

The Perception of People with Spinal Cord injury on Modified Home Environment

Submitted to

MSC in Rehabilitation Science, BHPI

Submitted by

Salim Rahman

Part –II, M.Sc. in Rehabilitation Science, Roll -08

Session: 2016-17

DU Registration No.: 2282

BHPI, CRP, Savar, Dhaka-1343

Submitted in Partial Fulfillment of the Requirements for the Degree of

M.Sc in Rehabilitation Science

May 2018



Bangladesh Health Professions Institute (BHPI)
Faculty of Medicine
University of Dhaka



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Declaration

- This work has not previously been accepted in substance for any degree and is not concurrently submitted in candidature for any degree.
- This thesis is being submitted in partial fulfillment of the requirements for the degree of MSc in Rehabilitation Science.
- This thesis 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.
- I confirm that if anything identified in my work that I have done plagiarism or any form of cheating that will directly awarded me fail and I am subject to disciplinary actions of authority.
- I confirm that the electronic copy is identical to the bound copy of the Thesis.

Signature:



Name: Salim Rahman

Date: June 06,2018



CERTIFICATE

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

“The Perception of People with Spinal cord injury on Modified Home Environment”

Submitted by **Salim Rahman**, for the partial fulfillment of the requirements for the degree of
M. Sc. in Rehabilitation Science.

Md. Obaidul Haque
Professor and Head
Department of Physiotherapy
Bangladesh Health Professions Institute

Md. Firoz Ahmed Mamin
Associate Professor, Department of, Physiotherapy
BHPI

Dr. Md. Mahmudul Haque, Associate Professor
Department of Community Medicine, NIPSOM
Mohakhali, Dhaka

S.J.M. Ummul Ambia
Lecturer, Rehabilitation Science

Date of approval..6|6|..... 2018

CERTIFICATE

LIST OF ACRONYMS

AOTA- American Occupational Therapy Association

ADLs- Activities of Daily Living

CRP- Centre for the Rehabilitation of the Paralysed

BHPI- Bangladesh Health Professions Institute

HI- Handicap International

CDD- Centre for Disability in Development

NITOR- National Institute Traumatology and Orthopedic Rehabilitation

WHO- World Health Organization

MDT- Multi Disciplinary Team

WC- Wheelchair

OT- Occupational Therapist

PT-Physiotherapy

SCI- Spinal Cord Injury

Acknowledgement

My heartiest appreciation goes out to all the persons who assisted me in completing my research. Firstly I would like to pay my gratitude to the almighty Allah for giving me a passion to go with the research project and to complete it successfully on time. I am much grateful to my parents and family members for their constant support to continue this study.

I want to show my gratitude to my honorable supervisor Professor Md Obaydul Haque **Department** of Physiotherapy, Bangladesh Health Professions Institute (BHPI) who has guided me at every stage of the investigation. His involvement and concern has been a constant source of encouragement, inspiration and support throughout the study.

I am grateful to **Muhammad Millat Hossain**, Assistant Professor, Dept. of Rehabilitation Science and **Miss Shamima Islam Nipa Lecturer** and fellow teachers of Dept. of Rehabilitation Science who encouraged and suggested me at every stage of the MRS study.

I am thankful to **Md. Shamim Mia**, Scientific officer, BMRC for his support, inspiration, and suggestions. I also would like to thank all of the participants of the study for their cooperation.

This dissertation dedicated to my parents, wife and daughter who have given support and encouragement to do complete the study and I also thanks to everyone whose cooperation and support made me capable to complete this study.

ABSTRACT

Introduction: SCI is a life threatening condition which creates so many dysfunctions in an individual's life such as unique personal, family and community challenges in activities of daily living return to previous work and modification of home and vicinity. An accessible home and environmental modification allows for free and safe movement, function and access for SCI

Objectives: The objective of the study was to find out the perception of people with spinal cord injury on modified home environment

Methodology: The study followed the interactive approach of qualitative design for search the Impact of modified home environment. In-depth interview were preceded for participants

Result: In this research, 10 (ten) participants (5 were male and 5 were female) were selected for in-depth interview. The mean age of participants was 35 years and Std. Deviation ± 14 whereas male and female ratio was 1:1 According to selected inclusion and exclusion criteria, 70% samples were recruited from different villages and 30% from urban. On the basis on multiple responses, all participants were modified their living room, toilet, bathroom and kitchen. Specially, 50% removed barriers from in front the kitchen, 60% leveled uneven in-front yard 40% participant had accessible job setting.

Study found that modified home environment allows free mobility individuals with SCI, 80% participants had positive perception on reduce independency, 70% participants got self-independence in functional tasks and had improved social relationship and communication though participant had faced interim economic hardship during way to home modification. Overall more than 70% participants had reported that modified home environment has a vital role to lead a quality and meaningful life.

Conclusion: An accessible home environment initiative to individual with SCI can enhance functional status to community. The integrated plan interventions are more effective to survive with a quality of life. In Bangladesh, both Government and Non-Government Organization are could ahead to take an effective measures for further action in all aspects for SCI rehabilitation to the community.

Key words: Perception, Spinal cord injury, Home environment, Modification

The Spinal cord injury (SCI) is a major burning issue in the concern of health sector. Gradually the burden of SCI is going to increase and the vulnerable impacts are focused on family and social life of an individual (Arifa, 2012) .SCI is a life threatening condition which creates so many dysfunctions in an individual's life. There is a diversity of issues faced by people with SCI is associated with unique personal, family and community challenges in activities of daily living, return to previous work and modification of their home and vicinity. (Ullah et.al 2012) Most of the cases are shows the dependency to social people and accessible environment. Moreover, inaccessible environment makes to create limited movements which disallow to communicate intra and inter environment. Literature shown that the an accessible home and environmental modification allows for free and safe movement, function and access for SCI regardless of age, sex or condition makes access by all, without obstacles, with dignity and with as much autonomy as possible (Trombly,2015).

It has been counted by research that disabled people are among the poorest of the poor in Bangladesh (World Bank 2010). As there are no social security benefits for disabled people, and no financial help to compensate the additional costs of living with impairments as required to home modification, treatment cost and daily living expenses adjustment. (Ullah et.al 2012).

Home modifications are adaption to living environment intended to increase usage, safety, security and independence for the SCI. However, in developing country like Bangladesh individual with SCI are facing difficulties regarding modification where life is also difficult for able bodies, the people with disabilities have experienced a great magnitude of problem (Ullah et.al 2012) .In the recent context, the people with disabilities are needs appropriate modification of home and environment which ensure them to lead a quality of life in the society.

The new WHO report, International perspectives on spinal cord injury, summarizes the best available evidence on the causes, prevention, care and lived experience of people with spinal cord injury. As many as 500 000 people suffer a spinal cord injury each year. People with spinal cord injuries are two to five times more likely to die prematurely, with worse survival rates in low- and middle-income countries

Males are most at risk of spinal cord injury between the ages of 20-29 years and 70 years and older, while females are most at risk between the ages of 15-19 years and 60 years and older. Studies report male to female ratios of at least 2:1 among adults. (SCI Aus).But things are changing as disability activists – have pushed to open up access to all people, including those with spinal cord injury, paralysis or mobility problems. (Changing rooms: the impact of adaptation on the meaning of home for a person with disabled and the role of Occupational Therapy process. 2009).

Up to 90% of spinal cord injury cases are due to traumatic causes such as road traffic crashes, falls and violence. Variations exist across regions. For example, road traffic crashes are the main contributor to spinal cord injury in the African Region (nearly 70% of cases) and the Western Pacific Region (55% of cases) and falls the leading cause in the South-East Asia and Eastern Mediterranean Regions (40% of cases). Non-traumatic spinal cord injury results from conditions such as tumors, spina bifida, and tuberculosis. A third of non-traumatic spinal cord injury is linked to tuberculosis in sub-Saharan Africa (SCI Wikipedia)

The World Health Organization developed the International classification of Functioning disabilities and health recognize the importance of viewing people with disabilities in a more holistic way as where they functional, human being engage in social, vocational and vocational purists . For the person with a disability such as SCI, reintegration involves re-establishing previously existing roles and relationships and developing new ones. Thus, even if the recently rehabilitated individual with SCI returns to a home that has been modified for him or her, or to the same job or career, the utilization of different resources and services and even different “spheres of influence” may create the need for unanticipated adjustments to a seemingly .(WHO,2001)

Justification

SCI is causing limitation of mobility or access. But may be reduced and optimum function can be enriched by using of accessible technologies and adjusted modification of whole home environment. Regarding the home modification, the perception is varied from person to person and society from society. Research proposal to identify client's view on home environment modification is important to ensure better health and accessible home environment. However evidence on client views on impact of modified home environment of the SCI patients are lacking in many developing countries. Only fewer studies are available on this issue. So that there is a still lack of evidenced based data on nature, extent of impact of modified home environment of the SCI patients.

This study will be undertaken to explore the client's on own view, expectation and importance of modified home environment. The rehabilitation professionals are vital to persons with spinal cord injury for their community re-integration and beside this the rehabilitation professions practice in Bangladesh aren't old enough to be self-reliant to help the clients without their sought requirements.

Meanwhile, many of the countries are making a constructive plan and using multi-sectorial workforce to maintain standard organogram for accessible home environment. Evidence shows that the very few community people have tendency to react both positive and negative towards home modification for an individual with SCI. Nonetheless, few factors are contributing to modification for home environment like culture, economy, knowledge, belief, values, and education of caregiver of SCI.

