Factors Influencing Toileting Task Performance among Patients with Subacute Stroke: A Cross-sectional Study

By
Basetun Nesa

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Bangladesh Health Professions Institute (BHPI)

Faculty of Medicine

University of Dhaka

Thesis completed by:

Mst. Basetun Nesa
4th year, B.Sc. in Occupational Therapy
Bangladesh Health Professions Institute (BHPI)
Centre for the Rehabilitation of the Paralysed (CRP) ……
Chapain, Savar, Dhaka: 1343 Signature

Supervisor's Name, Designation, and Signature

Shamima Akter
Associate Professor
Department of Occupational Therapy
Bangladesh Health Professions Institute (BHPI)
Centre for the Rehabilitation of the Paralysed (CRP) ……
Chapain, Savar, Dhaka: 1343 Signature

Co-Supervisor's Name, Designation, and Signature

Nayan Kumer Chanda
Assistant Professor
Department of Occupational Therapy
Bangladesh Health Professions Institute (BHPI)
Centre for the Rehabilitation of the Paralysed (CRP) ……
Chapain, Savar, Dhaka: 1343 Signature

Head of the Department's Name, Designation, and Signature

Sk. Moniruzzaman
Associate Professor & Head
Department of Occupational Therapy
Bangladesh Health Professions Institute (BHPI)
Centre for the Rehabilitation of the Paralysed (CRP) ……
Chapain, Savar, Dhaka: 1343 Signature

Board of Examiners

Statement of Authorship

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Mst Basetun Nesa
4th year, B.Sc. in Occupational Therapy
Bangladesh Health Professions Institute (BHPI)
Centre for the Rehabilitation of the Paralysed (CRP)
Chapain, Savar, Dhaka: 1343

.....
Signature

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Dedication

Dedicated to my honorable and beloved parents.

Table of contents

List of Tables

List of Figures

List of Abbreviations

ADL	Activities of Daily Living
ANOVA	Analysis of Variance
BBS	Berg Balance Scale
BAMSE	Bangla Adapted Mini Mental State Examination
FACT	Functional Assessment for Control of Trunk
FIM	Functional Independence Measure
MMSE	Mini Mental State Examination
QOL	Quality of Life
SIAS	Stroke Impairment Assessment Set
STROBE	Strengthening the Reporting of Observational studies in Epidemiology
WHO	World Health Organization

Abstract

Background: In individuals recovering from subacute strokes, toileting task performance is a critical aspect of daily living affected by various physical and cognitive factors. Understanding the predictors influencing toileting abilities is vital for optimizing rehabilitation strategies and improving the quality of life for stroke survivors.

Aim: This study aims to comprehensively assess the clinical, and functional characteristics of stroke survivors and to identify key predictors impacting their ability to perform toileting tasks.

Method: A quantitative cross-sectional study design was employed among 81 stroke survivors undergoing rehabilitation in Dhaka, Bangladesh, through structured survey questionnaires and standardized assessments. Descriptive statistical analysis was then conducted using SPSS version 20 to explore the relationships between toileting task performance and various physical and functional domains and to identify predictors of toileting task performance among stroke survivors.

Result: The study identified moderate significant correlation was found with different variables between toileting task performance and upper extremity motor function ($p<0.001$), lower extremity motor function ($p<0.001$), overall motor function ($p < 0.001$), sensory function ($p<0.001$), and cognitive function ($p < 0.01$). There is a strong positive correlation between toileting task performance and balance ($p<0.001$). Regression analysis highlighted balance ($\beta= 0.550$, $p <0.001$) suggesting a notable impact on toileting task performance and cognition ($\beta = 0.268$, $p= 0.001$) as strong predictors of toileting task

performance, underscoring their importance in rehabilitation interventions for subacute stroke patients.

Conclusion: Addressing balance and cognitive impairments is crucial for enhancing toileting task performance and overall functional independence in subacute stroke patients. Individualized treatment approach should be undertaken according to severity of impairment.

Keywords: Subacute stroke, toileting task performance, rehabilitation, upper extremity motor function, lower extremity motor function, balance, sensory function, cognitive function, predictors

CHAPTER I: INTRODUCTION

1.1 Background

The rising global burden of stroke is a significant concern, with millions of new cases reported each year, leading to considerable mortality, disability and morbidity worldwide over the last decades (Mukherjee & Patil, 2011; Avan et al., 2019; Katan & Luft, 2018; Mondol, Hasan, Khan & Mohammad, 2022). Stroke ranks as the second-leading cause of death and the third-leading cause of disability globally (Fujita, Yamamoto, et al., 2021). The incidence and prevalence of stroke have increased over the past three decades, with around 12.2 million incident case. The economic burden of stroke is substantial, estimated at $891 billion globally in 2017, equivalent to 1.12% of global GDP(Algurén, 2010). Geographic and economic inequalities significantly impact the burden of stroke worldwide, with lower-income and lower-middle-income countries bearing the brunt of the disease burden (Mukherjee & Patil, 2011). Sub-Saharan Africa and Asia experience a disproportionately high number of stroke-related deaths and disabilities. In 2019, estimates showed that age-standardized mortality and disability rates were nearly four times higher in low-income countries compared to high-income countries.

A nationwide survey by Mondol et al., 2022, found a prevalence rate of 11.39 per 1000 population in Bangladesh. Prevalence varied by age and sex. Rates were highest among individuals over 60 years, approximately 30.10 per thousand, and lowest below 40 years, approximately 4.60 per thousand. Male prevalence was double that of females (8.68 per thousand), and slightly higher in rural areas (11.85 per thousand) compared to urban (11.07 per thousand).

Stroke survivors commonly experience a spectrum of physical impairments, such as hemiparesis, sensory disturbances, and speech impairments, which directly impact their ability to perform tasks independently. The psychological impact of stroke is profound, with depression, anxiety, and emotional distress being prevalent among survivors. Sudden changes in physical abilities and lifestyle contribute to feelings of frustration, isolation, and low self-esteem. Post-stroke cognitive impairments, such as memory loss and executive dysfunction, compound these challenges, affecting decision-making and problem-solving skills necessary for planning and executing tasks effectively. Stroke survivors often face disruptions in their social roles and relationships, leading to feelings of isolation and dependence.

Withdrawal from social activities due to physical limitations and communication barriers contributes to social isolation and reliance on caregivers (Sato et al., 2016). Family dynamics may undergo significant shifts as caregivers assume new responsibilities, straining relationships and eroding the stroke survivor's sense of autonomy and dignity. Stroke imposes substantial economic burdens on individuals, families, and healthcare systems due to the costs associated with acute medical care, rehabilitation services, assistive devices, and long-term care. Loss of income and reduced earning capacity further exacerbate financial strain, hindering access to essential aids and caregiving support, and impacting broader economic productivity and healthcare resource allocation (Higashi et al., 2023).

Despite advancements in medical care and rehabilitation, stroke survivors often face persistent challenges in performing activities of daily living (ADLs), including toileting tasks. The ability to manage toileting independently is crucial for maintaining

dignity, autonomy, and social participation, yet stroke-related impairments frequently compromise this aspect of self-care (Pei et al., 2016).

Toilet hygiene, as defined in the context of occupational therapy literature, refers to the set of skills, behaviors, and activities required to independently manage personal hygiene and toileting tasks. It encompasses the physical, cognitive, and emotional abilities necessary for a person to perform tasks related to using the toilet, maintaining cleanliness, and ensuring comfort Occupational therapy emphasizes enabling individuals to perform toileting tasks independently and safely to the best of their abilities, considering their physical, cognitive, and emotional capacities. Occupational therapists work with individuals who have experienced strokes, injuries, or other health conditions to assess their specific needs, provide interventions, and offer education to enhance their toilet hygiene independence (Ito et al., 2022a).

