



Faculty of Medicine
University of Dhaka

**BARRIERS IN PERFORMING HOME EXERCISE AMONG THE
PATIENTS WITH ISCHEMIC STROKE AFTER DISCHARGE
FROM CENTER FOR THE REHABILITATION OF THE
PARALYSED (CRP)**

Abrin Sultana

Bachelor of Science in Physiotherapy (B.Sc. in PT)

DU Roll No: 907

DU Registration No: 3610

Session: 2015-2016

BHPI, CRP, Savar, Dhaka-1343



Bangladesh Health Professions Institute (BHPI)

Department of Physiotherapy

CRP, Savar, Dhaka-1343

Bangladesh

August, 2020

We the undersigned certify that we have carefully read and recommended to the Faculty
Of Medicine, University of Dhaka, for the acceptance of this dissertation entitled
**“BARRIERS IN PERFORMING HOME EXERCISE AMONG THE PATIENTS
WITH ISCHEMIC STROKE AFTER DISCHARGE FROM CENTER FOR THE
REHABILITATION OF THE PARALYSED (CRP)”**

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

Farjana Sharmin.....
Farjana Sharmin
Lecturer of BHPI
Consultant & OPD In-charge
Department of Physiotherapy
BHPI, CRP, Savar, Dhaka
Supervisor



.....
Professor Md. Obaidul Haque
Vice Principal
BHPI, CRP, Savar, Dhaka



.....
Mohammad Anwar Hossain
Associate Professor, Department of Physiotherapy, BHPI
Senior Consultant & Head of Physiotherapy Department
CRP, Savar, Dhaka

E. Rah.....

Ehsanur Rahman
Associate Professor & MPT Coordinator
Department of Physiotherapy
BHPI, CRP, Savar, Dhaka

Shofiq.....

Md. Shofiqul Islam
Associate Professor & Head
Department of Physiotherapy
BHPI, CRP, Savar, Dhaka

DECLARATION

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

Signature: Abtin Sultana

Date: 15.11.2021

Abrin Sultana

Bachelor of Science in Physiotherapy (B.Sc PT)

DU Roll:

Reg. No: 3610

Session: 2015-2016

BHPI, CRP, Savar, Dhaka- 1343

CONTENTS

Topic	Page no.
Acknowledgment	i
Acronyms	ii
List of table	iii
List of figure	iv-v
Abstract	vi
CHAPTER-I: INTRODUCTION	1-10
1.1 Background	1-5
1.2 Rationale	6
1.3 Research question	7
1.4 Objectives	8
1.5 Conceptual Framework	9
1.6 Operational Definition	10
CHAPTER-II: LITERATURE REVIEW	11-18
CHAPTER-III: METHODOLOGY	19-24
3.1 Study design	19
3.2 Study area	19
3.3 Study population	19
3.4 Sample size	20
3.5 Sampling technique	21

Topic	Page no.
3.6 Inclusion criteria	21
3.7 Exclusion criteria	21
3.8 Method of data collection	22
3.8.1 Data collection tools	22
3.8.2 Questionnaire	22
3.9 Data collection procedure	22
3.10 Data analysis	23
3.11 Ethical consideration	23
CHAPTER-IV: RESULTS	25-66
CHAPTER-V: DISCUSSION	67-72
5.1 Limitation of the study	72
CHAPTER-VI: CONCLUSION AND RECOMMENDATION	73-74
6.1 Conclusion	73
6.2 Recommendations	74
REFERENCES	75-84
APPENDIX	85-102
Appendix-I Permission letter	85-87
Appendix-II Consent form (Bengali & English)	88-89
Appendix-III Questionnaire form (Bengali & English)	90-102

Acknowledgement

First of all, I would like to pay my gratitude to the almighty Allah who has given me the ability to complete this project in time with success. The second acknowledgement must go to my family members who have always inspired me for preparing the project properly.

My deepest gratefulness goes to my respected research supervisor **Farjana Sharmin**, Lecturer of BHPI, Consultant & OPD In-charge, Department of Physiotherapy, BHPI, CRP, Savar, Dhaka for her meticulous advice, encouragement and support from the very beginning to winding up of my study. Then, my acknowledgement must go to Professor **Md. Obaidul Haque**, Vice Principal, BHPI, CRP, Savar, Dhaka for encourage me and his valuable advice.

I would like to pay my highest gratitude to **Mohammad Anwar Hossain**, Associate Professor, Department of Physiotherapy, BHPI, Senior Consultant & Head of Physiotherapy Department, CRP, Savar, Dhaka for his kind contribution to complete my research. I am also thankful to my honorable teacher **Md. Shofiqul Islam**, Associate Professor & Head, Department of Physiotherapy, BHPI, CRP, Savar, Dhaka. I would like to express my gratitude to my respected teacher **Ehsanur Rahman**, Associate Professor & MPT Coordinator, Department of Physiotherapy, BHPI, CRP, Savar, Dhaka for providing me excellent guidelines. I would express my admiration to **Muhammad Millat Hossain**, Assistant Professor, Department of Rehabilitation Science, Member Secretary, Institutional Review Board (IRB), BHPI, CRP, Savar, Dhaka for allowing me to conduct this research. I am also thankful to all of the staff of BHPI Library for their cordial help to find contribution to complete my research.

Finally, I would like to thanks those people who eagerly participated as study samples in the conduction of my study and the entire individual who are directly or indirectly involve with this study.

Acronyms

BHPI	Bangladesh Health Professions Institute
BMRC	Bangladesh Medical Research Council
B-PEDS	Barriers to Physical Activity and Disability Survey
CRP	Centre for the Rehabilitation of the Paralysed
CVA	Cerebrovascular accident
HSC	Higher Secondary School Certificate
IRB	Institutional Review Board
SPSS	Statistical Package for the Social Sciences
SSC	Secondary School Certificate
TB	Tuberculosis
TIA	Transient Ischemic Attack
WHO	World Health Organization

List of Tables

Table no.	Page no.
Table-1: Marital status of the participants	28
Table-2: Poor health condition	39
Table-3: Afraid of falling during exercise	47
Table-4: Cause of boringness	56
Table-5: Different type of family responsibility	62
Table-6: Association of gender and physical pain	65
Table-7: Association of age and poor health status	65
Table-8: Association of occupation and time for exercise	65
Table-9: Association of family type and depression	66
Table-10: Association of use of upper limb and family responsibility	66
Table-11: Association of assistive device and exercise equipment	66

List of Figures

Figure no	Page no.
Figure-1: Age of the participants	25
Figure-2: Gender of the participants	26
Figure-3: Residence of the participants	27
Figure-4: Educational status of the participants	29
Figure-5: Occupation of the participants	30
Figure-6: Family type of the participants	31
Figure-7: Family members	32
Figure-8: Use of assistive device by the participants	33
Figure-9: Use of upper limb	34
Figure-10: Use of lower limb	35
Figure-11: Feeling of pain during exercise	36
Figure-12: Lack of energy to do exercise	37
Figure-13: Health condition prevents to perform exercise	38
Figure-14: Feeling of tiredness to perform exercise	40
Figure-15: Present of muscle stiffness	41
Figure-16: Effect of muscle stiffness on home exercise	42
Figure-17: Injured from exercise	43
Figure-18: Types of injury from exercise	44
Figure-19: Health related problem during exercise	45
Figure-20: Type of health problem that causes to stop exercising	46

Figure no	Page no.
Figure-21: Feeling of laziness to do exercise	48
Figure-22: Presence of depressive symptoms among the participants	49
Figure-23: Afraid of having another stroke	50
Figure-24: Lack of motivation	51
Figure-25: Difficulties about doing exercise	52
Figure-26: Adequate time for perform exercise	53
Figure-27: Participants' belief about their extreme age for home exercise	54
Figure-28: Boringness to perform exercise	55
Figure-29: Improvement by exercise	57
Figure-30: Interest about exercise	58
Figure-31: Support from family members or friends of the effort to exercise	59
Figure-32: Carer assistance	60
Figure-33: Family responsibility	61
Figure-34: Family's culture, beliefs or morals prevent to exercise	63
Figure-35: Exercise equipment at home	64

ABSTRACT

Purpose: To find out barriers of performing home exercise in ischemic stroke patients. **Objectives:** The objectives of this research was to identify socio-demographic profile among the ischemic stroke patients and to explore their barriers in performing home exercise including physical difficulties, mental health related barriers, beliefs towards home exercise, familial obstacles, environment barriers after discharge from the rehabilitation center. **Methodology:** Descriptive studies in the form of cross sectional survey design was conducted for this research. Sample was conveniently selected from the patients with ischemic stroke after discharge from CRP, Savar, Dhaka by following the inclusion and exclusion criteria. A socio-demographic chart and semi structured questionnaire were used for data collection. Data was collected from 107 participants by interviews through phone call. **Results:** About 68% (n=73) participants were male and rest of them were female (n=34). Most of the participants faced stroke at their 6th decade of life. There were several reasons for the participants to not performing home exercise where the most commonly reported barriers including poor physical conditions, mental health of the stroke patients, negative beliefs about home exercise, family and home environment related obstacles. Poor past medical history (34%), physical pain (28%), tiredness (27%), fatigue (20%) represent the top physical health related barriers for them. Depression (39%), laziness (always 21%, occasionally 32%), fear of falling (29%) are the main mental issues for not being physically active. Lack of motivation, friends or family members support, home environment also acted like obstacles for some stroke survivors to performing exercise. **Conclusion:** Home based exercise is one of the most important part of rehabilitation. But stroke patients face many barriers at home to perform exercise. To eliminate these exercise related barriers first of all researcher have to identify the accurate obstacles in engaging home exercise program. This study helps to collect information from the post stroke patients about barriers of performing home exercise which further may help to establish an effective home exercise protocol for them and improve stroke patients' health outcome.

Key words: Stroke, Exercise, Barrier, Rehabilitation.

1.1 Background

Stroke seems to be a life-threatening condition that has brief physiological, mental as well as sociological effects (McKevitt et al., 2011). It is the most common reason among the grown-up people for developed severe impairment which is linked toward a decline in standard of living (Drigny et al., 2018). Around the world, cerebrovascular accident is the subsequent driving reason for death (Katan & Luft, 2018) and the 3rd driving reason for handicap (Johnson et al., 2016).

Throughout the most recent forty years, stroke occurrence in underdeveloped and middle class nations have dramatically increased (Feigin et al., 2014). In general, stroke causes less dying in individuals in wealthy nations when contrasted with the underdeveloped and middle class nations. In underdeveloped and middle class nations stroke happens 15 years sooner (Owolabi et al., 2015). Overall stroke related dying happens in economically developing nations about 86% which is assessed by WHO in 2001 (Wasay et al., 2014). Stroke demise rate is about 25 out of 100 in our country (Miah et al., 2012). It is dominating as vascular sickness that has a powerful effect in Asia. But the greater part of the total populace in the world lives in this continent isn't just the only reason for this (Karim et al., 2016). Globally losses of life due to stroke are likely >40% in South part of Asia which is the most elevated supporter of stroke mortality (Wasay et al., 2014). White Americans have higher stroke endurance that converts into lower stroke case-casualty, when contrasted with Afro-Americans where the danger of stroke demise was 44% higher (Sergeev, 2011). There is a significant expansion in the quantities of stroke patients as indicated by the current expectations up to 2050 around the world (Van der Riet et al., 2015).

The frequency of stroke is lower in female compare to male (Poorthuis et al., 2017). It is quite common in Bangladesh among provincial residents and men (Mohammad, 2013). The condition is more common in moderately aged individuals and older people. Although it is rare among younger generations, the consequences can be catastrophic for the victim and his/her surroundings (Miah et al., 2008). It is a rare case among the people whom ages are under forty years (Miah et al., 2012). However, researchers discovered that the risk of

stroke has been growing at an early age (Kissela et al., 2012). Roughly >9%-<15% of ischemic strokes happen in youthful grown-ups (Ji et al., 2013).

Worldwide, particularly throughout the underdeveloped nations, a large majority of individuals with functional limitations confront several challenges, where they can be frequently harassed, handicapped and humiliated (Gelaw et al., 2020). Internationally, 87% handicap-accepted livelihood as well as stroke-related passing and 70% cerebrovascular accident are faced in the underdeveloped and middle class nations (Johnson et al., 2016), just as in western nations it is the main source of long haul incapacity (Carod-Artal & Egado, 2009).

The majority of post-stroke patients are disabled as a result of access to the medical that frequently result in avoidable consequences (Shin et al., 2017). Stroke may prompt the most long haul inability among every neurological condition (Lynch et al., 2008). The pervasiveness of incapacity is about >23% to <55% among stroke survivors (Srivastava et al., 2010). Additional illnesses including sadness, discomfort, functional decline can occur gradually in disabled individuals, although these might be minimized by daily exercise (Mulligan et al., 2012).

Though significant progress is achieved in the clinical treatment of cerebrovascular accident, most post-stroke management will prefer to depend on rehabilitative approaches in the absence of a broadly applicable or successful medical care (Langhorne et al., 2011). Based on the area and severity of the abnormalities, the diagnosis and biostatistics is varies from patients to patients. Several initiatives are underway in industrialized nations to improve advanced detection and treatment of stroke-related illness and death. However, the situation is rather opposite in this country (Siddique et al., 2009).

People with chronic impairments including shoulder and spinal pain, rigidity, upper and lower limb impairment, walking problem, visual problem, lack of interaction, swallowing difficulties require post-stroke rehabilitation (Hebert et al., 2016). Because of their decreased physical activities, engagement restrictions, and functional limitations the majority of persons who have had a stroke require rehabilitation (Kristensen et al., 2016). To obtain their ideal enthusiastic, intellectual, physical, informative, social and useful movement level, stroke survivors go through the rehab program. This is an objective

orientated, dynamic and reformist procedure (Hebert et al., 2016). The objective of stroke rehabilitation is discharged at the most functionally independent stage as much as possible (Ogwumike et al., 2014). Furthermore, mobility is not often gained after discharge especially in poor hospitals because of less spaces and being hospitalized of the patients for few days. On the other hand, society-related rehab program facilities in few areas are undeveloped and insufficient (Scorrano et al., 2018).

Subsequently some of the time patients without recovery are sent at home. When they are at home, they get no help. The ideal results and restoration objectives are not reached by these patients because of early release. So home based exercise projects is being refused by them (Ogwumike et al., 2014). Official stroke treatment is regularly completed inside a half year. It is basic that after release from official treatment, stroke patients keep on practicing through home based exercise as the advantageous impacts of physical activity have been archived after that half year of treatment (Miller et al., 2010). A few quantities of clinical treatment events are declined throughout the past couple of years as stroke related restorative treatment expenses are expanded by 20%. A simple locally situated exercise framework with artificial intelligence depended communication is an expected answer for this (Saini et al., 2012).

Researchers said that an early restoration program at home can prompt a quicker recuperation (Gelaw et al., 2020). Hence, performing in home based exercise programs which is very significant and has a favorable impact on the functional result. This might result in a reduction in healthcare expenses as well as a reduction in fatality and adverse outcomes (Kara & Ntsiea, 2015). Locally established restoration for handicapped people is a promising option in contrast to the urgent cares or medical clinic-based recovery program due to its consoling similarity (Gelaw et al., 2020). This is a different technique with a number of benefits (Kruger et al., 2018). However, once release from rehabilitation, patients respond to the home exercise regimen is below the optimal level as causes of unwillingness to exercises differ from patients to patients (Miller et al., 2010).

Exercise program reduces muscle wasting while increasing muscular endurance, as well as improving functional ability and longevity (Gomes et al., 2017). As indicated by **World Health Organization** in 2010 actual exercise is “a sub classification of physical activity

that is planned, structured, repetitive, and has as a final or an intermediate objective the improvement or maintenance of one or more components of physical fitness". Exercise is related with different effective medical advantages such as decreased in general death rate, controlled tension, enhanced musculoskeletal wellbeing and diminished dangers of overweight, cardiorespiratory illness, malignant growth and CVD (Chekroud et al., 2018). A Study revealed that physical exercise related programs effectively affect physical capacities, inability, cardiovascular avoidance, personal satisfaction and mind-set (Drigny et al., 2018).

Daily workout is of monstrous advantage to stroke patients such as improved equilibrium and walk, cardiovascular wellness, cognizance, intellectual capacity, upgraded upper limb recuperation and capacity, expanded personal-adequacy levels and diminished fatigability (Idowu et al., 2015). Regular physical exercise after a stroke has been shown to be beneficial. Yet, unless regular exercise is continued, these advantages tend to fade. As a result, stroke victims are advised to engage in physical activity, whether it would be exercise or non-exercise, over time (Drigny et al., 2018). Physical exercise and levels of fitness are generally poor after a stroke and reduced physical fitness is linked to activity limits (Nicholson et al., 2014).

In spite of the significance of physical activity, several stroke patients are not genuinely dynamic (Banks et al., 2012). In any case, the suggested vigorous exercises after stroke are not taken as an interested task by most of patients. Additionally, substantial reductions in workout after minor stroke have been also observed (Drigny et al., 2018). Less engagement to regular exercise programs is an issue that affects people from all backgrounds of society, where many of them giving up exercise without seeing any personalized health advantages (Banks et al., 2012).

Sadly, most of stroke sufferers don't decide to be physically active though they are able to take part in advanced workout programs (Idowu et al., 2015). Researcher discovered a full engagement in individuals with stroke who had participated in a coordinated post-recovery practice program in current years. At that point when those people completed the regulated program and were told to proceed with self-exercise, participation in exercise were fallen at 55% for strength training and 76% for vigorous exercise (Miller et al., 2010).

Scientists recommend that 75% stroke survivors are either not thinking about being dynamic or not ever particularly dynamic (Gill & Sullivan, 2011). Through the finding of causes for not performing home based workout scheme after rehabilitation, can also contribute to a greater perception about the obstacles to self-exercise (Miller et al., 2010). People who have had a stroke seem to be more sedentary, have poorer levels of physical fitness, and have a narrower margin of health than the general populace (Rimmer et al., 2008). Understanding what stroke patients see as the barriers and facilitators to physical exercise is critical to assisting them in becoming physically active (Nicholson et al., 2014). Despite the well-established physical and psychological advantages of regular moderate-intensity physical activity, persons who have had a stroke have several hurdles to engaging in the forms of physical activity that they require to maintain their health and welfare (Rimmer et al., 2008).

1.2 Rationale

World Health Organization (WHO) stated that according to the death rate of stroke Bangladesh is placed as 84th among the other countries. The revealed commonness of stroke is 3/1000 in our country, albeit no information on stroke occurrence has been noted. The huge proportion of stroke related death demonstrates that stroke has a significant economic effect in this country (Islam et al., 2012). Rehabilitation program is the fundamental need for stroke affected patients. Home based exercise is a part of rehabilitation. To prevent recurrent stroke and get optimal recovery exercises are very beneficial, as the regular lifestyle is so vulnerable for the stroke patients. Bangladesh is an emergent nation which is attempting to create services and physiotherapy is a significant piece of medicinal services for forestall sicknesses to improve or augment freedom in individuals with handicaps. A stroke individual's house is regularly the most suitable and powerful setting for recuperating and to improve expanded freedom. Stroke survivors also showed low participation in exercise than those had a variety of other medical issues (Simpson et al., 2011). Though the number of individuals are encouraged to participate exercise, they face numerous boundaries.

On the other hand, the environmental and personal impediment as like as other barriers are varied among the disabled stroke survivors for any kind of exercise. To become physically fit they encounter various problems. Also, there is a deficiency of support for them. These barriers prevent people with stroke in participation to exercise. Without understanding the barriers in performing home exercise, it is difficult to establish an effective home exercise protocol in our country. In order to better understand why post-stroke patients don't perform physical exercise at their home, the researcher conducts this study to identify which barriers and perceptions are associated with exercise participation status who had completed rehabilitation from CRP. The goal of this research is to collect information from the post stroke patients about barriers of performing home exercise which further may help to minimize the barriers of performing exercise at home and improve stroke patients' health outcome. By understanding perceived barriers, investigators will be able to build up further interventions to the target barriers while building upon perceived motivators to increase and maintain stroke survivors' physical activity.

1.3 Research question

What are the barriers in performing home exercise among the patients with ischemic stroke after discharge from Center for the Rehabilitation of the Paralyzed (CRP)?

1.4 Study objectives

1.4.1 General objective

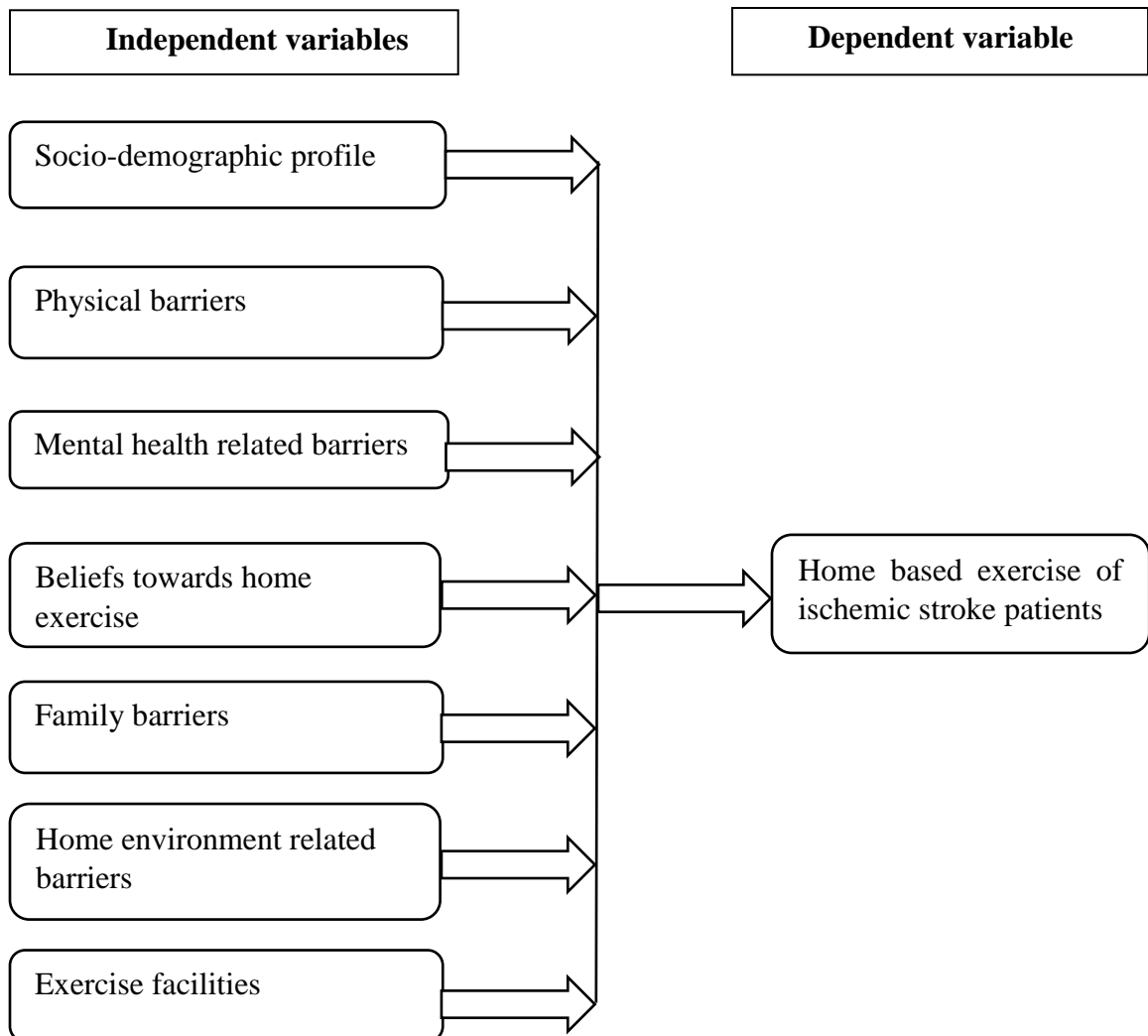
To identify the barriers in performing home exercise among the patients with ischemic stroke after discharge from Center for the Rehabilitation of the Paralyzed (CRP).

1.4.2 Specific objectives

- i. To find out socio-demographic profile among ischemic stroke patients
- ii. To explore the physical difficulties in performing home exercise
- iii. To recognize mental health related barriers through home exercise
- iv. To know about the beliefs towards home exercise of ischemic stroke survivors
- v. To point out the familial obstacles in their own community
- vi. To determine residential environment barriers
- vii. To discover the association between socio-demographic profile and exercise related barriers

1.5 Conceptual framework

1.5.1 List of variables



1.6 Operational definition

Stroke

Stroke is defined like a quickly emerging clinical symptom involving localized impairment of brain function that lasts longer over 24 hours or results in death and has no medical basis besides vascular origin (Hossain et al., 2011).

