SATISFACTION LEVEL OF LOWER LIMB PROSTHESIS USERS IN COMMUNITY LEVEL AFTER COMPLETING REHABILITATION PROTOCOL IN CRP

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We the undersigned certify that we have carefully read and recommended to the Faculty of Medicine, University of Dhaka, for the acceptance of this dissertation entitled

SATISFACTION LEVEL OF LOWER LIMB PROSTHESIS USERS IN COMMUNITY LEVEL AFTER COMPLETING REHABILITATION PROTOCOL IN CRP

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DECLARATION

I declare that the work presented here is my own. All sources used have been cited appropriately. Any mistakes or inaccuracies are my own. I also decline that same any publication, presentation or dissemination of information of the study. I would bind to take consent from the department of Physiotherapy of Bangladesh Health Professions Institute (BHPI).

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Contents

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Acronyms

&	And
ADL	Active Daily Living
BHPI	Bangladesh Health Professions Institute
CRP	Centre for the Rehabilitation of the Paralysed
CRPD	Convention of Rights for Persons with Disabilities
IRB	Institutional Review Board
LCI-5	Locomotor Capabilities Index-5
LEA	Lower Extremity Amputation
LLA	Lower Limb Amputation
P & O	Prothetics & Orthotics
PPI	Permanent Physical Impairment
QUEST 2.0	Quebec User Evaluation of Satisfaction with Assistive Technology Version 2.0
RTA	Road Traffic Accident
SD	Standard Deviation
SPSS	Statistical Package for Social Science
TF	Transfemoral
TFA	Trans Femoral Amputation
TT	Transtibial
TTA	Trans Tibial Amputation

List of Figures

List of Tables

Abstract

Purpose: To explore the satisfaction level of lower limb prosthesis users in community level after completing rehabilitation protocol in CRP. **Objectives:** To identify the satisfaction level of lower limb prosthesis and services after completing rehabilitation protocol from CRP in the community level, to find out the socio-demographic factors and physical activities interpreting independency. **Methodology:** The study design was cross sectional. Total 59 participants were attended willingly and conveniently for this study from the Prosthetic & Orthotic department of CRP. Data was collected by using Quebec User Evaluation of Satisfaction with Assistive Technology (QUEST 2.0) along with the socio-demographic questionnaire. Statistical Package for Social Sciences (SPPS version 20) was used for data analysis. **Result:** Among 59 participants most attended age group was 25-34 years (23%). Most of the participants were male (83%), married (80%) and businessmen (29%). Most of the participants had secondary education (34%), lived in rural areas (64%) and more than 12000 of family income and expenditure. In amputation statistics, most participants had transfemoral (TF) amputation (53%) with most apparent cause of accident (63%) and using unilateral TF prosthesis (56%). Most participants had unilateral amputation (98%), cylindrical shape of stump (75%), independency in physical activities and had less complication (76%) after using lower limb prosthesis. According to QUEST questionnaire, total mean score for prosthetic device was 4.49 and 4.89 was for services. The three most important satisfactory items were 'Service delivery', 'Professional service' and 'Comfort'. No socio-demographic and type of amputation was found significantly co-related with QUEST scores. **Conclusion:** The level of satisfaction was not co-related with the age, sex, occupation, living areas and level of amputation. The participants had showed their high levels of satisfaction about the prosthetic device and rehabilitation services along with functional independency in most of the physical activities. Besides they reported less complication after using lower limb prosthesis.

Key words

Satisfaction level, Lower limb amputation, Prosthesis, Rehabilitation, QUEST 2.0.

CHAPTER – I INTRODUCTION

1.1 Background

An amputation is the elimination of an organ or other limbs in the body. Amputation is defined as synthesis or spontaneous partial or completely removable portable or part of the processing body, which is covered by skin and is one of the most disabilities (Pooja & Sangeeta, 2013). Lower limb amputation is a permanent surgical procedure that can influence the daily activity of the person and also effect important functionality (Van Twillert et al., 2014).

Lower limb amputation is significantly more common than amputation of the upper limb, accounting for 65% of all existing cases of amputation in the U.S. Over 90% of amputations carried out in the U.K. in 2006-07 involved the lower limb, with 53% executed at the transtibial (TT) level, and a further 39% at the transfemoral (TF) level (Ziegler-Graham et al., 2008).

The majority (53%) cases of amputation are found as transtibial (TT) or below knee amputation (BKA), in which there is unilateral or bilateral amputation below the knee joint (Ziegler-Graham et al., 2008). Approximately 91.7% cases of lower limb amputation (LLA) occurred because of traumatic injury, wherever men were in a higher risk than female (Sahay et al., 2014). In recent study in Kolkata, 94.8% of the amputation people of lower limb amputees, 20s and 30s were found as the common age group affected by amputation (Pooja & Sangeeta, 2013). The population of lower limb amputation ranges were 0.2 per in Japan and 115.7 per in Sweden 10,000 of total population for first major amputation around the 90s aged population (Wegener et al., 2009).

Amputation may be performed at various anatomical levels. It may involve a single limb (unilateral), both the upper or lower limbs (bilateral). There is also a combination of upper and lower limb amputations (multiple amputations) (De Laat et al., 2011). Lower limb amputation also may involve removal of one or more toes, part of the foot, ankle disarticulation (disarticulation is the amputation of a body part through a joint), trans-

tibial (below the knee), amputation knee disarticulation, trans-femoral (above the knee) amputation, hemi-pelvectomy (removal of half of the pelvis) and hip disarticulation (Ziegler-Graham et al., 2008).

Lower limb amputations were much more common than upper limb amputations, on the accounting of 94.8% of all amputations. Among all lower limb amputation cases, below-knee amputations were the most common, followed by above-knee amputations (Pooja & Sangeeta, 2013).

As causes of lower limb amputation about 81% of the persons suffer an arterial embolism in the lower extremities have a high chance of developing extensive limb gangrene. RTA accounts for 10%, diabetes and associated complications accounts for 5% and severe limb infections accounts for 2% of lower extremity amputation (Azad et al., 2014).

Lower limb amputation (LLA) is obviously different from upper limb amputation. The difference comes out in terms of the frequency of their precipitating etiologies, consequences for mobility, and rehabilitation needs. The peripheral vascular disease and diabetes are the leading causes of LLA. But within economically developed countries the leading causes of upper limb amputation are traumatic (Lombard, 2017).

The most common causes of surgical amputations are the complications caused by diabetes (diabetic foot). A number of vascular complications in form of ischemia and peripheral artery disease are affected from diabetes (Feinglass et al., 2012). In all age groups, trauma was the leading cause of all amputations. The common traumas reported were road traffic accidents, railway accidents, and burns due to fire, electrocution and chemical injuries (VanWagner et al., 2012).

The next most common cause of amputation was peripheral vascular disease (27.7%). Cases of amputation for peripheral vascular disease increase with in parallel with age. Peripheral vascular disease (34.9%) was a more common cause of amputation than trauma (3.6%) in the people over 60 years. By the consequences of function loss, temporary damage is manifested to body mass distribution, coordination disorder and psychosocial disease (Pooja & Sangeeta, 2013).

The functional impairments affect many aspects of life including limitation inmobility, activities of daily living, body image in the society and sexuality, significantly the persons with lower limb amputation. Classification, measurement and comparison of the consequences of amputations has been impeded by the limited availability of internationally, multicultural standardized instruments in the amputee setting (Kohler et al., 2009).

Lower limb amputation (LLA) is considered as an ultimate surgical procedure, in which there are considerable consequences for function in daily life activities. These consequences can be decreased through rehabilitation protocols. Though amputation of limbs has saved many lives, but has significant inequality source, especially in countries of developing and under developed countries. Due to mining and road accidents, lower limb prosthesis occurs more frequently. Long years ago the collision, people had been injured due to the antipersonnel land mine and explosive residues (Zidarov et al., 2009).

Families having a person with amputation are faced with a specific set of problems as well as clinical services to regain independence. Rehabilitation protocol is very much important for regaining independence. Within a combined and coordinated use of medical, social, educational, and vocational measures are used to restore the individual to the highest possible level of functional ability (Wegener et al., 2009).

The ultimate goal of rehabilitation of persons with an amputation is reintegration into the pursuit of daily activities and users' satisfaction to use the provided devices are very much important to rehabilitate the person with an amputation (Luza et al., 2020).

Rehabilitation professionals try their best to restore the functionality through the effect of interventions of rehabilitation and there are positive outcomes of people with amputation. But there always remains a challenge that has lower limb prosthesis (Coffey et al., 2009). Specific measures and outcomes are selected for specific person with LLA for rehabilitation which is associated with premorbid functions (Horne & Neil, 2009). Surprisingly the amputee rehabilitation programs for amputee patients have common goals, which are to improve mobility and functioning through prosthetic fitting. It is also aims to assist community reintegration and to ultimately improve the overall functional

activity of persons with an LLA (Zidarov et al., 2009). The main theme of all rehabilitation programs of amputee patients is to restore mobility and locomotors function and the professionals give their best to prove their excellence (Franchignoni et al., 2007).

Lower limb amputation not only affects people's ability to walk, but also affect their participation in various specific daily activities, their body image perception in the society and their quality of life, which is associated with mobility. Lower activities of daily living slots and a lower level of social activity reduce the ability to walk with the prosthesis. This incidence decreases the ability to walk and doing activities with prosthesis in residence and society while doing daily living activities (Pooja & Sangeeta, 2013).

1.2 Rationale

In Bangladesh, there are some organizations that are manufacturing Prosthesis & Orthosis and providing support to the patients. Among them CRP is the renowned organization in terms of its volume of work and reputation. Only CRP has own institute to provide diploma course on Prosthetics & Orthotics (P & O) with highly qualified faculties from home and abroad. All the canters are committed to provide user friendly qualitative limbs and braces with appropriate technology, therefore, it is necessary to assess the satisfaction level its users. Justified recommendations might be generated through this study which will be created a favorable environment in terms of high quality of care for the patients. To facilitate personal mobility the Convention on the Rights of Persons with Disabilities (CRPD) promotes the availability, knowledge and use of assistive devices in rehabilitation programs, including prosthetic and orthotic services (Articles 26 and 20, UNCRPD).

Periodic evaluation of accumulated data allows not only for the detection of trends, but also for the constant monitoring of quality control of the service required for persons with an amputation service. It is always a continuing process in prosthetic design under study. Modifications of prostheses to give better functional ability and improved cosmetic appearance, as well as provisions for recreational prostheses are often mentioned in the literature. Thus, it is important to study whether the patients are satisfied with what has been and is being done for them to achieve maximum functioning, comfort and esthetic appeal. The purpose of this study was to obtain information which would be helpful in evaluating various services provided to amputee patients from the organization and to determine whether the patients felt that these services were adequate to him. It is also important to know about the reason behind satisfaction and dissatisfaction of the persons with an amputation for the effective service. If the reasons behind the satisfaction or dissatisfaction of amputees are known, it will be possible to minimize encountered problems by using an effective and cooperative way during the treatment sessions.

After the study, the researcher will share the outcomes of the study, information and results to the authorities respectively, thus adding to easily understanding the important variables that are lying behind the amputee's satisfaction. This research may be helpful

for the service providers to continue good understanding with the family/caregivers, by sharing and understanding possible problems before, during and after receiving prosthetic services.

1.3 Research question

What was the satisfaction level of lower limb prosthesis users in community level after completing rehabilitation protocol in CRP?

1.4 Objectives

1.4.1 General objectives

To identify the satisfaction level of lower limb prosthesis users in community level after completing rehabilitation protocol in CRP.

1.4.2 Specific objectives

- To find out the socio-demographic factors of the patients.
- To find out about the patient's physical activities and secondary complications.
- To discuss about the independency and dependency of the patients for their prosthesis using.
- To identify the mental satisfaction of the patients about device after using lower limb prosthesis.
- To identify the mental satisfaction of the patients about services after completing the rehabilitation program in CRP.

1.5 Operational definition

Amputation

Amputation is the surgical removal of all or part of a limb or extremity such as an arm, leg, foot, hand, toe, or finger. There are many reasons an amputation may be necessary. The most common is poor circulation because of damage or narrowing of the arteries, called peripheral arterial disease. Without adequate blood flow, the body's cells cannot get oxygen and nutrients they need from the bloodstream.

Prosthesis

Prosthesis or prosthetic device is an artificial device that replaces a missing body part. Prosthesis is typically used to replace parts lost by injury or missing from birth (congenital) or to supplement defective body parts.

Orthosis

Orthosis is a device applied to the body to control or enhance movement or to prevent movement or deformity.

Prosthetics

The branch of medicine or surgery that deals with the production and application of artificial body parts.

Orthotics

The science that deals with the use of specialized mechanical devices to support or supplement weakened or abnormal joints or limbs.

Prosthetist / orthotist

A person having completed an approved course of education and training is authorized by an appropriate national authority to design, measure and fit prostheses and orthosis.

CHAPTER – II LITERATURE REVIEW

Amputation is defined as the removal of a body part by surgery or trauma. It is used to control pain or disease process in the affected limb. Amputation of the lower limb results in a physical change in the human body's anatomy. Functional limitations are also results from lower limb amputation (LLA), such as an impaired ability to transfer, balance and ambulation capability. When the levels of amputation rise proximally on the residual limb, these impairments are greater, mostly in transfemoral amputation (TFA) (Wald & Alvaro, 2004).

Amputation of the extremity is one of the oldest surgical interventions that date back to the time of Hippocrates (Paudel et al., 2005). Amputation is a therapeutic procedure in which removal of an extremity is done when its function has been irreversibly compromised. From foot amputations to the more proximal knee and hip disarticulations is done on the basis of anatomical level. The incidence of lower limb amputation varies significantly across the globe, ranging from 5.8 to 31 per 100,000, (Hisam et al., 2016).

Amputation leads to an alteration in the life, function and mobility of the sufferers which leads a man to endless disability. Lower limb amputees suffer more than upper limb amputees as result of incidence of more frequency of lower limb amputation. In South-East Asia, the prevalence of disability ranges from 1.5% to 21.3% of the total population, depending on the definitive and severity of disability (Ziegler-Graham et al., 2008).

The age of the amputees ranged from below 20 years to above 70 years. The most common age group for amputation was 21-30 years of age, accounting for 32.0%of all amputees. The 31-40 year age group was second, accounting for 23.2% of all amputees and the 20 years and below age group was third which was near about 14.2%. In the same study various level of amputation as Permanent Physical Impairment (PPI) showed that below-knee amputation was 70%, through-knee amputation was 75%, above knee amputation was 85%, below-elbow amputation was 70%, above-elbow amputation was 85%, through-hip amputation was 90%, through-shoulder amputation was 90% and through-ankle amputation was 55% (Pooja & Sangeeta, 2013).

About 1.7 million people live with amputations and the number has increased in recent years on the basis of the newest statistics in the United State of America (Mousavi et al., 2012). In the United States, the estimation shows that one out of every 190 persons has lost a limb. If current trends continue, the number of persons living with amputation in the U.S. is projected to increase over two-fold by the year 2050. In the same study showed an increasing ratio for lower limb amputation which is less in upper limb amputation and it was about 65% in LLA in U.S (Ziegler-Graham et al., 2008).

An approximate rate of 5.1 per 100000 populations was found as the major amputation rate which remained unchangeable over 5 years. During the period of 1995-97, a assimilation of all causes of amputation revealed the lowest rates for lower limb amputation in Madrid and Spain (0.5 per 100,000 women and 2.8 per 100,000 men) while the highest rates were reported in Navajo region of the United States (22.4 per 100,000 women and 43.9 per 100,000 men) (Moxey et al., 2010).

Variation conflicts between countries according to each study, such as it ranges from 0.2 per 10,000 total populations for first major amputation in Japan, to 115.7 per 10,000 population aged over 90 years in Sweden (Sansam et al., 2009). Depending on the sample studied and the definition of what constitutes “success”, this proportion may be as low as 5% or as high as 100% (Brunelli et al., 2006). Better walking ability with a prosthesis is increased with the use of following rehabilitation (Gailey, 2006) and successful prosthetic rehabilitation has been shown to be significantly increased chance of living at home after lower limb amputation (Sansam et al., 2009).

There are many underlying causes behind amputation. Lower limb amputation can be occurred as a result of a wider range of causes: traumatic and non-traumatic, because of diseases. The four primary etiological aspects are requiring these - vascular disease and infection, trauma, tumors and congenital abnormalities (Ziegler-Graham et al., 2008).

