LEVEL OF FUNCTIONAL PERFORMANCE AFTER LOWER LIMB PROSTHETIC REHABILITATION

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

Level of Functional Performance after Lower Limb Prosthetic Rehabilitation

Submitted by **Rana Chandra Paul,** for the partial fulfillment of the requirements for the degree of Bachelor of Science in Physiotherapy (B.Sc. PT).

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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 declare that for any publication, presentation or dissemination of information of the study. I would be bound to take written consent from Department of Physiotherapy of Bangladesh Health Professions Institute (BHPI).

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Acronyms

AKA	Above Knee Amputation
BHPI	Bangladesh Health Profession Institute
BKA	Below Knee Amputation
BMRC	Bangladesh Medical Research Council
CRP	Centre for the Rehabilitation of Paralysed
IRB	Institutional Review Board
LCI	Locomotor Capabilities Index
LLA	Lower Limb Amputation
PEQ-MS	Prosthesis Evaluation Questionnaire- Mobility Subscale
TFA	Trans Tibial Amputation
TTA	Trans Femoral Amputation
WHO	World Health Organization

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Abstract

Purpose: To identify the level of functional performance after lower limb prosthetic rehabilitation. *Objectives:* To explore the socio-demography (age, sex, occupational status, and living area) of the lower limb prosthetic users. To find out the basic and advance capabilities by Locomotor Capabilities Index-5 (LCI-5) of lower limb prosthetic users. *Methodology*: The study design was cross-sectional. Total 40 samples were selected conveniently for this study from the Prosthetic and Orthotic department of CRP. Data was collected by using Locomotor Capabilities Index-5 (LCI-5). Descriptive statistic was used for data analysis which focused through table, pie chart and bar chart. *Results:* Among the 40 participants 14 (35%) participants were in age group between 15-25 years, 11 (27.5%) were in age group between 26-35 years, 8 (20%) participants were in age group 36-45 years and 7 (17.5%) participants were in age group 45-55 years. There mean age was 32.58±11.151 years. Overall 72.5% participants were between age group 15-35 years and 37.5% participants were between age group 36-55 years. In this study, 29 (72.5%) participants were male and 11 (27.5%) participants were female. Most of the participants 11 (27.5%) were businessmen, 8 (20%) were student, 6 (15%) were housewife, 5 (12.5%) were job holder and about 18 (45%) people were lived in urban area about 22 (55%) people were lived in rural areas. Of all amputations, 33 (82.5%) were unilateral amputees and 7 (17.5%) were bilateral amputees. Further, 33 (82.5%) unilateral amputees, 23 (57.5%) were right sided and 10 (25%) were left sided amputees. In percentage 28 (70%) were below knee amputation and 12 (30%) were above knee amputation. Averagely 27 (67.5%) prosthetic users able to perform basic activities alone without ambulation aids and 12-13 (30%-32.5%) prosthetic users able to perform advance activities alone without ambulation aids. *Conclusion:* From this study it could conclude that the level of functional performance is defer with the age, sex, side and level of prosthesis limb use. This study will the researcher for further study and the health professionals those are involve with treat prosthetic users.

Key wards: Amputation, prosthetic limb, prosthetic rehabilitation, Locomotor Capabilities Index LCI etc.

CHAPTER-I INTRODUCTION

1.1 Background

Amputation is one of the major causes of permanent disability (Pooja & Sangeeta, 2013). In addition, amputation can often be associated with anxiety, isolation and depression which may change the social and free time activities of the person with lower limb amputation (Deans et al., 2008).

Lower limb amputation is a permanent surgical procedure that has important functional and sequelae that can influence the daily activity of the person with amputation (Van Twillert et al., 2014). Although rehabilitation aims to address these measuring the effect of these interventions on rehabilitation outcomes of people who have had an LLA remains a challenge (Coffey et al., 2014). The selected outcomes must be related to rehabilitation goals that are specific to each person and associated with premorbid function (Horne & Neil, 2009). This is surprising given that amputee rehabilitation programs have common goals to improve mobility and functioning through prosthetic fitting to assist community reintegration and to ultimately improve the overall functional activity of persons with an LLA (Zidarov et al., 2009). The best possible restoration of mobility and locomotor function represents the cornerstone of rehabilitation programs (Franchignoni et al., 2007).

Lower limb amputation (LLA) is life-changing surgery (Geertzen et al., 2015). Shorter residual limbs are known to place greater physiological strain on patients than longer residual limbs; however, there is ongoing debate as to whether through-knee amputations are preferable to above-knee amputations (Penn-Barwell et al., 2011). The best possible restoration of mobility and locomotor function is a primary goal of rehabilitation programs following lower limb amputation (Larsson et al., 2009). To accurately examine the impact of therapeutic interventions, in particular of prosthetic (Robert, 2008). The extent of the likely impact on a specific patient treated with lower-limb amputation (LLA) will depend on a variety of factors, one of the principal ones being the height of amputation (Penn-Barwell et al., 2011). The use of physical activity to prevent and treat disease is an ancient concept, yet only recently has scientific evidence become available to support its many

benefits (Deans et al., 2008). Equally, those who face physical or psychological challenges or a combination of these can benefit from physical activity as advocated by many international health communities (AlSofyani et al., 2016).

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 (De Laat et al., 2011). 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-pelvectomy (removal of half of the pelvis). In high income countries, dysvascularity is the foremost cause of amputation; as a corollary the majority of amputations involve the lower limbs (Ziegler-Graham et al., 2008).

Providing a satisfactory, functional prosthesis following lower-limb amputation is a primary goal of rehabilitation. The objectives of this study were to describe the rate of successful prosthetic fitting; describe prosthetic use after amputation; and determine factors associated with greater prosthetic fitting, function, and satisfaction (Webster et al., 2012). A relationship between the level of activity and prosthetic components prescription was not found. The study shows that an agreement could not be found in the prescription criteria for any of the investigated prosthetic components (De Laat et al., 2011). The lack of guidelines that indicate the criteria for prescribing each prosthetic component could be the sole for those findings (Coffey et al., 2014).

By comparison, the evidence for superior walking ability after more distal and unilateral amputation levels is strong. This is likely to be related to the increased energy requirements to walk with above knee and bilateral prostheses (Sansam et al., 2009). In a medium quality article, reported that the presence of phantom pain was significantly associated with the ability to use a prosthesis and phantom limb pain specifically was not reported as a predictive factor outcome measure in previous studies (Van Eijk et al., 2012). In two separate high quality studies, reported that patients who had early rehabilitation initially made higher motor gains than those individuals who had later rehabilitation (Stineman et

al., 2010). Additionally, patients who received acute postoperative inpatient rehabilitation, compared to those with no evidence of inpatient rehabilitation, had an increased likelihood of one-year survival and home discharge. Prosthetic limb procurement did not differ significantly between groups (Obalum & Okeke, 2009).

A shorter time interval between surgery and admission for rehabilitation is related to better walking potential (Sansam et al., 2009). Similarly, the length of time taken from surgery to fitting for a prosthesis is significantly associated with outcome, with those waiting longer having poorer walking ability at one year. Reported trans-tibial (TTA) and trans-femoral amputee (TFA) patients were equally likely to ambulate independently or with assistance (within groups) at hospital discharge. Between groups, however, there were significant differences based on level of amputation. Patients who underwent a minor amputation were more likely to ambulate with or without assistance (Suckow et al., 2012).

Rates of amputations vary significantly both between and within countries (Awori & Ating, 2007). This is due to socio-economic and organizational environment and the clinicians' decision making (Stineman et al., 2010). The Orthotics and Prosthetics Users' Survey was designed to evaluate lower-extremity functional status and device satisfaction related to provision for both children and adults (Razak et al., 2016).

The rates of success were similar: 31% and 33% of amputees with trans-tibial (TTA) and trans-femoral (TFA), respectively, achieved mobility success when seen in a comprehensive inpatient rehabilitation unit (Czerniecki et al., 2012). The importance of an intact knee joint for providing the TTA patient with the ability to return to high-level mobility activities following rehabilitation. The majority of studies reported better walking ability and greater ability to achieve ADLs after distal and unilateral amputations compared with more proximal or bilateral amputations (Obalum & Okeke, 2009). Increased age was associated with significantly less prosthetic ambulation and age does have a role in prosthetic and functional determinations but that it should not restrict candidacy. (Jawaid et al., 2008).

1.2 Rationale

Lower extremity amputation is seen in clinical practice. Most of the cases have injuries caused by various disease or trauma. In recent years, disability caused by amputation has increased every year with the development of our country. Due to the improvement of clinical treatment, the survival rates of the patients will increase. This study describes the impact of lower limb amputation of different levels on patients' lives. The results indicate that level of functional performance of individual lower limb amputee patients after prosthetic rehabilitation.

There is no such relevant research has been conducted in this field yet in Bangladesh. The great majority of individuals with lower limb prosthetic have limitation in physical functioning especially problem in locomotion or mobility. So for their better future and integration in the social activity needs to give appropriate prosthetic training and rehabilitation. Fear of falling and fall during ambulation are one of the most common complain following lower limb prosthesis and may require proper prosthetic training program. Rau et al. (2007) shown that a short and intensive physiotherapy programme yields positive results in terms of improving the walking speed, the intervention being the best predictor of the main outcome.

The purpose of this study was to describe the level of functional performance of prosthetic rehabilitation patient. The study helps to find out the locomotion level of lower limb amputation patients by activities measurement with prosthesis such as sit to stand, walk, stair up and down, walk outside in different environmental condition etc. In addition, this study aims at demonstrating the importance of adequate prosthetic training or rehabilitation. Finding of this study will be brought to authority concerned for future study.

1.3 Research question

What is the level of functional performance after lower limb prosthetic rehabilitation?

1.4 Objectives

1.4.1 General objective

To find out level of functional performance after lower limb prosthetic rehabilitation.

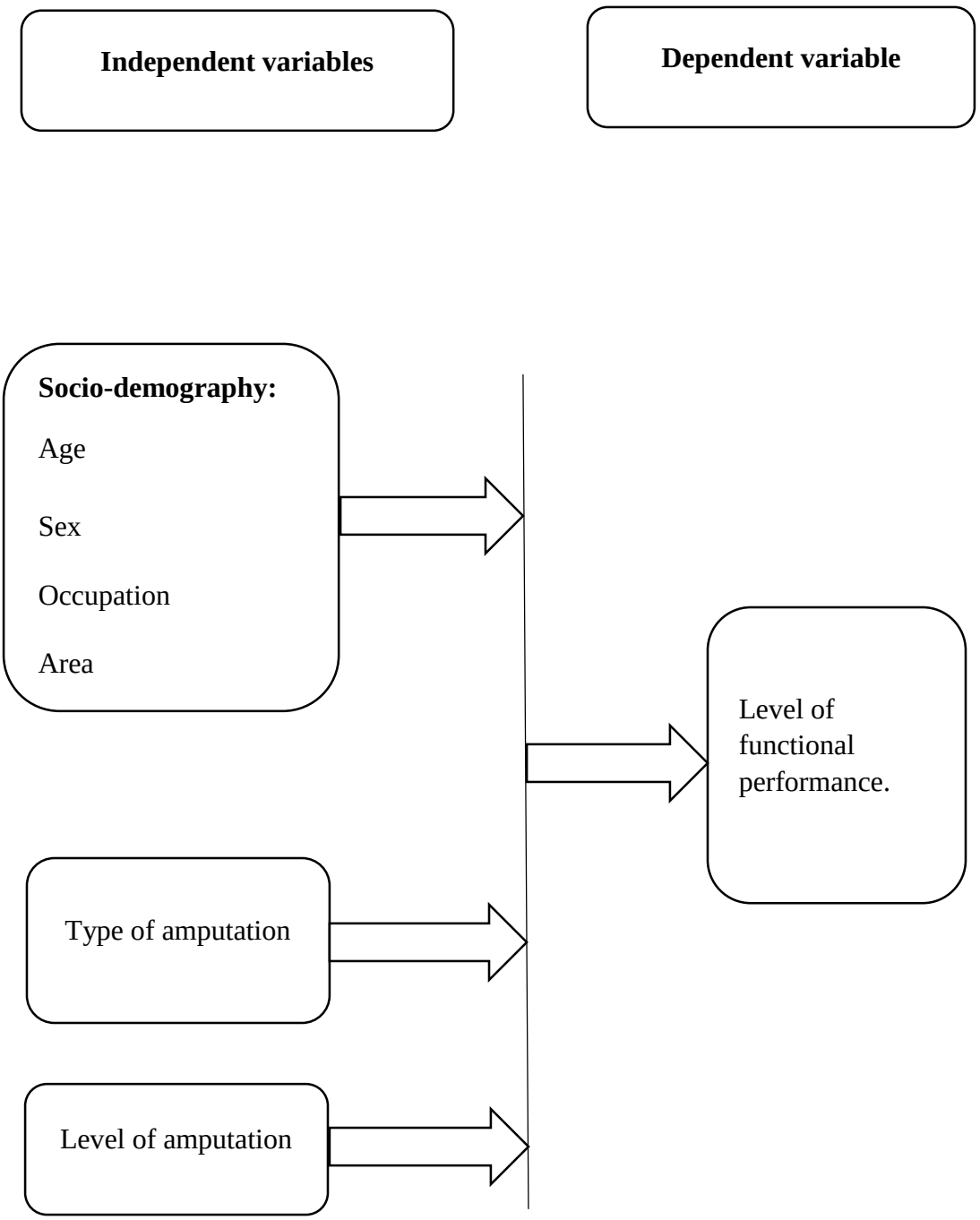
1.4.2 Specific objectives

I. To find out the socio-demographic information of the lower limb prosthetic patients.

II. To find out the basic capabilities after prosthetic rehabilitation using Locomotor Capabilities Index-5 (LCI-5).

III. To find out the advance capabilities after prosthetic rehabilitation using Locomotor Capabilities Index-5 (LCI-5).

1.5 Conceptual framework



1.6 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.

