MEASUREMENT OF QUALITY OF SERVICE IN PATIENTS WITH SPINAL CORD INJURY AT CRP, BANGLADESH

By

RUBI MALLA

Submitted in Partial Fulfillment of the Requirements for the Degree of

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Supervisor's Statement

As supervisor of Ms. Rubi Malla, M.Sc. Thesis work, we certify that we consider her thesis "Measurement of Quality of Service for patients with Spinal Cord Injury at CRP in Dhaka, Bangladesh" to be suitable for examination.

Mohammad Anwar Hossain

Associate Professor

Department of Physiotherapy

BHPI

(Supervisor)

Date: 25/05/19

We the undersigned certify that we have carefully read and recommended to the Faculty of Medicine, University of Dhaka, for acceptance of this thesis entitled, "**Measurement of Quality of Service in Patients with Spinal Cord Injury at CRP in Dhaka, Bangladesh**" submitted by **Rubi Malla**, for the partial fulfillment of the requirements for the degree of M. Sc in Rehabilitation Science.

Mohammad Anwar Hossain
Associate Professor
Department of Physiotherapy,
BHPI, CRP

Feroz Ahmed Mamin
Associate Professor
Department of Rehabilitation Science
BHPI, CRP

Dr. Md. Alamgir Kabir
Professor
Department of Statistics
Jahangirnagar University

Muhammad Millat Hossain
Assistant Professor
Department of Rehabilitation Science
BHPI, CRP

Date of Approval: 16/6/19

Declaration Form

- This work has not previously been accepted in substance for any degree and is not concurrently submitted in candidature for any degree.
- 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. A Bibliography is appended.
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Signature: Rubi Malla

Name: Rubi Malla

Date: 18/6/2019

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ACRONYMS

- ANSI- American National Standards Institute
- ASQ- American Society for Quality
- CRP- Center of Rehabilitation of Paralyzed
- CI- Confidence Interval
- CAHPS- Consumer Assessment Health Plans
- DC- Dissatisfaction Count
- PSQ- Patient Satisfaction Questionnaire
- SC- Satisfaction Count
- SCI- Spinal Cord Injury
- SQ- Service Quality
- UTI- Urinary Tract Infection
- WHO- World Health Organization
- χ^2- chi-square

ABSTRACT

Background: Continuous quality improvement and client based approach are of great importance when it comes to Spinal cord injury rehabilitation as it deals with patient's quality of life and well being. The service is considered good enough if only the patients are fully satisfied in various dimensions of care. Quality of service is the evaluation of whether the patient expectations have been met or not in regard to services delivered by the provider. **Objectives:** To evaluate the quality of service among SCI patients in Centre for Rehabilitation of Paralyzed (CRP) in Dhaka, Bangladesh. **Methodology:** A cross-sectional study of quantitative design was carried out using SERQUAL questionnaire among 120 SCI in-patients in SCI unit in CRP, Bangladesh. Convenience sampling technique was used to collect data. Data was analyzed by using SPSS. **Results:** All gap scores were negative which implies that patient's expectations weren't met. The data revealed the most significant service gap in tangible (μ=-0.32) followed by reliability (μ=-0.19), assurance (μ=-0.18), empathy (μ=-0.13) and responsiveness (μ=-0.123) at significance level ($P<0.05$, $P<0.01$ and $P<0.001$). In addition, there was a significant association between socio-demographics and service quality gaps. Length of stay [OR = 7.02, 95 % CI (1.288-38.26)] was associated with tangible gap and type of SCI [OR = 0.1, 95 % CI (.016-.646)] was associated with reliability gap. On the other hand, occupation [OR = 0.085, 95 % CI (.010-0.731)] and marital status [OR = 5.579, 95 % CI (1.220-27.186] were significantly associated with assurance gap. In addition, the gap of empathy was 28.108 times (CI=1.249-632.458) in female respondents than male. Also, there was a significant association between the residential area of participants and assurance gap (χ^2 = 8.585, p value = 0.014). **Conclusion:** The study concluded that there is an utmost need for modification or update in equipments and structural appearance of physical facilities in CRP. Management should focus on consultation time with doctors, interaction between patient and health professionals, staff's appearance, convenient operating hours and medicines accessibility. More care and attention must be shifted towards females, daily laborers, unmarried, triplegic SCI patients and those living in rural areas and those staying longer in CRP.

Key Words: Quality of service, Spinal Cord Injury, Expectation, Service gap

CHAPTER-I INTRODUCTION

1.1. Background

Globally, the incidence of SCI has been increasing with 8 to 246 cases per million populations per year and prevalence ranging from 236 to 1298 million per populations (Furlan, Sakakibara, Miller, & Krassioukov, 2013). In developed countries, SCI is estimated to be prevalent from 490 to 526 per million populations (Kang et al., 2017). In United States, prevalence is found to be highest i.e. 906 per million (Fehlings, Singh, Tetreault, Kalsi-Ryan, & Nouri, 2014). Similarly, the prevalence is higher than 681 per million in Australia (O'Connor, 2004). In Canada, 2,525 per million SCI were prevalent including both traumatic and non-traumatic cases (Noonan et al., 2012). On the other hand, in developing countries SCI incidence ranges from 2..1-130.7 per million per year (Rahimi-Movaghar et al., 2013). Ning, Wu, Li and Feng (2012) conducted a systematic review on epidemiology of traumatic SCI in Asia and concluded 12.06 to 61.6 per million of incidence rates of traumatic SCI. Likewise, the prevalence of SCI in Dharan, Nepal was found to be 849.8 per million in 2002 and prevalence rate in Kashmir, India was estimated to be 236 per million in 1986 (Furlan et al., 2013). Cervical injuries as well as injuries due to fall seems to be increasing (DeVivo, 2012). However, in Bangladesh, it is reverse. The incidence of SCI due to fall is higher which is then followed by traumatic SCI (Rahman et al., 2017). A worldwide literature study in 2006 revealed that 50% of the reported SCI had a complete lesion and about 33% were tetraplegic. Conversely, Bangladesh has different scenario. A study on epidemiology on SCI in Bangladesh concluded that approximately 61% had complete lesion and 52.33% were traumatic paraplegic.

Spinal Cord Injury (SCI) is a sudden and devastating condition that affects individual's physical, mental, familial as well as social life (Quadir et al., 2017). It has variety of causes that includes road traffic accidents, falls, violence, sports related and many others which distinguish its types i.e. traumatic and non-traumatic (Kang et al., 2017). Males are more affected than females especially among low socio-economic groups at the ratio ranging from 1.00:1 to 7.9:1 (Quadir et al., 2017). Traumatic SCI is found to be more prevalent than the other one while RTAs and falls are the major causes affecting mostly males than female (DeVivo, 2012). Major complications followed by SCI are pulmonary infections, Urinary tract infections and bed sores

(Yuan et al., 2018). Similarly, UTI and pressure sores were seen in 49% and 36% patients respectively post rehabilitation after a year (Haisma et al., 2007) while a study by Mckinley et al (1999) on long term medical complications after TSCI have found that autonomic dysreflexia and pneumonia/atelectasis were main complications at follow up along with pressure ulcers. However, its recovery depends upon the type and level of injury, severity, health facility, rehabilitation time, peer support, emotional stability and the active involvement of individual in the treatment procedures (Rahman et al., 2017).

Service quality (SQ) is the evaluation of whether the patient expectations have been met or not in regard to services given by the provider. It has two forms i.e. technical and functional quality. The former is related to outcome of service and later one is associated with the process of delivery (Gronroos, 1984). Various determinants of SQ had been introduced which includes reliability, responsiveness, competence, access, courtesy, communication, credibility, security, understanding/knowing and tangible (Parasuramn, 1985). Service quality of hospitals or rehabilitation center varies from place to place depending upon the infrastructure, personnel and management.

Bangladesh is a developing country. The transportation of Bangladeshi to the foreign countries in search for better health services suggest that Bangladesh falls back in terms of quality health care service which has cause huge impact on the country's economy i.e. about Tk. 500 million per year (Andaleeb, Siddiqui, & Khandakar, 2007). It is because the expectation of people is increasing for standard health care with the advancing technology. Hence, there is pressure on hospitals to meet the demand for quality control, good quality service and best intervention measures (Siddiqua & Choudhury, 2014). A review article by Pryu Bettger & Stineman in 2007 affirmed that health care policy makers and medicinal services administrators need precise and suitable data to guarantee that the most practical and gainful services are set up in accordance with patients need. Numerous significant research (evidence) based strategy choices should be made in search of adequacy, quality care including program assessments.

There's no government hospital especially for the management and rehabilitation for SCI in Bangladesh that reflects the negligence of the government towards them. A non-profitable organization, Center for the Rehabilitation of Paralysed, is the only

organization which has been working for around 30 years on SCI patients (Islam, Hafez, & Akter, 2011). Incorporating holistic approach of rehabilitation and community reintegration process, CRP has internationally recognized institution that provides various services to meet the needs of People with Disabilities such as medical services, therapy, rehabilitation, assistive technology and devices, education and training on income generating activities. Multidimensional approach is required for SCI rehabilitation and the professionals involved are Doctors, Physiotherapist, occupational therapists, Speech and language therapists, psychologists, neurologists, nurses and so on. However, a study by Whiteneck et al (2011) found that Physiotherapists and Occupational therapists had more intervention sessions for SCI inpatients and outpatients post discharge.

The SCI recovery process ordinarily incorporates various stages that occur over a time of weeks, months, or years. A study by Van Der Putten et al (2001) acknowledged that the main objective rehabilitation measure in SCI is to enhance independency through mobility training on bed or wheelchair and transfer techniques along with care giver education on pressure sores management, assistive devices and others. Other intervention measures include strengthening exercises, stretching/ROM exercises, respiratory management, aquatic exercises, gait training, balance exercises, endurance exercises, etc (Taylor et al., 2011).

Kang et al (2017) suggested updating health care treatment and rehabilitation measures to reduce the mortality rate of SCI as it is being increasing ranging from 3.1% to 22.1% in developed countries and 1.4% to 20% in non-developed countries. For management of SCI patients, client-centered and goal-oriented approach with trained multi-dimensional health professionals involvement and proper facilities is considered as a good rehabilitation program (Horsewell, Penninx, & Ahren, 2012). All the more obviously portraying the viability of post-acute recovery can help cost control endeavors in manners that maximally limit the loss of significant services and in this manner lessen the potential damage to patients. Cooperative endeavors among academicians, strategy producers, clinicians, and patients are important to guarantee that assets are connected in the most fitting approaches to upgrade the lives of individuals with SCI (Pryu Bettger & Stineman, 2007). However, due to expensive

treatment, slow recovery, lack of quality health care and family support, SCI patients are suffering from mental and financial pressure (Yuan, Shi, Cao, Li, & Feng, 2018).

1.2. Rationale of the study

Client based programs are needed to be developed for SCI patients for adequate care and services to prevent complications. Patients with SCI are abandoned, socially deprived and low level management. Not enough care has been applied for the rehabilitation of SCI patients that deteriorates their neurological condition such that it hampers their quality of life (Islam et al., 2011). SCI patients with more age and weight are high risk for death and hence, there is utmost need for high quality care to prevent complications (Kang et al., 2017). With this study, it is possible to determine the factors that can contribute to enhance the services quality and improve the health status and daily living.

People dissatisfaction on health services of Bangladesh is clearly addressed especially in government hospitals the situation is worst when it comes to waiting time for doctors, behavior and attitude of health professionals towards patients, lack of empathy, medicines, doctors, etc. On the other hand, in private hospitals, the major backlogs are lack of certified health professionals, unnecessary advice for tests and proper management protocol (World Bank, 2003). It may lead to patient loss of interest in follow up sessions, withdrawal behavior from following instructions and negative impression that affects hospital financially (Andaleeb et al., 2007). Hence, this study will help evaluate or measure the service quality gap that will be helpful for managers in rehabilitation center to take those gaps into account and introduce new behavior or plan for effective heath care with proper planning and determination.

According to Andaleeb (2000), public hospitals have low service quality in Bangladesh. Increase in number of patients with increasing demands, absence of sufficient talented health professionals, machines deficiency and negative discernments and convictions are the significant reasons behind the patients being coordinated towards the other choices (Savaş, 2002; Kara et al., 2003).

Continuous quality improvement is must in all sectors especially when it comes to medical services as it deals with people's life and care. Patient are beneficiaries so it is valuable to take their side of stories to evaluate the services offered in the hospitals. The service is considered good enough if only the patients are fully satisfied in

various dimensions of care (Jenkinson, Coulter, Bruster, Richards, & Chandola, 2002). This study will identify various determinants of patient satisfaction on the services delivered.

1.3. Research Question

What is the quality of service delivered to patients after spinal cord injury in a rehabilitation center?

1.4. Operational definition

Spinal cord injury: Spinal Cord Injury (SCI) is a sudden and unexpected lesion or injury in the spinal cord leading to loss or diminished sensory, motor or autonomic functions and often causing life threatening complications. It is a crippling condition that affects individual's physical, mental, familial as well as social life.

Quality of service: Quality of service is termed as the customer's perception regarding the level of services delivered by service provider whether it has met their expectation or not. In general, it is the difference between the client expectations and perceptions on services received by them. It is also a comparison of services before and after it has been received.

CHAPTER-II LITERATURE REVIEW

Spinal cord lesion (SCL) is the debilitating condition due to damage in spinal cord leading to partial or complete paralysis that affects individual's quality of life and considered to be most striking factor for disability in Asia including Bangladesh (Islam, Hafez, & Akter, 2011). It can be traumatic or non-traumatic. The former is due to direct trauma over spinal cord such as fractures, dislocations and contusions by motor vehicle accidents, falls, etc (Hagen et al., 2009; Krishblum et al., 2002). While, later is due to pathological reasons such as disease, tumor or infection. It results in complete or incomplete paralysis leading to tetraplegia or paraplegia respectively. 93% of SCL patients is mostly caused by traumatic events and more than 50% are paraplegic (Islam et al., 2011). Tetraplegia or quadriplegia is impairment or loss of motor and/or sensory function below the level of lesion involving four limbs, trunk and pelvic organs and paraplegia is impairment or loss of motor and/or sensory function below the level of injury involving legs, trunk and sometimes pelvic organs (Cohen, Jr, Donovan & Jr, 1998).

The less the education and the poor the financial status, more is the risk factor for SCL. More than 50% SCI is found to be prevalent in farmers, day laborers and jobless people. 45-70% of the injuries were seen in cervical region followed by lumbo-sacral region. It is more popularly seen in males at the ratio ranging from 2.1-5.71:1 and affects people with age from 30-50 years (Yuan et al., 2018). Similarly, uneducated people are mostly injured who involve in agriculture and small jobs and males are more affected than female at the ratio of 5:1. Women are not involved in risk jobs and the only working member of the family gets injured resulting in financial burden to family involving expensive treatment costs. The mean age range of SCI patients are 9-60 years and 65% of them are married (Islam et al., 2011).

Life expectancy after SCI is very low because of secondary complications, severity of lesion, social stigma and lack of quality care. After returning to community post-rehabilitation, patients don't follow the instructions as stated by the health professionals. As a result, number of complications arises that may affect entire system of the body including cardio-respiratory system, genitourinary system and others such as pressure sore and sexual dysfunction decreasing their quality of life. A

study on complications of SCI in 2017 concluded that out of approximately 23% participants who had pressure sores, 67.5% had mostly over buttock followed by 7.5% on ischial tuberosity while about 11% had urinary continence and 17% had burning sensation during urination. There comes an emergency of re-admission to hospital and quality care is needed within their stay (Quadir et al., 2017; Rahman et al., 2018). Not every intervention will have positive outcome. Hence, it is important to acknowledge the nature of activities implied in inpatient rehabilitation. A study by Taylor et al in 2011 affirmed that practice based evidence are more popular in inpatient settings that figure out which of those medications/administrations are related with the best results. Regular feedback or evaluation becomes necessary to check whether the particular intervention is effective or not.