Trauma, near about 3 to 47% of all amputations, is still the leading cause for amputation in developing countries (Eskelinen et al., 2006). The leading causes of trauma-related amputations have been reported of those injuries which involves machinery (40.1%),

powered tools and appliances (27.8%), firearms (8.5%), and motor vehicle crashes (8%) and others covered the rest (Dillingham et al., 2011).

Traumatic amputation can be the result of a work injury or motor vehicle accident. They are often a major cause of disability (Wald& Alvaro, 2004). Lower limb amputation (LLA) is done for a variety of reasons with the changing conditions from disease to trauma. LLA results in a wide range of consequences. Amputation generally results in reduced physical function, poor physical performance, lack of social gathering, liveliness, general health, and more pain compared to population standards. Amputation is devastating factor for both males and females but males usually have better physical function than females. People who consume the following features are usually not able to live independently in their homes after the amputation (Robinson et al., 2010).

Diabetes and its complications come first in the list of non-traumatic cause of lower limb amputation. Almost 50% of non-traumatic lower extremity amputations (LEA) worldwide occur in people with diabetes mellitus (Unwin, 2000). Diabetic population is at risk 20 times more than compare to non-diabetic population to get LLA. In most of the developing countries about 2% diabetic people suffers with ulceration annually and about 1% of them gets to amputation. This is caused by specially poverty, which leads them to poor education, poor home environment, lack of sanitation and hygiene, and especially barefoot walking leads to diabetic foot damage. In a Nigerian study, 58% of all major limb amputations were accounted due to diabetic foot gangrene (Udosen et al., 2009).

In cases of severe peripheral vascular disease, a significant amount of people near about 20-30 per 100,000 had LLA on the basis of an annual report of a total amount of population with peripheral vascular disease (Trautner et al., 2007). In developed countries, vascular complications are the major factors to lower limb amputations. But in the developing countries, it is more possible that the traumatic accidents are the major causes of amputation. Vascular complications and diabetes are increasing health issues in developing countries, and diabetic ulcers are ancestors of lower limb amputation (Hossain et al., 2007). Some 82.9% of those with lower limb amputation in Scotland lose a limb due to peripheral vascular disease, with 38.6% of this group having amputation

due to diabetes (Desmond & MacLachlan, 2010). With development of new surgical techniques, including bone graft and joint replacement as well as advancement in chemotherapy and radiation, the incidence of amputation due to osteosarcoma has decreased significantly (Carroll & Edelstein, 2006).

As a result of earthquake is also a leading cause LLA, and associated with significant morbidity, mortality and disability. The loss of limb also results in poor quality of life in terms of physical, psychological, jobs and social participation (Godlwana et al., 2008). Post-earthquake effects include physical and psychological trauma and many populations are displaced and depressed as a result of trauma (Roy et al., 2015).

Congenital limb deficiencies are another cause of amputation. Amputation can be performed as a disarticulation of a joint or as a transection through a long bone. The level of amputation is usually named by the joint or major bone through which the amputation has been made. There is no exact information of peripheral vascular disease prevalence of Bangladesh. Instead of diabetes and its complications, there are some other diseases or disorders leading to LLA like cancers 3%, infections 2% and congenital deformities 0.2%. Trauma accounts for 12% LLA, for example because of road traffic accidents, war injuries, violence, especially if delayed presentation to hospital (Pooja & Sangeeta, 2013).

Amputation may involve a single limb (unilateral), both the upper or lower limbs (bilateral), or a combination of upper and lower limb amputations (multiple amputations). Amputation may be performed at various anatomical levels (Larsson et al., 2009). Lower limb amputation may involve removal of one or more toes, part of the foot, ankle disarticulation (disarticulation is the amputation of a body part through a joint), trans-tibial (below the knee) amputation knee disarticulation, trans-femoral (above the knee) amputation, hip disarticulation and hemi-pelvictomy (removal of half of the pelvis) (Ziegler-Graham et al., 2008). The majority of studies have shown that after distal and unilateral amputations regain better and greater ability of walking and achieving ADLs than proximal or bilateral amputations (Obalum & Okeke, 2009).

One of the primary goals of rehabilitation is the successful fitting of a prosthesis and use of the prosthesis to achieve functional mobility after a successful lower-limb amputation (Kahle et al., 2016). Measuring and improving the quality of life should be given the first priority through the physical rehabilitation services for persons with amputations, as it has been given the prevalence and economic impact of amputation that the need for long-term rehabilitation and prosthetic services (Dillingham et al., 2011).

Several factors affect the Rehabilitation Status and Quality of life after amputation: pain, changes in functional abilities, psychosocial adjustment, impact on jobs and occupation and become burden to their families and society. For the reason of these features, the LLA patients have to face inability to live independently in their community. Pre-status of the people with LLA also determine the rehabilitation status such as non-ambulatory status (bed ridden), psychological disorder and people with age over 60 and having other disease. However, some people tend to perform their physical activity independently despite of those problem and infrequent use of their prosthesis (Mac Neill et al., 2008).

Pain refers to the secondary complication to limb of amputation is common for LLA (Wegener et al., 2009).Multiple factors work here as the cause for the presence and persistence of pain after lower limb amputation. Patients may experience immediate postoperative pain or may experience post-amputation pain including residual limb pain or phantom limb pain. Residual limb pain occurs in the part of the limb left after the amputation. This pain can be due to mechanical factors such as poor prosthetic fit, bruising of the limb, chafing, or rubbing of the skin. Pain in the residual limb can also be caused by ischemia, heterotopic ossification, or post amputation neuromas. Phantom pain occurs in the missing or amputated part of the limb(s) or some part of it. Phantom pain was experienced by one third of their respondents (Desmond & Maclachlan, 2010). Phantom sensations, such as tingling, warmth, cold, cramping, or constriction in the missing portion of the limb, are likely to be experienced by most amputees and may be present throughout their entire life. Phantom sensation should be considered normal and treated only if it becomes disruptive to functional activities. Physical problems associated with amputation include phantom sensations and phantom pain (Mosaku et al., 2009).

Pain was the common perception following lower limb amputation. However, people are more focus on mobility as their prime concern despite having great discomfort such as stump pain, phantom pain and impact to their sleep and other activities. However people with lower limb amputation have higher rate of wellbeing despite of their phantom pain (Bosmans et al., 2007).

Psychological well-being is considered as another significant aspect of amputee health. People with lower limb amputation experience anxiety and depression following amputation of the lower extremity (Mosaku et al., 2009). People with traumatic lower limb amputations have no psycho-social preparation for lower limb amputations as they are amputated on the day of admission (Godlwana et al., 2008). This may have been due to the fact that a person may be coming into the hospital for an emergency amputation following an injury. Therefore, a lacking of opportunities for counseling lower limb amputation can be a devastating experience for a person. Regarding this situation, psychological support is critical to successful rehabilitation (Wegener et al, 2009). Immobility due to amputation results in distress with psychological well-being especially in life satisfaction. Female remains more distress than male in overall life satisfaction (Misajon et al., 2006).

Physical rehabilitation is an important aspect in order to be able to meet the activities of daily life. Training must be needed for the amputees in order to be able to perform certain activities of daily living, such as self-care, mobility, transfer, balance and exercises performing their task independently. If the patient is planned for amputation exercise plays important role in healing of stump, mobility after amputation with wheelchair, walking with crutch. Muscle strengthening of lower extremity of both lower extremity is also important in order to make them enable to perform their activities of daily livings independently. The person should be educated about general hygiene such as bathing, dressing, transfer, mobility, balance and exercise (Nehler et al., 2014).

Rehabilitation Status in the community depends on the physical activity and their level of independency in the community. Successful rehabilitation following amputation is complex. It requires multiple medical, surgical, and rehabilitation specialties. Rehabilitation is important for enhancing the mobility of affected individuals and

improving their health and vocational prospects. Care of the stumps is an important aspect in the rehabilitation process of amputation for functional mobility. It involves washing or proper dressing to control infection, stump massage too promote blood circulation, exercise to prevent joint stiffness and contracture, bandaging for proper shape for fitting prosthesis. Failure to care for the stump may result in contracture, prosthesis loosening and pain. Individuals with amputations have a complex range of rehabilitation needs. They are faced with multiple physical challenges including impairments in physical functioning, pain, prosthesis use, alterations in body image and self-concept, changes in close personal relationships, employment status or occupation and disruptions to valued activities and lifestyle (Razak et al., 2016).

Comprehensive rehabilitation requires an interdisciplinary team approach in collaboration with partnership with the patient and their family. Amputation may influence negatively on mobility, emotion, sleep, pain and social function (De Laat et al., 2011). Amputees experience many problem when integrated to community, often caused by improper discharge planning, lack of information regarding care of their stumps, improper or no physical exercise, poor positioning of the limb resulting in contracture and poor fitting of prosthesis and improper gait training (Czerniecki et al., 2012).

The people with low socio economic status and with low or no formal education makes them difficult to either return to work if they had a physical job or find it difficult to get employment (Burger & Marinček, 2007). Even young people with traumatic amputations, who are healthy, report problems related to prosthetic fit that limit regular use of devices and the ability to walk for prolonged periods without pain or skin breakdown (Brown & Attinger, 2013; Dillingham et al., 2011).

Amputation of a limb is common in society today. A patient with an amputation feels disabled with diminished body image and faces many community challenges. Amputees experience many psychologically stressful experiences. Depression disorders among persons with amputation range from 21-35% compared to estimates of 10-15% in the general population (Williams et al., 2004). Individuals with an amputation are faced with adapting to not only several losses and changes to their lifestyle, but also social interactions and their identity (Coffey et al., 2009).

After amputation, a patient faces numerous challenges, both personally and socially. Amputees may have problems returning to employment after LEA (Burger & Marinček, 2007). Anxiety is a response to perceived life stressors. It is manifested by feelings of nervousness, fear and recurrent, frightening thoughts. Additional manifestations include a variety of physical responses, such as increased heart rate, profuse sweating, difficulty breathing, and muscle tension (Wald& Alvaro, 2004).

Prosthesis is an adaptive and enabling entities used by a significant number of individuals worldwide. The word itself has roots in Greek, meaning 'an addition', from 'pros' meaning towards and 'tithenai' to place (Jefferies, 2015).

Prosthesis is one of the earliest inventions of human civilization. The prisoner used to have a wooden limb to get assistance in walking. In later situations, researchers found a prosthetic device in Egypt which was used to replace a big toe. This prosthesis was made out of leather and carved wood. Researchers believe that it is approximately 3000 years old. An artificial leg, made of wood and copper, was found in Italy (Ostler et al., 2014).

In a study of 800 LEAs which was performed in one year in Scotland showed that 20% of the fitted amputees do not use their prosthesis. Another 20% occasionally use their prosthesis at one-year follow-up. This finding has implications for patients' well-being and healthcare cost efficiency (Callaghan et al., 2008).

For the purpose of limitations, persons with lower limb amputation are often fitted with a prosthetic device that may restore some of the physical and biomechanical features of the intact foot, ankle, shin, and knee. In addition to sufficient physical ability determined by an evaluation of a physiotherapist, it was shown that a low number of co-morbidities with a good ability to stand on one leg according to the patient's motivation to walk with a prosthesis, were factors for the successful prosthetic rehabilitation (Hamamura et al., 2009).

As much as of the functional ability can be restored, lost by the amputation by using prosthesis. The most important factor in determining the degree to which functional activity can be restored is the selection of the appropriate prosthetic component for the

amputee. For the TFA, the prosthetic components usually include a socket, knee, pylon, and foot. The design and function of the prosthetic knee is one of the most important parts because it is the most proximal artificial joint that the amputee must stabilize and control to regain functional, daily ambulation for the patient with TFA. Many available prosthetic comments are used which is designed for specific users, purposes or functions. Prosthetic knees are classified into two categories: one is exclusive mechanical control knee joints and another is used as microprocessor control to manage the swing and/or stance phases of gait cycle. In the past, TFA prosthesis had a passive, mechanical (i.e., free swing, manual lock, constant friction, weight-activated friction, and fixed fluid control) mechanism in the knee joint to control the swing and stance phases of gait. More recently, the new prosthetic knees have adopted active, microprocessor-controlled systems. Although mechanical and microprocessor controlled knees are functionally similar, microprocessor control allows dynamic function of the flexion and extension behavior of the knee joint throughout the gait cycle. This provides several potential benefits to the amputee (Hafner & Smith, 2009).

Proper prescription of prosthetic devices and rehabilitation services has the potential to increase of satisfaction with the prosthetic limb. It also improves overall quality of life for people with amputations. Advances in technology, ranging from specialized gel and silicone liners are used to improve the interface with the residual limb according to variable damping knees. Such as the Otto Bock C-Leg and the Ossur Rheo knee which have expanded prosthetic treatment options available for people with amputations (Van de Weg et al., 2008).

The main phases of prosthetic rehabilitation are: pre-prosthetic management; postoperative care; prosthetic training and long-term follow-up care including community reintegration and vocational rehabilitation (AlSofyani et al., 2016). During prosthetic training, the patient must learn how to on and off the prosthesis appropriately and must practice the skills necessary to perform activities of daily living in different environmental conditions (Obalum & Okeke, 2009). Basic training serves as a foundation for more complex skills which are learned with progressively less physical support and supervision over the course of rehabilitation (Christiansen et al., 2015). The complex

behavioral tasks inherent in prosthetic rehabilitation require both an adequate level of physical fitness and the cognitive capacity to learn new skills and adapt them to different situations, environments. Persons with cognitive deficits may struggle to retain this new information to initiate new behaviors necessary for optimal rehabilitation. Cognitive screening may be beneficial in identifying impairments and potential barriers to new learning which includes planning and setting of rehabilitation goals and when appropriate, identifying compensatory strategies should be taken to assist in achieving rehabilitation goals (Deans et al., 2008). For screening of a light of an example, cognitive rehabilitation techniques and compensatory strategies, such as errorless learning and vanishing cues techniques, may be of benefit in the amputation rehabilitation process for those with cognitive impairments (Desmond & Maclachlan, 2010).

For the measurement of mobility, the ease and objectivity of a timed walking test is used. Specifically for an elderly population with lower limb amputation, a test that incorporates a sit to stand and a turn, such as the Time up and goes seems appropriate (Deans et al., 2008). Currently, it is believed that the addition of the LCI-5 would provide important information on community mobility (Franchignoni et al., 2007).

Satisfaction with both the functional utility and cosmetic appearance of the prosthesis is an important outcome of prosthetic rehabilitation (Highsmith et al., 2016). It is essential to appreciate the factors that affect both prosthesis use and satisfaction to maximize outcomes following lower-limb amputation, especially any modifiable factors that might be targeted in rehabilitation interventions (Webster et al., 2012).

There are some special tools to measure satisfaction of the person with amputation: such as quality of prosthesis components, durability, weight, alignment, physiological and psychological aspect and so on. Subjective and objective information will be highly needed to indicate the perception and expectation of fitting and comfort of prosthesis to a Prosthetist. Most of the amputees expect that their prosthesis should be light weight, durable, highly cosmetic, easy to maintain, and easy for walking on level grounds even on uneven terrain, for walking stairs with low energy consumption and proper balance and coordination (David etal., 2012).

Alignment of the socket and shank is important for the optimal prosthetic functioning and comfort of a person with lower limb amputation for transferring the weight-bearing load between residual limb and stump along with the ground. In that case a proper alignment plays one of the key roles to ensure a successful prosthetic fitting. Inaccurate alignment will create various kinds of gait deviation also damage to the stump and body structure of the patient (Klute et al., 2009).

There are some factors associated with functioning such as age. Age is a significant issue with patients. Young amputees performed more active in ADL compared to older amputees. Gender is another issue for greater functionality where male are more confident to work compared to females. On the other hand, the patients with higher body mass will have more difficulty to perform more activities and those patients who are associated with some other disease such as kidney failure or heart disease are initially less active. Some extend and literature reported that amputees had changed their occupation after amputation and receiving prosthesis return to their own job. It is also observed that there were no changes of profession who were self-employed (Burger & Marinček, 2007).

The knee is very important in transfers, such as on and off the toilet, in and out of bed and up and down stairs. It also gives us greater ability to push forward, slow down and walk on slopes and stairs. To perform the walking functions in normal manner prosthetic feet are extremely important components for lower limb amputees. Evidence showed that patients reported high levels of mobility while using their device. Side by side they also experienced pain and difficulties walking on challenging surfaces (Magnusson et al., 2014).

So, in order to address articles within the Convention of Rights for Persons with Disabilities (CRPD), prosthetic and orthotic services need to be available and affordable in low-income countries which relate to personal mobility and access to rehabilitation services (Highsmith et al., 2016).