The goal is to support clients in achieving the highest level of functional independence possible, allowing them to engage in toileting tasks safely, comfortably, and with a sense of empowerment. Toilet hygiene encompasses a range of activities, including transferring, positioning, clothing management, personal cleansing, adaptive equipment uses, flush and handwashing, hygiene product usage, controlling incontinence, environmental adaptations, and cognitive and communication aspects (García-Rudolph et al., 2021). The ability to transfer safely and efficiently to and from the toilet. This may involve using mobility aids, grab bars, or other assistive devices (Yachnin et al., 2018a). Achieving a stable and comfortable sitting posture on the toilet seat can be especially important for individuals with mobility impairments or balance issues (Fujita et al., 2018). Managing clothing adjustments and fastenings before and after toileting, such as

pulling down and pulling up pants or skirts (Higashi et al., 2022). Effectively cleaning oneself after using the toilet, which may include tasks like wiping, washing, or using bidet systems. Engaging in proper hygiene practices after using the toilet, including flushing waste and washing hands thoroughly to prevent the spread of germs and maintain cleanliness (Yachnin et al., 2018a). The use of adaptive devices like grab bars, raised toilet seats, or wiping aids to facilitate safe and independent toileting.

Knowing how to use and apply hygiene products, such as toilet paper, wet wipes, and cleansers, appropriately and effectively (Yachnin et al., 2018b). Managing bladder and bowel control, addressing incontinence issues, and maintaining continence as much as possible through exercises, strategies, and adaptive equipment. Modifying the bathroom environment to ensure safety and accessibility, including installing grab bars, raised toilet seats, and non-slip surfaces (Mlinac & Feng, 2016). Being able to understand the sequence of steps involved in toileting, communicate needs effectively, and make informed decisions related to toileting (Yachnin et al., 2017).

Predicting toileting tasks allows for early identification of potential difficulties that stroke survivors may encounter in performing essential self-care activities. By assessing physical, cognitive, and emotional factors, clinicians can anticipate specific areas of need and implement proactive measures to address them. For example, identifying mobility limitations or cognitive impairments early on can prompt the introduction of assistive devices or cognitive rehabilitation strategies to facilitate toileting independence (Ito et al., 2022b).

Moreover, predicting toileting tasks enables the development of comprehensive assessment tools to evaluate functional abilities accurately. By incorporating predictive

factors into assessment protocols, clinicians can obtain a more robust understanding of an individual's toileting capabilities (Imura et al., 2021). This holistic assessment approach ensures that all relevant aspects, such as mobility, balance, cognition, and environmental factors, are considered when determining a person's level of independence in toileting. By understanding the predictors of toileting difficulties and implementing evidence-based strategies, healthcare professionals can empower stroke survivors to achieve greater independence and enhance their overall well-being.

1.2 Justification of the study

Understanding factors affecting toileting task performance can improve patients' quality of life, dignity, anxiety, stress, and recovery (Perry et al., 2011). It can also lead to targeted rehabilitation programs, reducing hospital stays (Salter et al., 2007). Family members can reduce caregiver burden and improve their well-being (Gitlin & Corcoran, 2015). Occupational therapists in Bangladesh can benefit from evidence-based practices and professional development (Occupational Therapy in Acute Care by Smith-Gabai & Hemphill). The research can lead to healthcare advancements, cost savings, enhanced rehabilitation infrastructure, and improved public health (The Lancet Neurology Commission on Global Stroke Rehabilitation, 2019). Benefits to Bangladesh include healthcare advances, cost savings, and improved public health outcomes (Chauhan et al., 2019; Brady et al., 2016). By addressing toileting challenges in stroke patients, the healthcare system can reduce the long-term healthcare burden and improve the quality of life for stroke survivors.

1.3 Operational Definition

1.3.1 Toileting Task Performance

The ability of people who have suffered a subacute stroke to independently and effectively perform activities related to using the restroom, such as getting in and out of the toilet, dressing, keeping balance, and controlling continence, is known as toileting task performance. Validated instruments that measure the degree of independence and functionality in toileting activities, such as the Toilet Transfer Assessment Scale (TTAS) and the Modified Rankin Scale (MRS), can be used to assess it. (Wilson et al., 2002; Drummond et al., 2015)

1.3.2 Subacute Stroke

The phase of stroke recovery that usually occurs between one weeks and six months following the first stroke event is known as subacute stroke. The subacute phase refers to 7 days to 6 months post-stroke. Doctors divide the subacute phase further, Early subacute phase: first 3 months post-stroke and Late subacute phase: 4–6 months post-stroke. People frequently undergo continuous neurological recovery throughout this time, working toward increasing their quality of life and regaining their functional independence through rehabilitation (Weinstein et al., 2016).

1.3.3 Factors

Factors are variables or aspects that significantly impact the execution of the toileting job in patients undergoing subacute stroke recovery. Physical, cognitive, psychological, and environmental elements are all included in this multifaceted range of components. (Bhogal et al., 2003)

1.4 Aim of the study

To comprehensively assess the clinical, and functional characteristics of stroke survivors, and to identify key predictors influencing their ability to perform toileting tasks.

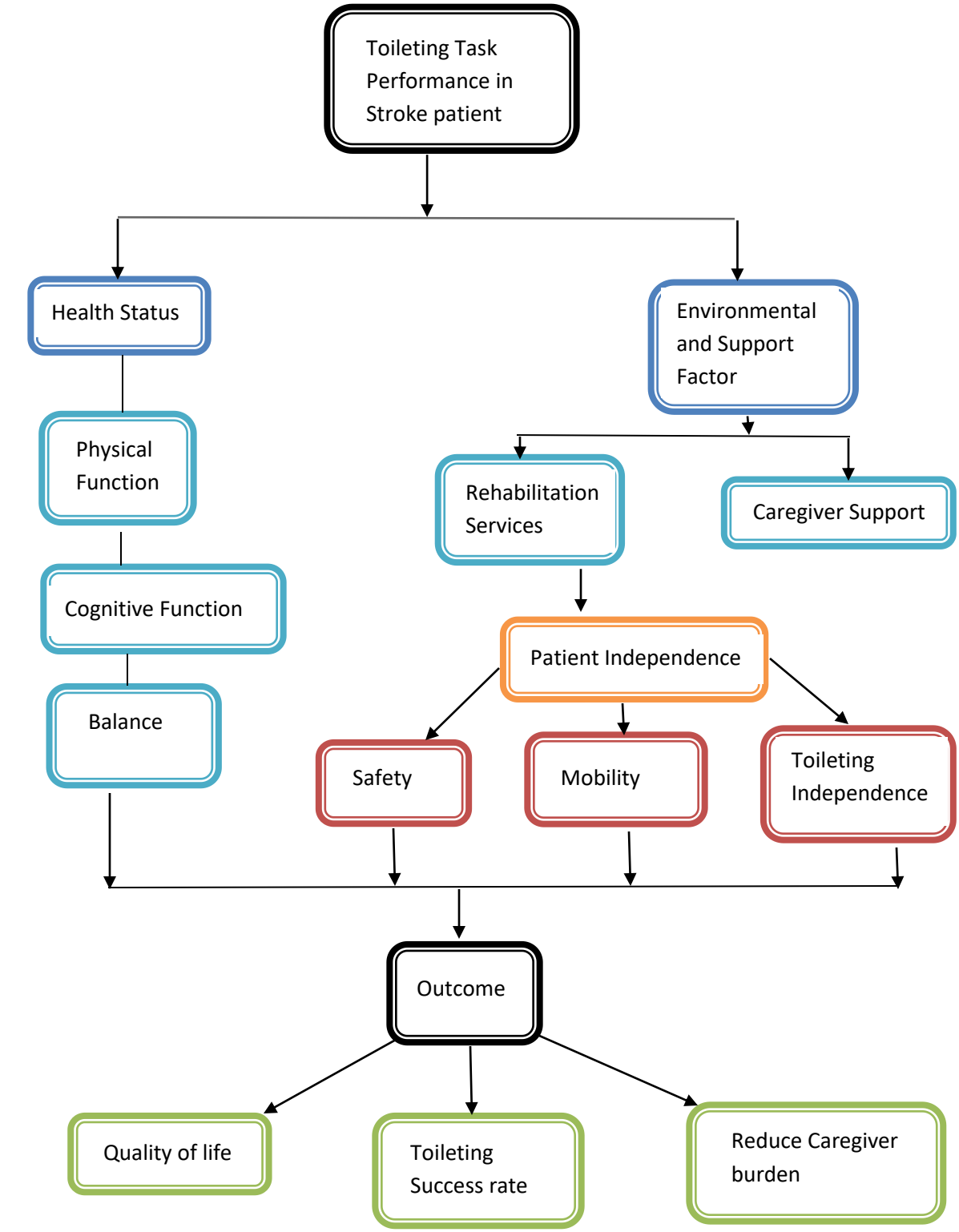
CHAPTER II: LITERATURE REVIEW

The Chapter covers the information about "Toileting Task Performance". The chapter offers a comprehensive analysis of the factors influencing toileting tasks, crucial for healthcare and caregiving. It discusses the interplay between environmental and support factors, health status, and physical and cognitive functions. Emphasizing outcomes like reduced caregiver burden, improved toileting success, enhanced quality of life, and fostering patient independence, the chapter also explores aspects like mobility, safety, rehabilitation services, caregiver support, toileting independence, and trunk function, making it valuable resource for research in healthcare and patient care management.