Functional performance

A technique to define the requirements of a project, product or service based on the required functions and the specific needs related to those functions. For each function, needs are expressed in terms of assessment criteria, levels of performance and flexibility for each level.

Locomotor Capabilities Index (LCI)

Locomotor Capabilities Index (LCI) were developed to delineate the prosthetic profile of the person with LLA but more specifically to identify the factors related to prosthetic use or nonuse the LCI refers to one particular question of the PPA (Prosthetic Profile of Amputation) but can be used independently.

Prosthetic rehabilitation

The Prosthetic rehabilitation program provides limb absence rehabilitation for patient who have experienced amputation as a results of various cause like trauma, infection or congenital etc.

CHAPTER-II LITERATURE REVIEW

Major lower extremity amputation is a common procedure that results in a profound change in a patient's life (Chalya et al., 2012). We sought to determine the association between social support and outcomes after amputation. We hypothesized that patients with greater social support will have better post amputation outcomes (Webster et al., 2012).

One of the primary goals of rehabilitation following lower-limb amputation is the successful fitting of a prosthesis and use of the prosthesis to achieve functional mobility (Kahle et al. 2016). Greater prosthesis use has been associated with higher levels of function and independence via improved self-care and mobility as well as improved perceived quality of life and employment success (Sansam et al., 2009). Satisfaction with both the functional utility and cosmetic appearance of the prosthesis is also an important outcome of prosthetic restoration (Highsmith et al., 2016). In order to maximize outcomes following lower-limb amputation, it is essential to better appreciate the factors that affect both prosthesis use and satisfaction, particularly any modifiable factors that might be targeted in rehabilitation interventions (Webster et al., 2012).

There is no consensus on the most appropriate outcome measure for patients with a lower-extremity amputation, and a wide array has been used in previous studies (Coffey et al., 2014). The outcome measures included in this study were used solely because they best allowed the pooling of data (Penn-Barwell et al., 2011). The only outcome measure in this analysis that is well validated and that incorporates physical functioning, role limitation, energy, pain and perception of health and is therefore regarded as the principal outcome measure (AlSofyani et al., 2016).

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 (Pooja & Sangeeta, 2013). 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%) (Pooja & Sangeeta, 2013). Non ambulatory status preoperatively, having an above-knee amputation, being home bound preoperatively, dementia, being over 60 years of age, having end-stage renal failure and having a coronary artery disease may be associated with not wearing a

prosthesis (Yari et al., 2008). People over the age of 70 and those with a bilateral lower limb amputation might not walk after the amputation (Tashkandi et al., 2011). Other physical problems associated with amputation include phantom sensations and phantom pain (Mosaku et al., 2009).

The global incidence of amputation is unknown, available data evidence considerable variation both between and within countries. The major amputation rate was 5·1 per 100 000 population and did not change over the 5 years (Moxey et al., 2010). 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 (Mont, 2007). Using a standard protocol for data collection, the Global Lower Extremity Amputation Study Group assessed the incidence of lower limb amputation in ten different locations worldwide and reported marked differences among test sites in their annual rates of lower limb amputation (Yari et al., 2008). According to newest statistics in the United State of America, about 1.7 million people live with amputations and the number has increased in recent years (Mousavi et al., 2012). Comparison of all-cause amputation rates during the 1995-1997 period, revealed lowest age-adjusted rates of first major lower limb amputation in Madrid, Spain (0.5 per 100,000 women, 2.8 per 100,000 men) while highest rates were reported in the Navajo region of the United States (22.4 per 100,000 women, 43.9 per 100,000 men) (Moxey et al., 2010). In the United States it is estimated that one out of every 190 persons has lost a limb; the number of persons living with amputation in the U.S. is projected to increase over two-fold to 3.6 million by the year 2050 if current trends continue (Ziegler-Graham et al., 2008).

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, 2007). Another important factor is the average age of the lower limb amputee population; the Scottish amputee population is predominantly elderly with around 80% of primary amputees over 60 and more than 20% over 80 (Verghese et al., 2008). On those attending a sub-regional English limb center, with trans-tibial amputation accounting for 50.5% and trans-femoral 49.5% of the vascular or diabetic cases (87.5% of the total amputee population) (Deans et al., 2008). These demographics give an indication of the low

preoperative activity levels likely in this group, and suggest that post-operative activity levels may also be reduced (Van Eijk et al., 2012). Following on from this, found that physical mobility was the only independent factor which significantly affected quality of life in amputees as measured by the Nottingham Health Profile and when compared with their nondisabled counterparts (Chin & Toda., 2016). Based on this novel research, one can speculate that creation of pre-operative and post-operative personalised activity programs will ultimately reduce the incidence of amputation by the reduction of metabolic disorders such as diabetes (Vrieling et al., 2008).

The incidence of vascular major lower limb amputations is higher in the developed countries than that reported in the developing ones mainly due to the ageing population (Awori & Ating, 2007). Safe and confident gait is important for mobility, especially for people with lower extremity amputations (Kendell et al., 2016). In the general population aged 45years, the incidence of vascular LLA at or proximal to the trans-metatarsal level is eight times higher in diabetic than in nondiabetic individuals. One in four amputees may require contralateral amputation and/or reamputation (Johannesson et al., 2009). Musculoskeletal imbalances or pathologies often develop into secondary physical conditions or complications that may affect the mobility and quality of life of people with lower limb amputation (Robert, 2008).

For appropriate lower limb prosthetic components prescription, the selection should match the prosthetic wearer's activity level (Malaheem, 2014). In this context, prosthetic wearer's activity level describes an amputee's functional status and is identified from the patients' self-report as well as the use of mobility scales (Chalya et al., 2012). Amputation due to injury is relatively rare and is the cause of only 10–20% of lower-limb loss in the developed world (Kahle et al., 2016). Approximately 55% of civilian LLA for trauma are BKA, 40% AKA and 1% bilateral amputations. Because of the low incidence of bilateral amputation, most studies recruit low numbers of these amputees (Amaefula et al., 2015).

Pain and employment require little explanation; the ability to walk 500 meter and the duration of daily prosthesis are less obvious measures (Kendell et al., 2016). The ability to walk a distance equivalent to approximately 500 meter has been identified as a key threshold to enable independent living and was used as it was possible to collate data across

a range of studies, unlike the wide range of other measures of mobility that were also used (Christiansen et al., 2015). Prosthesis use is widely regarded as an outcome measure because it is believed to be a surrogate marker of the extent of rehabilitation and stump health but has not been validated as such (Penn-Barwell et al., 2011).

The main phases of prosthetic rehabilitation are: pre-prosthetic management; postoperative care; prosthetic training; and long-term follow-p care including community reintegration and vocational rehabilitation (AlSofyani et al., 2016). During prosthetic training, the patient must learn how to don and doff 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 and persons with cognitive deficits may struggle to retain this new information or to initiate new behaviors necessary for optimal rehabilitation (Davie-Smith et al., 2016). Cognitive screening may be beneficial in identifying impairments and potential barriers to new learning, in informing planning and setting of rehabilitation goals and, when appropriate, identifying compensatory strategies to assist in achieving rehabilitation goals (Deans et al., 2008). For 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, 2007).

The social impact of amputation can be substantial. Recovery and rehabilitation encompasses reintegration into the family, community, and for some the work place, and may require negotiation of evolving roles, relationships and identities (Horne and Neil, 2009). Major lower limb amputation which significantly compromises mobility can necessitate significant adaptations to the patient's home or transition into residential care (Coffey et al., 2014). Changes and restrictions in participation are commonly reported after limb amputation and may be related to personal (e.g. functional abilities, balance confidence, social discomfort, public self-consciousness, emotional impact of amputation,

changes in goals and priorities) and/or external constraints (e.g. lack of accessibility, climate, transportation issues) (Tashkandi et al.,2011).

For measuring mobility, the ease and objectivity of a timed walking test is appealing. Specifically for an elderly population, including amputees, a test that incorporates a sit-to-stand and a turn, such as the Time up and go, seems appropriate (Deans et al., 2008). Currently, we believe that the addition of the LCI-5 would provide important information on community mobility (Franchignoni et al., 2007).

In the field of prosthetics, there is an increasing acknowledgement by practitioners, clinicians and therapists of the need to measure the outcomes of their practice (Amaefula et al., 2015). The goals of assessing health outcomes are to improve the quality of care, the quality of health, and thus ultimately the quality of life of patients (Davie-Smith et al., 2016). As the aim of providing people with more effective body functioning is central to the fitting of a limb prosthesis most outcomes research is concerned with ensuing physical adjustment (Deans et al. 2008). Amputation as a result of military conflict or civilian violence continues to constitute a serious public health problem in some regions (Franchignoni et al., 2015).

Lower limb amputation is also associated with morbidity and mortality. The survival rate varies across countries but mortality rate is generally high (Mousavi et al., 2012). Old age and higher anatomical level of amputation are associated with poor survival and the mortality rate is higher in both people with diabetes and people who do not have diabetes (Papazafiropoulou et al., 2009).

Individuals with amputations have a complex range of rehabilitation needs and are faced with multiple and evolving 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 (Czerniecki et al., 2012).

These findings support the need for greater acknowledgement by healthcare professionals involved in the care of those with amputation about the importance of the patient's social relationships with friends and family (Highsmith et al., 2016). Education about importance of increasing and maintaining a level of physical activity conducive to health benefits should be based on the implementation of such within a supportive sociable environment for the patient with lower limb amputation (Verghese et al., 2008).

Depressive symptomatology is the most commonly documented mood disturbance following amputation, estimates suggest that between 13% and 32% of individuals with limb amputations might experience significant depressive symptoms at any one time (Wegener et al., 2009). However, the totality of the rehabilitation experience and the entire rehabilitation team can impact on the patient's psychological and social wellbeing (Zidarov et al., 2009). Working within the limits of their professional competencies, team members, including the patient and their family, share responsibility for attending to psychosocial health across the continuum of care (Wegener et al., 2009).

Patients with amputation secondary to diabetes have elevated morbidity. The patient's overall health status complicates the challenge of amputation rehabilitation (Robert Gailey, 2008). Traumatic amputation (associated with mechanical, chemical, thermal and/or electrical injuries), is more common amongst working-age adults who are otherwise in good health. Trauma is the most common cause of acquired upper limb amputation (Kahle et al., 2016). The typical dysvascular patient with an amputation is older than 60 years of age and commonly experiences comorbidities; postoperative morbidity and mortality rates are high (Davie Smith et al., 2016).

Amputation may influence negatively on mobility, emotion, sleep, pain and social function (De Laat et al., 2011). Some people with a lower limb amputation can be mobile around their home while others may require a walking aid or use a wheelchair (Highsmith et al., 2016). Amputation may result in an inability to leave home (home bound) even with the assistance of the family thus impacting negatively on involvement in social activities (Gholizadeh et al., 2016). Even those who are able to leave home tend to use wheelchairs and only a few use walking aids. However, some people with a lower limb amputation

remain independent despite infrequent use of their prostheses and outdoor ambulation (Huang et al., 2016). Despite all the challenges faced by people following lower limb amputation some remain independent in activities of daily living and use their prostheses (Johannesson et al., 2009).