The needs of home modification are almost established in western countries to rehabilitation process where developing countries still not achieved it like Bangladesh. This study will be first its kind in Bangladesh as previous studies aren't available. This study will help us to understand clients view towards modified home environment .To facilitate the functional independence of the wheelchair users in their home rehabilitative expert need to ensure accessible home environment.

Home modification services are provided support to person with functional limitation to live independently at home (Arifa 2013). In our country it is not easy to promote the accessibility for people with SCI where still today we could not make uniform rights for people with disabilities. It assumes that this study will be helpful to identify the importance and impacts of modified home environment for individuals with SCI. An accessible home and environmental modification allows for free and safe movement, function and access for SCI regardless of age, sex or condition makes access by all, without obstacles, with dignity and with as much autonomy as possible (Andrew Jones et.al 2008).

The people's view, opinion, expectation, ideas and perception will help to modify, redesign the modification of home environment to improve accessibility of people with spinal cord injury in their respective community that will also help to grow rehabilitation professions in Bangladesh .The findings of the study will be incorporate to both government and non-government sectors.(Andrew Jones et.al 2008).

Conceptual Frame Work

Research question: What is the perception of people with spinal cord injury on modified home environment?

Objectives:

General objective:

To explore people with spinal cord injury perception on modified home environment.

Specific objectives

- To find out the socio-demographic information
- To find out people with opinion regarding importance of modified home environment
- To find out the reasons of home modification of people with spinal cord injury
- To find out the expectations of people with spinal cord on modified home environment.
- To find out the suggestions of people with spinal cord injury regarding modified home environment

Key variable: Perception, Spinal cord injury, Home environment, Modification

Ethical Consideration

The researcher maintained the ethical consideration in all aspect of the study. This is a crucial part of all forms of research. At first, the researcher took permission of Chairman of IRB, Bangladesh Health Professions Institute (BHPI). Ethical clearance was taken from BHPI according to the ethical committee guidelines before conducting this research. Before collecting data researcher was taken consent from the participants. According to the participant's level of understanding, they were verbally informed in Bangla about the title, aim, purpose and significance of the study. They also received a clear verbal description about the interview. The World Health Organization (WHO) and Bangladesh Medical Research Council guidelines also were followed to conduct data collection and study proceed

The researcher informed that the interview is a part of the study and they not be benefited from the study as participants, but it will be helpful to change or modify the home modifications if necessary. They informed that their personal identity, audio recorder information and all written documents were kept in confidential. The data only used for research publication. Participants were assured that taking part in this research would cause them no harm. It also ensures that the respondents have no risk and no compensation will be paid by researcher. The purpose of the research will be explicitly explained to the respondents and an assurance of confidentiality, anonymity and voluntarism that the participant is free to withdraw from participation at any time. Voice recording and snap shot will be taken from participants based on their permission.

Operational Definitions

Perception

There are suggestions that client's view has a significant effect on important outcomes in healthcare "This component to ability to co-ordinate one own perception with something". The perception denote as a personal opinion about something or way of understanding about something and attitudes towards something. It is an area in which individual frequently express opinion, dissatisfaction with the inadequate provision of information

Treatment outcome is a factor of client's perception and though other factors are also related such as environment ,treatment prices and facilities .When fulfill a client's hope, desire or ambition come together then he/she can show his/her views .

All clients' view is not the same, views can vary from person to person according to their needs and depends on client's age, sex diagnosis and educational background .It is important to know the client's view on given facilities to resume support building, re-set up the treatment/rehabilitation facilities and maintain follow up services which better to client's re-integration in to the communities

Spinal cord Injury

Spinal cord Injury is a disruption in the motor and sensory pathways at the site of lesion. It is refer to injury the regions (cervical, thoracic and lumber) of the spinal cord. A spinal cord injury is typically defined as damage or trauma to spinal cord that is turn results in a less of impair function resulting in reduce mobility or feeling. The Spinal Cord is the major reflex center and nerve pathway between the body and the brain.

The spinal cord seemingly cylindrical in shape and Spinal Cord extends from the lower part of skull (medulla oblongata) to above part of waist (the foramen magnum to the level of Lumber 1 or Lumber 2 vertebrae). The vertebral bodies protect the Spinal Cord anterior side and vertebral arches protect it laterally and posterior. Spinal Cord is a communicating link between the spinal nerves and the brain. So in fact, the spinal cord is the major tube through which motor and sensory information travels between the brain and the body

Home environment

Home is the place where man live for ensuring not only safety but also for comfort. It is a physical structure that ensures physical and psychological wellbeing for every human. It is a dwelling place that family members live together. The home environment is the total surrounding conditions of a home. The home is made for well bodied individual. However, when an individual become W/C bounded, then the home become a place of discomfort. Some elements in the individual's home environment may represent obstacles to independence mobility for paraplegic wheelchair user.

These are doors too narrow, steps too high, slippery floors, inaccessible storage space and unreachable light switches, distance of toilet and entrance inside and outside of toilet for wheelchair propel

Modification

Modification means the changes to the living environment that facilities for independence ease of use and safety in routine activities.

Home Environment Modification

Home modification refers to converting or adapting the living environment to make tasks easier, reduce accidents, and support independent living. Examples include installing ramps, hand-held showers, grab bars, better lighting, roll-in showers, and stair or chair lifts .Home environment modifications mean changes to the living environment that facilitate independence, ease of use and safety in routine activities. Home modifications can include rearranging furniture, building ramps, and widening doorways, grab bars, special toilet seats and other safety equipment to increase performance capabilities to the individual in their home setting.

Alterations made to a home to meet the needs of people with physical limitation, so they can live independently (to some degree) and safely. Home modifications to improve accessibility for physical limitation people

Spinal cord injury occurs when there is any damage to the spinal cord that blocks communication between the brain and the body. After a spinal cord injury, a person's sensory, motor and reflex messages are affected and may not be able to get past the damage in the spinal cord (ABC of Spinal Cord Injury 1996). In general, the higher on the spinal cord the injury occurs, the more dysfunction the person will experience. Injuries are referred to as complete or incomplete, based on whether any movement and sensation occurs at or below the level of injury (Understanding SCI 2018). A spinal cord injury (SCI) is damage to the spinal cord that causes changes in its function, either temporary or permanent. These changes translate into loss of muscle function, sensation, or autonomic function in parts of the body served by the spinal cord below the level of the lesion (Encyclopedia 2018) "Severe injury to the vertebral column can occur from any direction and result in dislocation fracture or dislocation with or without resultant displacement .(Sara et.al 2018) .

As many as 500 000 people suffer a spinal cord injury each year. People with spinal cord injuries are two to five times more likely to die prematurely, with worse survival rates in low- and middle-income countries. The new WHO report, International perspectives on spinal cord injury, summarizes the best available evidence on the causes, prevention, care and lived experience of people with spinal cord injury (WHO 2013)

Males are most at risk of spinal cord injury between the ages of 20-29 years and 70 years and older, while females are most at risk between the ages of 15-19 years and 60 years and older. Studies report male to female ratios of at least 2:1 among adults. (SCIA.).But things are changing as disability activists – have pushed to open up access to all people, including those with spinal cord injury, paralysis or mobility problems. (Changing rooms: the impact of adaptation on the meaning of home for a person with disabilities and the role of Occupational Therapy process 2009).

Up to 90% of spinal cord injury cases are due to traumatic causes such as road traffic crashes, falls and violence. Variations exist across regions. For example, road traffic crashes are the main contributor to spinal cord injury in the African Region (nearly 70% of cases) and the Western Pacific Region (55% of cases) and falls the leading cause in the South-East Asia and Eastern Mediterranean Regions (40% of cases). Non-traumatic spinal cord injury results from conditions such as tumors, spina bifida, and tuberculosis. A third of non-traumatic spinal cord injury is linked to tuberculosis in sub-Saharan Africa (Wikipedia) .The World Health Organization developed the International classification of Functioning disabilities and health recognize the importance of viewing people with disabilities in a more holistic way as where they functional, human being engage in social, vocational and avocational pursuits . For the person with a disability such as SCI, reintegration involves re-establishing previously existing roles and relationships and developing new ones. Thus, even if the recently rehabilitated individual with SCI returns to a home that has been modified for him or her, or to the same job or career, the utilization of different resources and services and even different “spheres of influence” may create the need for unanticipated adjustments to a seemingly .(WHO 2013)

Worldwide, the incidence (number of new cases) since 1995 of SCI ranges from 10.4 to 83 people per million per year. This wide range of numbers is probably partly due to differences among regions in whether and how injuries are reported. The estimated prevalence (number of people living with SCI) in the world ranges from 236 to 4187 per million. Little information is available from Asia, and even less from Africa and South America. In Western Europe the estimated prevalence is 300 per million people and in North America it is 853 per million. (Witiw & Fehlings 2015). Males account for four out of five traumatic spinal cord injuries. Most of these injuries occur in men under 30 years of age. (Office of Communications and Public Liaison) .The studies shows, it has been found that the incidence and prevalence of traumatic SCI in United States of America (USA) is more than any other countries in the world .Rates of injury are at their lowest in children, at their highest in the late teens to early twenties, then get progressively lower in older age groups; however rates may rise in the elderly (De Vivo 2012)

In Bangladesh, maximum people are illiterate and poor and even don't know about care of spinal cord and most of them are leading their livelihood and earning money through they get involve themselves in different types of risky jobs like carrying heavy loads on the head, construction of a building, travelling on a very crowded public transportation which leads to occur high percentage of fall from height, fall weight heavy loads on head, traffic accident and other unexpected accident (Rahman 2004).