2.1 Toileting Task Performance

Toileting is an important activity of daily living that is significantly impaired after a stroke. The problems related to toileting in stroke survivors are serious health concerns, and are associated with an increased frequency of falls, post-stroke depression and reduced quality of life (Kawanabe et al., 2018).

Figure 2.1 Overview of literature review finding



2.1.1 Health Status

The measurement of Health-related quality of life is complex because it is influenced by aspects such as previous experiences, expectations, beliefs, and subjective perceptions. However, there is a consensus that at least 4 dimensions should be assessed: physical (physical symptoms), functional (basic and instrumental activities), psychological (cognitive and emotional function, life satisfaction, perceived health) and social (interaction of the subject with the environment) (Castellanos Pinedo et al., 2012). Some health statuses like cognitive and physical dysfunctions in stroke patients cause a reduction in the activities of daily living (ADL), loss of independence in ADLs and quality of life (QOL). The clarification of factors that are related to and that influence independence in toileting is useful when planning effective rehabilitation programs. studies have reported that balance function is associated with the level of independence in overall ADLs.

Independence and ability to perform activities of daily living. The analysis of individual ADLs has also demonstrated Impaired balance is a well-characterized sequela associated with an association between balance and the ability to use the toilet. (Fujita, Kisara, et al., 2021) utilized a retrospective observational study design. The subjects were 157 patients who met the inclusion criteria among the stroke patients admitted to the convalescent rehabilitation ward at Kita-Fukushima Medical Center in Japan. The relationship between independence in ADLs and balance at 1, 2, and 3 months after stroke onset was examined. They collected and analyzed the scores of toilets, dressing, grooming, and stairs items in the FIM instrument, which have been reportedly strongly associated with balance. The Berg balance scale (BBS) was used as an index of balance.

According to previous studies, there is a possibility that cognitive function, unilateral spatial neglect, and affected lower limb function are related to toileting ability. These cognitive and physical functions may be associated with differences between supervision and dependent groups in toileting ability.(Fujita, Yamamoto, et al., 2021). (Sato et al., 2016) conducted a cross-sectional study. Patient data from nine rehabilitation hospitals were collected and analyzed. The study included 163 stroke patients who had unilateral cerebral hemispheric lesions. The FIM instrument for the toileting item was used to assess the independence level of toileting.

The Mini-mental State Examination (MMSE) was used to assess cognitive function and the Stroke Impairment Assessment Set (SIAS) items were used to assess the motor function of the affected lower limb, speech, and visuospatial function. The Functional Assessment for Control of Trunk (FACT) was used to assess trunk function. The study found that the need for toileting assistance in stroke patients is associated with affected lower limb function, cognitive function, and trunk function. Cut-off values were identified for these factors to help discern the need for toileting assistance: SIAS score for the affected lower limb function: 8/7 points. MMSE for cognitive function: 25/24 points. FACT for trunk control: 14/13 points. These findings highlight that both cognitive and physical dysfunctions in stroke patients lead to a reduction in activities of daily living including toileting.

2.1.2 Rehabilitation

The subacute phase refers to 7 days to 6 months post-stroke. Doctors divide the subacute phase further, Early subacute phase: first 3 months post-stroke and Late subacute phase:

4–6 months post-stroke. Stroke is additionally reason for functional impairment. Twenty percent of survivors require inpatient rehabilitation programs after 3 months (Go et al., 2014). A systemic review also indicated the need for more health care services 43 directed at patients with stroke, including rehabilitation services (Meyer et al., 2015). Different rehabilitation programs may be used to maximize an individual's functions after stroke (Dobkin, Plummer-D'Amato, Elashoff, & Lee, 2010; Nadeau et al., 2013). Considerable controversy and debate encompass the adequacy of related programs after stroke (Pollock et al., 2014). According to the World Health Organization (WHO), rehabilitation interventions are used to maximize function and minimize the limitations in activity using neurofacilitation, functional and compensatory training strategies (Stucki, Cieza, & Melvin, 2007).

The stroke patient if medically stable, rehabilitation can begin in the acute care facility within approximately 72 hours. In a stroke unit, these interventions can prevent or minimize the effects of deconditioning and the risk of secondary impairment (Bindawas et al., 2017). The crucial role of motivation in rehabilitation success. The study found that patients' internal motivation at the beginning of rehabilitation significantly correlates with their improvement in independence and performance of daily activities. Rehabilitation programs tailored to individual needs, emphasizing active participation and motivation, are shown to be more effective. This research highlights the importance of integrating motivational strategies into rehabilitation to enhance recovery outcomes for stroke patients. This summary is based on the research conducted by (Harari et al., 2020). The study involved 30 acute stroke patients, assessing their motivation using the Multidimensional Health Locus of Control scale and their daily activities performance

using the Functional Independence Measure (FIM). The results revealed that internal motivation at the beginning of rehabilitation significantly correlated with improvements in daily activities.

Throughout the rehabilitation, internal motivation increased, while external motivation decreased, emphasizing the importance of patient-centered motivational strategies in occupational therapy for stroke recovery. (Rapolienė et al., 2018 & Cumming et al., 2013) provide a comprehensive overview of cognitive rehabilitation following stroke. It highlights that cognitive impairment is a common consequence of stroke, impacting the quality of life and independence of patients. The article discusses various aspects of cognitive rehabilitation, including the challenges in addressing cognitive deficits, the effectiveness of different rehabilitation approaches, and the need for further research in this area.

Cognitive rehabilitation for stroke patients includes both compensatory and restorative approaches. Compensatory strategies focus on adapting the external environment and employing tools to assist with cognitive tasks, while restorative approaches aim to improve cognitive functions through training and exercises. The article also notes that while there have been successes in treating focal cognitive deficits like aphasia and neglect, effective treatments for more diffuse cognitive impairments are less established. The need for tailored rehabilitation approaches based on individual patient needs and the type of stroke is emphasized (Maki et al., 2023).

2.1.3 Patient Independence

(Bindawas et al., 2017) investigate the correlation between these cognitive and physical functions and the level of independence in toileting. Particularly, the motor function of the affected lower limb, cognitive function, and trunk function were significantly associated with toileting ability. The study identified cut-off values for these factors, providing a practical reference for determining the level of assistance required in toileting for stroke patients. These findings emphasize the importance of targeted rehabilitation strategies in improving patient independence in daily activities post-stroke. They identify the factors influencing patient independence in toileting post-stroke. The study's method involved assessing 163 first-stroke patients using the FIM instrument for toileting, along with cognitive and physical assessments like the MMSE, SIAS, and FACT (Sato et al., 2016). (Imura et al., 2021) emphasizes the significance of independence in toileting for stroke survivors.

It reveals that both stroke survivors and occupational therapists agree that independence in toileting is crucial for maintaining self-esteem and avoiding feelings of helplessness. However, stroke survivors extend this view, emphasizing that the method of toileting is as important as the independence itself. The study highlights the need for occupational therapists to consider both the method and independence in toileting during rehabilitation, understanding the impact on the patient's self-perception and quality of life. This underscores the importance of a patient-centred approach in rehabilitation for toileting independence post-stroke. They conducted interviews with stroke survivors and occupational therapists to gather their perspectives on toileting independence. The results showed a consensus on the significance of toileting independence for self-esteem and

autonomy. Stroke survivors particularly highlighted that the method of achieving this independence is as important as the independence itself, impacting their self-perception and quality of life. These findings underscore the need for patient-centered approaches in rehabilitation, considering both independence and the preferred methods of toileting (Clark, J., & Rugg, S. 2005).