Lower limb amputee patient, they are also not able to use a knee and ankle strategy (Vrieling et al., 2008). So in that case, patient who had undergone amputation received artificial limbs give little attention to rehabilitation training including lower limb strengthening exercise, weight bearing exercise, gait training, obstacle management (walking on uneven ground) and functional training have improved their performance (Rau et al., 2007).

Recent years have seen considerable advancement in the field of lower limb prosthetics. The development of powered prostheses has provided a potential gateway for lower limb trans-femoral amputees to walk on different terrains (Malaheem, 2014). In this study, we investigated using muscle synergies to classify locomotion modes for use in trans-femoral prostheses control (Salman and Laporte, 2010).

Amputation is a distressing experience that is likely to pose considerable challenges in terms of psychological and social adjustment (Geertzen et al., 2015). Not only does this procedure incur permanent physical loss, it may also lead to restrictions in many other important life domains (Highsmith et al., 2016). Limb amputation can lead to significant psychological and social dysfunction among some individuals, while many others adjust and function well (Desmond and MacLachlan, 2010).

Amputation affects the life of amputees greatly. Due to physical disability amputees suffer from many psychosocial problems (Hamamura et al., 2009). Unless he or she presents with apparent behavioral abnormally there is little attention given on the psychological state of the individual (Johannesson et al., 2009). In restraining long-term disabilities in an amputee early finding and treatment of psychological morbidity is very important (Highsmith et al., 2016). Cave paintings in Spain and France, about 36,000 years ago, have shown delineate of a mutilated hand (Ukibe et al., 2016).

Rig-Veda, an ancient sacred Indian poem, is supposed to have first written record of prosthesis. Written in Sanskrit between 3500 and 1800 Before Christ, it described story of a warrior, Queen Vishpla, who was fitted with iron prosthesis after losing her leg in battle and returned to battle (Horne et al., 2009). Amputation has been practiced for ritualistic, vindictive, curative, or vocational reasons since 43,000. Fitting with prostheses made of fiber, wood, bone, and metals, often lined with rags, practiced since at least 1,500 (Hamamura et al.,2009).

The evolvement of amputation as a successful technique in the treatment of injuries in World War I resulted in the first large group of amputees in history (Horne et al., 2009). From the time of surgery until return to normal life in the community, the majority of amputees are besiege in many suspicion and fears (Chalya et al., 2011). The amputee most often oppress for the lost limb and the old body image and is thought to go through four or five stages as a part of their oppressing process, that is, refusal, anger, dealing, depression, and acceptance. This often assimilates the way in which people usually respond to the death of a loved one or when being diagnosed with a life threatening illness (Chin and Toda, 2016).

Interposition in the amputee's distress addresses the psychological side of injury and healing which is foremost to physical rehabilitation. Investigators have noted high prevalence of depressive and anxiety symptoms in amputees (Czerniecki et al., 2012). Prosthetic rehabilitation is complex and versatile, involving both physical and psychosocial challenges for the patient (Gholizadeh et al., 2016). It aims to optimize health, function, and distinction, quality of life (Larsson et al., 2009). After discharge from rehabilitation, a long term acclimatization phase begins, during which the harsh realities of the disability are felt by the amputee patient in their own living environment without the direct support of the multidisciplinary rehabilitation team (Maqsood et al., 2015).

Clinicians have called for more insight into this phase, as they are concerned that the functional performance achieved in rehabilitation, especially of older amputee patients, spills after discharge (Narayanan et al., 2016). However, little is known about possible

changes in functional performance post-discharge and how patients comprehend their participation and swaraj in their own living environment (Papazafiropoulou et al., 2009).

More information is required about the factors that affect these results, so that the content of current rehabilitation programs can be exalted and amputee patients can be optimally prepared for the post-rehabilitation period (Suckow et al., 2012). To our knowledge, there have been only 4 follow-up studies after discharge from rehabilitation that have assessed the durability of certain rehabilitation results (Zidarov et al., 2009).

The studies found durability or progression in examined results, converse to the decline expected by clinicians (Schaffalitzky et al., 2009). More specifically, the studies found durability in functional status and prosthetic use after 2 months and, after 3 months, sustained low balance confidence scores ability (Suckow et al., 2012). Progression in walking, relative stability in quality of life and progression in prosthetic wear and locomotor capacity with the prosthesis and stability in the performance of life habits (Gailey et al., 2010).

Among self-report scales for people with LLA wearing a prosthesis, the Locomotor Capabilities Index (LCI) evaluates ambulatory skills through the assessment of the subject's capability in performing 14 different locomotor activities while wearing a prosthesis, rated with a 4-point ordinal scale ranging from 0–3 (Gauthier-Gagnon and Grisé, 2006). Franchignoni et al. (2007) mentioned that the version with a five-point ordinal scale, the LCI-5 (ranging from '0=not able' to '4=able to accomplish the activity without aids', with maximum score of 56). As an additional demonstration of the construct validity of both LCI-5 and LCI10-4, the general hierarchic arrangement found by Rasch analysis in the present report is consistent with clinical expectations. For example, 'Walk outside on uneven ground' was selected as a more demanding task than 'Walk outside on even ground' and the use of a handrail eased stair management. In addition, the strong correlation between LCI-5 and PEQ-MS indicates the close relationship between the constructs measured by the two scales, both related to ability in locomotor activities with a prosthesis (Franchignoni et al., 2007). The LCI and LCI-5 were found to be highly and significantly correlated ($r = 0.89$, $p < 0.001$) (Gauthier-Gagnon and Grisé, 2006). The LCI was designed to trace a comprehensive profile of ambulatory skills of the lower limb

amputee with the prosthesis and to evaluate their level of independence while performing these activities and is composed of 14 items that measure one general construct: locomotor capabilities of the lower limb amputee with the prosthesis.4 Two subscales emerge from this general construct: basic (7 items) and advanced (7 items) locomotor capabilities with the prosthesis (Gauthier-Gagnon and Grisé, 2006).

A difference of outcome measurements and follow-up periods were used, and thus it was hard to make analogy (Salman and Laporte, 2010). Beside, little attention has been paid to autonomy within participation, which is the extent to which patients can ordain which activities they participate in and how they participate (Sarvestani & Azam, 2013). Other studies have attempted to find out the factors that forecast functional outcome or quality of life of patients with lower limb amputation (Gailey et al., 2010). Age at amputation, one-leg balance on the unaffected limb, comorbidity and cognitive breach were detected in one study as patient factors that foreboding functional outcome (Geertzen et al., 2015). Functional performance was measured using the Two-Minute Walk Test and L test and found many diverse factors were found to affect functional performance and participation post-discharge, acting sometimes as barriers for some individuals and as facilitators for others (Van Twillert et al., 2014).

Many varied factors, such as perceived prosthetic mobility, prosthesis use and problems, use of an assistive device, phantom limb pain, residual limb pain, depression, social support, social activity participation, employment status, comorbidity and age, were identified as predictors of quality of life in 2 other studies (Desmond and MacLachlan, 2010). A study using secondary data analysis provided preliminary knowledge of the environmental barriers, activity limitations and participation restrictions experienced by patients with a major limb amputation (Kahle et al., 2016).

CHAPTER-III METHODOLOGY

3.1 Study design

Cross sectional study is selected for conduct the study. A cross-sectional study is a descriptive study in which disease and exposure status is measured simultaneously in a given population and the most important advantage are it is quick and cheap (Song & Chung, 2010).

3.2 Study site and study area:

This study is conducted in amputation patient at department of Prosthetics and Orthotics of Centre for the Rehabilitation of the Paralysed (Savar), Dhaka. This area had chosen because it was convene for the study and there were the samples which meet inclusion & exclusion criteria of the study. This place comes to amputee patients for prosthetic limb from different area of Bangladesh so that this place was selected.

3.3 Study population and sampling:

Sampling refers to the process of selection the subjects/individual. A population refers to the entire group of people or items that meet the criteria set by the researcher. Amputee patient with prosthetic rehabilitation is the study population and sample is taken by using convenience sampling technique due to time limitation and to perform easily. This technique was more feasible, less time consuming and less expensive to obtain relevant information (Koerber & McMichael, 2008).

3.4 Sample size

The equation of sample size calculation are given below-

$$n = \{\frac{z\left(1-\frac{\alpha}{2}\right)}{d}\}^2 \times pq$$

Here,

$z(1-\frac{\alpha}{2})$ = 1.96

P= .5

q= (1-p)

=1-.5

=0.5

d= Sampling errors which is 5%=0.05

According to this equation the sample should be more than 384 people but due to lack of opportunity the study is conducted with 40 patients attending at prosthesis and orthosis department selected according to inclusion and exclusion criteria.

3.5 Selection Criteria

3.5.1 Inclusion criteria:

I. Age range 15-55 years:

The age of the amputees ranged from 17 years to 70 years (Maqsood et al., 2015). 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 (Pooja & Sangeeta, 2013).

II. Both sex:

There were more male amputees than female ones, with 86% of all amputees being men (Pooja & Sangeeta, 2013).

III. Both lower limb:

Among all lower limb amputation cases, below-knee amputations were the most common, followed by above-knee amputations (Pooja & Sangeeta, 2013).

IV. Patients who have received prosthetic rehabilitation (gait training) (Franchignoni et al., 2007).

3.5.2 Exclusion criteria:

I. Age range less than 15 or more than 55 years.
II. Patients who aren't complete gait training (Franchignoni et al., 2007).
III. Willingness of the patient.
IV. Patient with cognitive problem.
V. Any Contraindication are found-

i. Pain
ii. Infections
iii. Recent trauma
iv. Vertebral malignancy

3.6 Data collection methods and tools

Data collection method is questionnaire and tools were pen, papers, consent form and outcome was measured by Locomotor Capabilities Index (LCI).

3.7 Data analysis

And descriptive statistics is use to analyze data. Descriptive statistics was used to analyze data. Data is analyzed with the software named Statistical Package for Social Science (SPSS) version 20.0. The variables were labeled in a list and the researcher established a computer based data definition record file that consist of a list of variables in order. The researcher put the name of the variables in the variable view of SPSS and defined the types, values, decimal, label alignment and measurement level of data. The next step was cleaning new data files to check the inputted data set to ensure that all data has been accurately transcribed from the questionnaire sheet to the SPSS data view. Then the raw data was ready for analysis in SPSS. Data was analyzed by descriptive statistics and calculated as percentages and presented by using table, bar graph, pie charts etc. Microsoft office Excel 2010 was used to decorating the bar graph and pie charts. The result of this study was consisted of quantitative data. By this study a lot of information was collected.

3.8 Ethical consideration

The research was submitted to the Institutional Review Board (IRB) of Bangladesh Health Profession Institute (BHPI) and after defense the research approval was taken from the IRB. A written/verbal consent was taken from participate before collecting of data. The World Health Organization (WHO) & Bangladesh Medical Research Council (BMRC) guideline was always followed to conduct the study. During the course of the study, the samples who were interested in the study had given consent forms and propose 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 participant will also be informed or given notice that the research result would not be harmful for them.

CHAPTER-IV RESULTS

The purpose of the study is to find out the level of functional performance after lower limb prosthetic rehabilitation of amputee patients at prosthesis and orthotics department of CRP and to achieve this goal the result need to calculate and analysis in the systemic way and the result or analyzed data represent by bar graph, pic charts and tables.

4.1 Socio-demographic Information

4.1.1 Age of the participants

Among the 40 participants 14 (35%) participants were in age group between 15-25 years, 11 (27.5%) were in age group between 26-35 years, 8 (20%) participants were in age group 36-45 years and 7 (17.5%) participants were in age group 45-55 years. There mean age was 32.58±11.151 years minimum age was 17 years and maximum age was 55 years. Overall 72.5% participants were between age group 15-35 years and 37.5% participants were between age group 36-55 years (Figure-1).