There are two common types of spinal cord injury are complete, according to ASIA scale 1994 “The term refers to loss of sensory and motor function in the thoracic, lumbar or sacral (but not cervical) segment of the spinal cord, secondary damage of neural elements within the spinal canal with paraplegia aim functioning spared, but depending of the level of injury, the trunk, the leg and pelvic organ may be involved

The term incomplete refers to if partial presentation to sensory and/or motor function is found below the neurological and the lowest sacral segment; the injury is defined as incomplete. Sacral sensation includes sensation at the anal musculocutaneous junction as well as deep anal sensation .The test of motor function is the presence of voluntary contraction of the external and sphincter upon digital examination” (Christensen 2014)

Spinal Cord Injury (SCI) is a common problem of health sector all over the world but the incidence varies from country to country (Arifa 2013). Spinal cord injury (SCI) has profound and long-lasting consequences occurs without warning and results in a dramatic reorganization of every aspect of an individual’s life, forcing them to adapt to a completely new lifestyle (Donnelly, Eng & Hall 2004). .Individuals who have incurred a spinal cord injury (SCI) face tremendous challenges in adapting not only to the physical aspect of the injury, but to the changes it may bring with regard to living situation, lifestyle, relationships, and adjustment. (Susan Charlifue 2014).These challenges first appear during rehabilitation, but are also encountered upon discharge back to the community. The rehabilitation challenges clearly involve not only adapting to an altered physical life, learning how to do often the most basic skills such as feeding or dressing oneself, but also coming to terms emotionally and psychologically with (Susan Charlifue 2014).

The client do identify the need for home environment intervention they may not know who can make modification, where to go to get service, and who to pay for them (Bayer, 2000). Individuals with SCI often face many barriers to community integration and activity participation including issues of accessibility, pain, lack of information, and psychological barriers (Law, Stewart & Strong 1995). Accessible home modification is crucial both to enable the implement of community care and to assist in giving people with SCI equal rights to independent living (Changing rooms: the impact of adaptation on the meaning of home for a person with disabled and the role of Occupational Therapy process 2009).

The first time many individuals with disabilities confront accessibility issues occurs when they move from institute to the community. The Government of Bangladesh and several non-government organizations (NGOs) are working to promote disabilities including spinal cord injury patients (SCI) as well but there is no special centre for the special cord injury in government health system. The Centre for the Rehabilitation of the Paralyzed (CRP) is only non –government facility which treats and rehabilitate patient with spinal cord injury (SCI) regardless of the patients socioeconomic status. The long term goal of spinal cord injury rehabilitation in CRP is to achieve community re-integration with maximum level of functional independence (Mohammad & Arifa 2012). The literature also indicates that rearranging or modification of home environment is high need for individual with SCI post rehabilitation (Home modification and repair, 2010). Most people with SCI are mostly dependent on some assistive device, so home environment and environmental accessibility plays a great role to influence their independence in the physical environment of their community (Mohammad & Arifa 2012)

World Health Organization is expressing the importance of environmental factors through International Classification of Functioning, Disability and Health (ICF) model. In anywhere if a physical structure contains stairs, narrow pathways, inaccessible doors and bathrooms the environment makes the people with limited mobility, elderly people as disabled (Heywood 2004). So disability is not just physical, mental, emotional, intellectual but also environmental. Fixing environment can make people with disabilities more functional. This treatment approach is introduced as environmental modification approach.

Now a day's environmental modification approach is not limited merely for the people with disabilities but also people with older age to compensate limited mobility and accident prevention .Environment means the surrounding context of someone. It has both positive and negative effect on occupation. Environment can be classified as individual, household, neighborhood, community and province or country. In other way environment is classified as cultural, economic, physical and social environment. Unsuitable environment can affect negatively on the person's functional performance. The effect of the environment on occupation cannot be understood all the time. Additionally it is a new dimension of viewing disability. (SCI Australia 2016)

Home modification is the changes made to adapt the environmental set up to accommodate the physical limitation to enhance function. Environmental modification can range from replacing doorknob to a project of constructing ramp to increase wheelchair accessibility (Söderback 2009). This is part of client centered practice as the therapist works with the client's goal, under the guidance and direction of the client.

Engagement in meaningful occupation is the right of people with disabilities and this is why occupational therapists work to learn from the experience of people with disabilities to use the knowledge in the needs of similar cases. This approach gives the extra dignity to the thought of the experienced client groups. Occupational therapy intervention respects the background, experience, values and cultural, social, physical and economic environment of clients (Law et.1991).

Two major concepts are recently being used in the field of home modification: Universal or barrier free design and architectural accessibility. Universal design means creating an environment, a product or a service for everyone beyond the limit of any limitation, age or disability. Architectural accessibility is restructuring or reconstructing an architectural building that ensures the access of all kind of people with disabilities. Another new concept is on rise is visit ability that is making all home structures with the concept of accessibility so that any kind of people with disability can visit anyone's home. Visit ability might cover at least one entrance without steps, a toilet in the ground floor so that people with any kind of physical limitation can visit and fulfill the goal of community involvement and social life (McCullough 2006).

The accessibility in home or home modification makes the person with SCI better functioning in their performance areas. The concept of home environment modification indicates a barrier free environment for people with SCI. A barrier free environment for SCI person can be constructed by general modification of the physical environment according to the patient's need. (Trombly 2015).As the patients have to reintegrate into their community, they need an accessible environment to cope with it (Whiteneck 2004).

Society places a significant amount of value on people who are independent and contribute to the greater population. The literature has shown that community or social attitudes play an important role in determining the reintegration (modification) of people with disabilities (Pedretti 2013).

The culture of rehabilitation facilities is focused on client performance and good attainment. The client's own culture may be compromised in the process of rehabilitation unless the team is sensitive to and incorporates clients' perspective into the intervention plan (Bonder 2002). Studies have shown that life satisfaction is more related to the level of SCI injuries but to social integration, access to environment and occupation (Richard 1999). To ensure the empowerment and inclusion of disabled individuals in the development of their own communities and status, strategies for change must be devised to give disabled people control and choice in their lives and also oversee the problem and service that directly affect them. (Hurst 1999). Accidents and frequent anticipation of being in an accident is a very common problem for people with spinal cord injury who experience it without any home modification. They also get anxiety due to the fear. Sometimes they miss their activities of daily living (ADL) due to the anxiety which results in decreased self-esteem. The literature also suggested there is a chance to reduce balance and increase the chance of falling for people with disabilities (Heywood 2004).

People with disability feel frustrated due to less access in every place of home and this leads them to feel bored and meaningless at home. They get depression due to dependence, humiliation, isolation, loss of control, loss of meaning of home. They get depressed mostly when people humiliate them as they cannot use the toilet independently and experience a lack of privacy during bathing and toileting. (Heywood 2004)

Caregivers and other family members of people with disabilities also experience some negative health effects due to lack of adaptations or less effective adaptation. They get problem due to carrying people with disabilities as well as overstress. Sometimes they get accident like falling during carrying the people with disabilities. Caregivers also get mental stress due to faulty modification (Heywood 2004). Lidal and colleagues reported that the most common barriers to integrating people with a SCI were inaccessibility of transportation, health and physical limitations, lack of education, work experience, education or training, physical or architectural barriers, discrimination by employers, and loss of benefits. Therefore, individuals with SCI discontinue the accessible environment to around. (Lidal et al, 2007). Home modification also ensures social participation.

According to WHO, 2013 SCI has costly consequences, both for individuals and society. People are left dependent, are excluded from school, and are less likely to be employed. Worst of all, they risk premature death. SCI is both a public health and human rights challenge. With the right policy responses, it is possible to live, thrive and contribute with SCI anywhere in the world. People with SCI are people with disabilities, and they are entitled to the same human rights and respect as all other people with disabilities. Once a person with SCI has had their immediate health needs met, social and environmental barriers are the main obstacles to successful functioning and inclusion in society. It is essential to ensure that health services, education, transport and employment are available and accessible to people with SCI, alongside other people with disabilities. SCI will always be life-changing, but it need not be a tragedy and it needs not a burden.

SCI has a debilitating psychological impact. 20–30% of people with SCI show clinically significant symptoms of depression, which is substantially higher than the general population although the majority of people eventually adapt well to SCI. People with SCI have a narrower margin of health, due partly to preventable complications such as urinary tract infections and pressure sores. SCI is associated with family breakdown, but also family resilience. Immediately after injury, SCI can have a negative impact on personal relationships and is associated with a higher rate of divorce. However, post-SCI relationships generally do better. Care givers of children and young people with spina bifida or traumatic SCI typically experience isolation and stress. (WHO 2013)

Low participation in school of children and young people with spina bifida or acquired SCI are less likely to attend school and less likely to participate in tertiary education. They face obstacles in the transition between school and tertiary education, and between education and employment. SCI are associated with lower rates of economic participation. Average global employment rates for people with SCI are only 37%, with a high of 51% in Europe. The costs of SCI are higher than for comparable conditions such as dementia, multiple sclerosis, cerebral palsy and bipolar disorder. (WHO 2013)

Most of the patients with SCI need a wheelchair or assistive device, whose mobility may be restricted. Many will depend on it to return home. There is no national register of wheelchair users in Bangladesh. The paraplegic wheelchair user faces difficulties to move freely in their home due to their inaccessible home environment. (Spinal cord injury: Quadriplegic and paraplegic injuries 2000-2008).

Home environment is the total physical structure of home which one lives. After discharge from hospital a SCI patient live in their own community. But for inaccessibility of home and community they face great difficulties to do free accessibility. Accessibility problems that existing in home environment presents for physical limitation person (Access for All 2010).As a result of physical limitation individuals are presented with obstacles which cause secondary complications and inconvenience. These also may restrict them to perform their activities of daily living such as cooking meals, bathing, toileting, doing other house hold works. Home environment modifications that are necessary to overcome those obstacles or barriers that substantially limit a consumer's (physical limitation people or paraplegic wheelchair user) ability to function independently in the home (Home modification and adaptive devices program (Access for All 2010).