CHAPTER – III METHODOLOGY

3.1 Study design

A cross-sectional descriptive study design was used to achieve the overall and specific objectives of the study which were based on a questionnaire including prosthetic patients' responses. In this study assistive device referred to lower limb prostheses. This study was performed in collaboration with the selected organizations and staff. A cross-sectional design allows researchers to compare many types of variables at the same time. Cross-sectional design was used to find out the quantitative information on different variables during the period of the data collection. Therefore, it provided a snapshot of related characteristics in a population at a given point of time.

3.2 Study population

A population refers to the entire group of people or items that meet the criteria set by the investigator. Amputee patient with prosthetic rehabilitation was the study population from the community.

3.3 Study area

Study area was unilateral transtibial and transfemoral amputee patients who attended in the Prosthetics and Orthotics unit of Centre for the Rehabilitation of the Paralysed (CRP), Savar. Because these patients came at CRP from all over the Bangladesh from all economic groups for comprehensive rehabilitation, so it reflected the entire population.

3.4 Sampling technique

The study was conducted by using the convenience sampling methods due to the time limitation and as it was the one of the easiest, cheapest and quicker method of sample selection. The researcher used this procedure, because, getting of those samples whose criteria were concerned with the study purpose.

3.5 Sample size

The equation of finite population correction in case of cross sectional study is:

$n = \frac{Z^2 pq}{d^2}$

$= \frac{(1.96)^2 \text{x } 0..5 \text{ x } 0.5}{(0.05)^2}$

=384

Here,

Z (95% confidence level) = 1.96

P (prevalence) = 50%

And, q= (1-p)

= (1-0.5)

= 0.5

The actual sample size was, n= 384

The researcher took 59 patients from the centre that was treated with prosthesis for lower limb amputation from June, 2021 to September, 2021. In this study the researcher also considered inclusion and exclusion criteria which helped the researcher to select suitable and appropriate participants for this study.

3.6 Inclusion criteria

- Above 18 years of age, with a lower limb amputee and having prosthetic devices.
- Both male female were selected.
- Only transtibial and transfemoral (both unilateral and bilateral) amputees using prosthesis.
- Lower limb amputees who had completed their gait training and discharged from CRP and living in the community.
- People who were willing to participate in the study.

3.7 Exclusion criteria

- Age range less than 18 years.
- Amputees other than transtbial and transfemoral amputation.
- Patients who didn't attend or complete rehabilitation program from CRP.
- Those who were not interested to attend the program at the time of data collection.
- People who had mental illness.
- The lower limb amputees who had problem in communication, hearing and speech impairment.

3.8 Data collection method

Data collection method was questionnaire and before collecting data, the study aims, objectives and study procedures were explained to participants. They were given the opportunity to ask questions and once they were satisfied they were asked to sign the written consent form. Once they signed the consent form, the researcher completed the Quebec User Evaluation of Satisfaction with Assistive Technology (QUEST 2.0) along with the demographic data.

3.9 Data collection tools

A modified mixed questionnaire has been used including Quebec User Evaluation of Satisfaction with Assistive Technology (QUEST 2.0) questionnaire to evaluate the patients' satisfaction with their assistive device and the service they received. The QUEST questionnaire is standard and valid to measure the satisfaction with assistive devices and services (Wessels et al., 2003). Moreover pen, papers, consent form were also included in the list of data collection tools.

3.10 Data analysis

Data was entered into Statistical Package for Social Science (SPSS) software Version 20 and excel spread sheet. Data also analyzed by SPSS software. The Quebec User Evaluation of Satisfaction with Assistive Technology (QUEST 2.0) and Socio-demographic questionnaire was analyzed and discussed about the socio-demographic

factors such as age, gender, occupation, educational status, marital status etc. The Quebec User Evaluation of Satisfaction with Assistive Technology (QUEST 2.0) manual were followed when summarizing QUEST total scores for satisfaction with assistive device and service which complies with 12 items outcome measure that assesses the user's satisfaction and dissatisfaction and all the process was carried out. During the interview session and analyzing data, the researcher never tried to influence the process by his own value, perception and biases. The investigator collected the information about types of disabilities and satisfaction of their life. Beside, researcher found out the results by SPSS software-version 20 that analyzed in excel and showed in column. Results were discussed and presented through figures and tables as applicable. The analysis would be done by using the Pearson correlation coefficient testto find out the correlation between QUEST scores and different socio-demographic characteristics and measuring p-value where the statistical significance value was less than five, the set at $p<0.05$ for statistical significance.

Pearson correlation coefficient test

The Pearson correlation coefficient also known as Pearson's (*r)*, the Pearson product-moment correlation coefficient (PPMCC), the bivariate correlation or colloquially simply as the correlation coefficient, is a measure of linear correlation between two sets of data.

Formula: the test statistical follow-

$$r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \sum (y_i - \bar{y})^2}}$$

Here,

r = correlation coefficient

x_i = values of x variable in a sample

$\bar{x}$ = mean of the values of x variable

y_i = values of y variable in a sample

$\bar{y}$ = mean of the values of y variable

Interpretation

Correlation coefficient formulas are used to find how strong a relationship is between data. The formulas return a value between -1 and 1, where:

- 1 indicates a strong positive relationship.
- -1 indicates a strong negative relationship.
- A result of zero indicates no relationship at all.

Table no: 1- Example of Pearson Correlation Test and interpretation

		Device subscale score		Service subscale score	
		Correlation co efficient (r)	p-value	Correlation co efficient (r)	p-value
Age	Below 50	.009	.945	.068	.611
	Above 50				

3.11 Ethical consideration

Study was conducted following the standard guidelines for ethical consideration. Ethical approval was taken from Institutional Review Board (IRB) of Bangladesh Health Professions Institute (BHPI) for conducting this study. Informed consent as well as questionnaires in both English and Bengali language was submitted along with proposal. During the course of the study, the samples who were interested in the study had given consent forms and the purpose of the research and the consent form were explained to them verbally. The study did not interfere with their jobs. They were informed that their participation was fully voluntary and they had the right to withdraw or discontinue from the research at any time. They were also informed that confidentiality was maintained regarding their information. It should be assured the participant that his or her name or address would not be used. The participants were also informed that the research result would not be harmful for them.

CHAPTER – IV RESULT

A total 59 subjects were studied in this study. Necessary information was collected from the respondents and after analysis data was presented as tables and graphical form below.

4.1 Socio-demographic findings of this study

4.1.1 Age

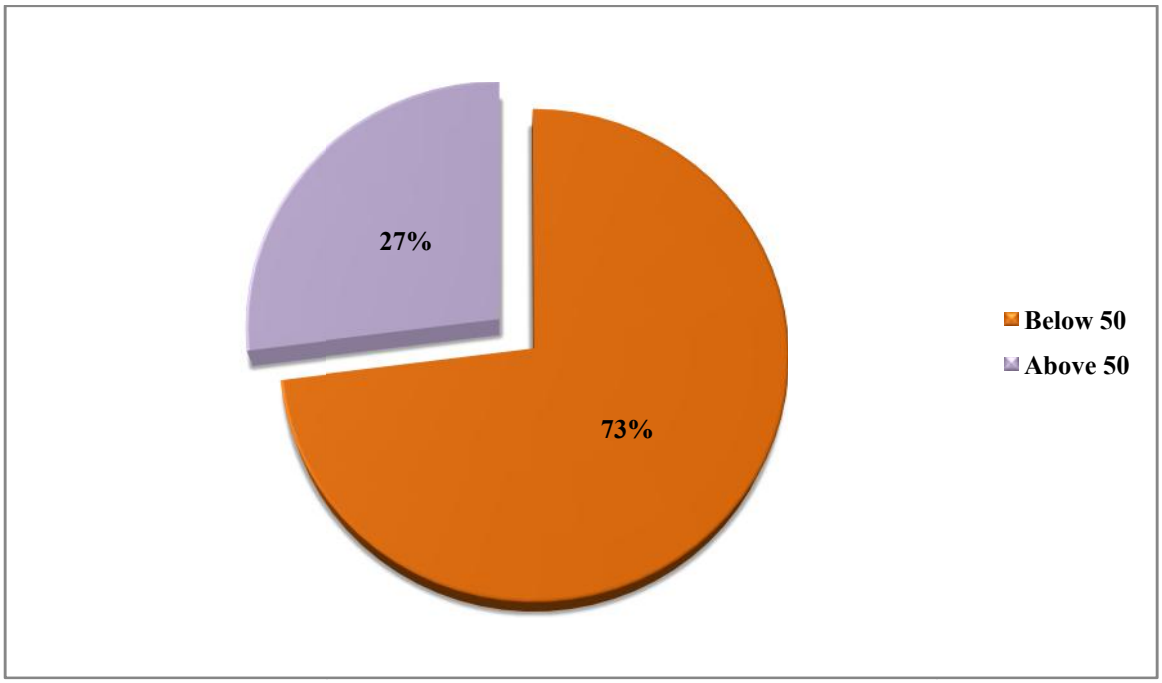

Figure no: 1-Age of the participants

Among 59 patients an age group above 18 years respondents was taken as participant in this study. In the case of age the most participants was attended from below 50 years age group 73% (n=43). The rest of the participants was above 50 years age group 27% (n=16).

4.1.2 Sex

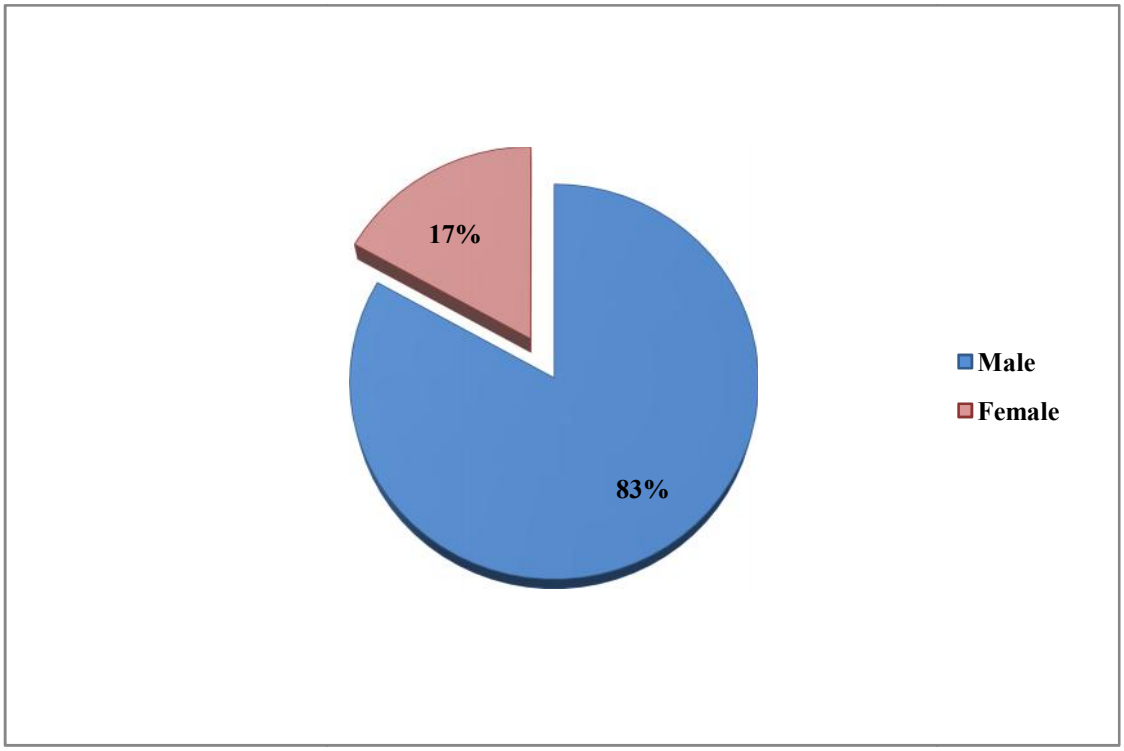

Figure no: 2- Sex of the participants

Among 59 participants, the most participants were male. Data showed that 83% (n=49) was male and 10% (n=10)was female.

4.1.3 Marital status

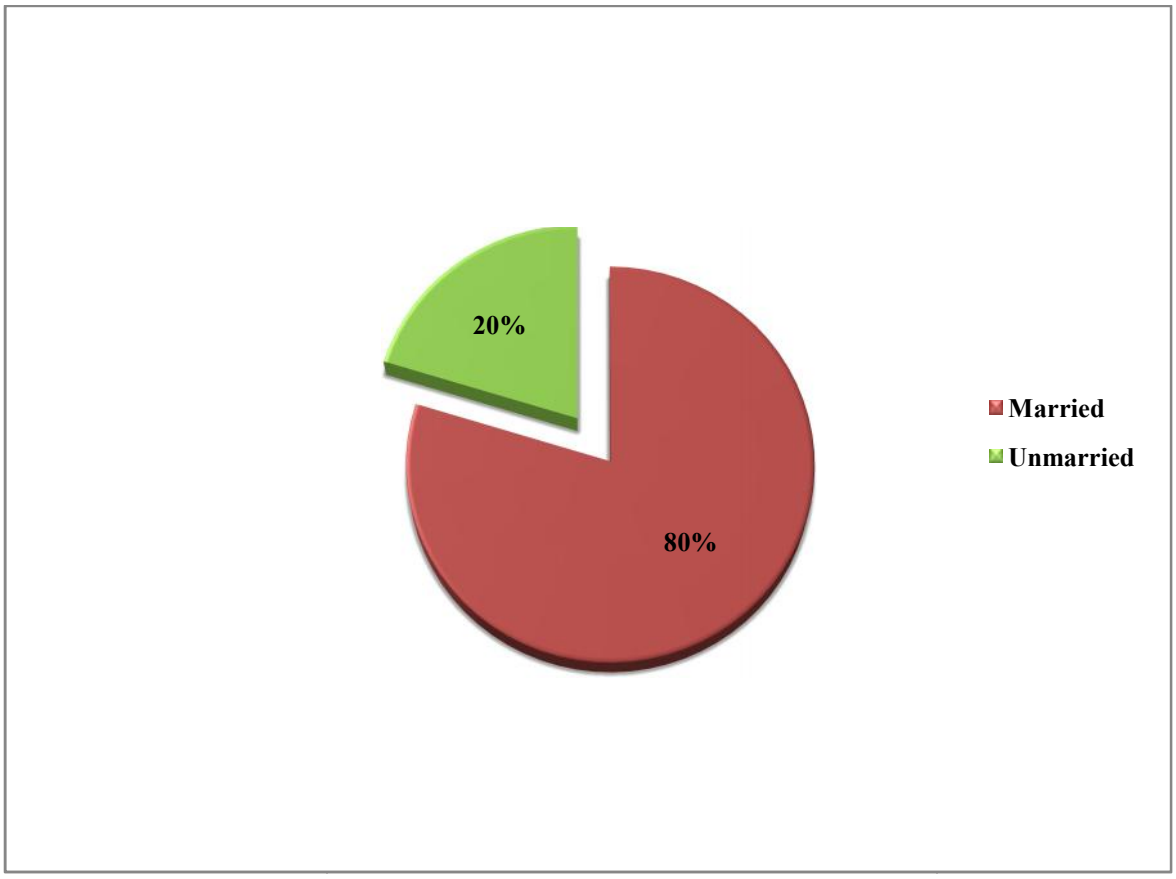

Figure no: 3- Marital status of the participants

Among 59 participants, most participants were married. Data showed that 80% (n=47) were married and 20% (n=12) were unmarried.

4.1.4 Socio-demographical characteristics of the participants of this study

Among 59 participants the most participants was attended from 25-34 age group 23.7% (n=14). In the rest of the participants, 18.6% (n=11) participants were in 15-24 age group, 20.3%(n=12) participants were in 35-44 age group, 22% (n=13) participants were in 45-54 age group, 10.2% (n=6) participants were in 55-64 age group and 5.1%(n=3) participants were in 65-74 age group. The most participants were male. Data showed that 83% (n=49) was male and 10% (n=10)was female. In the case of educational level of the participants 16.9% (n=10) participants were illiterate, 25.4% (n=15) participants had primary education, 33.9% (n=20) participants got secondary education, 8.5% (n=5) participants had higher secondary education, 11.9% (n=7) participants were graduated and 3.4% (n=2) participants were post graduated. Data showed that 80% (n=47) were married and 20% (n=12) were unmarried. In the case of occupation of the participants 1.7% (n=5) participants was government employee, 20.3% (n=12) participants were non-government employee, 28.8% (n=17) participants were businessman, 10.2% (n=6) participants were students, 11.9% (n=7) participants were house wife, 8.5% (n=5) participants were retired and 18.6% (n=11) participants were unemployed. Among 59 participants 64.4% (n=38) participants lived in rural areas, 18.6% (n=11) lived in urban areas and 16.9% (n=10) participants lived in semi-rural areas. On account of analysis about type of living place 27% (n=16) participants lived in buildings, 42% (n=25) participants lived in tin shaded houses and 31% (n=18) participants lived in mud houses among 59 participants (Table no: 2).