Horsewell et al. (2012) suggested that to evaluate the quality of services in SCI unit in a rehabilitation center, a practical method would be setting targets, assess if these have been met and thus, patient satisfaction can be measured. However, these targets vary depending upon the institution or country but practices that have been useful can be promoted and those not can be discarded. Similarly, a study on Patient Satisfaction and Rehabilitation Services by keith on 1998 concluded that level of patient satisfaction in rehabilitation setting can be determined depending on the improvement in activities in daily living and independency level post rehabilitation services. On the other hand, public reporting on the services could be helpful to best benefit patients and providers. Also, patients with SCI should be involved in setting qualities and outcomes. Multidisciplinary approach in the SCI rehabilitation unit is utmost important. The “BobScore” introduced by Thietje in 2010 includes not only functional but psycho-social-economic factors to determine the quality of care in the rehabilitation center. On the other hand, Functional independence measure is considered as key approach to evaluate the recovery and the effect of SCL on daily activities of patients that incorporates different areas of functioning such as self-care, sphincter control, mobility, locomotion, communication and social cognition and is widely accepted in many countries (Hamilton & Fuhrer, 1987). Patients are not qualified enough to analyze the technical quality and hence, functional quality becomes the essential factor for clients quality (Donabedian 1980, 1982; Kovner and Smits 1978). However, inappropriate care and lack of determination is seen in

rehabilitation settings for SCI patients which is the reason for finding the determinants of quality of service in those settings for proper management and early recovery.

Traditionally, quality was considered as special, unique and highly standard and is determined by consumer economic status. Quality was defined in the form of merit, significance, compliance to determination and meeting or surpassing client's desires (Reeves & Bednar, 1994). There is certain standard to be met to maintain the quality of service which is called quality control and it had been popular in health services too. However, this doesn't explain on what basis these standards have been set. On the other hand, quality is the extent to which a service meets its purpose. In addition, quality may vary in accordance with the institution, person, interest, priorities, etc (Diana, 1994). According to American National Standards Institute (ANSI) and the American Society for Quality (ASQ) is the totality of features and characteristics of a product or service that bears on its ability to satisfy given needs (Russel & Taylor, 2006). In health sectors, quality was determined in terms of technicalities in the past but in recent years, patient perspective is being considered as major element to define quality. Unfortunately, Bangladesh still follow traditional pattern ignoring patients opinions as a measure for service quality (Andaleeb, 2001). However, a study was carried out on some private hospitals in Dhaka, Banlgladesh where 110 patients were administered with closed ended questions and concluded that patient understanding on the service quality helps them to driven towards taking service from hospitals again (Siddiqua & Haque, 2014).

According to Al-Abri and Al-Balushi (2014), there are many instruments to measure patient satisfaction such as patient satisfaction questionnaires, PSQ-18 and consumer assessment health plans (CAHPS) which have good reliability and validity but limited questions. In contrast, quality of care can be examined through estimating patient's experiences of health care instead of satisfaction. No any studies have been carried out using both patient experience and satisfaction to evaluate service quality. From qualitative study, in-depth and rich information on patient care experience can be achieved. However, there is the possibility of researcher's bias on the results gained (Marques & McCall, 2005).

Customer's perceived service quality model was first introduced by Christian Gronroos in 1982. He proposed on the variation in the expected and perceived service quality by the customers. In mid 1980s, Parasuramn A, Valarie A. Zeithaml, and

Leonard L. Berry developed a conceptual model of service quality popularly known as "service quality gap model" which had initially 10 dimensions and formulated an instrument "SERVQUAL" to evaluate service quality in variety of organization. However, (in 1988) it is later modified constituting of 5 dimensions which are tangibles, reliability, responsiveness, assurance and empathy.

Tangibles: When you see good, you feel good. Hence, it is very important to have attractive or modern equipments and clean and tidy personnel working within the organization along with updated physical facilities that creates positive impression in consumers (Rajbhandari, 2017).

Reliability: Ability to perform promised service dependably and accurately. Duggirala et al. (2008) contended that, numerous medical clinics delay at the distinctive stages of the confirmation procedure. In this way the health care staffs should figure out how to diminish waiting time, mistake free records and produce expected archives to demonstrate the care and concern they possess for their patients (Boshoff and Gray, 2004).

Responsiveness: Effective communication is an important tool for service providers. In health sectors, stating about the condition clearly, willingness to help customers and provide prompt service when necessary highly effects on patient satisfaction and possess good impression about hospitals as well (Bitner, 1990; Lehtinen & Lehtinen, 1982).

Assurance: Health provider's knowledge on the patient's needs and their relevancy to the condition along with their friendly nature and courtesy are an important factor to inspire trust and confidence in patients (Duggirala et al., 2008).

Empathy: Understanding patient needs through care, individualized attention and maintaining inter-personal relationship with the customers build inner satisfaction (Roberts, Varki & Brodie, 2003). Similarly, Thongpapanl & Ashraf (2011) insisted on considering patient as an individual rather than a disease or a condition to boost up their confidence. Providing information when needed clearly, supporting and listening to patient's problems and giving sufficient time are important aspects of interpersonal relationship (keith, 1998).

SERVQUAL" has two main scales which are expectation and perception scale. Each scale includes all those 5 dimensions. These constitutes of 22 pairs of items on each scale. The difference of patients' expectations from perceptions, where expectation is

what client thinks the services should be and perception is what client perceives on the services delivered by the service provider, is called as Service quality (Parasuramn, 1985). Furthermore, in accordance to Gefen (2002), it is a comparison made by customers between what they want to receive and what they actually receive in hospitals. Initially, it was a 7 point likert scale and later reduced to 5 point likert scale ranging from strongly disagree (1) to strongly agree (5) to avoid confusion among participants during research (Babakus & Boller, 1992). Parasuraman et al (1988) further explains about gaps on the conceptual model of SQ. The gap approach can be utilized to analyze the desires, discernments and quality gaps for various client attributes.

Gap 1: Gap between consumer's expectations and management perceptions

Gap 2: Gap between management perception and SQ specifications

Gap 3: Gap between SQ specifications and actual service delivery

Gap 4: Gap between service delivery and external communications

Gap 5: Gap between perceived service and expected service

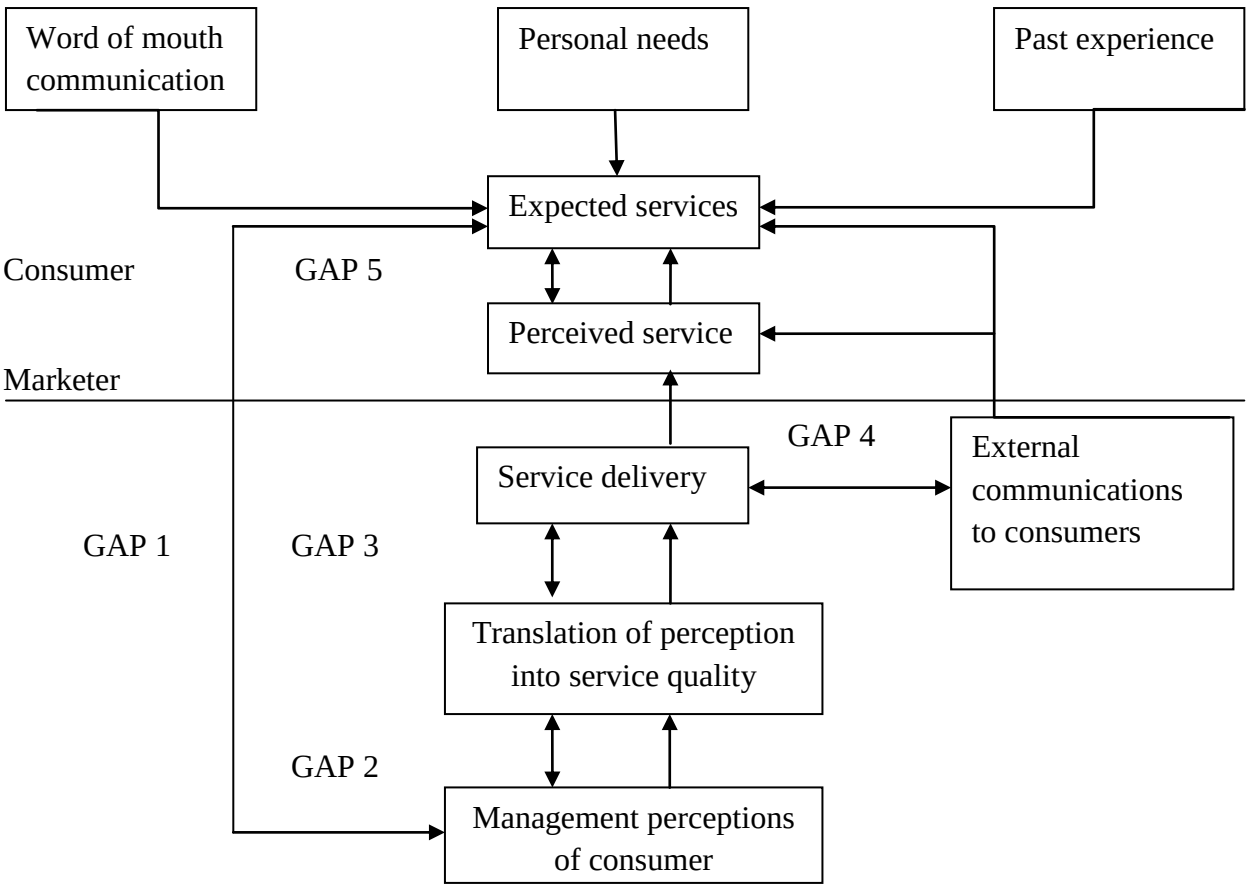


Fig 2.1: Conceptual model of Service Quality (Parsuraman, 1985)

SERVQUAL can be used in different sectors and most widely used in medical field. It is popularly known as the most reliable and valid measurement tool for measuring quality of service (Lam, 1997; Wong, 2002; Kilbourne *et al.*, 2004). It is a multiple item scale with high internal consistency with 0.92 Cronbach's alpha and high content and convergent validity that is applicable for measuring service quality of hospitals or any other areas by acknowledging the customer's expectation and perception. It also addresses the managerial action needed to improve quality of services delivered (Parasuraman et al., 1988). In a review study on quality of hospital service by Pai & chary (2013) stated that almost 50% studies used modified SERVQUAL as a measurement tool. Similarly, it has been adapted in a study by Solayappan, Jayakrishnan & Velmani in 2011 for measuring service quality gap in hospitals among 300 respondents from Chennai, Tamilnadu, India. Peprah & Atarah (2014) used and modified SERVQUAL to assess patient satisfaction at Sunyani Regional Hospital in Ghana.

Several gaps were identified in different determinants by researchers in previous studies. No study had been carried out regarding evaluating quality of service in SCI patients. However, similar studies on general patients have been carried out using different dimensions of service. A qualitative study regarding patient perception on hospital services came up with a conclusion that behavior of health professionals, treatment cost, and medicine accessibility, hospital physical structure play vital role in determining the quality of service (Rao, Peters, & Bandeen-Roche, 2006). Another study in Bangladesh determined assurance, discipline, communication, responsiveness and patient education as the contributing factors for measuring patient satisfaction (Andaleeb, 2001). However, 12 SERVQUAL variables under study had been categorized in accordance to their significance level. Competence, credibility, tangibles, reliability, courtesy and assurance were considered the most critical ones. Access, understanding, communication and responsiveness were found to be medium significant ones and empathy and security as the least critical ones (Amjeriya & Malviya, 2012). It demands right to information of patients at right time for early prevention, detection and treatment of diseases (Solayappan, Jayakrishnan, & Velmani, 2011).

Tangible dimension plays an important role in perceiving the service quality by patients. Physical facilities and infrastructure includes room formats and stylistic theme, housekeeping, TVs, nourishment, basic territory design and style, pantry, drug store, cafeteria, and so on which are essential aspect for quality service delivery (Dahlgaard, Khanji, & Kristensen, 2008). On the other hand, Stanga et al. (2003), food service is usually disregarded in contrast with other health care services. The longer the patient stays, the more prominent they appear disappointment regarding food services. However, it should meet the nutritional requirements of clients (Hartwell et al., 2006).

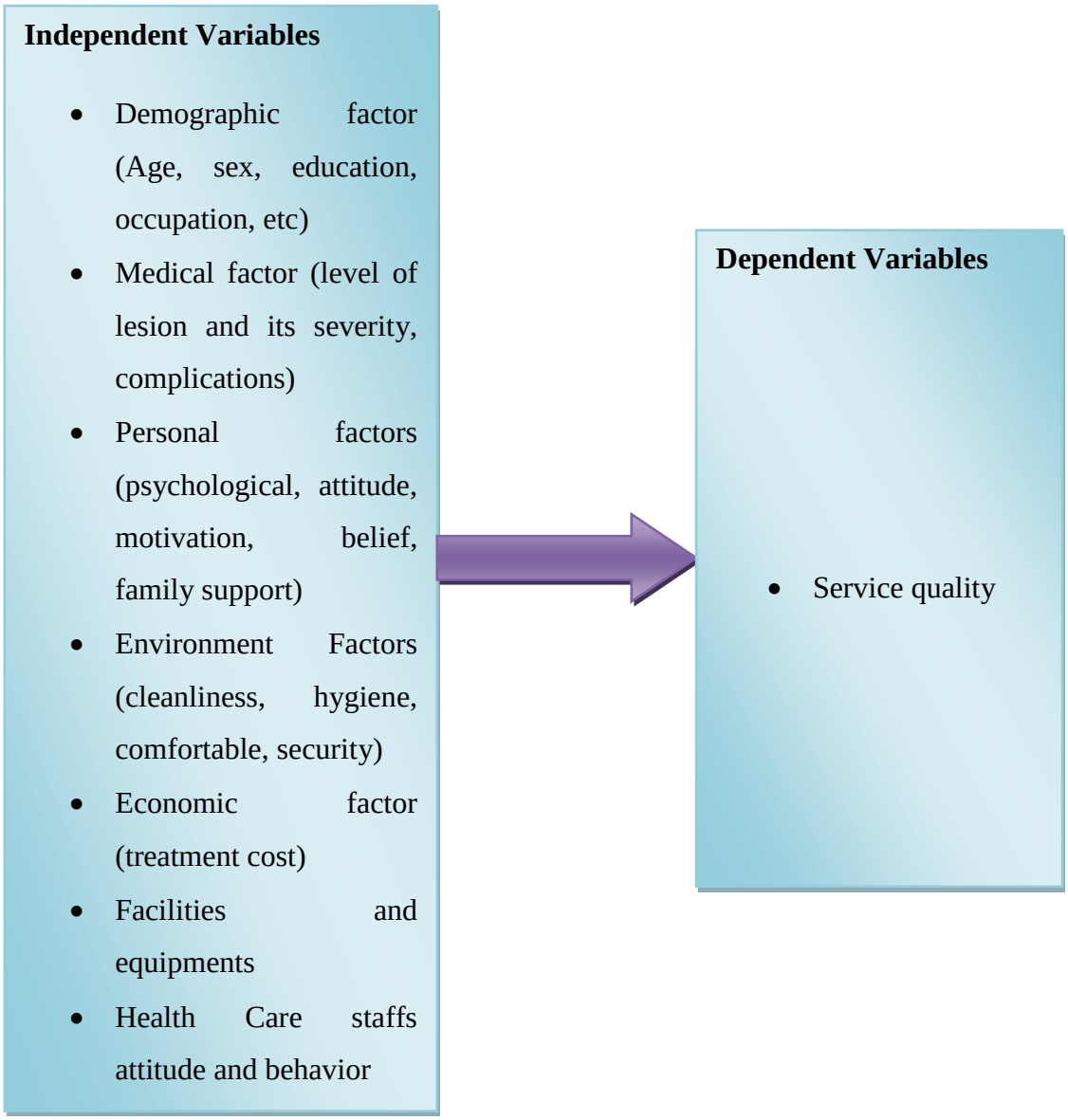
Health professional behavior and mannerism are observed as prevailing factor of patients' frames of mind regarding services. Though, full of feeling conduct makes patients believe that health care providers are highly educated, experienced and skilled (Ditto et al. 1995). As indicated by Padma et al. (2009), the health care staffs should be benevolent, reliable, sociable, honest and competent for the clients. Also, agreeable and supportive staffs can create certainty among the patients and is the center for patients' fulfillment (Kiran, 2010). Furthermore, kindliness, cordiality and concern of medical caretakers are relational factors subject to elucidation by patients (Otani et al., 2012).