Soon after spinal cord injury some changes need to be made at home to make it more accessible for bathing, toileting, transfers and movement into and out of the house using a wheelchair or walker. Basically it needs for paraplegic patient, who use wheelchair. Most people do make some modifications to their home. Home environment modification can prevent accidents for physical limitation person and make easier to carry out tasks such as cooking and cleaning, engage in major life activities. It also minimize the need for costly of personal care services (Weeks, Lamb & Pickens 2010).

However, some people relocate to a residence better suited to their needs. While each person with a spinal cord injury is unique, there are several basic rules and measurements standard for wheelchair users. Home environment modification and repair can accommodate lifestyle changes and increase comfort. It also ensures patient independence and prevents accidents (Essley 2010).

Home environment modification provides solutions to the everyday challenges, which's living with disabilities. Making the home more accessible helps to relieve the stresses associated with lifestyle changes and increases in physical capabilities for physical disable people (National home modification 2009).

Modified home environment can ensure appropriate accessibility in the home and community and help to individual with SCI to move easily and safely in their home environment. In fact appropriate modification of home environment is very difficult for physical disable people in Bangladesh as there is still lacks of required initiatives and services (Rashiduzzaman 2010). So therefore some of barriers would be raised during modifications and the consumers have also faces some challenges by their family and society people to modify their home environment. These are includes lack of information of importance of modification towards to SCI ,about procedure of modification, limited funding, inadequate services and less availability of enough space in home environment for modification. These issues are very interrelated (Arifa 2012). Limited information contributes to a lack of consumer demand, inexperienced of providers and remodelers, ill-suited modifications, small and scattered resources and less known about the modification for home modifications. The required resources for home modifications are hard to locate for consumers in their own community.

It has been counted by research that disabled people are among the poorest of the poor in Bangladesh (World Bank 2011). So extra expenses for home modification to provide assistance to SCI is burden in a low-income household, which have a disproportionately high level of need for modifications.

In most communities, coordination of home modification services is limited or nonexistent even among professionals who are aware of the need for assistance health care, rehabilitation, housing, and social service professionals (Home modification Resources 2018). There is no effective service delivery system to connect those who need home modifications with experienced remodeling. So most of the individuals with SCI are often frustrated by the process of obtaining and making home modifications and discouraged by the results

The maximization of utilization for modified home environment is to fit the environment for the person's improved function through environmental modification rather than changing the person (Access for All 2010). This study will focus to see the result of home modification for SCI. The findings of this study would encourage family members of persons with disabilities and SCI to do equity home modification for their beloved. Beside this, the professionals whom are paving rehabilitation issues for the SCI patients and intended for future modification may also encourage to motivate persons with SCI to do the home modification where is necessity of SCI as well the professional may have new opportunity to work on it as large scale . Inclusion' for an individual is the opportunity for them to fully participate in the social and economic life of their community as valued and respected members. (Commission Rights Australia 2014).

It may be open a new window for the different disable people organization (DPOs) and NGOs to lunches the scheme of installation of accessible facilities for home modification for the persons with physical disabilities. This study would help to other researchers in this issue of home modification as there is a study yet to conduct on this topic in Bangladesh.

The issue of social inclusion for the persons with disabilities in an important dimension of comprehensive rehabilitation and the inclusion process begins with home modification in a sense, where our society people may forward, thus persons with disabilities and SCI may feel empowered and social being with proper health and well-being as home modification also ensure social participation (Simplican, et al 2016) In fact it can be said that home modification increases roaming at the SCI patients home. If a home is modify by following the principles of universal design people with any assistive device can enter and use any facility of the home. The policy planners may stats to think about necessity of require home modification for SCI to promote accessible issue for then thus the person with SCI will be independent in his her daily living activities . If a home is modified by maintaining the principles of universal design people with any device can enter and use any facility of the home. In fact it can be said that home modification increased visit ability at the participant's home (Rasiduzzaman 2010)

Study Design

The qualitative study design was selected because qualitative method helps to explore the experience of participant. Qualitative design was used as research design which is descriptive, exploratory and contextual to determine the experience of perception of modified home environment for the people with spinal cord injury as Qualitative research is a exploratory in nature by which can gain insight into another person's view, opinions, feelings, and beliefs within their own natural setting (Hicks 1999)

As of aim this study is to find out the people with spinal cord injury perception on modified home environment. So this methodology was chosen to meet the study aim as an effective way to collect data .In this study researcher found this approach appropriate because each of the participants had own point of view on their experience as a service receiver, they expressed a detailed view on that particular event and they also had their own thoughts, attitudes and motivation regarding the rehabilitation process particularly home modification. On the other hand, this study was conducted on the natural setting of the participants where they live. This approach of qualitative method helped to show the participants actual response of their practical experiences which lastly formed the theme of the study by the interpretation and judgment of the collected data.

Data collect place

The data were collected from community areas throughout the country. The data were collected in the home of the participants as qualitative research is meant to be conducted in their natural setting (**Creswell, as cited in Ohman 2005: 274**). The researcher also did practical observation for own home environment of the participation. The general observations helped to state the perceptions that the participants from both the rural and semi-rural area of the country. Most of part study was carried out in Bangladesh Health Professions Institute (BHPI), CRP, Savar

They were using their modified home areas and some were planning to reconstruct that to make it better accessible. Moreover, interview in participant's community helped them to cooperate with the researcher comfortably. The necessary data cannot be obtained if the participant won't provide the exact information of what and how they feel about their modified home environment .The study is carried out in 10 community areas of Bangladesh such as Ashulia , Lakshipur, Savar ,Magura Sadar Gazipur Sadar etc

Participant selection criteria

Inclusion criteria:

- ✓ Spinal cord injury patient with home modification
- ✓ Both male and female were included.
- ✓ Living in the community and urban

Exclusion criteria:

- ✓ Spinal cord injury patients without modification
- ✓ The participants has a psychological and communication difficulties

Sampling Technique

Participants were selected by using purposive sampling from the define population who meet the inclusion criteria. Purposive sampling technique is a type of non-probability sampling where the researcher consciously selects particular elements or subjects for addition in a study so as to make sure that the elements will have certain characteristics pertinent to the study (Ask). It normally targets a particular group of people. Purposive sampling is based on some inclusion criteria (Depoy and Gitlin 1998).

Sample size

The seventeen percent of grounded theory studies sample size is used between 10-19 (Qualitative Research: Grounded Theory - Sample Size and Validity 2004). The investigator selected this small number of participant and investigated their perspectives deeply. Usually the qualitative method supports small number of participants. “One is minimizing variations only a small number of individual will be necessary to include in the study” (Depoy and Gitlin 1998). They also stated that a small number of participants provided a representative picture of the phenomenon or focus of the study. Total 10 participants were recruited for this study.

Once similar data were repeated from the participants then the researcher had stopped taking similar from the participants so reportedly the data saturation was happened. So due to have data saturation the researcher finally concluded with 10 participants. Saturation is frequently reported in qualitative research and may be the gold standard. However, the use of saturation within methods has varied (Walker 2012).The participant information was picked up from Spinal Cord Injury Development Association Bangladesh (SCIDAB). Following individual having phone calls and informed consent the participant interview was conducted.

Data collection methods & tools

In-depth interviews were undertaken by using questionnaire as well as check list to find out the perception of modified home environment of people with spinal cord injury. Every interview was undertaken by the researcher (Salim Rahman). The majority of interviews were occurred in the participants' homes (some occasion needed in respective workplace) and each interview scheduled was at least for approximately 15-20 minutes.

The interviews were guided for the issues from researcher own knowledge and experience of spent times and working with people who have SCI, and from also the issues that rose in both academic and autobiographical literatures. The questions were open-ended and didn't ask in a rigid order. In-depth interview was conducted among the people with SCI by using questionnaire as well as check list. A pre-test of questionnaire had been used before conducting original interview. Every participant were informed and explained about the study purpose and its benefits and written consent was taken with undersigned by the participants. All data also recorded by audio recorder of smartphone (Galaxy A 7 2016) In-depth interviews were conducted among the Spinal cord injury patients by using questionnaire as well as check list.

The pre testing questionnaire had used before conducting the interview. Every participant being informed about the study purpose and its benefits and written consent also served to participants and took under signed by participants. All data were recorded by audio tape recorder.

Data Analysis

Initially raw data had screened by researcher with cross-checked for measuring the validity of data. The collected information was continued analyzed, edited, summarized and sorted. Finally, content analysis and thematic discussion were used to present the data

After transcribing of the entire interview, these were organized according to interview question. The entire transcripts were read several times to get inside the data, to find out what the participants actually wanted to say, and to discover recurring themes which stand out .Once the data was completely familiar then the data analysis was commenced. The interview was in-depth and all the participants were asked the same question throughout the course.

The interview was in-depth a number of same questions were asked to all participants. A question analysis was used to which is similar to content analysis. As service users the participants may have given some ideas which they think they should give to services providers. But the individual interviews was read thoroughly and checked several times to identify the main themes. The same themes were cut off from the interviews corresponding to a particular question and from these themes a code list was developed. All codes were giving clear meaning so every time a participant said something that was reflected in same theme, it was coded according to the definition and the procedure was same for the entire question. The second step of analysis was done using content analysis which is analysis by the topic and each interview is segmented to those topics in to categories. During this analysis the interview were read several times to identify important topic and categories.