Table no: 2- Socio-demographical characteristics of the participants

Variables	Frequency (n=59)	Percent (%)
Age		
15-24 years	11	18.6
25-34 years	14	23.7
35-44 years	12	20.3
45-54 years	13	22.0
55-64 years	6	10.2
65-74 years	3	5.1
Sex		
Male	49	83.1
Female	10	16.9
Educational level		
Illiterate	10	16.9
Primary	15	25.4
Secondary	20	33.9
Higher secondary	5	8.5
Graduate	7	11.9
Post graduate	2	3.4
Marital status		
Married	47	79.7
Unmarried	12	20.3
Occupation		
Government employee	1	1.7
Non-government employee	12	20.3
Businessman	17	28.8
Student	6	10.2
House wife	7	11.9
Retired	5	8.5
Unemployed	11	18.6
Living area		
Rural	38	64.4
Urban	11	18.6
Semi-rural	10	16.9
Type of living place		
Building	16	27.1
Tin shaded	25	42.4
Mud house	18	30.5

4.1.5 Educational level

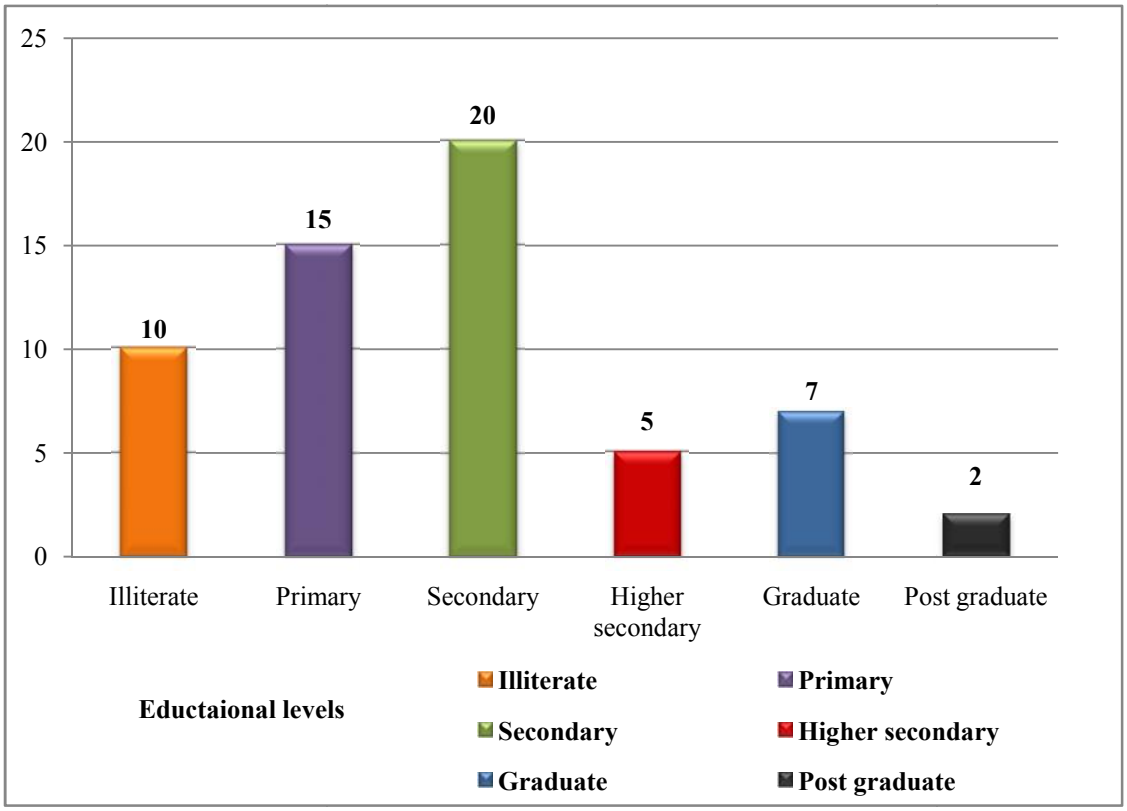

Figure no: 4- Educational level of the participants

In the case of educational level of the participants 16.9% (n=10) participants were illiterate, 25.4% (n=15) participants had primary education, 33.9% (n=20) participants got secondary education, 8.5% (n=5) participants had higher secondary education, 11.9% (n=7) participants were graduated and 3.4% (n=2) participants were post graduated.

4.1.6 Occupation

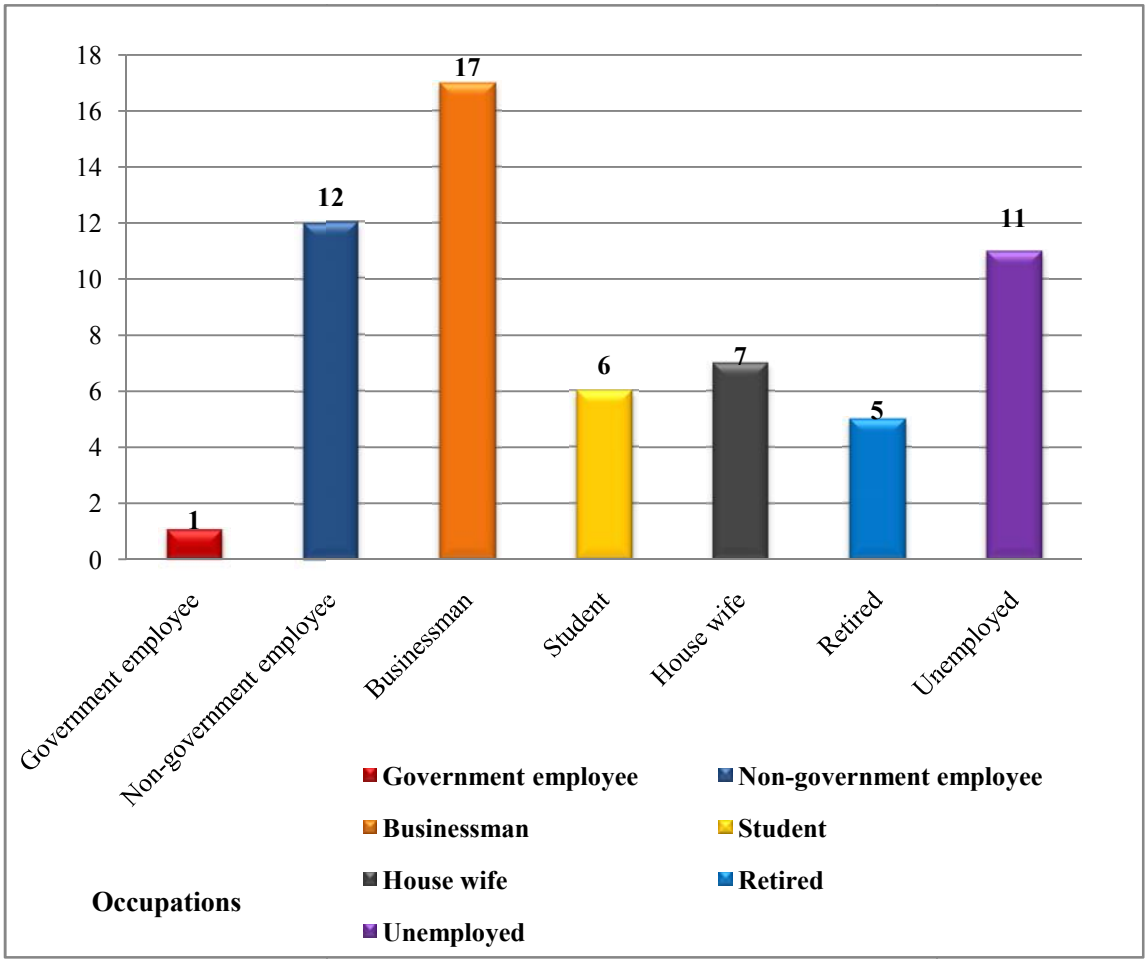

Figure no: 5- Occupation of the participants

In the case of occupation of the participants 1.7% (n=5) participants was government employee, 20.3% (n=12) participants were non-government employee, 28.8% (n=17) participants were businessman, 10.2% (n=6) participants were students, 11.9% (n=7) participants were house wife, 8.5% (n=5) participants were retired and 18.6% (n=11) participants were unemployed.

4.1.7 Living area

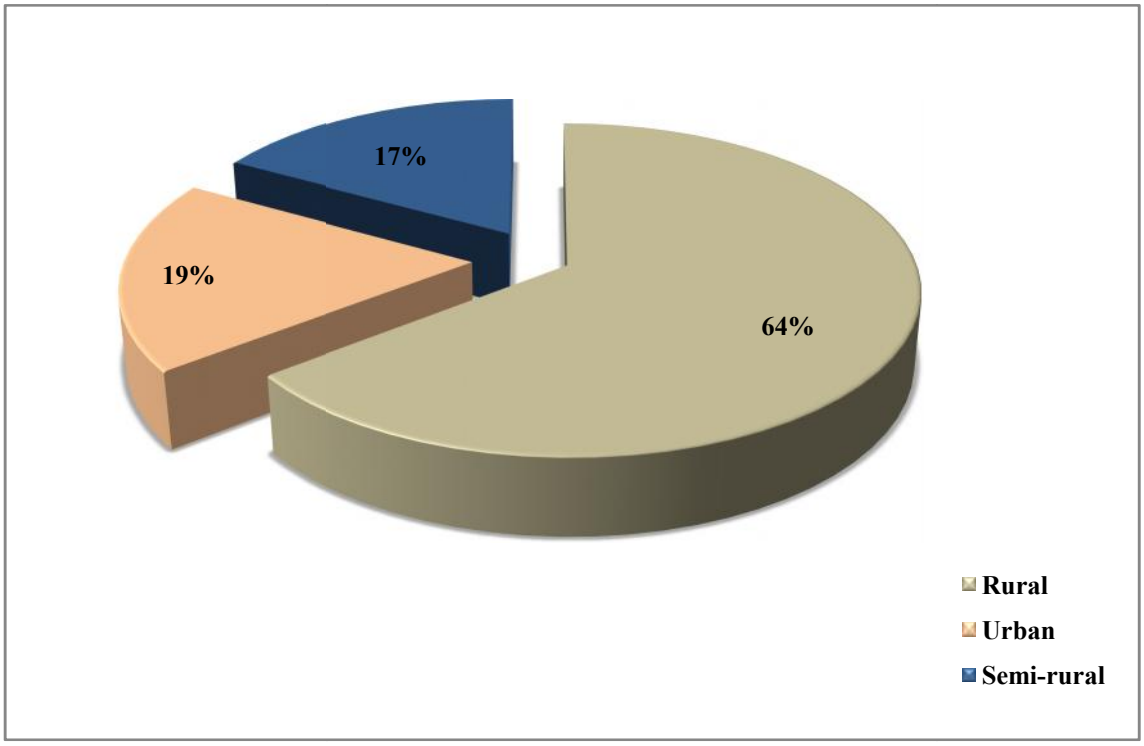

Figure no: 6- Living area of the participants

Among 59 participants 64.4% (n=38) participants lived in rural areas, 18.6% (n=11) lived in urban areas and 16.9% (n=10) participants lived in semi-rural areas.

4.1.8 Type of living place

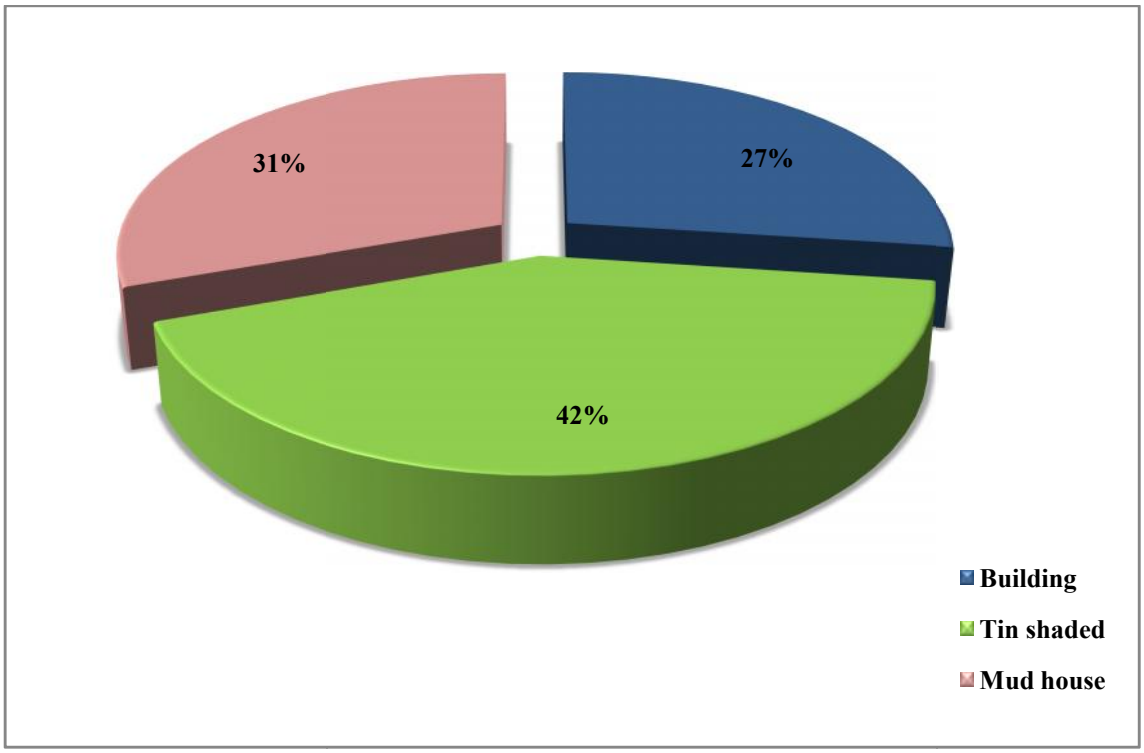

Figure no: 7- Type of living place of the participants

On account of analysis about type of living place 27% (n=16) participants lived in buildings, 42% (n=25) participants lived in tin shaded houses and 31% (n=18) participants lived in mud houses among 59 participants.

4.1.9 Family income and expenditure (monthly)

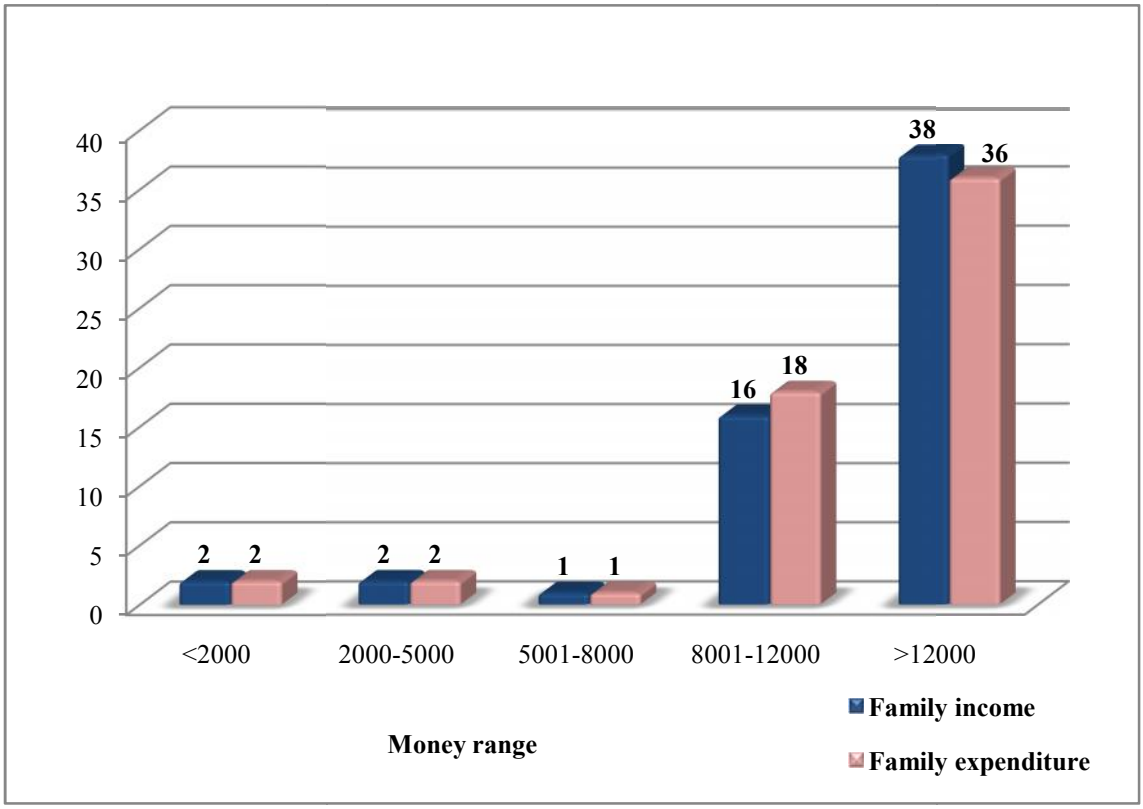

Figure no: 8- Monthly family income and expenditure of the participants

In the case of monthly family income and expendiure most particpants had more than 12000 income (n=38) and expenditure (n=36) and the percentage was 64% and 61% repectively. In 8001-12000 range family income and expenditure were found repectively in 27.1% (n=16) and 30.5% (n=18) particpants. 1.7% (n=1) particpants were found having 5001-8000 range of family income and expenditure. 3.4% (n=2) particpants were found having 2000-5000 and less than 2000 of family income and expenditure.