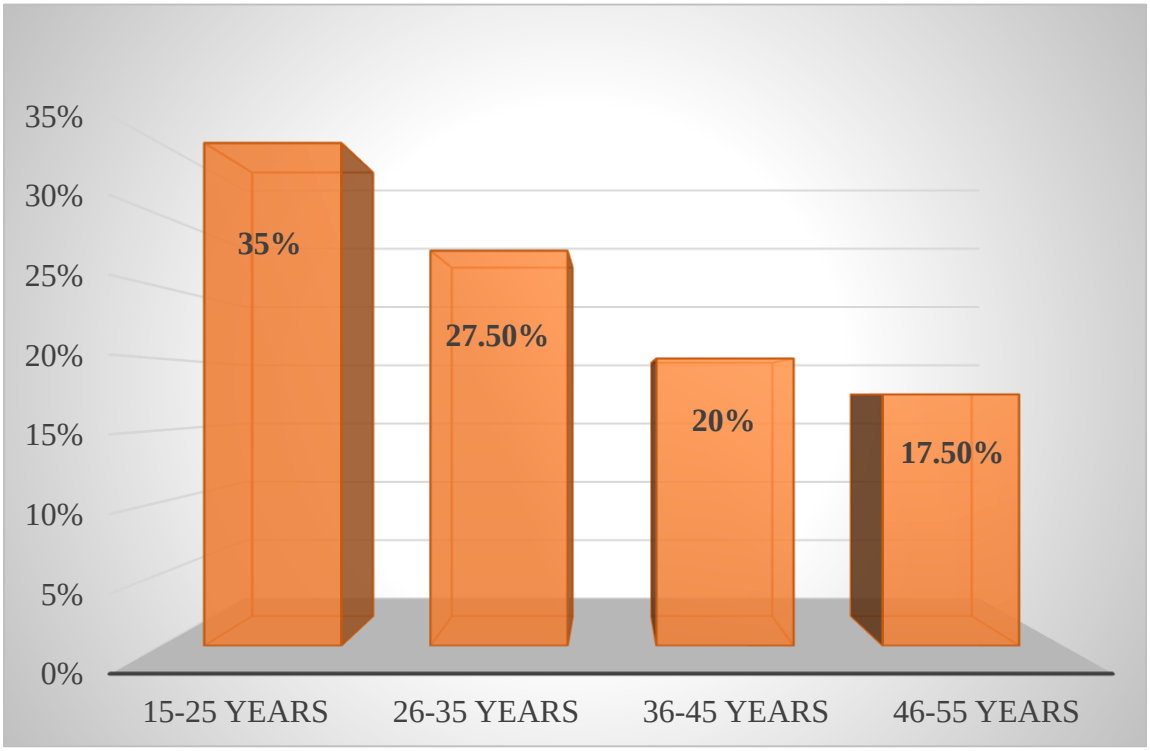


Figure-1: Age of the participants

4.1.2 Sex of the participants

In this study among 40 participants 29 (72.5%) participants were male and 11 (27.5%) participants were female (Figure-2).

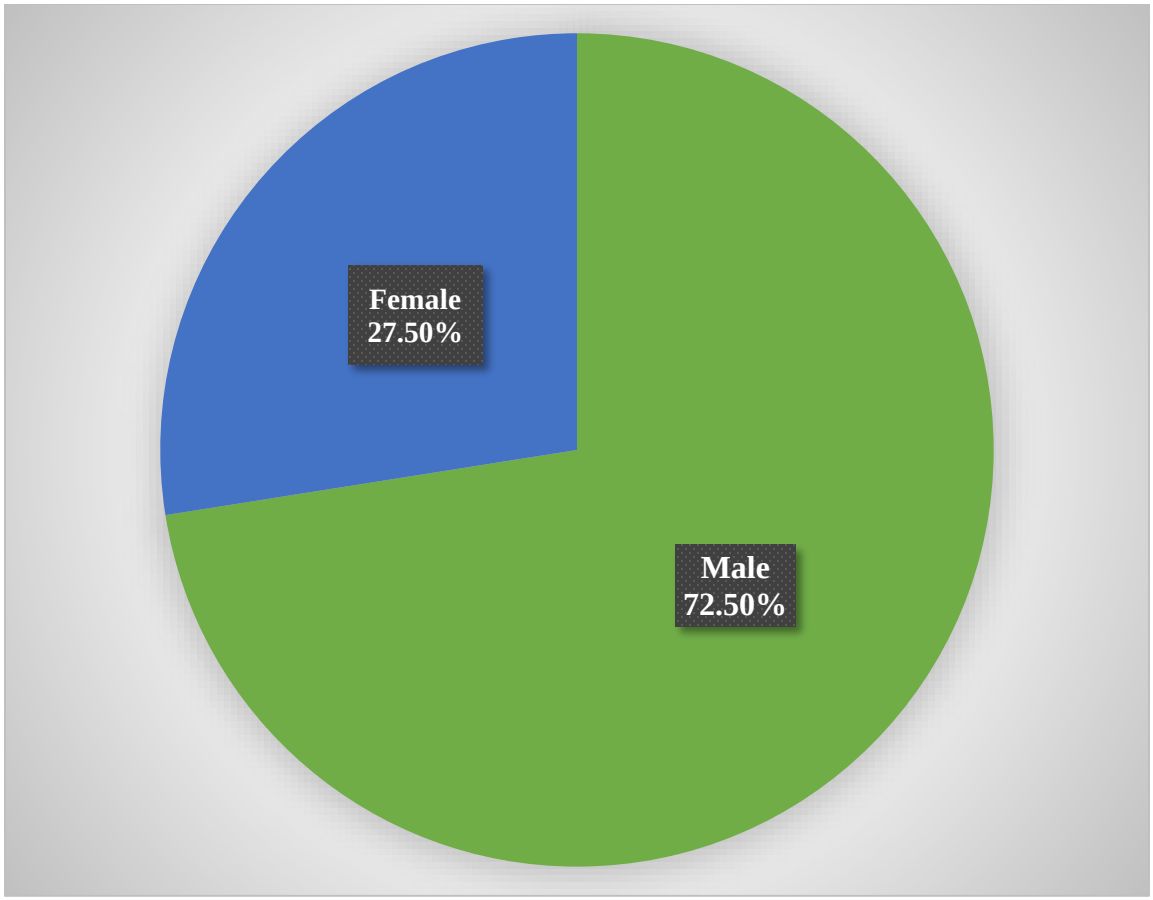


Figure-2: Sex of the participants

4.1.3 Occupation

About 40 participant were involved as sample in this study. Most of the participants 11 (27.5%) were businessmen, 8 (20%) were student, 6 (15%) were housewife, 5 (12.5%) were job holder. The study shows about the details information of the occupations of the participants.

Table-1: Occupation of the participants

Occupation	**Number(n)**	**Percentage (%)**
Student	8	20
Businessman	11	27.5
Job holder	5	12.5
Farmer	1	2.5
Housewife	6	15
Driver	3	7.5
Labourer	4	10
Others	2	5
Total	**40**	**100**

4.1.4 Living area

In this study about 18 (45%) people were lived in urban area about 22 (55%) people were lived in rural areas (Figure-3).

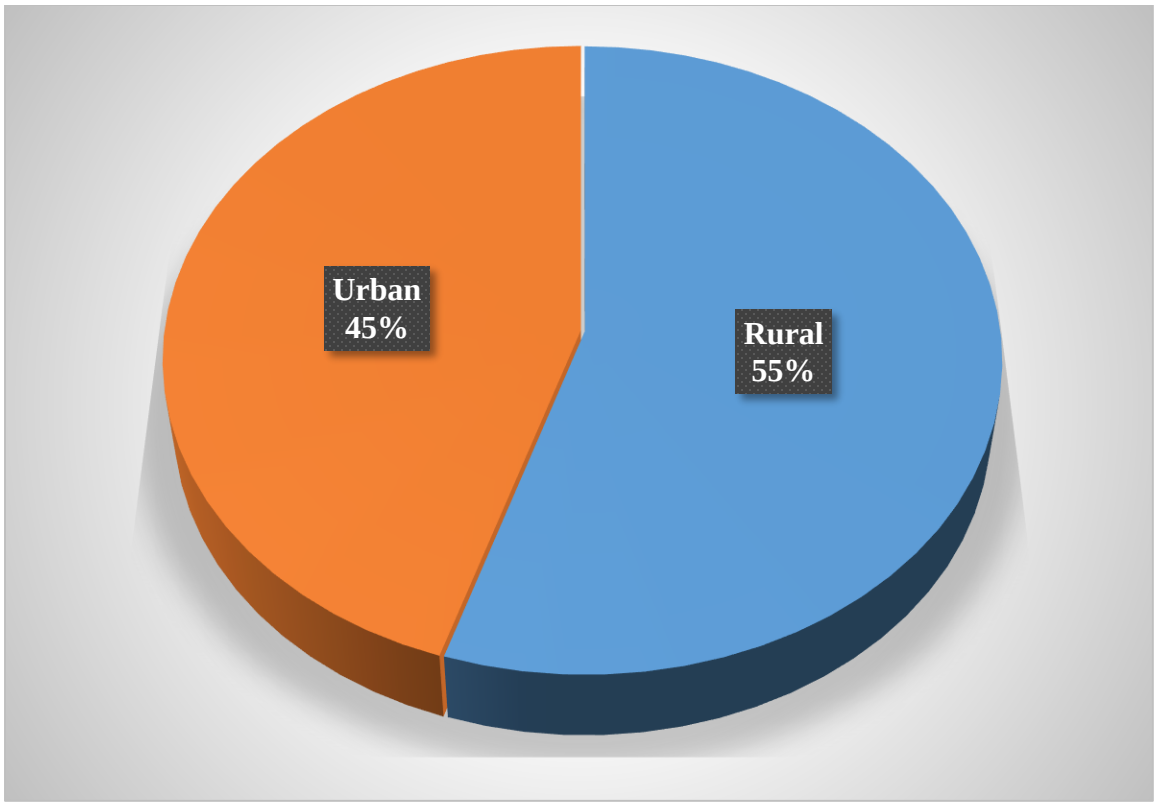


Figure-3: Living area of the participants

4.2 Amputation related information

4.2.1 Side of amputation

Among 40 of the participants, 33 (82.5%) were unilateral amputees and 7 (17.5%) were bilateral amputees. In 33 (82.5%) unilateral amputees, 23 (57.5%) were right sided and 10 (25%) were left sided amputees (Figure-4).

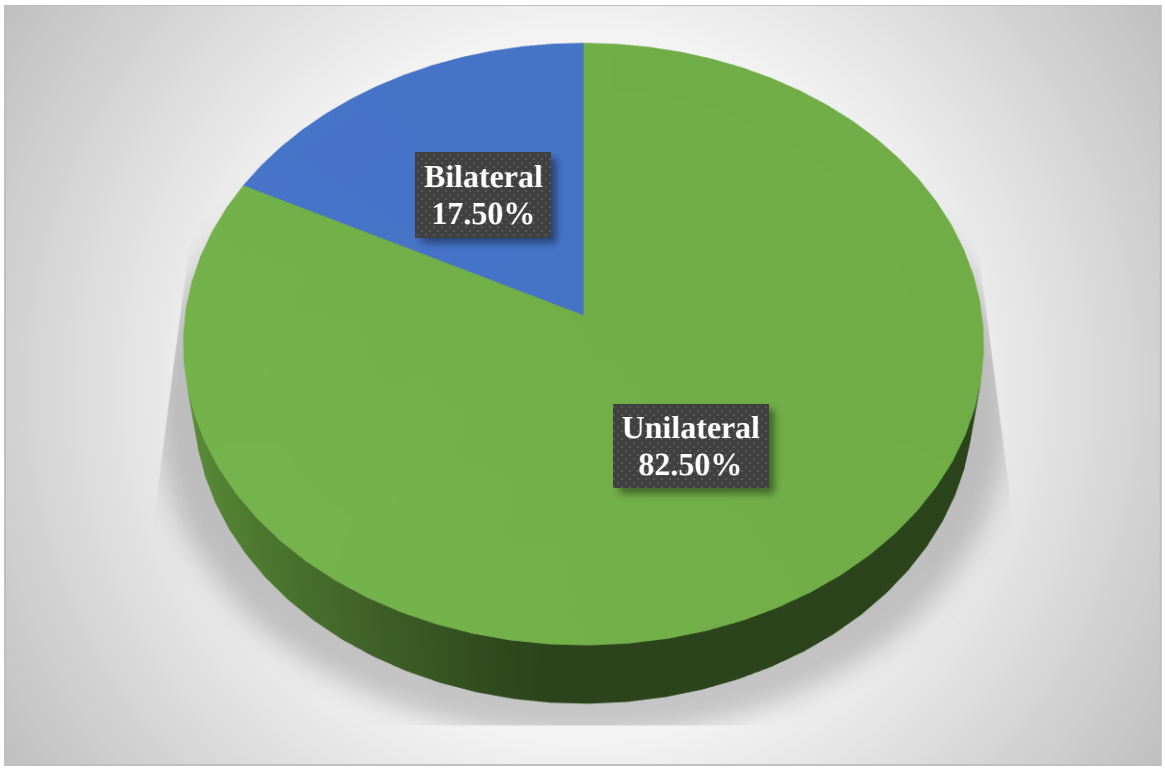


Figure-4: Side of the amputation

4.2.2 Level of amputation

Among 40 participants of amputation patients, in percentage 28 (70%) were below knee amputation and 12 (30%) were above knee amputation (Figure-5).