The categories were quality functions were performing by SCI patients due to proper home modification, the positive impact regarding social relationship and functional capabilities were developed after home modification disadvantage of home modifications were overcoming by family member and relatives due to good advantages ,home modification was played vital role for SCI patients to incorporating in social rehabilitation and most common home modifications to get maximize functional independence

All the codes are listed before were placed into these categories and according to these definitions. Then the result filtered from these categories written in to a separated page. Then to group data all codes were put into tables. The tables was formatted with all participant in raw and codes in a column. Then the participant's comment were placed each column categories. This helps to present a clear view of themes. Then the codes were tabulated. The benefits of this tabulation were that these allowed the researcher to saw the range of the themes quickly and easily

The result and discussion of this study were carried out at the same time and presented together. Literature also supported in this regard. The result and discussion are presented in this section because this common practice in reporting on qualitative studies (Stephenson and Willies, 2000)

In this research, 10 (ten) participants (5 were male and 5 were female) were selected for in-depth interview. The mean age of participants was 35 years and Std. Deviation ± 14 whereas male and female ratio was 1:1. According to selected inclusion and exclusion criteria, most samples (seven out of ten) were recruited from different villages and less than one third samples from urban. On the basis on multiple responses, all ten participants were modified their living room, toilet, bathroom and kitchen. Specially, half of ten participants (five) removed the barriers from the kitchen; more than half (six participants) levelled uneven yard and more than one-third (four participants) had accessible job setting.

Data were screened several times from in-depth interviews and transcript. Finally, following five themes were come out from data coding.

Themes:

1. Quality functions were performing by SCI patients due to proper home modification
2. The positive impact regarding social relationship and functional capabilities were developed after home modification
3. Disadvantage of home modifications were overcoming by family member and relatives due to good advantages
4. Home modification was played vital role for SCI patients to incorporating in social rehabilitation
5. Most common home modifications to get maximize functional independence

Quality functions were performed by SCI patients due to proper home modification.

Quality depends on the quality of work. Similarly, home modification is one of the quality works for Spinal Cord Injury patient to restore the function as well as self-independent. The high level of self-confidence was grown among participants as a normal during involved with functional activities. All participants had multiple responses.

Table 1: Quality functional care

Categories of modifications	Frequency(n)	Percentages (%)
Reduce dependency	8	80
Improvement of functional capabilities	7	70
Enhance to domestic functions	6	60
Re-establishment of job	4	40

Above mentioned table described the importance of home modification by 10 participants to SCI patients.

Among the respondents, maximum participants (eight out of ten) have given their heartiest opinion that home modification reduced their dependency for functional care and most of (seven out of ten) them also had emphasized on improvement of functional capabilities and just above one third participants were entitled for re-establishment of job.

One participant told that *“it is not easy to always get a care giver beside you as everyone has their own personal work and interest, so as an individual with SCI I think the modified home environment is very much important for me as it allows me to lead an independent life and now I can manage my functional self-care”*.

One participant told that” *Now I am very pleased that that I was able to modified my home environment, after these modifications I can manage my daily functional task and personal hygiene and even with a wheel chair independently I can go to bathroom as well”*

Regarding the importance of home modifications to self-independence one of the participant stated that *“Modified home environment has substantial importance to me as now I can maintain my family activities as I had before suck as I can cook for my siblings as well it also helps me to keep my job abiding and this is how I am almost independent”*

People with disabilities have lived experiences of particular impairment or sickness also is shaped by their environment and society around them. Disability is not merely health condition itself but is constraint regarded in the context of the community and societies in which the people with disabilities belongs (ICACBR 2014) .So home environment modification one is key issues to make them functionally independent and self reliant.

The positive impact regarding social relationship and functional capabilities were developed after home modification

Most of the cases, modification depend on the severity of the condition. In this regards, this study found that significant information from respondents about importance of home modification as well as empower of life sustainability. So, accessible home environment is a fundamental part though it varies place to place which deal with important aspects of community re-integration of SCI. All participants had multiple responses.

Table 2: Positive impact of home modification

Categories of reasons of modification	Frequency(n)	Percentages (%)
Self-independence in functional tasks	8	80
Improve social relationship	6	60
Improve mobility	7	70
Roaming around and reduces boringness in daily life	7	70
Improve of daily domestic activities capabilities	7	70

In this table the participants had expressed the positive impact of home modification.

Among the respondent maximum participants (eight) given their opinion that they are now self-independent in functional task and emphasized that modified home also allowed them to improve social relationship among with the community people. Among the 10 (ten) participants most of participants (seven persons) also had reported that modified home has importance for individual with SCI to improve daily domestic activities capabilities. A total of half of participants (5 persons) said that now they could enjoy roaming their in house and whenever they wish to do they can roam around home vicinity to get rid of their boredom relieve.

One of participant told that *“Following treatment of my accident I have changed my home environment for improving my self-independence which helps to do functional activities and now I can able to manage my mobility to all community areas to have and maintain my social relationships again”*. Regarding positive impacts of home modifications, one of the participants mentioned that *“After making my home change including ramp and even yard, I can get easily in, out and around of my house whenever I wish. If it wasn’t there, I would need family members help. Now that I have it, I don’t need anybody to help me to go inside the house or to come out of the house; I can do it all by my own and can go to neighbors and relatives to do my social relationship”*

Another participant said that *“after leveling my yard cut off threshold and re-arrangement of toilet and kitchen then I felt these very important to because it makes me functional for domestic activities and it was very pleasant that I can go outside with physical limitation”*. Regarding leisure point view one participant mentioned that *‘before modification I could only sit on my w/c and bed but changing after living room and made a ramp in front of my room that ease my come from room and roaming outside whenever I wish this helps me relieving stress’*

To enable persons with SCI to live independently and participate fully in all aspects of life the appropriate home environment can ensure access to persons with SCI, on an equal basis with others, to the physical environment, to transportation, and including information and communications technologies and systems, and to other facilities and services open or provided to the public, both in urban and in rural areas. The above mentioned data tells that the clients are being beneficial on such a way that they can roam around, get from place to place and above all, their self-independency is increased.

Disadvantage of home modifications were overcoming by family member and relatives due to good advantages.

Need based home modification is highly required for individual with spinal cord patients (SCI). SCI are mostly dependent on assistive devices, caregivers support, function based activity analysis, reliable safe environment which free from hazards. So, it could be assume that accessible environment plays a vital role to make them independent. Barriers of home modification deal with to decrease self-esteem, capabilities, level of performance and social communication etc. In this point of view, this study found some advantages, disadvantages and their overcoming pattern from the community by utilizing their local resources. All participants had multiple responses.

Table 3: Advantage, disadvantages of modification and overcoming pattern

Categories of area	Finding of discussion	Frequency(n)	Percentages %
Advantages	Allow free mobility to community areas	10	100
	Independence in functional care	8	80
	Able to manage domestic activities	7	70
	Re-establishment of job	4	40
	Allow to Involve in Social events	6	60
Disadvantages	Disagree and negative attitude from family members	6	60
	Interim economic hardship	5	50
	Difficulties to make understand the mason for new installations in home and less availability of materials/resources	6	60
	Lack of enough spaces in home	7	70
Overcoming	Able to convince family members	7	70
	Manage money by borrowing from family /relatives	5	50
	Able to make sense to mason regarding desire home modification and got the materials/resources through a referral	4	40
	Change the living room and Re-arrange/shifted furniture	4	40

This table displays the advantage, disadvantage of modified home environment to SCI patients and its overcoming pattern by SCI patients.

In above table all the participants (ten persons) had gave their heartiest opinion that modified home environment gave them free mobility in to their respective community and maximum of participants (eight) also emphasized has on its advantages for independence in functional care.

Among the ten (10) participants one participant told that *modified home environment gives me a tremendous advantage to do my own mobility and personal care which makes me independent to doing my activities of daily living.* From the view of advantage to modified home environment one participant said that *“Now, I don’t need anyone’s help me to go inside the house or to come out of the house; I can do these all by my own and can go to neighbors and relatives”*

In this study findings, most of participants (six persons) had faced disagreement and negative attitude from family member and half of participants had faced to economical disadvantages during their home environment modification and more than half of participants reported that they faced difficulties to made understood to a mason what the home modifications would looks a likes. One participant said that *“After discharge from hospital to my home I have faced difficulties and negative attitudes from few family members to make them understand the importance of modified home environment to adapt myself to own home as the injury event falls me in a new situation”*.One participant told that *“Problem that I faced a sufficient amount of money was needed to ensure and installation home modifications. So I had faced a great deal of difficulty to collect sufficient money .Another participant told that “it was hard for me to gather required amount of money to buy necessities supplies for my prescribed home modification.*

In this table also displays that most of participants (seven persons) had overcome the disagreement and negative attitude from family members and neighbors by explaining benefit of home modification to SCI patient as well as convince them to do home environment modification. All five of participants has managed their economical disadvantages during their home environment modification by borrowing money from his /her family members and relatives and more than one third of participants has managed their enough spaces for home environment modification with appropriate measurement by rearranged living room and relocated furniture. More than one third participants reported that they were managed to orientate mason on what the home modifications looks a likes and got the required material for appropriate materials through a referral.

One participant told “ *After convince my family about my desire home , I came to know that there was a money problem for me to arrange longing home modification as following accident I couldn’t do anything to earn money and that makes me requested to the relatives and family member to loan money for my required home change*”. Though it was quiet hard to lend money for relatives as home change itself a new issue for them”. Another participant said that “*I was very lucky that I could manage and motivated my mother first to make change in home for easy wheelchair propelling though the entire home then mother was able to convince rest of family members*”.