TIA

A transient ischemic attack (TIA) is described as an incident of localized neurological impairment which is characterized by sudden onset and fast remission that can last <24 hours caused by impaired circulation to a specific area of the brain (Panagos, 2012).

Rehabilitation

Rehabilitation can be defined as a collection of treatments aimed at improving productivity and reducing impairment in people with physical disabilities while they interact with their respective surroundings.

Disability

Disability refers as physically or psychologically problem which restricts an individual's ability to moves, presumptions or engage in certain activities.

Exercise

Any physiological action that improves or preserves fitness levels, general health and wellness is considered as exercise.

Barrier

A hedge or such obstruction which limits mobility or accessibility is known as a barrier.

It is stroke which is a typical, certifiable, and crippling social protection issue around the world (Langhorne et al., 2011). These days it is a significant general medical condition (Srivastava et al., 2010). Stroke is a crucial driver for the obtaining of grown-up people's inability in numerous countries and either 3rd or 2nd main purpose behind dying (Langhorne et al., 2011).

On the other hand psychic imperfection, relating to sensation, intellectuality problem, motor, communion, ophthalmic defacement, attitudinal disablement are consider as the prefix of stroke. These prefix may diverse from person to person (Harrison & Palmer, 2015). Dysphagia, unilateral paralysis, lateral rectus palsy, dysarthria, singultus, spasmodic cervix, shaking, heaving, disparity, sore head, obscuring of eyesight etc are known the typical attributes of this issue (Mohammad, 2013).

Though general load of ischemic versus hemorrhagic stroke is differing among the individual citizens, ischemic strokes is the bigger part. Primarily ischemic and hemorrhagic are the two type of stroke (Boehme et al., 2017) where hemorrhagic stroke is 15% and ischemic stroke is 85% (Amin et al., 2014).

These stroke attacks numerous individuals in elderliness (Miah et al., 2012). Like, in our nation the pervasiveness of stroke at the age of more than forty is three hundred seventy out of 100 thousand (Mohammad, 2013). This rate is rising as the ageing populace (Katan & Luft, 2018) and the occurrence of stroke are anticipated to increase because of the maturing of the populace (Spruit-van Eijk et al., 2010). Stroke inescapability is six hundred per 0.1 million people and recurrence is >149-<299 out of 100,000 individuals. In Dijon of France, the least raised pace of stroke is 2.4 as well as the most is 7.0 at Novosibirsk in Russia per one thousand people (Amin et al., 2014). After the coronary disease and powerful sicknesses like pneumonitis and influenza, stroke is placed 3rd driving explanation in our country regarding mortality which pervasiveness is 0.3/100 (Islam et al., 2013).

The majority of the information in Pakistan originate from the emergency clinic-based case arrangements where the approximated yearly stroke occurrence is 0.1/250 million populace

and that is extended to a gauge of 350 thousand latest stroke cases annually (Wasay et al., 2014). Stroke cases in India are predicted to be 84 to 262 in remote regions and 334 to 424 in metropolitan regions per 100 thousand people. As indicated by the ongoing populace centered investigations the frequency rate is >118 to <144 among 100 thousand people (Pandian & Sudhan, 2013). The pervasiveness of stroke at the Colombo locale in Sri Lanka was 37 for every one thousand grown-ups matured whom were more than 65 years old (Wagachchige Muthucumarana et al., 2018).

Gradually cerebrovascular accident (CVA) was the 1st as well as 3rd driving reason for dying among all the gender of different aged bunches in Thailand (Hanchaiphibookul et al., 2011). The rate of CVA is 1.8 per 1000 people in Singapore. But among the occupants whom ages are more than 50 years, the predominance rate is 4.03 per 100 people (Ng et al., 2013). In between 2010-2020, it is assessed that 17% as the occurrence of stroke will increment in the people of Netherland (Korpershoek et al., 2011). In Australia, CVA is influencing almost sixty thousand individuals consistently to face incapacity as it acts like a main source (Banks et al., 2012).

62 thousands individuals face stroke in Canada every yearly (Hebert et al., 2016). Almost 110 thousands CVA happen in England per annum (Lee et al., 2011). Each year around 232 people among 0.1 million population face CVA in Korea. One person among the forty people is also a sufferer of this stroke (Kim et al., 2019). Then again, roughly 795 thousands people are affected stroke every year in America for the first time where the stroke pervasiveness in grown-ups is about 7000000 (Kim et al., 2015). 180 thousands cases are intermittent strokes (Summers et al., 2009) heading with 5,000,000 people to lingering handicap in U.S.A (Brannigan et al., 2017).

Predisposing factor for stroke is divided into two group. One is modifiable predisposing factor and another one is irreversible factor (Hossain et al., 2011) which is also known as non-modifiable predisposing factor (Boehme et al., 2017). High blood pressure, erythremia, coronary artery disease, alcohol abuse, DM, habit of smoke, hypercholesterolemia, OCPs are the modifiable risk factors. Gender, age etc are likely the non-modifiable predisposing factors (Hossain et al., 2011). Scientist said hazard factor for ischemic CVA are likewise apoA1, psychic cause, work out, social cause, selection food,

belly fat (O'donnell et al., 2010). Then again, patients have a high danger of cerebrovascular accident after a mini stroke which is known as transient ischemic assault after only the initial 12 weeks (Amort et al., 2011). Medical management as well as managing the predisposing factor for cardiovascular disease reduce the possibility of repetitive stroke (Shah et al., 2013). After the inpatient service >2/3 overcomers of stroke go through rehab program (Winstein et al., 2016). So, quicker beginning of rehab program influences the progression result of stroke (Scorrano et al., 2018).

An investigation uncovered that stroke survivor face different type of physical, social, behavioral and environmental obstructions in their house after release from the emergency clinic (Urimubenshi & Rhoda, 2011). That type of obstructions prevent stroke and several disease survivor from completely partaking in the societies, hinder interest in being physically fit, stop the dynamic ways of life viably, decrease individual decision (Rimmer et al., 2008). Throughout the subsequence twenty years, the outbreak of CVA problem is supposed to rise (Langhorne et al., 2011).

Then again, researcher revealed that every people with stroke appeared low psychological and social creation and there is a relationship between poor physical dynamism and low psychosocial invent (Adeniyi et al., 2012). To become truly dynamic is like a supreme work. People with any ages may take part to upgrade their own wellbeing which encourages typical development and advancement. Physically active also can decrease danger of numerous persistent sicknesses and help individuals' perceive, nap and outcome to be more excellent (Piercy et al., 2018).

To recover after stroke, physical exercise which is repetitious and organizes physical activity is very necessary. The purpose of bodily exercise is to support and boost of movability and being healthy. By the repetitive particular activity, physical exercise help people to recover loss of activity after CVA as well as prevent the possibility of recurrent stroke (Banks et al., 2012). More physically active may influence firm healthy wellbeing of the patients as well as stroke recuperation. Also, bodily inertia or physically inactive is a modifiable predisposing factors for the first time and frequent stroke (Damush et al., 2007).

Yet, physically active is demonstrated high apparent boundaries to the stroke affected people (Idowu et al., 2015). Physical movement's negative results might be seen as reoccurrence of stroke, ache, humiliation, bothering about performing the incorrect exercise, basophobia, effect related assumption, lack of success. These factors also prevent participants to perform exercise (Morris et al., 2012). An overview shows that insufficient time regarding prime problems, possibility of being injured, determination, inspiration, monotony, impence are the significant obstructions in partaking daily physical activity (Costello et al., 2012). Medical conditions, lethargy, high price of exercise related materials, hazardous conditions, less exercise related provision are also the cause of being poor physically active for the stroke survivors (Junker & Carlberg, 2011).

Study stated that participants may face obstacles in physical activity from social or physical surrounding; or from both of surrounding (Mulligan et al., 2012). Another investigation indicated 44.2/100 participants were non follower while 55.8/100 participants were disciple to home based exercise among 52 stroke survivors (Ogwumike et al., 2014). In 2006 Shaughnessy showed absence of self-viability, exhaustion, absence of conviction about advantages of activity, absence of data and guidance on practice from specialist, expanding age, as impediments to physical activity as asserted by 321 participants (Mulligan et al., 2012). Proper exercise equipment, uneasiness, financial expenses and belief that exercise garments is weird are the most conventional obstacles for stroke patients (Idowu et al., 2015).

The caretaker of stroke survivors as well as the stroke patients are incredibly influenced by psychosocial and physiological prosperity (Carod-Artal & Egado, 2009). Also, because of psychiatric and corporal injury they can face trouble in participating everyday work (Kim et al., 2015). Caretaker also narrated some general cause for non-adhesion to home exercise. These were spasticity, ache, fatigue and sickness. Feeling of vomit, swollen, vertigo were referred by them as uncommon cause for not participating in home exercise (Scorrano et al., 2018). Stroke survivor also mentioned that they faced barriers in performing exercise because of the physiological disability which they confronted after the cerebrovascular accident (Damush et al., 2007).

In case of requisition of any caregiver for stroke survivor, being fatigue can be much incapacitate for them when they have to perform home exercise by himself/herself (Ogwumike et al., 2014). An investigation of elderly distinguished that poor health and more exhaustion acted like an influencer which stopped participants to start home based exercise (Jurkiewicz et al., 2011). In another examination a gathering shows that activity makes stroke patients exhausted or weariness or it is difficult task to performing for them (Malone et al., 2012). A few stroke survivor are change in numerous angles due to stroke. So occupational specification was mentioned by them as an apparent hindrance like as feeling awkward or being humiliated (Nicholson et al., 2014).

Then again, according to a research 33/100 stroke survivors mentioned that they faced muscle spasm or rigidity where this rate was 10/100 in other random individuals (Klit et al., 2011). In between 15 days just after a CVA, stroke survivors built up an expansion of muscle tone. This rate was about 25% (Wissel et al., 2010). Stroke victims face gait related problem because of unilateral paralysis of the body. This is called hemiplegia which causes deviation of symmetrical posture as well as muscle weakness and is responsible for poor balance and postural abnormality (Kim et al., 2015).

Pain is another result of stroke. It has accounted that in the initial 24 months just after a stroke incident, >14% to <50% patients are influenced by pain (Hansen et al., 2012). Stroke survivors can endure many kinds of ache because of their condition. Central neuropathic pain after stroke, pain at hemiplegic shoulder, cephalalgia as well as muscle and bones related torment are the possible type of ache among stroke victims (Klit et al., 2011).

An examination showed that 5% to 11% stroke victims are influenced by central post-stroke pain and >14% to <41% stroke survivor deal with shoulder ache in between 24 weeks just after a CVA. Then again, 4/100 to 11/100 people around the initial 24 months of stroke, present late beginning cephalalgia. But in acute phase of different types CVA, >26% to <32% stroke survivor had faced cephalalgia (Hansen et al., 2012). Another exploration guessed that 39 out of 100 stroke survivor said that they were affected by chronic pain within the past 24 month or just after affected by stroke (Klit et al., 2011). Physical activity can heal musculoskeletal related ache but if that pain do not control properly and carefully, it becomes an obstacle (Jackson et al., 2018).

Individuals with long time illness appear to have phobia of being injured when they have to be physically active (Damush et al., 2007). In this way, CVA survivor have also fall phobia. It is assessed about >31%-<89%. Again, >36%-<74% falling injury was occurred at home after release from hospital. An analysis revealed that 3.4-17.8 falls are happened every day among one thousand participants (Batchelor et al., 2012). Because of fall phobia, a few people are inhibiting from their activity which is recommended by a study following the connection in between fall phobia and functional activity quality (Jackson et al., 2018). Phobia of being injured as well as fall phobia are ordinarily referred as an obstacle to physical activity for grown-ups people (Costello et al., 2011). About 3/100 patients with stroke are face at least 2 or more falls which is also known as intermittent fall (Batchelor et al., 2012). In a current investigation according to the participants, there was a huge notable converse connection between fall phobia and less involvement in physical activity. Fall phobia and more involvement in physical activity also represent a huge notable converse connection (Jackson et al., 2018). People affected by stroke rely upon caretaker for support since they do not prefer to perform home exercise by himself/herself. Study stated that this is because of fear of falling (Scorrano et al., 2018).

Individual thought has a significant impact on the attitude which is related to physical activity. One of the prime causes of physically non-active is the negative trustiness to be physically activeness and performing less exercise by their own concept (Mulligan et al., 2012). Phobia about the result of exercising is connected with the post stroke disability. This fear forbid stroke survivors in performing physical activity (Damush et al., 2007). Study revealed that exercise related boringness and poor attraction acted like obstructions to commitment in being physically active (Morris et al., 2012). Like everyone, patients of stroke detailed that low energy, less inspiration or unwillingness kept them away from working out (Damush et al., 2007).

Poor mental health condition and their personal concept about exercise influence them in participating home based arrangement of exercise which was accounted by their caretakers (Scorrano et al., 2018). A survey reveal on the feedback to an inquiry that possibility of being injured and insufficient timetable were the prime obstacle for exercise (Costello et al., 2011). A critical non positive connection was additionally revealed about the believability on poor physical activity from stroke survivors own concept which mentioned

that being more physically active may occur a recurrent stroke or that would be harmful for the body. This analysis means that a massive number of stroke survivors had a harmful belief about physical activity while rest low number of stroke survivors performed exercise even with being less physically active (Jackson et al., 2018). Trusting about the difficulty of exercise and poor knowledge about how or whither to practice were boundaries for being physically active (Morris et al., 2012). Poor conviction acted like an obstacle for stroke patients in attending preliminary exercise referral schemes (Sharma et al., 2012).

There is a huge problem on prolong effect and possibility of functional cure which is influenced by post-stroke depressive disorder (Johnson et al., 2016). Despondency had an increasing occurrence rate of 52/100 around 60 months following stroke along with the outbreak of 29/100, where stroke survivor stayed stable in primary 120 months according to various analysis (Ayerbe et al., 2013). The prevalence of prime depressive disorder after a stroke were >2%-<41% (Srivastava et al., 2010). 31 participants out of 100 participants faced depressive disorder within the first 60 months of stroke which is accounted by the 25488 participants in sixty one latest cohort meta-investigation (Robinson & Jorge, 2016).

Moreover, Learning has a significant purpose in encouraging effective self-administration of long term illness and further occurrence of stroke (Hafsteinsdottir et al., 2011). Wisdom is fundamental for an intensive comprehension of the facilitators and obstacles to work out. But, stroke survivors' knowledge is limited (Simpson et al., 2011). Poor wisdom and low comprehension about home based exercise acted as influencer which impact on stroke patients to adherence with exercise (Ogwumike, 2014). Analysis showed that poor wisdom about the category and severity of post stroke physical activity also acted like an obstacle for stroke survivor (Nicholson et al., 2014).

Several survey revealed that participants affected with neural disorder may experience humiliation during exercise which is performing in open spaces in front of other people (Mulligan et al., 2012). Stroke survivors said that they realize of being rejected as they are too dependent their family and ally for help. They also mentioned that they feel guiltiness and lack of willingness during seeking help from their family and ally for additional work (Nicholson et al., 2014).

80 stroke survivors out of 100 survivors return their house though 40 survivors out of those 80 survivors require inalterable and short term support in the setting of home (Ogwumike et al, 2014). The mass well-known obstructions of in participation home exercise were different type of additional duties of caretakers, ordinary medical problem, tension and load of caretakers, poor community based help, poor self-concept and mental state, poor family support, fall phobia (Scorrano et al., 2018).

Researcher found that 42/100 members mentioned harsh climate as an environmental barrier to be physically active (Jackson et al., 2018). However, another analysis mentioned that proper environment, financial expenses of protocol, arrangements, learning, exercise tools, health center employees training and intimation acted as environmental barriers among the disable stroke survivors to be physically active (Rimmer et al., 2008). Natural and social elements are distinguished as boundaries to exercise for individuals living in far off and country zone. They are not skilled to discover time for the duties and obligations related with their domestic task, family and job (Boehm et al., 2013).

Researcher reveals that exercise in home and physically activation which are prescribe by doctor for the elderly can act as a useful part of social care. So physical activity of elderly and other people is seen to correspond with social care which is a social agent. There was a research on the U.S.A-African and countryside elder female where family support for being physically active also correspond with more involvement in physical activity (Damush et al., 2007). 28 stroke survivors out of 100 stroke survivors have transportation problem and 38.4 stroke survivors out of 100 stroke survivors faced poor social help which was the most widely recognized relational hindrance to physical activity (Jackson et al., 2018). Poor support during exercise and prospect deficiency for physical activity acted like obstacles in social environment for the stroke patients (Mulligan et al., 2012). Poor inspiration or low power for exercise also acted like a barrier for stroke survivor in present of social support (Damush et al., 2007).

3.1 Study design

To arrange this study a cross sectional design has been chosen by the researcher. For gather the statistics, this design is acted like a successful system to follow the study objective. Even if demand can occur over a prolonged point of time, entire assesses of this study are acquired at an individual period for the study people (Sedgwick, 2014). For experimental or narrative epidemiology a cross-sectional study design is the easiest form. To meet the data of person's behaviors, performances and wisdom according to physical aspects, it is one of the most common forms of research. A cross sectional is a particular approach which is related to the interest of the participants. It engages the investigators with some queries about a certain matter or topic by asking a massive class of population.

3.2 Study area

Data are collected from the Neurological unit of Centre for the Rehabilitation of the Paralyzed (CRP) which is Bangladesh's largest rehabilitation center for stroke sufferers. It is a non-profit organization in Bangladesh that provides entire rehabilitation to stroke survivors. Physical therapy, psychological rehabilitation, economic rehabilitation, and a planned discharge are all significant parts of CRP's holistic approach to rehabilitation, which recognizes that all aspects are vital for its success. Once the individual returns to the community, additional support is provided. CRP is also establishing a stroke rehab program for stroke victims. For that reason CRP was consider as a study place.

3.3 Study population

Study population were the patients with ischemic stroke after discharge from CRP by following the inclusion and exclusion criteria.

3.4 Sample size

For the design of a research, there is a significant role to determine the correct sample size (Charan & Biswas, 2013).

So to calculate proper sample size, the equation for cross sectional study is:

$$\begin{aligned}n &= \frac{Z^2 pq}{d^2} \\ &= \frac{(1.96)^2 \times 0.3 \times 0.7}{(0.05)^2} \\ &= 323\end{aligned}$$

Here,

Sample size = n

Confidence interval, Z = 1.96

Prevalence of stroke patients, p = 0.3 (Islam et al., 2013)

Expected non-prevalence, q = (1-p)

$$= (1 - 0.3)$$

$$= 0.7$$

Margin of error, d = 0.05

The estimated sample size was 323 according to the prevalence of stroke. But 107 samples were selected because it was quite difficult for researcher to collect data due to limited time during COVID-19 pandemic situation and this academic research was under the personal financing.

3.5 Sampling technique

Sample was chosen conveniently for the study people with ischemic stroke who discharged from Center for the Rehabilitation of the Paralyzed (CRP) because this selection is the fastest, uncomplicated inexpensive procedure.

3.6 Inclusion criteria

- Ischemic stroke patient with a verified diagnosis by the physician (Amin et al., 2014).
- The age range of the participants for this research is 40-69 years (Miah et al., 2012).
- Both male and female patients are included (Poorthuis et al., 2017).
- Discharge from rehabilitation center (Center for the Rehabilitation of the Paralyzed) at least 3 months ago (Drigny et al., 2019).
- First or recurrent stroke that is followed by upper and/or lower limb paresis (Mudge et al., 2009).
- Participants who are capable of giving informed consent (Urimubenshi & Rhoda, 2011).

3.7 Exclusion criteria

- People affected by hemorrhagic stroke are excluded from this study.
- Participants whom age range is less than 40 or more than 69 years.
- Patients with tumor, cancer, TB (Sheu et al., 2010) and other confirmed progressive neurologic disorders (Mudge et al., 2009).
- Participants who suffer from aphasia (Frimpong et al., 2014).
- Stroke survivors having any cognitive or mental impairments (Kalaria et al., 2016).
- Individuals who refuse to consent for conduct this research.

3.8 Method of data collection

3.8.1 Data collection tools:

- Verbal consent form
- Mobile phone
- B-PADS (modified version)
- File
- Paper
- Pen
- Pencil
- Calculator
- Laptop
- Printer

3.8.2 Questionnaire:

A socio-demographic chart and semi structured questionnaire were used for data collection to find out the barriers in performing home exercise among post ischemic stroke patients who were discharged from CRP.

3.9 Data collection procedure

Data was collected from 01.07.2021 to 30.09.2021. At first the researcher had to find out the people with ischemic stroke who had discharged from CRP by taking permission from the ethical body of BHPI. Those participators of the research had to fulfilled inclusion. Data was collected by the questionnaire via phone call. The investigator stated about the conduct of participator in this study through phone call. Researcher accepted a verbal consent from every participant. The investment of all members was on intentional premise and the consent form was comprehend by them. Those was guaranteed by the members. For better assume of any questions, the inquiry was posed by the Bangla format. Interview would be continued until the target point was gained. Every interview might take 15-20 minutes. For pulling back the assent, all members reserved the absolute privilege. During interview participants claimed to reject of any question to answer. The objectives and aim of the study were clarified by the researcher to them. Their data could be reminded private

which was educated obviously by the analyzer. Researcher clarified that later on incidents similar to them could be acquired an advantage from this study even though there might not an immediate profit for the members by the investigation. The investigation could not unsafe to the members which was guaranteed by the scientist. There would not private distinguished to any issuance accommodating the consequence of this research. Data of this investigation was namelessly encrypted to guarantee the secrecy.

3.10 Data analysis

Data was evaluated by using descriptive statistics. A methods of explaining about the collection of findings with its most important properties are referred to as descriptive statistics. Statistical Package for the Social Science (SPSS) version 20.0 was used to examine the data. Every questionnaire was double-checked for any statistics that was confusing or missing. The investigator named the variables in SPSS's variable view and established the data values, types, decimal, measurement level and label alignment. The next step was to enter data into SPSS's data view. After all of the data had been entered, the researcher again double-checked the data to make sure that it had been appropriately converted from the questionnaire sheet to the SPSS data view. The original data was then prepared for SPSS analysis. Data was examined through descriptive statistics where percentages were generated and displayed by using bar graphs, tables, pie charts along with other methods. The bar graph and pie charts are decorated by Microsoft Office Excel 2013. A lot of information was gathered as a result of this survey. All of the findings provided a deep insight into the barriers that ischemic stroke patients face while conducting home exercise.

Chi square (χ^2) Test

Chi square (χ^2) Test is the most popular discrete data hypothesis testing method. It is a non-parametric test of statistical significance for bivibrate tabular analysis with a contingency table. In this study Chi square (χ^2) test was done to measure the associations between two variables. It was used to test the statistical significance of results reported in bivariate tables.

Assumption

Different and Independent variable

Variables were quantitative

Normal Distribution of the variable

Formula: the test statistics follow:

$$\chi^2 = \sum_{i=1}^k (O - E)^2 / E$$

Here, χ^2 = Chi square value

Σ = The sum of

O = Observed count

E = Expected count

Chi square is the sum of the squared differences between observed (O) and the expected (E) data divided by expected (E) data in all possible categories.

3.11 Ethical consideration

A systemic step was followed to complete this research. At first the Institutional Review Board (IRB) which is the ethical committee of Bangladesh health professional institute (BHPI), Savar, Dhaka approved the submitted research proposal. World Health Organization (WHO) and Bangladesh Medical Research Council (BMRC) guideline were also abided to complete this research. The investigator had been started initially this study after receiving the consent from the authority. For gathering data, the investigator had been received permit from the neurology unit of CPR at Savar. To associate with the research all the participators were notified properly. Any kind of biasness were eliminated properly throughout the information collection and analysis. For accept the assent a written consent form was conducted verbally for each participator of the study via phone calling. The investigator clarified to all participants and the institution that they were not to be harmed by this research and the investigator would highly sustained of all types of loyalty. She might make sure not to leak out a bit of privacy. She also might be aware about the clinical and academic systems. So, the investigator had the knowledge about which should not to perform and which should to perform to conduct this research. Any kind of rights of any participators were hold sincerely. They were also allowed to ask any research linked queries to the investigator freely.

Data were analyzed by descriptive statistics and computed through percentages then submitted by tables, bar chart and pie chart.