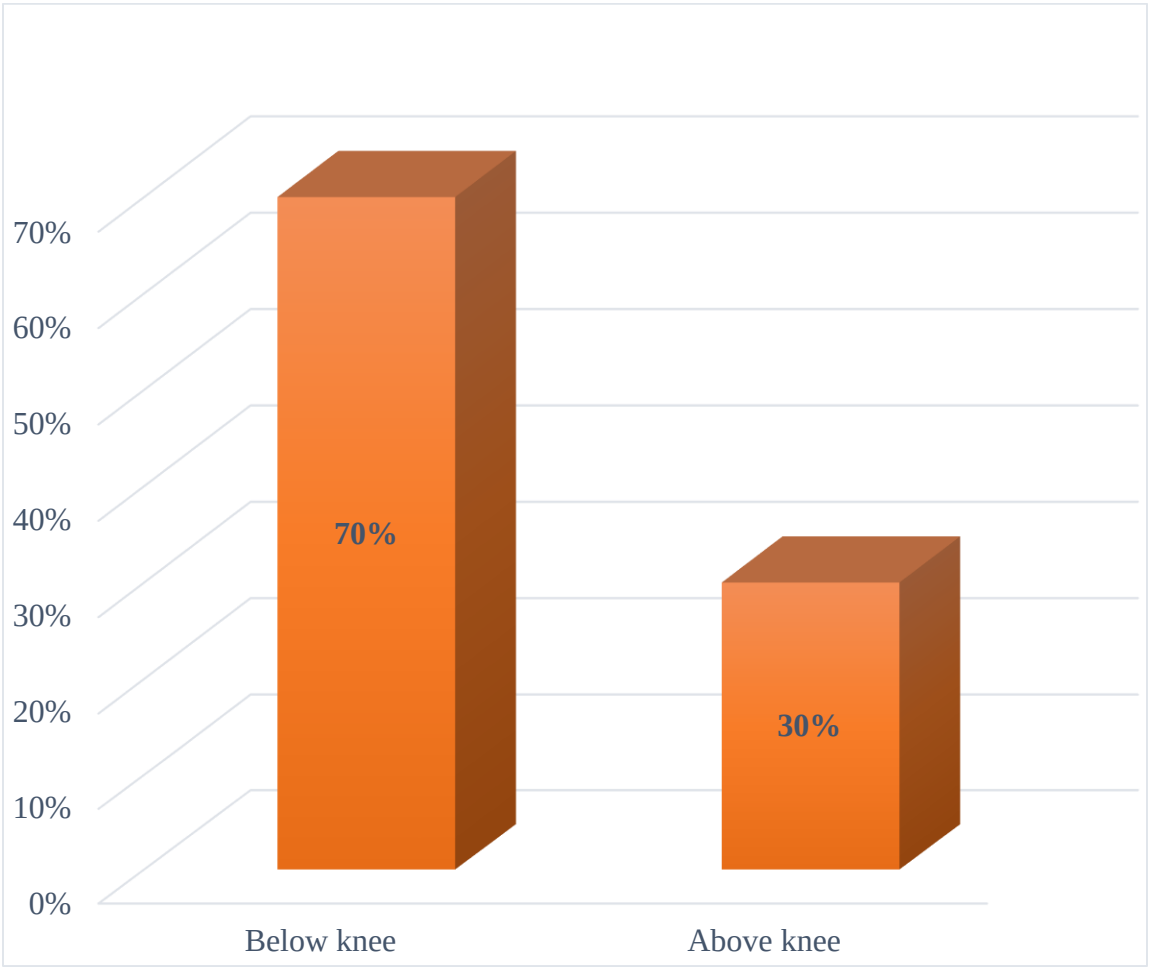


Figure-5: Level of amputation

4.3 Locomotors Capabilities Index (LCI)

4.3.1 Basic Capabilities

4.3.1.1 Get up from a chair

Among 40 participants, 32 (80%) were getting up from chair without ambulation aids and 7 (17.5%) were getting up from chair with ambulation aids. The study shows the more information about the score of get up from the chair.

Table-2: Get up from a chair

Age of the participants	Get up from a chair			Total
	Yes, if someone is near me	Yes, alone, with ambulation aids	Yes, alone, without ambulation aids	
15-25	0	3 (7.5%)	11 (27.5%)	14 (35%)
26-35	0	0	11 (27.5%)	11 (27.5%)
36-45	0	2 (5%)	6 (15%)	8 (20%)
46-55	1 (2.5%)	2 (5%)	4 (10%)	7 (17.5%)
Total	1 (2.5%)	7 (17.5%)	32 (80%)	40 (100%)

4.3.1.2 Walk in the room

Among 40 participants, 36 (90%) were walk in the room alone without ambulation aids and 4 (10%) were walk in the room alone with ambulation aids.

Table-3: Walk in the room

Age of the participants	Walk in the room		Total
	Yes, alone, with ambulation aids	Yes, alone, without ambulation aids	
15-25	1 (2.5%)	13 (32.5%)	14 (35%)
26-35	0	11 (27.5%)	11 (27.5%)
36-45	1 (2.5%)	7 (17.5%)	8 (20%)
46-55	2 (5%)	5 (12.5%)	7 (17.5%)
Total	4 (10%)	36 (90%)	40 (100%)

4.3.1.3 Walk outside on even ground

The study showed that out of this 40 participants, most of them 29 (72.5%) were walk alone without ambulation aids and 11 (27.5%) were walk alone with ambulation aids.

Table-4: Walk outside on even ground

Age of the participants	Walk outside on even ground		Total
	Yes, alone, with ambulation aids	Yes, alone, without ambulation aids	
15-25	2 (5%)	12 (30%)	14 (35%)
26-35	2 (5%)	9 (22.5%)	11 (27.5%)
36-45	3 (7.5%)	5 (12.5%)	8 (20%)
46-55	4 (10%)	3 (7.5%)	7 (17.5%)
Total	11 (27.5%)	29 (72.5%)	40 (100%)

4.3.1.4 Go up the stairs with handrail

Among 40 participants, 28 (70%) were go up with handrail alone without ambulation aids and 10 (25%) were go up with handrail alone with ambulation aids.

Table-5: Go up the stairs with handrail

Age of the participants	Go up the stairs with handrail				Total
	Yes, if someone helps me	Yes, if someone is near me	Yes, alone, with ambulation aids	Yes, alone, without ambulation aids	
15-25	0	0	2 (5%)	12 (30%)	14 (35%)
26-35	0	0	2 (5%)	9 (20%)	11 (27.5%)
36-45	1 (2.5%)	0	3 (7.5%)	4 (10%)	8 (20%)
46-55	0	1 (2.5%)	3 (7.5%)	3 (7.5%)	7 (17.5%)
Total	1 (2.5%)	1 (2.5%)	10 (25%)	28 (70%)	40 (100%)

4.3.1.5 Go down the stairs with handrail

Among 40 participants, 27 (67.5%) were go down with handrail alone without ambulation aids and 10 (25%) were go down with handrail alone with ambulation aids.

Table-6: Go down the stairs with handrail

Age of the participants	Go down the stairs with handrail				Total
	Yes, if someone helps me	Yes, if someone is near me	Yes, alone, with ambulation aids	Yes, alone, without ambulation aids	
15-25	0	0	2 (5%)	12 (30%)	14 (35%)
26-35	0	0	2 (5%)	9 (22.5%)	11 (27.5%)
36-45	2 (5%)	0	2 (5%)	4 (10%)	8 (20%)
46-55	0	1 (2.5%)	4 (10%)	2 (5%)	7 (17.5%)
Total	2 (5%)	1 (2.5%)	10 (25%)	27 (67.5%)	40 (100%)

4.3.1.6 Step up a sidewalk curb

The study showed that out of this 40 participants, 18 (45%) were step up a sidewalk curb alone without ambulation aids and 18 (45%) were step up a sidewalk curb alone with ambulation aids.

Table-7: Step up a sidewalk curb

Age of the participants	Step up a sidewalk curb			Total
	Yes, if someone helps me	Yes, alone, with ambulation aids	Yes, alone, without ambulation aids	
15-25	2 (5%)	3 (7.5%)	9 (22.5%)	14 (35%)
26-35	0	3 (7.5%)	8 (20%)	11 (27.5%)
36-45	1 (2.5%)	7 (17.5%)	0	8 (20%)
46-55	1 (2.5%)	5 (12.5%)	1 (2.5%)	7 (17.5%)
Total	4 (10%)	18 (40%)	18 (40%)	40 (100%)

4.3.1.7 Step down a sidewalk curb

The study showed that out of this 40 participants, 18 (45%) were step down a sidewalk curb alone without ambulation aids and 18 (45%) were step down a sidewalk curb alone with ambulation aids.

Table-8: Step down a sidewalk curb

Age of the participants	Step down a sidewalk curb			Total
	Yes, if someone helps me	Yes, alone, with ambulation aids	Yes, alone, without ambulation aids	
15-25	2 (5%)	3 (7.5%)	9 (22.5%)	14 (35%)
26-35	0	3 (7.5%)	8 (20%)	11 (27.5%)
36-45	1 (2.5%)	7 (17.5%)	0	8 (20%)
46-55	1 (2.5%)	5 (12.5%)	1 (2.5%)	7 (17.5%)
Total	4 (10%)	18 (40%)	18 (40%)	40 (100%)

4.3.1.8 At a glance, basic capabilities score of LCI

Table-9: Basic Capabilities of LCI

	Get up from a chair	Walk in the room alone	Walk outside on even ground	Go up with handrail	Go down with handrail	Step up a sidewalk curb	Step down a sidewalk curb
No	0	0	0	0	0	0	0
Yes, if someone helps me	0	0	0	1 (2.5%)	2 (5%)	4 (10%)	4 (10%)
Yes, if someone is near me	1 (2.5%)	0	0	1 (2.5%)	1 (2.5%)	0	0
Yes, alone, with ambulation aids	7 (17.5%)	4 (10%)	11 (27.5%)	10 (25%)	10 (25%)	18 (45%)	18 (45%)
Yes, alone, without ambulation aids	32 (80%)	36 (90%)	29 (72.5%)	28 (70%)	27 (67.5%)	18 (45%)	18 (45%)
Total	40	40	40	40	40	40	40

4.3.2 Advance Capabilities

4.3.2.1 Pick up an object from the floor

In this study, 25 (62.5%) were pick up an object from the floor alone without ambulation aids and 10 (25%) were pick up an object from the floor alone with ambulation aids.

Table-10: Pick up an object from the floor

Age of the participants	Pick up an object from the floor			Total
	Yes, if someone helps me	Yes, alone, with ambulation aids	Yes, alone, without ambulation aids	
15-25	2 (5%)	1 (2.5%)	11 (27.5%)	14 (35%)
26-35	1 (2.5%)	2 (5%)	8 (20%)	11 (27.5%)
36-45	1 (2.5%)	4 (10%)	3 (7.5%)	8 (20%)
46-55	1 (2.5%)	3 (7.5%)	3 (7.5%)	7 (17.5%)
Total	5 (12.5%)	10 (25%)	25 (62.5%)	40 (100%)

4.3.2.2 Get up from the floor

Among 40 participants, 12 (30%) were get up from the floor alone without ambulation aids and were with someone help, 14 (35%) were get up from the floor alone with ambulation aids and 2 (5%) were not able to get up from the floor.

Table-11: Get up from the floor

Age of the participants	Get up from the floor				Total
	No	Yes, if someone helps me	Yes, alone, with ambulation aids	Yes, alone, without ambulation aids	
15-25	0	4 (10%)	3 (7.5%)	7 (17.5%)	14 (35%)
26-35	1 (2.5%)	1 (2.5%)	4 (10%)	5 (12.5%)	11 (27.5%)
36-45	1 (2.5%)	3 (7.5%)	4 (10%)	0	8 (20%)
46-55	0	4 (10%)	3 (7.5%)	0	7 (17.5%)
Total	2 (5%)	12 (30%)	14 (35%)	12 (30%)	40 (100%)

4.3.2.3 Walk outside on uneven ground

Among 40 participants, 11 (27.5%) were walk outside on uneven ground alone without ambulation aids, 12 (30%) were walk outside on uneven with someone help, 15 (37.5%) were walk outside on uneven alone with ambulation aids and 1 (2.5%) were not able to walk outside on uneven.