4.2 Amputation related findings of this study

4.2.1 Type of amputation

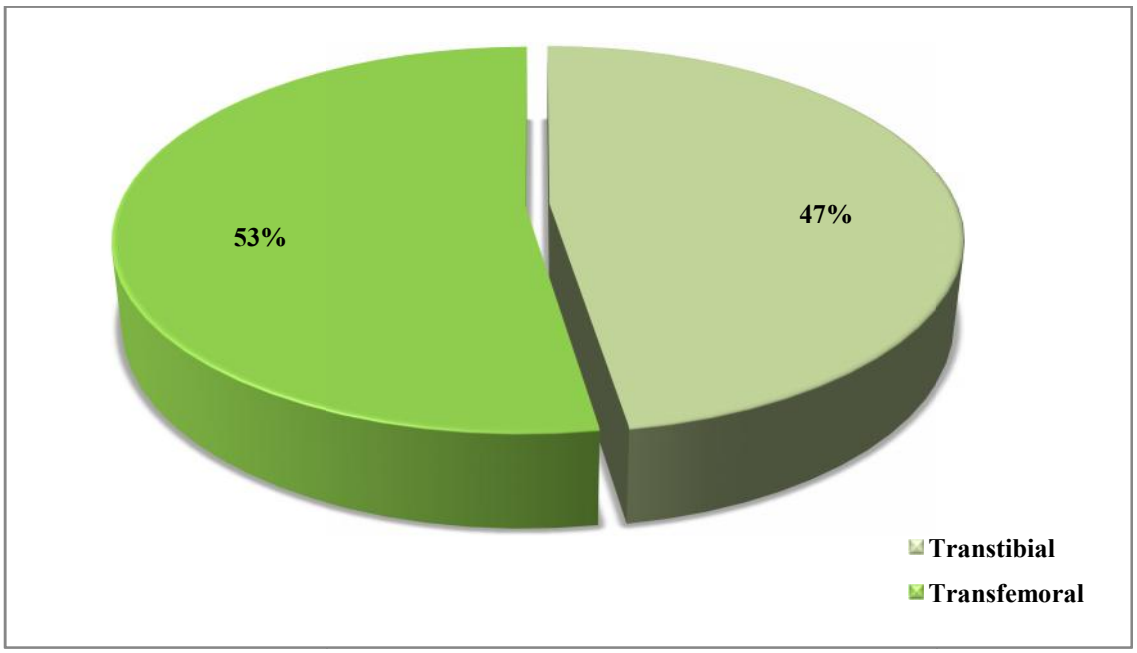

Figure no: 9- Type of amputation of the participants

Among 59 participants, most participants were transfemoral. Data showed that 47.5% (n=28) were transtibial and 52.5% (n=31) were transfemoral.

4.2.2 Cause of amputation

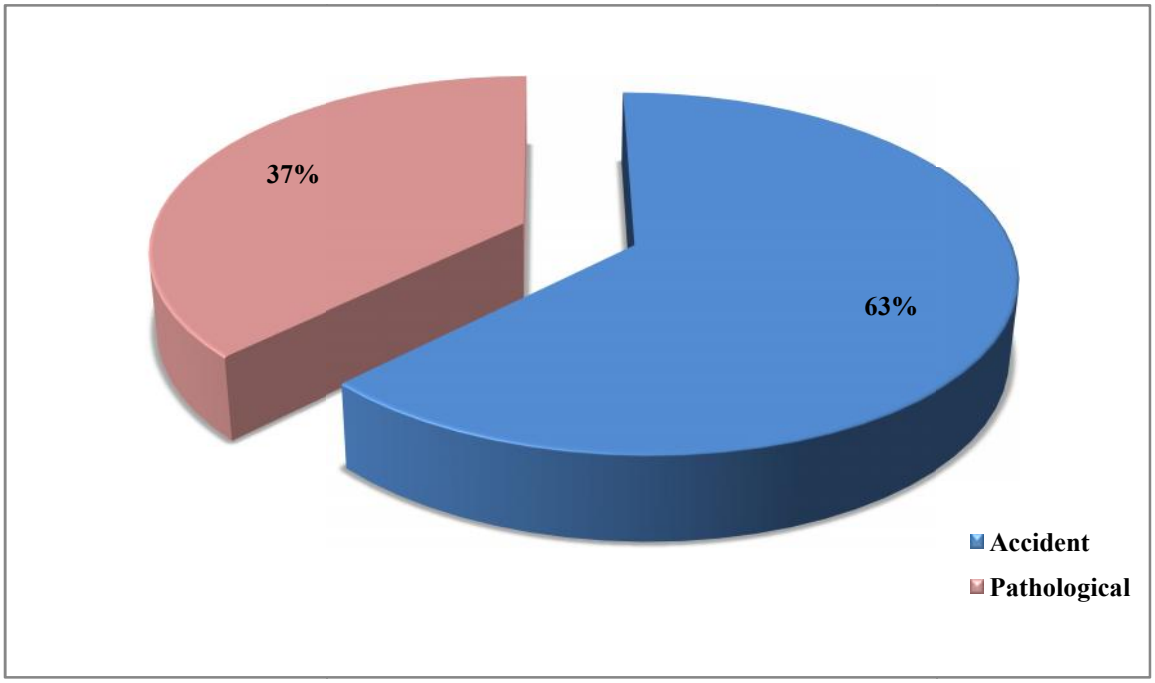

Figure no: 10- Cause of amputation of the participants

As the causes of amputation, most participants attended amputation because of accident. The data showed that 63% (n=37) participants were accidental and 37% (n=22) participants were pathological.

4.2.3 Site of amputation

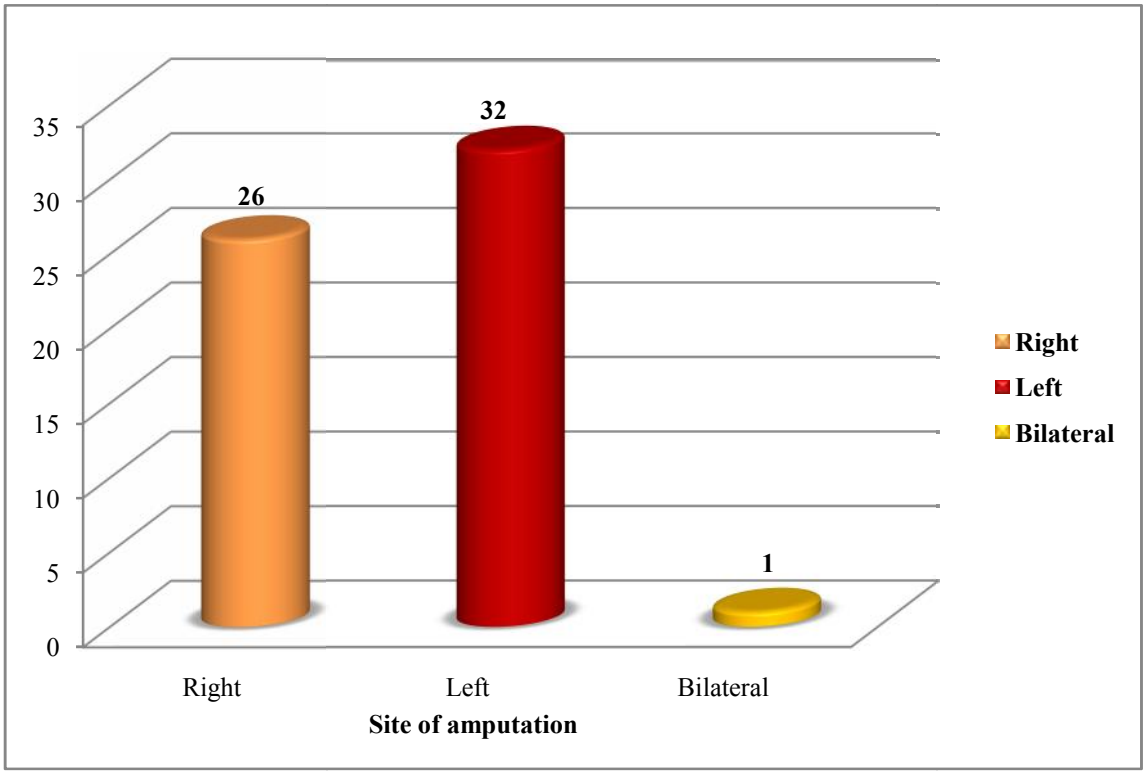

Figure no: 11-Site of amputation of the participants

Among 59 participants 44.1% (n=26) had right sided amputation, 54.2% (n=32) had left sided amputation and 1.7% (n=1) had both sided (bilateral) amputation.

4.2.4 Amputation related characteristics of the participants of this study

Among 59 participants 47.5% (n=28) were transtibial and 52.5% (n=31) were transfemoral. As the causes of amputation 63% (n=37) participants were accidental and 37% (n=22) participants were pathological. In the case of site of amputation 44.1% (n=26) had right sided amputation, 54.2% (n=32) had left sided amputation and 1.7% (n=1) had both sided (bilateral) amputation. As the shape of stump (residual limb) 3.4% (n=2) participants were club shaped, 74.6% (n=44) participants cylindrical and 22% (n=13) were participants conical. Among 59 participants 42.4% (n=25) had unilateral TT prosthesis, 1.7% (n=1) had bilateral TT and 55.9% (n=33) had unilateral TF. About the duration of using of the prosthesis 45.8% (n=27) participants were found using their prosthesis less than 6 months, 10.2% (n=6) participants used their prosthesis for 6 months-1 year and 44.1% (n=26) participants used their prosthesis more than 1 year. The most respondents reported no complications and it was 76% (n=45) of the attended participants. Data showed that 24% (n=14) participants got complications after using lower limb prosthesis (Table no: 3).

Table no: 3- Amputation related characteristics of the participants

Variables	Frequency (n=59)	Percent (%)
Type of amputation		
Transtibial	28	47.5
Transfemoral	31	52.5
Cause of amputation		
Accident	37	62.7
Pathological	22	37.3
Site of amputation		
Right	26	44.1
Left	32	54.2
Bilateral	1	1.7
Shape of stump		
Conical	13	22.0
Cylindrical	44	74.6
Club shaped	2	3.4
Type of prosthesis		
Unilateral TT	25	42.4
Bilateral TT	1	1.7
Unilateral TF	33	55.9
Duration of using prosthesis		
Less than 6 months	27	45.8
6 months-1 year	6	10.2
More than 1 year	26	44.1
Having complications		
Yes	14	23.7
No	45	76.3

4.2.5 Shape of stump

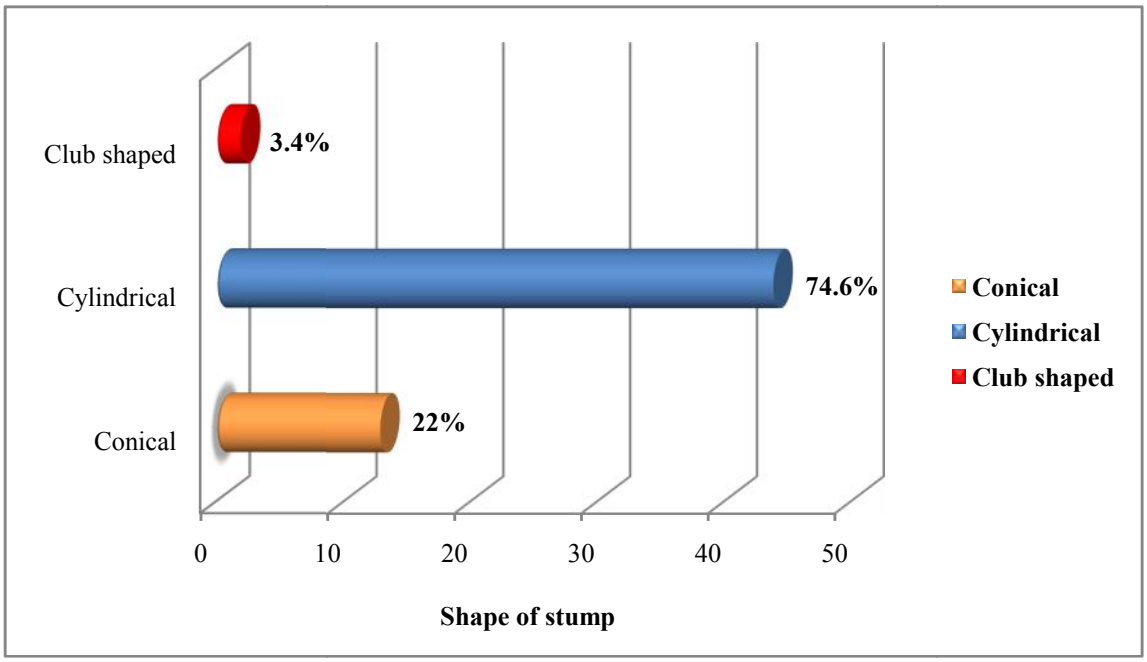

Figure no: 12- Shape of stump of the participants

The most shape of the stump was found in the data was cylindrical for a successful prosthesis fitting among the participants. As the shape of stump (residual limb) 3.4% (n=2) participants were club shaped, 74.6% (n=44) participants cylindrical and 22% (n=13) were participants conical.

4.2.6 Type of prosthesis

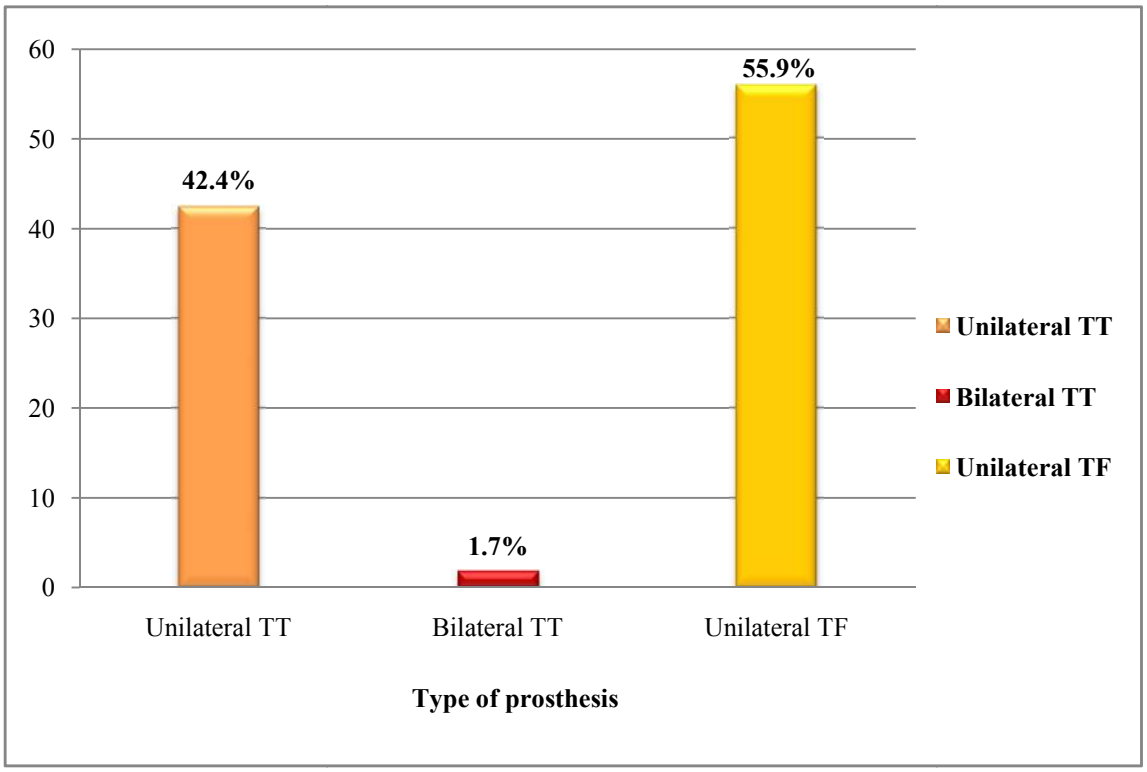

Figure no: 13- Type of prosthesis of the participants

Among 59 participants 42.4% (n=25) had unilateral TT prosthesis, 1.7% (n=1) had bilateral TT and 55.9% (n=33) had unilateral TF.