4.1 Socio-demographic profile of the participants

4.1.1 Age

The researcher reveals that among the 107 participants most of them were in between 50-54 years (n=23), 22%. 40-44 years were 15% (n=16), 45-49 years were 15% (n=16), 55-59 years were 18% (n=19), 60-64 years were 16% (n=18) and 65-69 years were 14% (n=15) participants.

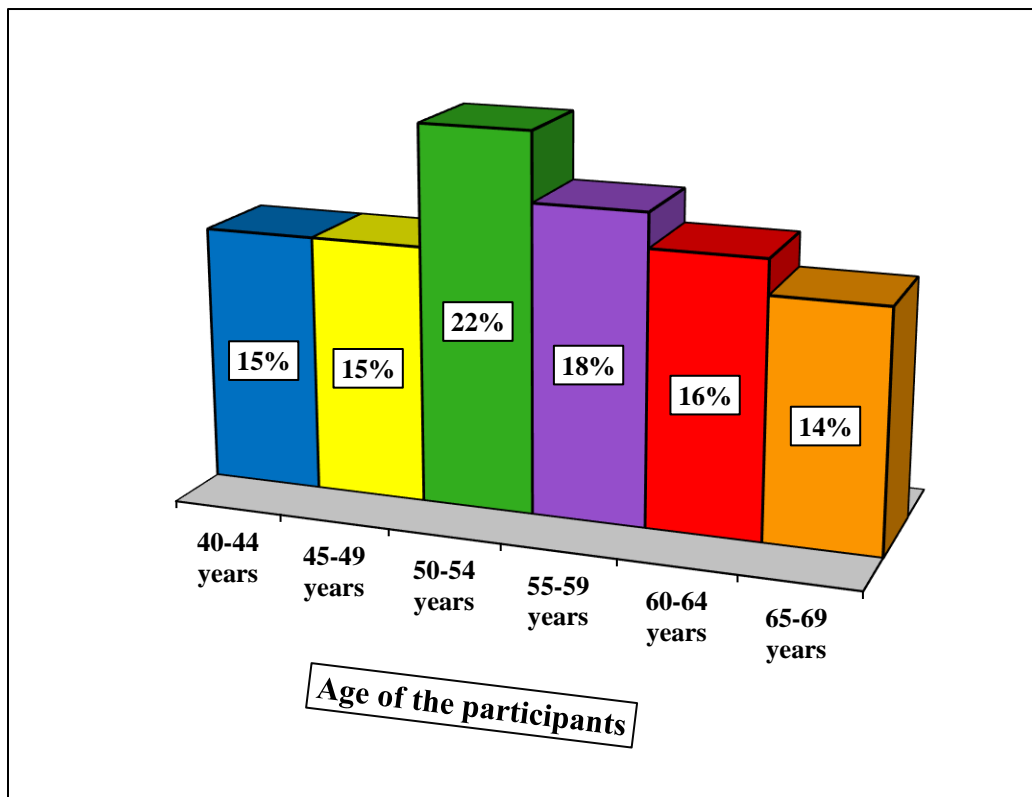


Figure 1: Age of the participants

4.1.2 Gender of the participants

Here figure No.02 shows that **females were less affected than male**. In this study, 68% (n=73) participants were male and 32% (n=34) participants were female.

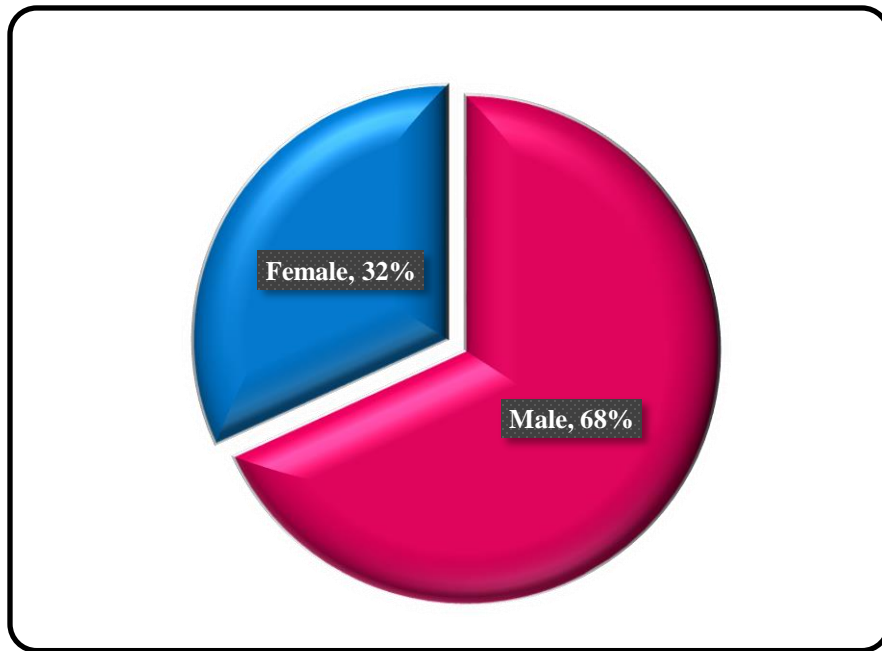


Figure 2: Gender of the participants

4.1.3 Residence of the participants:

Among 107 participants, 21% (n=23) participants lived in rural area, 24% (n=25) participants resided in urban area and 55% (n=59) participants dwelled in semi urban area.

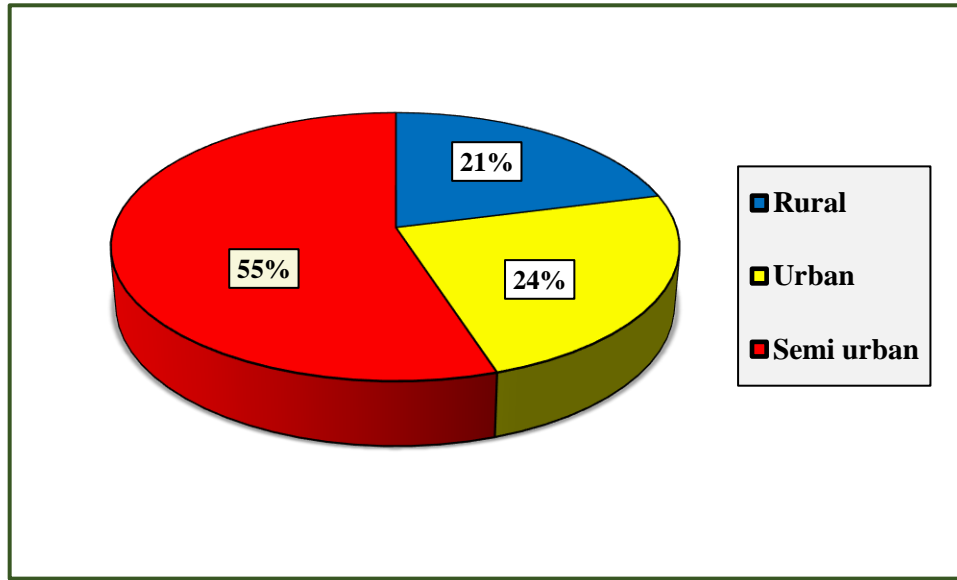


Figure 3: Residence of the participants

4.1.4 Marital status of the participants

Table I revealed that out of total participants, 96% (n=103) participants were married, 2% (n=2) participants were unmarried, 1% (n=1) participant were widow and 1% (n=1) participant were widower. So in this research, **most of the participants were married.**

Table I: Marital status of the participants

Marital status	Percentage	Participants
Married	96%	103
Unmarried	2%	2
Widow	1%	1
Widower	1%	1
Total	100%	107

4.1.5 Educational status of the participants

This bar chart focused that the educational status of 32% (n=34) participants were primary level which was the most prominent than other values. 19% (n=20) participants were illiterate, 17% (n=18) participants had completed their S.S.C level, 12% (n=13) participants had completed H.S.C level, 13% (n=14) participants were graduated and 7% (n=8) participants were post graduated.

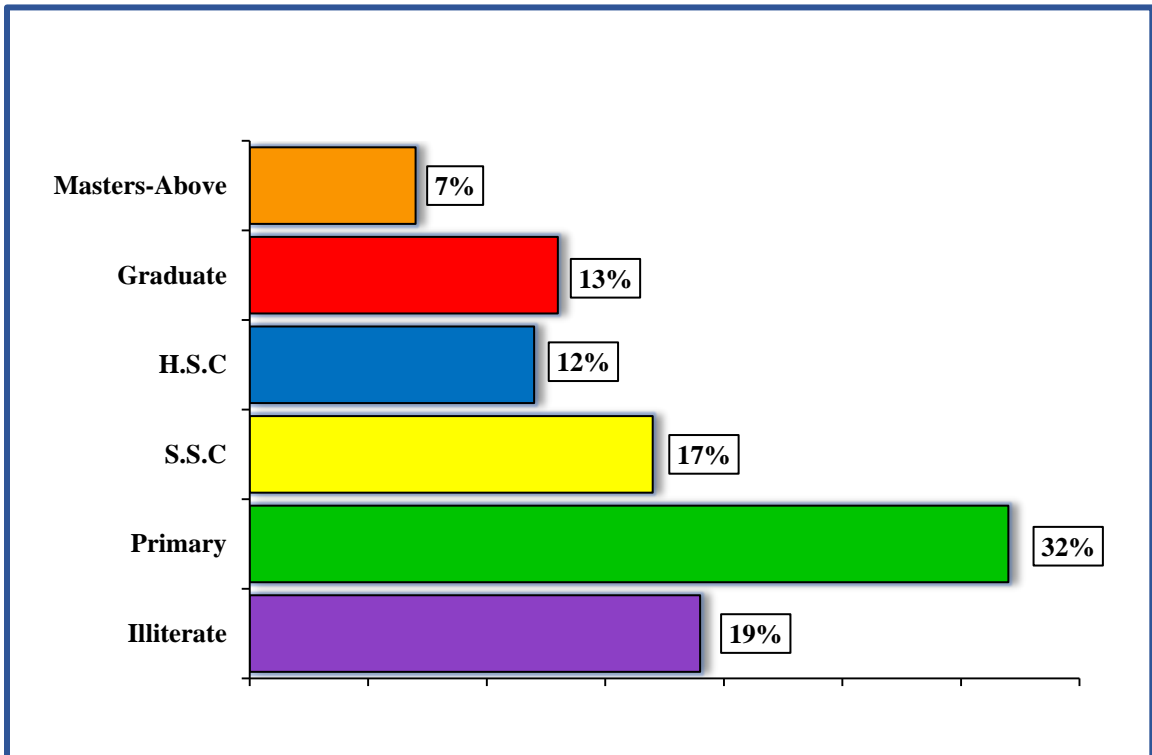


Figure 4: Educational status of the participants

4.1.6 Occupation of the participants

This analysis presents that around 107 participants were assumed as sample. Here, 12 participants were service holder (11%), 29 participants were housewife (27%), 4 participants were farmer (4%), 4 participants were teacher (4%), 1 participant was lawyer (1%), 20 participants were businessman (19%), 11 participants were out of work (10%), 3 participants were day labor (3%) and 23 participants were in other occupations (21%).

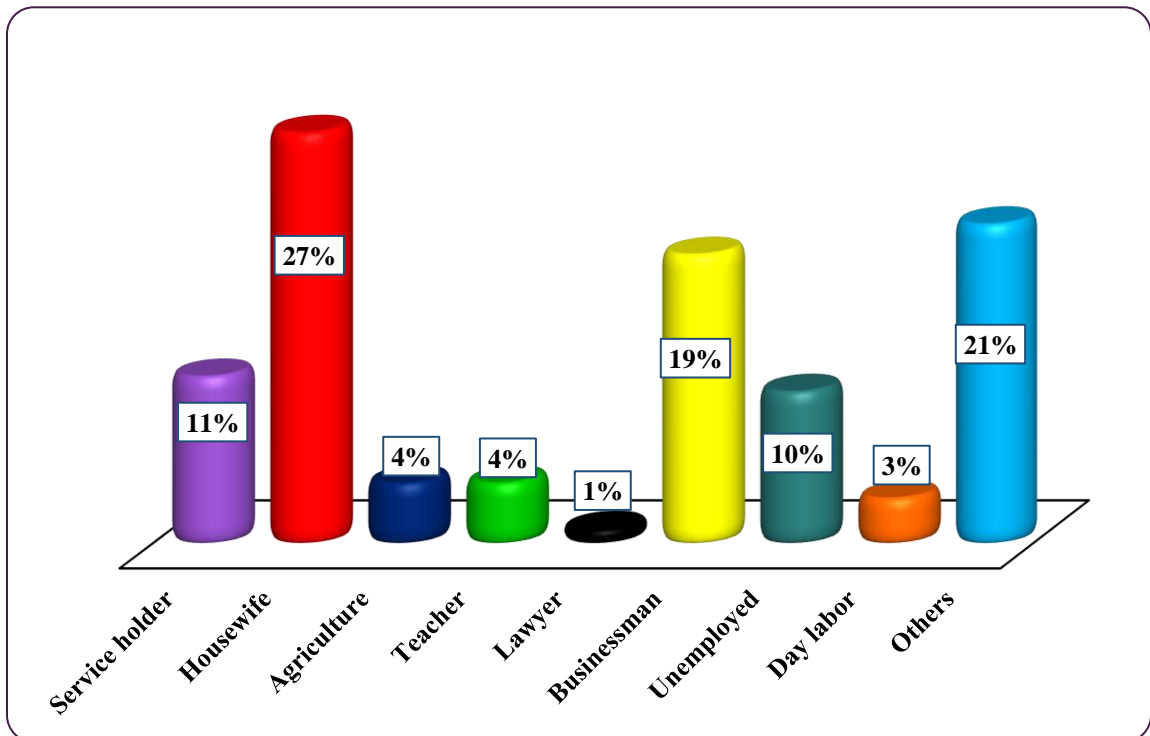


Figure 5: Occupation of the participants

4.1.7 Family type

In family type, nuclear family was 70% (n=75) as well as joint family was 30% (n=32) among all the participants.

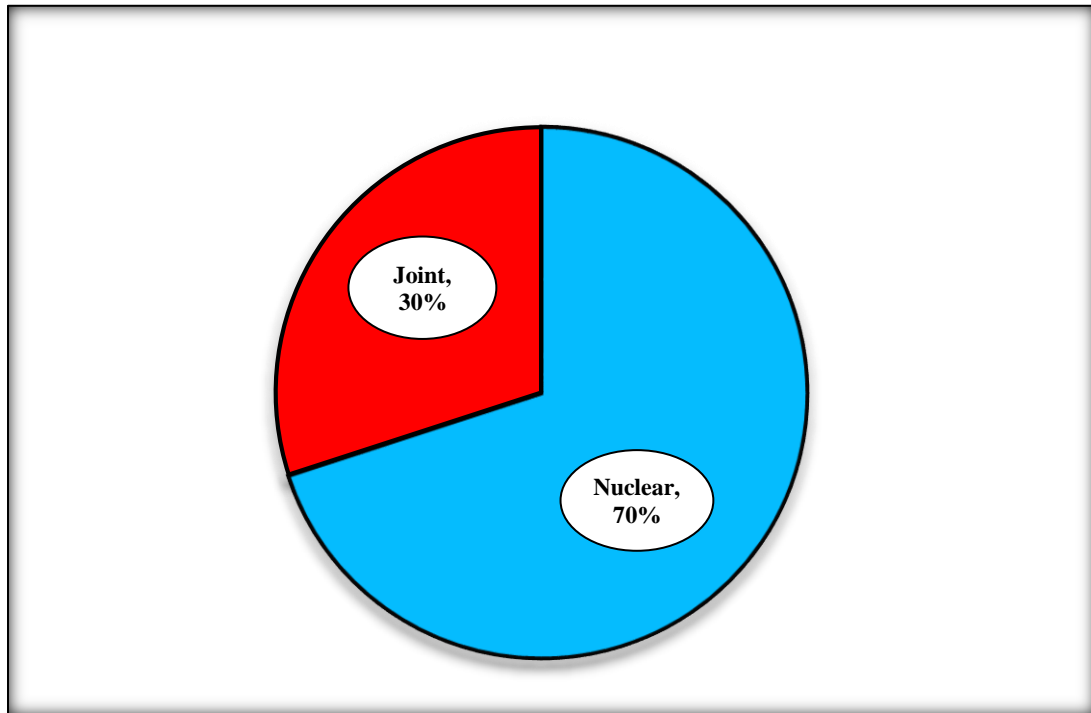


Figure 6: Family type of the participants

4.1.8 Family members

Among the total number of subjects, 1-5 family members were 65% (n=70), 6-10 family members were 32% (n=34) and more than 10 family members were 3% (n=3). So, **maximum participants had 1 to 5 members in their family.**

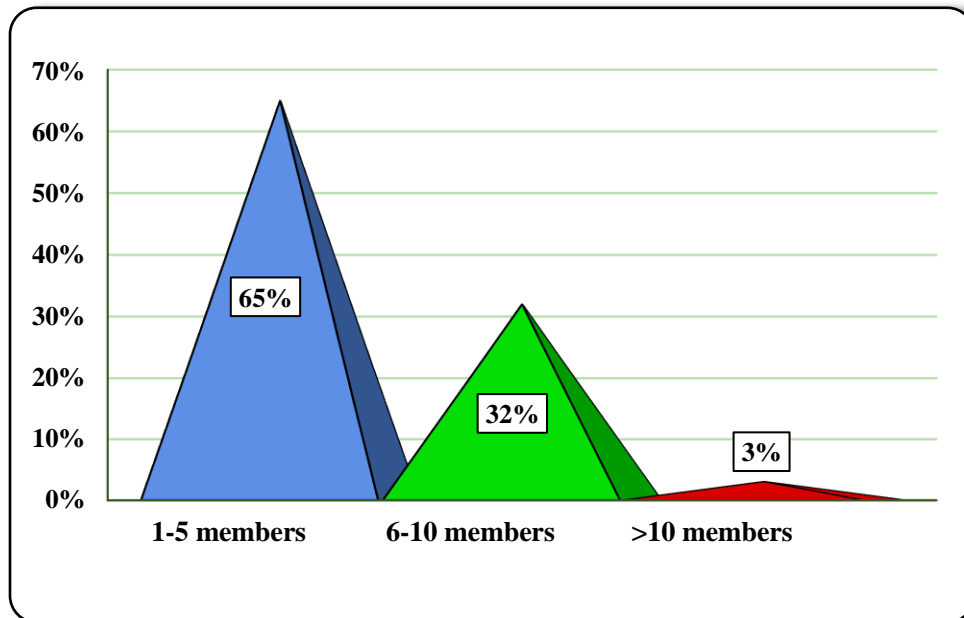


Figure 7: Family members

4.1.9 Use of assistive device

The pie chart shows the use of assistive device by the participants. Here among 107 participants, assistive device were used by 13% (n=14) whereas 87% (n=93) participants had no assistive device.

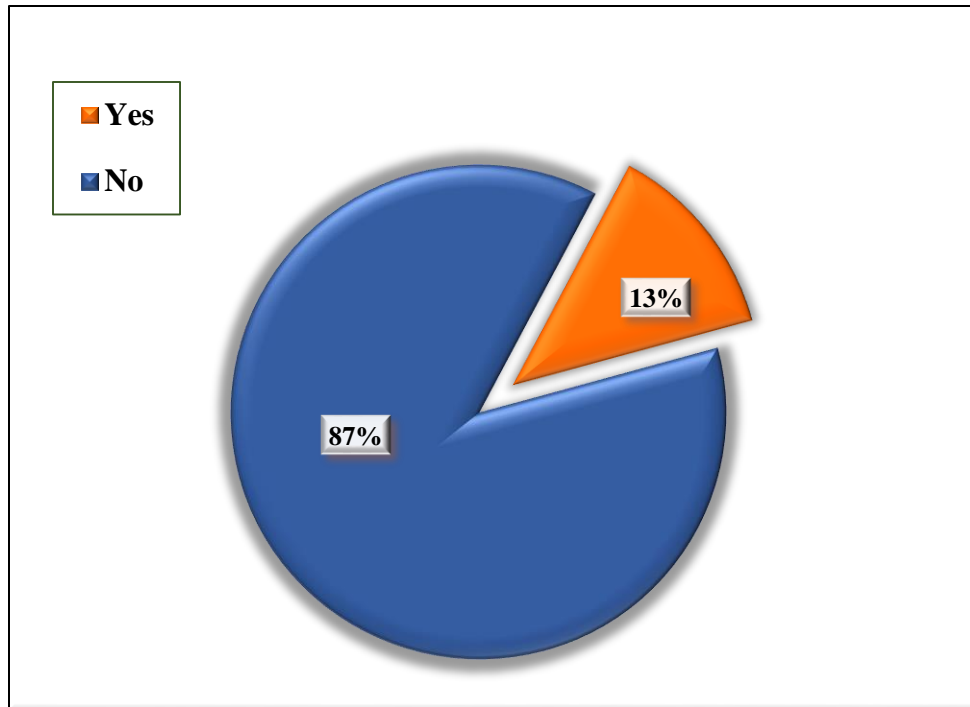


Figure 8: Use of assistive device by the participants

4.1.10 Use of affected limb

Among the 107 participants 6% (n=7) candidates could fully utilize and 94% (n=100) candidates could partially use their affected upper limb. There was no participants whom affected upper limb were unused. So, we found from this variable as **maximum (94%) candidates could partly usage their affected upper limb.**

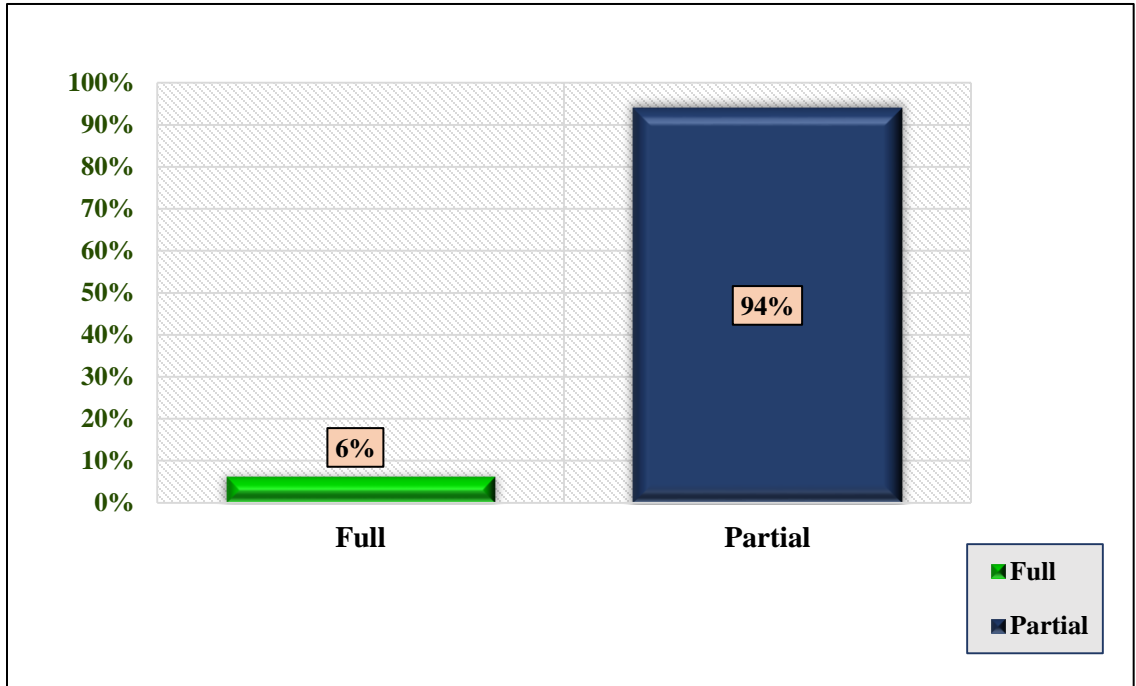


Figure 9: Use of upper limb

On the other hand, among all the participants 12% (n=13) participants could fully and 85% (n=91) participants could partially use their affected lower limb. 3% (n=3) participants made no use of the affected lower limb. So, **most of the participants (91) could partially utilize their affected lower limb.**

