



# FACTORS THAT INFLUENCE THE USAGE OF PROSTHESES AMONG PERSONS WITH LOWER LIMB AMPUTATION IN THE KUMASI METROPOLIS

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## ABSTRACT

There has been numerous technological advancements in dealing with major etiologies of lower limb amputation but lower limb amputation has been on the rise. According to Amoah et al (2018), it is estimated that about 145,299 people have been amputated in Ghana. Yet, estimates by WHO (2010) indicates that only 5-15% percent of Ghanaians in need of assistive technology only have access to it.

The objectives of this study is to assess the knowledge on usage of prostheses, determine the prevalence level of usage of prostheses, determine the factors that influence the use of prostheses and to identify the challenges of usage of prostheses among persons with lower limb amputation.

A descriptive research design which made use of a mixed (quantitative and qualitative) approach. The study was carried out within the confines of the Kumasi Metropolis from March, 2021 to September. The study involved 72 persons with lower limb amputation out of the 90 participants earlier proposed. 62 persons with lower limb amputation responded to a structured questionnaire while 10 other persons with lower limb amputation participated in an interview to help in the data collection to satisfy the objectives of the study. Data was analyzed using SPSS (Statistical Package for the Social Sciences) and thematic Analysis.

The findings reveal that most persons with lower limb amputation have good and very good knowledge of what prostheses are, the sources they can get prostheses from, prostheses training centers in Ghana. The number of persons with lower limb amputation who use prostheses are very low (40.3%) as opposed to the number who uses prostheses (59.7%). Cost is a major barrier to usage of prostheses among all the factors. Most persons with lower limb amputation said the prosthetic devices are very expensive unless through the benevolence of the society. The findings revealed that most persons with lower limb amputation experience pain when ambulating with the use of prostheses. Despite experiencing pain, they still use the prostheses.

This study concluded that prostheses have become very necessary to use because of the benefits derived from them. Prostheses have become more accessible in the advanced countries relative to that in lower income countries like Ghana and the major factor is attributed to the cost involved and the exchange rates of our currency.

It is recommended from evidence gathered from this study that a separate ministry which will be in the helm of affairs for only issues related to disability-related issues should be established so as to address the inadequacies and challenges faced by persons with disabilities in having access to assistive devices and more importantly subsidize the cost of prostheses.

**KEYWORDS:** Prosthesis, Amputation, Limbs, Disability

## INTRODUCTION

Despite the fact notable progress in the development of knowledge and technology, lower limb amputation has been on the rise (Amoah et al, 2018). Over 40 million amputees live in developing nations (Universal Prosthetics, 2016). According to WHO (2020), this population is expected to double by 2050. It is estimated that about 145,299 people have been amputated in Ghana (Amoah et al, 2018). The million-dollar question is; how many people are making use of prosthesis as a means of improving their function? Prosthesis today has been the main assistive device which is used to complement the human body and it has the ability to reinstate mobility and maximize independence among persons with lower limb amputation (Hahn & Sreckovic, 2018).



The history of usage of prostheses is traced to the ancient civilization thousands of years ago and often interlaced with the antiquities of war and medicine and the first orthodox prototype of an artificial limb is the tow of one Egyptian reverend woman which is traced to 950-710 BC (O’Keeffe and Rout 2019). A notable progress of technology evolved after the American civil war in the 19th century. After the First World War, it became necessary to produce prostheses for the seriously injured soldiers. (O’Keeffe and Rout, 2019).

Ramstrand (2021) documented that, most persons with lower limb amputation have lower knowledge in the usage of prostheses. This unfavorable experience has been one of those barriers to using prostheses. Magnusson (2017) also pointed out that, the average person with lower limb amputation in lower income countries do not have the financial muscle to afford all kinds of prostheses which is one of the major barriers to usage of prostheses.

The idea or conception of a losing lower limb is not only traumatic but disadvantageous to a lot of people. It becomes traumatic in the sense that it creates a psychological defect in the minds of the affected ones. Losing a lower limb becomes disadvantageous because it leads to outright or partial loss of function or self-image. (Breakey, 1997).

The significance of rehabilitating the body has succeeded with the introduction of artificial limbs with the aim of complementing the body of the person with limb amputation (Bekrater-Bodmann, 2021). Yet, estimates indicate 5-15percent of a population in need of assistive technology do not have access to it (WHO, 2010).

Today, the use of prostheses has generated immense benefits for persons with lower limb amputation such as improved quality of life, maximization of independence and reaching their perceived potentials (Schaffalitzky et al., 2011). Despite these enormous benefits, little is known about the factors that influenced the usage of prostheses among persons with lower limb amputation.

This study is designed to contribute to filling the existing gap in literature to identify the various factors that influence the usage of prostheses among Persons with lower limb amputation. The study further assesses the knowledge and challenges of usage of prostheses and how these challenges could be managed.

## OBJECTIVE

The study aimed to determine the factors that influence the usage of prostheses among persons with lower limb amputation, the knowledge on usage of prostheses among persons with lower limb amputation and to determine the factors that influence the use of prostheses among persons with lower limb amputation. To end this, the study focused on the challenges of usage of prostheses among persons with lower limb amputation.