4.2.7 Duration of using prosthesis

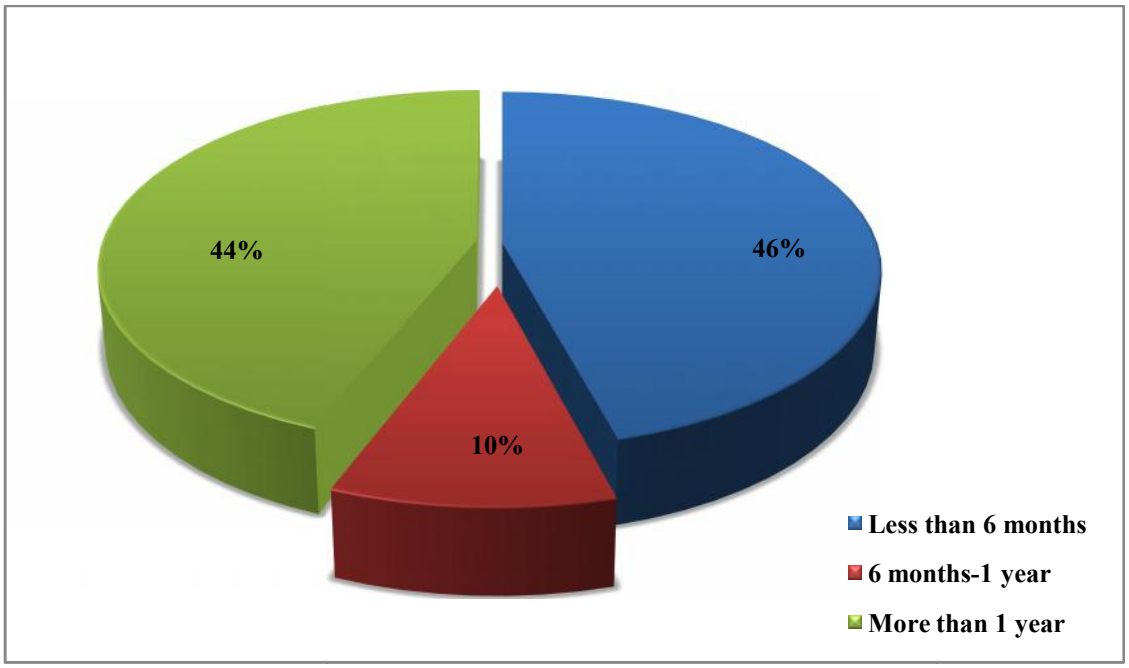

Figure no: 14-Duration of using the prosthesis of the participants

Among 59 participants 45.8% (n=27) participants were found using their prosthesis less than 6 months, 10.2% (n=6) participants used their prosthesis for 6 months-1 year and 44.1% (n=26) participants used their prosthesis more than 1 year.

4.2.8 Characteristics of participants about physical activities of this study

According to six independent questions physical activities was measured as their independency and dependency. Most of the participants showed their independency in all of the physical activities. Most independency was found in able to get up from chair 100% (n=59) and most dependency was found in able to go down on stairs 13.6% (n=8) of the participants (Table no: 4).

Table no: 4- Characteristics of participants about physical activities

Physical activities	Frequency (n=59)		Percent (%)	
	Independency (yes)	Dependency (no)	Independency (yes)	Dependency (no)
Able to get up from chair	59	0	100	0
Able to walk in home	58	1	98.3	1.7
Able to walk on uneven ground	52	7	88.1	11.9
Able to walk on inclement weather	43	16	72.9	27.1
Able to go up on stairs	53	6	89.8	10.2
Able to go down on stairs	51	8	86.4	13.6

4.2.9 Having complications

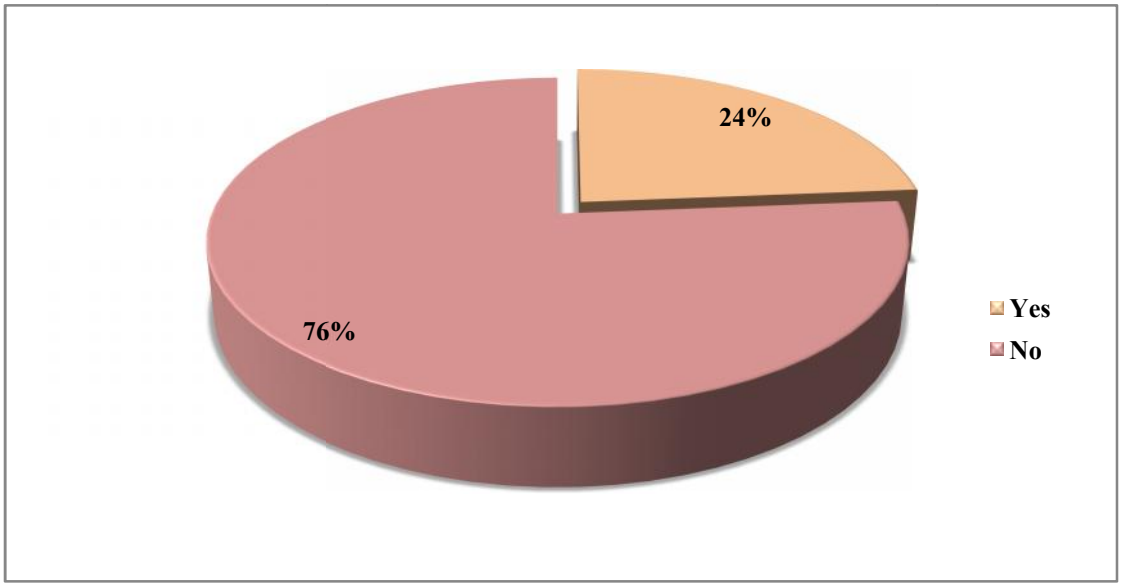

Figure no: 15- Complications of the participants

Among 59 participants, most reported no complications (edema, blisters, ulceration, gangrene, protruded bone) and it was 76% (n=45) of the attended participants. Data showed that 24% (n=14) participants got complications after using lower limb prosthesis.

4.3 Quebec User Evaluation of Satisfaction with assistive Technology (QUEST 2.0)

4.3.1 Assistive device

Table no: 5- QUEST score (assistive device)

	N	Mean±SD	Maximum	Minimum
How satisfied are you with				
The dimensions of your assistive device	59	4.64±.66340	5.00	2.00
The weight of your assistive device	59	4.35±.82551	5.00	2.00
The ease in adjusting the parts of your assistive device	59	4.45±.67778	5.00	3.00
How safe and secure your assistive device is	59	4.42±.62155	5.00	3.00
The durability of your assistive device	59	4.10±.80290	5.00	2.00
How easy it is to use your assistive device	59	4.62±.61303	5.00	3.00
How comfortable your assistive device is	59	4.50±.70400	5.00	3.00
How effective your assistive device is	59	4.55±.62343	5.00	2.00
Device subscale score	**59**	**4.49±.56851**	**5.00**	**3.00**

4.3.2 Service

Table no: 6- QUEST score (service)

	N	Mean±SD	Maximum	Minimum
How satisfied are you with				
Service delivery program you obtained for your assistive device	59	4.95±.22157	5.00	4.00
Repairs and servicing provided for your assistive device	59	4.52±.62577	5.00	2.00
Quality of the professional services for your assistive device	59	4.93±.25355	5.00	4.00
Follow up services received for your assistive device	59	4.63±.61303	5.00	3.00
Services subscale score	**59**	**4.89±.35695**	**5.00**	**3.00**

Based on Quebec User Evaluation of Satisfaction with assistive Technology (QUEST 2.0), the total mean±SD score for satisfaction about assistive device and service delivery was respectively (4.49 ± .56851) and (4.89 ± .35695) (Table no: 5 and Table no: 6).

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4.3.3 The most important items in the Quebec User Evaluation of Satisfaction with assistive Technology questionnaire

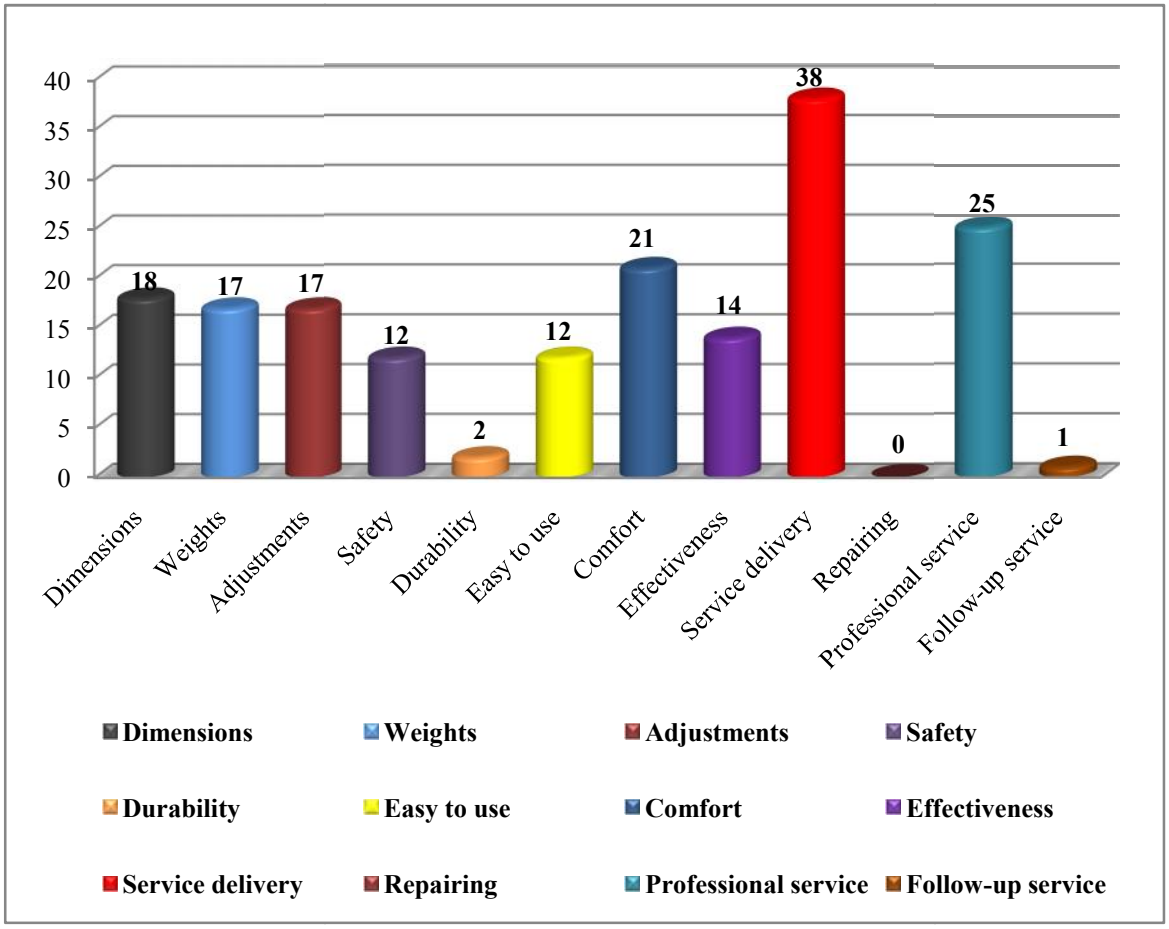

Figure no: 16- The most important items of the participants

Participants were asked to choose what they considered to be the 3 most important items included in the Quebec User Evaluation of Satisfaction with assistive Technology (QUEST) questionnaire. They reported that 'Service delivery' was the most important followed by 'Professional service' and 'Comfort' and their percentage were 64.4% (n=38), 42.4% (n=25) and 35.6% (n=21) respectively. According to the response three most important items were consequently 'Service delivery', 'Professional service' and 'Comfort'. On the other hand three less important items were consequently 'Repairing' (1%) (n=0), 'Follow-up service' (1.70%) (n=1) and 'Durability' (3.40%) (n=2).

4.4 Pearson Correlation Test

4.4.1 Age between QUEST SCORES

It was found that age was not significantly co-related with device satisfaction (p>0.05) and service related satisfaction (p>0.05)(Table no: 7).

Table no: 7- Pearson Correlation Test between age group with QUEST scores

		Device subscale score		Service subscale score	
		Correlation co efficient (r)	p-value	Correlation co efficient (r)	p-value
Age group	Below 50	.009	.945	.068	.611
	Above 50				

[*p<0.05, level of significance]

4.4.2 Sex between QUEST SCORES

It was found that sex was not significantly co-related with device satisfaction (p>0.05) and service related satisfaction (p>0.05)(Table no: 8).

Table no: 8- Pearson Correlation Test between sex with QUEST scores

		Device subscale score		Service subscale score	
		Correlation co efficient (r)	p-value	Correlation co efficient (r)	p-value
Sex	Male	.073	.581	.125	.344
	Female				

[*p<0.05, level of significance]

4.4.3 Living area between QUEST SCORES

It was found that living area was not significantly co-related with device satisfaction ($p>0.05$) and service related satisfaction ($p>0.05$) (Table no: 9).

Table no: 9- Pearson Correlation Test between living areas with QUEST scores

		Device subscale score		Service subscale score	
		Correlation co efficient (r)	p-value	Correlation co efficient (r)	p-value
Living area	Rural	.245	.062	.178	. 178
	Urban				
	Semi-rural				

[*p<0.05, level of significance]

4.4.4 Type of amputation between QUEST SCORES

It was found that type of amputation was not significantly co-related with device satisfaction ($p>0.05$) and service related satisfaction ($p>0.05$) (Table no: 10).

Table no: 10- Pearson Correlation Test between types of amputation with QUEST scores

		Device subscale score		Service subscale score	
		Correlation co efficient (r)	p-value	Correlation co efficient (r)	p-value
Type of amputation	Transtibial	.014	.914	.015	.912
	Transfemoral				

[*p<0.05, level of significance]

CHAPTER – V DISCUSSION

The purpose of this study was to identify the satisfaction level among the lower limb prosthesis users in the community level after their completing rehabilitation protocol in CRP. For this study 59 participants were selected who had completed their rehabilitation protocol from CRP and using lower limb prosthesis in their community. In the case of age, the most participants were attended from 25-34 age groups (23.7%) (n=14). Among 59 of the participants 18.6%(n=11) participants were in 15-24 age group, 20.3%(n=12) participants were in 35-44 age group, 22%(n=13) participants were in 45-54 age group, 10.2%(n=6) participants were in 55-64 age group and 5.1% (n=3) participants were in 65-74 age group. In the other hand the most participants were male and there was 83%(n=49) participants who was male and 10% (n=10) participants who was female. In the case of educational level of the participants in this study found that the most participants had the secondary education and it was about 34%(n=20) of the subjects. Among the rest participants 16.9%(n=10) participants were illiterate, 25.4%(n=15) participants had primary education, 8.5% (n=5) participants had higher secondary education, 11.9% (n=7) participants were graduated and 3.4% (n=2) participants were post graduated. A relevant research which was done among the population of Kolkata showed that the most common age group for amputation was 21-30 years of age, accounting for 32.0% of all amputees. The 31-40 year age group was second, accounting for 23.2% of all amputees and the 20 years and below age group was third (14.2%). There were more male amputees than female ones, with 86% of all amputees being men (Pooja & Sangeeta, 2013). In another study from Bangladesh, reported that the 21-30 years group accounted for 26.2% of all cases followed by 31-40 years (22.2%) and 41-50 years (19.9%). Majority of the victims were male (87.7%) and had no formal education or only primary level education (62.0%) (Hassan et al., 2020).