2.2 Key Gaps

- It does not explore throughly into the specific factors that influence toileting task performance, which could provide valuable insights for developing targeted intervention (Higashi et al., 2023).
- While this study investigates functional independence post-stroke, it lacks specific examination of toileting task performance as a distinct area of inquiry (Zhou et al., 2022).

CHAPTER III: METHODS

3.1 Study Question, Aim, Objective

3.1.1 Study Question

How do individual characteristics, physical, cognitive and perceptual factors impact toileting task performance in patients with subacute stroke?

3.1.2 Aim

The study aim was to comprehensively assess the demographic, clinical, and functional characteristics of stroke survivors, and to identify key predictors influencing their ability to perform toileting tasks.

3.1.3 Objectives

1. To measure the severity of impairment in muscle tone, balance, sensory, motor, cognitive and perceptual function among stroke survivors.
2. To determine the level of independence in performing toileting tasks among stroke survivors.
3. To explore the relationships between toileting task performance and various physical and functional domains, including motor function, sensory perception, cognitive abilities, and perceptual function.
4. To identify predictors of toileting task performance of stroke survivors.

3.2 Study Design

3.2.1 Study Methods

The quantitative method involved the systematic collection of numerical data through structured survey questionnaires and standardized assessments. This method facilitated the measurement and analysis of variables such as muscle tone, balance, sensory perception, motor function, cognitive abilities, and perceptual function. The data collected were subjected to statistical analysis to identify patterns, relationships, and predictors related to toileting task performance.

3.2.2 Study Approach

A cross-sectional approach was adopted, which enabled the researchers to collect data from participants at a single point in time. All data gathered primarily refer to the period around the time of data collection, as described by Kesmodel (2018). This approach provided a snapshot of the study variables among subacute stroke patients undergoing rehabilitation at the Center for the Rehabilitation of the Paralysed (CRP) in savar and Mirpur, Dhaka, Bangladesh. The collected data provided insights into the current state of toileting abilities and associated factors, offering a valuable snapshot of this specific patient population's circumstances. By examining the characteristics and factors influencing toileting task performance at a specific moment, the study aimed to provide insights into the rehabilitation needs of this population.

3.3 Study Setting and Period

3.3.1 Study Setting

The study carried out within the premises of the Center for the Rehabilitation of the Paralysed, located at Savar & Mirpur, Dhaka, Bangladesh. CRP is a prominent institution renowned for its specialized care and rehabilitation services for individuals with physical disabilities, including stroke patients. Specifically, the study was conducted in CRP's neurology unit, where stroke patients receive comprehensive rehabilitation and healthcare support. This unit is equipped with facilities and expertise tailored to the specific needs of stroke patients during their recovery journey. CRP's status as a leading rehabilitation center in Bangladesh ensures that the study will have access to a well-informed and relevant study population. Furthermore, CRP maintains a rigorous ethical framework and Institutional Review Board to oversee research involving patients, ensuring the ethical conduct of the study and the protection of participants' rights and privacy. The choice of CRP as the study setting is strategically made to align with the study's objectives, the availability of participants, ethical considerations, and its local context specificity, allowing for an in-depth exploration of the factors influencing toileting task performance in subacute stroke patients within the unique healthcare landscape of Bangladesh.

3.3.2 Study Period

The study was conducted over a period spanning from May 2023 to February 2024. Data collection, however, specifically occurred from December 1st to December 31st, 2023.

3.4 Study Participant

3.4.1 Study Population

The study population for this research comprises individuals who have experienced subacute strokes. These individuals have recently undergone strokes and are in the process of rehabilitation and recovery. The diagnosis criteria include the presence of focal neurological deficits, such as hemiparesis, hemiplegia, sensory disturbances, or speech impairment and symptoms persisting for more than 24 hours. There should be the absence of non-vascular causes of neurological deficits (e.g., brain tumour, infection) as the primary explanation for symptoms. The confirmation of acute infarction or haemorrhage on neuroimaging studies, such as magnetic resonance imaging or computed tomography scan. In addition, subacute stroke refers to the phase of stroke recovery that occurs between the acute phase and the chronic phase. During this phase, which typically lasts from several days to several weeks after the stroke event, patients experience ongoing recovery and rehabilitation as they regain function and adapt to any residual disabilities.

3.4.2 Sampling Techniques

The sampling techniques employed for this study is purposive sampling. This method involves the intentional selection of participants based on specific criteria that align with the research objectives. In this case, participants will be chosen purposefully to ensure relevance to the study's focus. According to Adolph Jenson, “A purposive selection denotes the method of selecting a number of groups of units in such a way that selected groups together yield as nearly as possible the same average or proportion as the totality

with respect of those characteristics which are already a matter of statistical knowledge." (Rai & Thapa, 2019)

3.4.3 Inclusion Criteria

- Participants who have experienced subacute strokes are defined as strokes that occur between the acute phase and the chronic phase (7 days to 6 months post-stroke).
- Subacute stroke patients who are currently receiving comprehensive rehabilitation services and care at the Center for the Rehabilitation of the Paralysed in the Savar ana Mirpur Branch, Dhaka, Bangladesh.
- Participants aged 18 years and older.
- Participants with or without the use of wheelchairs.

3.4.4 Exclusion Criteria

- There should be the absence of non-vascular causes of neurological deficits (e.g., brain tumor, infection) as the primary explanation for symptoms.
- Participants who do not receive services from the CRP Outpatient Neurology Unit, where subacute stroke patients typically undergo rehabilitation.

3.4.5 Sample Size

The investigator used a 95% confidence interval for this research; thus, the sampling error is 0.05. The investigator did not know the prevalence rate, so the prevalence is 50% = 0.5, q = (1-0.5) = 0.5, then the investigator calculated the sample size (N) and it stood for:

$N = z^2pq/d^2$

$= (1.96)^2 \times 0.5 \times (1-0.5)/ (0.05)^2$

$=384.16$

Here,

z = Confidence level at 95% (standard value of 1.96)

N= required sample size

p = prevalence

q = (1-p)

d = margin of error at 5% (standard value of 0.05)

so, the estimated sample size is 384.

Data collection was limited to 81 participants instead of the planned 384 due to allocated time frame for the study. However, efforts were made to gather sufficient information to address the research questions adequately and draw meaningful conclusions despite the smaller sample size.

3.5 Ethical Consideration

3.5.1 Ethical Clearance from IRB

Ethical clearance has been sought from the Institutional Review Board (IRB) explaining the purpose of the research, through the Department of Occupational Therapy, Bangladesh Health Professions Institute (BHPI). IRB form number CRP-BHPI/IRB/10/2023/753. Permission from the OT Neurology dept. from savar and Mirpur branch also taken before taking participants' information.

3.5.2 Informed Consent

The student researcher explained the purpose of the research to the participant, those who felt willing to participate, their data was collected. Written consent was taken from the participants as they have been assessed or interviewed face to face.

3.5.3 Right of Refusal to Participate or Withdraw

In this study, participants were free to choose, whether to participate or not. They were also free to withdraw participation from the study within 2 weeks from the time of interview.

3.5.4 Confidentiality

The information provided by the participants was confidential. Their name and identity were not disclosed to anyone except for the supervisor, and it was stated on the information sheet. The participants were informed that their identity will remain confidential for future uses, such as report writing, publication, conference or any other written materials and verbal discussion.

3.5.5 Unequal Relationship

The student researcher did not have any unequal or power relationship with the participants.

3.5.6 Risk and Beneficence

The participants did not have any risk and they did not get any benefit from this research.

3.6 Data Collection Process

3.6.1 Participant recruitment

The participant recruitment process for this study involved several key steps. First, ethical approval for the research, including the recruitment process, was obtained from the Institutional Review Board. Eligible participants, who are subacute stroke patients currently undergoing rehabilitation at CRP, will be identified within the CRP's neurology unit. The researcher approached potential participants and provided a detailed explanation of the study's objectives and procedures. The participant was presented with an information sheet outlining the study's aims, potential risks, and benefits.

Those who expressed their willingness to participate were asked to provide written informed consent. Subsequently, participants were requested to complete structured survey questionnaires and assessments related to their toileting task performance. Throughout the recruitment process, utmost attention was given to maintaining the confidentiality of participants' information, and their privacy and rights rigorously protected. This recruitment process aims to ensure that eligible subacute stroke patients are informed, willing participants in the study, contributing valuable insights into the factors influencing toileting task performance in this specific population.