Table-12: Walk outside on uneven ground

Age of the participants	Walk outside on uneven ground					Total
	No	Yes, if someone helps me	Yes, if someone is near me	Yes, alone, with ambulation aids	Yes, alone, without ambulation aids	
15-25	0	2 (5%)	1 (2.5%)	8 (20%)	3 (7.5%)	14 (35%)
26-35	0	2 (5%)	0	2 (5%)	7 (17.5%)	11 (27.5%)
36-45	1 (2.5%)	4 (10%)	0	2 (5%)	1 (2.5%)	8 (20%)
46-55	0	4 (10%)	0	3 (7.5%)	0	7 (17.5%)
Total	1 (2.5%)	12 (30%)	1 (2.5%)	15 (37.5%)	11 (27.5%)	40 (100%)

4.3.2.4 Walk outside on inclement ground

The study showed that out of this 40 participants, 4 (10%) were walk outside on inclement ground alone with ambulation aids, 13 (32.5%) were walk outside on inclement with someone help, 3 (7.5%) were walk outside on inclement if someone near him and 20 (50%) were not able to walk outside on inclement.

Table-13: Walk outside on inclement ground

Age of the participants	Walk outside on inclement ground				Total
	No	Yes, if someone helps me	Yes, alone, with ambulation aids	Yes, alone, without ambulation aids	
15-25	4 (10%)	8 (20%)	2 (5%)	0	14 (35%)
26-35	3 (7.5%)	3 (7.5%)	1 (2.5%)	4 (10%)	11 (27.5%)
36-45	6 (15%)	2 (5%)	0	0	8 (20%)
46-55	7 (17.5%)	0	0	0	7 (17.5%)
Total	20 (50%)	13 (32.5%)	3 (7.5%)	4 (10%)	40 (100%)

4.3.2.5 Go up a few steps without a handrail

Among 40 participants, 10 (25%) were go up a few steps without a handrail alone without ambulation aids, 20 (50%) were go up a few steps without a handrail alone with ambulation aids, 9 (22.5%) were go up a few steps without a handrail with someone help and 1 (2.5%) were go up a few steps without a handrail if someone near him.

Table-14: Go up a few steps without a handrail

Age of the participants	Go up a few steps without a handrail				Total
	No	Yes, if someone helps me	Yes, alone, with ambulation aids	Yes, alone, without ambulation aids	
15-25	2 (5%)	0	9 (22.5%)	3 (7.5%)	14 (35%)
26-35	0	1 (2.5%)	3 (7.5%)	7 (17.5%)	11 (27.5%)
36-45	2 (5%)	0	6 (15%)	0	8 (20%)
46-55	5 (12.5%)	0	2 (5%)	0	7 (17.5%)
Total	9 (22.5%)	1 (2.5%)	20 (50%)	10 (25%)	40 (100%)

4.3.2.6 Go down a few steps without a handrail

In this study among 40 participants, 10 (25%) were go down a few steps without a handrail alone without ambulation aids, 20 (50%) were go down a few steps without a handrail alone with ambulation aids, 9 (22.5%) were go down a few steps without a handrail with someone help and 1 (2.5%) were go down a few steps without a handrail if someone near him.

Table-15: Go down a few steps without a handrail

Age of the participants	Go down a few steps without a handrail				Total
	No	Yes, if someone helps me	Yes, alone, with ambulation aids	Yes, alone, without ambulation aids	
15-25	2 (5%)	0	9 (22.5%)	3 (7.5%)	14 (35%)
26-35	0	1 (2.5%)	3 (7.5%)	7 (17.5%)	11 (27.5%)
36-45	2 (5%)	0	6 (15%)	0	8 (20%)
46-55	5 (12.5%)	0	2 (5%)	0	7 (17.5%)
Total	9 (22.5%)	1 (2.5%)	20 (50%)	10 (25%)	40 (100%)

4.3.2.7 Walk while carrying an object

The study showed that out of this 40 participants, 12 (30%) were walk while carrying an object alone without ambulation aids and 23 (57.5%) were walk while carrying an object alone with ambulation aids, 3 (7.5%) were walk while carrying an object with someone help and 1 (2.5%) were not able to walk while carrying an object.

Table-16: Walk while carrying an object

Age of the participants	Walk while carrying an object				Total
	No	Yes, if someone helps me	Yes, alone, with ambulation aids	Yes, alone, without ambulation aids	
15-25	0	1 (2.5%)	7 (17.5%)	6 (15%)	14 (35%)
26-35	0	0	5 (12.5%)	6 (15%)	11 (27.5%)
36-45	0	1 (2.5%)	6 (15%)	1 (2.5%)	8 (20%)
46-55	1 (2.5%)	1 (2.5%)	5 (12.5%)	0	7 (17.5%)
Total	1 (2.5%)	3 (7.5%)	23 (57.5%)	12 (30%)	40 (100%)

4.3.2.8 At a glance, advance capabilities score of LCI

Table-17: Active Capabilities of LCI

	Pick up an object from the	Get up from the floor	Walk outside on uneven ground	Walk outside on incleme nt ground	Go up a few steps without a handrail	Go down a few steps without a handrail	Walk while carrying an object
No	0	2 (5%)	1 (2.5%)	20 (50%)	0	0	1 (2.5%)
Yes, if someone helps me	5 (12.5%)	12 (30%)	12 (30%)	13 (32.5%)	9 (22.5%)	9 (22.5%)	0
Yes, if someone is near me	0	0	1 (2.5%)	3 (7.5%)	1 (2.5%)	1 (2.5%)	3 (7.5%)
Yes, alone, with ambulation aids	10 (25%)	14 (35%)	15 (37.5%)	4 (10%)	20 (50%)	20 (50%)	23 (57.5%)
Yes, alone, without ambulation aids	25 (62.5%)	12 (30%)	11 (27.5%)	0	10 (25%)	10 (25%)	13 (32.5%)
Total	40 (100%)	40 (100%)	40 (100%)	40 (100%)	40 (100%)	40 (100%)	40 (100%)

CHAPTER-V DISCUSSION

The aim of this study was to assess the level of functional performance after lower limb prosthetic rehabilitation of amputee patient at prosthetic and orthotic department of Centre for the Rehabilitation of the Paralyzed (CRP). The examiner took 40 samples and tries to find out level of functional performance after lower limb prosthetic rehabilitation.

Age is one of variable in this study. Here the mean age was 32.58±11.15 years; other study in India mean age 35.50±10.50 years (Pooja & Sangeeta, 2013). In Nigeria mean age was 36.0±16.2 years (Obalim & Okeke, 2009). In Netherland mean age was 65±12 years (De Laat et al., 2011), in Italy mean age was 50±5 years (Franchignoni et al., 2007). in Canada another study reported that mean age was 67.0 (±12.3) (Davie-Smith et al., 2016), in New Zealand mean age was 67.4 with SD12.5 years (Gailey et al., 2010), in Sweden showed that mean age was 68 (SD, 10) years (Wegener et al., 2009.

In my study, male participants were 72.5% and female participants were 27.5%. In Sweden, study showed that male 76% and female 24% (Huang et al., 2016), in Netherland male 77.78% and female 22.22% (Yari et al., 2008), in Nigeria male participants were 71.42% and female 28.57% (Ukibe et al., 2016), in Pakistan male were 75% and female were 25% (Jawaid et al., 2008), in Italy male 66.07% and female 33.93% (Larsson et al., 2009). In Iran male 62.96% and female 37.03% (Mousavi et al., 2012). In Jardan, men 25 and women 16 (Malaheem, 2014) and in another study men 29 and women 20 (Salman & Laporte 2010). In UK male 37 and female 38 (Ziegler-Graham et al., 2008), in India, another study was conducted between 30 male and 24 female (Maqsood et al., 2015.

Study showed that 45% participants were from urban and 55% participants were from rural area. In India, study showed that 54% urban patient and 46% rural patient (Pooja & Sangeeta, 2013). Another study (Narayanan et al., 2016) 85.6% were from urban and 14.4% were from rural, in this study also reported that rural stroke increased with age. In Pakistan, 71.44% were urban and 28.55% were rural, in Iran, 50.07% were from urban and 49.92% were from rural, in Nigeria 53.65% lived in urban and 46.34% lived in rural (Amaefula et al., 2015), in Saudi Arabia. 50.15% were urban and 49.85% were from rural (AlSofyani et al., 2016).

In this study. Most of the participants 11 (27.5%) were businessmen, 8 (20%) were student, 6 (15%) were housewife, 5 (12.5%) were job holder In India, 2% were students, 34% were housewife, and 32% were farmer / laborer, 16.5% were retired, 15.5% were service holder/ businessmen (Pooja & Sangeeta, 2013).

Among 40 of the participants, 33 (82.5%) were unilateral amputees and 7 (17.5%) were bilateral amputees. In 33 (82.5%) unilateral amputees, 23 (57.5%) were right sided and 10 (25%) were left sided amputees. This study showed 28 (70%) were below knee amputation and 12 (30%) were above knee amputation. The analysis showed that 27 (67.5%) prosthetic users able to perform basic activities alone without ambulation aids and 12-13 (30%-32.5%) prosthetic users able to perform advance activities alone without ambulation aids.

Ability to perform basic capabilities among 40 participants, 36 (90%) were walk in the room alone without ambulation aids and 4 (10%) were walk in the room alone with ambulation aids. Most of them, 29 (72.5%) were walk alone without ambulation aids and 11 (27.5%) were walk alone with ambulation aids. 28 (70%) were go up with handrail alone without ambulation aids and 10 (25%) were go up with handrail alone with ambulation aids. 27 (67.5%) were go down with handrail alone without ambulation aids and 10 (25%) were go down with handrail alone with ambulation aids. 18 (45%) were step up a sidewalk curb alone without ambulation aids and 18 (45%) were step up a sidewalk curb alone with ambulation aids. 18 (45%) were step down a sidewalk curb alone without ambulation aids and 18 (45%) were step down a sidewalk curb alone with ambulation aids.

The study showed that out of this 40 participants level of perform advance capabilities, 12 (30%) were get up from the floor alone without ambulation aids and were with someone help, 14 (35%) were get up from the floor alone with ambulation aids and 2 (5%) were not able to get up from the floor. 11 (27.5%) were walk outside on uneven ground alone without ambulation aids, 12 (30%) were walk outside on uneven with someone help, 15 (37.5%) were walk outside on uneven alone with ambulation aids and 1 (2.5%) were not able to walk outside on uneven. 4 (10%) were walk outside on inclement ground alone with ambulation aids, 13 (32.5%) were walk outside on inclement with someone help, 3 (7.5%) were walk outside on inclement if someone near him and 20 (50%) were not able to walk outside on inclement. 10 (25%) were go up a few steps without a handrail alone without

ambulation aids, 20 (50%) were go up a few steps without a handrail alone with ambulation aids, 9 (22.5%) were go up a few steps without a handrail with someone help and 1 (2.5%) were go up a few steps without a handrail if someone near him. 10 (25%) were go down a few steps without a handrail alone without ambulation aids, 20 (50%) were go down a few steps without a handrail alone with ambulation aids, 9 (22.5%) were go down a few steps without a handrail with someone help and 1 (2.5%) were go down a few steps without a handrail if someone near him. 12 (30%) were walk while carrying an object alone without ambulation aids and 23 (57.5%) were walk while carrying an object alone with ambulation aids, 3 (7.5%) were walk while carrying an object with someone help and 1 (2.5%) were not able to walk while carrying an object. Further, it was also confirmed that as age increased, functional independence decreased, and that below-knee amputees were more independent than above-knee and bilateral amputees.

High scores on the LCI reflect greater locomotor capabilities with the prosthesis and less dependence on external assistance. 1 to 5 years after discharge, prosthetic users had maintained a high level of independence with the prosthesis and were capable of managing most of the basic and advanced activities with the prosthesis. Global scores and basic scores did not differ significantly for people with transtibial and transfemoral amputations, but advanced scores did (Gauthier-Gagnon and Grisé, 2006). testing of new items with higher difficulty than the present ones (e.g., ‘Walk on slippery surfaces’, ‘Walk for up to two hours’, or ‘Climb a steep slope’) (Franchignoni et al., 2007).

By comparison, the evidence for superior walking ability after more distal and unilateral amputation levels is strong. This is likely to be related to the increased energy requirements to walk with above knee and bilateral prostheses (Sansam et al., 2009).

100% accuracy will not be possible in any research so that some limitation may exist. 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 40 samples and could not able to generalize the collecting samples because, there were not adequate subjects and study period was short. The one of 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. Convenience sampling often suffers from biases because this method may represent the views of a specific group and not the entire population. In this study sample was conducted at Centre for the Rehabilitation of the paralysed (CRP) which may not represent the whole country. No research has been done before on this topic specifically. So there was little evidence to support the result of this project in the context of Bangladesh.