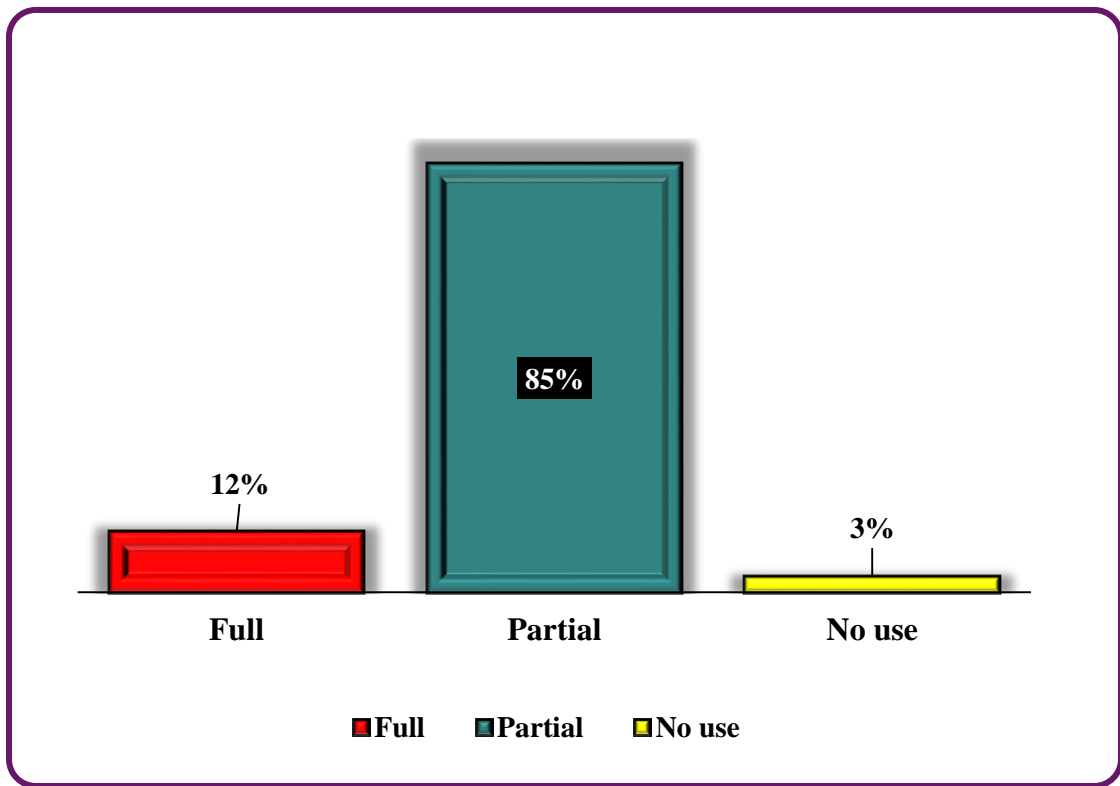


Figure 10: Use of lower limb

4.2 Barriers related statistics

4.2.1 Physical barriers

4.2.1.1 Feeling of pain during exercise

The analyzer desired to discover whether physical pain prevents the participants from exercise or not. Physical pain resisted 28% (n=30) participants to perform exercise, 38% (n=40) participants occasionally stayed away exercise due to pain whereas 34% (n=37) were not affected by pain to carry out exercise. Here, **more than 1/4 participants faced problem to perform exercise due to physical pain.**

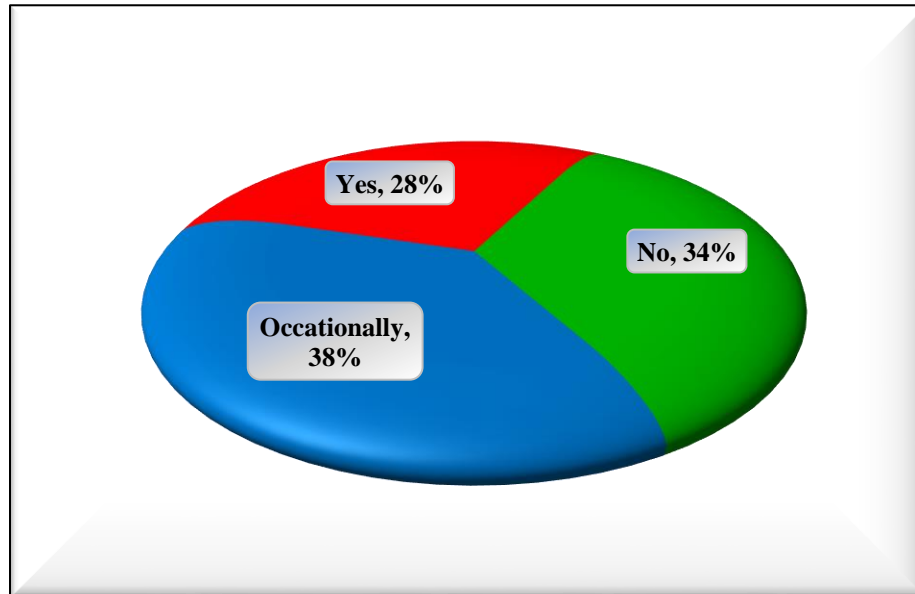


Figure 11: Feeling of pain during exercise

4.2.1.2 Lack of energy

In total 100% of participants, 20% (n=21) participants felt lack of energy, 44% (n=47) participants did not face lack of energy and 36% (n=39) participants occasionally felt lack of energy during exercise.

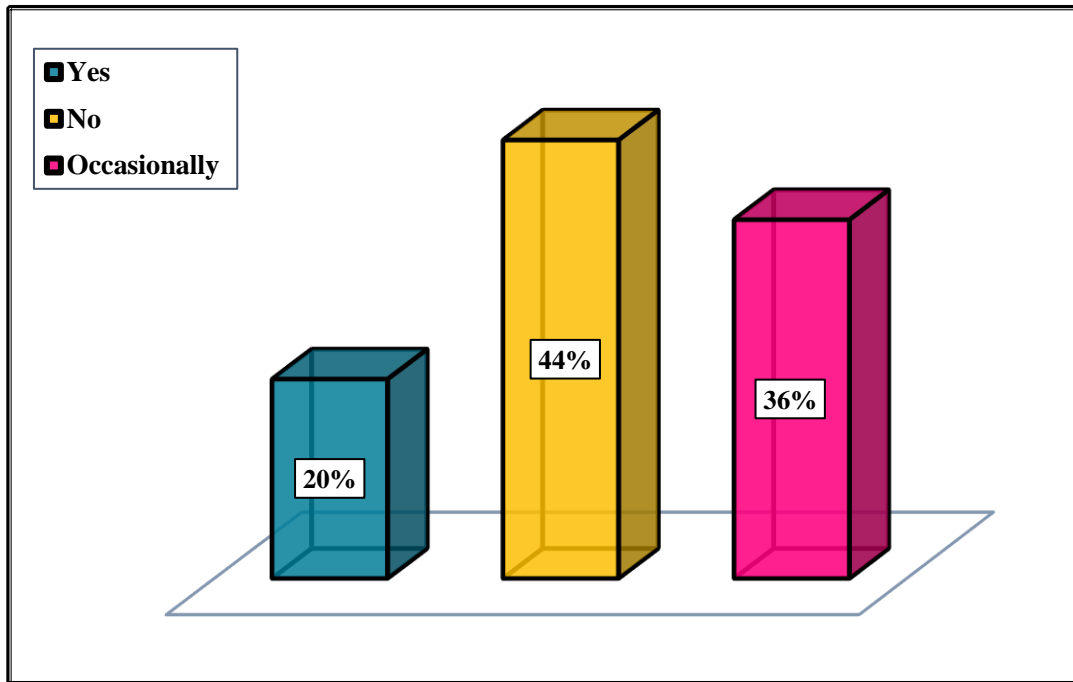


Figure 12: Lack of energy to do exercise

4.2.1.3 Health condition to perform exercise

In the number of 107 participants, 66% (n=71) participants answered that they had good health condition to perform exercise. 34% (n=36) participants replied as they could not conduct exercise due to poor health condition. So this result indicates, **almost 1/3 participants faced negative impact for their additional health condition.**

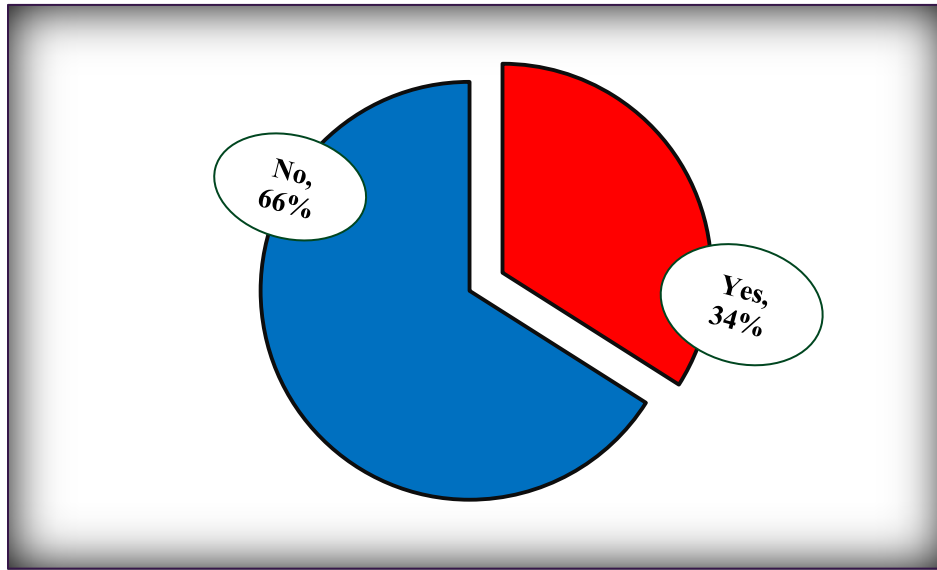


Figure 13: Health condition prevents to perform exercise

From 13 no. figure we can see, 36 (34%) participants faced problem to perform exercise where 8% (n=8) had heart disease, 10% (n=11) experienced with diabetes, 10% (n=11) went through blood pressure, 2% (n=2) got respiratory complication and 4% (n=4) found other complications.

Table II: Poor health condition

Health conditions that prevent to perform exercise	Percentage	Participants
Heart disease	8%	8
Diabetes	10%	11
Blood pressure	10%	11
Respiratory complication	2%	2
Others	4%	4
Total	34%	36

4.2.1.4 Feeling of tiredness to perform exercise

Analysis shows that between 107 participants, 27% (n=29) participants got tired, 40% (n=43) participants didn't become tired and 33% (n=35) participants turned occasionally tired during performing exercise.

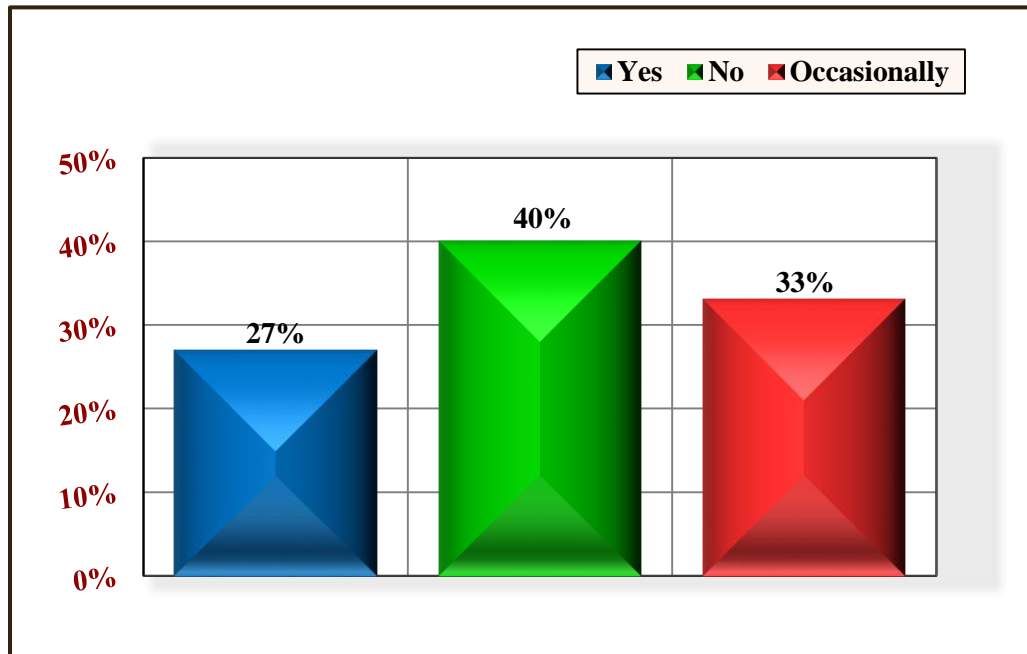


Figure 14: Feeling of tiredness to perform exercise

4.2.1.5 Present of muscle stiffness

Here is the total outcome about the presence of muscle stiffness among all participants.

Though 27% (n=29) participants had muscle stiffness, 73% (n=78) participants had not.

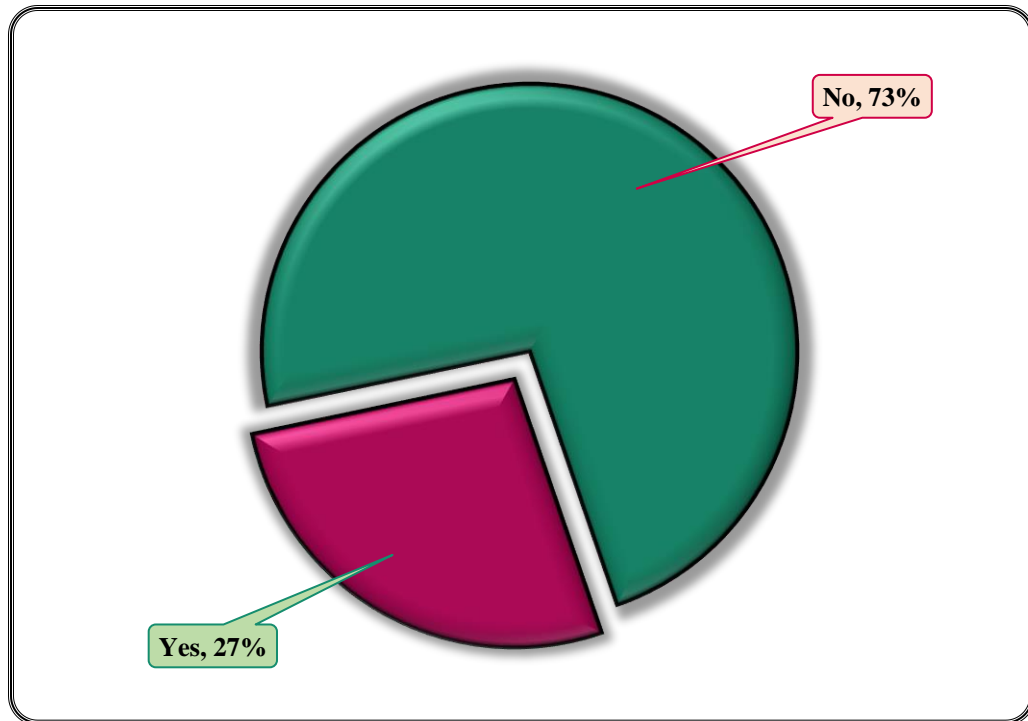


Figure 15: Present of muscle stiffness

From previous result (**figure No.15**) those 29 (27%) participants narrated that 6% (n=6) of them could not perform exercise, 8% (n=9) participants had no problem to perform exercise and 13% (n=14) participants had occasionally done exercise due to muscle stiffness. So, **muscle stiffness was a cause of not proper participating in home exercise.**

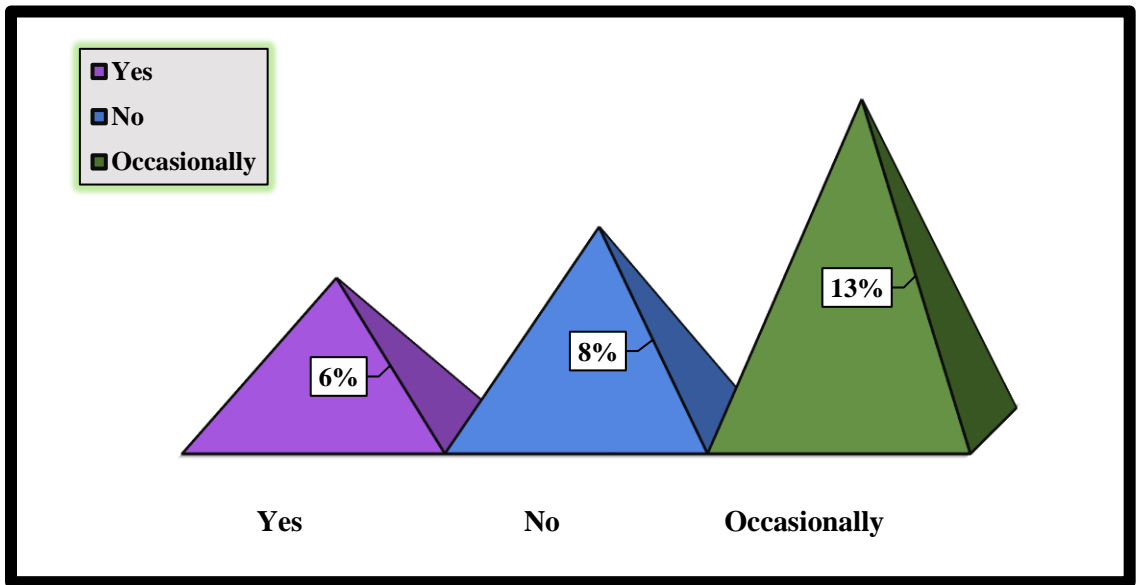


Figure 16: Effect of muscle stiffness on home exercise

4.2.1.6 Injured from exercise

The pie chart demonstrated that 11% (n=12) participants got injury while 89% (n=95) were not get any injury during performing exercise.

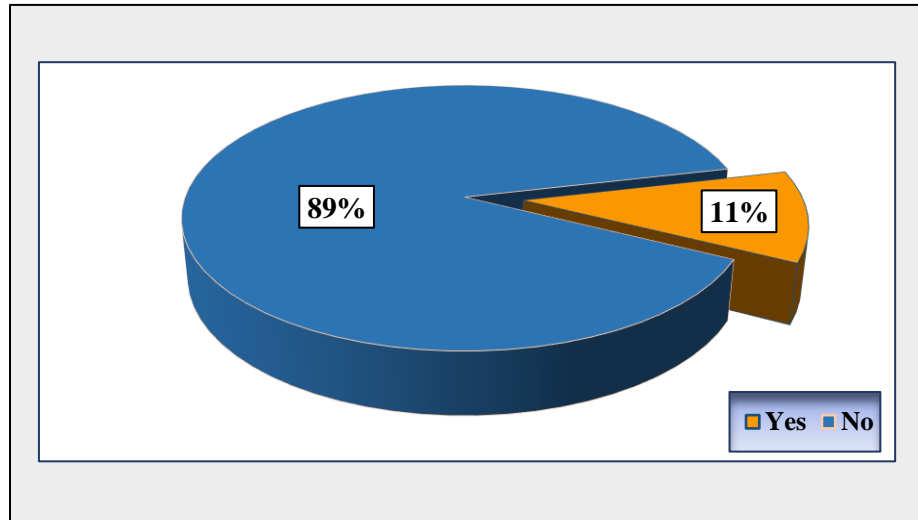


Figure 17: Injured from exercise

That 11% participants from the **figure no.17** mentioned that 2% (n=2) of them got sprain, 1% (n=1) obtained bruises, 3% (n=4) received muscle cramp and 5% (n=5) earned others injury during exercise.

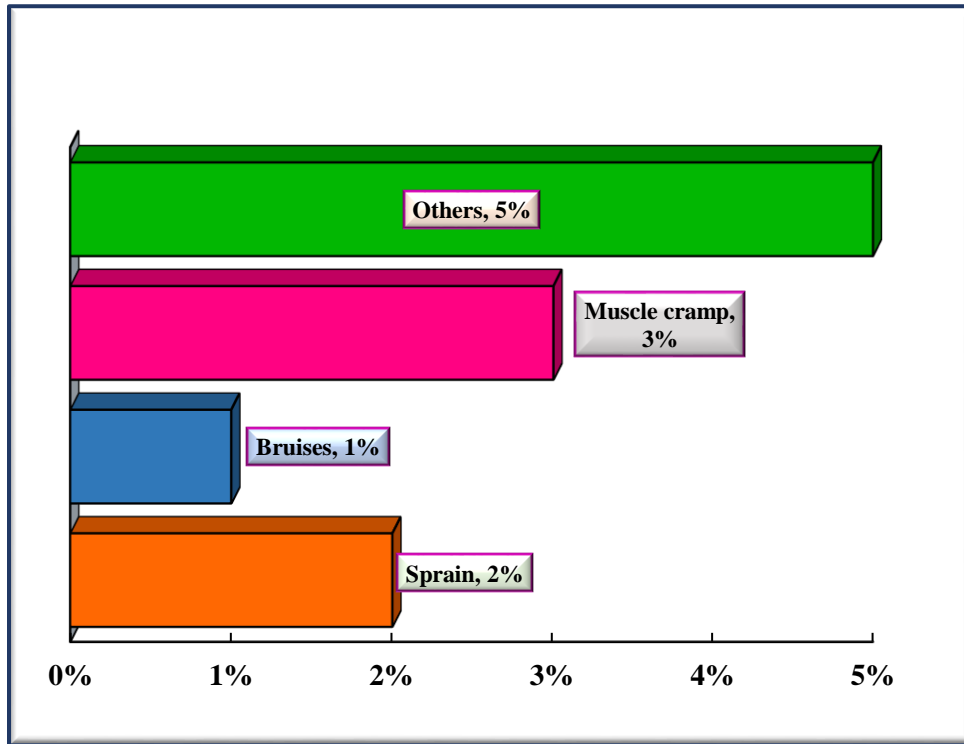


Figure 18: Types of injury from exercise

4.2.1.7 Health related problem during exercise

This figure manifests about health related problem from the participants with ischemic stroke. Among 107 participants, 16% (n=17) participants came to accept some health related problem while 84% (n=90) had not faced any health related problem during exercise.