3.6.2 Data Collection Method

The data collection method for this study likely involved conducting assessments and evaluations directly with the stroke survivors. These assessments included structured interviews, standardized tests, and physical examinations to gather information on demographic details, clinical history, and functional abilities such as muscle tone,

balance, sensory perception, motor function, cognitive abilities, and toileting task performance. Additionally, medical records may have been reviewed to obtain relevant clinical data.

3.6.3 Data Collection Instrument

Table 3.6.3 Overview of Data Collection Instrument

Data Collection tools	**Type of tools**	**Subscale**	**Items**	**Scoring**	**Interpretation**
Modified Ashworth Scale	Clinical Tool		6 items	Score ranges from 0 to 4	0 representing no increase in tone and higher scores on the Ashworth Scale indicate more severe muscle spasticity, with 4 indicating rigidity in flexion or extension.
BAMSE	Clinical tool	Orientation (2) Registration (1) Attention & Calculation (2) Recall (1) Language (5) Copying (1)	11 items	Each item is scored individually with a total score ranges between (0-30)	≤ 17 indicates severe impairment and ≥ 24 indicate no impairment.
Perceptual Assessment	Clinical tool	Somatognosis (8) Unilateral Neglect (7) Right/Left discrimination (8) Finger Agnosia (8) Visual Agnosia	71 items	3 point scale (1=Absent, 2=Impaired, 3=Normal)	Out of 93 ,Score ≤ 31 indicates absent, between 32-62 indicates impaired and ≥ 63 indicates normal for (perceptual

		(8) Tactile Agnosia (8) Spatial Relation (13) Apraxia (11)			somatognosis, unilateral neglect, right/left discrimination and finger agnosia). For Perceptual agnosia and apraxia out of 243 score ≤ 40 indicates absent, between 41-80 indicates impaired and ≥ 81 indicates normal .
Berg Balance Scale	Clinical tool		14 items	A five-point scale, a range of 0-4. 0 = lowest level of function 4 = highest level of function.	Total score ranges between (0-20) indicates high fall risk, (21-40) indicates medium fall risk and score between (41-56) indicates low fall risk
Toileting Task Assessment Form	Clinical tool	Wheelchair to the toilet seat (9) Performance on toilet seat (6) Toilet seat to the wheelchair (9)	24 items	TTAF indicate level of independence (eg: Independence, require supervision or verbal assistance, require assistance)	Total Score ≤ 24 indicates require assistance, score between (25-48) require supervision or verbal assistance and ≥ 49 indicates Independent
FMA-UE	Clinical tool	Upper extremity, sitting position (5) Wrist (5)	30 items for motor function, 3 items assessing	FMA has 3-point ordinal scale (0=cannot perform,	Out of total score 60, Score ≤ 35 indicates severe

		Hand (2) Grasp (5) Coordination (3) Sensation (2) Passive Joint motion (5) Joint pain (5)	reflex function and 6 items of sensory function	1=performs partially, 2=performs fully) FMA-UE is scored out of 66, with sub-scores of 36 for the upper arm and 30 for the wrist and hand.	impairment, between (36-49) indicates moderate impairment and ≥ 50 indicate mild impairment
FMA-LE	Clinical tool	Lower extremity (5) Coordination (3) Sensation (2) Passive joint motion (5) Joint Pain (5)	14 items for motor function, 3 items of reflex function and 6 items of sensory function	FMA has 3-point ordinal scale (0=cannot perform, 1=performs partially, 2=performs fully), 34 points for lower extremity	Out of total score 34, scores of ≤ 19 indicate severe impairment, between 20-28 indicate moderate impairment and ≥ indicate mild impairment

The data collection instrument for this study involves the use of structured questionnaires. Questionnaires were given to the participants which they filled out and answered. Additionally, various assessment tools were employed to gather comprehensive data. These assessment tools include Modified Ashworth Scale (Bohannon, R. W., & Smith, M. B., 1987), BAMSE (Kabir & Herlitz, 2000), Perceptual Assessment (Brown, G. T., & Jackel, A. L., 2007), BBS (Berg et al., 1989), TTAF (Kitamura et al., 2021), FMA (Fugl-Meyer et al., 1975). This standardized assessment ensures a comprehensive approach to data collection, enabling the study to examine a wide range of factors influencing toileting task performance among subacute stroke patients.

3.6.4 Field Test

The assessment tools employed in this study have undergone thorough validation and reliability testing, ensuring their trustworthiness within the field in literature. Unlike newly developed tools that require field testing to assess their reliability, these established measures have been extensively utilized and validated by researchers and practitioners. As a result, there is no need for additional field testing, as the standardized questionnaires used in this research are already well-established and validated.

3.6.5 Variables

3.6.5 Table List of Variables

Lists of Variables		**Definition**	**Measurement**
Outcome Variable (Dependent Variables)	Toileting Task Assessment Form	Refers to the level of independence or assistance required by individuals in performing toileting tasks, such as using the toilet, maintaining hygiene, and managing clothing.	Toileting Task Assessment Form
Exposures (Independent Variables)	Motor Function of Upper Extremity	Refers to the level of motor control, strength, and coordination in the upper limbs.	Fugl-Meyer Assessment for Upper Extremity
	Motor Function of Lower Extremity	Refers to the level of motor control, strength, and coordination in the lower limbs.	Fugl-Meyer Assessment for Lower Extremity

	Muscle Tone	Refers to the degree of muscle tension or resistance to passive movement.	Modified Ashworth Scale
	Balance	Refers to the ability to maintain stability and control posture during various activities.	Berg Balance Scale
	Sensory Function of Upper and Lower Extremity (Combined)	Refers to the perception and interpretation of sensory stimuli in both upper and lower limbs.	Sensory perception tests included in the Fugl-Meyer Assessment.
	Cognitive Function	Refers to various cognitive abilities such as memory, attention, executive function, and problem-solving.	Bangla Adapted Mini Mental State Examination
Potential Confounders	Demographic factors (e.g., age, sex) Duration of stroke		General Assessment

3.7 Data Management and Analysis

Initially, data were gathered from the study participants using structured survey questionnaires and standardized assessments. Once collected, the data were systematically entered into a statistical software, such as Statistical Package for Social Sciences (SPSS), version 28 by the researcher. Each participant's responses and assessment scores were recorded accurately to minimize errors during the data entry process.

During data input, attention was given to maintaining consistency and uniformity in coding and formatting to facilitate analysis. This involved assigning numerical codes to categorical variables and ensuring that all data fields were correctly labelled and categorized. Data validation checks were implemented to identify and correct any discrepancies or outliers in the entered data. These checks involved verifying the accuracy of data entry through double-entry validation or comparison with source documents. Throughout the data management process, measures were taken to protect the confidentiality and privacy of participants' information. Access to the data was restricted to authorized personnel only, and appropriate security protocols were implemented to safeguard against unauthorized access or disclosure.

Descriptive statistics was used to summarize the demographic characteristics of the study population, including measures such as mean, range, standard deviation, and frequency distributions.

Inferential statistics including Spearman’s rank-order correlation was utilized to investigate the relationship between toileting task performance and various factors such as cognition, balance, motor function, muscle tone, and perceptual function. Multivariable logistic regression analysis was conducted to assess the factors affecting toileting task performance while controlling for potential confounders. Independent variables included factors such as cognition, balance, motor function, and muscle tone. The regression model's overall significance was assessed through Analysis of Variance (ANOVA). Confounding variables, such as age, sex, and type of stroke, were accounted for during the analysis using techniques like multivariable logistic regression. By including these variables in the regression model, the influence of potential confounders

on the relationship between independent and dependent variables was controlled. The multicollinearity of the independent variables was assessed using the variance inflation factor.

3.8 Quality Control and Quality Assurance

3.8.1 Quality Control

In the study, close attention was paid to ensuring the precision and reliability of the findings. Strict data collection procedures were established and followed consistently by the investigator. Clear data entry protocols were set, and measures were taken to minimize errors, including double-checking the data for accuracy. Detailed records of data collection activities were maintained to ensure transparency and facilitate verification. Additionally, continuous reflection on roles and potential biases was undertaken, and input from mentors was sought to improve the quality of data collection. Participants were allowed to review and verify their responses, enhancing the credibility of the findings.