CHAPTER-VI CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

Amputation is one of the leading causes of poor functioning, hampered daily living activities and a socioeconomic challenge. This is particularly true for developing countries like Bangladesh, where health support system including the rehabilitation system is not within the reach of ordinary people. It is clear that, this destructive condition not only affects the patient but also their family. Bangladesh is a developing country with low socio-economic condition where people are not enough concerned about prosthetic limb and rehabilitation. Health services are not sufficient in the Government and non-government sector. So, most people are not know about prosthetic rehabilitation and they are suffering from lack of proper treatment. Now a day's different private clinics, hospital and ngio's are trying to bring latest prosthetic limb facilities in our country. But many people in our country are not aware about prosthetic limb which can able to them mobile, walk and able to do ADL's by using prosthetic limb. Most of the people are not enough familiar about prosthetic limb and rehabilitation.

Mobility of the person with lower limb amputation is the main problem because of loss of limb and sensory feedback. As a result it strikes the mobility of the amputee very much. For normal mobility and lead life amputee can use prosthetic limb. By prosthetic rehabilitation under responsible physiotherapist amputee can lead a normal life with mobility.

6.2 Recommendations

The aim of this study was to assess the level of functional performance after lower limb prosthetic rehabilitation of amputee patient at prosthetic and orthotic department of Centre for the Rehabilitation of the Paralyzed (CRP) and the result which found from the study has fulfilled the aim of this research project. The following recommendations are-

I. Should take more samples for generating the result and make more valid and reliable.

II. Should do pilot study to establish the appropriateness of the questionnaire.

III. Sample should collect from different hospital, clinic, institute and organization in different district of Bangladesh to generalize the result.

IV. To find out an effective and efficient result in generalized form, other measurement scale should be used in consideration.

This is an undergraduate study and doing the same study at graduate level will give more precise output. There were some limitation of this study mentioned at the relevant section; it is recommended to overcome those limitations during further study. So for further study it is strongly recommended to increase sample size with adequate time to generalize the result in all of the lower limb prosthetic patient in Bangladesh for better results and perspectives

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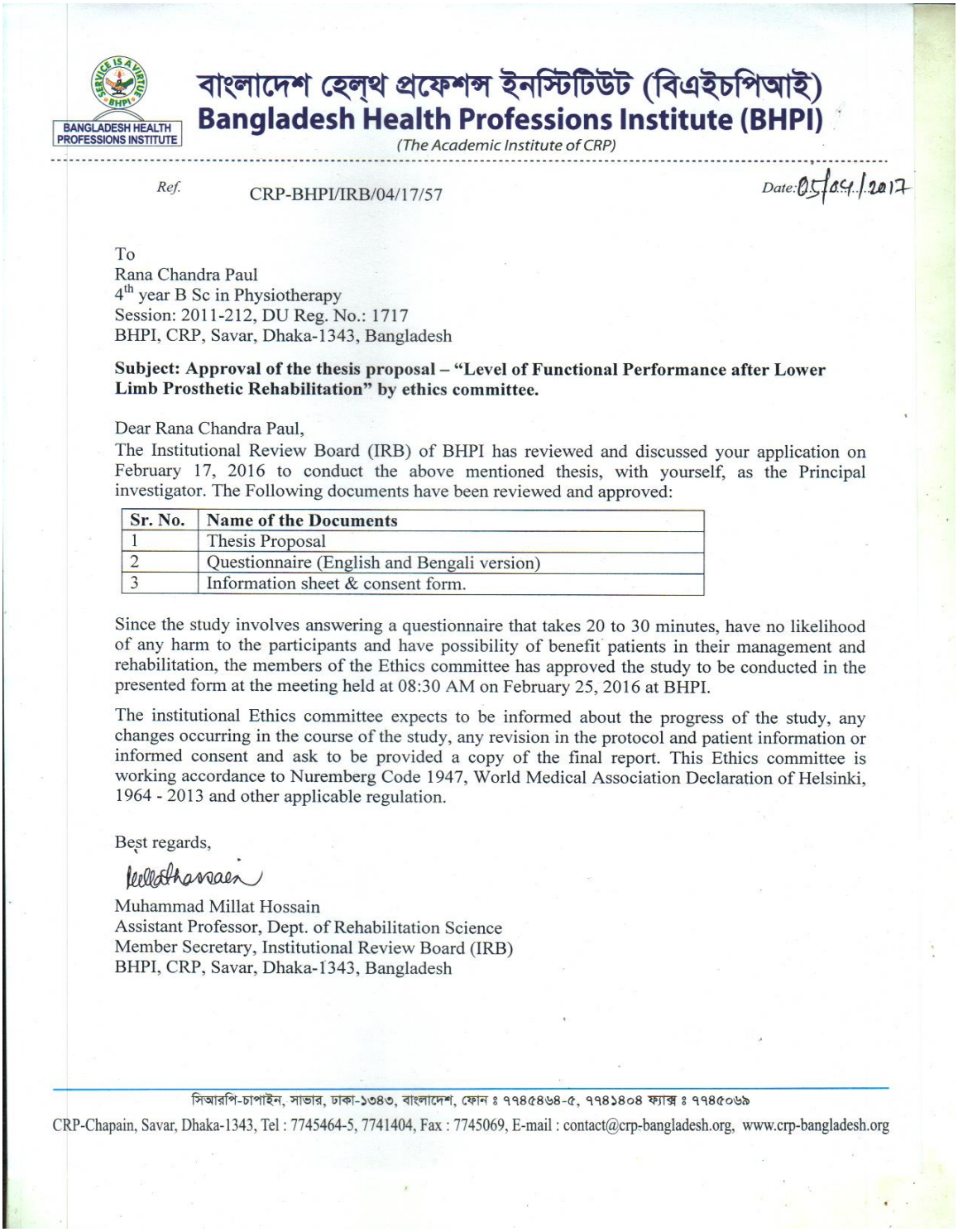
APPENDIX

Institutional Review Board (IRB) Approval



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

BANGLADESH HEALTH PROFESSIONS INSTITUTE

Ref. CRP-BHPI/IRB/04/17/57 *Date:* 05/04/2017

To
Rana Chandra Paul
4th year B Sc in Physiotherapy
Session: 2011-212, DU Reg. No.: 1717
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Subject: Approval of the thesis proposal – "Level of Functional Performance after Lower Limb Prosthetic Rehabilitation" by ethics committee.

Dear Rana Chandra Paul,
The Institutional Review Board (IRB) of BHPI has reviewed and discussed your application on February 17, 2016 to conduct the above mentioned thesis, with yourself, as the Principal investigator. The Following documents have been reviewed and approved:

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

Since the study involves answering a questionnaire that takes 20 to 30 minutes, have no likelihood of any harm to the participants and have possibility of benefit patients in their management and rehabilitation, the members of the Ethics committee has approved the study to be conducted in the presented form at the meeting held at 08:30 AM on February 25, 2016 at BHPI.

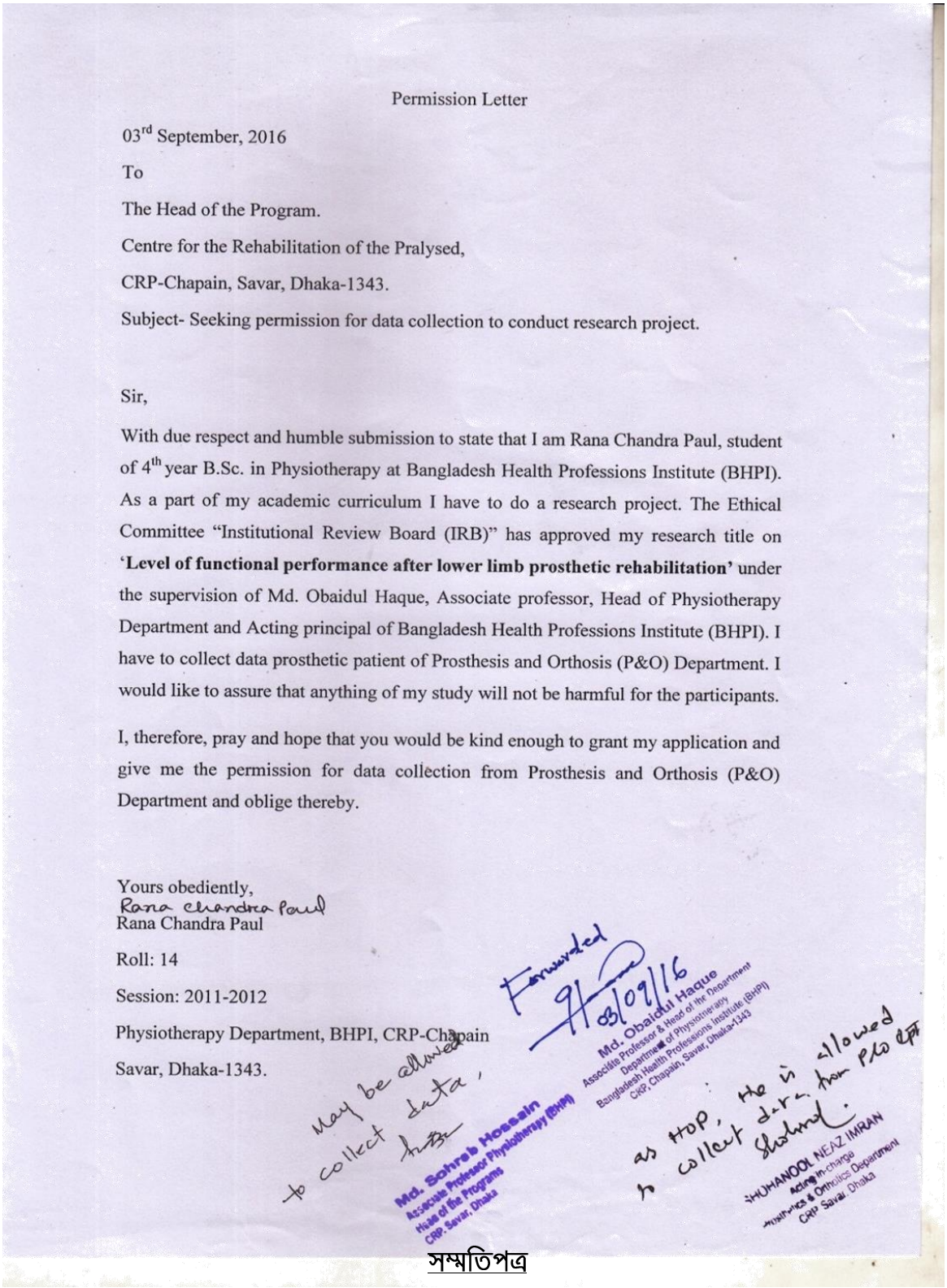
The institutional Ethics committee expects to be informed about the progress of the study, any changes occurring in the course of the study, any revision in the protocol and patient information or informed consent and ask to be provided a copy of the final report. This Ethics committee is working accordance 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

সিআরপি-চাপাইন, সাভার, ঢাকা-১৩৪৩, বাংলাদেশ, ফোন ঃ ৭৭৪৫৪৬৪-৫, ৭৭৪১৪০৪ ফ্যাক্স ঃ ৭৭৪৫০৬৯
CRP-Chapain, Savar, Dhaka-1343, Tel : 7745464-5, 7741404, Fax : 7745069, E-mail : contact@crp-bangladesh.org, www.crp-bangladesh.org

Permission Letter



Permission Letter

03rd September, 2016

To

The Head of the Program.

Centre for the Rehabilitation of the Pralysed,

CRP-Chapain, Savar, Dhaka-1343.

Subject- Seeking permission for data collection to conduct research project.

Sir,

With due respect and humble submission to state that I am Rana Chandra Paul, student of 4th year B.Sc. in Physiotherapy at Bangladesh Health Professions Institute (BHPI). As a part of my academic curriculum I have to do a research project. The Ethical Committee "Institutional Review Board (IRB)" has approved my research title on **'Level of functional performance after lower limb prosthetic rehabilitation'** under the supervision of Md. Obaidul Haque, Associate professor, Head of Physiotherapy Department and Acting principal of Bangladesh Health Professions Institute (BHPI). I have to collect data prosthetic patient of Prosthesis and Orthosis (P&O) Department. I would like to assure that anything of my study will not be harmful for the participants.

I, therefore, pray and hope that you would be kind enough to grant my application and give me the permission for data collection from Prosthesis and Orthosis (P&O) Department and oblige thereby.

Yours obediently,
Rana chandra Paul
Rana Chandra Paul

Roll: 14

Session: 2011-2012

Physiotherapy Department, BHPI, CRP-Chapain

Savar, Dhaka-1343.