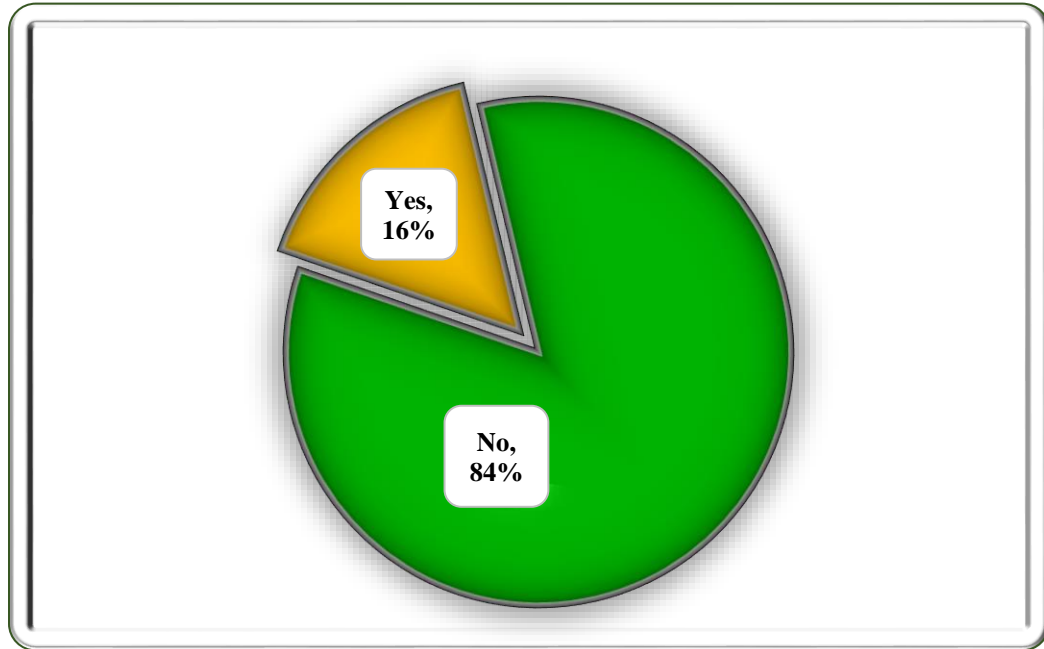


Figure 19: Health related problem during exercise

Again, among that 16% (n=17) participants 4% (n=4) had breathlessness, 3% (n=3) felt too hot, 1% (n=1) had chest pain, 6% (n=6) felt heavy limb and 2% (n=3) faced other health problems in the course of performing exercise. So we can conclude, **though a number of participants faced health related problems during exercise, those varied from person to person.**

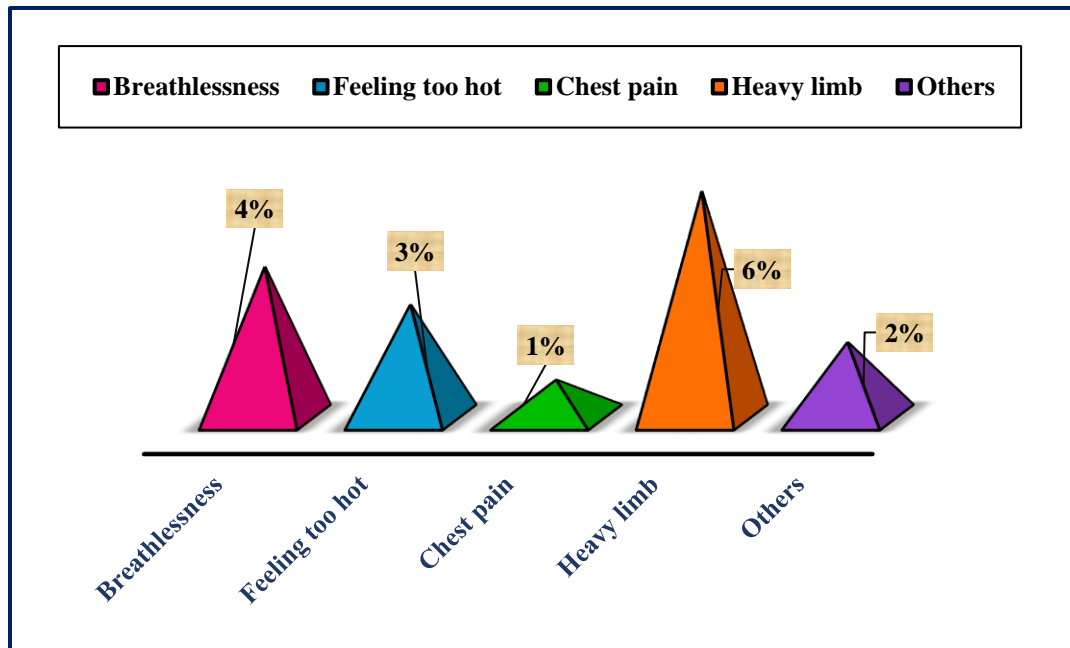


Figure 20: Type of health problem that causes to stop exercising

4.2.2 Mental health related barriers

4.2.2.1 Afraid of falling during exercise

The table reveals that among all participants 29% (n=31) were afraid of falling while 23% (n=25) were occasionally afraid of falling during exercise; on the other hand 48% (n=51) participants had no fear of falling during exercise. So, **almost 1/4 participants were afraid of falling during exercise which is uncommon in normal people.**

Table III: Afraid of falling during exercise

Afraid of falling	Percentage	Number of participants
Being afraid of falling	29%	31
Weren't afraid of falling	48%	51
Occasionally afraid of falling	23%	25
Total	100%	107

4.2.2.2 Feeling of laziness to do exercise

Here the participants mentioned their feelings of laziness to perform exercise. According to participants 21% (n=22) felt laziness, 47% (n=51) did not feel laziness and 32% (n=34) were occasionally faced laziness to perform home exercise. **That number of participants (21%) whom felt laziness during exercise were not low at all.**

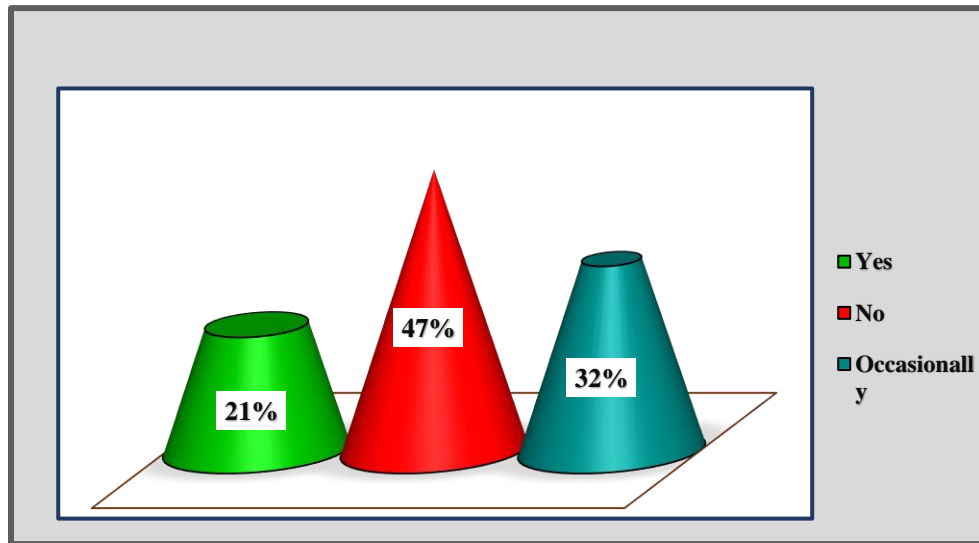


Figure 21: Feeling of laziness to do exercise

4.2.2.3 Presence of depressive symptoms

Among the 107 participants, where 39% (n=42) stroke survivors were depressed and 61% (n=65) stroke survivors were not depressed about their condition to perform physical exercise. Thus, **this was a fairly large number of participants as they affected by depressive symptoms.**

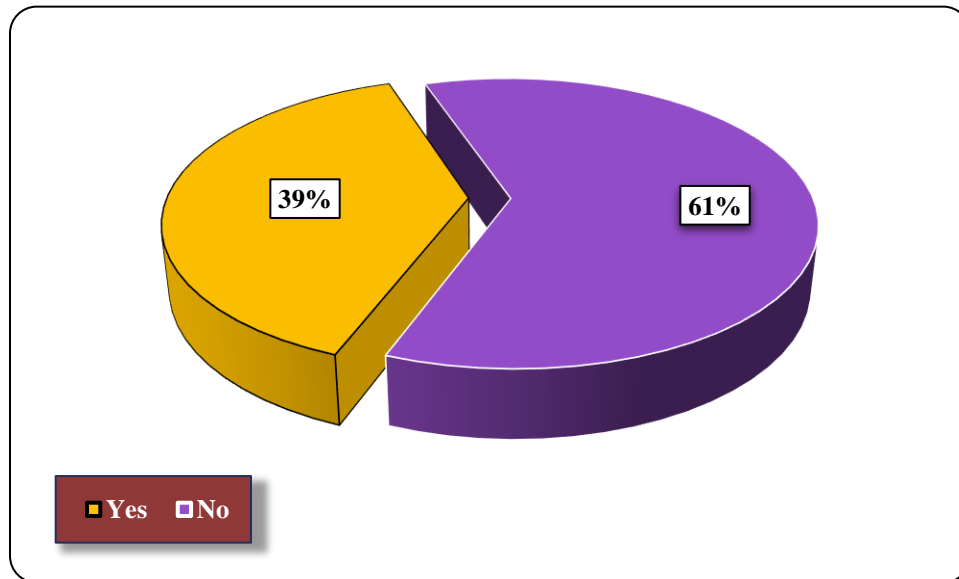


Figure 22: Presence of depressive symptoms among the participants

4.2.2.4 Afraid of having another stroke

The bar chart shows that among 107 participants 8% (n=8) were afraid, 67% (n=72) were not afraid and 25% (n=27) were occasionally afraid of having another stroke. This fear prevented some participants to perform exercise.

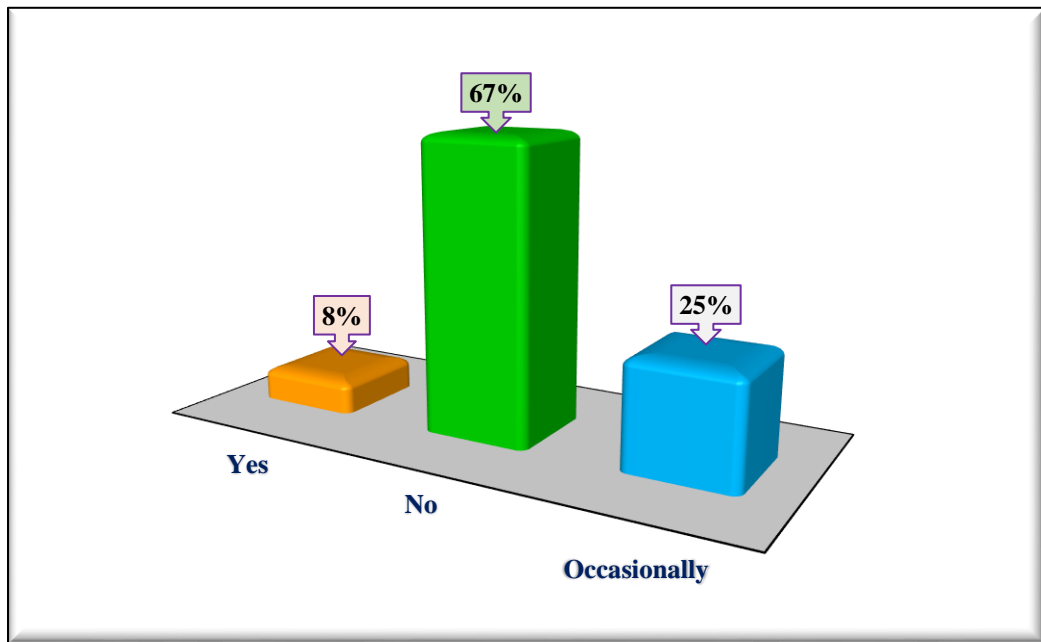


Figure 23: Afraid of having another stroke

4.2.3 Beliefs towards home exercise

4.2.3.1 Lack of motivation

Among 107 participants, 81% (n=86) participants thought they did not have any lack of motivation while 19% (n=21) participants felt lack of motivation which prevent them to perform exercise.

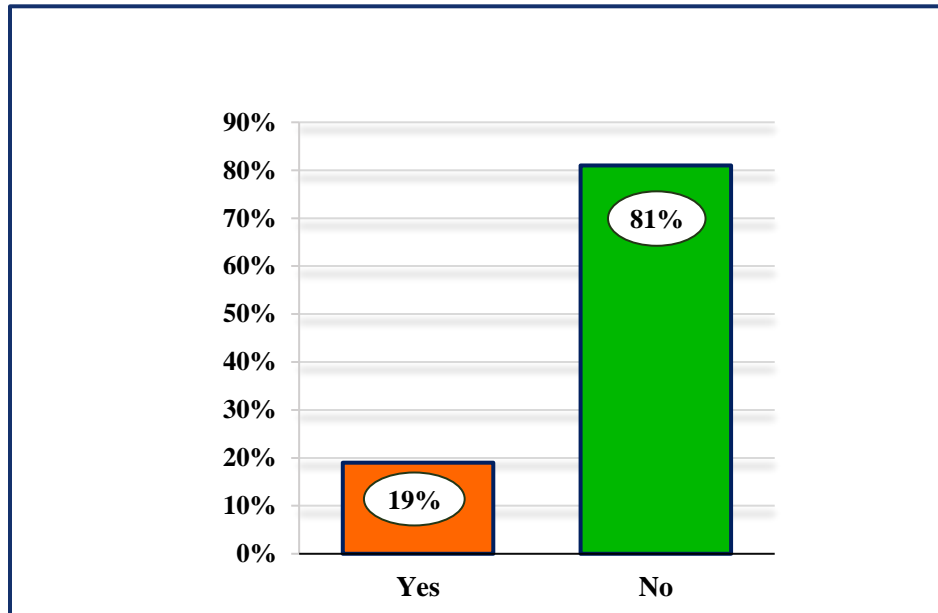


Figure 24: Lack of motivation

4.2.3.2 Difficulties about doing exercise

This investigation disclaimed that 13% (n=14) participants thought home exercise is difficult, 38% (n=40) thought home exercise is not such difficult. On the other hand, exercise is occasionally difficult was mentioned by 49% (n=53) participants.

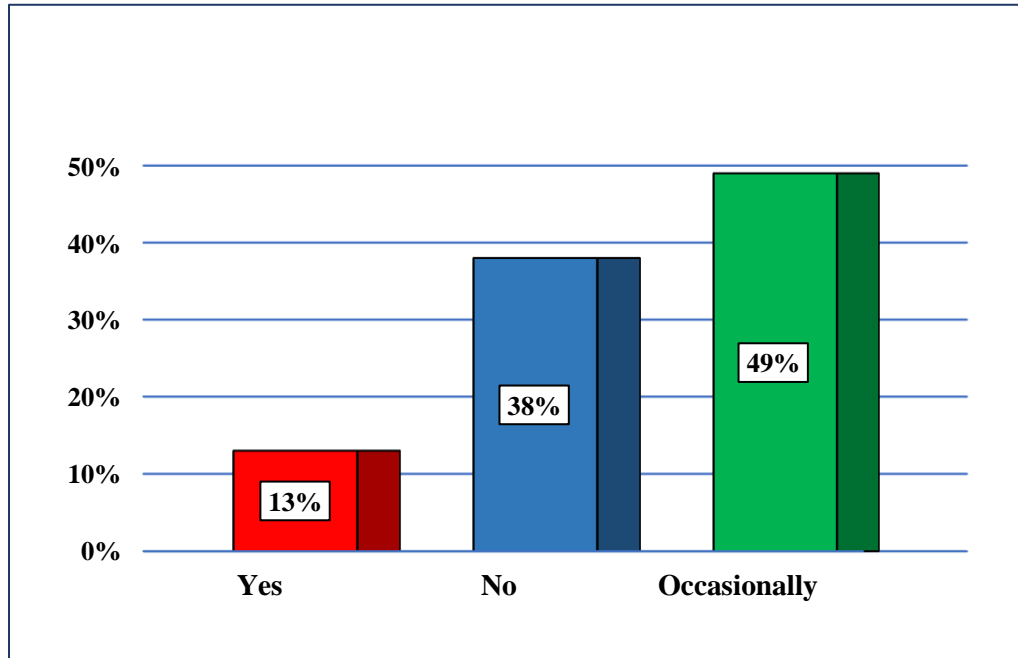


Figure 25: Difficulties about doing exercise

4.2.3.3 Time for perform exercise

Figure no. 26 described that 85% (n=91) participants made enough time of exercise and rest of 15% (n=16) participants had not enough time to perform exercise.

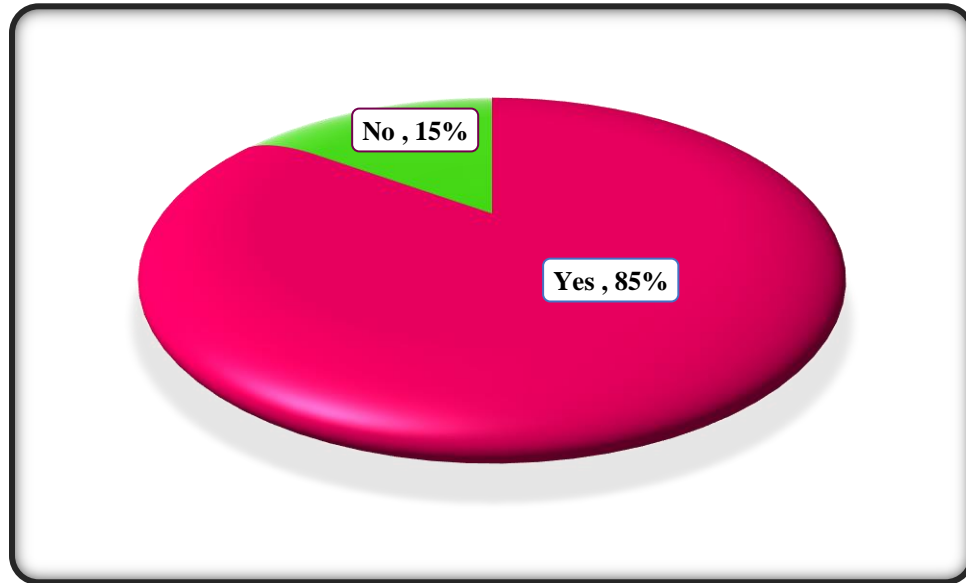


Figure 26: Adequate time for perform exercise

4.2.3.4 Participant's belief about their age for home exercise

From those 100% participants, 8% (n=8) participants were strongly agreed and 9% (n=10) participants were agreed that they were too old to carry on exercise. On the other hand, 54% (n=58) participants were not agreed and 29% (n=31) were strongly disagree that their age were too much for exercise.

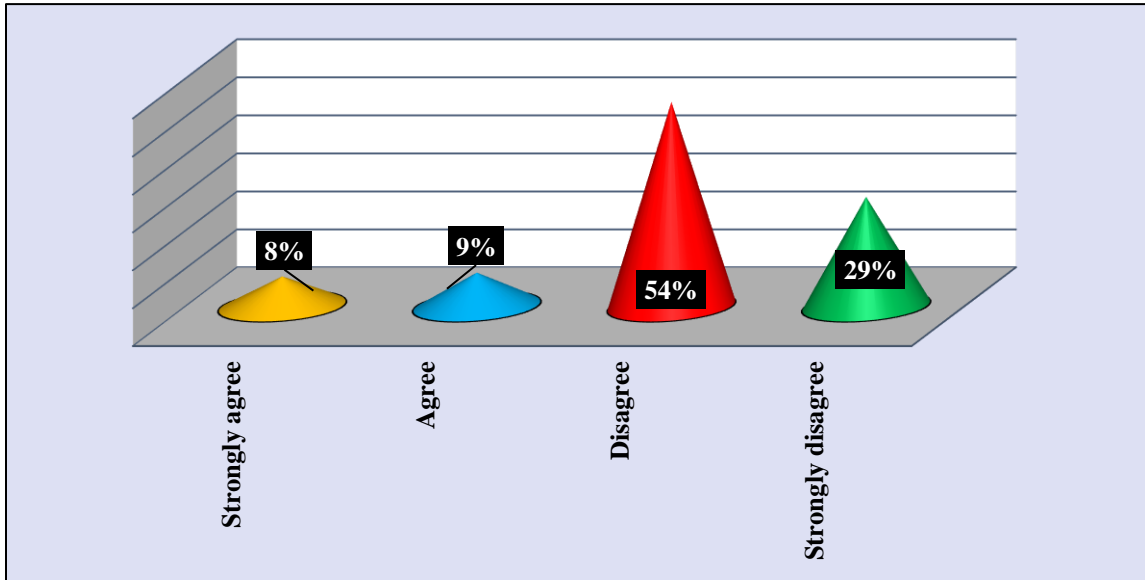


Figure 27: Participants' belief about their extreme age for home exercise

4.2.3.5 Boringness to perform exercise

The analysis also discovered that 15% (n=16) participants thought exercise was boring whereas 85% (n=91) participants did not think so.

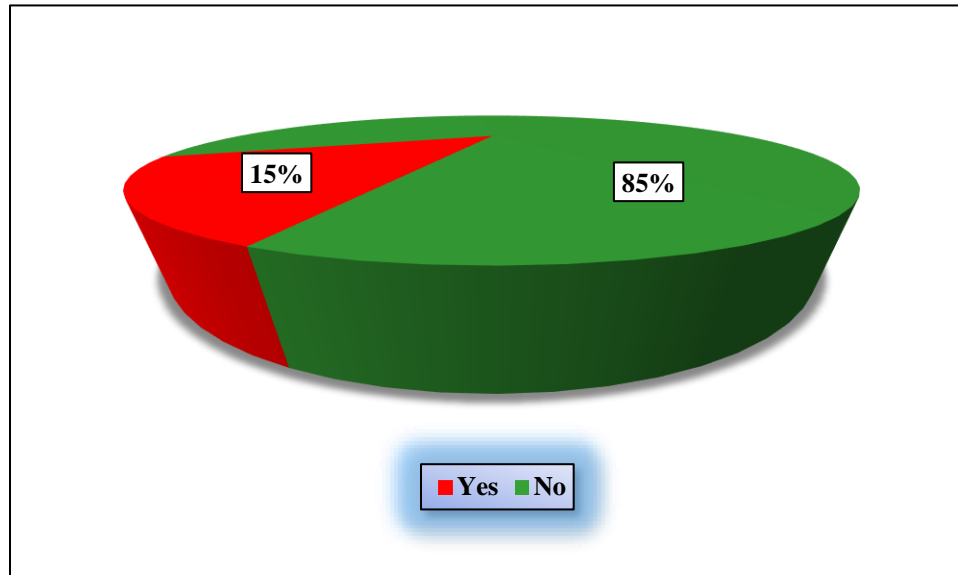


Figure 28: Boringness to perform exercise

So table no. IV conceptualized about the reason of boringness to perform exercise. Here, 9% (n=9) felt embarrass, 4% (n=4) thought exercise was monotonous and 2% (n=3) had other reasons among that 16 participants (**figure no. 28**).

Table IV: Cause of boringness

Cause of boringness	Percentage	Participants
“I feel embarrassed”	9%	9
“Exercise is monotonous”	4%	4
Others	2%	3
Total	15%	16

4.2.3.6 Believe about improvement by doing exercise

According to the participants of this study, 8% (n=9) thought exercise makes no improvement for post stroke condition while 92% (n=98) were positive about this believe. So, this chart indicates that **most of the participants accepted physiotherapy positively for their rehabilitation.**

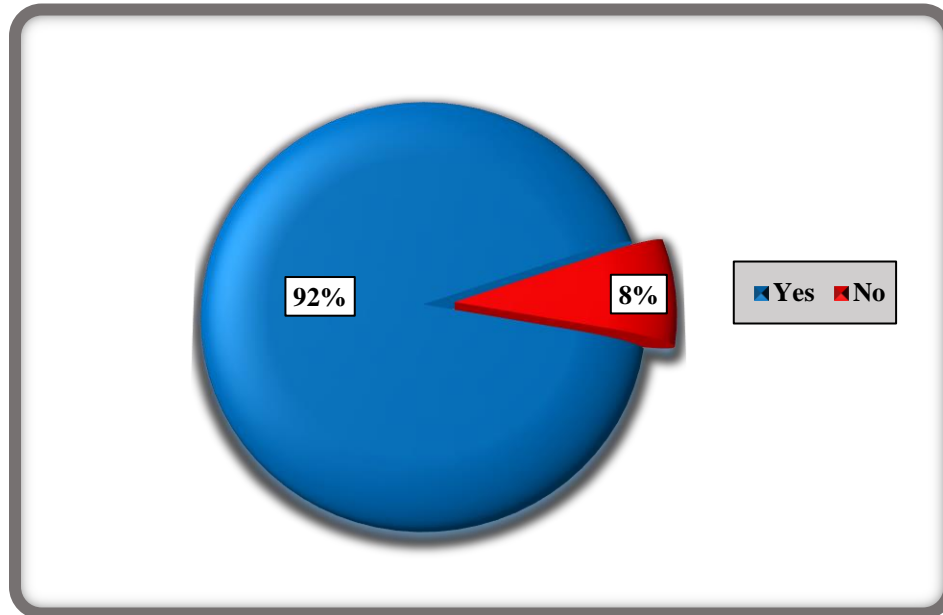


Figure 29: Improvement by doing exercise

4.2.3.7 Interest about exercise

Among the 107 participants with ischemic stroke almost 50% (n=53) participants felt interest to perform exercise, 13% (n=14) participants didn't make any interest to do exercise and 37% (n=40) participants occasionally observed interest to conduct exercise.

