and Dijkstra (2009) who reported that lower limb amputation limits a person's performance of marital activities, including expression of sexual feelings between partners.

On the subject of life satisfaction, the respondents reported that their vocational situation, sexual life, financial situation, and psychological health were rather dissatisfying. This could probably be due to the rehabilitation centre primarily focussing on the physical limitations of the respondents, but not on their economic, emotional and psychological needs. This finding agrees with a study that investigated the experiences of amputees and reported that due to the traumatic events, amputated victims go through psychological torture and loss of employment (Kakooza et al, 2020). Furthermore, another study reported that peoples' lifestyles are forced to change due to disability caused by amputation, and sources of earning a living partially or badly affected (Mugo, 2010). Also, evidence suggests that in addition to lowering lifestyle quality, limb amputations are financially taxing to both clients and healthcare systems (Jindeel & Narahara, 2012; Joret et al, 2016). On sexual life, these findings agree with Williamson and Walters (2010) who stated that for some people with amputation, achieving the desired sexual position with a partner can be troublesome. Research also suggests that individuals with physical disabilities experience problems in forming and maintaining intimate, romantic, and sexual relationships (Taleporos & McCabe, 2001). In determining whether activity limitations have direct impact on life satisfaction, it was revealed that there was a strong statistical relationship between activity limitations and life satisfaction. This means that the more a person is limited in the execution of ADLs and IADLs, the more dissatisfied the person is with various life domains. It thus means that activity limitation is a predictor or determinant of life satisfaction. Dias (2006) found similar results and reported a significant and positive relationship between life satisfaction and the health status domain, such as physical functioning in amputees. A study conducted among an aged population with physical disabilities including amputations reported contradictory results and stated that there was no significant association between activity limitations and life satisfaction (Jørgensen et al, 2017). However, Blace (2012) reported that individuals with higher mobility impairment are more likely to report lower life satisfaction. In a study of life satisfaction among amputees by Pereira et al (2018) similar findings were reported that the experience of mobility

difficulties in amputees may predispose individuals to be less satisfied with their life.

## **Limitations**

Due to its cross-sectional nature, this study failed to establish the relationship between the demographic characteristics and activity limitations as well as life satisfaction. The researchers believe this could have directly influenced respondents' responses. However, a longitudinal study would be required to establish this. Another limitation is that the study population is not representative of the general population of amputees.

## **CONCLUSION**

Amputation has a significant impact on activity limitations and life satisfaction. The amputees experienced some limitations when performing ADLs and IADLs. Most of the activities with which they had difficulty and limitations are mobility-related activities for ADLs and the more complex activities of IADLs, such as preparing breakfast and dinner, doing light and heavy household activities, washing and ironing, making beds and shopping. The life satisfaction of respondents was moderately satisfying. The amputees showed dissatisfaction in their vocational situation, sexual life, financial situation, and psychological health, as compared to family life, partner relationship, and physical health that were very satisfying. There was a statistically significant relationship between activity limitations and life satisfaction; therefore, the more an amputee experiences limitations in ADLs and IADLs, the less satisfied he/she is with life.

## **Implications**

The loss of a limb has severe implications for a person's mobility and ability to perform activities of daily living. This negatively impacts their participation, integration into society and quality of life. The goal of rehabilitation after amputation is to train the individual to ambulate successfully, return to a high level of activity performance and social reintegration. It is therefore recommended that the Ministry of Health and its agencies such as the Ghana Health Service (GHS), and stakeholders such as the medical and rehabilitation professionals who are involved in the management of amputees, must explore the amputees' limitations and difficulties in engaging and performing activities; this is required to inform the planning and preparation of a comprehensive



rehabilitation programme. This can be done through a transdisciplinary team of various rehabilitation professionals and stakeholders. The country must adopt a comprehensive rehabilitation programme which clearly focuses on pre-operative preparation, amputation surgery and acute post-surgical management, prosthetic assessments, prescription and training, community integration, vocational rehabilitation and follow-up. It is highly recommended that throughout all these phases, rehabilitation professionals ensure that a rehabilitation treatment plan is well utilised together with service users to guide the care of an individual who has undergone an amputation and to adapt to their needs and perspectives. It is further recommended that rehabilitation interventions start from the date of admission to the hospital or rehabilitation centre, through to discharge and integration into the community, with a focus on addressing disabilities or activity limitations as a consequence of amputations, to improve the overall satisfaction and quality of life of the amputee population. Furthermore, practitioners such as doctors, rehabilitation nurses, occupational therapists, physiotherapists and social workers who extend care to the amputee population need to seek training programmes that will improve their skills, if they are to contribute significantly to the lives of the amputee population. This can be done in the form of workshops, seminars, CPD programmes and attending further studies.

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