Patient evaluation of quality of care came into existence during 1990s and then, it directed light on the patient satisfaction with health services. Surveys on satisfaction were found to be methodologically weak as concentration was given more on the clinicians and managers rather than clients. In developing countries, patient satisfaction is rarely utilized as an indicator of service quality. They are given less opportunity to participate in studies defining health service standards or assessing satisfaction (Andaleeb et al., 2007). However, WHO and Organization for Economic Co-operation and Development (OECD) have considered patient outcome as measure of hospital performance since 2000 (Murray, & Frenk, 2000). Furthermore, a study by Omer et al (2011) suggests that for continuous evaluation of health services in Bangladesh, it is important to consider both patient ratings as well as views on hospital care and concluded that hygienic environment, patient privacy and availability of medicines are essential element of patient care. In addition, a patient could make a proper judgment as he has physical, psychological, social and economic experiences of overall health care.

Jetkinson et al. (2002) stated that patient satisfaction is an important indicator of evaluating service quality related to health. The patient's perception on delivery of health services as a whole becomes a vital factor for judging services acceptable and beneficial for them. Physical comfort, emotional support and patient centered care have been ruled out as main dimensions for patient satisfaction. A review article suggested main dimensions of patient satisfaction that includes interpersonal manner, technical quality, accessibility or convenience, treatment costs, physical features, availability of facilities and personnel, efficacy and continuous care (keith, 1998). In another study, effective communication and clear explanation had the positive impact on patient satisfaction while the association of demographic factors with satisfaction is found to be diverse in accordance to different literature studies (Al-Abri & Al-Balushi, 2014). Tangibility, reliability, courtesy and empathy were important criteria for customer satisfaction. Managers should be efficient enough to look after the services provided in the rehabilitation center or hospital (Zaim, Bayyurt, & Zaim, 2010). On the basis of focus group discussions, several determinants were identified in relation to patient satisfaction in context of Bangladesh. These are reliability, responsiveness, assurance, tangibles, communication, empathy, process features and additional factors including costs and availability or access. Above all, service orientation of doctors (tangibles) was on the top if its public, private or foreign hospitals (Andaleeb et al., 2007). However, the standards for estimating the quality of health care goes beyond technical quality, for example responsiveness, worthiness also, trust; measuring apparent quality and contrast and clinical quality; measuring quality at various aspects of care during clinical experience; measuring the prompt and upstream drivers of nature of consideration; measuring aggregate and exclusively surveyed quality and its relationship to control, social customs and trust (Hanefeld et al., 2017).

CHAPTER-III RESEARCH METHODOLOGY

3.1 Conceptual Framework



3.2. Study Objectives:

3.2.1 General Objective

- To evaluate the service quality among SCI patients in a rehabilitation center.

3.2.2 Specific Objectives

- To assess the expectation level in patients with SCI on service delivered at CRP.
- To assess the perception level in patients with SCI on service delivered at CRP.
- To identify service quality gap among dimensions of heath care in a rehab center.
- To compare performance among different dimensions of services

3.3. Study design:

A cross-sectional study of quantitative design was used to measure the perception and expectation level in patients with SCI on services delivered at Center for the rehabilitation of paralysed in Bangladesh. Quality of service is not constant for any organization or institute. As, this study was based on measuring service delivery at CRP for the current scenario, cross sectional study was appropriate method for this purpose. Quantitative data of various variables and relationship among them can be obtained through this method.

3.4. Study population:

The study was taken with SCI in-patients from CRP in between September 2018 to December 2018.

3.5. Study area:

The study was conducted at Centre for the rehabilitation of the paralyzed (CRP) in Spinal cord Injury department. CRP is the mother institution in regard to rehabilitation in Bangladesh that has been working for people with disabilities for more than 30 years. People from different region of Bangladesh come to CRP for comprehensive rehabilitation. Hence, it represents the overall population of Bangladesh.

3.6. Study period:

The study was carried out from September, 2018 to February, 2019.

3.7. Sample size:

There's no exact data on prevalence of SCI in Bangladesh. Hence 50% prevalence of SCI was used to determine sample size for the study which states 95% confidence interval and 5% error level.

The formulae for determining sample size:

$$n = \frac{Z^2 P(1-P)}{d^2}$$

Here, z= 1.96 (CI 95%), d= 0.05 (error level 5%), p=0.50 (50% prevalence). Hence, $z= (1.96)^2 \times 0.5 \times 0.5 \div (0.05)^2$, n = 384.

From the above calculation, it was estimated to have total sample size of 384 but due to time limitation, lack of patient availability and criteria's for subject selection led the researcher to collect data from 120 participants in total.

3.8. Inclusion and exclusion criteria area:

3.8.1. Inclusion criteria:

- Both male and female person with spinal cord injury.
- The patient with spinal cord injury who must be admitted for at least 1 month.
- The Patient with Spinal Cord Injury aged above 19 years.
- All type of injury will be included (Complete or Incomplete, Traumatic or Non traumatic, Paraplegic or Tetraplegic or triplegic).
- The patient who has better understanding of command.
- The Patient who willingly agree & complete the consent form for the study.

3.8.2. Exclusion criteria:

- Outpatients and inpatients for less than 1 month.
- Patients with other problems like diabetes, amputation.
- Patients diagnosed with mental illness and mental disorder.
- Patients who are not interested and can't manage time for study.

3.9. Sampling technique:

The sample was selected using convenience sampling which is a non probability type of sampling. It is convenient and fastest way of selecting sample. The researcher had easy access to SCI patients that assists in collecting representative data within expected time period.

3.10. Data collection tools:

Thorough literature studies were carried out by researcher on quality of services in medical institutions or organizations to develop questionnaire and finally came up with a structured questionnaire with simple language i.e. SERVQUAL. Originally, it had 48 close ended questions, but only 38 questions were included in this study with some modifications in accordance to the requirements by patients and actual situation of the rehabilitation center. It was translated into Bangla by three clinical

professionals who were Bangladeshi, then, those translated versions were examined carefully and converted to one final questionnaire. Later, it was again translated back to English and compared with the original one to maintain its meaning and originality. It was pre-tested, refined and finally ready to deliver to participants. After approval from IRB and SCI department head, questionnaire was administered to participants. The socio-demographic data were collected from hospital records. The time taken by each participant was 15-20 minutes. The questionnaire constituted of 2 parts.

Section 1: Demographic Questionnaire

It consisted of 10 items which are age, gender, marital status, residential area, educational status, occupational status, monthly income, length of stay in CRP, level of injury ad type of injury.

Section 2: SERVQUAL Questionnaire

This questionnaire was developed to measure the quality of service provided by CRP in SCI patients in terms of five different dimensions of service. It consisted of two scales: perception scale and expectation scale. Each scale had 19 questions representing five dimensions of service i.e. Tangible, reliability, responsiveness, assurance and empathy. The first two dimensions had 10 questions (5 each) while rest of them had 9 questions (3 each) which means total questions of 38 were finally administered to participants and were asked to rate the expectation and perception level. It had 5 point likert rating scale system where 1 is “strongly disagree”, 2 is “disagree”, 3 is “neutral”, 4 is “agree” and 5 is “strongly agree”. The service quality gap is the difference between perception and expectation score. When the perception score exceeded expectation score than, the SQ gap was negative which means that the patient expectations were not met and they were “dissatisfied” with the service at CRP while when the expectation score exceeded than perception score than, SQ gap was positive and patient expectations were met which means they were “satisfied” with the CRP service. On the other hand, when Perception and expectation score were equal and SQ was zero, patients were termed as “satisfied” as they exactly fitted on the line.

Perception>Expectation ⟶ Dissatisfied

Perception=Expectation ⟶ Satisfied

Perception<Expectation ⟶ Satisfied

A pilot study was conducted before administering questionnaire to measure its consistency and correlation coefficient. The chronbach's alpha coefficient had been generated i.e. 0.8 which is greater than 0.75 which means that this scales was reliable enough to proceed for further data collection procedure.

3.11 Data analysis:

The questionnaire based on SERVQUAL was used on this study which had two main scales i.e. Expectation scale and Perception scale. Each constituted of 19 questions and 5 point likert scale was used that ranged from strongly disagree (1) to strongly agree (5). Service quality (SQ) is the discrepancy between patient perception (P) and expectation (Q) i.e. P-E=SQ. When SQ value was negative, it indicated that there was service quality gap and if positive than expectations were met or exceeded. The data was than analyzed using Statistical Package for Social Sciences (SPSS) 16 for statistical analysis. Firstly, all data were imported into SPSS through MS-Excel and then recoding was done as necessary. For instance, monthly income was re-coded as <5000 as 1, 5001-15000 as 2 and so on. Frequency table and percentage distribution were calculated for all demographic data. Residential area of participants and type of SCI were illustrated in pie-chart with percentage distribution. Then, frequency distribution of age with gender and type of SCI with level of SCI were demonstrated through cross table and bar graph with percentages and count. After that, chronbach's alpha of 38 items was calculated to check the internal consistency of data which was found to be 0.844. Hence, the data was found to be reliable for analysis. Descriptive statistics (mean and standard deviations) were calculated for each items of perception and expectation scale of service quality including each dimension separately in each representing scale. Through computation, mean gaps had been calculated in each items of scale including in each dimension of both scales. Then, to find the significance level of their gap, paired sample t-test was performed in 38 items plus the 10 dimensions. When $p<0.05$, it was considered significant. Then, line graph was drawn to show the differences between the expectation and perception scale in terms of mean followed by bar graph that showed the mean gaps in each dimensions of service quality.

The main scoring method was carried out through computation to find the average gap in each dimension which is:

SQ1 (Tangible) = $\{$(P1-E1)+(P2-E2)+(P3-E3)+(P4-E4)+(P5-E5) $\}$/5

SQ2 (Reliability) = $\{$(P6-E6)+(P7-E7)+(P8-E8)+(P9-E9)+(P10-E10) $\}$/5

SQ3 (Responsiveness) = $\{$(P11-E11)+(P12-E12)+(P13-E13)$\}$ /3

SQ4 (Assurance) = $\{$(P14-E14)+(P15-E15)+(P16-E16) $\}$/3

SQ5 (Empathy) = $\{$(P17-E17)+(P18-E18)+(P19-E19) $\}$ /3

To find the association of socio-demographic variables with service quality gap in each dimension, binary logistic regression was performed using Odds Ratio. Before that, each dimension mean gaps were transformed into binomial data type where 0 was labeled as "dissatisfied" and 1 was labeled as "satisfied". The result was considered significant when $p<0.05$ and 95% confidence interval (CI). Formula used were

Model $\pi(X) = \frac{e^{\alpha+\beta X}}{1+e^{\alpha+\beta X}}$ where β= value of B in each category and X = the set of categories.

Logit Model $\frac{\pi}{1-\pi} = \alpha + \beta X$

Even though, the calculation was performed among demographics and dimensions gap, only statistically significant results were illustrated on table including Odds ratios and their 95% CI. One level of each demographic variable was regarded as reference, which is selected by researcher.

3.12 Quality control and quality assurance

The primary aim of SERVQUAL questionnaire was to assess the quality of service among SCI patients in CRP. Firstly, the questionnaire was translated into Bangla language considering the standard linguistic procedure and then translated back to English to maintain the originality and its significance. Three clinical professionals, who were Bangladeshi, were approached for forward translation and they came up with three different version of questionnaire on their own. Next, another individual, who had experience with translation, was assigned to compare and review all those three versions and finally, questionnaire was translated. Again, another individual was approached for backward translation, which was good in both the languages. All of them discussed and finally came up with the final translated version of questionnaire

in bangali. The researcher consulted with supervisor and other experts regarding the questionnaire for opinions and then it was finalized. Researcher supervised and assisted the data collectors in the center so that the data collected would be accurate and interpreted properly. The pilot study was carried out to check its validity and necessary changes were made making it simple and clear with respect to the services at CRP and patient understanding. Researcher neither putted his thoughts or opinions on the answers of the participants nor was he biased towards his perspectives which maintained the quality of the study. The filled questionnaires were kept in confidential. The data collected were entered meticulously in SPSS to reduce the possibility of errors. Recoding of variables was performed where required. Lastly, the researcher verified data many times to acquire valid results and maintain accuracy.

3.13 Ethical consideration

Following the standard procedure for ethical consideration, firstly, approval from course coordinator of Masters in Rehabilitation Science Department and supervisor followed by research proposal submission to concerning authority was made. Then, the ethical approval from Institutional Review Board (IRB) of Bangladesh Health Professions Institute was taken for the study to be conducted. The researcher obtained consent from the Ethical committee of BHPI followed by Head of Spinal cord injury Department at CRP. A voluntary consent form was given to all participants prior to their participation in the study making them aware of aims and implication of the study and full authority was given to participants to withdraw from the study whenever they like. Neither physical nor mental pressure was given on them. On the other hand, no incentives or reward was offered to the patients and assurance about their privacy and confidentiality was made.

CHAPTER- IV RESULTS

4.1 Socio-Demographic variables

Table 4.1.1 Descriptive statistics of demographic variables

Variables		Frequency	Percent
Gender	Male	109	90.8
	Female	11	9.2
Age	20 thru 30	58	48.3
	31 thru 40	30	25.0
	41 thru 50	21	17.5
	51 thru highest	11	9.2
Educational Status	Illiterate	34	28.3
	Primary	40	33.3
	Secondary	28	23.3
	Higher Sec.	12	10.0
	Graduate & above	6	5.0
Occupational Status	Farmer	31	25.8
	Daily laborer	30	25.0
	Service holder	7	5.8
	Student	12	10.0
	Business	12	10.0
	Driver	6	5.0
	Overseas worker	7	5.0
	Housewife	6	5.0
	Others	9	7.0
Monthly Income	< =5000	41	34.2
	5001-15000	62	51.7
	15001-25000	14	11.7
	25000+	3	2.5

The above table demonstrates the socio-demographic variables under study. Most (90.8%, n=109) of the participants were male. Nearly 50% were within the range of 20 to 30 years of age followed by 25% (n=30) and 17.5% (n=21) within the range from 31-40 years and 41 to 50 years of age respectively. 28.3% (n=40) of participants were uneducated. However, most of them (33.3%; n=34) had primary schooling followed by secondary schooling (23.3%, n=28). 10% (n=12) had studied till higher secondary school while 5% (n=6) had qualification of graduate and above. On the other hand, There was relatively similar number of subjects who were farmers (n=31)

and day laborers (n=30). Students and business man accounted for similar numbers i.e. 10% (n=12). On the other hand, 6% were service holders followed by overseas worker, driver and housewives constituting of equal proportion of 5% (n=6) each. Those who were electricians and teachers were included in others with 7% (n=9). Furthermore, more than 50% of participants have monthly income within the range of 5001 to 15000 taka whereas 34.2% have less than or equals to 5000 taka.

4.1.2 Residential area

In this study, most (70%) of the subjects resides in rural area (n=84) and 19% (n=23) resides in urban areas while few (11%) live in semi or sub-urban areas (n=13).