In the case of occupation of the participants, the most participants were businessmen and it was 29% (n=17) of the subjects. The following major occupations showed the most participants were job holder or non-government employee 20.3% (n=12) and unemployed 18.6% (n=11). In the rest 1.7%(n=1) participant was government employee, 10.2%(n=6)

participants were students, 11.9%(n=7) participants were house wife and 8.5%(n=5) participants were retired persons. Among 59 participants, most participants were married. Data showed that 80% (n=47) participants were married and 20% (n=12) participants were unmarried. On the other hand most participants lived in rural areas (n=38) occupying 64% of the subjects while 18.6% (n=11) participants lived in urban areas and 16.9%(n=10) participants lived in semi-rural areas. In the case of monthly family income and expendiure most particpants had more than 12000 income (64%) and expenditure (61%). In 8001-12000 range family income and expenditure were found repectively in 27.1% and 30.5% particpants. 1.7% particpants were found having 5001-8000 range of family income and expenditure. 3.4% particpants were found having 2000-5000 and less than 2000 of family income and expenditure. Other studies showed the similar report of having most participants from rural side (65%), married participants (78%) and a large group having full time jobs (19%) (Hassan et al., 2020). In the case of family income Dillingham and his team showed that among patients who reported income, more than half were poor according to federal guidelines, with a household income of less than $15,000 per year (Dillingham et al., 2011). Regarding their marital status, most of the males (76.82%) and most of the females (60.97%) were married. Regarding residence, most of the males and females (50.84% and 53.65%) are from rural areas. Finally, regarding income, more than half of the males and females (61.01% and 65.85%) have unsatisfactory income (Mohammed & Shebl, 2014).

From 59 participants, though most participants were transfemoral (TF) amputation, but the transtibial (TT) amputations were not less in count. Data showed that 47.5% (n=28) participants were TT and 52.5% (n=31) participants were TF. As the causes of amputation, most participants attended amputation because of accidents or traumatic causes. The study showed that 62.7 (n=37) participants were accidental and 37.3% (n=22) participants had pathological or non-traumatic cause. As well as among 59 participants 44.1% (n=26) had right sided amputation, 54.2% (n=32) had left sided amputation and 1.7% (n=1) had both sided (bilateral) amputation. Among 59 participants 42.4% (n=25) had unilateral TT prosthesis, 55.9% (n=33) had unilateral TF and 1.7% (n=1) had bilateral TT. In different studies it was found that among all lower limb amputation cases, below-knee (TF) amputations were the most common, followed by

above-knee (TT) amputations. In the same study, out of 155 amputation cases, 109 patients (70.3%) were victims of trauma, making this the most common cause of amputation. The next most common cause of amputation was peripheral vascular disease (27.7%) (Pooja & Sangeeta, 2013). In another study, 89% of the participants were unilateral amputations and it was 80% for TTA, making the most common followed by TFA (26%) (Kamrad et al., 2020). In 2010-2012, 17 participants had a unilateral LLA at time of admission (13 transtibial and 4 transfemoral), at the end of follow up a further 13 patients underwent unilateral LLA in a subsequent admission resulting in 30 bilateral amputees (30.9%). A similar finding was found from 2000-2002 where 29 patients (33.3%) were bilateral amputees at the end of data collection (Kelly et al., 2017).

Complications can be occurred during using lower limb prosthesis. The major complications that found in many researches were edema, blisters, ulceration, gangrene, protruded bone etc. Among 59 participants, most reported no complications and it was 76% (n=45) of the attended participants. Data showed that 24%(n=14) participants got complications after using lower limb prosthesis. In a research studied for outcomes of major limb amputations found that forty four patients (45%) suffered one or more complications. Of the 12 patients with a wound infection, four required a return to community (Kelly et al., 2017). In another research, 107 complications of 65 patients occurred (67%), mostly perioperative complications include cardiac, pulmonary, pressure sores, sepsis, bleeding, and reoperation and wound infection (Ploeg et al., 2005).

Based on Quebec User Evaluation of Satisfaction with assistive Technology (QUEST 2.0), the total mean score for satisfaction about assistive device and service delivery was respectively 4.49 and 4.89. Participants were asked to choose what they considered to be the 3 most important items included in the Quebec User Evaluation of Satisfaction with assistive Technology (QUEST) questionnaire. They reported that ‘Service delivery’ was the most important followed by ‘Professional service’ and ‘Comfort’ and their percentage were 64.4%, 42.4% and 35.6% respectively. According to the response three most important items were consequently ‘Service delivery’, ‘Professional service’ and ‘Comfort’. On the other hand three less important items were consequently ‘Repairing’ (1%), ‘Follow-up service’ (1.70%) and ‘Durability’ (3.40%). One would expect clients

whose problem is solved more satisfactorily will be more satisfied with the solution. The mean satisfaction level for the device provided increases from 3.59 for people whose problem has not been solved at all, to 4.31 for people whose problem has been fully solved. The mean satisfaction level for the service provided increases from 3.71 for people whose problem has not been solved at all, to 4.24 for people whose problem has been fully solved. Apparently the degree to which the problem is solved has a slightly larger influence on the satisfaction level for the device, than it has on the satisfaction level for the service (Wessels et al., 2003). In Taiwan, QUEST 2.0 had been used to develop the cross-cultural version on assistive device in the community. The study found that the domain means (SD) for device, service and total score of the QUEST were 3.42 (0.64), 3.06 (0.79) and 3.28 (0.63) respectively. These scores were above the 'more or less satisfactory' level. The three items of QUEST was ranked as the most important aspects affecting satisfaction were 'Safety' (37.1%), 'Durability' (36.2%), and 'Comfort' (27.6%). The three least important items were 'Professional services' (2.9%), 'Follow-up services' (2.9%) and 'Service delivery' (1%). All three were in the service domain (Mao et al., 2010). In another research, three most important items were 'Repairing', 'Adjustments' and 'Weights' and the ratio was respectively 85%, 73% and 31% (Wessels et al., 2003).

In co-relations with socio-demographic with QUEST scores in showed small co-relations significantly age with total satisfaction and living area with device satisfaction. The rest of the domains showed no co-relations significantly with satisfaction. Different types of amputation also showed no significant co-relations with satisfaction. In the study of Kark & Simmons (2011), they reported that participant's demographics did not correlate significantly with any of the satisfaction measures used in this study. Level of amputation showed a small correlation with satisfaction with walking, with transfemoral amputees reporting lower levels of satisfaction in this domain than transtibial amputees, although this relationship did not reach significance (Kark& Simmons, 2011). Another study showed that in relation to age, there are statistically significant negative relations with mental satisfaction. Regarding site of amputation, also there are significant statistics in relation to upper limb and physical component (0.043, $p< 0.05$, respectively) in addition to lower limb and mental component (0.034, $p< 0.05$, respectively). But no statistically

significant relation is found among them regarding educational level, residence and causes of amputation (Mohammed & Shebl, 2014).

Limitation of the study:

Regarding this study, there were some limitations or barriers to consider the result of the study. The limitation of this study was small sample size. It was taken only 59 samples. The satisfaction of the persons with lower limb prosthesis could not be measured through small sample size. More samples could not able to collect by random selection because, there were not adequate subjects and study period was short. Another major limitation was time. To conduct the research project on this topic, time period was very limited. As the study period was short so the adequate number of sample could not arrange for the study. Time and resources were limited which have a great deal of impact on the study.

CHAPTER – VI CONCLUSION & RECOMMENDATION

6.1 Conclusion

Satisfaction is neither constant nor concrete. Defining and measuring satisfaction is complicated by interpersonal and over-time variability and therefore any instrument developed to quantify satisfaction must be both activity- and time-specific. Through Quebec User Evaluation of Satisfaction with Assistive Technology (QUEST 2.0), the researcher tried to identify satisfaction level of the participants about the prosthesis device and services. It had been observed that the participants had reported their high levels satisfaction with the prosthetic device and rehabilitation services along with functional independency in most of the physical activities. Besides they reported less complication after using lower limb prosthesis. Most satisfactory items about the device and service were 'Service delivery', 'Professional service' and 'Comfort'. This reflected the professional empowerment and enriched with Prosthetics & Orthotics department in CRP. Lower satisfaction was found in 'Repairing', 'Follow-up service' and 'Durability'. So, urgent attention and modification was needed on these fields in Bangladesh to increase satisfaction with prosthetic device and services. Finally satisfaction about devices and services was not found significantly co-related with age, sex, occupation, living areas, type of amputation.

6.2 Recommendation

Participants self-report of satisfaction with the lower limb prosthesis and rehabilitation services revealed that the design and manufacture of prosthetic low-cost technology needs to improve in order to get facilitate or enable ambulation on challenging surfaces. Though P & O department of CRP is enriched with highly experienced and knowledgeable professionals, some attentions and modifications are needed to be directed towards access to durability of the devices, follow-up services and repairs and to address the general condition of provided devices. According to the study results, the professionals should give more attention on their follow-up and repairing services following modification in devices and rehabilitation program for lower limb prosthesis users.

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APPENDIX-1

Approval of Thesis Proposal

বাংলাদেশ হেল্‌থ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই)
Bangladesh Health Professions Institute (BHPI)
(The Academic Institute of CRP)

Ref: CRP-BHPI/IRB/02/2021/447 Date: 28.02.2021

Md. Saiyed Hossain
4th year B. Sc. in Physiotherapy
Session: 2015-16, Student ID:112150283
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Subject: Approval of the thesis proposal **'Satisfaction level of lower limb prosthesis users in community level after completing rehabilitation protocol in CRP"** by ethics committee.

Dear Md. Saiyed Hossain,
Congratulations.
The Institutional Review Board (IRB) of BHPI has reviewed and discussed your application to conduct the above mentioned dissertation, with yourself, as the Principal investigator. The Following documents have been reviewed and approved:

Sr. No.	Name of the Documents
1	Dissertation Proposal
2	Questionnaire (English and Bengali version)
3	Information sheet & consent form.

The purpose of the study is to investigate the satisfactory level among lower limb prosthesis users and related service delivery is used for their rehabilitation in CRP. The study involves taking personal details and health and service related details by having face to face interview, identifying satisfactory level using standard questionnaires (QUEST Version 2.0). There is no likelihood of any harm to the participants. The members of the Ethics committee have approved the study to be conducted in the presented form at the meeting held at 10.00 AM on 1st March 2020 at BHPI (23rd IRB Meeting).

The institutional Ethics committee expects to be informed about the progress of the study, any changes occurring in the course of the study, any revision in the protocol and patient information or informed consent and ask to be provided a copy of the final report. This Ethics committee is working accordance to Nuremberg Code 1947, World Medical Association Declaration of Helsinki, 1964 - 2013 and other applicable regulation.

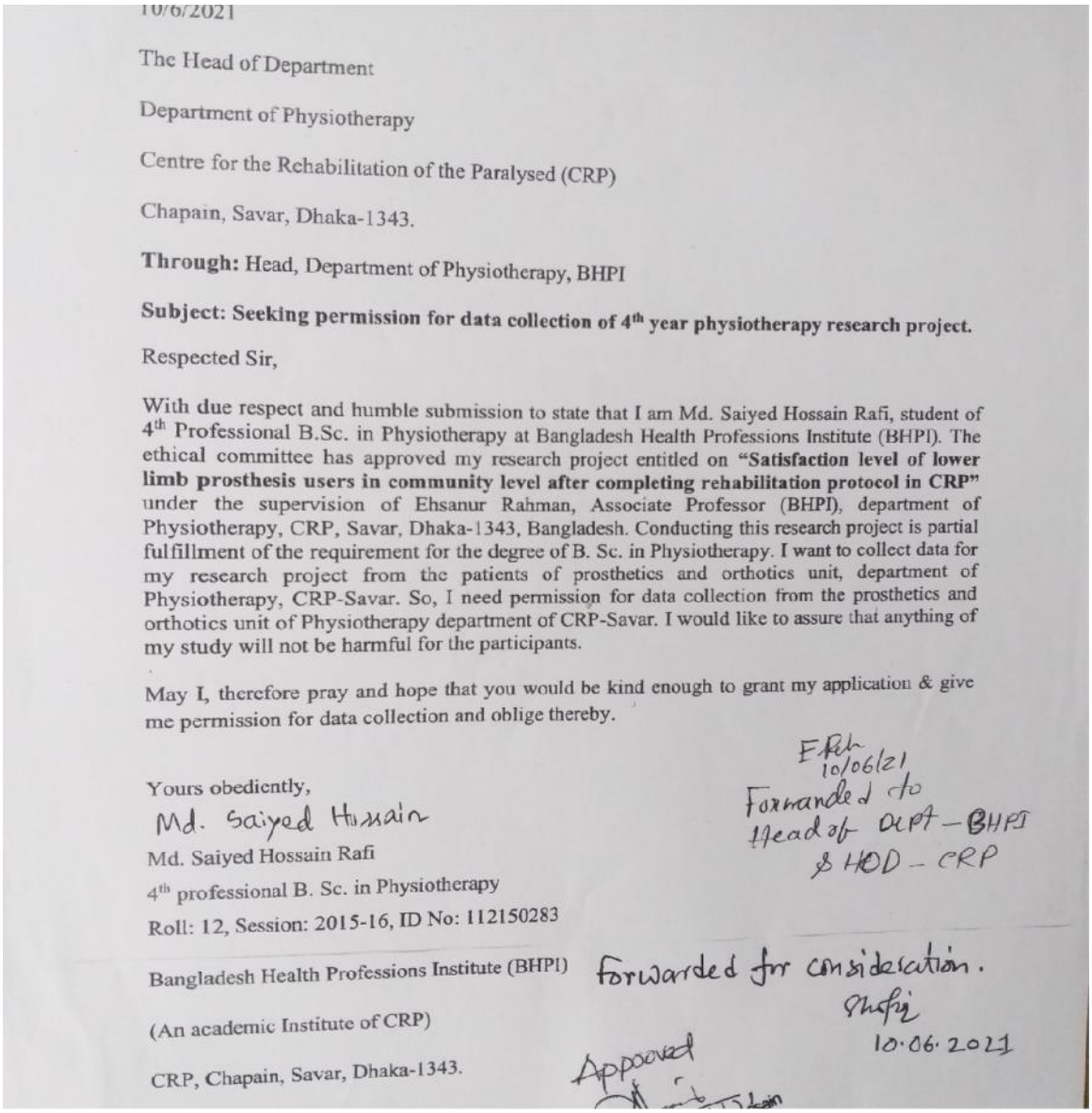
Best regards,

Muhammad Millat Hossain
Assistant Professor, Dept. of Rehabilitation Science
Member Secretary, Institutional Review Board (IRB)
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

CRP-Chapain, Savar, Dhaka-1343, Tel : 7745464-5, 7741404
E-mail : principal-bhpi@crp-bangladesh.org, Web: bhpi.edu.bd, www.crp-bangladesh.org

APPENDIX-2

Permission Letter



10/6/2021

The Head of Department

Department of Physiotherapy

Centre for the Rehabilitation of the Paralysed (CRP)

Chapain, Savar, Dhaka-1343.

Through: Head, Department of Physiotherapy, BHPI

Subject: Seeking permission for data collection of 4th year physiotherapy research project.

Respected Sir,

With due respect and humble submission to state that I am Md. Saiyed Hossain Rafi, student of 4th Professional B.Sc. in Physiotherapy at Bangladesh Health Professions Institute (BHPI). The ethical committee has approved my research project entitled on **"Satisfaction level of lower limb prosthesis users in community level after completing rehabilitation protocol in CRP"** under the supervision of Ehsanur Rahman, Associate Professor (BHPI), department of Physiotherapy, CRP, Savar, Dhaka-1343, Bangladesh. Conducting this research project is partial fulfillment of the requirement for the degree of B. Sc. in Physiotherapy. I want to collect data for my research project from the patients of prosthetics and orthotics unit, department of Physiotherapy, CRP-Savar. So, I need permission for data collection from the prosthetics and orthotics unit of Physiotherapy department of CRP-Savar. I would like to assure that anything of my study will not be harmful for the participants.

May I, therefore pray and hope that you would be kind enough to grant my application & give me permission for data collection and oblige thereby.