## METHODS

### *Design*

The research design employed was a descriptive design and the study approach used was a mixed approach. The study sought to draw the strengths of both quantitative and qualitative approach. The study also seeks to determine the factors that influences the usage of prostheses and examine, describe, explain and interpret these occurrences to maximize understanding. The purpose of using this approach was to achieve the objectives in the best possible way. With this approach, a researcher tests variables with large samples and then to explore in more depth with a few cases during the qualitative phase. (Burns and Grove, 1993)

### *Study site*

The research was conducted within the confines of the Kumasi Metropolis. Kumasi is in the Ashanti Region with twenty-seven (27) districts. It is among the largest Metropolitan areas in Ghana. Kumasi is approximately 500 kilometers north of the equator and 200 Kilometers north of the Gulf of Guinea. It is the second largest city in Ghana, after the capital, Accra. The Metropolis shares boundaries with Kwabre East and Afigya Kwabre Districts to the north, Atwima Kwanwoma and Atwima Nwabiagya District to the south (Ghana Statistical Service, 2010).

The population of Kumasi Metropolis forms 36.2 percent of the total population of Ashanti Region. About 2.4 percent of the Metropolis total population has a disability. The number of PWDs represents 2.4% of the population of the Metropolis. There are about 2.5% of females with disability in the Metropolis as against 2.3% of males. Less is known on the number and percentage of persons with lower limb amputation.

### *Sample size and sample technique*

The sample was taken from the Ghana Society of the Physically Disabled (GSPD). Seventy-two respondents were taken to represent persons with lower limb amputations in the Kumasi Metropolis. Sixty-two (62) respondents were taken for the quantitative studies while ten (10) participants were taken for the qualitative studies. Respondents for the quantitative study were taken by the use of the Yamane’s formula in determine the sample size as indicated below:



$$n = \frac{N}{1 + N(e^2)}$$

Where n =sample size, N= population size, e = confidence level (confidence level of 95).

The study used the convenience sampling technique to recruit the respondents that is persons with lower amputation in the Kumasi Metropolis. Convenience sampling (Haphazard sampling) according to Ilker (2016), is a form of non-probability sampling where members of the target population that meet certain criteria such as willingness to participate are included for the purpose of the study. This sampling method was used because the respondents are located at different environs within Kumasi metropolis.

**Data Collection Method**

The data for the study was collected from persons with lower limb amputation in Ghana Society of the Physically Disabled (GSPD). The instrument for data collection was by the use of a structured questionnaire and interview. The questionnaire and the interview guide were designed based on the objectives of the research. The primary data was gathered from persons with lower limb amputation from GSPD. In-depth interviews were held using an interview guide to collect information from the participants (among persons with lower limb amputation) and also challenges they encounter in the usage of prostheses. Individuals present during a single interview included one researcher (interviewer), one participant and one research assistant (to take notes). Each interview began with a broad data-generating question: “Please tell me the challenges you face when using prosthesis” After that, additional questions were asked to further know the knowledge on the usage of prosthesis. Example probes were “can you narrate your experiences of using a Prosthesis.” kindly outline the major components of a prosthesis?’ and so on. All participants were interviewed separately except for one person who wanted the relative present as a support during the interview

**Data Analysis**

Data was collected using the online google forms, downloaded in an excel format and imported into the SPSS system. The made use of the frequency tool on the descriptive statistics tab on the analyze button. After following through the commands, tables were generated for the variables and the results of the analyses was captured in the lists of tables.

Thematic Analyses was used as tool to analyze the qualitative data generated using the interview guide. Qualitative data recorded was transcribed verbatim. The data was read several times until the researcher became familiarized with the data. Codes were generated afterwards as this enabled the researcher to reduce lots of data into a much more summarized meaning or organized data that seemed to address the research questions. Further, the researcher examined clearly the codes and some of them fitted together into broader themes that was specific about the research questions. The coding divergences were resolved by discussions between the coders. After obtaining the consensus of codes, the codes were classified into categories, of which the themes and sub-themes were extracts.

**RESULTS PERSONAL PROFILE OF RESPONDENTS**

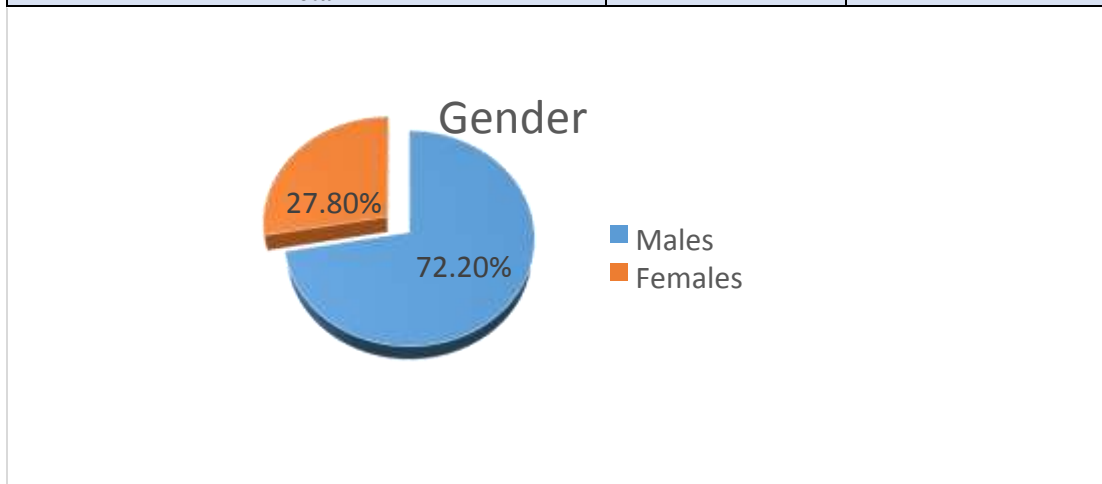
As shown in the table below (Table 1), more than half 52 (72.2 %) of the respondents were males; with the remaining 20 (27.8 %) been females. From the table below, 13 people representing 18.1% fell below age 25 whereas 17 people representing 23.6% were within the ages of 25-29 years. Also only 9 people were found within ages 30-34 years representing 12.5%. 18 people representing 25% fell within ages 35-39 whereas 15 persons are above 40 years representing 20.8%. With respect to the highest Education Received, 13 people representing 18.1% only completed Primary level. 41 people representing 56.9% completed the Junior High School level whereas 11 people representing 15.3% only completed the Senior High School level. 7 people representing 9.7% had a degree.