One of respondent mentioned that *“when I was admitted in CRP my mother and sister were along with me around six months and during my discharge the doctors and therapist were given much information on home change and its benefits to me .After discharge when other members were disagree to make changes at home for me but mother and sister has able overcome this disagreement and negative attitude from family members by explaining benefit of home modification me as well as convince them to do home environment modification”*

So, it seems that accessible environment plays a vital role to make people with SCI independent. Barriers free home modification could be allotted with increase self-esteem, capabilities, level of performance and social communication so on.

Home modifications was played vital role for SCI patients to incorporating in social reintegration

Home modification has a great impact on social rehabilitation though it may consider as a small part due depending on severity and requirements of spinal cord injury patients. Home modification allows the respondents to access in social participation, empowerment, sustainability of the quality of life (partially depend on income generative activities), inter and intra communication between each other's or other parties. Home modification ensured the participants locus of privacy, security, control, freedom, belonging and rootedness. This table shows the necessity of home environment for SCI patients which incorporating in social rehabilitation. All participants had multiple responses.

Table 4: Impact on Social reintegration

Categories of home modification incorporating in social reintegration	Frequency(n)	Percentages (%)
Improved social communication	7	70
Meaningful life	7	70
Improved social network	6	60
Increased income generating activities	7	70

In this table all of participants had emphasized modified home on social communication, meaningful life, and social network and income generating activities respectively. Among ten participants one participant told that *“After making my home modification, I can roam inside and outside of my house environment whenever I wish. If it wasn't there, I wouldn't be able to this as I am doing now; and can go to neighbors and relatives home to do maintain my social relationship”*

Another participant told that *“After being discharged from CRP as individual with disabilities I became an executive member of a local disable people organization (DPO) and then I have been involved with social work to establishment of rights of people with disabilities in to a community for that frequently I need to go local administration office and Upazila administration and social services offices. This will not possible except having a modified home environment for me”*

One participant said that *“After this drastic event to me and following all treatment I moved into a new house and I carefully I have done my house modify to meet my needs. Several home dimensions positively improved, such as my home as a place of privacy, a place of significant relationships and a place of belonging and rootedness. It has good benefit to my life”*. Another participant said that *“after changing the setting of home environment, now I can go to society people whom are nearby my home as when I feel that they could help me socially when do I needed and it made my life meaningful again”*. One participant said *“It gives me most privilege that now I can go to any social gathering like any festival, marriage ceremony and I can go my groceries shop in local bazaar .I thanks to rehabilitation professionals who gave the suggestions of home change and instructions on how to do installations to home modification and as a man with limitation without my home modifications I could not maintain my work and social communication”*

Societal accommodation is an important issue for people with disabilities to fullest community re-integration as a part of their rehabilitation. Therefore it is a foremost and requisite issue for primary rehabilitation aspects for community reintegration for people with disabilities. Including people with disabilities in everyday activities and encouraging them to have roles similar to their peers who do not have a disability is disability inclusion. (Simplican, et al 2016)

Most common home modification to get maximize functional independence

Environmental modifications include rearranging furniture, building ramps, widening doorways, special toilet seats and other safety equipment in the home environment. Already it assumed that accessible technologies and adjusted modification to reduce partial/full barriers and enrich optimum functional capability according to the patient's ability. All participants had multiple responses.

Table 5: SCI people most observe home modifications

Needs of participants	Finding from discussion	Frequency (n)	Percentages %
Wash room and toilet facilities accessible	To increase self-care	10	100
	To reduce dependency	10	100
Living room accessible and bed adjust to Wheelchair	To easy and self-transfer	10	100
	To increase self-mobility in living room	10	100
To installation a ramp	Increase easy and independent access to home from main road	10	100
Kitchen accessible	Access to available community resources for individual with SCI	05	50
Yard accessible	To roaming around home	6	60
Work place adjusted	To accessible work site and improve socioeconomic status	04	40
To installation of roof lift	To roam on roof when feels bored	01	10
Approach road repair	To access from to community place (nearby market)	02	20
Adjustable furniture	To easy and effective use domestic furniture	10	100

The table briefly described that among 10 participants had somewhat modified home environment.

All respondents had shown their needs of accessible wash and living room and toilet facilities and installation ramp and roof lift to be more in depended in self-care and ADL.

Among ten half of participants had explored their needs of modification for kitchen as all five were female and from the participant's point of view, home modification of above mentioned areas are strongly recommended on need basis. More than one-third of participants had reshaped their respective work place to get more accessible.

One participant whom living in a village of North region of Bangladesh said that *“as soon after I discharged from hospital I found difficulties to come from and entering to the toilet and I decided to renovate my home to compatible my wheelchair as I wanted to become independent in daily living matters”*

Another participant said the importance segment or area of home environment modification was *“As my family members are remain busy with our family business concern and I wanted to be spent times with my society people and be independently in my self-care and movement then I decided to level my home entrance and cut off threshold in front of toilet and rearranged my living room furniture's to easy maneuver my wheelchair. Now I could go to outside whenever I love to do”*

Home environment is a part of community inclusion for people with SCI. Most of the people with SCI lives in the rural community of Bangladesh. On the other hand, accessible home environment is crucial both to enable the implementation of community care and to assist in giving people with disability equal right to independent living (Changing rooms: the impact of adaptation on the meaning of home for a disabled person and the role of occupational therapists in the process 2009). One participant said that *“It would be better if someone could modify his her toilets and ramp just after his return home come and install require accessories at home in a local community or villages which would help him to be self-independent”*.

One participant who had accident in the overseas said that *“I was aware about the importance of accessible home for people with SCI as the doctors and other health professionals given me idea that accessible housing keeps functional, promotes psychological well-being and improves mobility status and returned home I did all my rooms wash block modified and I also installed a hand propelled lift to getting on the roof top as I love to spent free times by sitting on the roof”*

Home modifications are adaptations to living environments intended to increase usage, safety, security and independence for the user. However, individual with paraplegic wheelchair user may face difficulties regarding home modification as in Bangladesh where life is difficult for able bodied, there people with disability may experience a great magnitude of problem (Hossain, Atkinson & underwood 2002). On the other hand, there is a common idea in Bangladesh that home environment modification will be luxury for individual with SCI who already lost their job or have no job at all (Rashiduzzaman 2010) However, they also can design adapted home in different cultural and economic context. Therefore, they can work even in Bangladesh within low resource.

From the variation of importance of independence another participant said that *I believed that it would be very handy if I had totally accessible home just right after coming back home as I have had faced lot of transfer and mobility difficulties and also I didn't have any idea how could I made my home and room more accessible and smooth”*

It has been realized by all respondents that rehabilitation depends on proper utilization of home modifications at very beginning of community life reintegrated. From the finding, it was calculated from all respondents about community resources like all necessary materials which are highly related towards modification.

Despite faced problems most all the participants regardless made their required rearrange home modifications (partial or full damage). It is particularly entitled that whole study participants emphasized on convenience repairing toilet, bathroom, kitchen and ramp as well as main entrance to home. One of the participants told that *“Once I had lost my maximum performance and got dependency to the caregiver I felt is badly needed to fix my toilet accessible as it is matter privacy and I also did my kitchen and yard elevation and surround accessible to increase my independent domestic functions and movements”*

From inclusion point of view another participant said that *“the government and other humanitarian organization should be forwarded for upgrading the services which are currently available to the people with disabilities. Moreover, the mass people will need to forward their helping hand to the people with the disabilities for their inclusion and empowerment of in the society by accessible home and communities families”*.

It is important to get aware and increase sensitivity about disability rights and minimize their limitation and challenges not only the establishing services like health and education but it is also foremost necessity ensure physical environment for all people with disabilities as an equity basis then it would be easy to them to be self-dependently mobility around where they lives .Home modification ensured the participants locus of privacy, security, control, freedom, belonging and rootedness which are necessities for people with SCI patients to incorporate life in social rehabilitation.

Discussion

Quality depends on the quality of work. Similarly, home modification is one of the quality works for people with spinal cord injury to restore the function as well as self-independent. It seemed that the high level of self-confidence is grown among participants as a normal during involved with increase functional activities .Among the 10 (ten) respondents, 80% of the participants said that they have got positive impact after got modified home because of it reduced dependency for functional care to others and 70% of them had emphasized on improvement of functional capabilities. Literature mentioned that maximum independence in self-care is important because none of have desire to be dependent upon others for personal care. ‘If the patient is independent in self-care activities which are important for them, they are encouraged to greater efforts in life (Turner 2009) .If person with SCI can manage his/her own personal care and activities this enhance their ADLs, self-esteem confidences and ADLs are important for improving quality of life.

In this study among the 10 participants 70% emphasized that it’s has better impact to allowed them to improve social relationship among with the community people and 70% of them said that now they can enjoy roaming around whenever they wish to do they can roam around for their boredom relieve .Literature mentioned that the modified home environment facilitates the client’s community participation which also influences the wellbeing of the client as part of society. It is also said that unsuccessful community reintegration leads to develop secondary complications and causing secondary injury (Scovil 2012).