3.8.2 Quality Assurance

The quality control was made up of several parts. First, they developed study-related research questions and established targeted research objectives. This guaranteed that the research stayed on course and that the objectives were met.

Secondly, ethical protocols and authorizations for research were adhered to. The goal of the study, the voluntary nature of participation, and the confidentiality of the responses were explained to the participants. Throughout the data collection, consistency checks had been implemented, and responses and assessments had been cross-checked to

identify discrepancies or outliers that might have required clarification or correction. Thorough documentation of all data collection activities had been maintained, including dates, locations, and any deviations from the established protocol, to enhance transparency and facilitate future verification. A rigorous data cleaning process had been implemented to identify and rectify any anomalies, errors, or outliers within the collected data, ensuring data quality. The research complies with strict guidelines, offering insightful information to healthcare practices and enhancing patient care outcomes. This entails creating a strong study design, precise objectives, and suitable methodologies. It also covers ethical considerations, such as obtaining informed consent, protecting participant privacy, and upholding ethical conduct throughout the study.

CHAPTER IV: RESULTS

4.1 Characteristics of the Participants

Table 4.1: Characteristics of the participants (N=81)

Variables	Category	Frequency (n)	Percent (%)
Sex	Male	47	58.0
	Female	34	42.0
Age(years)	Mean±SD	51.81±9.559	
	Age range	35-72 years	
Diagnosis	Left sided hemiplegia	39	48.1
	Right sided hemiplegia	42	51.9
Duration of Stroke (weeks)	Mean±SD	21.20±8.074	
	Duration range	2-35 weeks	

Among the 81 participants, 58.0% were male, while 42.0% were female. This suggests a slightly higher representation of males in the sample. The age of participants ranged from 35 to 72 years, with a mean age of 51.81 years and a standard deviation of 9.559 years. This indicates that the sample predominantly consists of middle-aged to older adults. Most participants had right side hemiplegia (51.9%), while 48.1% had left side hemiplegia. This suggests a relatively balanced distribution of hemiplegia types among the participants. The duration of stroke varied widely among participants, with a mean duration of 21.20 weeks and a standard deviation of 8.074 weeks. The shortest duration recorded was 2 weeks, while the longest duration was 35 weeks. This indicates diversity in the timing of stroke occurrence among the sample population.

4.2 Measurement of Muscle Tone, Balance, Sensory and Motor Function

Table 4.2: Muscle tone, balance, sensory and motor assessment results for the participants (N=81)

Measures	Category	Frequency (n)	Percent (%)
Muscle tone			
	Flaccid	14	17.30
	Spasticity	67	64.70
Balance			
	High fall risk (0-20)	41	50.60
	Medium fall risk (21-40)	18	22.20
	Low fall risk (41-56)	22	27.20
Sensory			
	Severe impairment (0-11)	4	4.90
	Moderate impairment (12-17)	8	9.90
	Mild impairment (18-24)	69	85.2
Motor (FMA-UE)			
	Severe impairment (0-35)	74	91.40
	Moderate impairment (36-49)	3	3.70
	Mild impairment (50-66)	4	4.90
Motor (FMA-LE)			
	Severe impairment0-19	56	69.10
	Moderate impairment20-28	18	22.20
	Mild impairment29-34	7	8.60
Motor (FMA-UE & LE)			
	Very severe (0-35)	53	65.40
	Severe (36-55)	22	27.20
	Moderate (56-79)	3	3.70
	Mild (80-100)	3	3.70

The table 4.2 presents data on three different categories: muscle tone, fall risk, and motor function in both upper and lower limb as assessed in a group of 81 individuals. Each category is broken down into different levels with corresponding frequencies and percentages of individuals in each level. Muscle tone was assessed primarily in two categories, such as flaccid and hypertonicity. A notable portion of the sample had a flaccid tone (17.3%).

Balance was assessed using the Berg Balance Scale based on fall risk categories, including high, medium, and low fall risk. Most patients were categorized as high fall risk (50.6%), indicating compromised balance. A smaller proportion fell into the medium fall risk category (22.2%). However, a considerable number of patients were classified as low fall risk (27.2%), suggesting better balance control in this subgroup.

Motor function was assessed using the Fugl-Meyer Assessment for the upper extremity, lower extremity, and combined (FMA-UE & LE). The majority of participants showed severe impairment in both upper extremity (91.40%) and lower extremity (69.10%) motor function. For combined upper and lower extremity assessment, 65.40% were categorized as very severe, 27.20% as severe, and smaller percentages as moderate (3.70%) or mild (3.70%) impairment.

4.3 Measurement of Perceptual and Cognitive Functions

Table 4.3 Cognitive and perceptual assessment results for the participants (N=81)

Measures	Category	Frequency (n)	Percent (%)
Cognitive Assessment			
Level of cognitive impairment	Severe impairment (0-17)	3	3.7
	Mild impairment (18-23)	20	24.7
	No impairment (24-30)	58	71.6
Perceptual Assessment			
Perceptual Somatognosis	Normal (63-93)	81	100
Agnosia Somatognosis	Normal (81-120)	81	100

The Table 4.2 shows that among the participants assessed using BAMSE (n=81), the majority (71.6%) showed no cognitive impairment, scoring in the range of 24-30. 24.7% of participants exhibited mild cognitive impairment, falling within the score range of 18-

23. A smaller percentage (3.7%) of participants displayed severe cognitive impairment, scoring between 0-17 on the BAMSE assessment.

Two perceptual assessments were conducted: Perceptual Somatognosis and Agnosia Somatognosis. All participants (100%) scored within the normal range (63-93), indicating intact perceptual somatognosis abilities across the sample. Similar to Perceptual Somatognosis, all participants (100%) scored within the normal range (81-120), suggesting no agnosia somatognosis present in the sample.

4.4 Measurement of Toileting Task Performance

Table 4.4 Toileting task performance assessment results for participants (N=81)

Measure	Category	Frequency (n)	Percent (%)
Toileting Task Performance	Require assistance (1-24)	27	33.3
	Require supervision or verbal assistance (25-48)	23	28.4
	Independent (49-72)	31	38.3

The table presents the distribution of participants based on their level of required assistance in toileting task performance, categorized into three groups. 33.3% of participants fell into this category, indicating that they required assistance for toileting tasks, scoring between 1 and 24 on the assessment scale. 28.4% of participants were categorized as requiring supervision or verbal assistance, scoring between 25 and 48 on the assessment scale. The majority of the participants (38.3%) were classified as independent in toileting task performance, scoring between 49 and 72 on the assessment scale.

4.5 Correlation of Toileting Task with Motor, Sensory, Cognitive and Perceptual Function

Table 4.5 Correlation matrix of motor, sensory, cognitive and perceptual measure for participants (N=81)

	Toileting Task	Motor-UE	Motor-LE	Motor-UE&LE	Sensory-UE&LE	Balance	Muscle Tone	Cognition	Perception
Toileting Task	1.00								
Motor-UE	.506**	1.00							
Motor-LE	.636**	.598**	1.00						
Motor-UE&LE	.662**	.899**	.860**	1.00					
Sensory-UE&LE	.370**	.439**	.557**	.565**	1.00				
Balance	.711**	.669**	.812**	.828**	.537**	1.00			
Muscle Tone	.273*	.593**	.513**	.581**	.461**	.502**	1.00		
Cognition	.329**	.068	.039	.100	.323**	.095	.097	1.00	
Perception	.128	-.071	-.154	-.118	.062	-.113	-.050	.409**	1.00

Correlation is significant at .01 level, *significant, **highly significant.

This table 4.5 highlights the relationships between toileting task performance and various aspects of function, including motor, sensory, muscle tone, cognitive, and perceptual domains using correlation matrix. The Spearman correlation coefficient (r_s) between toileting task measure of the strength and direction of the linear relationship between the variables. The aim of this analysis is to examine the correlations between toileting task performance and various predictor variables among sub-acute stroke patients, which can inform rehabilitation interventions and improve patient outcomes.

The most significant correlation was found between toileting task performance and their static and dynamic balance which was assessed by the Berg Balance Scale. There is a strong positive correlation between toileting task performance and balance ($r_s = 0.711$, $p < 0.01$):, indicating a robust relationship between the two variables.