Further, the findings of the marital status of respondents/participants are outlined as follows; 37 people representing 51.6% were single whereas 13 people of the respondents/participants representing 18.1% were found to be married. 4 of the respondents/participants representing 5.6% were found to be separated from the spouses due to their conditions. 13 people representing 18.1% were found to be living as married whereas 3 people representing 4.2% were divorced from their spouses. 2 people representing 2.8% were widowed.

Again, the question of the employment status of the respondents were asked and these are found to be their responses; 49 people representing 68.1% was found to be self-employed whereas 16 people representing 22.2 were found to be employed by someone. However, only 7 people representing 9.7% were found to be unemployed.

**Table 1. Personal Profile of Respondents**

Variable	Category	Frequency	Percentage (%)
<b>Gender</b>	Male	52	72.2
	Female	20	27.8
Total		72	100.0
<b>Age(years)</b>	< 25	13	18.1
	25-29	17	23.6
	30-34	9	12.5
	35-39	18	25.0
	>40	15	20.8
Total		72	100.0
<b>Highest Education Received</b>	Primary Level	13	18.1
	Junior High School Level	41	56.9
	Senior High School Level	11	15.3
	Degree Level	7	9.7
Total		72	100.0
<b>Marital Status</b>	Single	37	51.4
	Married	13	18.1
	Separated	4	5.6
	Living as Married	13	18.1
	Divorced	3	4.2
	Widowed	2	2.8
Total		72	100.0
<b>Employment Status</b>	Self Employed	49	68.1
	Employed by Someone	16	22.2
	Unemployed	7	9.7
<b>Total</b>		72	100.0



**KNOWLEDGE ON THE USAGE OF PROSTHESES**

When asked whether respondents have an idea of what a prosthesis is, as shown in table 1.2 below, it was largely noticed only 1 person representing 1.6% had a fair idea of what a prosthesis is whereas 36 people representing 58.1% had a good knowledge on what a prosthesis is. 24 people representing 38.7% had a very good knowledge on what prosthesis is. Again, only 1 person representing 1.6% had a poor knowledge on what prosthesis is.



Also, when asked whether participants/respondents know of sources they can get prostheses from, as depicted in table 4.2 below, it was found that 9 people representing 14.5% had a fair knowledge, 38 people representing 61.3% had a good knowledge, 14 people representing 22.6% had a very good knowledge and only 1 person representing 1.6% had a poor knowledge of the sources they can get prostheses from.

On the issue of whether respondents had any knowledge on prostheses training centers, it was largely found that, 14 people representing 22.6% had a fair knowledge, 33 people representing 53.2% had a good knowledge, 13 people representing 21% had very good knowledge and 2 people representing 3.2% had poor knowledge on Prostheses training centers in Ghana.

With respect to having knowledge on the various types of lower limb prostheses, 6 people representing 9.7% had a fair knowledge, 37 people representing 59.7% had a good knowledge, 16 people representing 25.8% had a very good knowledge whereas only 3 people representing 4.8% had a poor knowledge on the various types of the lower limb amputation.

Concerning the knowledge on whether the level of amputation determines the type of prostheses used, 20 people representing 32.3% had good knowledge, 40 people representing 64.5% had a very good knowledge and only 2 people representing 3.2% had a poor knowledge on whether the level of amputation determines the prostheses used.

When participants/respondents were asked whether they know the level of amputation determines the type of prostheses used, 20 people representing 32.3 % had good knowledge, 40 people representing 64.5% had very good knowledge and only 2 people representing 3.2% had poor knowledge on the subject.

Furthermore, when participants/respondents were asked whether they have an idea of the various components of a lower limb prosthesis, 17 people representing 27.4% had a fair knowledge, 12 people representing 19.4% had a good knowledge, 6 people representing 9.7% had a very good knowledge and 27 people representing 43.5% had a poor knowledge on the subject.

Again, when participants/respondents were asked whether they know of some NGOs that provide free access to prostheses, 6 people representing 9.7% responded to have a fair knowledge, 4 people representing 6.4% had a good knowledge, 2 people representing 3.2% had very good knowledge and 50 people representing 80.6% had a poor knowledge.