The accessibility in home or home modification makes the person better functioning in their performance areas. The concept of the accessible environment indicates a barrier free environment. A barrier free environment for SCI person can be constructed by general modification of the physical environment according to the patient's need. (Arifa 2012). When the proper home modification is completed then the wheelchair user spinal cord patient performs their activity independently (Wheelchair Accessible 2004)

Accessibility for spinal cord injury patient is vital aspect of their social rehabilitation as free mobility allows them more confident to lead their life in community. All the participants (10) of had gave their heartiest opinion that modified home environment gave them free mobility in to their community though have physical limitation Literature shown that mobility is one of the most important areas for individual with SCI (Pilati2004).Indeed, due to the drastic reduction in physical capabilities and mobility of the individuals resulting from their quadriplegic or paraplegic state, remaining in the same lodging conditions would have had disastrous impact on their home experience (Arifa, 2012). Accessible home keeps functional, promotes psychological well-being and improves mobility status of SCI user in the home. Home modifications are adaptations to living environments intended to increase usage, safety, security and independence for the user (Haque 2009)

Barriers of home modification deal with to decrease self-esteem, capabilities, level of performance and social communication etc. In this point of view, this study found some disadvantages and their overcoming pattern from the community by utilizing their local resources .In this study finding, 60% participants had faced disagreement and negative attitude from family member.

Among 10 participants 50% respondent had faced to economical disadvantages during their home environment modification. Economic barriers are related to inability to purchase needed equipment, supplies and services. Economic barriers may restrict to the possible solution of both environment and personal barriers (Zejdlik, 1992)

After discharge from the rehabilitation shelter to community area the SCI patient have faced difficulties to cope themselves to their own territory as the injury event falls him a in new situation and ultimately they are leading to dependent to other family members and relatives for their daily living activities. Whybrow and Salam (2001) stated that “Negative attitude towards the SCI are commonly stated to be a barrier to community integration. Society negative attitude toward the SCI is the greatest challenged for managed their home modification. Whybrow and Salam (2001) stated that “Family support was essential for successful community reintegration for individuals with SCI. In the successful and unsuccessful cases the families were all giving support to the person with disabilities. Most family encouraged the disable person, helping to motivate the disabled person to participate in rehabilitation or take job. The family is pioneer to support the person with SCI for food, money, cloths and talking care of him”

Home modification has tremendous impact on social rehabilitation though it may consider as a small part due to depending on severity and requirements of spinal cord injury patients. Home modification allows the respondents to access in social participation, empowerment, sustainability of the quality of life (partially depend on income generative activities), inter and intra communication between each other's or other parties.

Home modification ensured the participants locus of privacy, security, control, freedom, belonging and rootedness. In this study 70 % participant reported that modified home environment has impact of improve social communication and leading a meaningful life. Accessible home environment is crucial both to enable the implementation of community care and to assist in giving people with disability equal right to independent living (Changing rooms: the impact of adaptation on the meaning of home for a disabled person and the role of occupational therapists in the process 2009).The accessibility in home or home modification makes the person better functioning in their performance areas. The concept of the accessible environment indicates a barrier free environment. A barrier free environment for SCI person can be constructed by general modification of the physical environment according to the patient's need. (Arifa 2012).

Home modifications are adaptations to living environments intended to increase usage, safety, security and independence for the user (Haque 2009). Literature shown that the an accessible home and environmental modification allows for free and safe movement, function and access for SCI regardless of age, sex or condition makes access by all, without obstacles, with dignity and with as much autonomy as possible (Trombly 2015).

Home environment and environmental accessibility plays a great role to influence their independence in the physical environment of their community (Rahman 2003).

Almost one third of the respondents had shown their needs of follow up after every 6 months due to their necessity (such as rapidly repairing the toilet, bathroom and kitchen). Among them 40% explored their needs of follow up after every 12 months of modification. From the participant's point of view, home visit or follow was strongly recommended on need basis.

Literature suggested that the purpose of home visit is to see how the SCI patients cope to their own community environment and to identify if there is any problem that has arisen after their discharge (Ambia 2006). Another study conducted in South Africa by Occupational Therapy association which revealed that home visit is necessary particularly if the patient's physical condition is permanent. It is helpful to modify and structural change of patient's home entirely (Conlan, 2000) and follow up programme after discharge that emphasized skill training, identification of interest including environmental change, social and recreational activities (Trombly and Versluys 1989). After the hospitalization and rehabilitation, individuals with SCI face problems in uneven terrain and inaccessible homes and communities (Bayer 2000). So the importance of follow up visit is high in that cases the practitioners would try to solve the modifications problems as the client can get in and out and around of home . The follow up visit is needed to be performed to facilitate the client's proper community reintegration. Another study also indicates that rearranging or modification of home environment is high need for individuals with SCI post rehabilitation (*Home modification and repair 2005-2010*).

It is said that, planning an effective home modification requires a thorough knowledge of the needs of the people who live in the home (Heywood, as cited in Weeks et al. 2010). Accessible home modification enabled the respondents to focus on home activities as well as to catch up the equal rights as normal. According to Trombly (cited in Rashiduzzaman, 2010) an accessible home environment allows for free and safe movement, function and access for all, regardless of age, sex or condition. It is a space or a set of services that can be accessed by all, without obstacles, with dignity and with as much autonomy as possible.

It has been realized by all respondents that rehabilitation depends on proper utilization of community resources and its allocation. From the finding, it was calculated from all respondents about community resources like all necessary materials which are highly related towards modification. Beside it also be ensured to promote awareness among local people about disability concerning issues (disability rights) and trained to the selected professionals (such as mason, plumber e.t.c).

According to North (1999) Social support is frequently described as having an important positive effort as psychological distress following stress full life event such spinal cord Social support is vital important for individual with SCI to reintegrate into community to lead a meaningful life. Everyone with SCI patient needs access to society, medical facilities, and income generating activities, to visit neighbors, to use the toilet and water point. If there are barriers within the home and environment and services are not accessible facilities, full participation in the social and economic life of the community and basic human rights are denied to people.

The comprehensiveness of modification depends highly on people with SCI wish, family intention and necessary resources. But modified home environment promotes the positive impact to community reintegration and the goal of rehabilitation of people with SCI .It is important to understand the value of environmental modifications in achieving goals in meaningful occupation, and is aware that people with disability frequently have many barriers in their physical environment. This includes people with mental health, intellectual, and sensory needs, not only those with physical disability.

Consequently, the activity or occupation that an environmental modification aims to support should be the driver of modifications: a person only interacts with their environment through activity. Modifications may be made to a wide variety of environments, including to a person's home, school, work place, or shared community facility. The modification and designs may be the responsibility of the individual, a service provider, or government, amongst others. For instance, one local government regarding modifications to the home, governments, organizations, and the individual should be aware that the majority of our existing housing stock is likely to require renovation and modification in order to meet the changing requirements of the people with disabilities who live there over their lifespan. When the existing home design becomes overly problematic, relocating to a new home with a more appropriate design may be the simplest and most economical option (Bridge 2010).

Limitations of the study

- Home modifications to spinal cord injury are new aspect of rehabilitation in Bangladesh. So therefore a very few related literature has found on this topic in the context of Bangladesh
- Apparently, in online database (Pubmed, Google scholar, Google web page, Hinari and OT Seeker) and manual search (Books and library resources), had not been found any study straight related to perception of modified home environment. The most closely related studies were used to support the evidence on uses of assistive devices and facilities.
- In this study the male and female number was not fair big
- Most of the participants were not well educated and not familiar with the interview process, so sometimes it had been seen that some irrelevant information were given by participants when asked the questions.
- Initially the researcher faced difficulties to pick up the actual data from participants during the interview session on specific issues as the participants sometimes had obscure information
- Availed less time to do study as elaborated

CHAPTER V RECOMMENDATION & CONCLUSION

During study time researcher felt that it is badly needed to take initiatives from Government and NGOs for ensuring accessible environment for individual with disabilities like spinal cord injury patient by integrated rehabilitation in to community.

Recommendation for future research-

- Further research should be conducted with large numbers of participants as same study.
- Further research is needed to find out the challenges of SCI patient in home environment modification.
- Further research should be made to find out the comparisons between the impact of modified home environment and the patient who has not modified their home environment.
- Further research should be made to find out the impact of psychological aspect of home environment modification.
- Further research should be made to find out the recreational status of youth adult with spinal cord injury patient
- A follow up study of comparing the earlier modification status of the client's own environment with the later when the study will be conducted. The photo and video analysis can be performed to measure the difference between the former and later state of modified home environment.

Conclusion

In this study researcher has found positive perception toward on modified home environment for functional impact on life on people with spinal cord injury as it reduced dependency for self-functional care and improved of functional capabilities and led for re-establishment of the job. Modified home environment of the people with spinal cord also allows them to be socially reintegrated. This study revealed some of outstanding performances were presented by people with spinal cord injury through proper modified home environment although few of them had faced challenges to made home environment accessible

A supportive home environment is one of key to maximizing independence for people of all ages. This study was conducted to find out the importance of modified home environment to people with SCI. Home modification is one of the quality works for people with spinal cord injury to restore the function as well as self-independent. The high level of self-confidence was grown among participants as a normal during involved with functional activities. Need based home modification is highly required for individual with SCI. All the participants had emphasized that modified home environment make them free from dependency to care givers and allow them free access to all.

In this study finding, it was considered from all respondents about community resources like all necessary materials which are highly related towards required home modification for SCI. The analyzed data shows that people with spinal cord injury though have got positive impact from modified home environment but also faced challenges at different extent.

Beside this it also be ensured to promote awareness among the local people about disability concerning issues (disability rights) and trained to the selected professionals (such as mason, plumber etc.) for required accessible maintenance in to the local community areas. The program of awareness raising and education, resources services on home environment modification and accessibility shall be helpful to community people to know about the rights of accessibility of individual with disabilities as well as people with spinal cord injury.