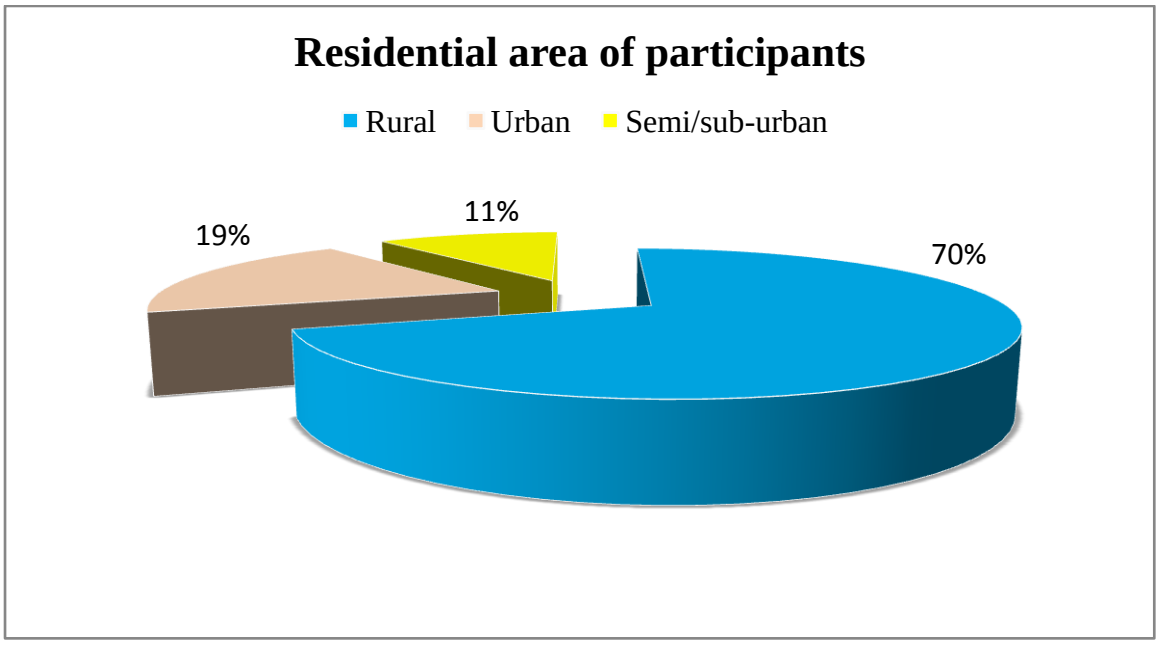


Fig 4.1.2: Residential area of subjects

4.1.3 Marital status

In this study, 75.8% (n=91) of participants were married and 24.2% (n=29) were single.

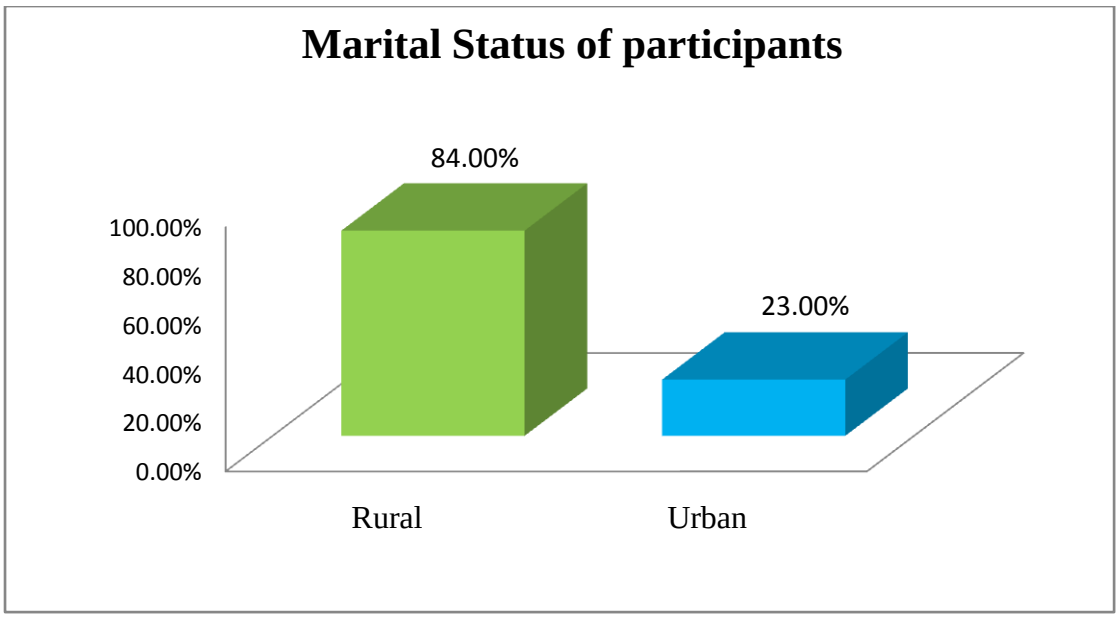


Fig 4.1.3: Marital status of participants

4.1.4 Length of stay

The bar graph below demonstrates the length of time patients stay in CRP in months. Most (59.2%, n=71) participants stayed for 1 to 2 months followed by 25% (n=30) who stayed for 3 to 4 months and 15.8% (n=19) stayed 5 months and longer at CRP.

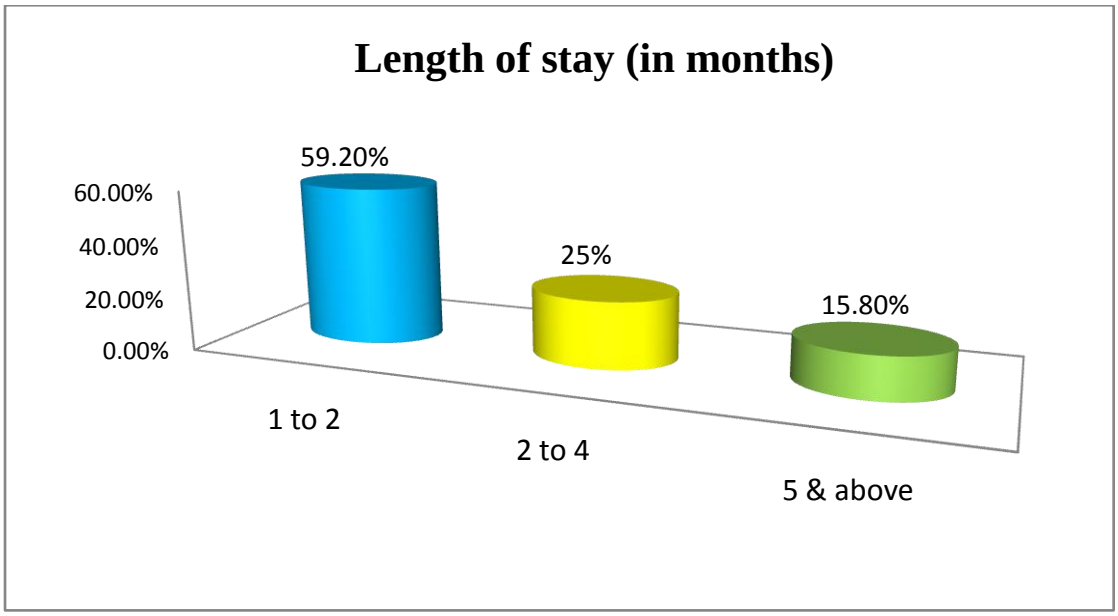


Fig 4.1.4: Length of stay (in months)

4.1.5 Types of Spinal Cord Injury

The pie-chart below illustrates the types of spinal cord injury observed during the study. Most (77%) of the participants were paraplegic (n=93) followed by quadriplegia (18%; n=21) and triplegia (5%; n=6).

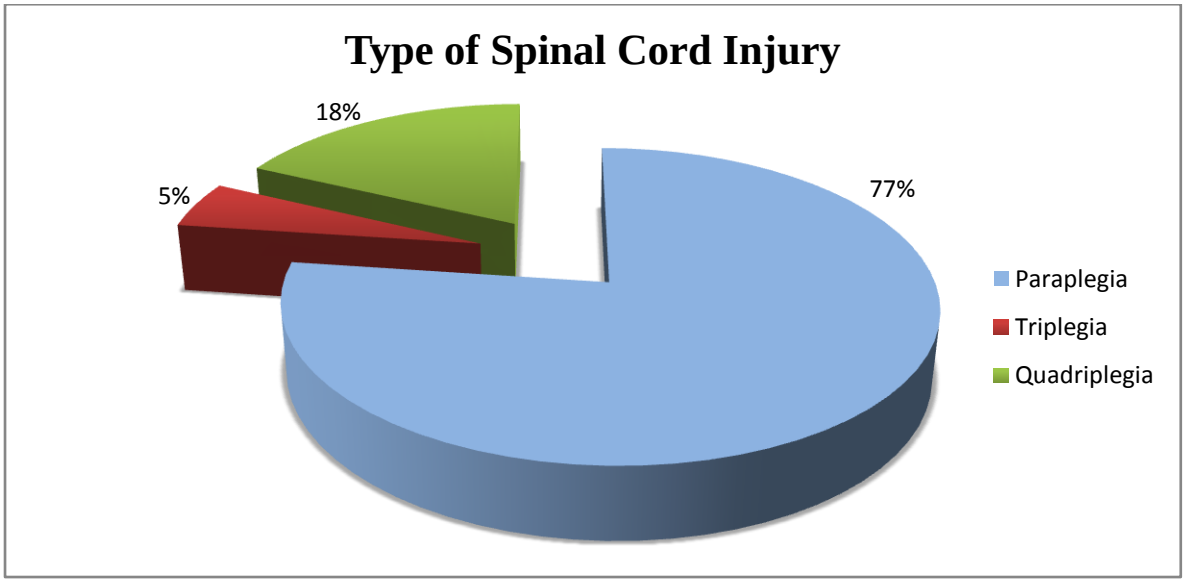


Fig 4.1.5: Types of Spinal Cord Injury

4.2 Frequency distribution of age and gender

4.2. Distribution of age and gender

The bar graph below demonstrates the distributing of age according to gender of participants. The total participants are 120. Among 109 male participants, the highest were within the range of 20-30 years with 46.8% followed by 31-40 with 25.7% and the least were within the range of 51 and above with 9.2%. Similarly, among 11 female participants, 63.6% of them were in age group of 20-30 years, 18.2% were in age group of 31-40 years followed by 9.1% within the age group of 41-50 years and 51 years and above both.

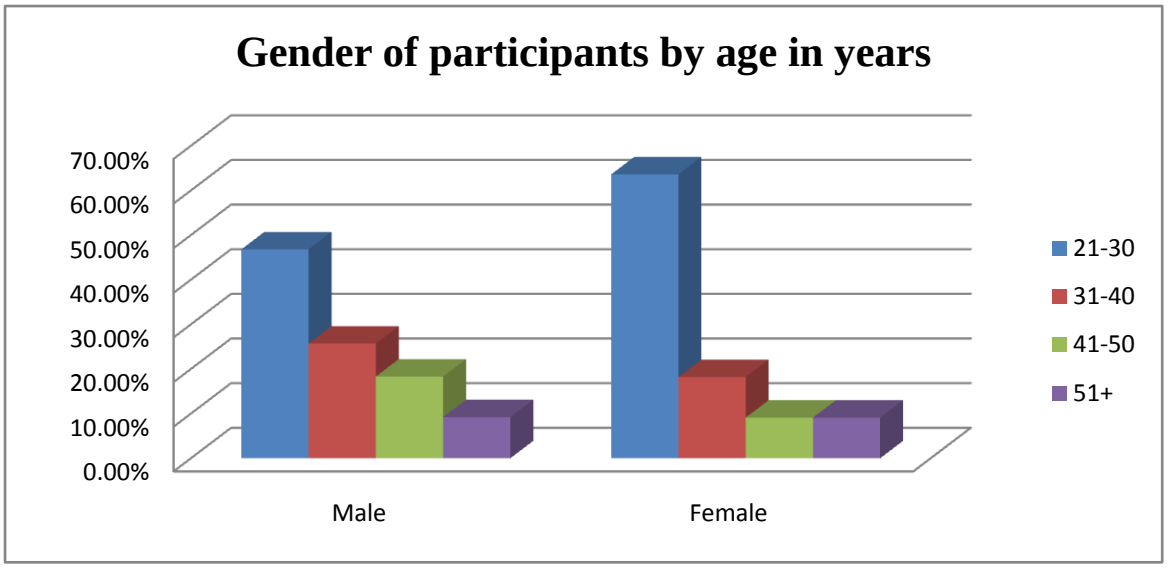


Fig 4.2.1: Gender of participants by age in years

4.3 Reliability of Data

Table 4.3 Reliability statistics

Chronbach's alpha	No of items
0.844	38

84.4% of variance in the items can be considered or called true score variance or internally consistent reliable variable.

The above table illustrates that all the items in questionnaire has chronbach's alpha greater than 0.7 which depicts high internal consistency of variables and their stability (NUnnally and Bernstein, 1994). Hence, the scales are sufficiently reliable for data analysis

4.4 Paired sample t-test of 38 items in SERVQUAL Scale

Table 4.4.1 Paired sample test of Tangible dimension of service quality

S.No.	Questions	t-value	df	P value	95% Confidence Interval of the difference	
					Lower	Upper
1.	Up-to date equipments	5.697	119	**.000***	.326	.674
2.	Visually appealing physical equipments	7.392	119	**.000***	.470	.814
3.	Clean environment and good employees appearance	3.039	119	**.003****	.064	.303
4.	medicines easily available	3.857	119	**.000***	.081	.252
5.	Hygienic meal	2.224	119	**.028***	.014	.236
6.	Tangible expectation – Tangible perception	8.103	119	**.000****	1.222	2.012

Significance level *P<0.05, **P<0.01, ***P<0.001

The above table illustrates the paired sample t-test of Tangible dimension of service quality and statistical results were achieved. The first ($t_{5.967}$ = 119, P<0.001), second ($t_{7.392}$ = 119, P<0.001) and fourth item ($t_{3.857}$ = 119, P<0.001) in this dimension showed significant average difference between expectation and perception scores. Also, third and fifth items had p value less than 0.05 which means null hypothesis was rejected. Over all, the mean score difference was -0.32 within 95% CI (1.222 to 2.012) in tangible dimension.

Table 4.4.2 Paired sample test of Reliability dimension of service quality

S. No.	Questions	t-value	df	P value	95% Confidence Interval of the difference	
					Lower	Upper
1.	Services provision in time as promised	4.000	119	**.000*** **	.067	.199
2.	Error free records	2.465	119	**.015***	.021	.195
3.	Hospital employees show a sincere interest in solving patients problems	2.762	119	**.007****	.050	.300
4.	Accurate and reasonable in billing	3.040	119	**.003****	.061	.289
5.	Sufficient time to examine patients	4.992	119	**.000*** **	.216	.500
6.	Reliability expectation – Reliability perception	7.557	119	**.000*** **	.701	1.199

Significance level *P<0.05, **P<0.01, ***P<0.001

The above table demonstrates the statistically significant paired sample t-test of five different items in Reliability dimension of service quality. There was significant difference between expectation and perception scores in first (t_4 = 119, P<0.001) and fifth ($t_{4.992}$ = 119, P<0.001) items while third and fourth items was significant at p<0.01 and hence, alternate hypothesis was accepted. In addition, second item had p value less than 0.05 that depicted statistically significant results. The difference between reliability expectation and reliability perception scores was statistically significant (M=-0.19), t(119)=7.557, p<0.01 (2-tailed).

Table 4.4.3 Paired sample test of Responsiveness dimension of service quality

S. No.	Questions	t-value	df	P value	95% Confidence Interval of the difference	
					Lower	Upper
1.	Provide clear explanation on the treatment and health condition to the patients	4.619	119	**.000*** **	.109	.274
2.	Prompt service to patients	1.906	119	.059	-.003	.136
3.	Employees always willing to help patients	2.465	119	**.015***	.021	.195
4.	Responsiveness expectation – Responsiveness perception	5.098	119	**.000*** **	.224	.509

Significance level *P<0.05, **P<0.01, ***P<0.001

The above table illustrates the paired sample t-test of items under responsiveness dimension of service quality. The first ($t_{4.619}$ = 119, P<0.001) and third ($t_{2.465}$ = 119, P<0.05) items showed statistically significant results however second items had p value greater than 0.05 which means null hypothesis is accepted. There was no significant difference between expectation and perception scores of second item. The difference between responsiveness expectation and responsiveness perception scores was statistically significant (M=-0.123), t(119)=5.098, p<0.01 (2-tailed).