When asked whether they believe prostheses can maximize independence for persons with lower limb amputation, 1 person representing 1.6% had fair knowledge, 1 person representing 1.6% also had good knowledge, and also, 1 person representing 1.6% also had poor knowledge while 59 people representing 95.2% had very good knowledge that Prostheses can maximize independence for persons with lower limb amputation.

Table 1.2 Knowledge on the Usage of Prostheses

Item	Response	Frequency	Percentage (%)
I have an idea of what a prosthesis is	Fair Knowledge	1	1.6
	Good Knowledge	36	58.1
	Poor Knowledge	1	1.6
	Very good Knowledge	24	38.7
I know of sources I can get Prostheses from	Fair Knowledge	9	14.5
	Good Knowledge	38	61.3
	Poor Knowledge	1	1.6
	Very good Knowledge	14	22.6
I know of Prostheses Training Centres in Ghana	Fair Knowledge	14	22.6
	Good Knowledge	33	53.2
	Poor Knowledge	2	3.2
	Very good Knowledge	13	21
There are various types of lower limb prostheses?	Fair Knowledge	6	9.7
	Good Knowledge	37	59.7
	Poor Knowledge	3	4.8
	Very good Knowledge	16	25.8
The level of amputation determines the type of prostheses used?	Good Knowledge	20	32.3
	Poor Knowledge	2	3.2
	Very good Knowledge	40	64.5
I have an idea of the various components of a lower limb prosthesis.	Fair Knowledge	17	27.4
	Good Knowledge	12	19.4
	Poor Knowledge	27	43.5



I know of some NGOs that provide free access to Prostheses.	Very good Knowledge	6	9.7
	Fair Knowledge	6	9.7
	Good Knowledge	4	6.4
	Poor Knowledge	50	80.6
	Very good Knowledge	2	3.2
Prostheses can maximize independence for persons with lower limb amputation	Fair Knowledge	1	1.6
	Good Knowledge	1	1.6
	Poor Knowledge	1	1.6
	Very good Knowledge	59	95.2

### Experiences of using a prosthesis

The study qualitatively sought information on the experiences of using a prosthesis among persons with lower limb amputation. In light of the findings, it could be largely noticed that almost all the participants had varied experiences when it comes to usage of prostheses. Two (2) of the participants had similar experiences like P1 and P6, who recounted that they had an unfavorable experience with the way the prostheses were manufactured. Over time, wearing the prostheses became very difficult because the legs became swollen after wearing it for some time so they had to take the device back to the manufacturers to loosen up the prostheses and that consequently incurred more cost for them.

However, P5 said,

*“Since I started wearing prostheses, life has become easier”*. He added, *“I used to feel pains, but not anymore. I could go on a long journey wearing the prosthesis now”*.

P4 also said,

*“I find it very difficult to walk in it. I think it’s because it’s not the natural limb”*

From this viewpoint expressed by participants, it was found that the prostheses were helpful but they experience some discomforts using it.

### Description of Usage of Prostheses

Some of the participants gave a very good description of how to use a prosthesis, whereas, some clearly lacked the technical know-how to use a prosthesis. A psychological reason behind the usage of prostheses was also given by some participants. P5 said something interesting,

*“The first thing to do when you want to don a prosthesis is to find out if you’re psychologically well before you use it”*. He added, *“I am the chairman of my group and I have noticed many people are not able to use the prostheses well because they fear falling on the ground”*. He said using the prostheses well starts from the mind. P4 also said,

*“Initially, wearing a prosthesis seems impossible because of the pain you go through”*.

However, P2 said,

*“Prostheses users should apply their full weight of their amputated lower limb on the prostheses”*.

He added, *“Users should walk naturally and avoid opening their legs while walking”*.

P1 also added,

*“Before you wear a prosthesis for the first time, train before you use it”*. He later gave a brief description of how to train, *“Try and stand erect leaning against a support wearing it. Try it for a week and after that, you try to stand wearing it without leaning against a support”*.

### PREVALENCE LEVEL OF USAGE OF PROSTHESES

When respondents were asked whether they use prostheses or not, as shown in table 1.3 below, 37 people representing 59.7% had a NO response, while 25 people representing 40.3% had a YES response.

Also, Participants/respondents were asked which type of lower limb prostheses they use, 1 person representing 1.6% said they use prosthetic ankle and foot system, 19 people representing 30.6% use the prosthetic knee system, 5 people representing 8.1% use the sport-specific prosthetic foot and knee system while 37 people representing 59.7% do not use the prosthesis at all.