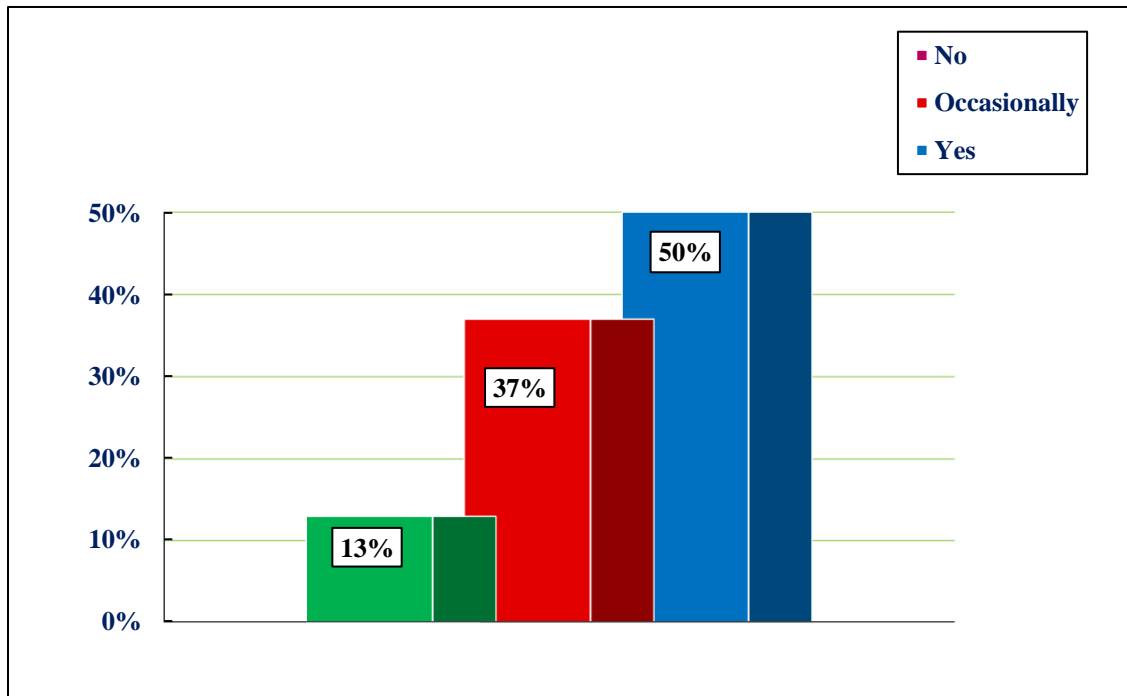


Figure 30: Interest about exercise

4.2.4 Family barriers

4.2.4.1 Support from family members or friends of the effort to exercise

Researcher found that 3% (n=3) participants were strongly agree, 6% (n=6) participants were agree, 48% (n=52) participants were disagree and 43% (n=46) participants were strongly disagree with the state “my family members or friends aren’t supportive of the effort to exercise”. So, most of the participants got positive support from their family members.

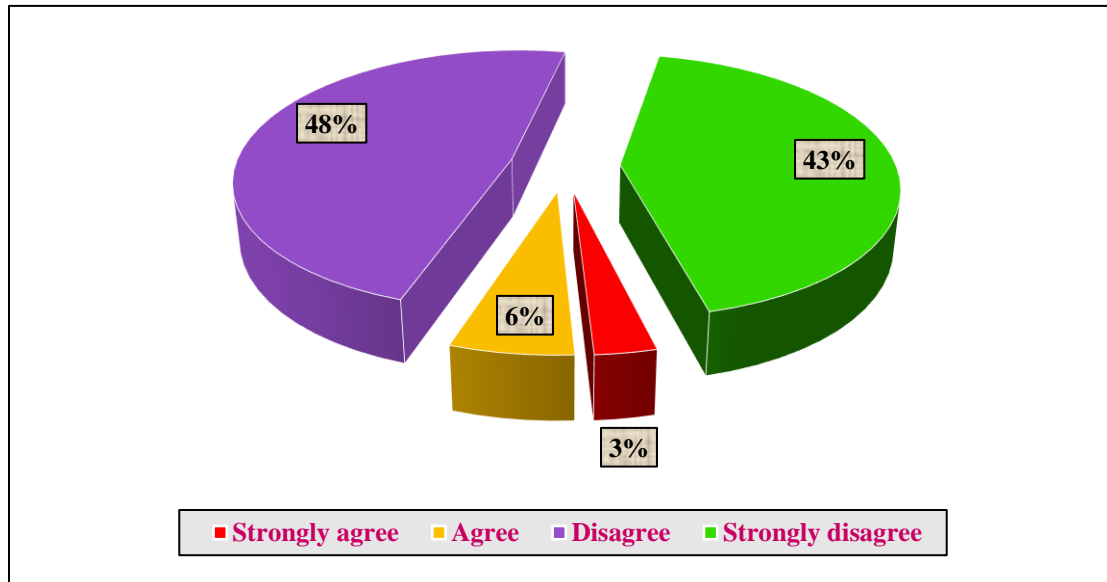


Figure 31: Support from family members or friends of the effort to exercise

4.2.4.2 Carer assistance

Here the participants mentioned that 72% (n=77) of them got carer assistance, 15% (n=16) did not get carer assistance while 13% (n=14) occasionally got carer assistance during their need. **A large number of people were not fully self-dependent as they need carer help.**

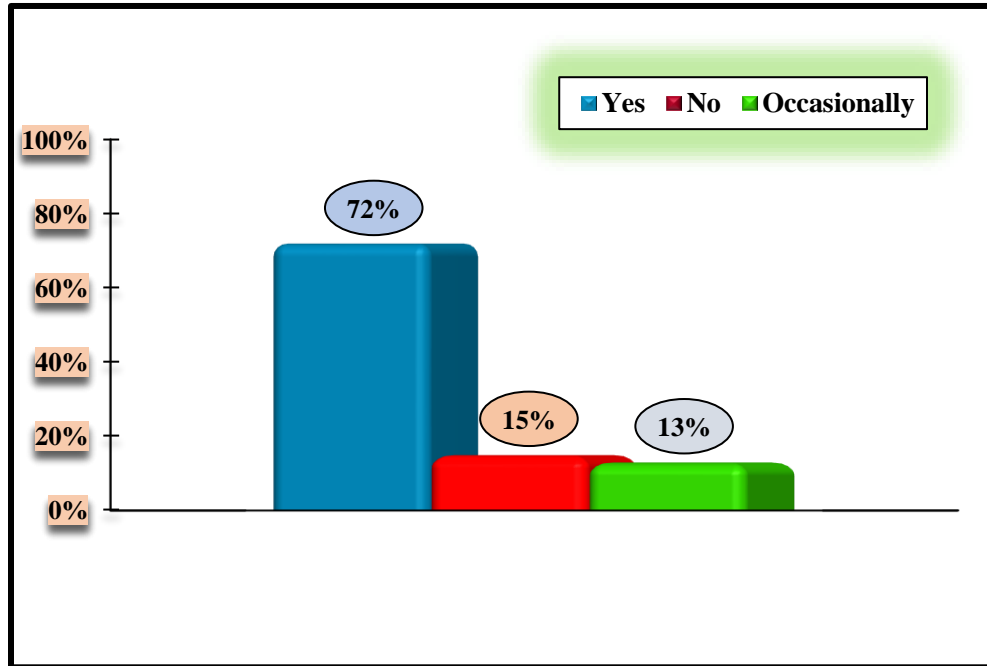


Figure 32: Carer assistance

4.2.4.3 Family responsibility

The researcher wanted to find out about the responsibility of the participants which disturb them to perform exercise. In this study, 11% (n=12) participants had some responsibilities (Table: V) meanwhile 89% (n=95) participants did not have any responsibilities that prevent them to carry out exercise.

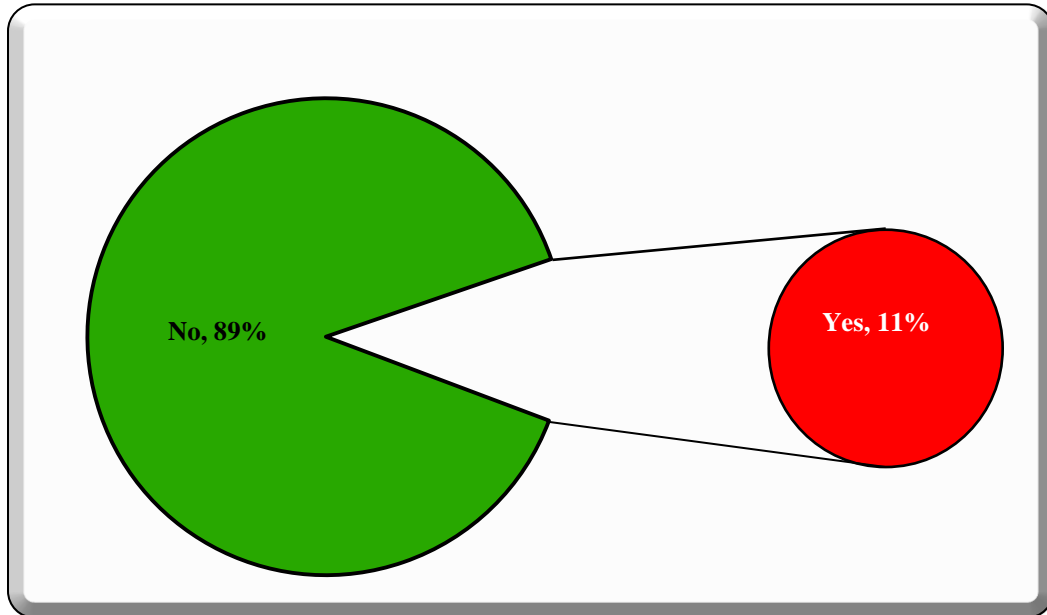


Figure 33: Family responsibility

At this place, table No.V narrated that 3% (n=4) participants had to do household work, 2% (n=2) participants had to care their children, 6% (n=6) participants had other responsibility to perform exercise.

Table V. Different type of family responsibility:

		Percentage	Participants
Family responsibility	Household work	3%	4
	Care of children	2%	2
	Others	6%	6
Total		11%	12

4.2.4.4 Family's culture, beliefs or morals that prevent to exercise

Among 107 participants family's culture, belief or morals prevents 12% (n=13) participants to perform exercise on the other hand 88% (n=94) participants had not faced that. So, those family culture, belief or morals had little impact to act like a barriers.

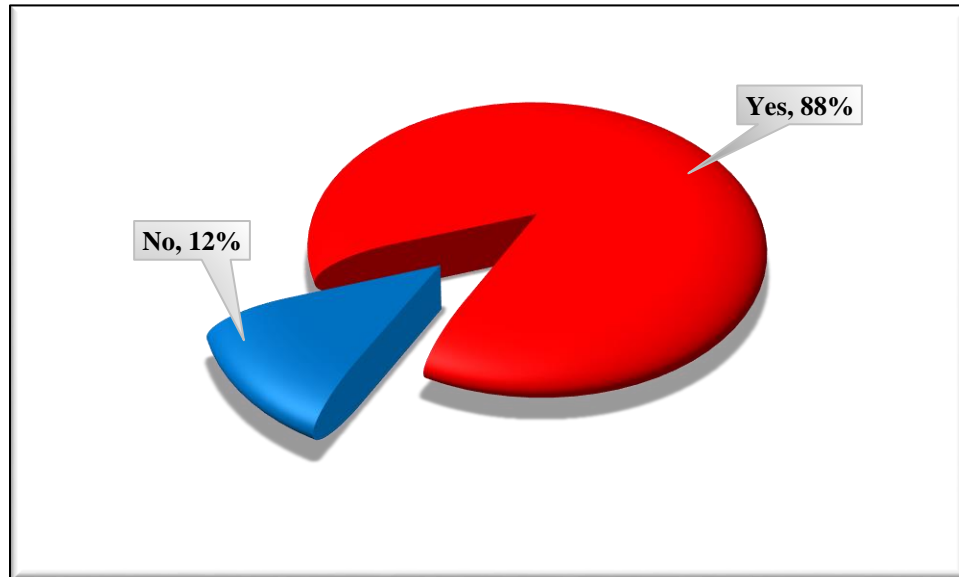


Figure 34: Family's culture, beliefs or morals prevent to exercise

4.2.5 Home environment related barriers

4.2.5.1 Exercise equipment at home

In this study, from the 107 participants 37% (n=39) of them said that they had exercise equipment and rest of 63% (n=68) participants had no exercise equipment at home.

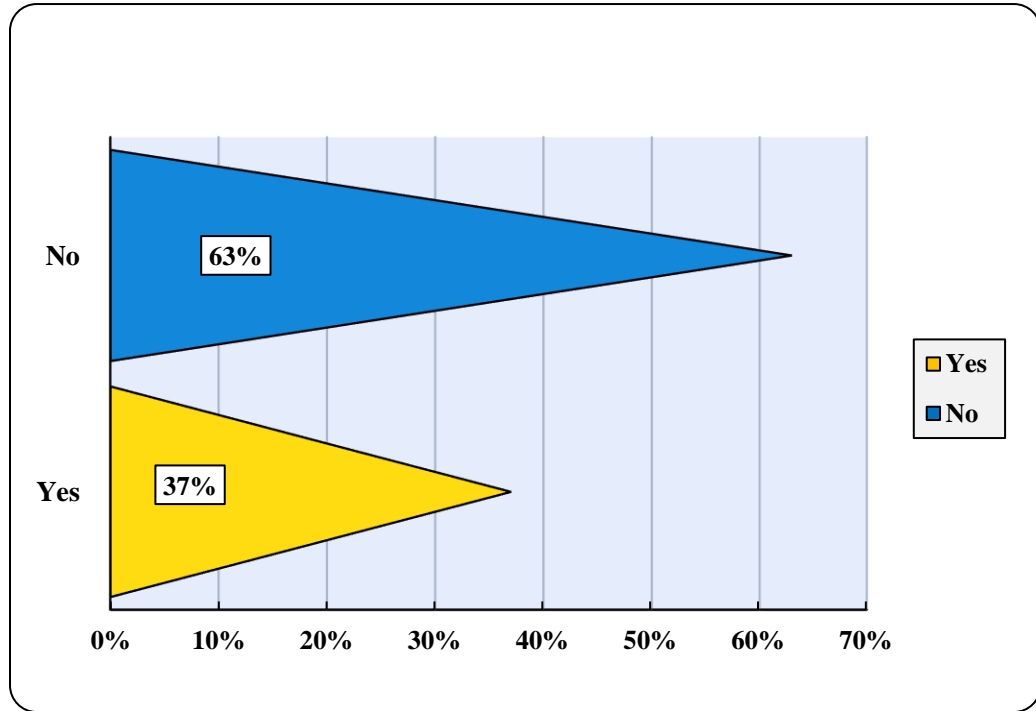


Figure 35: Exercise equipment at home

4.2.6 Analysis between subjects for association

In Chi-square test we see the association. If the P-value is <0.05 then the result is significant which means there is association between the variables.

Table 4.2.6.1: Association of gender and physical pain

Gender and physical pain	Chi-Square	P-Value
	1.39	0.5

For association of gender and physical pain, P-value is 0.5 which is more than 0.05. So the result is not significant that indicates there is no association between gender and physical pain.

Table 4.2.6.2: Association of age and poor health status

Age and poor health status	Chi-Square	P-Value
	32.7	0.03

The observed P-value for association of age and poor health status is 0.03. So the result is significant that means there is association between age and poor health status.

Table 4.2.6.3: Association of occupation and time for exercise

Occupation and time for exercise	Chi-Square	P-Value
	20.81	0.00

The observed P-value for association of occupation and time for exercise is 0.00. So the result is significant that indicates there is association between occupation and time for exercise.

Table 4.2.6.4: Association of family type and depression

Family type and depression	Chi-Square	P-Value
	3.6	0.04

For association of family type and depression, P-value is 0.04 which is <0.05 that means the result is significant which points out that there is association between family type and depression.

Table 4.2.6.5: Association of use of upper limb and family responsibility

Use of upper limb and family responsibility	Chi-Square	P-Value
	7.53	0.00

There is strong association of use of upper limb and family responsibility as their found P-value is 0.00 which is <0.05 .

Table 4.2.6.6: Association of assistive device and exercise equipment

Assistive device and exercise equipment	Chi-Square	P-Value
	5.38	0.02

The observed P-value for association of assistive device and exercise equipment is 0.02 which is less than 0.05 that indicates there is association of assistive device and exercise equipment.

The main objective of this research was to identify perceived barriers in performing home exercise by the patients with ischemic stroke after discharge from Center for the Rehabilitation of the Paralyzed (CRP). The result of the study indicates that there are many barriers to perform home exercises in stroke survivors after discharge from CRP. More than 84% stroke is ischemic type of stroke (Mohammad et al., 2013). A study on elderly people showed that 68 participants out of 100 participants had ischemic stroke (Miah et al., 2012). So, the researcher sets the aim of this study on the ischemic stroke patients to find out the barriers in performing exercise from home along with their socio-demographic profile.

The results of this study revealed that the age of 40% participants out of total participants were in between 50 to 59 years group. So, most of the participants were faced stroke at their 6th decade of life. In Bangladesh, stroke prevalence rate at the 6th decade of age is about 3/1000 (Miah et al., 2012). On the other hand, stroke occurrence is the most typical at the age of 40-59 years for any individuals (Mohammad et al., 2013). Among the 107 participants 73 participants were male where 34 participants were female. Male participants were more than double regarding the female participants. So, male were more vulnerable compared to female according to this analysis. Study showed that the prevalence of stroke for the male was about 3.44/1000 where that was about 2.41/1000 for the female patients (Miah et al., 2012). Researcher also found that the incident of stroke was 45% higher in male than female (Appelros et al., 2009). So males are more sufferer of stroke in comparison with females.

Here, most of the participants lived in semi urban area (55%) and rest of them were from rural (21%) and urban area (24%). Analyzer argued that in Bangladesh people who lived at village are more prominent by stroke than others (Mohammad et al., 2013). About 32% participants did not take further academic education after completing their primary school according to investigation. In this exploration 19% stroke survivors were illiterate, 17% survivors were S.S.C passed, 12% survivors were H.S.C passed, 13% survivors completed their graduation and 7% survivors were post graduated. A study on acute ischemic stroke

survivors in Korea revealed that 56% participants of that assess completed just their high school study and ever on some of them were below that level (Shin et al., 2017). On the other hand another research showed that 66.6% stroke survivors just completed either their middle school study or not (Rimmer et al., 2008). But, education which is very important for the carer and stroke survivor was mentioned by an analyzer at the phase of stroke rehabilitation (Hafsteinsdottir et al., 2011).

Here, 87% stroke survivors had no assistive device but 13% stroke survivors had assistive device. But a probation focused on 83 stroke survivors whom had hemiplegia and most of them were needed assistive modalities (Rimmer et al., 2008). Among the participants, 94% stroke survivors could partially and 6% stroke survivors could fully use their affected upper limb. 85% stroke survivors could partially, 12% stroke survivors could fully and 3% stroke survivors couldn't totally use their affected lower limb. That's mean most of the participants can't use the affected limb properly. So, Rimmer et al. (2008) mentioned that stroke survivors indicated different obstacles regarding their low participation at home exercise.

In this research there are several reasons for not performing exercise where the most commonly reported barriers including poor physical conditions, mental health of the stroke patients, beliefs about home exercise, family and home environment. The section "Disability and Secondary Conditions" of "The Healthy People 2010: Understanding and Improving Health" also mentioned that the notable poor involvement of handicap population in home exercise might be including social perspectives, structural obstructions, One's self boundaries, biasness, associational rules and systems and natural boundaries (Rimmer et al., 2008).

Jurkiewicz et al. (2011) was done a research on 28 participants where 57% participants faced musculoskeletal problem to perform physical exercise. In this study, 28% participants are affected in participant home exercise due to musculoskeletal pain. Physical pain also inhibits 38% participants out of total participants infrequently into the performance of exercise. Klit et al. (2011) found that the prevalence rate of novel pain was in between 11%-53% after affected by stroke. Besides, 18% stroke survivor reported exercise is painful during the period of discharge by the home exercise programs (Miller

et al., 2010). Another examination in Denmark suggested that 39% stroke survivors developed a long term physical pain within 24 months of stroke incident where this rate was about 28.9% in general people (Klit et al., 2011). During performing exercise 20% participants felt lack of energy and 36% participants felt energyless now and then in this investigation. Lack of energy indicated as a barrier to physical exercise in some analysis (Scorrano et al., 2018). The prevalence of lack of energy after stroke was 35%-92% (Billinger et al., 2014). Lacking of energy also known as fatigue which was reported as main or one of the main manifestation by 40% participants after stroke (Duncan et al., 2012).

In this study, 34% participants reported the past medical status as their barriers to exercise. Diabetes, heart disease, blood pressure, respiratory and other complications were mentioned by them. Miah et al. (2012) have shown that 20% stroke survivor had diabetes and 7% stroke survivor had ischemic heart disease where all of the participants' age was more than 45 years. In another exploration, 63% stroke survivor had hypertension which was consider as a significant risk factor of stroke (Hossain et al., 2011). Analysis also indicated that expiration and inspiration rate decrease after affected by stroke regarding the healthy people (Menezes et al., 2016).

In this check-out, 27% participants became tired and 33% participants tired occasionally during performing exercise. Researcher found that tiredness was an obstacle for stroke survivors in South Africa (Scorrano et al., 2018). An investigation had done on 52 stroke survivors where tiredness was reported as a barrier with other obstacles to home exercise (Ogwumike et al., 2014). Among the participants 27% stroke survivors had muscle stiffness which resisted them to engage exercise. A hypothesis revealed that the incidence of spasticity among paretic patients has been reported to 23%-43% at ½ year and 34% at 1.5 years after stroke (Sommerfeld et al., 2012). This assess stated that 11% participants were got injure during exercise which act as a barrier for them. A research found that 6% stroke survivor got injured via home exercise program at the phase of discharge (Miller et al., 2010).

29% stroke survivors were afraid of falling while 23% stroke survivors were occasionally afraid of falling during exercise according the analyst. Goh et al. (2016) stated that

occurrence rate of falling after stroke is >13%-<74% which is the most well-known complexity than other complexities. Another fact-finding revealed that 18% stroke survivors were afraid of falling while fulfill the home exercise programs (Miller et al., 2010). 21% participants felt laziness and 32% participants were being lazy once or twice to perform home exercise. This laziness in participating exercise acts a barrier for physical exercise. Researcher argued that 33% stroke survivors felt laziness to perform exercise (Morris et al., 2012).

Investigator stated 39% participants were depressed about their condition which forbid them to perform physical exercise in this study. A research declared that 35.29% stroke patients affected by depression (Srivastava et al., 2010). In USA, the prevalence of depressive disorder among them was 30% or more (Billinger et al., 2014). 29% stroke patients also reported about depression after stroke in another hypothesis (Jurkiewicz et al., 2011). 25% stroke patients were occasionally and 8% stroke patients were regularly afraid of having another stroke during exercise. Billinger et al. (2014) revealed that almost 30% stroke participants can affected by further stroke. This fearfulness stopped the stroke patient to attending exercise at home environment.

In this investigation, 19% stroke patients don't get proper motivation for performing exercise at home. Lack of motivation acts like a barrier for them. This barrier placed at top 5 for not performing home exercise (Morris et al., 2012). A study was done in Canada where 16 stroke survivors out of 28 stroke survivors also reported lack of motivation as a barrier to perform exercise (Jurkiewicz et al., 2011). Though home exercise is mentioned confoundedly difficult by 13% participants in this research, 49% participants also felt difficulty from time to time to do exercise. Other researcher also focused on the difficulty about home exercise in their study (Ogwumike et al., 2014). However, 20 stroke patients out of 100 stroke patients also thought exercise is very hard (Rimmer et al., 2008).

In this study 15% stroke survivors had not enough time to perform exercise at home. Stroke survivor also reported about lack of time for exercise in an analysis (Costello et al., 2011). In a study, 11% stroke patients reported about insufficient time to perform home exercise (Rimmer et al., 2008). Researcher found that 15% participants thought exercise is boring through this investigation. Exercise is not enjoyable was also indicated by 25% stroke

patients in other research (Jurkiewicz et al., 2011). 18% stroke survivor also reported that exercise is boring for them in another investigation (Rimmer et al., 2008).

Though a large number of participants in this study thought physical improvement is possible by exercise but 8% participants don't think so. So, this belief about exercise acts like a barrier for those 8% participants. As, 9% stroke survivors also thought that exercise was unhelpful (Rimmer et al., 2008). Another exploration suggested that 25% stroke patients reported about exercise which had no benefit on improving their poor health status (Jurkiewicz et al., 2011). In this study, 13% participants were completely uninterested to perform exercise while 37% participants sometimes felt interested or sometimes not. Lack of interest was reported by 16% stroke patients as a barriers for home exercise in a survey (Rimmer et al., 2008) while 36.7% stroke patients had lack of interest in another examination (Moschny et al., 2011).

Lack of family support was also indicated as a barrier by stroke survivors (Scorrano et al., 2018). In this hypothesis, 9% participants didn't get any support from their friends or family members at their effort to engage in exercise. 15% participants did not get carer assistance while 13% participants occasionally got carer assistance to perform exercise during their need although more than 90% stroke patients mentioned in an investigation that during performing exercise friends or family members had a duty to help them (Galvin et al., 2009). Meanwhile family culture, belief or morals acted like a barriers for 12% stroke survivors according to survey. Jackson et al. (2018) also reported that negative beliefs to engage in home based exercise after stroke performed as an obstacle for the patients.