Table 4.4.4 Paired sample test of Assurance dimension of service quality

S. No.	Questions	t-value	df	P value	95% Confidence Interval of the difference	
					Lower	Upper
1.	Patients feel safe and comfortable in their interactions with employees	2.111	119	**.037***	.007	.210
2.	Knowledgeable and flexible employees	3.648	119	**.000*** **	.099	.334

3.	Polite and respectful employees	4.161	119	**.000*** **	.109	.307
4.	Assurance expectation – Assurance perception	5.105	119	**.000*** **	.326	.740

Significance level *P<0.05, **P<0.01, ***P<0.001

The above table represents the paired sample t-test between expectation and perception scores among items in assurance dimension of service quality. The second and third items were statistically significant at the level of 0.001 which suggested that the null hypothesis was rejected Also, the difference was significant in first ($t_{2.111}$ = 119, P<0.05) item. The difference between assurance expectation and assurance perception scores was statistically significant (M=-0.18), t(119)=5.105, p<0.01 (2-tailed).

Table 4.4.5 Paired sample test of Empathy dimension of service quality

S. No.	Questions	t-value	df	P value	95% Confidence Interval of the difference	
					Lower	Upper
1.	Employees provide personal attention to patients with major complications	2.928	119	**.004****	.030	.154
2.	Understand the specific needs of patients	2.452	119	**.016***	.024	.226
3.	CRP have operating hours convenient to all their patients -	3.736	119	**.000****	.082	.268
4.	Empathy expectation – Empathy perception	4.714	119	**.000****	.227	.556

Significance level *P<0.05, **P<0.01, ***P<0.001

The above table illustrates the statistically significant paired sample t-test of five different items in Empathy dimension of service quality. The difference between expectation and perception scores was statistically significant in all three items i.e. first ($t_{2.928}$ = 119, P<0.01), second ($t_{2.452}$ = 119, P<0.05) and third ($t_{3.736}$ = 119, P<0.001). The overall difference between empathy expectation and empathy

perception scores was statistically significant (M=-0.13), t(119)=4.714, p<0.01 (2-tailed).

Table 4.4.6 Paired sample test of overall items in SERVQUAL scale

Paired sample t-test of overall items	t-value	df	P value	95% Confidence Interval of the difference	
				Lower	Upper
Total expectation scale - Total perception scale	11.879	119	.000**	3.215	4.501

Significance level *P<0.05, **P<0.01

The table above demonstrates the paired sample test between expectation and perception scores of overall items of SERQUAL scale and showed statistically significant results i.e. $t_{4.714}$ = 119 and P<0.001 which means alternate hypothesis was accepted.

4.5 Gaps between Expectations and Perception scores

4.5 Dimension Gaps between Expectations and Perception scores of SERVQUAL scale

The line graph illustrates the differences in means of five different dimensions in terms of expectation and perception scale of participants based on SERVQUAL scale of measuring service quality at Center for the Rehabilitation of Paralyzed in Bangladesh. The major gap was seen in the first dimension which is Tangibles (mean=-0.32) followed by reliability (mean=-0.19) and assurance (mean=-0.18) while responsiveness and empathy have almost similar mean differences among expectation and perception scale which are -0.123 and -0.13 respectively. Even though the assurance ranks third in the service gap, patient has highest expectation (mean=4.36) and perception (mean=4.18) on this dimension while tangible has the least expectation

(mean=4.08). On the other hand, reliability ranks second in gap, expectation (mean=4.28) and perception (mean=4.09) score as well.

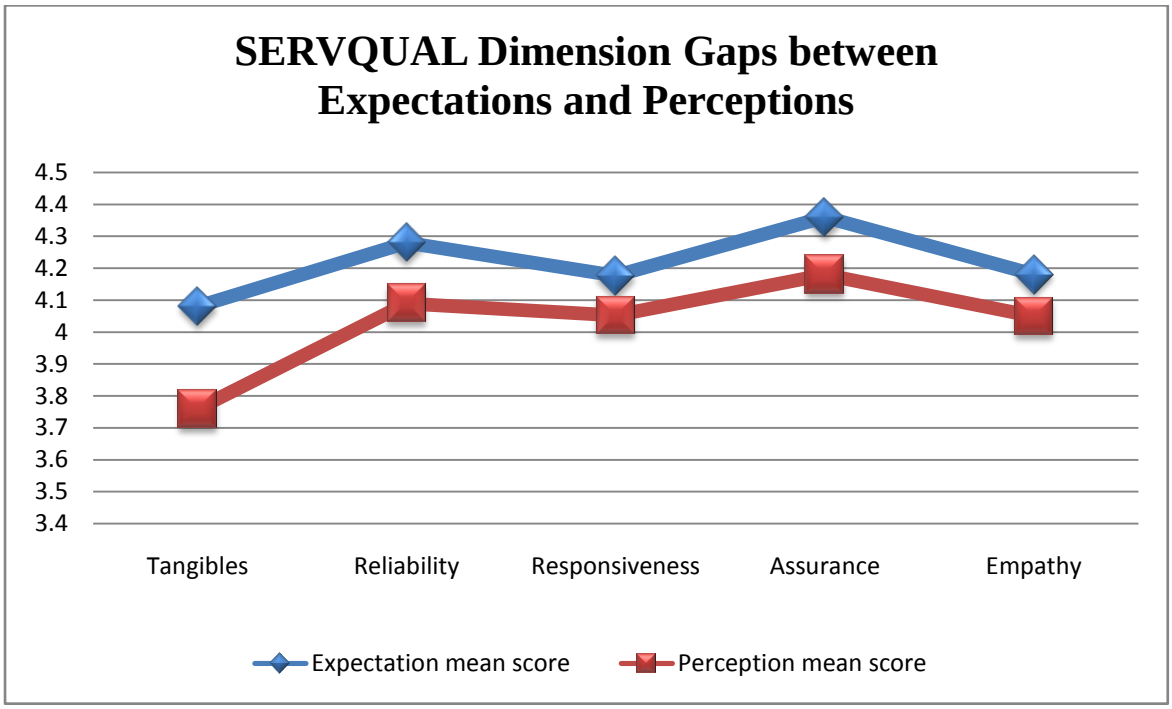


Fig 4.5: Gaps between expectation and perception mean scores

4.6 Quality of service gap differences

4.6 Differences among dimensions of service quality

The bar chart demonstrates the gap score for each domain of service quality. The most striking result is that none of the domain has positive gap score which means patients expectations were not met in any of dimensions. Large gap was seen in tangible with mean gap score of -0.32. Second largest gap was seen in reliability with mean gap score of -0.19 followed by assurance with -0.18. The least SQ gap was found in responsiveness i.e. -0.123.

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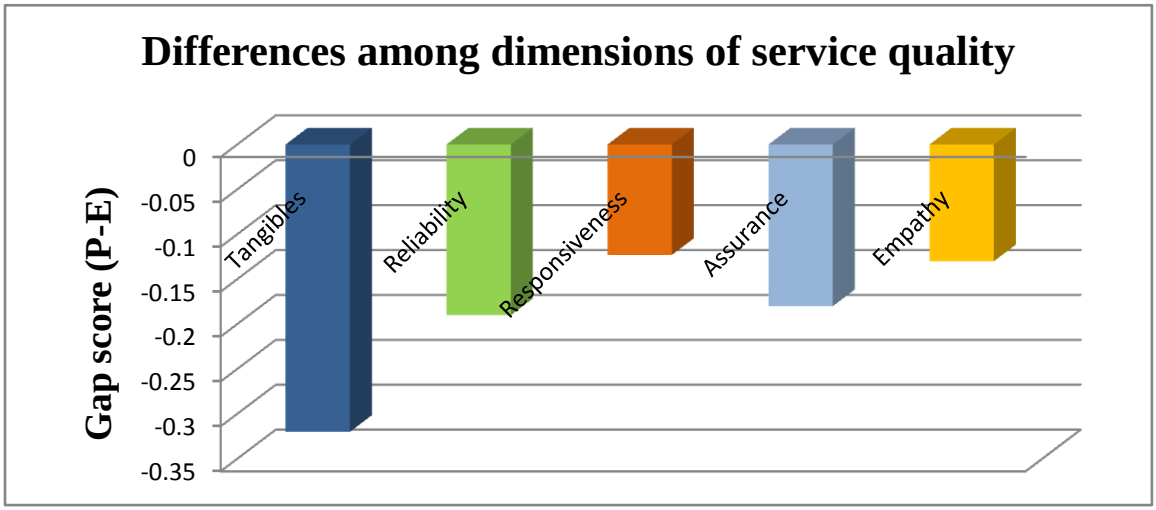

Fig 4.6: Differences among dimensions of service quality

4.7 Satisfaction and dissatisfaction level

4.7 Satisfaction and dissatisfaction level among attributes of service

The graph below illustrates the proportion of satisfaction and dissatisfaction level among five different dimensions of service provided in CRP for spinal cord injury patients. The results obtained revealed that subjects were dissatisfied with the services provided at CRP in tangibles and reliability dimensions while participants were satisfied in rest of the dimensions of SQ. The highest proportion of dissatisfaction constitutes of 65.8% in tangible followed by reliability with 55.8%. In contrast, the highest proportion of satisfaction was found in responsiveness with 72.5% followed by empathy and assurance with 64.2% and 55% respectively.

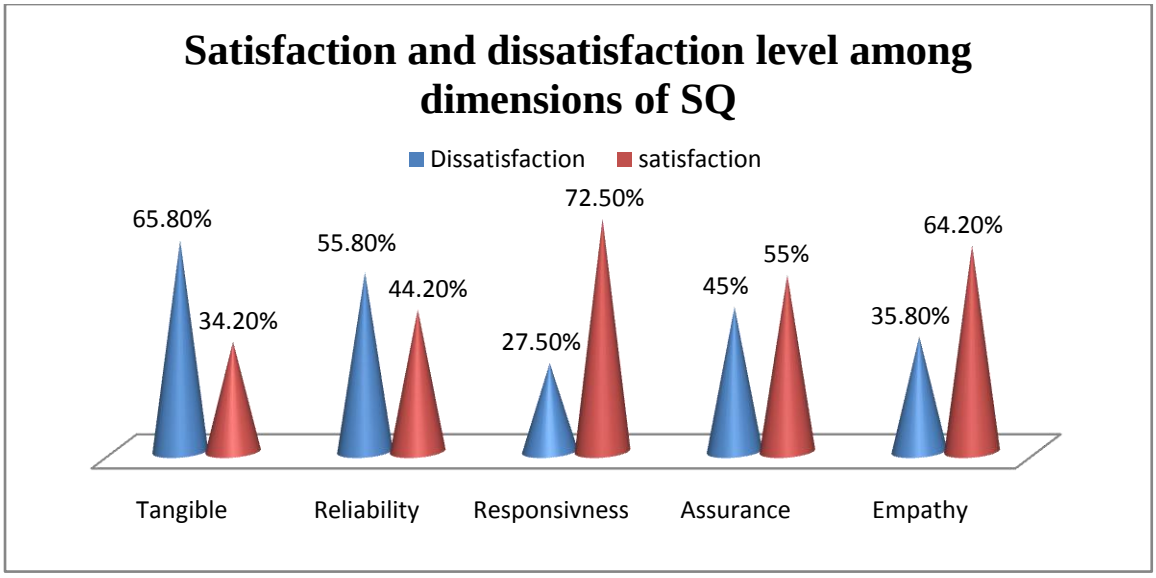

Fig 4.7: Satisfaction and dissatisfaction level among attributes of Service

4.8 Association between socio-demographics and attributes of service

Table 4.8.1 Association of age of participants with five dimensions mean gap of service

Age in years	Tangible gap		Reliability gap		Responsiveness gap		Assurance gap		Empathy gap	
	DC	SC	DC	SC	DC	SC	DC	SC	DC	SC
20-30 (%)	44.3	56.1	43.3	54.7	45.5	49.4	53.7	43.9	44.2	50.6
31-40 (%)	26.6	22	26.9	22.6	27.3	24.1	22.2	27.3	27.9	23.4
41-50 (%)	20.3	12.2	16.4	18.9	18.2	17.2	14.8	19.7	16.3	18.2
50^{+} (%)	8.9	9.8	13.4	3.8	9.1	9.2	9.3	9.1	11.6	7.8
Total (%)	65.8	34.2	55.8	44.2	27.5	72.5	45	55	35.8	64.2
Chi-square (χ2/df)	2.033/3		4.125/3		0.184/3		1.294/3		0.965/3	
P value	0.565		0.248		0.98		0.73		0.81	

The above table demonstrates the satisfaction count and dissatisfaction count of participants in five different dimensions of service quality in relation to age groups. Participants of age between 20 to 30 years had highest satisfaction rate (56%, n=23) in tangible dimension and largest dissatisfaction (53.7%, n=29) in assurance attribute.

Among those within the age between 31 to 40 years, highest proportion (27.3%) of satisfaction was found in assurance dimension whereas equal and highest proportion (27.3%) of dissatisfaction was observed in responsiveness and assurance dimension. Participants of age between 41 to 50 years had highest satisfaction rate (19.7%) in assurance dimension and largest dissatisfaction (20.3%) in tangbile attribute. Participants 50 years and over had highest satisfaction (9.8%) in tangible dimension and higest dissatisfaction (13.4%) in reliability dimension.

The chi-square test was carried out to reveal the association of participant's age with five dimensions of service. However, none of the results were statistically significant as P value was greater than 0.05.

Table 4.8.2 Association of Length of stay with five dimensions mean gap of service quality

LOS in months	Tangible gap		Reliability gap		Responsiveness gap		Assurance gap		Empathy gap	
	DC	**SC**	**DC**	**SC**	**DC**	**SC**	**DC**	**SC**	**DC**	**SC**
1-2 (%)	70.4	29.6	57.7	42.3	23.9	76.1	45.1	54.9	32.4	67.7
3-4 (%)	43.3	56.7	50	50	30	70	50	50	36.7	63.3
5 & above (%)	84.2	15.8	57.9	42.1	36.8	63.2	36.8	63.2	47.4	52.6
Total (%)	65.8	34.2	55.8	44.2	27.5	72.5	45	55	35.8	64.2
Chi-square (χ2/df)	10.27/2		0.552/2		1.376/2		0.814/2		1.474/2	
P value	**0.006**		0.759		0.503		0.666		0.479	

The above table demonstrates the satisfaction count and dissatisfaction count of participants in five different dimensions of service quality with respect to length of stay of SCI patients in CRP. Participants who stayed for 1 to 2 months had highest dissatisfaction rate of 70.4% (n=50) in tangible dimension and highest satisfaction in responsiveness dimension with 76.1% (n=54). The equal and high proportion of dissatisfaction among subjects who stayed 3-4 months was observed in reliability (50%, n=15) and assurance (50%, n=15) dimensions while highest satisfaction level was found in responsiveness dimension with 70% (n=21). Furthermore, the highest

dissatisfaction among those who stayed 5 months and longer was found in tangible with 84.2% (n=16) while highest satisfaction was observed in equal proportion in responsiveness and assurance i.e. 63.2% (n=12).

The chi-square test was performed to find the association between length of stay with all five dimensions. All of these showed insignificant results i.e. P>0.05 except for the tangible dimension. In tangible, among 71 patients who stayed for 1-2 months, 70.4% (n=50) were dissatisfied and 29.6% (n=21) were satisfied while among 30 patients who stayed for 3-4 months, 56.7% (n=17) were satisfied and 43.3% (n=13) were dissatisfied. On the other hand, 84.2% (n=16) were dissatisfied and 15.8% (n=3) were satisfied within 19 participants. The result from chi- square test for association between duration of stay and tangible gap was $\chi^2 = 10.27$ and p value = 0.006. This result shows there was significant association between the duration of patient stay and tangible gap as p value is less than 0.05 and thus, null hypothesis is rejected.