Participants/respondents were asked about how often they wear a prosthesis when in the house, 2 people out of the 25 people representing 8% said they always wear the prostheses when in the house, 7 people representing 28% said they have never worn the



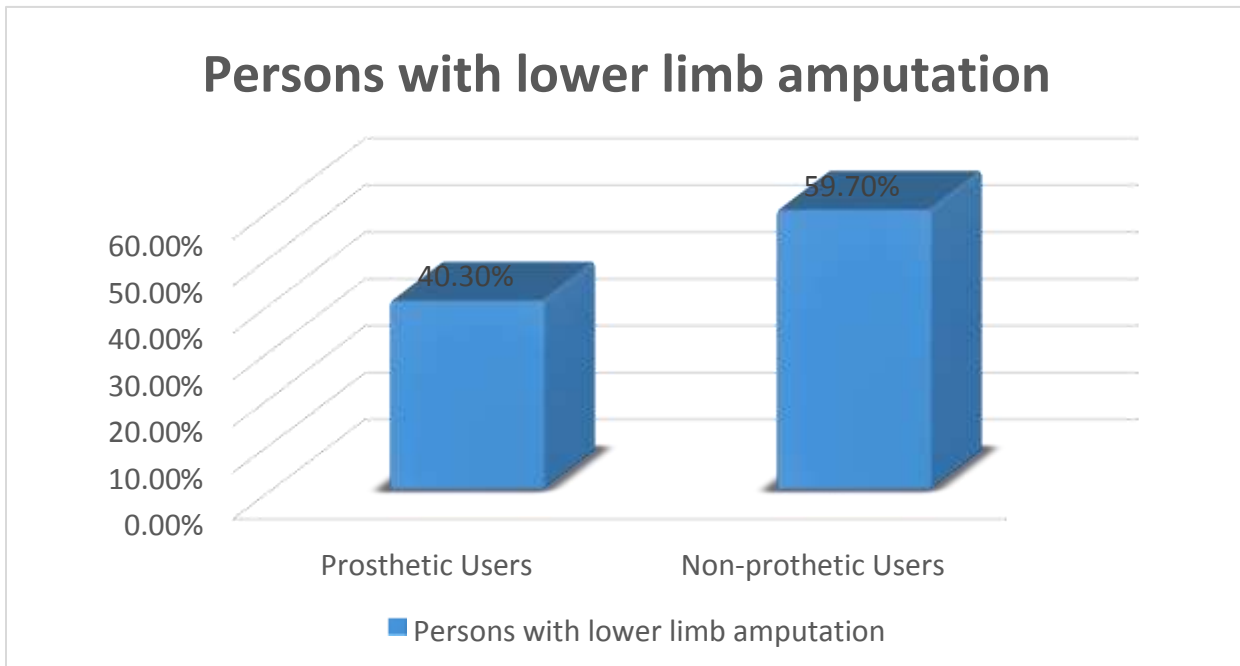
prostheses when in the house. 4 people representing 16% do rarely wear the prostheses when in the house. 11 people representing 44% sometimes wear the prosthesis when in the house and 1 person representing 4% wear the prostheses very often when in the house.

Participants were asked how often they wear the prostheses when outside the house, 14 people representing 56% said they always wear the prostheses when outside the house, 2 people representing 8% said they have never worn the prostheses when outside the house. 1 person representing 4% often wear the prostheses when outside the house. 2 people representing 8% rarely wear the prosthesis when outside the house and 6 people representing 24% wear the prostheses very often when outside the house.

Participants/respondents were asked which age group uses prostheses much often, 1 person representing 1.6% believe that persons from 13-19 years are the age group which uses prostheses much often. 28 people representing 38.9% believe that persons from 19-30 years are the age group which uses prostheses much often. 32 people representing 44.4% believe that persons from 30-60 years are the age group which uses prostheses much often. 1 person representing 1.6% believe that persons from 6-12 years are the age group which uses prostheses much often.

**Table 1.3 Prevalence Level of Usage of Prostheses**

Item	Response	Frequency	Percentage (%)
Do you use a prosthesis?	Yes	25	40.3
	No	37	59.7
Which type of lower limb prostheses do you use?	Prosthetic ankle and foot system	1	1.6
	Prosthetic Knee System	19	30.6
	Sport- Specific prosthetic foot and knee system	5	8.1
	N/A	37	59.7
How often do you wear a prosthesis when in the house?	Always	2	8
	Never	7	28
	Rarely	4	16
	Sometimes	11	44
	Very Often	1	4
How often do you wear a Prosthesis outside the house?	Always	14	56
	Never	2	8
	Often	1	4
	Rarely	2	8
Which age group uses Prostheses much often?	Very Often	6	24
	13-19 years	1	1.6
	19-30 years	28	45.2
	30-60 years	32	51.6
	6-12 years	1	1.6



**Usage of Prostheses**

The study sought to find out whether participants have used a prosthesis or never used a prosthesis before, are still using a prosthesis or never used a prosthesis. Under this theme, participants are allowed to give their opinion why age affects the usage of prostheses. Seven (7) said they are still using the prostheses while three (3) of them have never used a prosthesis before because of certain factors that will be highlighted in the subsequent sections. Participants 1, 2, 3,4,5,6 and 7 all use Prostheses but they believe persons below forty (40) years use prostheses much often while participants 8, 9 and 10 also agreed to the assertion that persons ranging from 20-50 years use prostheses much often.