Accessible home modification enabled the respondents to focus on home domestic activities as well as to catch up the equal rights as normal. So, accessible home environment is a fundamental part for the people with SCI though it varies place to place which deal with important aspects of community re-integration .In this study, though discussion was focused on find out the perception of modified home environment from people with SCI but also found some guidelines about how to managed or overcome the barriers to home modification. That organization which has been working with disabilities or its future project to person of disabilities to re-integrate their own community and who use wheelchair, then these study findings can help them to provide modification services.SCI will continue to affect mainly individuals in the prime of life. Ensuring an adequate medical and rehabilitation response, followed by supportive services and accessible environments, will help minimize the disruption to people with SCI and their families. These measures will also reduce the overall costs to society, in terms of dependency and lost productivity, and to the individual, in terms of lower self-esteem and impaired quality of life. SCI is preventable, survivable and need not preclude good health and social inclusion. But action by governments and other stakeholders is urgently required. Without effective action, SCI will remain, all too often, a catastrophe. (WHO 2013).

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Appendices

Questionnaire:

Questionnaire Part 1: Demographic Part

- Age
- Sex
- Home : Village /town/ urban
- Education status :
- Cause of injury
- Level of injury
- Previous Occupation :
- Marital status :
- Source of income :

Questionnaire Part 2

1. Do you think home modification is important for people with spinal cord injury?
if yes. Why
2. Would you please tell us why have you done home modification after returning
3. Do you think modified home environment is important for community
reintegration of people with spinal cord injury?
4. Do you think home modification would be benefited for people with spinal cord
injury?
5. What types of modification(s) are required for people with spinal cord injury?
6. What was/were modification (s) required for you at home
7. What were the barriers that you faced during home modification was
implemented?
8. Please explain how do overcame these barriers
9. What is your suggestions regarding future home modifications for people with
spinal cord injury

প্রশ্নমালা

বয়স :

লিঙ্গ :

বাড়ী : গ্রাম/শহর

শিক্ষাগত যোগ্যতা

আঘাতের কারণ

আঘাতের ধরন

পূর্বে পেশা

বৈবাহিক অবস্থা

আয়ের উৎস

১. আপনি কি মনে করেন পক্ষাঘাতগ্রস্ত রোগীদের জন্য বাড়ীর অবস্থা পরিবর্তন করা গুরুত্বপূর্ণ ?
যদি হ্যাঁ, কেন?
২. আপনি কি বলবেন কেন আপনি আপনার বাড়ীর অবস্থা বাড়ীতে ফিরে আসার পর পরিবর্তন করলেন ?
৩. আপনি কি মনে করেন পক্ষাঘাতগ্রস্ত রোগীদের জন্য বাড়ীর অবস্থা পরিবর্তন সমাজভিত্তি পূর্ণবাসনে গুরুত্বপূর্ণ?
৪. আপনি কি মনে করেন বাড়ীর অবস্থা পরিবর্তন পক্ষাঘাতগ্রস্ত রোগীদের সুবিধা প্রদান করবে ?
৫. কোন কোন ধরনের বাড়ীর অবস্থার পরিবর্তন পক্ষাঘাতগ্রস্ত রোগীদের জন্য প্রয়োজন ?
৬. আপনার জন্য কোন ধরনের পরিবর্তন বাড়ীতে করতে হয়েছিল ?
৭. আপনার বাড়ীর অবস্থা পরিবর্তনে ক্ষেত্রে কি কি বাধার সম্মুখীন হয়েছিলেন ?
৮. কিভাবে সেই বাধা সমূহ অতিক্রম করলেন ? বর্ণনা করুন ?
৯. ভবিষ্যৎ পক্ষাঘাতগ্রস্ত রোগীদের জন্য বাড়ীর অবস্থায় পরিবর্তনের ক্ষেত্রে আপনার সুপারিশ গুলো কি?

Consent Form

Assalamu Aalaikum,

I am Salim Rahman, a student of M Sc in Rehabilitation Science (MRS) Bangladesh Health Professions Institute (BHPI) which is affiliated by University of Dhaka, Bangladesh. Currently I am going to conduct a research titled “The perception of people with spinal cord injury on modified home environment”. This research is part of my MRS program. I would like to ask you some questions regarding this issue. Whatever information you provide will be kept strictly confidential and will not be shown to other persons. I shall take about 15 - 20 minutes of your valuable and busy schedule and your information shall be recorded for future uses. I humble mention that there is no remuneration will be offered for your participation in interview session and you shall enjoy the right of withdrawal yourself from any time of interview session and you won't be bound to answers the questions which you don't like or prefer

However, hope that you will participate in this study since your perception is important. Your opinion is extremely important for this study. I appreciate your cooperation.

Do you agree to give me the information? 1. Yes 2. No

Name of the participant: _____ ID. No (if any)

Phone: _____

Signed: _____

Date: _____

Witness Sign (if any)

Date: _____

সম্মতিপত্র

আস্‌সালামুআলাইকুম..... ।

আমি সেলিম রহমান। মাস্টার্স অব রিহ্যাবিলিটেশন বিভাগের একজন ছাত্র। এই মাস্টার্স কোর্সটি বাংলাদেশ হেলথ প্রফেশন্স ইন্সটিটিউটের বিএইচপিআই চলমান এবং বিএইচপিআই, ঢাকা বিশ্ববিদ্যালয় কর্তৃক অধিভুক্ত। বর্তমানে আমি একটি গবেষণা পরিচালনা যার শিরোনাম হচ্ছে “পক্ষাঘাতগ্রস্ত রোগীদের জন্য বাড়ীর অবস্থায় পরিবর্তনের উপলদ্ধি”। এই গবেষণা পত্রটি আমার মাস্টার্স কোর্সের একটি অংশ বিশেষ। আমি আপনাকে বাড়ীর অবস্থা পরিবর্তন সম্পর্কে আপনার উপলদ্ধি সংক্রান্ত কিছু প্রশ্ন করবো। এখানে উল্লেখ্য যে, আপনি যে তথ্যাদি সরবরাহ করবে তা অত্যন্ত গোপন থাকবে এবং অন্য কাউকে তা দেখানো হবে না। সম্ভবত আমি আপনার মূল্যবান ও ব্যস্ত সময়ের ১৫-২০ মিনিট চেয়ে নেবো এবং আপনার তথ্যাদি রেকর্ড করবো।

আমি অত্যন্ত বিনয়ের করছি যে, সাথে উল্লেখ্য করছিল। এই সাক্ষাত পর্বের জন্য আপনি কোন রূপ ভাতা বা সম্মানী গ্রহণ পাবেন না এবং আপনি চাইলে যেকোন সময় এই ইন্টারভিউ/সাক্ষাতকার হতে নিজেকে সরিয়ে নিতে পারেন বা চাইলে আপনি আপনার পছন্দের প্রশ্নের উত্তর দিতে পারেনবা কোন প্রশ্নের উত্তর নাও দিতে পারেন।

তথাপি, আশা করি আপনি এই গবেষণায় অংশগ্রহণ করবেন কারণ আপনার এই বিষয়ের উপলদ্ধি ও মতামত অত্যন্ত গুরুত্বপূর্ণ। আপনার সহযোগিতা কামনা করি।

আপনি আপনার তথ্যাদি দিতে সম্মতি

১. রাজী

২. রাজী না

অংশগ্রহনকারীর নাম :

ফোন :

স্বাক্ষর :

তারিখ :

সাক্ষীর স্বাক্ষর :

তারিখ :



BANGLADESH HEALTH
PROFESSIONS INSTITUTE

বাংলাদেশ হেল্থ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই)
Bangladesh Health Professions Institute (BHPI)

(The Academic Institute of CRP)

Ref.

CRP-BHPI/IRB/03/18/202

Date: 19/03/2018

To
Salim Rahman
Part II, M.Sc. in Rehabilitation Science
Session: 2016-17, Student ID: 181160049
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Subject: Approval of the thesis proposal- "Perception of people with spinal cord injury on modified home environment" by ethics committee.

Dear Salim Rahman,

Congratulations.

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

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

Since the study involves answering a questionnaire that take about 10-15 minutes and have no likelihood of any harm to the participants, the members of the Ethics committee have approved the study to be conducted in the presented form at the meeting held at 9.00 AM on 6th May, 2017 at BHPI.

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

Best regards,

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

Date: March 22, 2018

To
The Chairman
Institutional Review Board (IRB)
Bangladesh Health Professions Institute, CRP

Subject: Application for review and ethical approval

Dear Sir,

With humble to mention that this is Salim Rahman a student of M.Sc in Rehabilitation Science at Bangladesh Health Professions Institute (BHPI) -an academic institute of CRP with affiliation of University of Dhaka. With referring my M.Sc in Rehabilitation Science course content with close supervision of Md. Obaidul Haque, Associate Professor and Head of Department of Physiotherapy, BHPI I am heading to have research titled "Perception of people with spinal cord injury on modified home environment" .The aim of research is to explore the perception of people with spinal cord injury on modified home environment. A semi-structured questionnaire will be used to explore the perception of people with spinal cord injury on modified home environment and hoping about 15 minutes would require getting that perception by using questionnaire (attached) and the participant would be chosen as convenient manner. The researched himself shall take each of interviews and will be recorded to use further and Bangla consent will be used to follow the privacy issue of participant.

So ,hence I look forward with high anticipation to have your king approval for research proposal and to start data collection process and here I also assured you that I shall oblige the all requirement of research .

Yours Sincerely


(Salim Rahman)

Part II, M.Sc. in Rehabilitation Science
Session: 2016-17, Student ID: 181160049
BHPI, CRP, Savar, Dhaka-1343

Recommendation



(Md. Obaidul Haque)

Associate Professor and Head
Department of Physiotherapy
BHPI, CRP, Savar, Dhaka-1343,