On the other hand, in this study table VI shows that association wasn't found between the gender and physical pain where p value is 0.5 ($p < 0.05$) and χ^2 value is 1.39 which was statistically not significant. Similar study found that Development of pain was equally common in stroke patients and reference subjects (22.0% vs 18.5%, $p = 0.14$), but more common in women compared with men ($p = 0.002$) (Klit et al., 2011). Association found between age and poor health status where p value is 0.03 ($p < 0.05$) and χ^2 value is 32.7 which was statistically significant. Another study on poor health condition of stroke survivors showed that 17.6% patients in both young and older group had the history of TIA or stroke. History of TIA showed statistically significant in development of stroke ($p <$

0.001). In young age group 58.8% and in old age group 48.2% patients had hypertension. Hypertension is statistically significant for development of stroke more in young age group ($p < 0.05$). In old age group 7% patients had IHD but none was in young age group ($p < 0.05$) (Miah et al., 2012). Association found between family type and depression where p value is 0.04 ($p < 0.05$) and χ^2 value is 3.6 which was statistically significant. Also, when patients who were depressed ($n = 18$) were compared to those who were not depressed ($n = 33$), it was noted that depressed patients were living in nuclear families ($P < 0.03$) (Srivastava et al., 2010).

5.1 Limitation of the study

There are some limitations in most of the research. Some limitations were also framed for this study that might influence the accuracy of this research. As it was the first research project for the researcher and she was a 4th year B.Sc. in physiotherapy student, she is still learning many strategies and approaches regarding the practical atmosphere of research. So, there might be some mistakes that should be overlooked by the supervisor and the honorable teachers.

- This research was conducted only on the patients with ischemic stroke where hemorrhagic stroke patients were excluded.
- The study only focused on the identification and find out about home exercise related barriers among stroke survivors but did not emphasize on how to fix these issues.
- This research was done at COVID-19 pandemic situation so analyzer got a very short study period.
- Sample size ($n=107$) was limited and was not sufficient enough for the analysis to generalize the wider population of this condition.
- Due to pandemic situation, data was collected for this study by telephone instead of face to face method.
- As the study was conducted at selected area of Center for the Rehabilitation of the Paralyzed (CRP) in neurology unit which can't represent the related criteria of the whole patients with ischemic stroke in Bangladesh.

6.1 Conclusion

Ischemic stroke is one of the most common cause of disability. Many people are affected by ischemic stroke every year in our country. To reduce stroke related disability, rehabilitation must be needed. Home based exercise is one of the most important part of rehabilitation. But stroke patients face many barriers at home to perform physical exercise. This study explored the barriers in performing home exercise. In spite of some limitations of the study, this research provides valuable insight into the barriers in performing home exercise among the patients with ischemic stroke. The researcher also explored the socio-demographic profile of the participants. Most of the patients were wanted to engage exercise to maintain in health and prevent secondary conditions. But they face many problem including physical health related barriers, mental health related barriers, negative beliefs, family and environmental barriers. Physical pain, lack of energy, poor past medical history, tiredness, muscle spasticity represent the top physical health related barriers for them. Depression, fear of falling, fear of further stroke, laziness are the main mental issues for not being physically active. Lack of motivation, lack of time, exercise difficulties, boringness, lack of interest, lack of friends or family members support, home environment also acted like obstacles for some stroke survivors to performing exercise. Equal consideration must be given to these realities faced by individuals so that they can reach to their effective potential, overcome the physical and mental barriers, get sufficient time to exercise, make the exercise easy, know exercise properly, feel interest in exercise, take step to prevent injury during exercise. Since now a days there has been progress in giving advanced access to affordable services such as home equipment, so it is important to grow a better exercise support and health promotion programs at home. Because hospital based treatment or rehabilitation can't alone perform to nourish, enhance or restore the body function of the stroke survivors. Being aware of the potential barriers of adherence to home exercise, can give health care professionals insight in how to optimize adherence and possibly improve in engaging home exercise properly for the stroke survivors.

6.2 Recommendations

The aim of the study was to identify the barriers in performing home exercise among the patients with ischemic stroke after discharge from CRP. Though the study had some restrictions but researcher pointed out some further step that might be taken for the better accomplishment of further research. The main recommendations would be to include both ischemic and hemorrhagic stroke patients to ensure the generalize ability of this study. As this study only focuses on the identification and find out about home based exercise barriers so additional research is recommended how to solve these issues. The study period was limited in duration, it should be performed over a longer period of time subsequently. In future, the sample size should be large to produce more trustworthy and meaningful results. Face to face data collection is recommended if further study is done. The investigator took the participants only from one selected hospital of Savar for this analysis. To summarize the findings, sample should be gathered from various clinics, hospitals, institutes and groups throughout Bangladesh.

REFERENCES

- Adeniyi, A.F., Idowu, O.A., Ogwumike, O.O. and Adeniyi, C.Y., (2012). Comparative influence of self-efficacy, social support and perceived barriers on low physical activity development in patients with type 2 diabetes, hypertension or stroke. *Ethiopian journal of health sciences*, 22(2):113-119.
- Amin, M.R., Mohammad, H., Ahmed, K.G.U. and Sarkar, D.N., (2014). CRP in Patients with Acute Ischemic Stroke in Bangladesh. *Journal of Medicine*, 15(1):41-47.
- Amort, M., Fluri, F., Schafer, J., Weisskopf, F., Katan, M., Burow, A., Bucher, H.C., Bonati, L.H., Lyrer, P.A. and Engelter, S.T., (2011). Transient ischemic attack versus transient ischemic attack mimics: frequency, clinical characteristics and outcome. *Cerebrovascular Diseases*, 32(1):57-64.
- Appelros, P., Stegmayr, B. and Terent, A., (2009). Sex differences in stroke epidemiology: a systematic review. *Stroke*, 40(4):1082-1090.
- Ayerbe, L., Ayis, S., Wolfe, C.D. and Rudd, A.G., (2013). Natural history, predictors and outcomes of depression after stroke: systematic review and meta-analysis. *The British Journal of Psychiatry*, 202(1):14-21.
- Banks, G., Bernhardt, J., Churilov, L. and Cumming, T., (2012). Exercise Preferences Are Different after Stroke. *Stroke Research and Treatment*, 2012:1-9.
- Batchelor, F.A., Mackintosh, S.F., Said, C.M. and Hill, K.D., (2012). Falls after stroke. *International Journal of Stroke*, 7(6):482-490.
- Billinger, S.A., Arena, R., Bernhardt, J., Eng, J.J., Franklin, B.A., Johnson, C.M., MacKay-Lyons, M., Macko, R.F., Mead, G.E., Roth, E.J. and Shaughnessy, M., (2014). Physical activity and exercise recommendations for stroke survivors: a statement for healthcare professionals from the American Heart Association/American Stroke Association. *Stroke*, 45(8):2532-2553.
- Boehm, J., Franklin, R.C., Newitt, R., McFarlane, K., Grant, T. and Kurkowski, B., (2013). Barriers and motivators to exercise for older adults: A focus on those living in rural and remote areas of Australia. *Australian journal of rural health*, 21(3):141-149.
- Boehme, A.K., Esenwa, C. and Elkind, M.S., (2017). Stroke risk factors, genetics, and prevention. *Circulation research*, 120(3):472-495.

Brannigan, C., Galvin, R., Walsh, M.E., Loughnane, C., Morrissey, E.J., Macey, C., Delargy, M. and Horgan, N.F., (2017). Barriers and facilitators associated with return to work after stroke: a qualitative meta-synthesis. *Disability and rehabilitation*, 39(3):211-222.

Carod-Artal, F.J. and Egidio, J.A., (2009). Quality of life after stroke: the importance of a good recovery. *Cerebrovascular diseases*, 27(1):204-214.

Charan, J. and Biswas, T., (2013.) How to calculate sample size for different study designs in medical research?. *Indian journal of psychological medicine*, 35(2):121.

Chekroud, S.R., Gueorguieva, R., Zheutlin, A.B., Paulus, M., Krumholz, H.M., Krystal, J.H. and Chekroud, A.M., (2018). Association between physical exercise and mental health in 1·2 million individuals in the USA between 2011 and 2015: a cross-sectional study. *The Lancet Psychiatry*, 5(9):739-746.

Costello, E., Kafchinski, M., Vrazel, J. and Sullivan, P., (2011). Motivators, barriers, and beliefs regarding physical activity in an older adult population. *Journal of geriatric physical therapy*, 34(3):138-147.

Damush, T.M., Plue, L., Bakas, T., Schmid, A. and Williams, L.S., (2007). Barriers and facilitators to exercise among stroke survivors. *Rehabilitation nursing*, 32(6):253-262.

Drigny, J., Jousain, C., Gremeaux, V., Morello, R., Van Truc, P.H., Stapley, P., Touzé, E. and Ruet, A., (2019). Development and validation of a questionnaire to assess barriers to physical activity after stroke: the barriers to physical activity after stroke scale. *Archives of physical medicine and rehabilitation*, 100(9):1672-1679.

Duncan, F., Kutlubaev, M.A., Dennis, M.S., Greig, C. and Mead, G.E., (2012). Fatigue after stroke: a systematic review of associations with impaired physical fitness. *International Journal of Stroke*, 7(2):157-162.

Feigin, V.L., Forouzanfar, M.H., Krishnamurthi, R., Mensah, G.A., Connor, M., Bennett, D.A., Moran, A.E., Sacco, R.L., Anderson, L., Truelsen, T. and O'Donnell, M., (2014). Global and regional burden of stroke during 1990–2010: findings from the Global Burden of Disease Study 2010. *The Lancet*, 383(9913):245-255.

Frimpong, E., Olawale, O.A., Antwi, D.A., Antwi-Boasiako, C. and Dzudzor, B., (2014). Task-oriented circuit training improves ambulatory functions in acute stroke: a randomized

controlled trial. *International Research Journal of Medicine and Medical Sciences*, 5(8):169-175.

Galvin, R., Cusack, T. and Stokes, E., (2009). To what extent are family members and friends involved in physiotherapy and the delivery of exercises to people with stroke?. *Disability and Rehabilitation*, 31(11):898-905.

Gelaw, A.Y., Janakiraman, B., Gebremeskel, B.F. and Ravichandran, H., (2020). Effectiveness of Home-based rehabilitation in improving physical function of persons with Stroke and other physical disability: A systematic review of randomized controlled trials. *Journal of Stroke and Cerebrovascular Diseases*, 29(6):104800.

Gill, L. and Sullivan, K.A., (2011). Boosting exercise beliefs and motivation through a psychological intervention designed for poststroke populations. *Topics in stroke rehabilitation*, 18(5):470-480.

Goh, H.T., Nadarajah, M., Hamzah, N.B., Varadan, P. and Tan, M.P., (2016). Falls and fear of falling after stroke: a case-control study. *PM&R*, 8(12):1173-1180.

Gomes, M.J., Martinez, P.F., Pagan, L.U., Damatto, R.L., Cezar, M.D.M., Lima, A.R.R., Okoshi, K. and Okoshi, M.P., (2017). Skeletal muscle aging: influence of oxidative stress and physical exercise. *Oncotarget*, 8(12):20428.

Hafsteinsdottir, T.B., Vergunst, M., Lindeman, E. and Schuurmans, M., (2011). Educational needs of patients with a stroke and their caregivers: a systematic review of the literature. *Patient education and counseling*, 85(1):14-25.

Hanchaiphiboolkul, S., Pongvarin, N., Nidhinandana, S., Suwanwela, N.C., Puthkhao, P., Towanabut, S., Tantirittisak, T., Suwantamee, J. and Samsen, M., (2011). Prevalence of stroke and stroke risk factors in Thailand: Thai Epidemiologic Stroke (TES) Study. *Journal of the Medical Association of Thailand*, 94(4):427.

Hansen, A.P., Marcussen, N.S., Klit, H., Andersen, G., Finnerup, N.B. and Jensen, T.S., (2012). Pain following stroke: a prospective study. *European journal of pain*, 16(8):1128-1136.

Harrison, M. and Palmer, R., (2015). Exploring patient and public involvement in stroke research: a qualitative study. *Disability and rehabilitation*, 37(23):2174-2183.

Hebert, D., Lindsay, M.P., McIntyre, A., Kirton, A., Rumney, P.G., Bagg, S., Bayley, M., Dowlathahi, D., Dukelow, S., Garnhum, M. and Glasser, E., (2016). Canadian stroke best

practice recommendations: stroke rehabilitation practice guidelines, update 2015. *International Journal of Stroke*, 11(4):459-484.

Hossain, A.M., Ahmed, N.U., Rahman, M., Islam, M.R., Sadhya, G. and Fatema, K., (2011). Analysis of sociodemographic and clinical factors associated with hospitalized stroke patients of Bangladesh. *Faridpur Medical College Journal*, 6(1):19-23.

Idowu, O., Adeniyi, A., Ogwumike, O., Fawole, H. and Akinrolie, O., (2015). Perceived barriers to physical activity among Nigerian stroke survivors. *Pan African Medical Journal*, 21(1).

Islam, M.N., Moniruzzaman, M., Khalil, M.I., Basri, R., Alam, M.K., Loo, K.W. and Gan, S.H., (2013). Burden of stroke in Bangladesh. *International journal of stroke*, 8(3):211-213.

Jackson, S., Mercer, C. and Singer, B.J., (2018). An exploration of factors influencing physical activity levels amongst a cohort of people living in the community after stroke in the south of England. *Disability and rehabilitation*, 40(4):414-424.

Ji, R., Schwamm, L.H., Pervez, M.A. and Singhal, A.B., (2013). Ischemic stroke and transient ischemic attack in young adults: risk factors, diagnostic yield, neuroimaging, and thrombolysis. *JAMA neurology*, 70(1):51-57.

Johnson, W., Onuma, O., Owolabi, M. and Sachdev, S., (2016). Stroke: a global response is needed. *Bulletin of the World Health Organization*, 94(9):634.

Junker, L. and Carlberg, E.B., (2011). Factors that affect exercise participation among people with physical disabilities. *Advances in Physiotherapy*, 13(1):18-25.

Jurkiewicz, M.T., Marzolini, S. and Oh, P., (2011). Adherence to a home-based exercise program for individuals after stroke. *Topics in stroke rehabilitation*, 18(3):277-284.

Kalaria, R.N., Akinyemi, R. and Ihara, M., (2016). Stroke injury, cognitive impairment and vascular dementia. *Biochimica et Biophysica Acta (BBA)-Molecular Basis of Disease*, 1862(5):915-925.

Kara, S. and Ntsiea, M.V., (2015). The effect of a written and pictorial home exercise prescription on adherence for people with stroke. *Hong Kong Journal of Occupational Therapy*, 26(1):33-41.

Karim, M.E., Mondal, S.K., Kabir, A.H., Das, P.P., Biswas, S. and Ahmed, N.S., (2016). Association of Hypertriglyceridemia with Ischemic Stroke, Study in a Tertiary Care Hospital in Bangladesh. *Journal of Medicine*, 17(1):21-26.

Katan, M. and Luft, A., (2018). Global burden of stroke. *Seminars in neurology*, 38(2):208-211.

Kim, J.Y., Kang, K., Kang, J., Koo, J., Kim, D.H., Kim, B.J., Kim, W.J., Kim, E.G., Kim, J.G., Kim, J.M. and Kim, J.T., (2019). Executive summary of stroke statistics in Korea 2018: a report from the epidemiology research council of the Korean Stroke Society. *Journal of stroke*, 21(1):42.

Kim, K., Lee, D.K. and Jung, S.I., (2015). Effect of coordination movement using the PNF pattern underwater on the balance and gait of stroke patients. *Journal of physical therapy science*, 27(12):3699-3701.

Kissela, B.M., Houry, J.C., Alwell, K., Moomaw, C.J., Woo, D., Adeoye, O., Flaherty, M.L., Khatri, P., Ferioli, S., La Rosa, F.D.L.R. and Broderick, J.P., (2012). Age at stroke: temporal trends in stroke incidence in a large, biracial population. *Neurology*, 79(17):1781-1787.

Klit, H., Finnerup, N.B., Overvad, K., Andersen, G. and Jensen, T.S., (2011). Pain following stroke: a population-based follow-up study. *PloS one*, 6(11):27607.

Korpershoek, C., Van der Bijl, J. and Hafsteinsdóttir, T.B., (2011). Self-efficacy and its influence on recovery of patients with stroke: a systematic review. *Journal of advanced nursing*, 67(9):1876-1894.

Kristensen, H.K., Ytterberg, C., Jones, D.L. and Lund, H., (2016). Research-based evidence in stroke rehabilitation: an investigation of its implementation by physiotherapists and occupational therapists. *Disability and rehabilitation*, 38(26):2564-2574.

Kruger, C., McNeely, M.L., Bailey, R.J., Yavari, M., Abraldes, J.G., Carbonneau, M., Newnham, K., DenHeyer, V., Ma, M., Thompson, R. and Paterson, I., (2018). Home exercise training improves exercise capacity in cirrhosis patients: role of exercise adherence. *Scientific reports*, 8(1):1-10.

Langhorne, P., Bernhardt, J. and Kwakkel, G., (2011). Stroke rehabilitation. *The Lancet*, 377(9778):1693-1702.

Lee, S., Shafe, A.C. and Cowie, M.R., (2011). UK stroke incidence, mortality and cardiovascular risk management 1999–2008: time-trend analysis from the General Practice Research Database. *BMJ open*, 1(2):269.

Lynch, E.B., Butt, Z., Heinemann, A., Victorson, D., Nowinski, C.J., Perez, L. and Cella, D., (2008). A qualitative study of quality of life after stroke: the importance of social relationships. *Journal of rehabilitation medicine*, 40(7):518-523.

Malone, L.A., Barfield, J.P. and Brasher, J.D., (2012). Perceived benefits and barriers to exercise among persons with physical disabilities or chronic health conditions within action or maintenance stages of exercise. *Disability and Health Journal*, 5(4):254-260.

McKevitt, C., Fudge, N., Redfern, J., Sheldenkar, A., Crichton, S., Rudd, A.R., Forster, A., Young, J., Nazareth, I., Silver, L.E. and Rothwell, P.M., (2011). Self-reported long-term needs after stroke. *Stroke*, 42(5):1398-1403.

Menezes, K.K., Nascimento, L.R., Ada, L., Polese, J.C., Avelino, P.R. and Teixeira-Salmela, L.F., (2016). Respiratory muscle training increases respiratory muscle strength and reduces respiratory complications after stroke: a systematic review. *Journal of physiotherapy*, 62(3):138-144.

Miah, M.N.A., Azhar, M.A., Rahman, A., Halder, D., Akteruzzaman, M. and Kundu, N.C., (2012). Risk factors of stroke in young and old age group-a comparative study. *Journal of Medicine*, 13(2):138-142.

Miah, M.T., Hoque, A.A., Tarafder, B.K., Romel, S.M.A. and Hassan, M.K., (2008). Stroke in young age-study of 50 cases. *Journal of Medicine*, 9(1):10-15.

Miller, E.L., Murray, L., Richards, L., Zorowitz, R.D., Bakas, T., Clark, P. and Billinger, S.A., (2010). Comprehensive overview of nursing and interdisciplinary rehabilitation care of the stroke patient: a scientific statement from the American Heart Association. *Stroke*, 41(10):2402-2448.

Mohammad, Q.D., (2013). Management of stroke-Bangladesh perspective. *Bangladesh Medical Journal*, 42(1):34-37.

Morris, J., Oliver, T., Kroll, T. and MacGillivray, S., (2012). The Importance of Psychological and Social Factors in Influencing the Uptake and Maintenance of Physical Activity after Stroke: A Structured Review of the Empirical Literature. *Stroke Research and Treatment*, 2012:1-20.

Moschny, A., Platen, P., Klaaben-Mielke, R., Trampisch, U. and Hinrichs, T., (2011). Barriers to physical activity in older adults in Germany: a cross-sectional study. *International Journal of Behavioral Nutrition and Physical Activity*, 8(1):1-10.

Mudge, S., Barber, P.A. and Stott, N.S., (2009). Circuit-based rehabilitation improves gait endurance but not usual walking activity in chronic stroke: a randomized controlled trial. *Archives of physical medicine and rehabilitation*, 90(12):1989-1996.

Mulligan, H.F., Hale, L.A., Whitehead, L. and Baxter, G.D., (2012). Barriers to physical activity for people with long-term neurological conditions: a review study. *Adapted Physical Activity Quarterly*, 29(3):243-265.

Ng, Y.S., Astrid, S., De Silva, D.A., Tan, M.L.D., Tan, Y.L. and Chew, E., (2013). Functional outcomes after inpatient rehabilitation in a prospective stroke cohort. *Proceedings of Singapore Healthcare*, 22(3):175-182.

Nicholson, S.L., Donaghy, M., Johnston, M., Sniehotta, F.F., Van Wijck, F., Johnston, D., Greig, C., McMurdo, M.E. and Mead, G., (2014). A qualitative theory guided analysis of stroke survivors' perceived barriers and facilitators to physical activity. *Disability and rehabilitation*, 36(22):1857-1868.

O'donnell, M.J., Xavier, D., Liu, L., Zhang, H., Chin, S.L., Rao-Melacini, P., Rangarajan, S., Islam, S., Pais, P., McQueen, M.J. and Mondo, C., (2010). Risk factors for ischaemic and intracerebral haemorrhagic stroke in 22 countries (the INTERSTROKE study): a case-control study. *The Lancet*, 376(9735):112-123.

Ogwumike, O.O., Badaru, U.M. and Adeniyi, A.F., (2014). Factors influencing adherence to home-based exercise by stroke survivors in North Western Nigeria. *International journal of therapies and rehabilitation research*, 3(1):1.

Owolabi, M.O., Arulogun, O., Melikam, S., Adeoye, A.M., Akarolo-Anthony, S., Akinyemi, R., Arnett, D., Tiwari, H., Gebregziabher, M., Jenkins, C. and Lackland, D., (2015). The burden of stroke in Africa: a glance at the present and a glimpse into the future. *Cardiovascular journal of Africa*, 26(2):27.

Panagos, P.D., (2012). Transient ischemic attack (TIA): the initial diagnostic and therapeutic dilemma. *The American journal of emergency medicine*, 30(5):794-799.

Pandian, J.D. and Sudhan, P., (2013). Stroke epidemiology and stroke care services in India. *Journal of stroke*, 15(3):128.

Piercy, K.L., Troiano, R.P., Ballard, R.M., Carlson, S.A., Fulton, J.E., Galuska, D.A., George, S.M. and Olson, R.D., (2018). The physical activity guidelines for Americans. *Jama*, 320(19):2020-2028.

Poorthuis, M.H., Algra, A.M., Algra, A., Kappelle, L.J. and Klijn, C.J., (2017). Female- and male-specific risk factors for stroke: a systematic review and meta-analysis. *JAMA neurology*, 74(1):75-81.

Rimmer, J.H., Wang, E. and Smith, D., (2008). Barriers associated with exercise and community access for individuals with stroke. *Journal of rehabilitation research & development*, 45(2):315-322.

Robinson, R.G. and Jorge, R.E., (2016). Post-stroke depression: a review. *American Journal of Psychiatry*, 173(3):221-231.

Saini, S., Rambli, D.R.A., Sulaiman, S., Zakaria, M.N. and Shukri, S.R.M., (2012). A low-cost game framework for a home-based stroke rehabilitation system. 2012 International Conference on Computer & Information Science (ICCIS), 1:55-60.

Scorrano, M., Ntsiea, V. and Maleka, D., (2018). Enablers and barriers of adherence to home exercise programmes after stroke: Caregiver perceptions. *International Journal of Therapy and Rehabilitation*, 25(7):353-364.

Sedgwick, P., (2014). Cross sectional studies: advantages and disadvantages. *BMJ*, 348(2):2276-2276.

Sergeev, A.V., (2011). Racial and rural-urban disparities in stroke mortality outside the Stroke Belt. *Ethnicity and Disease*, 21(3):307.

Shah, N.S., Huffman, M.D., Ning, H. and Lloyd-Jones, D.M., (2013). Trends in vascular risk factor treatment and control in US stroke survivors: the National Health and Nutrition Examination Surveys (1999–2010). *Circulation: Cardiovascular Quality and Outcomes*, 6(3):270-277.

Sharma, H., Bulley, C. and van Wijck, F.M., (2012). Experiences of an exercise referral scheme from the perspective of people with chronic stroke: a qualitative study. *Physiotherapy*, 98(4):336-343.

Sheu, J.J., Chiou, H.Y., Kang, J.H., Chen, Y.H. and Lin, H.C., (2010). Tuberculosis and the risk of ischemic stroke: a 3-year follow-up study. *Stroke*, 41(2):244-249.