Table 4.8.3 Association between Residential area and attributes of service gap

Residential area of participants	Tangible gap		Reliability gap		Responsiveness gap		Assurance gap		Empathy gap	
	DC	**SC**	**DC**	**SC**	**DC**	**SC**	**DC**	**SC**	**DC**	**SC**
Rural %	63.1	36.9	56.0	44.0	29.8	70.2	53.6	46.4	33.3	66.7
Urban %	78.3	21.7	56.5	43.5	21.7	78.3	21.7	78.3	34.8	65.2
Semi-urban %	61.5	38.5	53.8	46.2	23.1	76.9	30.8	69.2	53.8	46.2
Total %	65.8	34.2	55.8	44.2	27.5	72.5	45	55	35.8	64.2
Chi-square (χ2/df)	1.966/2		0.026/2		0.726/2		8.585/2		2.074/2	
P value	0.374		0.987		0.987		**0.014**		0.355	

The above table demonstrates the satisfaction and dissatisfaction proportion among five dimensions of scale with respect to residential area of participants and In tangible dimension, the highest dissatisfaction was observed in with 63.1% (n=53) while highest satisfaction in Responsiveness was spotted with 70.2% (n=59) among the ones living in rural areas. In urban areas, equal proportion of (78.3%, n=18) participants were found to be dissatisfied and satisfied in tangible, responsiveness and assurance

attributes of service. On the other hand, in semi-urban areas, highest dissatisfaction of 61.5% (n=8) was observed in tangible and maximum satisfaction of 76.9% (n=10) was found in responsiveness dimension of service.

The chi-square value was calculated to find the association among five dimensions of scale and residential area of participants. All dimensions showed insignificant results as p value is greater than 0.05 except for the assurance dimension. Among 84 participants living in rural area, 53.6% (n=45) were dissatisfied and 46.4% (n=39) were satisfied while those (n=23) living in urban areas, 78.3% (n=18) were satisfied and 21.7% (n=5) were dissatisfied. On the other hand, 69.2% (n=9) were satisfied and 30.8% (n=4) were dissatisfied within13 participants residing at semi-urban areas. The result from chi-square test for association between residential area and assurance gap was $\chi^2 = 8.585$ and p value = 0.014. This result shows there was significant association between the residential area of participants and assurance gap as $p<0.05$ and thus, null hypothesis is rejected.

Table 4.8.4 Association of Occupation of participants with five dimensions mean gap of service quality

Occupation of participants	Tangible gap		Reliability gap		Responsiveness gap		Assurance gap		Empathy gap	
	DC	SC	DC	SC	DC	SC	DC	SC	DC	SC
Farmer %	58.1	41.9	61.3	38.7	25.8	74.2	64.5	35.5	35.5	64.5
Daily laborer %	63.3	36.7	60.0	40.0	23.3	76.7	40.0	60.0	36.7	63.3
Service holder %	71.4	28.6	42.9	57.1	57.1	42.9	57.1	42.9	57.1	42.9
Student %	66.7	33.3	41.7	58.3	16.7	83.3	41.7	58.3	25.0	75.0
Business %	75.0	25.0	58.3	41.7	8.3	91.7	33.3	66.7	41.7	58.3
Driver %	66.7	33.3	50.0	50.0	66.7	33.3	50.0	50.0	50.0	50.0
Overseas worker %	85.7	14.3	71.4	28.6	42.9	57.1	42.9	57.1	14.3	85.7
Housewife %	83.3	16.7	33.3	66.7	33.3	66.7	16.7	83.3	33.3	66.7
Others %	55.6	44.4	55.6	44.4	22.2	77.8	22.2	77.8	33.3	66.7
Total %	65.8	34.2	55.8	44.2	27.5	72.5	45	55	35.8	64.2
Chi-square (χ2/df)	3.936/8		4.076/8		11.981/8		10.111/8		4.161/8	
P value	0.863		0.85		0.152		0.257		0.842	

The above table shows whether the participants under study are satisfied or not regarding services provided at CRP in respect to their occupational status. In tangibles dimension, the most dissatisfied participants are daily laborers (63.3%; 19/30) followed by farmers with 58% (18/31) while others holds the least satisfaction proportion of 55.6% (5/9). Reverse is with reliability dimension, the most dissatisfied ones were others (44%; 4/5) followed by farmers (41.9%; 13/31). The highest satisfaction proportion (66.7%; 4/6) is in responsiveness dimension with housewives farmers and highest dissatisfaction was among farmer with 61.3% (19/31). The second most satisfied dimension is empathy where housewives (4/6) and others (6/9) have same proportion of satisfaction level (66.7%) Lastly, within assurance

dimension, satisfaction level was seen high in farmers with 64.5% (20/31) while dissatisfaction level was found to be highest among housewives with 83.3% (5/6). The chi-square test was carried out to reveal the association of occupation of participants with five dimensions of service. However, none of the results were statistically significant as P value was greater than 0.05.

Table 4.8.5 Association of educational status of participants with five dimensions mean gap of service quality

Educational status	Tangible gap		Reliability gap		Responsiveness gap		Assurance gap		Empathy gap	
	DC	SC	DC	SC	DC	SC	DC	SC	DC	SC
Illiterate %	70.6	29.4	52.9	47.1	23.5	76.5	47.1	52.9	41.2	58.8
Primary school %	62.5	37.5	55.0	45	30.0	70	47.5	52.5	35	65
Secondary school %	53.6	46.4	60.7	39.3	32.1	67.9	42.9	57.1	32.1	67.9
Higher secondary school %	91.7	8.3	66.7	33.3	8.3	91.7	33.3	66.7	33.3	66
Graduate %	75	25	.0	100	50	50	50	50	25	75
Post graduate and above %	50	50	100	0	50	50	50	50	50	0
Total %	65.8	34.2	55.8	44.2	27.5	72.5	45	55	35.8	64.2
Chi-square (χ2/df)	5.973/4		2.2/4		4.432/4		0.932/4		0.649/4	
P value	0.201		0.699		0.351		0.92		0.957	

The above table shows whether the participants under study are satisfied or not regarding the service provided at CRP in respect to their educational status. The highest proportion of illiterate subject was dissatisfied in tangible dimension with 70.6% (24/34) followed by reliability and assurance with 52.9% (18/34) and 47.1% (16/34) respectively. The highest dissatisfaction count proportion was observed in primary school subjects with 62.5% (25/40) in tangible while 70% (28/40) satisfaction was observed in responsiveness. The highest proportion of secondary school subjects who were dissatisfied was 60.7% (17/28) in reliability and relatively highest proportion who were satisfied were observed in both empathy and responsiveness with 67.9% (19/28). Equal proportion was dissatisfied and satisfied among participants with higher secondary degree i.e. 97.1% (11/12) under tangible and responsiveness dimensions respectively. With graduate participants, the highest

proportion of dissatisfaction was found in tangible with 75% (3/4) while all of them (100%; 4/4) were satisfied in reliability. In case of post graduate and above participants, all dimensions have equal proportion of satisfied and dissatisfied count except reliability which had 100% (1/2) dissatisfaction count.

The chi-square test was carried out to reveal the association of education of participants with five dimensions of service. However, none of the results were statistically significant as P value was greater than 0.05.

4.9 Association among attributes of service

Table 4.9.1 Correlations coefficient using Pearson correlation among attributes on expectation scale

Dimensions on Expectation scale		Expectation on tangibles	Expectation on reliability	Expectation on responsiveness	Expectation on assurance	Expectation on empathy
Expectation on tangibles	Pearson Correlation	1				
	Sig. (2-tailed)					
Expectation on reliability	Pearson Correlation	.318**	1			
	Sig. (2-tailed)	**.000****				
Expectation on responsiveness	Pearson Correlation	.444**	**.**505**	1		
	Sig. (2-tailed)	**.000****	**.000****			
Expectation on assurance	Pearson Correlation	.034	.248**	.216*	1	
	Sig. (2-tailed)	.711	**.006****	**.018***		
Expectation on empathy	Pearson Correlation	.522**	.428**	.655**	.064	1
	Sig. (2-tailed)	**.000****	**.000****	**.000****	.485	

*****. Correlation is significant at the 0.01 level (2-tailed).***

****. Correlation is significant at the 0.05 level (2-tailed).***

The above table represents the association among dimensions on expectation scale. In expectation scale, all dimensions have statistical significance (p<0.05) with each other except assurance with tangibles and empathy. Tangible has positive intermediate

relationship ($0.25 < |r| < 0.75$) with reliability, responsiveness. Similarly, reliability has positive intermediate relationship ($0.25 < |r| < 0.75$) with responsiveness and empathy while weak positive association ($0 < |r| < 0.25$) with assurance. On the other hand, responsiveness has intermediate positive association with empathy but weak positive relationship with assurance i.e. ($0 < |r| < 0.25$). It means variable are dependent on each other.

Table 4.9.2 Correlations coefficient using Pearson correlation among attributes on perception scale

Dimensions on Perception scale		Perception on tangibles	Perception on reliability	Perception on responsiveness	Perception on assurance	Perception on empathy
Perception on tangibles	Pearson Correlation	1				
	Sig. (2-tailed)					
Perception on reliability	Pearson Correlation	.274**	1			
	Sig. (2-tailed)	**.002****				
Perception on responsiveness	Pearson Correlation	.152	.588**	1		
	Sig. (2-tailed)	.097	**.000****			
Perception on assurance	Pearson Correlation	.072	.568**	.474**	1	
	Sig. (2-tailed)	.433	**.000****	**.000****		
Perception on empathy	Pearson Correlation	.207*	.501**	.596**	.362**	1
	Sig. (2-tailed)	**.023***	**.000****	**.000****	**.000****	

. Correlation is significant at the 0.01 level (2-tailed).

****. Correlation is significant at the 0.05 level (2-tailed).***

The above table represents the association among dimensions on perception scale. In perception scale, all five dimensions showed statistically significant liner relationship ($p<0.05$) with each other except tangible with responsiveness and assurance.

However, the strength and direction of association between tangible and empathy is weak i.e. ($0 < |r| < 0.25$) and positive respectively while it has intermediate positive association ($0.25 < |r| < 0.75$) with reliability. Also, the magnitude and direction of relationship of reliability with assurance and empathy is intermediate ($0.25 < |r| < 0.75$) and positive. Similarly, positive intermediate associations were observed between responsiveness with assurance, empathy and responsiveness and empathy and assurance. It means with increase in one variable, other variable also increases.

4.10 Binary logistic results

Table 4.10 Relationship between socio-demographic variables attributes of SQ

Variables	Dimensions					
	Tangibles			Reliability		
	P value	Exp(B)	(95% C.I.)	P value	Exp(B)	(95% C.I.)
Length of stay (in months)						
1-2		0	*Reference*			
3-4	.413	1.909	.406-8.983			
5 & above	**.024***	7.020	1.288-38.26			
Types of SCI						
Paraplegia					0	*Reference*
Triplegia				**.016***	.100	.016-.646
Quadriplegia				.298	.229	.014-3.687
	Assurance			**Empathy**		
Occupation						
Farmer		0	*Reference*			
Day labor	**.025***	.085	.010-0.731			
Service holder	.214	.272	.035-2.124			
Student	.088	.102	.007-1.403			
Business	.537	2.550	.130-49.918			
Driver	.236	.231	.020-2.604			
Overseas worker	.107	.113	.008-1.597			
Housewife	.184	.165	.012-2.359			
Others	.888	.753	.015-38.74			
Marital status						
Married		0	*Reference*			
Unmarried	**.027***	5.759	1.220-27.186			
Gender						
Male					0	*Reference*
Female				**0.036***	28.108	1.249-632.458

Variable(s) entered: Q2, Q3, Q4, Q9, Q10, Inc_category, Age_category, LOS_category, Q5.

Significance level *P<0.05

The above table illustrates the association between different socio-demographic variables with gaps in dimensions of service quality.

Length of stay and Tangible gap

The length of stay (in months) of participants at CRP is categorized into 3 sub categories as mentioned in above table and it was found to be significant subjects who had been admitted in CRP for 5 months and above which has p-value <0.05. Also, e^{β} value of graduate level is 7.02 ($e^{\beta}=e^{1.949}$ = 7.02) which means that those participants who stayed longer (five months and more) had more gap in tangible dimension than those who stayed for shorter period of time by 7.02 times. Hence, we can conclude that there is relationship among length of stay of subjects and tangible gap of SQ.

Type of SCI and Reliability gap

Type of Spinal cord injury was observed to have significance level less than 0.05 in triplegic subjects in reliability dimension and has e^{β} value of 0.1. Here, odds ratio for type of SCI is $e^{\beta}=e^{2.298}$ = 0.1. Hence, we can conclude that there is relationship among type of injury and reliability gap of SQ. So, the gap of reliability in participants with triplegia was 0.1 times than that of other types of SCI.

Occupation of participants and Assurance gap

Day laborers had significant impact on the service quality gap in assurance dimension i.e. p-value<0.05 and consists of e^{β} value (0.085). Here, odds ratio graduate level participant is $e^{\beta}=e^{2.46}$= 0.085 which means that the gap of assurance in day laborers was 0.08 times than other occupation holders. Hence, there is association of day laborers with assurance gap of SQ.

Marital status and Assurance gap

There is association of unmarried participants with assurance gap of SQ. Unmarried subjects had also significance level less than 0.05 and contains e^{β} value >1 i.e. 5.759 in assurance dimension. Here, odds ratio graduate level participant is $e^{\beta}=e^{1.751}$= 5.759. So, the gap of assurance in unmarried subjects was 5.759 times than married ones.

Gender and Empathy gap

Gender was observed to have significance level less than 0.05 among females in empathy dimension and has e^{β} value of 28.108. Here, odds ratio graduate level participant is $e^{\beta}=e^{3.336}$=28.108 which suggested that females had huge impact on service quality gap in empathy dimension than males by 28.108 times.

CHAPTER-V: DISCUSSION

Spinal Cord Injury (SCI) is a highly destructive and devitalizing neurological life-disrupting condition leading to sudden and abrupt changes in individual's daily living style. Service quality is termed as the customer's perception regarding the level of services delivered by service provider whether it has met their expectation or not. The study was conducted to determine the quality of service in SCI patients at mother institution "Center for Rehabilitation of Paralyzed" in Bangladesh. For this purpose, expectation and perception of SCI patients on quality of service offered at CRP were ruled out to determine the SQ gaps and patient satisfaction accordingly. All of the gaps were negative which indicates service quality were low on each dimensions of service considering lowest at tangible dimension. Huge gap of -0.64 and -0.36 were seen in item 2 "CRP physical facilities are visually appealing" and item 10 "the doctor gives enough time to examine patients respectively. In contrast, the most smallest gap of -0.01 was observed in item 12 "patients receive prompt service from CRP employees" followed by item 17"CRP employees provide personal attention to patients especially with major complications" However, item 4 "CRP has all the necessary medicines easily available" and item 19 "CRP has operating hours convenient to all their patients" has had relatively similar gaps of -0.17. Similarly item 3 "CRP employees appear neat", item 8 "When patients have problems, CRP employees should show a sincere interest in solving it" and item 9 "CRP is accurate and reasonable in its billing" had similar gaps of -0.18. In addition, there was positive association among socio-demographic and quality of service except for the responsiveness attribute. Furthermore, dimensions of service were observed to be positively correlated with each others.

In this study, among 120 total participants, 90.8% of subjects were within the age from 20 to 50, 109 (90.8%) were male and rest (11) 9.2% were female. Also, 93 (77%) were paraplegic, 21 (18%) were quadriplegic and 6 (5%) were trigplegic. 38 (31.7%) had injury level at C1-C7 region, 16 (13.3%) at D1-D6 region, 53(44.2%) at D7-D12 region and 13 (10.8%) at L1-L5 region. In contrast, in a demographic study by Quadir et al (2017) at CRP, male constituted 176 (87.6%) and female constituted 25 (12.4%) in numbers within the age from 21 to 50. 88.4% were within the age range between 0-50. 652 (55.6%) were paraplegic and 520 (44.4%) were tetraplegic. 30.7%

had injury level at cervical region, 30.1% at thoracic region and 22.1% at lumber region. Another demographic study at CRP by Hoque, Grangeon & Reed (1999) concluded that 218 (88%) were males and 29 (12%) were females. 81% of them were between 10-40 years of age. The rate of SCI in this study was found to be high in rural areas (70%) followed by urban and semi-urban. Slight differences in socio-demograhics could be due to sample size and purpose of the study.