This sub-theme also sought information on the duration of usage of prostheses. Participating in this interview;

P1 said,

*“I wear the prostheses approximately 13 hours a day when I go outside”* P4 said,

*“I wear the prostheses for roughly 13-24 hours. It depends on my condition that day”.*

P5 said,

*“I wear the prostheses for approximately, 13 hours a day”*

P6 also said,

*“I wear prostheses from 13 hours going. When I’m in the house, I seldom wear it”*

On the contrary, P2 had a different response altogether. He said,

*“I wear the Prostheses for 15-20 hours in a day. I even sometimes sleep wearing it”.*

**FACTORS THAT INFLUENCE THE USAGE OF PROSTHESES**

Participants were asked whether they have a strong belief against the usage of prostheses, as shown in table 1.4 below, 1 person representing 1.6% agree having a strong belief against the usage of prostheses. 1 person representing 1.6% also disagree having a strong belief against the usage of prostheses. 3 people representing 4.8% strongly agree having a strong belief against the usage of prostheses whereas 57 people representing 91.9% strongly disagree having a strong belief against the usage of prostheses.

Again, participants were asked whether cost is a major barrier in the acquisition of prostheses, 1 person representing 1.6% agree that cost is a major barrier to the acquisition of prostheses. 60 people representing 96.8% strongly agree that cost is a major to the acquisition of prostheses. 1 person representing 1.6% also strongly disagree that cost is a major barrier to the acquisition of prostheses.

Participants were again questioned whether the attitude of people around them prevents the usage of prostheses, 1 person representing 1.6% agree, 3 people representing 4.8% disagree, 29 people representing 46.8% took a neutral position, 14 people representing 22.6% strongly agree and 15





people representing 24.2% strongly disagree that the attitude of people around them prevents the usage of prostheses.

Participants/respondents were asked whether their religion endorses the usage of prostheses, 3 people representing 4.8% agree to that, 58 people representing 93.5% strongly agree and 1 person representing 1.6% strongly disagree that their religion endorses the usage of prostheses.

Again, participants were asked whether knowing the risks of a sedentary lifestyle motivates them to use a prosthesis, 4 people representing 6.4% agree, 57 people representing 91.9% strongly agree and 1 person representing 1.6% said that knowing the risks of living a sedentary lifestyle motivates them to use prostheses.

Lastly, participants were asked whether their environment is conducive for them to use a prosthesis, 24 people representing 38.7% said YES while 38 people representing 61.3% said NO.

**Table 1.4 Factors that influence the usage of Prostheses**

Item	Response	Frequency	Percentage (%)
I have a strong belief against the usage of Prostheses	Agree	1	1.6
	Disagree	1	1.6
	Strongly Agree	3	4.8
	Strongly disagree	57	91.9
Cost is a major barrier in the acquisition of Prostheses	Agree	1	1.6
	Strongly Agree	60	96.8
	Strongly disagree	1	1.6
Attitude of people around me prevents the usage of Prostheses	Agree	1	1.6
	Disagree	3	4.8
	Neutral	29	46.8
	Strongly Agree	14	22.6
	Strongly disagree	15	24.2
My Religion endorses the usage of Prostheses	Agree	3	4.8
	Strongly Agree	58	93.5
	Strongly disagree	1	1.6
Knowing the risks of living a sedentary lifestyle motivates me to use a prosthesis	Agree	4	6.4
	Strongly Agree	57	91.9
	Strongly disagree	1	1.6
Is your environment conducive for you to use a prosthesis?	No	38	61.3
	Yes	24	38.7

*The major factors that influence the usage of prostheses*

This sub-theme sought to identify the factors that influence the usage of prostheses. In the interview with the participants, P1 said,

*“The ability to remain employable and to get money to purchase certain basic materials influenced my decision to use a prosthesis”*

Participant 2 (P2) also said,

*“I am from a poor background. I wouldn't have anyone to support me for the rest of my life so I had to work to survive”.*

P5 said,

*“I do some farming and that's my only source of survival so that motivated me to use a prosthesis”*

Participant 6 also said something similar,



*“To be able to work and the motivation I received from the manufacturer of my prostheses influenced my decision to use a prosthesis”.*

In contrast to what has been said above, Participant 8, 9 and 10 said something different.

P8 said,

*“The cost accompanied in purchasing and maintaining the prostheses influenced my decision not to use a prosthesis because I can’t afford it”.* He added, he wanted to learn how to repair a spoiled prosthesis at one Prostheses training center at **Koforidua** but was asked purchase the device, pay a little money in addition to purchasing the device before he can be allowed to learn.

Participants 9 and 10 also said something similar to that of Participant 8.

*Ways in which these factors have influenced the decision to use a prosthesis*

P1 said,

*“Cost was a major barrier to not using a prosthesis in the first four years of my amputation. I had the amputation in 2007 but it took me four (4) years to acquire a prosthesis in 2011”.* He added, *“I live in a busy environment. Everyone leaves the house for work in the morning and comes back in the evening which makes life boring. That motivated me to use a prosthesis”.* Also, *“its normal people show negative attitudes to you because you’re impaired”.* Another response from P2 revealed that,

*“Lack of funds to purchase a new prostheses or even maintain the one I’m using may deter me from using a prosthesis one day”.*

He also said, *“The ground is very uneven and I’m not able to wear it all the time”.*

He added, *“No one shows any negative attitudes to him for wearing a prosthesis”*

P6 said, *“I didn’t have money to purchase a prosthesis but through the benevolence of my boss, I had access to a prosthesis”.* He also continued saying,

*“My environment was unfavorable for me right from the onset”.* Finally, he added, *“Friends even abandoned me when I started wearing Prostheses”.*

## CHALLENGES IN THE USAGE OF PROSTHESES

In this session, participants/respondents were asked whether they can drive with the use of prostheses, **as shown in table 1.5 below**, 36 people representing 58.1% said no, 1 person representing 1.6% said yes, if someone helps them, 1 person representing 1.6% said yes, if someone is near them while 24 people representing 38.7% said yes, when alone.