Yours obediently,

Md. Saiyed Hossain

Md. Saiyed Hossain Rafi

4th professional B. Sc. in Physiotherapy

Roll: 12, Session: 2015-16, ID No: 112150283

Bangladesh Health Professions Institute (BHPI)

(An academic Institute of CRP)

CRP, Chapain, Savar, Dhaka-1343.

Forwarded for consideration.

10.06.2021

Approved

APPENDIX-3

সম্মতিপ

আসসালামুআলাইকুম,

□□ মোঃ □□□□□ হোসেন, এ□ □□□□□ প্রকল্প □□□□□□□ হেলথ প্রফেশ ইন্সটিটি (□□□□□□□□)- □ □□□□□□□ □□□ □□ □□□ চতুর্থ বর্ষ □□□□ □□ □□□□□□□□ কোর্স অন্তর্ভুক্ত। □□□ □□□□□□ □□□□□□ □□- **"□□ □□□-তে পুনর্বাসন সেবা সমাপ্তির □□ □□□□□□ স্তরে নিম্নাংশের কৃত্রিম □□ ব্যবহারকারীদের সন্তুষ্টির মাত্রা"** □□ মাধ্যমে □□ □□□□□ স্তরে কৃত্রিম গ□ ব্যবহারকারীদের সন্তুষ্টির মাত্রা □□□□ □□□। □□ □□□ □□□□□ আনুষঙ্গিক □□□প্র □□□ চাচ্ছি। □□□ □□□□□ □□-□□ □□□□ □□□ □□।

□□ □□□□□ □□□ যে, □□ □□□ অধ্যয়নের □□ □□□ □□ অন্য কোন উদ্দেশ্যে ব্যবহৃত □□ □□। □□□ যেসব তথ্য প্রদান □□□□ □□ গোপনীয়তা ব□□ □□□□ □□□ যেকোন প্রতিবেদনে বা প্রকাশনায় □□ নিশ্চিত □□ □□□ যে □□ তথ্যের উৎস অপ্রকাশিত থ□□□।

□□ অধ্যয়নে □□□□ অংশগ্রহণ স্বেচ্ছা প্রণোদীত এ□ □□□ যেকোন □□ □□ অধ্যয়ন থেকে নেতিবাচক □□□□ □□□□ □□□□ প্রত্যাহার □□□ □□□□□□। □□□□ □□□□ □□□ অপছন্দ □□□ কোন প্রশ্নের উত্তরনা দেওয়ার পূর্ণ □□□□ □ □□□□ □□□।

□□ অধ্যয়নে অংশগ্রহণকারী □□□□ □□ □□□□ কোন প্র □□□ □□□□ □□□ □□□□ □□□ / □□ □□□ □□□□□□□□ □□□□□□□□□, □□□□□□ অধ্যাপক, □□□□□□□□ □□□□, □□□□, □□□, □□□-□□□ তে যোগাযোগ কর□ □□□□।

সাক্ষাৎকার শু □□□ □□ □□ □□□□ কোন প্র □□?

-

□□□□ □□ □□ □□□□ □□□□□□ □□ সাক্ষাৎকার শু □□□ □□?

☐ হ্যাঁ ☐ □□

অংশগ্রহণকারীর স্বাক্ষর ও □□□ _____

উপাত্ত সংগ্রহকারীর স্বাক্ষর ও □□□ _____

সাক্ষীর স্বাক্ষর ও □□□ _____

APPENDIX-4

CONSENT STATEMENT

Assalamualaikum,

I am Md. Saiyed Hossain, 4th professional B. Sc. in Physiotherapy student of Bangladesh Health Professions Institute (BHPI) affiliated to the Faculty of Medicine, University of Dhaka. To obtain my Bachelor degree, I have to conduct a research project and it is a part of my study. My research title is **"SATISFACTION LEVEL OF LOWER LIMB PROSTHESIS USERS IN COMMUNITY LEVEL AFTER COMPLETING REHABILITATION PROTOCOL IN CRP."** By this I would like to know the satisfaction level among the prosthesis users in the community. Now I want to ask some related questions. This will take approximately 20-30 minutes.

I would like to inform you that this is a purely academic study and will not be used for any other purpose. Your participation in the research will have no impact on your present or future treatment in this area. All information provided by you will be treated as confidential and in the event of any report or publication it will be ensured that source of information remains anonymous.

Your participation in this study is voluntary and you may withdraw yourself at any time during this study without any negative consequences. You also have the right not to answer a particular question that you do not like or want to answer during interview.

If you have query about the study or your right as a participant, you may contact with me and/or my research supervisor Ehsanur Rahman, Associate Professor, Physiotherapy Department, BHPI, CRP, Savar, Dhaka-1343.

Do you have any question before I start?

-

So may I have your consent to proceed with the interview?

☐ Yes ☐ No

Signature and date of the participant _____

Signature and date of the interviewer _____

Signature and date of the witness _____

APPENDIX-5

প্রশ্নপ

□. ব্যক্তি গততথ্য

তথ্য গ্রহণের □□□□	
রোগীর □□□	
ঠিকানা	
মোবাইল নাম্বার (য□□ □□□□)	

□. □□□□□□ □□□ জনসংখ্যাতাত্ত্বিকতথ

প্রশ্নাবলী	প্রতিক্রিয়	কোড
□. □□□		
□. লিঙ্গ	□. পুরুষ	□
	□. □□□	□
□. শিক্ষাগত যোগ্যতা	□. অশিক্ষিত	□
	□. প্রাথমিক	□
	□. মাধ্যমিক	□
	□. উচ্চমাধ্যমিক	□
	□. স্নাতক	□
	□.স্নাতকোত্তর	□
□. বৈবাহিক অবস্থা	□. □□□□□	□
	□. □□□□□□	□
	□. তালাকপ্রাপ্ত	□
	□. বিচ্ছেদ	□

□. পেশা	□. □□□□□ কর্মচারী	□
	□. বেসরকারি কর্মচারী	□
	□. ব্যবসায়ী	□
	□. ছাত্র	□
	□. □□□□	□
	□.অবসরপ্রাপ্ত	□
	□. বেকার	□
□. □□□□□□ স্থান	□. গ্রাম	□
	□. □□□	□
	□. মফস্বল	□
□. □□□□ যোগ্য স্থানের ধরণ	□. □□□	□
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	□. □□□	□
□. উপার্জনক্ষম ব্যক্তির সংখ্যা		
□. □□□□□□ □□ (□□□)	□. < □□□	□
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□. অঙ্গহানিসম্পর্কিততথ

প্রশ্নাবলী	প্রতিক্রিয়	কোড
□□. অঙ্গ□□□□ □□□	□. □□□□□□□□ □. □□□□□ □□□□	□ □
□□. অঙ্গহানির কারণ	□. দূর্ঘটনা □. রোগগত	□ □
□□. অঙ্গহানির তারিখ		
□□. অঙ্গহানির অবস্থান	□. □□□ □. □□□ □. উভয় পার্শ্বে	□ □ □
□□. স্টাম্পে (অবশিষ্টঅ) □□□	□. মোচক আকৃতি □. বেলন আকৃতি □. □□□/লাঠিআ·□□□	□ □ □
□□. কৃত্রিম পা-এ□ □□□	□. হাঁটুর নিচে একপার্শ্বে □. হাঁটুর নিচে উভয় পার্শ্বে □.হাঁটুর উপরে একপার্শ্বে □.হাঁটুর উপরে উভয় পার্শ্বে	□ □ □ □
□□. আপনি কত দিন যাবত কৃত্রিম পা ব্যবহার করছেন?	□. □ □□□□□ □□ □. □□□□ - □ □□□ □. □ বছরের বেশি	□ □ □
□□. আপনি দিনে গড়ে কত ঘন্টা কৃত্রিম পা ব্যবহার করেন?		
□□. আপনি কি কৃত্রিম পা ব্যবহার করে চেয়ার থেকে উঠতে সক্ষম?	□. হ্যাঁ □. □□	□ □

□□. আপনি কি কৃত্রিম পা ব্যবহার করে বাড়িতে হাঁটতে সক্ষম?	□. হ্যাঁ □. □□	□ □
□□. আপনি কি কৃত্রিম পা ব্যবহার করে □□□□ □□□□□ □□□□□ □□□□□ □□□□□ সক্ষম?	□. হ্যাঁ □. □□	□ □
□□. আপনি কি কৃত্রিম পা ব্যবহার করে বাড়ির বাহিরে দূর্যোগপূর্ণ আবহাওয়ায় হাঁটতে সক্ষম?	১. ২.	□. হ্যাঁ □. □□	□ □
□□. আপনি কি কৃত্রিম পা ব্যবহার করে হাতল ছাড়া সিঁড়ির কয়েকটি ধাপ উঠতে সক্ষম?	□. হ্যাঁ □. □□	□ □
□□.আপনি কি কৃত্রিম পা ব্যবহার করে হাতল ছাড়া সিঁড়ি থেকে কয়েকটি ধাপ নামতে সক্ষম?	১. হ্যাঁ ২.	□. হ্যাঁ □. □□	□ □
□□. আপনি কি কৃত্রিম পা ব্যবহারের ফলে কোন প্রকার জটিলতায় (ফুলে □□□□, ফোস্কা, □□, □□□, হাঁড় বৃদ্ধি) □□□□□?	□. হ্যাঁ □. □□	□ □

. Quebec User Evaluation of Satisfaction with assistive Technology

QUEST (Version 2.0)

. কৃত্রিম পা-এ , থেকে আপনি কতটুকু সন্তুষ্ট?					
. কৃত্রিম পা-এর ওজনের দিক থেকে আপনি কতটুকু সন্তুষ্ট?					
. কৃত্রিম পা সহজে লাগানো ও খোলার দিক থেকে আপনি কতটুকু সন্তুষ্ট?					
. কৃত্রিম পা ব্যবহারে সুরক্ষা ও নিরাপত্তা নিয়ে আপনি কতটুকু সন্তুষ্ট?					
. কৃত্রিম পা-এর স্থায়িত্বের দিক থেকে আপনি কতটুকু সন্তুষ্ট?					
. কৃত্রিম পা ব্যবহার কতটা সহজ বলে ?					
. কৃত্রিম পা ব্যবহার কতটা আরামদায়ক ?					
. কৃত্রিম পা আপনার দৈনন্দিন প্রয়োজন মেটাতে কতটুকু কার্যকর বলে ১ ?					

সেবা	□□□□□□□□ সন্তুষ্ট ন□	বেশি সন্তুষ্ট ন□	□□□□ সন্তুষ্ট	মোটামুটি সন্তুষ্ট	□□□ সন্তুষ্ট
□. আপনি যে কেন্দ্রে সেবা নিয়েছেন সে কেন্দ্রের সেবার মানের দিক থেকে আপনি কতটুকু সন্তুষ্ট?	□	□	□	□	□
□□. কেন্দ্র থেকে কৃত্রিম পা-এর মেরামত ও সার্ভিসের মানের দিক থেকে আপনি কতটুকু সন্তুষ্ট?	□	□	□	□	□
□□. কৃত্রিম পা ব্যবহার করানোর জন্য দায়িত্বে নিয়োজিতদের পেশাগত সার্ভিসের মানের দিক থেকে আপনি কতটুকু সন্তুষ্ট?	□	□	□	□	□
□□. কৃত্রিম পা-এর জন্য পুনরায় সেবা প্রাপ্তির দিক থেকে আপনি কতটুকু সন্তুষ্ট?	□	□	□	□	□

- নিচে পূর্বের ১২টি সন্তুষ্টির তালিকা আছে। উক্ত ১২টি বিষয়ের মধ্যে আপনার নিকট সবচেয়ে বেশি গুরুত্বপূর্ণ মনে হয় এমন ৩টি টি বিষয় চিহ্নিত করুন। চিহ্নিত বিষয়গুলির উপর টিক(√) দিন।

□. □□□-□□□□	□. □□□□□□□
□. □□□	□. কার্যকারীতা
□. লাগানো ও খোলা	□. সেবার মান
□. নিরাপত্তা	□□. মেরামত
□. স্থায়িত্ব	□□. পেশাগত সেবা
□. ব্যবহারে সহজ	□□. পুনরায় সেবা

APPENDIX-6

QUESTIONNAIRE

A. Personal Information

Date of assessment	
Patient's name	
Address	
Contact number (if possible)	

B. Socio-demographic Information

Questions	Response	Code
1. Age		
2. Sex	1. Male 2. Female	1 2
3. Educational level	1. Illiterate 2. Primary 3. Secondary 4. Higher secondary 5. Graduate 6. Post graduate	1 2 3 4 5 6
4. Marital status	1. Married 2. Unmarried 3. Divorced 4. Separated	1 2 3 4

5. Occupation	1. Government employee 2. Non-government employee 3. Businessman 4. Student 5. House wife 6. Retired 7. Unemployed	1 2 3 4 5 6 7
6. Living area	1. Rural 2. Urban 3. Semi-rural	1 2 3
7. Type of living place	1. Building 2. Tin shaded 3. Mud house	1 2 3
8. Earning persons in the family		
9. Family income (monthly)	1. < 2000 2. 2000-5000 3. 5001-8000 4. 8001-12000 5. < 12000	1 2 3 4 5
10. Family expenditure (monthly)	1. < 2000 2. 2000-5000 3. 5001-8000 4. 8001-12000 5. < 12000	1 2 3 4 5

C. Amputation Related Information

Questions	Response	Code
11. Type of amputation	1. Transtibial (TT) 2. Transfemoral (TF)	1 2
12. Cause of amputation	1. Accident 2. Pathological	1 2
13. Date of amputation		
14. Site of amputation	1. Right 2. Left 3. Bilateral	1 2 3
15. Shape of stump (residual limb)	1. Conical 2. Cylindrical 3. Club shaped	1 2 3
16. Type of prosthesis	1. Unilateral TT 2. Bilateral TT 3. Unilateral TF 4. Bilateral TF	1 2 3 4
17. How long you are using prosthesis?	1. Less than 6 months 2. 6 months – 1 year 3. More than 1 year	1 2 3
18. How many hours do you use the prosthesis in an average per day?		
19. Are you able to get up from chair by using lower limb prosthesis?	1. Yes 2. No	1 2
20. Are you able to walk in home by using lower limb prosthesis?	1. Yes 2. No	1 2

21. Are you able to walk outside on uneven ground by using lower limb prosthesis?	1. Yes 2. No	1 2
22. Are you able to walk outside on inclement weather by using lower limb prosthesis?	1. Yes 2. No	1 2
23. Are you able to go up a few steps (stairs) without a handrail by using lower limb prosthesis?	1. Yes 2. No	1 2
24. Are you able to go down a few steps (stairs) without a handrail by using lower limb prosthesis?	1. Yes 2. No	1 2
25. Do you have any complications (edema, blisters, ulceration, gangrene, protruded bone) caused by using lower limb prosthesis?	1. Yes 2. No	1 2

D. Quebec User Evaluation of Satisfaction with assistive Technology

QUEST (Version2.0)

Assistive Device **How satisfied are you with**	**Not satisfied at all**	**Not very satisfied**	**More or less satisfied**	**Quite satisfied**	**Very satisfied**
1. The dimensions (size, height, length, width) of your assistive device?	1	2	3	4	5
2. The weight of your assistive device?	1	2	3	4	5
3. The ease in adjusting (fixing, fastening) the parts of your assistive device?	1	2	3	4	5
4. How safe and secure your assistive device is?	1	2	3	4	5
5. The durability (endurance, resistance to wear) of your assistive device?	1	2	3	4	5
6. How easy it is to use your assistive device?	1	2	3	4	5
7. How comfortable your assistive device is?	1	2	3	4	5
8. How effective your assistive device is (the degree to which your device meets your needs)?	1	2	3	4	5

Services **How satisfied are you with**	**Not satisfied at all**	**Not very satisfied**	**More or less satisfied**	**Quite satisfied**	**Very satisfied**
9. The service delivery program (procedures, length of time) in which you obtained your assistive device?	1	2	3	4	5
10. The repairs and servicing (maintenance) provided for your assistive device?	1	2	3	4	5
11. The quality of the professional services (information, attention) you received for using your assistive device?	1	2	3	4	5
12. The follow-up services (continuing support services) received for your assistive device?	1	2	3	4	5

- Below is the list of same 12 satisfaction items. Please select the three items that you consider to be the most important to you. Please put an (√) in the 3 numbers of your choice.

1. Dimensions
2. Weights
3. Adjustments
4. Safety
5. Durability
6. Easy to use
7. Comfort
8. Effectiveness
9. Service delivery
10. Repairs/servicing
11. Professional service
12. Follow-up services