In this study, all 19 items showed negative gaps which means patient's expectations weren't met. Also, the differences were significant i.e. $P<0.05$ except for the item 12 "patients receive prompt service from CRP employees" which significance is slightly higher than 0.05. Hence, patient expectations were met for this particular item of responsiveness dimension. However, most poor in tangible (M=-0.32) and reliability (M=-0.19) dimensions along with service quality gap lower in assurance (M=-0.18), empathy (M=-0.13) and responsiveness (M=-0.123) comparatively. Similarly, perception score was higher than expectation score in all five dimensions in this study but highest gap was seen in empathy with mean score of -1.83 followed by responsiveness (M=-1.712) and assurance (M=-1.62) while least gap was seen in tangible and then, empathy with mean score of -1.49 and -1.466 respectively (Neupane & Gurung, 2014). On the other hand, a study by Peprah & Atarah (2014) found ultimate differences between patient perceptions and expectations in reliability at large in combination with responsiveness, communication and assurance. In addition, a dimension was incorporated with five dimensions to measure hospital services. The largest gap was found to be in economy and then responsiveness followed by empathy, assurance, reliability and tangibles (Fan et al., 2017). In a study by Solayappan et al (2011), Reliability held the highest gap with mean gap of -1.10 followed by empathy (M=-1.09), tangible (M=-1.06), assurance (M=-0.93) and responsiveness (M=-0.93).

In this study, highest expectation was observed in assurance dimension (M=4.36) followed by reliability, empathy, responsiveness and tangibles and highest perception was found in assurance (M=4.18) followed by reliability, responsiveness, empathy and tangibles. A study by Fan et al (2017) revealed that maximum expectation was seen in assurance (M=4.18) dimension, second highest was empathy followed by responsiveness, reliability, economy and tangibles. Similarly, patient had the maximum perception on assurance and then, reliability followed by empathy,

tangibles, responsiveness and economy. In another study, participants had almost similar expectation scores mean ranging from 4.49 to 4.95 with highest on tangible dimension. Similarly, they had highest perception scores on tangible dimension mean ranging from 2.07 to 4.59 (Neupane & Gurung, 2014). Furthermore, outcomes from this study contrast from PZB's expectation level among SERVQUAL dimensions, which was reliability, responsiveness, assurance, empathy, and physical assets. This may be because of contrasts in political, monetary, and social factors among nations and measurable techniques utilized by researchers, all of which add to contrasts in the interest for medicinal administrations. In accordance to Solayappan et al (2011), highest expectation was found in reliability (M=5.78) followed by assurance, tangible, empathy, responsiveness and highest perception was observed in assurance (M=4.72), reliability, tangible, responsiveness and empathy. However tangible and responsiveness had similar perception mean gap of 4.6.

The lowest perception scores were observed in item 2 “CRP physical facilities are visually appealing” (M=3.18) followed by item 1 “CRP has up-do-date equipment” (M=3.26) of tangible dimension which suggests that CRP should improve their physical infrastructure and need to use modern equipments or update them. Even though most of the participants were from rural areas engaged in farming and daily labor with low income, their perception if CRP billing was reasonable was quite good as compared to a study where patients had lowest perception score on economy construct indicating huge financial burden on them (Fan et al.,2017). In contrast, lowest and equal perception (M=4.42) was found in “Personnel in excellent hospitals/clinics will tell patients exactly when services will be performed” and “excellent hospitals/clinics will get things right at the first time itself” of responsiveness and reliability dimension respectively (Solayappan et al., 2011).

The gap of empathy in this study among female subjects was 28.108 times (95% CI 1.249 to 632.458) that of male subjects while in another study by Fan et al (2017), it was completely different. Male subjects were 0.69 (95% CI 0.553 to 0.860) times than that of female subjects in responsiveness gap. In addition, the participants whose educational level is low showed significant relationship with economic gap dimension. The economic gap among juniors and high school level participants was 0.381 times (95% CI 0.182 to 0.796) and 0.407 times (95% CI 0.198 to 0.838) respectively than that of higher educational level subjects. Also, the gap of economy

among subjects between 41 to 50 years of age was 0.592 times (95% CI 0.406 to 0.863) than other age groups subjects. However, in this study age and educational level of participants had no significant association with any dimensions of SQ gap. It may be because in this study, participants were more specifically selected.

In a study by Fan et al (2017), six dimensions were used to measure SQ and its chronbach's alpha in expectation scale was 0.967 and perception scale was 0.933. Also, each dimension scored more than 0.8 chronbach's alpha. In contrast, in this study, the chronbach's alpha for expectation scale was 0.748 and perception scale was 0.774 and all those dimensions constituted less than 0.7 chronbach's alpha but overall rating was 0.844. In another study by Zubayer (2017), the overall chronbach's alpha was 0.889 which is again greater than 0.7.

The positive relationship was observed among SERVQUAL attributes in this study except for the association of assurance with tangibles and empathy which p-value are 0.711 and 0.485 respectively i.e. p-value>0.05 in expectation scale and relationship of tangible with responsiveness and assurance which p-value are 0.097 and 0.433 respectively i.e. p-value>0.05 in perception scale. However, a study by Amjeriya & Malviya (2012) observed that assurance has intermediate positive relationship ($0.25 < |r| < 0.75$) with tangibles and empathy i.e. p-value<0.01 and the correlation was statistically significant.

A study concluded that the foundation of more elevated amounts of quality of service will lead patients to have an increased state of satisfaction. There was a significant impact of SQ constructs on patient satisfaction excluding tangibles (Rao, Peter, & Bandeen-Roche, 2006). In this study, the highest satisfaction level was in responsiveness whereas highest dissatisfaction level was observed in tangible dimension. Patients were satisfied in assurance (55%), empathy (64.24%) and responsiveness (72.5%) while they were dissatisfied in tangibles (65.8%) and reliability (55.8%). Empathy was found to have impact on patient satisfaction the most according to odd ratio value where the gap of empathy was 28.108 times (p value=0.036) more in females than males. Tangibles took the second position followed by assurance and reliability. However, responsiveness had no impact on patient satisfaction. A study by Andaleeb in 2001 affirmed that tangible had the greatest impact on patient satisfaction (β=0.348, p value=0.001) followed by assurance, responsiveness, communication and baksheesh.

In this study, there was no association between age of participants and SQ and educational status and SQ as p value was greater than 0.05 which means null hypothesis was rejected. However, keith (1998) affirmed that the more the age and the less the education, patient seems to be more satisfied. A study by Tucker (2002) concluded that the relationship among satisfaction and sex, social class, race and conjugal status are vague. Furthermore, young, low education, married, serious medical condition depict less satisfaction. Also, the monthly wage has direct effect on patient fulfillment levels (Mummalaneni et al. 1995).

Paired sample t-test of 5 dimensions was performed and statistical results were achieved. In tangibles, the mean score difference was -0.32 within 95% CI (1.222 to 2.012). The difference between reliability expectation and reliability perception scores was statistically significant (M=-0.19), $t(119)=7.557$, $p<0.01$ (2-tailed).The difference between empathy expectation and empathy perception scores was statistically significant (M=-0.13), $t(119)=4.714$, $p<0.01$ (2-tailed). However, in a study by Neupane & Gurung (2014), the mean score difference in tangible dimension was 1.48 (95% CI, 1.41 to 1.56). The mean score difference in empathy dimension was 1.83 (95% CI, 1.72 to 1.94). Statistical difference was observed in reliability dimension i.e. $t(118) = 36.84$, $p< 0.0001$ (two-tailed).

Limitations

- In this study, only inpatients were included hence, perceptions of outpatients were compromised that could influence results to some extent. Future study should include outpatients as well.
- The study was conducted in a rehabilitation center. If it had been carried out including few more rehabilitation centers than more representative outcomes would have been achieved.
- Researcher faced language barrier in explaining the contents of questionnaire and what it purports to measure to data collectors. Hence, data collectors might not able to understand the exact meaning of items in questionnaire which could interfere with the quality of study.
- Even though 120 participants were included in the study, the results can't be generalized. A larger sample size from different centers would determine the exact service quality gap among SCI patients.
- Several studies had been conducted regarding measurement of quality of services in general patients in hospital settings but none in specific condition. Hence, research faced difficulties in reviewing literature.

CHAPTER-VI: CONCLUSION AND RECOMMENDATION

This study concluded that there is an utmost need for modification or update in equipments and structural appearance of physical facilities. Patients were found to have problems with less consultation time with doctors. They even doubt regarding the staffs competency as some of them don't perceive them explaining about the treatment and their health status clearly due to lack of interest or time. Also, some don't perceive staffs to be polite and respectful towards them. In addition, the appearance of employees also reflects upon the service quality. CRP operating hours was found to be inconvenient for all patients and medicines accessibility is also another gap that was found in this study. On the other hand, socio-demographics were found to be associated with service quality. Females, daily laborers and triplegic participants and those who were unmarried and who stayed longer in CRP have statistically significant association with service quality gap. However, none of the socio-demographic variables found related with responsiveness SQ.

The evaluation and understanding of service quality and service provider performance as perceived by the patient is essential to health care delivery since it is an idea vital to the arrangement of a superior, progressively centered quality administration for patients. So as to accomplish this, it is utmost important to collect and analyze data on patient needs, expectations and perceptions to evaluate the care they receive in health centers. This will at that point help service providers or administration to distinguish where necessary amendments are required. The findings from this study can be utilized to enhance health care delivery promoting center's name and fame in communities by the patients through referral which in turn increase financial stability of rehabilitation center. Also, it can also be of great use for researchers in academics and health care professionals.

The last utilization of gap data is to enable supervisors to follow the effect of any improvement activities that have been acquainted with endeavor to close recognized gaps. Gap investigation will demonstrate where administration quality gap happen however won't fundamentally show what is expected to close the gap. A noteworthy gap in the Physical facilities measurement might was identified with a deficiency in assets or to an unseemly prioritization of assets. It indicates that management must

work on updating treatment techniques, modalities or machines and physical infrastructure to satisfy patient needs and exceed patient expectations. The gap approach, in any case, does empower the management to survey at some phase later on whether administration upgrades that have been presented have had any impact. Further analysis of gap scores will enable the administrator to survey the effect of enhancements.

Recommendations

- Future studies can be conducted including both inpatients and outpatients to measure quality of services in Spinal Cord Injury patients.
- Future study can be carried out in various centers to achieve Spinal cord injury patient's satisfaction in health services.
- It is highly recommended to include health professional perception along with patient and compare them while evaluating service quality in health sectors.
- As this study determines the expectation and perception of SCI patients, it would be valuable to conduct similar studies in other countries and compare and contrast the findings.

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APPENDIX- A

Service quality gaps (means) of each item on five dimensions with paired sample t-tests

S. No.	Questions	Mean (E)	Mean (P)	Mean GAP (P-E)	t-value	P-value	Rank
	TANGIBLES	**4.08**	**3.76**	**-0.32**	**8.103**	**.000****	**1**
1.	CRP has up-do-date equipment.	3.76	3.26	-0.5	5.697	.000**	
2.	CRP physical facilities are visually appealing.	3.82	3.18	-0.64	7.392	.000**	
3.	CRP employees appear neat.	4.32	4.14	-0.18	3.039	.003**	
4.	CRP has all the necessary medicines easily available.	4.27	4.10	-0.17	3.857	.000**	
5.	Meal appears to be hygienic.	4.25	4.12	-0.13	2.224	.028*	
	RELIABILITY	**4.28**	**4.09**	**-0.19**	**7.557**	**.000****	**2**
6.	CRP provides its services at the time it promises to do so.	4.19	4.06	-0.13	4.000	.000**	
7.	CRP insists on error free records.	4.21	4.10	-0.11	2.465	.015*	
8.	When patients have problems, CRP employees should show a sincere interest in solving it.	4.21	4.03	-0.18	2.762	.007**	
9.	CRP is accurate and reasonable in its billing.	4.27	4.09	-0.18	3.040	.003**	
10.	The doctor gives enough time to examine patients.	4.53	4.17	-0.36	4.992	.000**	

	RESPONSIVENESS	**4.176**	**4.053**	**-0.123**	**5.098**	**.000****	**5**
11.	CRP employees provide clear explanation on treatment and health condition to the patients.	4.23	4.03	-0.2	4.619	.000**	
12.	Patients receive prompt service from CRP employees.	4.13	4.07	-0.06	1.906	.059	
13.	CRP employees are always willing to help patients.	4.17	4.06	-0.11	2.465	.015*	
	ASSURANCE	**4.36**	**4.18**	**-0.18**	**5.105**	**.000****	**3**
14.	Patients feel safe and comfortable in their interactions with CRP employees.	4.13	4.02	-0.11	2.111	.037*	
15.	CRP employees are knowledgeable and flexible.	4.56	4.34	-0.22	3.648	.000**	
16.	CRP employees are polite and respectful.	4.38	4.18	-0.2	4.161	.000**	
	EMPATHY	**4.18**	**4.05**	**-0.13**	**4.714**	**.000****	**4**
17.	CRP employees provide personal attention to patients especially with major complications.	4.13	4.04	-0.09	2.928	.004**	
18.	The personals of CRP understand the specific needs of their patients.	4.16	4.03	-0.13	2.452	.016*	
19.	CRP has operating hours convenient to all their patients.	4.24	4.07	-0.17	3.736	.000**	

Appendix-B: I: Information Sheet & Consent Form (Bangla)

শিরোনাম: পক্ষাঘাতগ্রস্থদের পুনর্বাসন কেন্দ্র সিআরপি, ঢাকা, বাংলাদেশ এ মেরুজ্জুতে আঘাতপ্রাপ্ত রোগীদের দেয়া সেবার মান নির্ধারণ।

গবেষনায় অংশগ্রহণের জন্য সম্মতিপত্র

ওহে! আমার নাম রুবি মালা। আমি ঢাকা বিশ্ববিদ্যালয়ের অধীনে বাংলাদেশ হেলথ প্রফেশন্স ইনস্টিটিউট এর ছাত্রী। আমার পাঠ্যসূচী অনুযায়ী আমাকে একটি গবেষনামূলক কাজ করতে হবে যার নাম হচ্ছে "পক্ষাঘাতগ্রস্থদের পুনর্বাসন কেন্দ্র সিআরপি, ঢাকা, বাংলাদেশ এ মেরুজ্জুতে আঘাতপ্রাপ্ত রোগীদের দেয়া সেবার মান নির্ধারণ।" এটার মূল লক্ষ্য হল সি. আর. পি তে যে মেরুদন্ডে আঘাতপ্রাপ্ত রোগীদের সেবা দেওয়া হয় সেটার মান পরিমাপ করা। এটার উদ্দেশ্য আমি কিছু প্রশ্ন জিজ্ঞাস করতে চাচ্ছি। আপনার সাহায্য প্রশংসিত হবে। আমি আপনাকে অনুরোধ করছি, সঠিক তথ্য প্রদান করার জন্য। প্রশ্নের উত্তর এর জন্য ৩০ মিনিট লাগবে। আপনি যদি প্রশ্নের উত্তর দিতে না চান তাহলে আপনি প্রত্যাহার করতে পারেন।

আমি এই গবেষণার বিষয়বস্তু সর্ম্পকে অবগত এবং স্বেচ্ছাসেবক হিসেবে অংশগ্রহণ করতেছি।

অংশগ্রহণকারীর নামঃ

অংশগ্রহণ কারীর স্বাক্ষরঃ

তারিখঃ

II: Information Sheet & Consent Form (English)

Title: Measurement of Quality of services in patients with Spinal cord injury at Centre for the Rehabilitation of Paralysed in Dhaka, Bangladesh.

Consent form to Participate in Research

Hello! My name is Rubi Malla. I am a student of Bangladesh Health Professions Institute under Dhaka University, Bangladesh. As per of my curriculum for thesis, I am conducting a research on "Measurement of quality of services in patients with Spinal cord injury at Centre for the Rehabilitation of Paralysed in Dhaka, Bangladesh". It is mainly about finding the quality of services delivered at CRP for SCI patients. So, I am going to ask these questions for this matter. Your help will be appreciated. I would request you to provide true information. It will take 30 minutes to fill the questionnaire. You can withdraw or choose not to answer the question.

I am informed about the topic of research and consent voluntarily to be a participant in this study.