The moderate significant correlation was found with different independent variables including motor function of lower extremity, motor function of upper and lower extremity, sensory function of upper and lower extremity, and cognitive function. There is a moderate to strong positive correlation between toileting task performance and motor function of both upper and lower extremities ($r_s = 0.662$, $p < 0.01$), suggesting a significant association.

The correlation between toileting task performance and motor function of the lower extremity ($r_s = 0.636$, $p < 0.01$) is moderately significant, indicating a meaningful relationship. The correlation between toileting task performance and combined sensory function of upper and lower extremities ($r_s = 0.370$, $p < 0.01$) is moderate, indicating a notable association. There is a moderate positive correlation between toileting task performance and cognition ($r_s = 0.329$, $p < 0.01$), suggesting a meaningful relationship.

Although the correlation between toileting task performance and motor function of the upper extremity (r_s = 0.506, p < 0.01) is positive, it is categorized as less significant due to the presence of stronger correlations with other motor variables. The correlation between toileting task performance and muscle tone (r_s = 0.273, p < 0.05) is weak, indicating a less pronounced association compared to other factors. The correlation between toileting task performance and perception (r_s = 0.128, p > 0.05) is very weak and statistically non-significant, suggesting a minimal relationship between these variables.

4.6 Predictors of Toileting Task Performance

4.6.1 Regression Model Summary

Model	R	R Square R^2	Adjusted R Square	Standard Error (SE)
1	.783	.614	.577	.553

The regression model achieved an R value of .783, indicating a strong correlation between the predictor variables and the dependent variable. The R Square value of .614 suggests that approximately 61.4% of the variance in toileting task performance can be explained by the predictor variables included in the model. The Adjusted R Square value of .577 provides a more conservative estimate of the proportion of variance explained, considering the number of predictors in the model. The standard error of the estimate is .553, representing the average distance between the observed values and the predicted values by the regression model.

Table 4.6.2 *Significance of Regression Model Using Analysis of Variance test*

Model	Sum of Squares	Df	Mean Square	F	Sig
Regression	35.479	7	5.068	16.574	.000
Residual	22.324	73	.306	-	-
Total	57.802	80	-	-	-

The regression model's overall significance was assessed through ANOVA, yielding a significant F statistic of 16.574 ($p < .001$), indicating that the regression model is statistically significant. The regression model accounted for a substantial portion of the variance in toileting task performance, with a regression sum of squares of 35.479 and a mean square value of 5.068.

The residual sum of squares was (R^2=22.324), indicating the variability in the dependent variable not explained by the model. The total sum of squares was 57.802, representing the total variability in the dependent variable.

Table 4.6.3 *Regression analysis to predict toileting task performance.*

Variables	Standardized Coefficient (β)	Significance level (*p*)	95% CI Upper Limit	95% CI Lower Limit	VIF
Motor Function of Upper Extremity	-.073	.552	.309	-.574	1.155
Motor Function of Lower Extremity	.019	.852	.289	-.240	1.235
Motor Function of Upper and Lower Extremity	.203	.148	.550	-.084	2.148
Muscle tone	-.078	.365	.206	-.554	1.121
Balance	.570**	.000	.761	.371	2.097
Sensory function of Upper and Lower Extremity	.065	.463	.400	-.184	1.157
Cognitive	.268**	.001	.668	.169	1.235

*Standardized Coefficient (SC), Standard Error (SE), Variance Inflation Factor (VIF), Confidence Interval (CI)

This table 4.6 represents the regression analysis aimed to identify predictors of toileting task performance among the sub-acute stroke patients. Four predictor variables were included: upper extremity motor function, lower extremity motor function, combine motor function of upper and lower extremity, combined sensory function of upper and lower extremity, muscle tone, cognitive function and balance. The analysis yielded the following results:

The standardized coefficients (β) and corresponding p-values, along with 95% confidence intervals, provided insights into the associations between predictor variables and toileting task performance.

The standardized coefficient for upper extremity motor function (β= -0.073, p= 0.552) and muscle tone (β= -0.078, p = 0.365) suggests a non-significant negative association with toileting task performance. These findings indicate that variations in upper extremity motor function and muscle tone do not significantly predict changes in toileting task performance among sub-acute stroke patients.

In contrast, motor function of lower extremity, the standardized coefficient is .019 (p = .852), indicating a non-significant positive association with toileting task performance. Similarly, the standardized coefficient is .203 (p = .148) and .065 (p = .463), indicating a non-significant positive association among toileting task performance and combined motor and sensory function upper and lower extremity, respectively.

However, in the case of balance, a significant positive association with toileting task performance was observed. The standardized coefficient for balance was 0.570 (p < 0.001), suggesting a notable impact on toileting task performance. Additionally, the 95% confidence interval ranged from -0.184 to 0.400, further supporting the significance of this association. Similarly, cognitive function also demonstrated a significant positive association, with a standardized coefficient of 0.268 (p = 0.001), and a 95% confidence interval ranging from 0.169 to 0.668.

The confidence interval ranged from 0.359 to 0.748, suggesting that we can be 95% confident that the true effect of balance on toilet task performance falls within this

range. This wide interval underscores the robustness of the association between balance and toileting task performance.

The 95% confidence interval ranged from 0.172 to 0.674, indicating a considerable variability in the predicted effect of cognition on toilet task performance falls within this range, while wider than that of balance, it still provides a relatively precise estimate of the effect of cognition on toileting task performance. The confidence intervals for balance and cognition indicate that these variables have more precise estimated effects on toileting task performance compared to the other predictor variables.

These results suggest that balance and cognitive function are significant predictors of toileting task performance, as indicated by their significant standardized coefficients and p-values. The other predictor variables, including upper extremity motor function, lower extremity motor function, combine motor function of upper and lower extremity, combined sensory function of upper and lower extremity, muscle tone, do not show significant associations with toileting task performance, emphasizing the importance of addressing predicted factors in rehabilitation interventions.

CHAPTER V: DISCUSSION

This study examined factors influencing toileting task performance in sub-acute stroke. The study measured how much stroke survivors were affected in different areas like muscle tone, balance, sensation, motor function, cognition, and perceptual function. Based on the study, cognition, balance, both upper and lower extremity motor and sensory function were predictors of toileting task performance. Cognition and balance as the most important factors affecting toileting task performance.

Following the result many participants had increased muscle tone (spasticity) and the percentage is 64.70, this aligns with previous research indicating that spasticity is a common complication in post-stroke. Spasticity can significantly impede functional mobility and hinder rehabilitation progress (Schinwelski et al., 2019). Most of them had mild impairments in sensation and severe impairment in motor function. Additionally, cognitive and perceptual abilities were assessed and found that most participants like 71.6 percentage of participants had no significant impairments in cognition and all participants are well in perceptual abilities. The total parcentage of balance is 50.60 indicating a high risk of falling.

(Kitamura et al., 2023) indicating that one reason for the difficulty of main tasks (toileting) may be that they require a high degree of balance. Balance is a predictor of independence in the main tasks of toileting. For example, when transferring from the wheelchair to the toilet seat, it is necessary to turn and sit in a specific position because the toilet seat has a narrow surface and it is easy to lose one’s balance. Alternatively,

limited space in the bathroom makes it difficult to position the wheelchair close to the toilet seat to minimize the rotation angle, and the required angle is greater than that for bed-wheelchair transferring, which may necessitate more difficult postural control. Manipulating one's lower garments while standing also requires a high degree of balance, as it must be done while reaching down and toward the paretic side.

The study findings showed that a significant portion of participants required some level of assistance like 33.3 and 38.3 parcentage participants were independent in toileting task performance. So, a greater number of participants were able to perform these tasks independently. (*Takayuki Watabe*, n.d. 2020) indicates that independent toileting is an important activity of daily living. For patients with stroke, independent toileting ability is essential for independent living because it is an activity that normally requires a standing position, and therefore, has a high risk for falls. It emphasizes the important role of rehabilitation strategies in enhancing functional independence and improving overall quality of life post-stroke.