- Shin, C.N., An, K. and Sim, J., (2017). Facilitators of and barriers to emergency medical service use by acute ischemic stroke patients: A retrospective survey. *International journal of nursing sciences*, 4(1):52-57.
- Siddique, M.A.N., Nur, Z., Mahbub, M.S., Alam, M.B. and Miah, M.T., (2009). Clinical presentation and epidemiology of stroke: a study of 100 cases. *Journal of Medicine*, 10(2):86-89.
- Simpson, L.A., Eng, J.J. and Tawashy, A.E., (2011). Exercise perceptions among people with stroke: barriers and facilitators to participation. *International journal of therapy and rehabilitation*, 18(9):520-529.
- Sommerfeld, D.K., Gripenstedt, U. and Welmer, A.K., (2012). Spasticity after stroke: an overview of prevalence, test instruments, and treatments. *American Journal of Physical Medicine & Rehabilitation*, 91(9):814-820.
- Spruit-van Eijk, M., Buijck, B.I., Zuidema, S.U., Voncken, F.L., Geurts, A.C. and Koopmans, R.T., (2010). Geriatric rehabilitation of stroke patients in nursing homes: a study protocol. *BMC geriatrics*, 10(1):1-7.
- Srivastava, A., Taly, A.B., Gupta, A. and Murali, T., (2010). Post-stroke depression: prevalence and relationship with disability in chronic stroke survivors. *Annals of Indian Academy of Neurology*, 13(2):123.
- Summers, D., Leonard, A., Wentworth, D., Saver, J.L., Simpson, J., Spilker, J.A., Hock, N., Miller, E. and Mitchell, P.H., (2009). Comprehensive overview of nursing and interdisciplinary care of the acute ischemic stroke patient: a scientific statement from the American Heart Association. *Stroke*, 40(8):2911-2944.
- Urimubenshi, G. and Rhoda, A., (2011). Environmental barriers experienced by stroke patients in Musanze district in Rwanda: a descriptive qualitative study. *African Health Sciences*, 11(3):398-406.
- Van der Riet, P., Maguire, J., Dedkhard, S. and Sibbritt, D., (2015). Are traditional Thai therapies better than conventional treatment for stroke rehabilitation? A quasi-experimental study. *European Journal of Integrative Medicine*, 7(1):16-22.
- Wagachchige Muthucumarana, M., Samarasinghe, K. and Elgan, C., (2018). Caring for stroke survivors: Experiences of family caregivers in Sri Lanka—a qualitative study. *Topics in stroke rehabilitation*, 25(6):397-402.

Wasay, M., Khatri, I.A. and Kaul, S., (2014). Stroke in south Asian countries. *Nature reviews neurology*, 10(3):135-143.

Winstein, C.J., Stein, J., Arena, R., Bates, B., Cherney, L.R., Cramer, S.C., Deruyter, F., Eng, J.J., Fisher, B., Harvey, R.L. and Lang, C.E., (2016). Guidelines for adult stroke rehabilitation and recovery: a guideline for healthcare professionals from the American Heart Association/American Stroke Association. *Stroke*, 47(6):98-169.

Wissel, J., Schelosky, L.D., Scott, J., Christe, W., Faiss, J.H. and Mueller, J., (2010). Early development of spasticity following stroke: a prospective, observational trial. *Journal of neurology*, 257(7):1067-1072.

APPENDIX

Appendix-1 (A)

Permission Letter

Date: 30.12.2020

Head

Department of Physiotherapy

Centre for the Rehabilitation of the Paralysed (CRP)

Chapain, Savar, Dhaka-1343.

Through: Head, Department of Physiotherapy, BHPI.

Subject: Prayer for seeking permission to collect data for conducting research project.

Sir,

With due respect and humble submission to state that I am Abrin Sultana, a student of 4th year B.Sc in Physiotherapy at Bangladesh Health Profession Institute (BHPI). The Ethical committee has approved my research project "**Barriers in performing home exercise among the patients with ischemic stroke after discharge from Center for the Rehabilitation of the Paralysed (CRP)**" under the supervision of Farjana Sharmin, Lecturer of Bangladesh Health Professions Institute (BHPI), Jr. Consultant and OPD In-charge, Department of Physiotherapy, CRP, Savar, Dhaka-1343. I want to collect data for my research project from the Department of Physiotherapy at CRP. So, I need permission for data collection from Neurology unit of Physiotherapy Department at CRP (CRP, Chapain, Savar, Dhaka-1343). I would like to assure that anything of the study will not be harmful for the participants.

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

Your Faithfully,



Abrin Sultana

4th year

B.Sc. in Physiotherapy

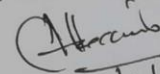
Class Roll: 06, Session: 2015-16

Bangladesh Health Professions Institute (BHPI)

(An academic Institution of CRP)

CRP-Chapain, Savar, Dhaka-1343.

Approved



3/01/21

Rumana

03.01.2021

Appendix-1 (B)

Date: December 27, 2020

The Chairman

Institutional Review Board (IRB)

Bangladesh Health Professions Institute (BHPI)

CRP-Savar, Dhaka-1343, Bangladesh

Subject: Application for review and ethical approval.

Sir,

With due respect and humble submission to state that I am Abrin Sultana, student of 4th Professional B.Sc. in Physiotherapy at Bangladesh Health Professions Institute (BHPI). This is a 4(four) year full time course. Conducting thesis project is partial fulfillment of the requirement for the degree of B.Sc. in physiotherapy. I have to conduct a thesis entitled, **“Barriers in performing home exercise among the patients with ischemic stroke after discharge from Center for the Rehabilitation of the Paralyzed (CRP)”** under the supervision of Farjana Sharmin, Lecturer of Bangladesh Health Professions Institute (BHPI), Jr. Consultant and OPD In-charge, Department of Physiotherapy, CRP, Savar, Dhaka-1343. The purpose of this study is to identify the barriers in performing home exercise among the patients with ischemic stroke after discharge from Center for the Rehabilitation of the Paralyzed (CRP). I would like to assure that anything of my study will not be harmful for the participants. Informed consent will be received from all participants, data will be kept confidential.

I, therefore pray and hope that your honor would be kind enough to approve my thesis proposal and give me permission to start data collection and oblige thereby.

Sincerely,



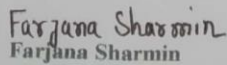
Abrin Sultana

4th professional B.Sc. in Physiotherapy

Roll: 06, Session: 2015-16, ID: 112150277

BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Recommendation from the thesis supervisor:



Farjana Sharmin

Farjana Sharmin

Lecturer of Bangladesh Health Professions Institute (BHPI)

Jr. Consultant and OPD In-charge

Department of Physiotherapy

CRP, Savar, Dhaka

Attachment: Thesis Proposal, Questionnaire (English & Bengali version), Informed consent.

Appendix-1 (C)



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

Ref.

CRP-BHPI/IRB/12/2020/434

Date: 27/12/2020

Abrin Sultana
B.Sc. in Physiotherapy
Session: 2015-16, Student ID:112150277
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Subject: Approval of the thesis proposal “**Barriers in performing home exercise among the patients with ischemic stroke after discharge from Center for the Rehabilitation of the Paralysed (CRP)**” by ethics committee.

Dear Abrin Sultana,
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 & Bengali version)
3	Information sheet & consent form.

The purpose of the study is to find out the nature of practice of Physiotherapy in Bangladesh. The study involves use of a questionnaire to explore that may take 15 to 20 minutes to answer the specimen and there is no likelihood of any harm to the participants. Data collectors will receive informed consents from all participants. Any data collected will be kept confidential. The members of the Ethics committee have approved the study to be conducted in the presented form at the meeting held at 8:30AM on 1st March, 2020 at BHPI (23rd IRB Meeting).

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

Best regards,

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

সিআরপি-চাপাইন, সাভার, ঢাকা-১৩৪৩, বাংলাদেশ, ফোন : ৭৭৪৫৪৬৪-৫, ৭৭৪১৪০৪ ফ্যাক্স : ৭৭৪৫০৬৯

CRP-Chapain, Savar, Dhaka-1343, Tel : 7745464-5, 7741404, Fax : 7745069, E-mail : contact@crp-bangladesh.org, www.crp-bangladesh.org

Appendix-2 (A)

অনুমোদন পত্র

আসসালামুআলাইকুম/নমস্কার,

আমি আবরিন সুলতানা, বাংলাদেশ হেলথ প্রফেশনস ইনস্টিটিউট (বিএইচপিআই) এর চতুর্থ বর্ষের একজন শিক্ষার্থী। আমি “ইস্কেমিক স্ট্রোকে আক্রান্ত রোগীদের পক্ষাঘাত গ্রন্থদের পুনর্বাসন কেন্দ্র (সিআরপি) থেকে চিকিৎসা গ্রহন শেষে বাড়িতে ব্যায়াম সম্পাদনে প্রতিবন্ধকতাসমূহ” শিরোনামে একটি গবেষণা করছি যা আমার অধ্যয়নের অন্তর্গত। এই জন্য আমি আপনার কাছে কিছু তথ্য জানতে চাচ্ছি, যা ১৫-২০ মিনিটের বেশি সময় লাগবে না। আমি এটাও নিশ্চিত করছি যে আপনার প্রদানকৃত তথ্যের গোপনীয়তা বজায় থাকবে।

আপনি স্বেচ্ছায় এই গবেষণায় অংশ নিতে পারেন। আপনি যদি চান তবে আপনার অংশগ্রহণ প্রত্যাহার করতে বা তালিকা থেকে যে কোনও প্রশ্ন এড়িয়ে যেতে পারেন। এছাড়াও, এই গবেষণায় অংশগ্রহণকারী হিসেবে যদি কোনো সমস্যা বা প্রশ্ন থাকে তবে আপনি আমার অথবা আমার গবেষণা তত্ত্বাবধায়ক ফারজানা শারমিন, কনসালট্যান্ট, আউটপেশেন্ট ইনচার্জ অ্যান্ড লেকচারার অব বিএইচপিআই, সিআরপি, সাভার, ঢাকা-১৩৪৩, এর সাথে যোগাযোগ করতে পারেন।

গবেষণাটি শুরু করার আগে আপনার কোনো প্রশ্ন আছে?

আমি কি এই সাক্ষাৎকার শুরু করতে পারি?

হ্যাঁ.....

না.....

সাক্ষাৎকার প্রদানকারীর স্বাক্ষর:

তারিখ:

সাক্ষাৎকার গ্রহণকারীর স্বাক্ষর:

তারিখ:

Appendix-2 (B)

Consent Form

Assalamualaikum/Namasker,

My name is Abrin Sultana, student of 4th Professional B.Sc. in Physiotherapy in Bangladesh Health Profession Institute (BHPI). I am conducting a research which is included in my course and the title is “**Barriers in performing home exercise among the patients with ischemic stroke after discharge from Center for the Rehabilitation of the Paralyzed (CRP)**”. Because of that I would like to know some information, which will not take more than 15-20 minutes. It also guarantees that your provided information will be remained confidential.

You can participate in this study voluntarily. If you want, you can withdraw your participation or skip any question at any time from the list. Also, if there is any problem or as a participant in this study if you have any queries, you can contact with me or my research supervisor Farjana Sharmin, Consultant, Out-patient In-charge & Lecturer of BHPI, CRP, Savar, Dhaka-1343.

Do you have any questions before starting the research?

Can I start this interview?

Yes.....

No.....

Signature of the Participant.....

Date.....

Signature of Interviewer.....

Date.....

Appendix-3(A)

ইস্কেমিক স্ট্রোকে আক্রান্ত রোগীদের পক্ষাঘাত গ্রন্থদের পুনর্বাসন কেন্দ্র (সিআরপি) থেকে চিকিৎসা গ্রহন শেষে বাড়িতে ব্যায়াম সম্পাদনে প্রতিবন্ধকতাসমূহ

বাংলা প্রশ্নাবলী

রোগীর আইডি:

সাক্ষাৎকারের তারিখ:

অংশ – ১: সামাজিক-জনসংখ্যা তাত্ত্বিক তথ্য

	প্রশ্ন	প্রতিক্রিয়া
১.১	বয়স	
১.২	লিঙ্গ	১) পুরুষ ২) মহিলা
১.৩	বাসস্থান	১) গ্রাম ২) শহর ৩) উপ শহর
১.৪	বৈবাহিক অবস্থা	১) বিবাহিত ২) অবিবাহিত ৩) বিধবা ৪) আলাদা বাস ৫) তালাক প্রাপ্ত ৬) বিপত্নীক
১.৫	শিক্ষাগত যোগ্যতা	১) অশিক্ষিত ২) প্রাইমারী ৩) এস.এস.সি ৪) এইচ.এস.সি ৫) স্নাতক ৬) স্নাতকোত্তর অথবা তদুর্ধ

১.৬	পেশা	১) চাকরিজীবী ২) গৃহিণী ৩) কৃষি ৪) শিক্ষক ৫) কারখানা / পোশাক শ্রমিক ৬) উকিল ৭) ব্যবসায়ী ৮) ডাক্তার ৯) বেকার ১০) শিক্ষার্থী ১১) দিনমজুর ১২) অন্যান্য
১.৭	পরিবারের ধরন	১) একক ২) যৌথ
১.৮	আপনার পরিবারের সদস্য সংখ্যা কত?	
১.৯	সহায়ক ডিভাইসের ব্যবহার	১) হ্যাঁ ২) না
১.১০	হাতের ব্যবহার	১) সম্পূর্ণ ২) আংশিক ৩) ব্যবহার নাই
১.১১	পায়ের ব্যবহার	১) সম্পূর্ণ ২) আংশিক ৩) ব্যবহার নাই

অংশ – ২: ব্যায়াম করতে প্রতিবন্ধক সম্পর্কিত তথ্য

	প্রশ্ন	প্রতিক্রিয়া
২.১	আপনার কি স্পাষ্টিসিটি বা মাংসপেশি শক্ত হয়ে গেছে?	১) হ্যাঁ ২) না যদি না হয় ২.১.১ প্রশ্নটি পরিহার করুন
২.১.১	স্পাষ্টিসিটি বা শক্ত মাংসপেশি কি ব্যায়াম করতে বাধা দেয়?	১) হ্যাঁ ২) না ৩) মাঝে মধ্যে
২.২	ব্যায়াম করতে ব্যাথা আপনাকে বাধা দেয়?	১) হ্যাঁ ২) না ৩) মাঝে মধ্যে
২.৩	আপনি কি শক্তির অভাবে ব্যায়াম করা থেকে বিরত থাকেন?	১) হ্যাঁ ২) না ৩) মাঝে মধ্যে
২.৪	ব্যায়াম করতে কোনও শারীরিক অবস্থা আপনার বিঘ্ন ঘটায়?	১) হ্যাঁ ২) না যদি না হয় ২.৪.১ প্রশ্নটি পরিহার করুন
২.৪.১	যদি হ্যাঁ হয়, কোনটি?	১) হৃদরোগ ২) বহুমূত্র ৩) রক্ত চাপ ৪) শ্বাস প্রশ্বাসের জটিলতা ৫) অন্যান্য
২.৫	ব্যায়াম করতে গিয়ে কখনও আঘাত প্রাপ্ত হয়েছেন?	১) হ্যাঁ ২) না যদি না হয় ২.৫.১ প্রশ্নটি পরিহার করুন
২.৫.১	যদি হ্যাঁ হয়, কোন ধরনের আঘাত?	১) মচকানো ২) হাড়ের স্থানচ্যুতি ৩) কালশিটা

		৪) পেশীটান ৫) অন্যান্য
২.৬	আপনি কি ব্যায়াম করার সময় পড়ে যাওয়ার ভয় পান?	১) হ্যাঁ ২) না ৩) মাঝে মধ্যে
২.৭	ব্যায়ামের সময় ব্যায়াম করা বন্ধ করে দিতে হয় এমন কোন শারীরিক সমস্যার সম্মুখীন হোন?	১) হ্যাঁ ২) না যদি না হয় ২.৭.১ প্রশ্নটি পরিহার করুন
২.৭.১	আপনার কোন ধরনের শারীরিক সমস্যায় ব্যায়াম করা বন্ধ করে দিতে হয়?	১) শ্বাস কষ্ট ২) অত্যধিক গরম অনুভূতি ৩) বুকে ব্যাথা ৪) হাত পা ভারী লাগা ৫) অন্যান্য
২.৮	পুনরায় স্ট্রোকের ভয়ে আপনি কি ব্যায়াম করতে বাধা পান?	১) হ্যাঁ ২) না ৩) মাঝে মধ্যে
২.৯	ব্যায়াম করার ক্ষেত্রে আপনি কি ক্লান্ত হয়ে যান?	১) হ্যাঁ ২) না ৩) মাঝে মধ্যে
২.১০	ব্যায়াম করতে অলসতা বোধ করেন?	১) হ্যাঁ ২) না ৩) মাঝে মধ্যে
২.১১	আপনি কি নিজেকে হতাশ বলে মনে করেন?	১) হ্যাঁ ২) না
২.১২	“ব্যায়াম করার জন্য আমার বয়স অনেক বেশি হয়ে গেছে”	১) দৃঢ়ভাবে একমত ২) একমত ৩) দ্বিমত ৪) দৃঢ়ভাবে দ্বিমত

২.১৩	ব্যায়াম করতে আপনি আগ্রহ বোধ করেন কি?	১) হ্যাঁ ২) না ৩) মাঝে মধ্যে
২.১৪	আপনি কি উৎসাহের অভাবে ব্যায়াম করা থেকে বিরত থাকেন?	১) হ্যাঁ ২) না
২.১৫	আপনার কি মনে হয় ব্যায়াম স্বাস্থ্যের অবস্থার কোন উন্নতি ঘটায় না?	১) হ্যাঁ ২) না
২.১৬	আপনার কাছে ব্যায়াম করা কি বিরক্তিকর মনে হয়?	১) হ্যাঁ ২) না যদি না হয় ২.১৬.১ প্রশ্নটি পরিহার করুন
২.১৬.১	যদি হ্যাঁ হয়, কেন?	১) কী ব্যায়াম করতে হবে আমি জানি না ২) শারীরিকভাবে কর্মক্ষম হবার কোন প্রয়োজন নাই আমার ৩) আমি বিরতবোধ করি ৪) ব্যায়াম একঘেয়ে লাগে ৫) অন্যান্য
২.১৭	ব্যায়াম করা খুব কঠিন?	১) হ্যাঁ ২) না ৩) মাঝে মধ্যে
২.১৮	আপনার কি ব্যায়াম করার জন্য যথেষ্ট সময় আছে?	১) হ্যাঁ ২) না
২.১৯	আপনার পরিচর্যাকারী আপনাকে প্রয়োজনে ব্যায়াম করতে সহায়তা করে?	১) হ্যাঁ ২) না ৩) মাঝে মধ্যে
২.২০	“পরিবারের সদস্য বা বন্ধুরা আমার ব্যায়াম করার প্রচেষ্টায় সহায়ক নয়”	১) দৃঢ়ভাবে একমত ২) একমত ৩) দ্বিমত ৪) দৃঢ়ভাবে দ্বিমত

২.২১	পরিবারের সংস্কৃতি, বিশ্বাস বা নৈতিকতা কি আপনাকে ব্যায়াম করতে বাধা দেয়?	১) হ্যাঁ ২) না
২.২২	ব্যায়াম করতে বাধা দেয় এমন কোন পারিবারিক দায়িত্ব আপনার রয়েছে?	১) হ্যাঁ ২) না যদি না হয় ২.২২.১ প্রশ্নটি পরিহার করুন
২.২২.১	সেটা কি?	১) গৃহকর্ম ২) সন্তানদের যত্নাদি ৩) সঙ্গীর যত্নাদি ৪) চাকরি ৫) অন্যান্য
২.২৩	আপনার ঘরে ব্যায়াম করার কোনো উপকরণ আছে কি?	১) হ্যাঁ ২) না
২.২৪	ব্যায়াম করার জন্য আপনার বাড়িতে পর্যাপ্ত জায়গা আছে?	১) হ্যাঁ ২) না
২.২৫	আপনার বাড়ির পরিবেশ কি ব্যায়ামের জন্য উপযুক্ত?	১) হ্যাঁ ২) না

Appendix-3(B)

**BARRIERS IN PERFORMING HOME EXERCISE AMONG THE
PARIENS WITH ISCHEMIC STROKE AFTER DISCHARGE FROM
CENTER FOR THE REHABILITATION OF THE PARALYSE (CRP)**

Questionnaire

Patient's ID:

Date of interview:

Part-1: Patient's Socio-demographic Information

	Questions	Responses
1.1	Age	
1.2	Gender	1) Male 2) Female
1.3	Residence	1) Rural 2) Urban 3) Semi urban
1.4	Marital status	1) Married 2) Single 3) Widow 4) Separated 5) Divorced 6) Widower
1.5	Level of education	1) Illiterate 2) Primary 3) S.S.C 4) H.S.C 5) Graduate 6) Masters or above

1.6	Occupation	<ul style="list-style-type: none"> 1) Service holder 2) Housewife 3) Agriculture 4) Teacher 5) Factory/garments worker 6) Lawyer 7) Businessman 8) Doctor 9) Unemployed 10) Student 11) Day labor 12) Others
1.7	Family type	<ul style="list-style-type: none"> 1) Nuclear 2) Joint
1.8	How many members are there in your family?	
1.9	Using assistive devices	<ul style="list-style-type: none"> 1) Yes 2) No
1.10	Use of arms	<ul style="list-style-type: none"> 1) Full 2) Partial 3) No use
1.11	Use of legs	<ul style="list-style-type: none"> 1) Full 2) Partial 3) No use

Part-2: Barriers related information

	Questions	Responses
2.1	Do you have spasticity or muscle stiffness?	1) Yes 2) No If “no” skip to question 2.1.1
2.1.1	Does your spasticity or muscle stiffness prevent you to perform exercise?	1) Yes 2) No 3) Occasionally
2.2	Does pain prevent you from exercising?	1) Yes 2) No 3) Occasionally
2.3	Is lack of energy hinder you from exercise?	1) Yes 2) No 3) Occasionally
2.4	Does any health condition prevent you from exercise?	1) Yes 2) No If “no” skip to question 2.4.1
2.4.1	If yes, which condition?	1) Heart disease 2) Diabetes 3) Blood pressure 4) Respiratory complication 5) Others

2.5	Have you ever gotten injured from exercise?	1) Yes 2) No If “no” skip to question 2.5.1
2.5.1	If yes, what kind of injury?	1) Sprain 2) Dislocation 3) Bruises 4) Muscle cramp 5) Others
2.6	Are you afraid of falling during exercise?	1) Yes 2) No 3) Occasionally
2.7	Do you face any health problem during exercise that causes you to stop exercise?	1) Yes 2) No If “no” skip to question 2.7.1
2.7.1	Which type of health problem that causes you to stop exercising?	1) Breathlessness 2) Feeling too hot 3) Chest pain 4) Heavy limb 5) Others
2.8	Are you afraid of having another stroke that prevent you to perform exercise?	1) Yes 2) No 3) Occasionally

2.9	Do you get tired to perform exercise?	1) Yes 2) No 3) Occasionally
2.10	Do you feel laziness to do exercise?	1) Yes 2) No 3) Occasionally
2.11	Do you consider yourself to be depressed?	1) Yes 2) No
2.12	“I am too old to exercise”	1) Strongly agree 2) Agree 3) Disagree 4) Strongly disagree
2.13	Do you feel interest to do exercise?	1) Yes 2) No 3) Occasionally
2.14	Is lack of motivation prevent you to perform exercise?	1) Yes 2) No
2.15	Do you think exercise makes no improvement in health condition?	1) Yes 2) No
2.16	Do you think exercise is boring?	1) Yes 2) No If “no” skip to question 2.16.1

2.16.1	If yes, why?	1) I don't know what exercise to do 2) I have no reason to physically fit 3) I feel embarrassed 4) Exercise is monotonous 5) Others
2.17	Is exercise too difficult to do?	1) Yes 2) No 3) Occasionally
2.18	Do you have enough time to exercise?	1) Yes 2) No
2.19	Does your carer assist you to exercise if need?	1) Yes 2) No 3)Occasionally
2.20	“My family members or friends aren't supportive of my efforts to exercise”	1) Strongly agree 2) Agree 3) Disagree 4) Strongly disagree
2.21	Do your family's culture, beliefs or morals prevent you to do exercise?	1) Yes 2) No
2.22	Is there any family responsibility that prevent you to exercise?	1) Yes

		2) No If “no” skip to question 2.22.1
2.22.1	What is it?	1) Household work 2) Care of children 3) Care of partner 4) Employment 5) Others
2.23	Do you have any exercise equipment at home?	1) Yes 2) No
2.24	Have you enough space to perform exercise in home?	1) Yes 2) No
2.25	Is your home setting suitable for exercising?	1) Yes 2) No