Forwarded
03/09/16
Md. Obaidul Haque
Associate Professor & Head of the Department
Department of Physiotherapy
Bangladesh Health Professions Institute (BHPI)
CRP, Chapain, Savar, Dhaka-1343

May be allowed to collect data,

Md. Sohrab Hossain
Associate Professor Physiotherapy (BHPI)
Head of the Programs
CRP, Savar, Dhaka

as hop, he is allowed to collect data from P&O dept.

SHUHANOOL NEAZ IMRAN
Acting In-charge
Prosthetics & Orthotics Department
CRP Savar, Dhaka

সম্মতিপত্র

আসসালামুয়ালাইকুম / নমস্কার,

আমি রানা চন্দ্র পাল, ঢাকা বিশ্ববিদ্যালয়ের চিকিৎসা অনুষদের অধিভুক্ত বাংলাদেশ হেলথ প্রফেশনস্ ইন্সিটিটিউট এর বি.এস.সি ইন ফিজিওথেরাপি কোর্সের চূড়ান্ত বর্ষের একজন শিক্ষার্থী। অধ্যায়নের অংশ হিসেবে আমাকে একটি গবেষণা সম্পাদন করতে হবে এবং এটা আমার প্রাতিষ্ঠানিক কাজের একটা অংশ। নিম্নোক্ত তথ্যাদি পাঠ করার পর আপনাকে গবেষণায় অংশগ্রহনের জন্য অনুরোধ করা হলো ।

আমার গবেষণার বিষয় হল **"নিম্ন অঙ্গের প্রস্থেটিক পুনর্বাসনের পর কার্মিক কর্মক্ষমতার মাত্রা"**। এই পরীক্ষামূলক গবেষণার মাধ্যমে আমি একটি অনুমান পরীক্ষা করব যে, কৃত্রিম পা সম্বলিত রোগীদের ক্ষেত্রে গেইট প্রশিক্ষনের পর প্রাথমিক এবং এডভান্স কার্যকলাপের ফলাফল। আমি যদি আমার গবেষণাটি সার্থক ভাবে সম্পূর্ণ করতে পারি তবে যেসব রোগী কৃত্রিম পা সম্বলিত তারা উপকৃত হবেন এবং এটি হবে একটি পরীক্ষামূলক প্রমাণ। গবেষণাটি সম্পাদনের জন্য, আমার তথ্য সংগ্রহ করা প্রয়োজন হবে। গবেষণার ক্ষেত্র বিবেচনা করে আপনার মাঝে আমার গবেষণায় অংশগ্রহণ করার জন্য প্রয়োজনীয় বৈশিষ্ট্য লক্ষ্য করা গেছে। এজন্য, আপনি আমার গবেষণার একজন সম্মানিত অংশগ্রহণকারী হতে পারেন এবং আমি আপনাকে আমার গবেষণায় অংশগ্রহন করতে অনুরোধ জানাচ্ছি।

আমি প্রতিজ্ঞা করছি যে,এই গবেষণা আপনার জন্য ঝুঁকিপূর্ণ হবে না অথবা আপনার কোন ক্ষতি করবে না। গবেষণা চলাকলীন সময়ে কোন রকম দ্বিধা বা ঝুঁকি ছাড়াই যেকোন সময়ে আপনি এটাকে বাদ দিতে পারবেন। এই গবেষণার প্রাপ্ত তথ্য সম্পূর্ণভাবে গোপনীয় থাকবে এবং অংশগ্রহণকারীর ব্যক্তিগত তথ্য অন্য কোথাও প্রকাশ করা হবে না।

যদি আপনার গবেষণা সম্পর্কে কোনো জিজ্ঞসা থাকে তবে আপনি অনুগ্রহপূবক যোগাযোগ করতে পারেন আমি অথবা মোঃ ওবায়দুল হক, সহযোগী অধ্যাপক, বিএইচপিআই-সিআরপি, সাভার, ঢাকা-১৩৪৩ এর সাথে।

শুরু করার আগে আপনার কি কোন প্রশ্ন আছে?

আমি কি শুরু করতে পারি?

☐ হ্যাঁ ☐ না

অংশগ্রহণকারীর স্বাক্ষরও তারিখ .....

গবেষকের স্বাক্ষরও তারিখ .....

স্বাক্ষীর স্বাক্ষরও তারিখ .....

Consent Form

Assalamualaikum\ Namashker,

I am Rana Chandra Paul, Final Year of B.Sc. in Physiotherapy student of Bangladesh Health Professions Institute (BHPI) under the Faculty of Medicine, University of Dhaka.

To obtain my Graduation degree, I have to conduct a research project and it is a part of my study. You are requested to participate in the study after a brief of the following.

My research title is "**Level of functional performance after lower limb prosthetic rehabilitation**". Through this study I will find the level of functional performance after lower limb prosthetic rehabilitation. If I can complete this study successfully, patients may get benefits whom are lower limb prosthetic patient.

To fulfill my research project, I need to collect data. So, you are respected to participate in the study. I want to meet you a sessions, after your prosthetic rehabilitation.

I would like to inform you that this is a purely academic study and will not be used for any other purposes. I assure that all data will be kept confidential. Your participation will be voluntary. You may have the rights to withdraw consent and discontinue participation at any time of the study. You also have the rights to answer a particular question that you don't like.

If you have any query about the study or right as a participant, you may contact with me or Md. Obaidul Haque, Associate professor, Head of Physiotherapy Department, BHPI, CPR, Savar, Dhaka-1343.

Do you have any questions before I start?

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

Yes ☐ No ☐

Signature of Participant and date ……..

Signature of Investigator and Date……..

Signature of witness and Date……..

প্রশ্নাবলী (বাংলা)

পর্ব-ক:ব্যক্তিগত তথ্যাবলী

এই প্রশ্নপত্রটি গড়ে তলা হয়েছে কৃত্রিম পা সম্বলিত রোগীদের জন্য। ব্যক্তিগত তথ্যাবলী অংশটি রোগী কিন্তু বিশেষ বিবেচনায় গবেষক কালো নীল/ কালি বলপেন দ্বারা পূরণ করবেন। সঠিক জবাবটির বাম পাশে টিক(√) চিহ্ন দিতে হবে।

রোগীর কোড নং:

তারিখ :

- রোগীর নামঃ
- বয়সঃ ☐ ১৫-২৫ বছর ☐ ৬-৩৫ বছর ☐ ৩৬-৪৫ বছর ☐ ৪৬-৫৫ বছর
- লিঙ্গঃ ☐ পুরুষ ☐ নারী
- ঠিকানাঃ

  মোবাইল নম্বরঃ ইমেইলঃ
- পেশাঃ ☐ ছাত্র/ছাত্রী ☐ ব্যবসায়ী ☐ চাকুরিজিবী ☐ অন্যান্য
- বসবাসের এলাকাঃ ☐ শহুরে ☐ গ্রাম্য
- অর্থনৈতিক অবস্থাঃ
- এম্পুটেশন লেভেল এবং সাইডঃ

  ☐ বাম পায়ের হাঁটুর নীচে ☐ বাম পায়ের হাঁটুর উপরে

  ☐ ডান পায়ের হাঁটুর নীচে ☐ ডান পায়ের হাঁটুর উপরে

  ☐ দুই পায়ের হাঁটুর নীচে ☐ দুই পায়ের হাঁটুর উপরে

পর্ব-খ-চলাচলের ধারনক্ষমতার নির্দেশকঃ

প্রাথমিক কার্যকলাপঃ

০ - না।

১ - হ্যাঁ, যদি আমাকে কেউ সাহায্য করে।

২ - হ্যাঁ, যদি আমার কাছে কেউ থাকে।

৩ - হ্যাঁ, একা, চলাচলের উপকরন সহ।

৪ - হ্যাঁ, একা, চলাচলের উপকরন ছাড়া।

সিরিয়াল নং	নির্দেশনা	স্কোর
১	চেয়ার থেকে উঠে বসা	০ ১ ২ ৩ ৪
২	রুমে হাঁটা	০ ১ ২ ৩ ৪
৩	বাহিরে মসৃন মাঠে হাঁটা	০ ১ ২ ৩ ৪
৪	হাতল ধরে সিঁড়ি বেয়ে উপরে উঠা	০ ১ ২ ৩ ৪
৫	হাতল না ধরে সিঁড়ি বেয়ে উপরে উঠা	০ ১ ২ ৩ ৪
৬	প্রতিবন্ধকে স্টেপ দিয়ে উঠা	০ ১ ২ ৩ ৪
৭	প্রতিবন্ধকে স্টেপ দিয়ে নামা	০ ১ ২ ৩ ৪
	প্রাথমিক কার্যকলাপের স্কোর	

এডভান্স কার্যকলাপঃ

০ - না।

১ - হ্যাঁ, যদি আমাকে কেউ সাহায্য করে।

২ - হ্যাঁ, যদি আমার কাছে কেউ থাকে।

৩ - হ্যাঁ, একা, চলাচলের উপকরন সহ।

৪ - হ্যাঁ, একা, চলাচলের উপকরন ছাড়া।

সিরিয়াল নং	নির্দেশনা	স্কোর
১	মেঝে থেকে কোন বস্তু উঠানো (যখন আপনি কৃত্রিম পা পরে দাঁড়িয়ে থাকেন)	০ ১ ২ ৩ ৪
২	মেঝে থেকে উঠে দাঁড়ানো (যেমনঃ যদি আপনি পরে যান)	০ ১ ২ ৩ ৪
৩	বাহিরে অমসৃন মাঠে হাঁটা (যেমনঃ ঘাস, নুড়িপাথর, ঢালু স্থান)	০ ১ ২ ৩ ৪
৪	বাহিরে ঝড়ো আবহাওয়ায় হাঁটা (যেমনঃ তুষার, বৃষ্টি, বরফ)	০ ১ ২ ৩ ৪
৫	হাতল ধরে কিছু স্টেপ (সিঁড়ি) উপরে উঠা	০ ১ ২ ৩ ৪
৬	হাতল ধরে কিছু স্টেপ (সিঁড়ি) নিচে নামা	০ ১ ২ ৩ ৪
৭	কোন কিছু হাতে বহন করে হাঁটা	০ ১ ২ ৩ ৪
	এডভান্স কার্যকলাপের স্কোর	

টোটাল স্কোরঃ

<u>Questionnaire (English)</u>

Part-A: Subjective Information

This questionnaire is developed to measure **level of functional performance after lower limb prosthetic rehabilitation** and this section will be filled by tick (V) mark in the left of point by investigator using a black or blue pen.

Code No:

Date:

- Patients name:
- Age:
- Sex: ☐ Male ☐ Female
- Address:

  Mobile number: E-mail:
- Occupation:

  ☐ Student ☐ Businessman ☐ Job holder ☐ Housewife

  ☐ Farmer ☐ Driver ☐ Laborer ☐ Unemployed ☐ Others
- Living Area: ☐ Urban ☐ Rural
- Economic status:

  Monthly income (In BD):
- Amputation level and side :

  ☐ Below knee right side ☐ Above knee right side

  ☐ Below knee left side ☐ Above knee left side

  ☐ Below knee both side ☐ Above knee both side

Part-B :LOCOMOTOR CAPABILITIES INDEX (LCI)

Basic Activities:

0= NO

1= YES, if someone helps me

2=YES, if someone is near me

3= YES, alone, with ambulation aids

4=YES, alone, without ambulation aids

Number	Instruction	Amount Score
1.	Get up from a chair	**0 1 2 3 4**
2.	Walk in the room	**0 1 2 3 4**
3.	Walk outside on even ground	**0 1 2 3 4**
4.	Go up the stairs with handrail	**0 1 2 3 4**
5.	Go down the stairs with handrail	**0 1 2 3 4**
6.	Step up a sidewalk curb	**0 1 2 3 4**
7.	Step down a sidewalk curb	**0 1 2 3 4**
	Basic Activities Score	

Advance Activities:

0= NO

1= YES, if someone helps me

2=YES, if someone is near me

3= YES, alone, with ambulation aids

4=YES, alone, without ambulation aids

Number	**Instruction**	**Amount Score**
1.	Pick up an object from the floor (when you are standing up with your prosthesis)	**0 1 2 3 4**
2.	Get up from the floor (e.g. if you fall)	**0 1 2 3 4**
3.	Walk outside on uneven ground (e.g. grass, gravel, slope)	**0 1 2 3 4**
4.	Walk outside in inclement weather (e.g. snow, rain, ice)	**0 1 2 3 4**
5.	Go up a few steps (stairs) without a handrail	**0 1 2 3 4**
6.	Go down a few steps (stairs) without a handrail	**0 1 2 3 4**
7.	Walk while carrying an object	**0 1 2 3 4**
	Advance Activities Score	

Total Score: