MEASURING THE LEVEL OF SATISFACTION WITH LOWER LIMB PROSTHETIC DEVICES AMONG THE USERS OF THE CENTRE FOR THE REHABILITATION OF THE PARALYSED (CRP) AND CENTRE FOR DISABILITY IN DEVELOPMENT (CDD)

M. Sc Thesis in Rehabilitation Science

Bangladesh Health Professions Institute (BHPI)

Faculty of Medicine

UNIVERSITY OF DHAKA

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- This dissertation is being submitted in partial fulfillment of the requirements for the degree of M. Sc in Rehabilitation Science.
- This dissertation is the result of my own independent work/investigation, except where otherwise stated. Other sources are acknowledged by giving explicit references.
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LIST OF ABBREVIATIONS AND ACRONYMS

AD	Assistive Device
AK	Above Knee
BBS	Bangladesh Bureau of Statistics
BHPI	Bangladesh Health Professions Institute
BK	Below Knee
CDD	Centre for Disability in Development
CRP	Centre for the Rehabilitation of the Paralysed
CRPD	Convention on the Rights of Persons with Disabilities
GoB	Government of Bangladesh
ICRC	International Committee of the Red Cross
IRB	Institutional Review Board
KG	Kilogram
KM	Kilometer
LLA	Lower Limb Amputee
P & O	Prosthesis and Orthosis
QUEST	Quebec User Evaluation of Satisfaction with Assistive Technology
RTA	Road Traffic Accident
SPSS	Statistical Package for the Social Sciences
SD	Standard Deviation
UN	United Nations
US	United States
USA	United States of America

ABSTRACT

According to the United Nations more than 13 million people is suffering from at least one kind of disability in Bangladesh, furthermore, among those disabled population 22.5% are suffering from physical disability. Amputation and mobility difficulties are prominent causes of disability (Cochrane, et. al. (2015)). About 81% of the people 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)). In Bangladesh, CRP and CDD are the renowned organizations in terms of their volume of work on providing assistive technology to the people with amputation and they have own reputation in national level to work with the persons with disabilities.

Objectives: To investigate lower-limb prosthetic patients' satisfaction with their lower limb prosthesis and related services provided at CRP and CDD.

Methods: It was a cross sectional descriptive study. Convenience sampling method was used to select 145 patients who answered a modified questionnaire, including the Quebec User Evaluation of Satisfaction with Assistive Technology questionnaire (QUEST 2.0). Statistical Package for Social Sciences (SPPS version 6.0) was used for data analysis. Chi square test was employed to signify association between variables at 0.05 significance levels.

Results: Mean age with standard deviation of the CRP and CDD respondents were 38.14 ± 13.37 years and 39.58 ± 11.94 years respectively. In both organizations, majority of the respondents were male. In this study, significant relation was found between device change and device type, difficulties face and device type for respondents of both organizations. Overall, patients were quite satisfied with their prosthetic devices (below knee) and with the services provided from CRP's P and O department (mean score was 4.35 for BK device, in providing service for BK and AK device mean score were 4.79 and 4.59 respectively out of 5 in QUEST result) and more or less satisfied with above knee prosthesis (mean score was 3.94). But in-contrast patients of CDD were not so happy with AK device (mean score 2.71) and not satisfied at all with the services provided (mean score 1.78) with AK device and more or less satisfied with their below knee prosthetic devices (mean score 3.78) and not very satisfied with the services (mean score 2.14) with their BK device. In CRP, the weight, safety and device adjustments were 20%, 16.67% and 15.83% respectively may be considered as most important satisfaction level and in-contrast CDD indicated that durability, weight and effectiveness were 18.97%, 18.46% and 12.31% respectively, which may be considered as most important satisfaction level.

Conclusion: Patients of CRP reported their higher level satisfaction in comparison with the patients of CDD. Limitations in the effectiveness of assistive devices and limited access to follow-up services and repairs were issues desired to be addressed.

Key words*: Amputation, Prosthesis, Service, Satisfaction, Rehabilitation.*

CHAPTER I

INTRODUCTION

1.1 Introduction

Bangladesh is one of the most densely populated countries of the world, with about 160 million people (GoB, 2011). Despite various efforts in poverty reduction, over 25.6% of Bangladeshi households still live below the national poverty line of US $1.90 per day (BBS 2014). It is estimated that 15% of the world's population lives with a disability (World Report on Disability (2011)). According to estimation of Bangladesh Bureau of Statistics (BBS) household income expenditure survey conducted in 2010 that had found persons with disabilities are 9.07% of the total population. It is estimated that 80% of persons with disabilities live in developing countries (UN). According to the United Nation estimate more than 13 million people is suffering at least one kind of disability in Bangladesh, furthermore, among those disabled population 22.5% people is suffering with physical disability. Amputation and mobility difficulties are prominent causes of disability (Cochrane, et. al. (2015)). Disability is a complex term to define and to classify and there are a lot of reasons for being disability. The major causes of disability are birth defects, road traffic accidents (RTA), industrial accidents, illnesses and surgical complications (Salahuddin (2005)). Every person wants to walk and move within the community but some doesn't get the chance due to physical impairment. Some technology may help them to move forward through artificially correcting their impairment. 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)).

Person with amputee and their families are faced with a specific set of problems requiring clinical services to regain independence (Pezzin, et. al. (2000)). For regaining independence rehabilitation is very much part within a combined and coordinated use of medical, social, educational, and vocational measures to restore the individual to the

highest possible level of functional ability (Wegner, et. al. (2008)). 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.

1.2 Justification of the study

In Bangladesh, there are some organizations who are manufacturing Prosthesis and Orthoses and providing support to the patients among them CDD and CRP are the renowned organizations in terms of their volume of work and reputation. Only CRP has own institute to provide diploma course on P and O with highly qualified faculties from home and abroad, but yet to measures the satisfaction of provided P and O to the patients is not known. Also, CDD is the oldest one in Bangladesh to manufacture P and O and they are providing service to the patients about more than 800 clients per year but still there is also lack of measure of the satisfaction of the patients. 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 conducive 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 programmes, including prosthetic and orthotic services (Articles 26 and 20, UNCRPD). In addition, till to date no studies have been done on the patients who require prostheses or orthoses in the centres to investigate their satisfaction with the Assistive Device (AD) and the services received, nor have any studies assessed their perception regarding the uses of devices.

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 organizations 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

How much satisfied the lower-limb prosthetic patients' with their assistive devices and related service delivery by the centres ?

1.4 Operational definition

Above-knee amputation: "Amputation of the lower-limb between the hip joint and the knee joint", trans-femoral amputation. Below-knee amputation: "Amputation of the lower-limb between the knee joint and the ankle joint", trans-tibial amputation. Lower-limb prosthesis: "Prosthesis used to replace the whole or part of the lower-limb", functional characteristics of the neuromuscular and skeletal systems". Prosthesis; prosthetic device: "Externally applied device used to replace wholly, or in part, an absent or deficient limb segment". Prosthetist/orthotist: "A person who, having completed an approved course of education and training, is authorized by an appropriate national authority to design, measure and fit prostheses and orthoses".

Lower limb amputation is a condition caused by mainly disease and trauma that can occur at any time and any stage of life. The result of the amputation will be impairment,

activity limitation and participation restriction for the patient. The aim of the rehabilitation following amputation is to restore significant levels of functioning that might allow the patients to achieve their expected goals, to enhance their personal health and to improve their participation in society and to get a better quality of life while using a prosthesis than without prosthesis.

CHAPTER II

LITERATURE REVIEW

Amputation of the extremity is one of the oldest surgical interventions that date back to the time of Hippocrates (Paudel, et. al. (2005)). Amputation as a therapeutic procedure is the removal of an extremity when its function has been irreversibly compromised; traumatic amputation is the accidental separation of a limb. Based on the anatomical level of separation, lower limb amputations may range from foot amputations to the more proximal knee and hip disarticulations. The incidence of lower limb amputation varies significantly across the globe, ranging from 5.8 to 31 per 100,000, (Hisam, et. al. (2016)). Lower limb amputation (LLA) is defined as a total loss in the transverse anatomical plane of any part of the lower limb with any cause (Wegner, et. Al. (2008)). Lower limb amputation can be divided into two categories: major and minor. A minor amputation is any amputation which is distal to the ankle joint and a major amputation is any level of amputation through or proximal to the ankle joint.

Normally, a lower limb amputation is performed as a lifesaving process and it happens at all ages level but literature reported that an increased rate of LLA with age (Dillingham et al. 2002) leading to the estimated amputation rate in United States being higher for persons aged 65 years and older (National Diabetes Data Group [NDDG] 1995). Most of the people who became amputees are over 60 years of age: respectively 64 years for males and 73 years for females (LEA, 2000). It is often performed when the upper part of the limb can be re-secured and kept following severe injury such as war injury or road traffic accident. An amputation can also be needed when there is soft tissue loss due to vascular occlusive disease, or to control severe infections (Wegner, et. al. (2008)). Besides, in the cases of Osteosarcoma and Ewing sarcoma, being the most common bone cancers in the lower extremity, amputation is the best solution to avoid further spreading of disease. It will save the life of patients (Passguina, et. al. (2014)).

Lower limb amputation can be occurred as a result of a wider range of causes: traumatic and non-traumatic, because of diseases. Firstly, diabetes and its complications, almost

50% of non-traumatic lower extremity amputations worldwide occur in people with diabetes mellitus (Global Lower Extremity Amputation Study, (2000)). Diabetic population is at risk 20 times more than compare to non-diabetic population to get LLA (Spichler et. al. (2001)). The leading causes of trauma-related amputations have been reported to be injuries involving machinery (40.1%), powered tools and appliances (27.8%), firearms (8.5%), and motor vehicle crashes (8%) (Dillingham, Pezzin & MacKenzie, (2002)).

In most of the developing countries annual ulceration of foot among the people with diabetes is about 2% and, 1% of them having amputation. This complication of diabetes is associated with poverty, which leads to poor education, poor home environment, lack of sanitation and hygiene, and especially barefoot walking leads to diabetic foot damage (Bulton, (2005)). In a Nigerian study, 58% of all major limb amputations were accounted due to diabetic foot gangrene (Udosen, et. al. (2004)). In India, it is estimated that approximately 40000 legs are being amputated every year (Pendse (2010)).

In cases of severe peripheral vascular disease will patient's annual incidence rate of LLA be as high as 20-30 per 100,000 people, which is based on the total population of persons with peripheral vascular disease (Trautner, et. al. (2001)). There is no exact information of peripheral vascular disease prevalence of Bangladesh. Besides diabetes and its complications, there are some other diseases or disorders leading to LLA like Cancers 3%, infections 2% and congenital deformities 0.2% (Spichler, et. al. (2001)).

Trauma accounts for 12% LLA, for example because of road traffic accidents, war injuries, violence, especially if delayed presentation to hospital (Spichler, et. al. (2001)). Trauma is still the leading cause for amputation in developing countries; it is 3 to 47 % of all amputations in different studies. Among the persons with amputation 74.29% were found to be the leading cause for major lower limb amputations (Eskelinen, et al, (2001)), Burns, Rhabdomyolysis, Sepsis and Cellulites also lead to LLA (Wong (2005)).

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 etc. Subjective and objective information will highly indicate the perception of fit and comfort of prosthesis to a Prosthetist (David, et. al. (2012)).

Alignment of the socket and shank is important for the optimal prosthetic functioning and comfort of a person with amputation by transferring the weight-bearing load between residual limb/stump and the ground. Proper alignment plays one of the key roles in successful prosthetic fit. Inaccurate alignment will create various kinds of gait deviation, as well as, damage to the stump and body structure of the patient (Klute, et. al. (2001)).

After the amputation, most of the patients have their functional outcome decreased. Patients with above knee assistive devices face more difficulties during walking and moving around. Compared with patients using below-knee assistive devices patients using above-knee assistive devices experienced more difficulties (Magnusson, et al. (2014)). There are some factors associated with functioning such as age. Age is a significant issue with patients, young amputees performed more active in activities of daily living compared to older amputees. Male are more confident to work compared to females; 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. After amputation and receiving prosthesis patients changes their occupation in some extend and literature reported that amputees have to return to their own job and it is observed that there were no changes of profession due to the fact that the amputees were self-employed (Guarino, Chamlian and Masiero, (2007)). After the operation some patients are suffering from phantom pain and severe stump pain (considered to be mental impairments), what also can be related with co-morbidity. Physical and environmental accessibility is important to attain proper functional outcome for lower limb amputees (Condie, et. al. (2006)). In the rehabilitation phase family support is very essential to rehabilitate the persons with amputation. Positive attitudes and reinforcement from family members can inspire patients' commitment to recovery and help them adapt to new physical challenges or limitations (Alexandrou (2014)).

The knee is very important in transfers, such as on and off the toilet, in and out of bed, and up and down stairs, and it also gives us greater ability to push forward, slow down, and walk on slopes and stairs. Prosthetic feet are extremely important components for lower limb amputees to perform the walking functions in a normal manner. Evidence showed that patients reported high levels of mobility while using their device although

they experienced pain and difficulties walking on challenging surfaces (Magnusson, et. al. (2014)). Most of the amputees are wishing/expecting that their prosthesis is light weight, durable, highly cosmetic, easy to maintain, and easy for walking on level grounds well as on uneven terrain, for walking stairs with low energy consumption and proper balance (Daniel & Ivan, (2001)). Prosthetic and orthotic services need to be available and affordable in low-income countries in order to address articles within the Convention of Rights for Persons with Disabilities (CRPD), which relate to personal mobility and access to rehabilitation services.

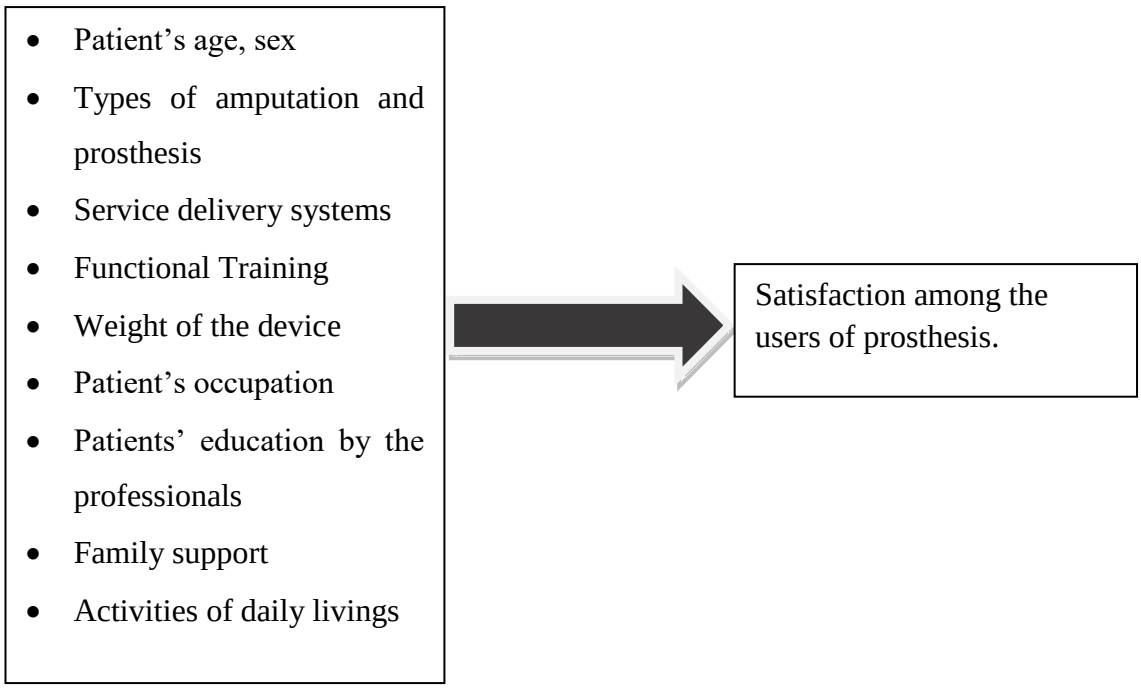
CHAPTER III

RESEARCH METHODOLOGY

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 refers 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 (IWH, (2017)). Cross-sectional design was used to find out the quantitative information on different variables during the period of the data collection. Therefore, it provides a snapshot of related characteristics in a population at a given point of time (Mann. 2003, Franenkel and Wallen (2000)).

3.1 Conceptual Framework

Independent variables **Dependent variables**



3.2 Study Objectives

3.2.1 General Objective

- To investigate lower-limb prosthetic patients' satisfaction with their lower limb prosthesis and related services provided at CRP and CDD.

3.2.2 Specific objectives

- To compare the group of prosthesis or device using patients' satisfaction regarding the prosthesis, age, gender, occupation and family support.
- To identify the factors associated with satisfaction of the prosthesis/device user with the services, they got from CRP and CDD.

3.3 Study population

Participants were selected from the database of the CRP and CDD who were received prosthesis from the both centres including gait training and are living in Bangladesh.

3.4 Study site

CRP (the largest rehabilitation centre in Bangladesh) and CDD (the renowned organization in Bangladesh who is working for persons with disabilities). However, the study was conducted in the P and O department of the centres who came to receive follow up services in the centre and who were not available during the data collection period at CRP then data were collected through mobile phone conversation also. And at CDD though there was no provision of follow up services for the patients and thus, data were collected through phone conversation.

3.5 Study period

Actually, this study was conducted during the time of December 2017 to May 2018 as academic calendar.

3.6 Sample size

The researcher took 145 patients from both the centres (CRP=80 and CDD=65) who were treated with prosthesis of lower limb amputees from the beginning to March, 2018. In this study the researcher also considered inclusion and exclusion criteria which were helped the researcher to select suitable and appropriate patients for this study.

3.7 Inclusion criteria

- Above 15 years of age, with a lower limb amputee and having prosthetic devices from the database of the centres.
- Lower limb amputees who completed their gait training and discharged from the centres and living in the community.

3.8 Exclusion criteria

- The lower limb amputees who have problem in communication, hearing and speech impairment.
- The lower limb amputees who have amputation below the ankle joint (minor amputees).
- Uncooperative patient.

3.9 Sampling technique

We have used convenience sampling method. A population refers to the entire group of people or items that meet the criteria set by the researcher. Subjects, who met the inclusion criteria, were taken as sample for this cross-sectional study. The convenience sampling method is one of the easiest, cheapest/simplest and quicker method of sample selection (Etikan, Musa, & Alkassim, (2016)).

3.10 Data collection tools/materials

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)). In addition, participants could also be added their own comments in the questionnaire for further analysis.

3.11 Data Analysis

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 (Magnusson and Ahlstrom, (2017)) 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.

3.12 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. Then, a written permission from the concerned authority/managing authority of the two centres was obtained prior to this study. Individual informed consent was taken from respondent before starting data collection and also ensured that participants have the right to leave from the study at any time. The respondents were informed that he has the right to leave or not give answer if he is not willing to answer any question within the questionnaire. Participants were not forced or coerced to answer the questions if they were not willing to provide. Confidentiality and anonymity of the information provided by respondent was maintained. It is protected by the law "right to privacy" which prevents the researcher from disclosing any direct information about the participants of the research. Researcher was ready to answer any study related question or queries to the participants.

CHAPTER IV

EXPECTED OUTCOME

Participants experiences i.e. status of devices have been identified. The assumed results from the QUEST are the mean score of the 12 items of the questionnaire. The differences between mean score was represented the level of satisfaction of the uses of prosthesis and services. In the comment section, participant was able to provide their own undisclosed thought and thinking from their own perspectives but nobody expressed their own thought and thinking during interview.

CHAPTER V

RESULTS

A total 145 subjects were studied in the present study. Necessary information was collected from the respondents and after analysis; data was presented as tables and graphical form below.

5.1 Socio-demographic findings of the study population

5.1.1 Age distribution of the respondents

Participants of CRP

Age group	Frequency	Percent
18-30	32	40.0
31-40	15	18.75
41-50	21	26.25
51-60	7	8.75
>60	5	6.25
Total	80	100.0

Table 5.1.1a Age distribution of the respondents

Among the respondents of CRP, during this study it was found that the mean age of the respondents was 38.14 ± 13.37 years ranging from 18 to 72 years. About 40.0% were in the age range 18-30 years, 18.75% were in the age range 31-40 years, 26.25% were in the age range 41-50 years, 8.75% were in the age range 51-60 years and only few respondents were in the above 60 years.

Participants of CDD

Age group	Frequency	Percent
15-20	3	4.62
21-30	13	20.0
31-40	21	32.31
41-50	17	26.16
51-60	9	13.84
>60	2	3.07
Total	65	100.0

Table 5.1.1b Age distribution of the respondents

In the present study we found that the mean age of the respondents of CDD was 39.58 ± 11.94 years ranging from 15 to 70 years. About 4.62% were in the age range 15-20 years, 20.0% were in the age range 21-30 years, 32.31% were in the age range 31-40 years, 26.16% were in the age range 41-50 years, 13.84% were in the age range 51-60 years, and few respondents were in the above 60 years. So, it is said that the study population predominately represents the middle aged and young aged people.

5.1.2 Gender distribution of the participants

Gender	Frequency	Percent
Male	70	87.5
Female	10	12.5
Total	80	100.0

Table 5.1.2a Gender distribution of the respondents of CRP

From the table (5.1.2a), it can be seen that most of the participants of CRP were male which was 87.5% and the rest of the population were female.

Gender	Frequency	Percent
Male	55	84.6
Female	10	15.4
Total	65	100.0

Table 5.1.2b Gender distribution of the respondents of CDD

From the table (5.1.2b), it can be seen that most of the participants of CDD were male which was 84.6% and the rest of the population were female.

It is evident that among the total population of CRP, male and female percentage were 87% and 13% respectively and at CDD, there percentage were 85% and 15% respectively.

5.1.3 Occupation

Participants at CRP

Occupation	Frequency	Percent
Business	27	33.8
Service	19	23.8
Student	12	15.0
Unemployed	15	18.8
Others	2	2.5
Housewife	5	6.3
Total	80	100.0

Table 5.1.3a: Occupation of the respondents

Participants at CDD

Occupation	Frequency	Percent
Business	25	38.5
Service	12	18.5
Student	6	9.2
Unemployed	18	27.7
Housewife	4	6.2
Total	65	100.0

Table 5.1.3b: Occupation of the respondents

Occupation of the respondents at CRP and CDD is presented in the table 5.1.3.a and 5.1.3b respectively. Percentages of business people were 33.8% and 38.5% respectively. Other occupations of CRP and CDD service holder were 23.8% and 18.5%, student were 15.0% and 9.2%, unemployed were 18.8% and 27.7%, housewife were 6.2% and 6.2% respectively and others occupation at CRP were 2.5%.

5.1.4 Type of amputation

Types of amputation	Frequency	Percent
Trans Tibial	50	62.5
Trans Femoral	30	37.5
Total	80	100.0

Table 5.1.4a: Types of amputation at CRP

Types of amputation	Frequency	Percent
Trans Tibial	51	78.5
Trans Femoral	14	21.5
Total	65	100.0

Table 5.1.4b: Types of amputation at CDD

In the above table (5.1.4a and 5.1.4b) distribution of type of amputation are presented. It was found that at CRP and CDD, below knee amputation (Trans Tibial) were 62.5% and 78.5% respectively. And above knee amputation (Trans Femoral) were 37.5% and 21.5% at CRP and CDD respectively.

5.1.5 Name of the device

Table 5.1.5a: Name of the device at CRP (n=80)

Device name	Frequency	Percent
Bellow knee (BK)	50	62.5
Above knee (AK)	30	37.5
Total	80	100.0

Table 5.1.5b: Name of the device at CDD (n=65)

Device name	Frequency	Percent
Bellow knee (BK)	51	78.5
Above knee (AK)	14	21.5
Total	65	100.0

Among the participants of CRP, below knee and above knee prosthesis users were 50 (62.5%) and 30 (37.5%) respectively (Table-5.1.5a). And among the 65 participants of CDD, below knee prosthesis users were 51 (78.5%) and above knee prosthesis users were 14 (21.5%) (Table-5.1.5b).

5.1.6 Weight (KG) of the device

Table 5.1.6a: Weight of the device (Above knee) of CRP (n=30)

Weight of the device(kg)	Frequency	Percent
2.0-2.5	3	10.0
>2.5	27	90.0
Total	30	100.0

Table 5.1.6b: Weight of the device (Above knee) of CDD (n=14)

Weight of the device(kg)	Frequency	Percent
2.0-2.5	3	21.4
>2.5	11	78.6
Total	14	100.0

Table 5.1.6c: Weight of the device (Below knee) of CRP (n=50)

Weight of the device(kg)	Frequency	Percent
2.0-2.5	46	92.0
>2.5	4	8.0
Total	50	100.0

Table 5.1.6d: Weight of the device (Below knee) of CDD (n=51)

Weight of the device(kg)	Frequency	Percent
2.0-2.5	20	39.21
>2.5	31	60.79
Total	51	100.0

Among the participants of CRP, about 10% above knee prosthesis devices was in the weight range 2.0-2.5 kg and majority (90%) were above 2.5 kg. Among the participants of CDD, about 21% above knee prosthesis devices was in the weight range 2.0-2.5 kg and majority (78.6%) were above 2.5 kg.

Among the participants of CRP, 92% below knee prosthesis devices was in the weight range 2.0-2.5 kg and rest were above 2.5 kg. Among the participants of CDD, about 39% below knee prosthesis devices was in the weight range 2.0-2.5 kg and about 60% were above 2.5 kg.

5.1.7 Family support frequency

Table 5.1.7a: Family support at CRP (n=80)

Family support	Frequency	Percent
No support	1	1.3
Minimum support	3	3.8
Moderate support	24	30.0
Maximum support	52	65.0
Total	80	100.0

Table 5.1.7b: Family support at CDD (n=65)

Family support	Frequency	Percent
Minimum support	20	30.8
Moderate support	19	29.2
Maximum support	26	40.0
Total	65	100.0

In this section of family support, respondents were asked to share their experiences about family support during using the device. At CRP, among the total participants, 1.3% did not take any family support, they received minimum, moderate and maximum support are 3.8%, 30% and 65% respectively (Table-5.1.8a). In contrast, among the participants of CDD, they received minimum, moderate and maximum family support are 30.8%, 29.2% and 40.0% respectively (Table-5.1.8b).

5.1.8 Per-day walking distance (km)

Table 5.1.8.a: Walking distance per day (km) with Above Knee prosthesis * Weight of the device (kg)

Respondents at CRP

Walking distance per day (km) with Above Knee prosthesis		Weight of the device(kg)		Chi Square	P-value
		2.0-2.5	>2.5		
Walking per day (km)	0.5-2.0	1	6	.186	.666
	>2.0	2	21		

In the above: 5.1.8.a, we see that walking per day (km) with Above Knee prosthesis and weight of the device (kg) are not significantly associated (p-value=.666).

Table 5.1.8.b: Walking distance per day (km) with Above Knee prosthesis * Weight of the device (kg)

Respondents at CDD

Walking distance per day (km) with Above Knee prosthesis		Weight of the device(kg)		Chi Square	P-value
		2.0-2.5	>2.5		
Walking per day (km)	0.5-2.0	2	10	1.131	.287
	>2.0	1	1		

Walking per day (km) with Above Knee prosthesis and weight of the device (kg) are not significantly associated (p-value=.287) for the respondents of CDD.

Table 5.1.8c: Walking distance per day (km) with Below Knee prosthesis * Weight of the device (kg)

Respondents at CRP

Walking distance per day (km) with Below Knee prosthesis		Weight of the device (kg)		Chi Square	p-value
		2.0-2.5	>2.5		
Walking per day (km)	0.5-2.0	37	3	.068	.794
	>2.0	9	1		

The association between walking per day (km) with Below Knee prosthesis and weight of the device (kg) is not statistically significant (p=.794) for the respondents of the CRP.

Table 5.1.8d: Walking distance per day (km) with Below Knee prosthesis * weight of the device (kg)

Respondents at CDD

Walking distance per day (km) with Below Knee prosthesis		Weight of the device (kg)		Chi Square	P-value
		2.0 – 2.5	>2.5		
Walking per day (km)	0.5-2.0	17	29	1.005	.316
	>2.0	3	2		

The association between walking per day (km) with Below Knee prosthesis and weight of the device (kg) is not statistically significant (p=.316) for the respondents of the CDD.

In the above tables, though there is no significant relationship between walking distance (km) per day and weight of the device of both types of prosthesis, but patients mental and physical strength may help them to walk more with the devices rather considering of the weight of the devices.

5.1.9 Device change

Table 5.1.9a: Change the device * Name of the device

Respondents at CRP

Change the device	Name of the device		Chi Square	P-value
	Above knee	Bellow knee		
Yes	7	3		
No	23	47	5.15	.023

There exists significant relation between device change and name of the device (p-value=.023) for the respondents of CRP.

Table 5.1.9b: Change the device * Name of the device

Respondents at CDD

Change the device	Name of the device		Chi Square	P-value
	Above knee	Bellow knee		
Yes	1	3		
No	13	48	.030	.862

There exists no significant relation between device change and name of the device (p-value=.862) for the respondents of CDD.

From the above cross table, it is evident that there exists positive relationship in between the two attributes at CRP but at CDD there is no positive relationship, because of CRP has follow up service facility but CDD provided the devices from their different projects to the patients and thus, they have no follow up service and repairing facility. So, if follow up and repairing service would be provided then some realistic relationship could be seen.

Table 5.1.9c: Change the device * weight of the device (kg)

Respondents at CRP

Change the device	weight of the device (kg)		Chi Square	P-value
	2.0-2.5	>2.5		
Yes	5	5		
No	44	26	.609	.435

For the respondents of CRP, there exists no significant relation between device change and weight of the device (p-value=.435)

Table 5.1.9d: Change the device * weight of the device (kg)

Respondents at CDD

Change the device	weight of the device (kg)		Chi Square	P-value
	2.0-2.5	>2.5		
Yes	1	2		
No	22	40	.406	.261

For the respondents of CRP, there exists no significant relation between device change and weight of the device (p-value=.261)

5.1.10 Difficulty faces with prosthesis

Table 5.1.10a: Face any difficulty during daily activity * Name of the device

Respondents at CRP

Face any difficulty during daily activity	Name of the device		Chi Square	p-value
	Above knee	Bellow knee		
YES	7	5		
No	23	45	2.614	.106

The difficulty face and device type is not significantly associated for the respondents of CRP (p-value=.106)

Table 5.1.10b: Face any difficulty during daily activity * Name of the device

Respondents at CDD

Face any difficulty during daily activity	Name of the device		Chi Square	p-value
	Above knee	Bellow knee		
YES	9	3		
No	5	48	24.89	.000

The difficulty face and device type is significantly associated for the respondents of CDD (p-value=.00)

From above all the cross table it is evident that there exist some positive relationship between the two attributes, but due to lack of sufficient information (data) we can not make any strong comment in this regard. So, if further study could be conducted on based large scale data (patients) we believe in that situation we may get so suitable and realistic positive result in favour of our study.

5.1.11 Results of patients' level of satisfaction with prosthesis and services

Table-5.1.11a: Level of satisfaction with above knee prosthesis

Response scale 1-5	CRP all AK prosthesis users, n=30		CDD all AK prosthesis users, n=14	
	Mean	**SD**	**Mean**	**SD**
Satisfaction with assistive device				
Q1. How satisfied you are with the dimensions of your assistive device?	3.93	.784	3.14	.864
Q2. How satisfied you are with the weight of your assistive device?	4.06	.639	2.71	1.20
Q3. How satisfied you are with the ease in adjusting the parts of your assistive device?	4.00	.587	2.78	.699
Q4. How satisfied you are with how safe and secure your assistive device is?	3.97	1.13	3.14	1.23
Q5. How satisfied you are with the durability of your assistive device?	4.03	.964	3.21	1.18
Q6. How satisfied you are with how easy it is to use your assistive device?	4.06	.944	2.57	1.28
Q7. How satisfied you are with how comfortable your assistive device is?	3.70	1.207	2.14	1.02
Q8. How satisfied you are with how effective your assistive device is (the degree to which your assistive device meets your needs?)	3.80	1.095	2.35	1.39
Assistive device, total score	**3.94**	**.698**	**2.71**	**1.07**

Satisfaction with services

Q9. How satisfied you are with the service delivery programme in which you obtain your assistive device?	4.53	.819	3.42	1.15
Q10. How satisfied you are with the repairs and servicing provided for your assistive device?	4.36	1.06	.214	.801
Q11. How satisfied you are with the quality of the professional services you received for using your assistive device?	4.73	.449	2.78	1.42
Q12. How satisfied you are with the follow-up services received for your assistive device?	4.46	.819	.214	.801
Services, total score	**4.59**	**.775**	**1.78**	**.611**

Table-5.1.11b: Level of satisfaction with below knee prosthesis

Response scale 1-5	CRP all BK prosthesis users, n=50		CDD all BK prosthesis users, n=51	
	Mean	**SD**	**Mean**	**SD**
Satisfaction with assistive device				
Q1. How satisfied you are with the dimensions of your assistive device?	4.32	.652	3.92	.934
Q2. How satisfied you are with the weight of your assistive device?	4.30	.677	3.70	.965
Q3. How satisfied you are with the ease in adjusting the parts of your assistive device?	4.30	.677	3.78	1.119
Q4. How satisfied you are with how safe and secure your assistive device is?	4.38	.602	3.76	1.03
Q5. How satisfied you are with the durability of your assistive device?	4.36	.692	3.74	.913
Q6. How satisfied you are with how easy it is to use your assistive device?	4.22	.736	3.90	1.118
Q7. How satisfied you are with how comfortable your assistive device is?	4.16	.618	3.66	1.32

Q8. How satisfied you are with how effective your assistive device is (the degree to which your assistive device meets your needs?)	4.52	.579	3.66	1.107
Assistive device, total score	**4.35**	**.554**	**3.78**	**1.00**
Satisfaction with services				
Q9. How satisfied you are with the service delivery programme in which you obtain your assistive device?	4.74	.486	.078	.560
Q10. How satisfied you are with the repairs and servicing provided for your assistive device?	4.58	.498	3.62	1.58
Q11. How satisfied you are with the quality of the professional services you received for using your assistive device?	4.74	.486	.352	.955
Q12. How satisfied you are with the follow-up services received for your assistive device?	4.70	.462	.352	.955
Services, total score	**4.79**	**.354**	**2.14**	**.662**

Based on the QUEST, the total mean score of CRP and CDD for satisfaction with above knee (AK) prosthesis were 3.94 and 2.71 respectively; the total mean score for satisfaction with services of CRP and CDD were 4.59 and 1.78 respectively (Table-5.1.11a).

In the section of below knee prosthesis users, the total mean score of CRP and CDD for satisfaction were 4.35 and 3.78 respectively; the total mean score for satisfaction with services of CRP and CDD were 4.79 and 2.14 respectively (Table-5.1.11b).

Table-5.1.11c: Descriptive statistics for the QUEST scores of CRP respondents

	Scale	Mean Score	Standard Deviation	Min-Max
QUEST	AK Device (n=30)	3.94	.698	3.70-4.06
	Service (n=30)	4.59	.775	4.36-4.73
	BK Device (n=50)	4.35	.554	4.16-4.52
	Service (n=50)	4.79	.354	4.58-4.74

Table-5.1.11d: Descriptive statistics for the QUEST scores of CDD respondents

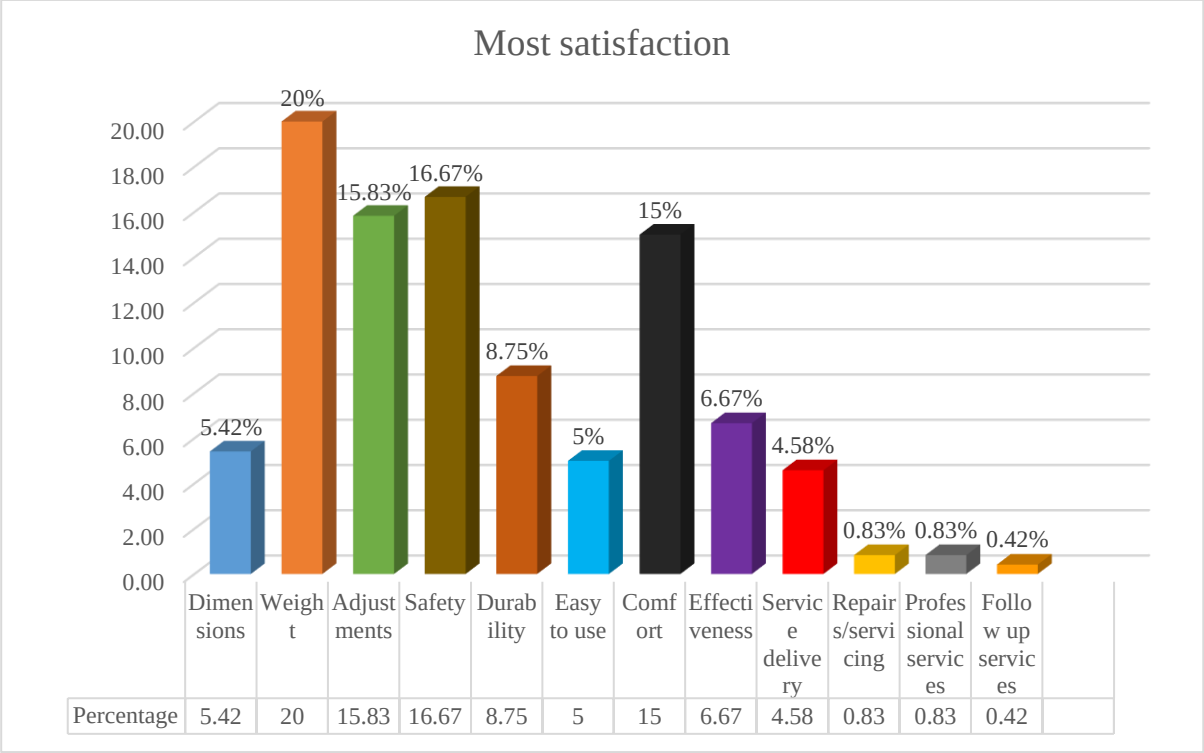
	Scale	Mean Score	Standard Deviation	Min-Max
QUEST	AK Device (n=14)	2.71	1.07	2.14-3.14
	Service (n=14)	1.78	.611	0.21-3.42
	BK Device (n=51)	3.78	1.00	3.66-3.92
	Service (n=51)	2.14	.662	.078-3.62

Based on the QUEST, the total mean score of CRP and CDD for satisfaction with above knee (AK) prosthesis were 3.94 and 2.71 respectively; the total mean score for satisfaction with services of CRP and CDD were 4.59 and 1.78 respectively (Table-5.1.11a).

In the section of below knee prosthesis users, the total mean score of CRP and CDD for satisfaction were 4.35 and 3.78 respectively; the total mean score for satisfaction with services of CRP and CDD were 4.79 and 2.14 respectively (Table-5.1.11b).

5.1.12 The most important items in the Quebec User Evaluation of Satisfaction with Assistive Technology (QUEST) questionnaire

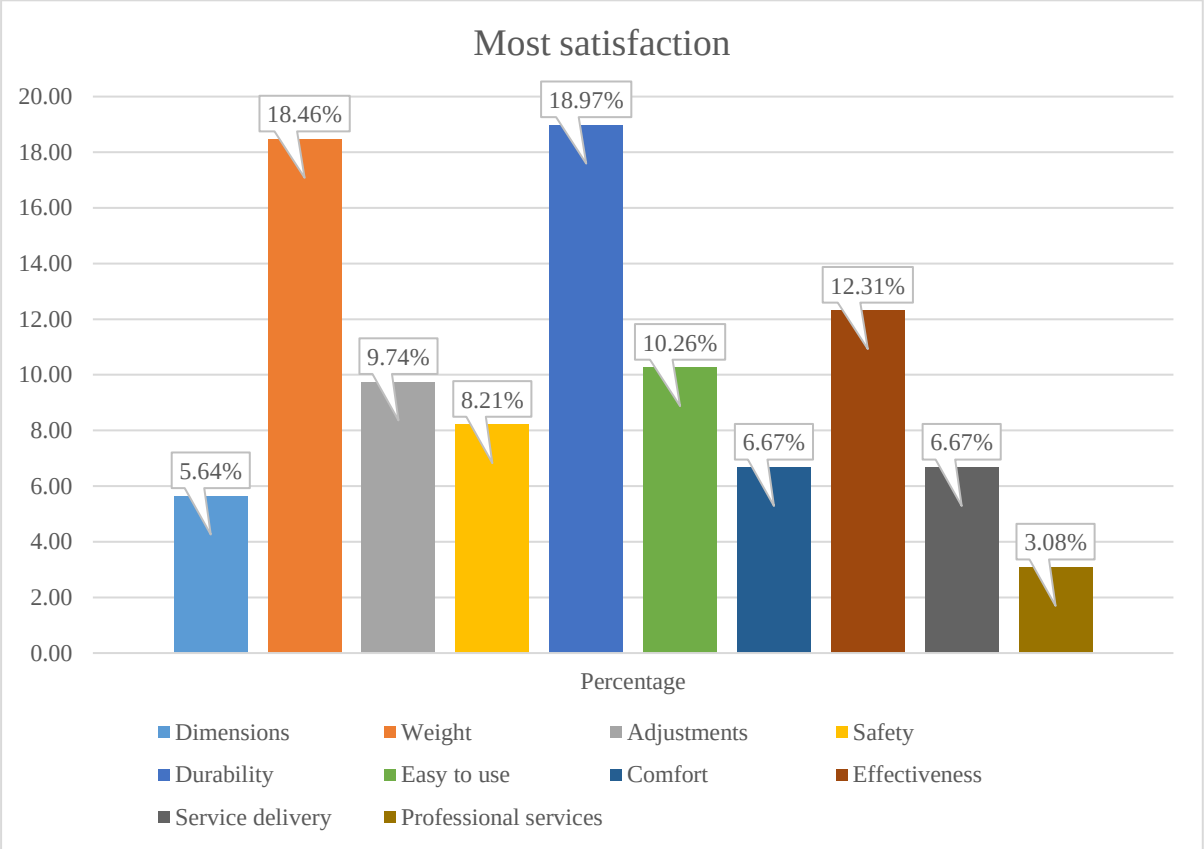
Graph-I: Three most satisfaction at CRP



	Dimensions	Weight	Adjustments	Safety	Durability	Easy to use	Comfort	Effectiveness	Service delivery	Repairs/servicing	Professional services	Follow up services
Percentage	5.42	20	15.83	16.67	8.75	5	15	6.67	4.58	0.83	0.83	0.42

Patients were asked to choose the 3 most important QUEST items.

Graph-II: Three most satisfaction at CDD



Patients were asked to choose the 3 most important QUEST items here also.

Participants were asked to choose what they considered to be the 3 most important items included in QUEST both for the CRP and CDD. In CRP, they reported that weight of the device was the most important followed by safety of the device and adjustments, and their percentage were 20%, 16.67% and 15.83% respectively (Graph-I). In-contrast at CDD, they reported that durability of the device was most important followed by device weight and effectiveness and the percentage were 18.97%, 18.46% and 12.31% respectively (Graph- II).

5.2 Data analysis

Descriptive statistics were used to summarize results. Only four participants were possible to conduct face to face interview. Others were conducted through mobile phonic correspondents as much as possible due to unavailability of follow up visit within the time frame. We have conducted interview to those who were willing to participate. Some device receivers were dead, some receiver phone numbers were switched off and some were unwilling to participate in this study and some were not willing to give time more. Some people are able and willing to expound more than others and some could not spend that much time (Burke and Miller, (2001)) and some mobile number were invalid also. Many device receivers were given their local care givers numbers instead of their own contact numbers and so, those people could not provide information accurately. Generally, only 2-3 patients come to take follow up services from CRP per month having prosthesis but in CDD there is seldom numbers are visited after taking prosthesis. The response on the question of date of injury nobody can answer the exact date but they informed about the probable length of injury. Even they could not provide information about the questions of receiving date and technology of the device due to they were not informed about that. But in general CRP uses the technology of ICRC and CDD uses mostly LIMBS International USA and Mobility India Technology but now CDD are using only Mobility India Technology due to low price. Participants were not ready to share about the causes of changing the device as well as about the difficulties faces with the devices when answer was ‘yes’. SPSS version 16.0 was used for statistical analyses and sometimes MS excel spread sheet and calculator were also used for data analysis purpose.

To explore which factors were associated with satisfaction with assistive device and services, graphical analyses were conducted with satisfaction with assistive device and services as dependent variables. On the basis of statistical analysis data were analyzed as mean score, standard deviation and percentile to analyze the level of satisfaction in terms of device and related services. Chi square test was also applied to signify association between variables at 0.05 significance levels.

CHAPTER VI

DISCUSSION

Overall, patients were quite satisfied with their prosthetic devices (below knee) and with the services provided from CRP's P and O department and more or less satisfied with above knee prosthesis, having some limitations in desired activities and needs i.e. distance of centre, hard to buy due to poor economic condition (Table- 5.1.11a and 5.1.11b). But in-contrast patients were not very satisfied with AK device and not satisfied at all with service having AK device and more or less satisfied with their below knee prosthetic devices and not very satisfied with the services having the same prosthesis provided from CDD's P and O department (Table-5.1.11a and 5.1.11b). In the One-Sample 't' test it is evident that at CDD above knee prosthesis users were more satisfied compare to the provided services. Access to services was further limited for lack of finances to pay fees for service provider. In the comment sections of the questionnaire, it was observed the differences in between the two rehabilitation centres in terms of their quality of services and device technology.

While it is estimated from the data base of both centres that out of 475 LLA people in CRP (367) and in CDD (108) are using the prosthetic, the data base used to recruit patients for this study, which included only lower limb prosthetic devices. Among the participants of CRP there about 129 participants do not have mobile number or with some invalid number and among the participants of CDD, there were only 5 invalid numbers. Regression analyses demonstrated that the condition of the device was a factor associated with both satisfaction with the device and services. This finding was consistent with results from QUEST, Graph-I which indicated that weight, safety and device adjustments were considered as most important at CRP's P and O department and in-contrast CDD (Graph-II) indicated that durability, weight and effectiveness were considered as most important factors. It was interesting to note that the ability to pay for costs associated with receiving services was a factor that also contributed to satisfaction with prosthetic service delivery. It was likely that financial limitation is a major reason affecting access to follow-up services and repairs.

A total 145 subjects (CRP=80 and CDD=65) were studied in the present study. The mean age of the CRP respondents was 38.14 ± 13.37 years while it was 39.58 ± 11.94 for 87.5% respondents of CRP was male. Similarly, 84.6% respondents of CDD were male.
It was found that at CRP, AK prosthesis male users were 90% and female 10% and BK prosthesis male users were 86% and female were 14%. On the other hand, at CDD, it was found that among the 65 participants, 55 (84.6%) participants were male and 10 (15.4%) participants were female. Among the above knee and below knee prosthesis users at CDD, AK prosthesis male users were 85.7% and female 14.3% and BK prosthesis male users were 84.3% and female users were 15.7%. This might implicate that males are more active and contribute more to productivity in comparison to female and are more vulnerable to risks and accidents in Bangladesh as like as in other parts of the world. Males are at a significantly higher risk for trauma related amputations than females.

At CRP, in this research fifteen persons (18.8%) of participants were unemployed and it might not be related to the disability as much. May be there were some other factors such as level of education, lack of skill training or personal matters. Twenty-seven persons (33.8%) of the participants were involved in business, nineteen persons (23.8%) were service holder, twelve persons (15%) were student, house wife were 5 persons (6.2%) and others occupation were only 2.5%. In contrast to CDD there were eighteen persons (27.7%) were unemployed, twenty-five persons (38.5%) were business man, twelve persons (18.5%) were service holder, six (9.2%) were students and four (6.2%) were housewife.

In our study, it was found that at CRP, fifty persons (62.5%) were trans-tibial (below knee) and 30 persons (37.5%) were trans-femoral (above knee) amputation. And at CDD, it was found that below knee amputation (Trans Tibial) were 51 persons (78.5%) and above knee amputation (trans-femoral) were fourteen persons (21.5%) where the same numbers of participants used same name of prosthesis. The weight of the devices of both centres was more or less same but CRP used lighter weight technology. where CRP's above knee average weight was 4.45 kg and below knee weight was 2.68 kg and in contrast at CDD, there average device weight of above knee was 4.04 kg and below knee weight was 2.70 kg.

During patients' activities of daily livings and for occupation, they have to walk daily with their prosthesis to contribute in the meaningful lives. The participants with above knee prosthesis of CRP, walked on an average 1.62 km with SD (1.24) and with below knee prosthesis walked on an average 1.81 km with SD (.97) per day. The participants of CDD with their above knee prosthesis, walked on an average 1.04 km with SD (.69) and with below knee prosthesis they walked about 1.23 km with SD (.93). Walking per day (km) with Above Knee prosthesis and weight of the device (kg) is not significantly associated (p-value >.05) for CRP and CDD respondents.

Participants reported that at CRP, only 1 person (1.3%) did not receive any family support, rest of the participants received minimum, moderate and maximum support such as three persons (3.8%), twenty-four persons (30%) and fifty-two persons (65%) respectively. In contrast, among the participants of CDD, they received minimum, moderate and maximum family support as twenty persons (30.8%), nineteen persons (29.2%) and twenty six persons (40.0%) respectively. So, here it was found that maximum persons were received family support from their family members of the both the centre patients. Family support plays a vital role in the rehabilitation process for a number of reasons.

The study showed that the participants of CRP, among eighty participants only eight persons (10%) reported their device changing experience and at CDD, only four persons (6.2%) prosthetic users among sixty five participants were needed to change their device due to poor fitting, inappropriate gait training, pain, etc. Maximum participants never change their devices i.e. at CRP 90% and CDD 93.8% did not change their devices. There exists significant relation between device change and name of the device (p-value=.023) for the respondents of CRP. There exists no significant relation between device change and name of the device (p-value=.862) for the respondents of CDD. CDD provided their services through some projects activities at their different project locations and participants received the devices with free of cost. For this reason, participants of CDD did not get chance to change their devices but the participants of CRP purchased their desired device with changing guaranty/warranty. If we see the factor facing difficulties, we see that the participants of CRP, only twelve persons (15%) were faced different types of difficulties during their daily life activities with their prosthesis and sixty eight persons (85%) did not face any difficulties at all. Among the prosthesis users

of CDD, only twelve (18.5%) participants faces different types of difficulties during their daily life activities as well as with their prosthesis and, fifty three (81.5%) do not face any difficulties. The difficulty face and device type is not significantly associated for the respondents of CRP (p-value=.106). In contrast, the difficulty face and device type is significantly associated for the respondents of CDD (p-value<.05).

Based on the QUEST, the total mean score of CRP for satisfaction with above knee (AK) prosthesis and below knee (BK) prosthesis were 3.94 and 4.35 respectively. The total mean scores of CDD were 2.71 and 3.78 respectively. In comparison between CRP and CDD for satisfaction with assistive devices, the CRP is in better position than CDD.

In the section of below knee and above knee prosthesis users, the total mean score of CRP for satisfaction with services were 4.35 and 4.59 respectively. For CDD, the scores were 2.14 and 1.78 respectively. It can be said that the users are more satisfied with services of CRP than CDD.

In the comment section of the questionnaire, the respondents of CRP shared their experiences regarding the satisfaction of uses the Lower Limb (LL) prosthesis and the experiences were safe, light weight (vary from client's psychology), comfortable (maximum patient said). They also shared that the follow up services of CRP was very good and thus they can receive consultancy after delivery and can solve their problems which they experienced during using the devices as well as the professional services were also good. The participants said that CRP has repairing and servicing facilities, so the clients can repair and can take service for their devices as well. On the other hand, the respondents of CDD shared their experiences regarding their low-level satisfaction during using the LL prosthesis and they shared that the device was safe but weight is little bit higher (i.e. heavy) (which also vary from clients' psychology), comfortable. They also shared that they did not have any idea about the follow up services so, they can't share their experiences with the service providers and thus they reported the professional services were satisfactory. Due to lack of follow up services CDD did not have their repair and servicing facilities also.

CHAPTER VII

RECOMMENDATION AND CONCLUSION

7.1 LIMITATIONS OF THE STUDY

The result of the study should not be generalized all over the country as it is carried out within only two centres and the centres were selected based on personal judgement. Researcher did not get so much time to take face to face interview and thus mobile phonic conversation was applied to collect data, which was more challenging to get in-depth data. With quantitative measures it is really difficult to measure satisfaction of LLA patients, a mix method quantitative and qualitative would have being better. And if the researcher uses the both research methods then the results might be different. Both the centres CRP and CDD the P and O department have a limited choice of materials and components (only ICRC prosthetic components are available and Mobility India respectively). Component selection should be based on the condition of amputees; there was no choice for LLA patients regarding components. The price of prosthesis was too high in context with their economic status.

7.2 RECOMMENDATION(S)

Patients' self-reports of satisfaction with the lower limb prosthesis 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. Attention are needed to be directed towards access to follow-up services and repairs and to address the general condition of provided devices. According to the study results, the following below listed steps have to be taken to improve the quality of P and O department of CRP and CDD:

- Ensure proper gait training facility through gait assessment tools and increase clinical spaces.
- Ensure the indoor facilities while patients will be staying at the centre and/or provide emphasizes in the CBR program.
- Use alternative appropriate prosthetics components in combination with ICRC technology and Mobility India as per need of patients.
- Should maintain liaison or improve collaboration with government stakeholders to provide door to door support.
- Should encourage the clinical staff and students to do continue research and evaluation regarding prosthetic services at CRP and CDD.

7.3 CONCLUSION

It has been observed that the patients have reported their high levels satisfaction with the devices and services although they have some adverse experienced difficulties in walking on challenging surfaces. The professional service and the quality of devices are more enriched in CRP in-contrast to CDD but it would be needed to take another survey through face to face in-depth interview to gather depth knowledge. Lower satisfaction with service was associated with the condition of the device, ability to walk on uneven ground and ability to pay for costs associated with the service and maintenance of the devices. Limitations in the effectiveness of assistive devices and issues with service delivery programmes, such as limited access to follow-up services and repairs, were also issues desired to be addressed by professionals within the rehabilitation field as well as health policymakers. Implementation of the Convention of Rights for Persons with Disabilities regarding personal mobility and access to rehabilitation service requires urgent attention in Bangladesh. The quality of the prosthesis and the quality of prosthetics services appear to be relatively important for LLA patients to reach optimal functional outcomes with activities of daily livings. Due to family support, study participant's psychosocial satisfaction was at a high standard level that was indicated to help managing social discrimination by those LLA patients who received strong family support. In addition to that the perceptions of LLA patients were associated with demographic criteria such as age, sex, occupation, level of amputation, etc.

CHAPTER VIII

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APPENDIX

A. CONSENT FORM (English and Bengali version)

This research is a part of M. Sc in Rehabilitation Science course and the name of the researcher is Md. Abdul Koddus, a student of Bangladesh Health Professions Institute (BHPI). The study is entitled as **'Measuring the level of satisfaction with lower limb prosthetic devices among the users of the Centre for the Rehabilitation of the Paralysed (CRP) and Centre for Disability in Development (CDD).'**

In this study, I am a participant and I have been clearly informed about the purpose and aim of the study. I will have the right to refuse in taking part any time at any stage of the study. I will not be bound to answer to anybody. This study has no connection with me and there will be no impact on me and regarding treatment at present and in future.

I have been informed about the above mentioned information and I am willing to participate in the study with giving consent.

Signature/Finger print of the Participant:	Date:
Signature of the Researcher:	Date:
Signature/Finger print of the witness:	Date:

সম্মতিপত্র

এই গবেষণাটি এমএসসি ইন রিহেবিলিটেশন সাইন্স কোর্সের একটি অংশ এবং গবেষক মোঃ আব্দুল কুদ্দুস একজন বাংলাদেশ হেলথ প্রফেশন্স ইন্সটিটিউটের ছাত্র। গবেষণাটির শিরোনাম হচ্ছে **'Measuring the level of satisfaction with lower limb prosthetic devices among the users of the Centre for the Rehabilitation of the Paralysed (CRP) and Centre for Disability in Development (CDD)'**।

এই গবেষণায় আমি ... ...বয়স ... ..., একজন অংশগ্রহণকারী এবং আমি উক্ত গবেষণার লক্ষ্য ও উদ্দেশ্য সম্পর্কে সম্পূর্ণ অবগত। এই গবেষণা চলাকালীন সময়ের যেকোন পর্বে অংশগ্রহণ হতে নিজেকে সরিয়ে নেয়ার অধিকার আমার থাকবে। আমি যে কারও কাছে উত্তর দিতে বাধ্য থাকবনা। আমার সাথে এই গবেষণার কোন সম্পর্ক নেই এবং আমার উপর এবং বর্তমান ও ভবিষ্যতের চিকিৎসা সংক্রান্ত বিষয়ে কোন প্রভাব ফেলবেনা।

আমি উপরে বর্ণিত তথ্য সম্পর্কে সম্পূর্ণ অবগত এবং আমি স্বেচ্ছায় গবেষণাটিতে অংশগ্রহণ করার সম্মতি প্রদান করছি।

অংশগ্রহণকারীর স্বাক্ষর/টিপসই:	তারিখ:
গবেষকের স্বাক্ষর:	তারিখ:
স্বাক্ষীর স্বাক্ষর/টিপসই:	তারিখ:

B. QUESTIONNAIRE

Basic information (প্রাথমিক তথ্য):

Date of assessment (তথ্য গ্রহণের তারিখ)				
User name (উপকরণটি ব্যবহারকারীর নাম)		Age (বয়স):	Sex (লিঙ্গ):	
Occupation (পেশা)		Date of injury (আঘাত প্রাপ্তির তাং):		
Type of amputation (পা কর্তনের ধরণ)		Name of the device (নকল পায়ের নাম)		
Date of receiving the device (নকল পা প্রাপ্তির তারিখ)				
Technology of the device (নকল পা প্রস্তুতির প্রযুক্তির নাম)				
Weight of the device (নকল পা'টির ওজন)		How much distance do you walk on an average per day (আপনি গড়ে প্রতিদিন কতটুকু দূরত্ব হাটেন)?		
According to your opinion what is the possibility of an accident during using this device (আপনার মতে নকল পা'টি ব্যবহারের সময় দূর্ঘটনার সম্ভাবনা আছে কি না, যদি থাকে কতটুকু)? Yes (হ্যাঁ) / No (না)	Per day (number)- প্রতিদিন (সংখ্যা):	Per week (number)- প্রতি সপ্তাহ (সংখ্যা):		Per month (number)- প্রতি মাস (সংখ্যা):
How much assistance do you get from your family members (আপনার পরিবারের সদস্যদের নিকট থেকে আপনি কতটুকু সহযোগিতা পান)?	No assistance (কোন সহযোগিতা না)	Minimum (মোটামুটি)	Moderate (মাঝামাঝি)	Maximum (সর্বোচ্চ)

During using the device have you ever change the device (ব্যবহারের সময় কখনও কি উপকরণটি পরিবর্তন করতে হয়েছে)?	Yes (হ্যাঁ)		If yes, when/why/how/where, etc (যদি হয়, কখন/কেন/কিভাবে/কোথায়, ইত্যাদি):
	No (না)		
Do you face any difficulty during your daily activities? (আপনার দৈনন্দিন কার্য সম্পাদনে আপনি কি কোন অসুবিধার সম্মুখিন হন?)	Yes (হ্যাঁ)		If yes, remarks (যদি হন, কোন ধরণের অসুবিধার সম্মুখিন হন):
	No (না)		

The purpose of the QUEST questionnaire is to evaluate how satisfied you are with your assistive device and the related services you experienced. The questionnaire consists of 12 satisfaction items.

- For each of the 12 items, rate your satisfaction with your assistive device and the related services you experienced by using the following scale of 1 to 5.
- Please circle or mark the one number that best describes your degree of satisfaction with each of the 12 items.
- Do not leave any question unanswered.
- For any item that you were not "very satisfied", please comment in the section comments.

Thank you for completing the QUEST questionnaire.

1 (১)	2 (২)	3 (৩)	4 (৪)	5 (৫)
not satisfied at all (একেবারেই সন্তোষ্ট নই)	not very Satisfied (বেশি সন্তোষ্ট নই)	more or less Satisfied (কিছুটা সন্তোষ্ট)	quite satisfied (মোটামুটি সন্তোষ্ট)	very satisfied (খুবই সন্তোষ্ট)

ASSISTIVE DEVICE (সহায়ক উপকরণ) ***How satisfied are you with*** **(**নকল পা'টি পেয়ে আপনি কতটুকু সন্তোষ্ট**),**	
1. the **dimensions** (size, height, length, width) of your assistive device? (নকল অঙ্গটির আকার-আকৃতির দিক থেকে-) *Comments* (মন্তব্য):	১ ২ ৩ ৪ ৫
2. the **weight** of your assistive device? (অঙ্গটির ওজনের দিক থেকে-) *Comments* (মন্তব্য):	১ ২ ৩ ৪ ৫
3. the **ease in adjusting** (fixing, fastening) the parts of your assistive device? (অঙ্গটি সহজে লাগানো ও খোলানোর দিক থেকে-) *Comments* (মন্তব্য):	১ ২ ৩ ৪ ৫
4. how **safe and secure** your assistive device is? (অঙ্গটি/উপকরণটি ব্যবহারে ঝুকিমুক্ত ও নিরাপদ কতটুকু-) *Comments* (মন্তব্য):	১ ২ ৩ ৪ ৫
5. the **durability** (endurance, resistance to wear) of your assistive device? (নকল অঙ্গটির স্থায়িত্ব/টেকসই কতটুকু?) *Comments* (মন্তব্য):	১ ২ ৩ ৪ ৫
6. how **easy** it is to use your assistive device? (ব্যবহার বিধি কতটা সহজ ও সুবিধাজনক-) *Comments* (মন্তব্য):	১ ২ ৩ ৪ ৫
7. how **comfortable** your assistive device is? (আরামদায়ক কতটুকু-)	১ ২ ৩ ৪ ৫

Comments (মন্তব্য):	
8. how **effective** your assistive device is (the degree to which your device meets your needs)? (দৈনন্দিন প্রয়োজন মেটানোর দিক থেকে কতটা কার্যউপযুগি-) *Comments* (মন্তব্য):	১ ২ ৩ ৪ ৫

1 (১)	2 (২)	3 (৩)	4 (৪)	5 (৫)
not satisfied at all (একেবারেই সন্তোষ্ট নই)	not very Satisfied (বেশি সন্তোষ্ট নই)	more or less Satisfied (কিছুটা সন্তোষ্ট)	quite satisfied (মোটামুটি সন্তোষ্ট)	very satisfied (খুবই সন্তোষ্ট)

SERVICES (সেবা) ***How satisfied are you with*** (সেবার মানে আপনি কতটুকু সন্তোষ্ট)**,**	
9. the **service delivery** program (procedures, length of time) in which you obtained your assistive device? (আপনি যে কেন্দ্রে সেবা নিচ্ছেন সে কেন্দ্রের সেবাদানের মান কেমন?) *Comments* (মন্তব্য):	১ ২ ৩ ৪ ৫
10. the **repairs and servicing** (maintenance) provided for your assistive device? (কেন্দ্র থেকে প্রদেয় মেরামতকরণ ও সার্ভিসের কেমন?) *Comments* (মন্তব্য):	১ ২ ৩ ৪ ৫
11. the quality of the **professional services** (information, attention) you received for using your assistive device? (উপকরণটি ব্যবহার করার জন্য দায়িত্বে নিয়োজিত ব্যক্তিদের প্রয়োজনীয় পেশাগত সার্ভিসের মান কেমন?) *Comments* (মন্তব্য):	১ ২ ৩ ৪ ৫
12. the **follow-up services** (continuing support services) received for your assistive device? (পুনরায় সেবা প্রাপ্তির দিক থেকে-)	১ ২ ৩ ৪ ৫

Below is the list of the same 12 satisfaction items. PLEASE **SELECT THE THREE ITEMS** that you consider to be **the most important to you**. Please put an 'X' in the **3 boxes** of your choice. (নিচে পূর্বের ১২ টি সন্তুষ্টির তালিকা আছে। উক্ত ১২ টি বিষয়ের মধ্যে আপনার নিকট যেটি সবচেয়ে বেশি গুরুত্বপূর্ণ মনে হয় এমন ৩ টি বক্সের মধ্যে 'X' চিহ্ন দিন।)

- ☐ 1. Dimensions (আকার-আকৃতি)
- ☐ 2. Weight (ওজন)
- ☐ 3. Adjustments (লাগানো ও খোলানো)
- ☐ 4. Safety (নিরাপত্তা)
- ☐ 5. Durability (টেকসই)
- ☐ 6. Easy to use (ব্যবহারে সহজতর)
- ☐ 7. Comfort (আরামদায়ক)
- ☐ 8. Effectiveness (কার্যোপযুগি)
- ☐ 9. Service delivery (সেবার মান)
- ☐ 10. Repairs/servicing (মেরামত)
- ☐ 11. Professional service (পেশাগত সেবা)
- ☐ 12. Follow-up services (পুনরায় সেবাপ্রাপ্তি)

QUEST

Scoring Sheet

This page is for scoring the answers to your questions.

DO NOT WRITE ON THIS PAGE.

- Number of non-valid responses _____ ☐
- **Device** subscale score _____ ☐

For items 1 to 8, add the ratings of the valid responses and divide this sum by the number of valid items in this scale.

- **Services** subscale score _____ ☐

For items 9 to 12, add the ratings of the valid responses and divide this sum by the number of valid items in this scale.

- Total QUEST score _____ ☐

For items 1 to 12, add the ratings of the valid responses and divide this sum by the number of valid items.

- The 3 most important satisfaction items:

QUEST (version 2.0)

1	2	3	4	5
Not satisfied at All	not very satisfied	more or Less Satisfied	Quite Satisfied	Very Satisfied

C. APPLICATION FOR ETHICAL APPROVAL

February 14, 2018

To
The Chairman
Institutional Review Board (IRB)
Bangladesh Health Professions Institute (BHPI)
CRP, Chapain, Savar, Dhaka-1343, Bangladesh.

Subject: **Application for review and ethical approval.**

Sir,
With due respect, I would like to draw your kind attention that I am a student of Masters of Science in Rehabilitation Science at Bangladesh Health Professions Institute (BHP) under the Faculty of Medicine of University of Dhaka (DU). For the requirement of my course curriculum I have to conduct a research entitled **"Measuring the level of satisfaction with lower limb prosthetic devices among the users of CRP and CDD"** that will be supervised by Dr. Md. Forhad Hossain, Professor, Dept. of Statistics, Jahangirnagar University. The objective of the study is to investigate lower-limb prosthetic patients' satisfaction with their assistive device and related service delivery in CRP and CDD. Quebec User Evaluation of Satisfaction with assistive Technology- QUEST (Version 2.0) questionnaire will be used by face to face interview. That will take about 25-30 minutes. Related information will be collected from the participant according to additional questionnaire. The study will not be cause of any harm to the participant. Data collectors will receive informed consents from all participants as written record. Any kind of collected data will be kept confidential.

Therefore, I look forward to having your kind approval for the research proposal and to start data collection. I also assure you that I will maintain all the requirements for study.

Sincerely yours,

Md. Abdul Koddus
Session: 2016-2017
Student ID: 181160057
Student of M. Sc in Rehabilitation Science
BHPI, CRP, Savar, Dhaka-1343, Bangladesh.

Recommendation from the thesis supervisor:

March 19, 2018

Dr. Md. Forhad Hossain
Professor, Department of Statistics
Jahangirnagar University, Savar, Dhaka. Bangladesh.

D. PERMISSION LETTER

BANGLADESH HEALTH PROFESSIONS INSTITUTE

বাংলাদেশ হেল্‌থ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই)

Bangladesh Health Professions Institute (BHPI)

(The Academic Institute of CRP)

Ref. CRP-BHPI/IRB/03/18/203 *Date:* 24/03/2018

To
Md. Abdul Koddus
M. Sc in Rehabilitation Science
Session: 2016-2017
Student ID: 181160057
BHPI, CRP, Savar, Dhaka-1343, Bangladesh.

Subject: Approval of thesis proposal 'Measuring the level of satisfaction with lower limb prosthetic devices among the users of CRP and CDD' by ethics committee.

Dear Md. Abdul Koddus,
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	Bengali version of the Questionnaire
3	Information sheet & consent form

Since the study involves investigating lower-limb prosthetic patients' satisfaction with their assistive device and related service delivery in CRP and CDD through a questionnaire that takes 25 to 30 minutes and have 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 9:00 AM on May 06, 2017 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,

Millat Hossain

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

E. CONCERN LETTER

BANGLADESH HEALTH PROFESSIONS INSTITUTE

বাংলাদেশ হেল্‌থ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই)

Bangladesh Health Professions Institute (BHPI)

(The Academic Institute of CRP)

Ref. CRP-BHP/MRS/03/18/0109

Date: 24/03/2018

To Whom It May Concern

This is to certify that Md. Abdul Koddus, a student of M. Sc in Rehabilitation science at Bangladesh Health Professions Institute (BHPI) under the Faculty of Medicine of the University of Dhaka (DU). He has to conduct a thesis entitled 'Measuring the level of satisfaction with lower limb prosthetic devices among the users of CRP and CDD' under thesis supervisor Dr. Md. Forhad Hossain, Professor, Dept. of Statistics, Jahangirnagar University, Savar, Dhaka. The objective of the study is to investigate lower-limb prosthetic patients' satisfaction with their assistive device and related service delivery in CRP and CDD. A Quebec User Evaluation of Satisfaction with assistive Technology- QUEST (Version 2.0) questionnaire will be used to collect related information from the participants which will take about 25 to 30 minutes and the study have no likelihood of any harm to the participant. Data collector will receive informed consents from all participants. Any data collected will be kept confidential. The research proposal has been approved by Institutional Review Board (IRB) of this institute. To accomplish research objectives, he will need to collect data from Prosthetics & Orthotics department at Centre for the Rehabilitation of the Paralysed (CRP) and Centre for Disability in Development (CDD), Savar, Dhaka.

I, therefore, request you to provide him necessary support from the said department. I wish him every success in order to accomplish him research.

Best regards.

Muhammad Millat Hossain
Assistant Professor & Course Coordinator
Dept. of Rehabilitation Science
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

F. PERMISSION LETTER OF CDD

Centre for Disability in Development

CENTRE FOR DISABILITY IN DEVELOPMENT

Equal opportunities and full participation for persons with disabilities in all spheres of life

Date: 04 April 2018

To whom it may concern

This is to inform that CDD has given permission to Mr. Abdull Koddus, a student of M. Sc. in Rehabilitation Science from Bangladesh Health Professions Institute (BHPI) under the Faculty of Medicine of University of Dhaka to collect relevant data from the users of lower limb prosthetic devices from CDD's "National Resource Centre for Assistive Technology (NRCAT)" to conduct a thesis titled "Measuring the level of satisfaction with lower limb prosthetic devices among users of CRP and CDD". He will conduct interviews of a number of lower limb prosthetic users during the period of 4th April to 30th May 2018.

CDD wish successful completion of his thesis.

Sincerely

A H M Noman Khan
Executive Director

House No. A-18/6, Genda, Savar, Dhaka-1340, Bangladesh.
Phone: 01713021695, E-mail: cdd@bangla.net