Name of Participant:

Signature of Participant:

Date:

Appendix- C: Questionnaire (Bangla)

প্রশ্নপত্র

প্রথমভাগঃ ব্যক্তিগত তথ্য

কোড নং

১.১. নাম	
১.২. রোগীর নিবন্ধন নম্বর	
১.৩. বর্তমান ঠিকানা	
১.৪. স্থায়ী ঠিকানা	
১.৫. ফোন নাম্বার	

দিত্বীয় ভাগ: জন সামাজিক বৈশিষ্ট্য

(সঠিক উত্তরটি লিখুন বা টিক চিহ্ন দিন)

২.১. বয়স	
২.২. লিঙ্গ	☐ মহিলা ☐ পুরুষ
২.৩. বৈবাহিক অবস্থা	☐ বিবাহিত ☐ অবিবাহিত ☐ তালাকপ্রাপ্ত ☐ বিধবা
২.৪. ধর্ম	☐ ইসলাম

	☐ হিন্দু ☐ অন্যান্য
২.৫. পেশা	☐ কৃষক ☐ দিনমজুর ☐ চাকুরিজীবি ☐ ছাত্র ☐ অন্যান্য
২.৬. বসবাসের স্থান	☐ গ্রাম ☐ শহর ☐ মফস্বল শহর
২.৭. শিক্ষাগত যোগ্যতা	☐ নিরক্ষর ☐ প্রাথমিক ☐ মাধ্যমিক ☐ উচ্চ মাধ্যমিক ☐ স্নাতক ☐ স্নাতকত্তর এবং তার উপরে

তৃতীয় ভাগ: জরিপ সংক্রান্ত প্রশ্নাবলী

(সঠিক উত্তরটির জন্য টিক চিহ্ন দিন)

কোড:

5 পয়েন্ট স্বল্প স্কেল রেটিং সিস্টেম:

৫= দৃঢ়ভাবে সম্মত
৪= সম্মত
৩= অনিশ্চিয়ত/উত্তরজানা নেই
২= অসম্মত
১= দৃঢ়ভাবে অসম্মত

৩.১ প্রত্যাশাগত স্কেল

ক্রমিক নং	প্রশ্নঃ	দৃঢ়ভাবে অসম্মত (১)	অসম্মত (২)	অনিশ্চিয়ত/ উত্তর জানা নেই (৩)	সম্মত (৪)	দৃঢ়ভাবে সম্মত (৫)
৩.১.১.	**অবকাঠামোগতঃ-** সিআরপির কাছে আধুনিক যন্ত্রপাতি থাকা উচিৎ					
৩.১.২.	সিআরপির থেরাপিউটিক যন্ত্রগুলি দৃশ্যত আকর্ষণীয় হওয়া উচিৎ					
৩.১.৩.	সিআরপির পরিবেশএবং কর্মীদের পরিস্কার পরিচ্ছন্ন থাকা উচিৎ					
৩.১.৪.	সিআরপিতে সব প্রয়োজনীয়ঔষধ সহজলভ্য হওয়া উচিৎ					
৩.১.৫.	সিআরপির খাবার সাস্থ্যসম্মত হওয়া উচিৎ					
৩.১.৬.	**নির্ভরযোগ্যতাঃ** সিআরপির উচিৎ প্রদত্ত সময় অনুযায়ী যথাযথ সেবা প্রদান করা					
৩.১.৭.	সিআরপির অবশ্যই নির্ভূল তথ্য সংরক্ষনের উপর জোর দেওয়া উচিৎ					
৩.১.৮.	রোগীর সমস্যা সমাধানে হাসপাতালের কর্মচারিদের আন্তরিকতা দেখানো উচিৎ					
৩.১.৯.	সেবারমুল্য নেওয়ার ক্ষেত্রে সিআরপিকে অবশ্যই সঠিক এবং যুক্তিসঙ্গত হওয়া প্রয়োজন					
৩.১.১০.	রোগীর যথাযথ পর্যবেক্ষনের জন্য ডাক্তারের পর্যাপ্ত সময় নেওয়া উচিৎ					
	দায়িত্বশীলতা সিআরপির স্বাস্থ্য কর্মীদের উচিৎ রোগীর সমস্যা এবং চিকিৎস্যার ব্যাপারে রোগীকে					

৩.১.১১.	যথাযথ ধারনা দেওয়া					
৩.১.১২.	সিআরপির স্বাস্থ্যসেবা প্রদানকারীর কাছে রোগী দ্রুত সেবা প্রত্যাশা করতে পারবে					
৩.১.১৩.	সিআরপির স্বাস্থ্যসেবা প্রদানকারীদের উচিৎ সবসময় রোগীর সাহায্য করার মানসিকতা পোষণ করা।					
৩.১.১৪.	**প্রতিশ্রুতিঃ** সিআরপির সাস্থ্যসেবা প্রদানকারীদের এমন হওয়া উচিৎ যাতে রোগীরা তাদের সাথে যোগাযোগ করতে নিরাপদ ও স্বাচ্ছন্দ বোধ করে					
৩.১.১৫.	সিআরপির সাস্থ্যসেবা প্রদানকারীদের জ্ঞানী ও নমনীয় হওয়া উচিৎ					
৩.১.১৬.	সিআরপির সাস্থ্যসেবা প্রদানকারীদের নম্র ও সম্মানশীল হওয়া উচিৎ					
৩.১.১৮.	**সহমর্মিতাঃ** সাস্থ্যসেবা প্রদানকারীদের উচিৎ গুরুতর সমস্যযুক্ত রোগীদের প্রতি বিশেষ মনোযোগ দেওয়া।					
৩.১.১৯.	সিআরপি কর্তৃপক্ষের উচিৎ রোগীদের বিশেষ প্রয়োজনগুলো বুঝতে পারা।					
৩.১.২০.	সিআরপির উচিৎ সব রোগীর সুবিধামত সময়ে সেবা প্রদান করা					

৩.২ ধারণাগত স্কেলঃ

ক্রমিকনং	**প্রশ্নঃ**	**দৃঢ়ভাবে অসম্মত (১)**	**অসম্মত (২)**	**অনিশ্চিয়ত/ উত্তর জানা নেই (৩)**	**সম্মত (৪)**	**দৃঢ়ভাবে সম্মত (৫)**
৩.২.১.	**অবকাঠামোগতঃ-** সিআরপির কাছে আধুনিক যন্ত্রপাতি আছে					

৩.২.২.	সিআরপির থেরাপিউটিক যন্ত্রগুলি দৃশ্যত আকর্ষণীয়					
৩.২.৩.	সিআরপির পরিবেশএবং কর্মীদের পরিস্কার পরিচ্ছন্ন থাকে					
৩.২.৪.	সিআরপিতে সব প্রয়োজনীয়ঔষধ সহজলভ্য					
৩.২.৫.	সিআরপির খাবার সাস্থ্যসম্মত					
৩.২.৬.	**নির্ভরযোগ্যতাঃ** সিআরপির প্রদত্ত সময় অনুযায়ী যথাযথ সেবা প্রদান করে					
৩.২.৭.	সিআরপির অবশ্যই নির্ভূল তথ্য সংরক্ষনের উপর জোর দেয়					
৩.২.৮.	রোগীর সমস্যা সমাধানে হাসপাতালের কর্মচারিরা আন্তরিক					
৩.২.৯.	সেবারমুল্য নেওয়ার ক্ষেত্রে সিআরপি অবশ্যই সঠিক এবং যুক্তিসঙ্গত					
৩.২.১০.	রোগীর যথাযথ পর্যবেক্ষনের জন্য ডাক্তারের পর্যাপ্ত সময় নেয়					
৩.২.১১.	**দায়িত্বশীলতা** সিআরপির স্বাস্থ্য কর্মীরা রোগীর সমস্যা এবং চিকিৎস্যার ব্যাপারে রোগীকে যথাযথ ধারনা দেয়					
৩.২.১২.	সিআরপির স্বাস্থ্যসেবা প্রদানকারীর কাছে থেকে রোগী দ্রুত সেবা পায়					
৩.২.১৩.	সিআরপির স্বাস্থ্যসেবা প্রদানকারীরা সবসময় রোগীর সাহায্য করার মানসিকতা পোষণ করে।					
৩.২.১৪.	**প্রতিশ্রুতিঃ** সিআরপির সাস্থ্যসেবা প্রদানকারীদের সাথে যোগাযোগ করতে রোগীরা নিরাপদ ও স্বাচ্ছন্দ বোধ করে					
৩.২.১৫.	সিআরপির সাস্থ্যসেবা প্রদানকারীরা জ্ঞানী ও নমনীয়					
৩.২.১৬.	সিআরপির সাস্থ্যসেবা প্রদানকারীরা নম্র ও রোগীর প্রতি সম্মানশীল					
৩.২.১৮.	**সহমর্মিতাঃ** সাস্থ্যসেবা প্রদানকারীরা গুরুতর সমস্যযুক্ত রোগীদের প্রতি বিশেষ মনোযোগ দেয়।					

৩.২.১৯.	সিআরপি কর্তৃপক্ষ রোগীদের বিশেষ প্রয়োজনগুলো বুঝতে পারে।					
৩.২.২০.	সিআরপির সব রোগীর সুবিধামত সময়ে সেবা প্রদান করে।					

Appendix- C: Questionnaire (English)

PART ONE: PERSONAL DETAILS **Code No.:**

1.1. Name	
1.2. Participant ID No.	
1.3. Current address	
1.4. Permanent address	
1.5. Contact No.	

PART TWO: SOCIO-DEMOGRAPHIC FACTORS

(Please write or put tick marks for the appropriate answer)

2.1. Age (in years)	
2.2. Sex	□ Male □ Female
2.3. Marital status	□ Married □ Single □ Divorced □ Widowed
2.4. Religion	□ Islam □ Hindu □ Others
2.5. Occupation	□ Farmer □ Day labor □ Service holder

	□ Student □ Others
2.6. Area of residence	□ Rural □ Urban □ Semi/sub-urban
2.7. Educational status	□ Illiterate □ Primary School □ Secondary School □ HSC □ Graduate □ Post-graduate & above
2.8. Monthly income (taka)	
2.9. Length of stay in CRP	
2.10. Type of injury	
2.11. Level of injury	

PART III: SERVQUAL QUESTIONNAIRE

(Please put tick marks for the appropriate answer)

Code:

5 Point likert scale rating system:
5= Strongly agree
4= Agree
3= Uncertain
2= Disagree
1= Strongly disagree

3.1 Expectation Scale

S. No.	Questions	Strongly disagree (1)	Disagree (2)	Uncertain (3)	Agree (4)	Strongly agree (5)
	Tangibles					
3.1.1.	CRP should have up-to-date equipments.					

3.1.2.	CRP physical equipments should be visually appealing.					
3.1.3.	CRP employees and area should appear neat.					
3.1.4.	CRP should have all the necessary medicines easily available.					
3.1.5.	Meal should be hygienic.					
3.1.6.	**Reliability** CRP should provide their services at the time they promised to do so.					
3.1.7.	CRP must insist on error free records.					
3.1.8.	When patient have problems, hospital employees should show a sincere interest in solving it.					
3.1.9.	CRP should be accurate and reasonable in their billing.					
3.1.10.	The doctor should take enough time to examine patients.					
3.1.11.	**Responsiveness** CRP employees should provide clear explanation on the treatment and health condition to the patient.					
3.1.12.	Patients should expect prompt service from CRP employees.					
3.1.13.	CRP employees should always be willing to help patients.					

3.1.14.	**Assurance** Patients should be able to feel safe and comfortable in their interactions with CRP employees.					
3.1.15.	CRP employees should be knowledgeable and flexible.					
3.1.16.	CRP employees should be polite and respectful.					
3.1.17.	**Empathy** CRP employees should provide personal attention to patients especially with major complications.					
3.1.18.	The personals of CRP should understand the specific needs of their patients.					
3.1.19.	CRP must have operating hours convenient to all their patients.					

3.2 Perception Scale

S. No.	Questions	Strongly disagree (1)	Disagree (2)	Uncertain (3)	Agree (4)	Strongly agree (5)
3.2.1.	**Tangibles** CRP has up-do-date equipment.					
3.2.2.	CRP physical facilities are visually appealing.					

3.2.3.	CRP employees appear neat.					
3.2.4.	CRP has all the necessary medicines easily available.					
3.2.5.	Meal appears to be hygienic.					
3.2.6.	**Reliability** CRP provides its services at the time it promises to do so.					
3.2.7.	CRP insists on error free records.					
3.2.8.	When patients have problems, CRP employees should show a sincere interest in solving it.					
3.2.9.	CRP is accurate and reasonable in its billing.					
3.2.10.	The doctor gives enough time to examine patients.					
3.2.11.	**Responsiveness** CRP employees provide clear explanation on treatment and health condition to the patients.					
3.2.12.	Patients receive prompt service from CRP employees.					
3.2.13.	CRP employees are always willing to help patients.					
3.2.14.	**Assurance** Patients feel safe and comfortable in their interactions with CRP employees.					
3.2.15.	CRP employees are knowledgeable and flexible.					

3.2.16.	CRP employees are polite and respectful.					
3.2.17.	**Empathy** CRP employees provide personal attention to patients especially with major complications.					
3.2.18.	The personals of CRP understand the specific needs of their patients.					
3.2.19.	CRP has operating hours convenient to all their patients.					

Appendix- D: Approval of thesis proposal

BANGLADESH HEALTH PROFESSIONS INSTITUTE

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

Ref. CRP-BHPI/IRB/08/18/1221 Date: 27/08/2018

To,
Rubi Malla
M.Sc. in Rehabilitation Science (MRS)
Session: 2017-2018, Student ID 181170092
BHPI, CRP-Savar, Dhaka-1343, Bangladesh

Subject: Approval of thesis proposal "Measurement of quality of services in patients with Spinal cord injury at Centre for the Rehabilitation of Paralysed in Dhaka, Bangladesh" by ethics committee.

Dear Rubi Malla,

Congratulations,

The Institutional Review Board (IRB) of BHPI has reviewed and discussed your application to conduct the above mentioned thesis, with yourself, as the Principal Investigator" The Following documents have been reviewed and approved:

S.N.	Name of Documents
1.	Thesis Proposal
2.	Questionnaire (English and / or Bangla version)
3.	Information sheet & consent form.

Since the study involves use of a SERVQUAL questionnaire to measure the SCI patient's expectation and perception on services delivered at CRP in Bangladesh that may take 20 to 25 minutes to fill in the questionnaire. Since, there is no likelihood of any harm to the participants, the members of the Ethics committee have approved the study to be conducted in the presented form at the meeting held at 10.00 AM on 22/04/2018 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

Appendix-E: Permission Letter for Data Collection

Date: 30/08/2018

To,

The Head of Physiotherapy Department
Centre for the Rehabilitation on Paralysed (CRP)
Savar, Dhaka-1343, Bangladesh

Subject: Application for permission to collect data in Spinal Cord Injury Unit

Dear Sir,

After per my thesis study, titled, "**Measurement of quality of services in patients with Spinal cord injury at Centre for the Rehabilitation on Paralysed in Dhaka, Bangladesh**", under the honorable supervisor, **Mohammad Anwar Hossain**, Associate professor and Head of department of CRP, Dhaka, Bangladesh. The purpose of the study is to determine the quality of services delivered in patients with Spinal cord injury at CRP in Bangladesh.

The study involves use of a **SERVQUAL** questionnaire to measure the SCI patient's expectation and perception on services delivered at CRP in Bangladesh that may take 20 to 25 minutes to fill in the questionnaire. There is no likelihood of any harm to the participants and / or participation in the study may benefit the participants or other stakeholders as service quality gap can be determined to identify patient satisfaction on services delivered and accordingly necessary measures can be taken to provide quality care to the Spinal cord injury patients. Related information will be collected from the patient's guide books. Data collectors will receive informed consent from all participants. Any data collected will be kept confidential.

Sincerely,

Rubi Malla
Part-II MRS 4th Batch
Student of M.Sc. in Rehabilitation Science (MRS)
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Approved
Mohammad Anwar Hossain
Associate Professor & Head
Physiotherapy Dept., CRP
CRP-Chapain, Savar, Dhaka-1343

Recommendation from the Head of Physiotherapy Department:

30/08/18
Mohammad Anwar Hossain
Associate professor and Head of department of CRP, Dhaka, Bangladesh

Allow for data collection at SCI unit.
Hossain 30.8.18