In addition, Participants/respondents were asked whether they can get up from a chair wearing a prosthesis, 22 people representing 35.5% said no, 1 person representing 1.6% said yes, if someone helps them, again, 1 person representing 1.6% also said yes, if someone is near them whereas 38 people representing 61.3% said yes, when alone.

Again, Participants/respondents were asked whether they can get up from the floor when wearing (example if they fall), 22 people representing 35.5% said no, 3 people representing 4.8% said yes, if someone is near them. 37 people representing 59.7% said yes, when alone

Participants/respondents were again asked whether they can walk outside on even ground, 22 people representing 35.5% said No whereas 40 people representing 55.6% said Yes, when alone. Can you walk outside on uneven ground? 22 people representing 35.5% said No, 1 person representing 1.6% said Yes, if someone helps them, 2 people representing 3.2% responded Yes, if someone is near them whereas 37 people representing 59.7% said Yes, when alone.

Participants/respondents were asked again whether they can walk in the house, wearing the prostheses. 22 people representing 35.5% said No whereas 40 people representing 64.5% responded Yes, when alone.

Can you walk outside when it is raining? The findings of the participants/respondents are as follows; 32 people representing 51.6% said No, 1 person representing 1.6% said, Yes, if someone helps them. 3 people representing 4.8% said Yes, when someone is near them. 26 people representing 41.9% said Yes, when alone.

Participants/respondents were asked whether they can go up the stairs with a hand-rail. 22 people representing 35.5% said No. 1 person representing 1.6% said Yes, if someone helps them. 4 people representing 6.4% said Yes, if someone is near them. 35 people representing 56.5% said Yes, when alone.

Participants were asked further whether they feel pain anytime they wear a prosthesis, 30 people representing 48.4% said No whereas 32 people representing 51.6% said yes.



**Table 1.5 Challenges in the usage of Prostheses**

Item	Response	Frequency	Percentage (%)
Can drive with the use of Prostheses?	No	36	58.1
	Yes, If someone helps me	1	1.6
	Yes, if someone is near me	1	1.6
	Yes, when alone	24	38.7
I can get up from a chair wearing a prosthesis	No	22	35.5
	Yes, If someone helps me	1	1.6
	Yes, if someone is near me	1	1.6
	Yes, when alone	38	61.3
Get up from the floor (Example, if you fall)?	No	22	35.5
	Yes, if someone is near me	3	4.8
	Yes, when alone	37	59.7
Walk outside on even ground?	No	22	35.5
	Yes, when alone	40	64.5
Walk outside on uneven ground?	No	22	35.5
	Yes, If someone helps me	1	1.6
	Yes, if someone is near me	2	3.2
	Yes, when alone	37	59.7
Walk in the house?	No	22	35.5
	Yes, when alone	40	64.5
Walk outside when it is raining?	No	32	51.6
	Yes, If someone helps me	1	1.6
	Yes, if someone is near me	3	4.8
	Yes, when alone	26	41.9
Go up the stairs with a hand-rail?	No	22	35.5
	Yes, If someone helps me	1	1.6
	Yes, if someone is near me	4	6.4
	Yes, when alone	35	56.5
I feel pain anytime I wear a prosthesis	No	30	48.4
	Yes	32	51.6

*Challenges faced by persons with lower limb amputation in the usage of prostheses.*

The challenges faced by persons with lower limb amputation were sought.

P1 said:

*“I feel more pains when I wear it for long hours within the day”* P2 and P4 also said something similar to what P1 said.

P5 said:

*“I used to feel pains but not anymore. The cost of maintenance drains my money”* P6 also said,

*“At times I fall down but over time, I have mastered walking with the use of Prostheses”*. He also added, *“Most at times, heat develops in the Prostheses”*.

*Ways the Challenges have affected Persons the Participants*

Have the challenges affected the participants positively or negatively? This was their responses; P1 said:

*“During the late hours, I’m unable to do anything wearing the Prostheses”* P4 also said:

*“The cost of repairs have led to an increase in incurment of cost because I have to send the prostheses to a prosthesis repair centre at Duayaw Nkwanta for repairs”* P6 also said:

*“I was not able to go to work during the times I experience these challenges”*.

*Coping Mechanisms employed to address the Challenges*

What are the coping mechanisms employed to address the challenges faced by the participants?

P1 said:



*"During my training, I was told to apply ointment to the region where I feel pains to minimize the pain"*

P2 also said:

*"I persevered and walked in the prostheses though I feel pains donning it"*. P4 also said:

*"I wear bandages before wearing the prostheses to minimize the impact of the prostheses"*.

P5 said: *"I wear three or four socks before wearing the prostheses to cater for the loose adjustments of my prostheses"*. Finally, P6 said:

*"I sit more and stand less"*.

## DISCUSSION

In relation to the findings, it has been widely noticed that a larger percentage of people with lower limb amputation know what prostheses are (referred to as: artificial legs of most people with lower limb amputation). Participants knew the sources of getting the device if they needed and the prostheses training centers in Ghana. However, it was more noticeable that most of the participants, with or without prostheses, did not have any knowledge of the components of prostheses. A higher percentage of participants/respondents (80.6%) were unaware of certain NGOs such as Legs4Africa, Exceed Worldwide, and the International Committee of the Red Cross (ICRC) indicating why most participants does not use Prostheses. In the qualitative findings, some participants said they had never heard of such organizations providing free prostheses. They called on philanthropists to freely give them prostheses.

The present study shows that a higher number of participants do not use prostheses compared to the number of participants who do not use prostheses indicating that there are several factors that influence people with lower limb amputation from in accessing prosthetic services. This finding is consistent with the findings of Magnusson (2017) who show that prosthetic services are virtually inaccessible in low-income countries where Ghana is no exception.

Again, other findings show that 88% of participants who wear prostheses sometimes, rarely and never wear prostheses when at home respectively. This finding was the opposite when they were outdoors (84%) who always, often, very often wore prostheses when they were outdoors. They have the knowledge and understanding that their viability depends on their capacity to work and earn a living. The findings also revealed that most participants wore prostheses for at least 13 hours consistent with findings revealed in a study by The Edge and Coalition.

Findings from this study revealed that a higher percentage of participants (93.5%) did not believe that their religion played a large part in the use of prostheses. However, only 6.5% of participants disagreed and strongly disagreed with the use of prostheses. This illustrates that religion is not a major barrier to the use of prostheses. Moreover, the current results also show that a higher percentage of participants (98.4%) strongly agree and agree that cost is a major barrier to obtaining prostheses. The need for prosthetic rehabilitation is growing but one factor that has influenced people with lower limb amputation is the ability to buy a prosthesis that costs \$ 5,000. Most participants who used prostheses had access to them by virtue of some known or unknown person. None of the participants could afford to buy a prosthesis due to the high cost of buying a prosthesis. Again, it was more noticeable that most participants gained access to prostheses three or more years after amputation due to the high cost of prostheses. This finding is consistent with the findings of Lundquist (2002).

It was more noticeable that a higher percentage of participants complained of having pain and discomfort with the use of prostheses. None of the participants did not complain of having absolute satisfaction with wearing the prostheses. Some of the participating people with transfemoral amputation (Above-knee) were especially those that took a very long time and had difficulty ambulating using their prostheses. The reason is, they feel severe pain every time they wear prostheses. This usually affects the number of times they wear it in a week. Most participants complained of having rashes, feeling heat in the prostheses after wearing them for a long time. This finding is related to the findings of Ramstrand (2021). All of these findings suggest that people with lower limb amputation experience more challenges in using Prostheses. Leaving in these conditions people with lower limb amputation without care can lead to an increase in not using prostheses. This will eventually put a strain on the macro-economic indicators when the annual expected revenues will decrease because they will not be able to work to contribute to the economy.

## CONCLUSION

Generally, prostheses have become very necessary to use because of the benefits derived from them. Prostheses are intended to restore normal functions of the body by replacing body parts. In the advanced countries like the United Kingdom, the prevalence of usage of prostheses is very high according to research. On the whole, most persons with lower limb amputation have undergone prosthetic rehabilitation.

However, the situation is different in lower-income countries like Ghana where higher number of people do not use prostheses. Therefore, the factors influencing the usage of prostheses such as cost, environment, attitude of family and peers need to be looked at critically in order to eliminate the barriers to usage of prostheses.



## RECOMMENDATIONS

A separate ministry should be created or established like Ireland and Australia, which will be on the helm of affairs for only issues related to disability to address the inadequacies and challenges of persons with disabilities especially, persons with lower limb amputation. A disability ministry when assigned a cabinet minister will oversee that a budget is drawn to secure assistive devices such as prostheses for persons with lower limb amputation. Under this separate ministry, a sector in charge of providing assistive devices should be established. This sector will organize seminars, fora and suitable training sessions to educate persons with lower limb amputation on prosthetic devices, sources where they can access prostheses and how they can don and doff the prostheses.

The media being one of the most powerful and influential tool should be used as advocacy tool to maximize the use of prostheses. This is where I think the media should come in; to host more programmes on the need to maximize the use of assistive devices to clear the negative perceptions of people. The media should be an avenue to empower persons with lower limb amputation to seize the opportunity to make use of assistive devices to increase their self-image as well.

Again, as part of their curriculum, prosthetic trainers should be educated on how to apply multidisciplinary rehabilitation in order to address emotional, psychosocial, medical and social concerns during pre and post-amputation. This will help remove emotional, psychological medical and social barriers to the successful usage of prostheses.

One of the major problems faced by persons with lower limb amputation is to have access to prosthetic rehabilitation centers. Most of them have to travel to longer distances before they can access a prosthetic rehabilitation center. This is one of the demotivating factors to seek for rehabilitation. Therefore, there should be the need to establish more prosthetic rehabilitation centers in all the regions so as to make these prosthetic rehabilitation centers more accessible to persons with lower limb amputation. Establishing more rehabilitation centers in every region will make it much easier for persons with lower limb amputation to locate and have access to these rehabilitation centers.

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