The study investigated how toileting task performance related to other functions like motor skills, sensation, cognition, and perception. The results showed strong positive correlations between toileting task performance and balance (r_s = 0.711, p < 0.01), suggesting that better balance was linked to greater independence in toileting. This aligns with previous research emphasizing the crucial role of balance and mobility outcome among stroke survivors (Hill et al., 1997).This finding suggests that being better balanced is connected to being more independent when using the toilet. They showed that having good balance is really important for doing everyday activities after a stroke. The study also found moderate associations with motor function (r_s = 0.662, p < 0.01), indicating

that both upper and lower limb movements played a role in toileting independence. This finding aligns with the (Bonita & Beaglehole, 1988) indicates that both upper and lower limb functionality contribute significantly to the ability to perform tasks independently, including those related to personal hygiene and self-care. The relationship between motor function and the ability to use the bathroom independently emphasizes how crucial it is to take into account of motor function while doing functional assessments and stroke rehabilitation.

According to Bonita & Beaglehole, 1988 deficiencies in the movements of the upper and lower limbs may affect a person's capacity to maintain balance, coordinate movements, and carry out the tasks required for independent toileting. However, there was moderate positive correlation between toileting task performance and combined sensory function of upper and lower extremities (r_s= 0.370, $p < 0.01$) is moderate, indicating a notable association. This suggests that individuals with sensory deficits, such as reduced conscious proprioception or tactile sensation, may experience challenges in performing toileting tasks independently. The findings align with the (Prakoso et al., 2016) investigate a broader discussion on ipsilesional sensory deficits after stroke, indicating that sensory impairments in the affected upper limb can impact functional tasks like toileting. As observed in the study, individuals with sensory deficits may have difficulty discriminating shape, temperature, or maintaining protective sensation, which can hinder the ability to perform toileting tasks effectively.

With the muscle tone (r_s = 0.273, p < 0.05) shows a weak positive correlation. Cognitive function showed a moderate positive correlation (r_s= 0.329, p < 0.01), highlighting its importance in toileting task performance. The study by (Cho & Lee, 2012) identify the impact of cognitive impairment on functional outcomes following stroke, providing valuable information into the relationship between cognitive abilities and overall recovery. Cognitive impairment is a common consequence of stroke and can significantly affect a patient's ability to perform activities of daily living, including toileting tasks.

The study aims to identify factors that could predict how well stroke survivors could perform toileting tasks. Regression analysis revealed that the standardized coefficient for balance was 0.570 (p < 0.001) and for cognitive factor, the standardized coefficient was 0.268 (p < 0.001) indicating balance and cognition were significant predictors of toileting task performance. This aligns with previous research highlighting the importance of balance in ADL performance among stroke survivors (Hill et al., 1997). The study indicate that improved balance not only enhances physical stability but also enables individuals to have better balance this helps people move more easily when they go to the bathroom, which means they can do it by themselves, making them more independent (Prakoso et al., 2016).

In the present study was similar to published studies as the most significant predictive variable was balance, showing a positive correlation with toileting function. This finding can be substantiated by several assumptions. Firstly, stroke survivors often encounter challenges in maintaining both static and dynamic balance immediately after

the stroke due to unilateral weakness in the upper limb, lower limb, and torso. Secondly, the perceived difficulty in balancing their body, which is associated with low body awareness and learned non-use, can further hinder their ability to regain confidence in static and standing balance.

This suggests that addressing balance deficits early in stroke rehabilitation may play a crucial role in enhancing toileting function and overall functional independence. By focusing on interventions aimed at improving balance control and body awareness, occupational therapists can potentially facilitate better outcomes in toileting performance for stroke survivors.

The article of Prakoso et al., 2016 supports the findings by also reporting significant correlations between cognitive functions, specifically orientation to time and verbal recall, and IADL in stroke patients. The correlation coefficient values for orientation to time and verbal recall were r_s= 0.517 (p = 0.011) and r_s = 0.424 (p = 0.044) respectively, indicating moderate to strong positive correlations. Due to its impact on the quality of life following a stroke, cognitive impairments have become a common complication that post-stroke patients or, at the at least, health professionals should be more concerned about. Patients recovering from a stroke should receive rehabilitation that addresses both their cognitive and motor abilities, as both are necessary for carrying out complicated tasks as well as simple daily activities.

Furthermore, cognition encompasses various aspects such as memory, the ability to follow instructions, orientation, recognition, and the capacity to learn new things. Stroke rehabilitation involves acquiring new motor and functional skills as development

reverses and addressing the cognitive component becomes pivotal for occupational therapists. It is essential because, without adequate cognitive function, stroke survivors may encounter difficulties in learning toileting tasks independently. Cognitive abilities such as memory, attention, and problem-solving skills are essential for executing sequential tasks involved in toileting, such as planning, coordination, and decision-making So, Better balance and cognitive abilities were associated with greater independence in toileting.

This assumption aligns with the findings of the study, which indicate a significant relationship between independence in toileting tasks and cognition. Moreover, the results suggest that better independence in toileting tasks can be predicted when an individual has intact cognitive function or minimal impairment. Therefore, it highlights the importance of considering balance and cognitive abilities in stroke rehabilitation interventions aimed at promoting independence in activities of daily living, including toileting tasks.

CHAPTER VI: CONCLUSION

6.1 Strengths and Limitations

6.1.1 Strengths

- The study was done using a quantitative cross-sectional research design, allowing for the collection of data at a specific point in time, and providing valuable insights into the current state of toileting abilities among subacute stroke patients.
- The study utilizes well-established and validated assessment tools for evaluating different variables, ensuring reliability and consistency in data collection. These tools include the Fugle Meyar Motor Assessment, Modified Ashworth Scale, Berg Balance Scale, and Toileting Task Assessment Form.
- The use of purposive sampling ensures that participants are selected based on specific criteria relevant to the research objectives, enhancing the relevance and applicability of the findings to the target population.
- The study adheres to rigorous ethical standards, obtaining clearance from the IRB and ensuring informed consent from participants.
- The study employs robust data management and analysis techniques, including descriptive statistics, correlation analysis, and regression analysis. These methods allow for a thorough examination of relationships between variables and identification of predictors influencing toileting task performance.
- Following the Strengthening the Reporting of Observational studies in Epidemiology (STROBE) guidelines makes the study stronger by ensuring clear,

comprehensive reporting, which helps maintain quality and credibility in research findings.

6.1.2 Limitations

- Despite its strengths, the research also has limitations that should be acknowledged, it is more difficult to demonstrate a causal relationship between predictor variables and toileting task performance when using a cross-sectional approach.
- The study's limited sample size may reduce the generalizability of findings to a larger population.
- The use of purposive sampling may introduce selection bias, as participants were selected based on specific criteria, potentially limiting the representativeness of the sample.
- Conducting the study in a single rehabilitation center may limit the diversity of participants and the generalizability of results to other settings. R
- reliance on self-reported data for certain variables, such as toileting task performance, may introduce bias due to participants' subjective interpretations or social desirability bias.
- The study did not account for all potential confounding variables, such as severity and level of rehabilitation, which could influence toileting task performance.

6.2 Practice Implications

6.2.1 Recommendations for future Practice

- Healthcare professionals can use the identified predictors, such as motor function, balance, and cognition, to develop personalized rehabilitation programs targeting

specific areas of impairment to improve toileting task performance in stroke survivors.

- Given the significant association between balance and toileting function, rehabilitation programs should prioritize balance training interventions to enhance both static and dynamic balance control, thereby improving overall functional independence.
- Incorporating cognitive rehabilitation strategies, such as memory enhancement techniques, task sequencing, and problem-solving exercises, can be beneficial for stroke survivors to overcome cognitive deficits and facilitate learning and independence in toileting tasks.
- Collaborative efforts among occupational therapists, physical therapists, speech therapists, and other healthcare professionals are essential to address the multifaceted needs of stroke survivors comprehensively and optimize functional outcomes related to toileting task performance.
- Recommending appropriate assistive devices, such as grab bars, raised toilet seats, or adaptive equipment, and modifying home environments to enhance accessibility and safety can further support stroke survivors in performing toileting tasks independently.
- Providing education and training to caregivers on assisting stroke survivors with toileting tasks, including techniques for safe transfers and communication strategies, can alleviate caregiver burden and improve overall caregiving outcomes.

6.2.2 Recommendations for future Research

- Investigate the effectiveness and optimal delivery of balance training and cognitive rehabilitation interventions in improving toileting task performance and overall quality of life for stroke survivor.
- Explore the optimal timing, intensity, and duration of rehabilitation interventions targeting motor, balance, and cognition to maximize functional recovery and independence in toileting tasks post-stroke.
- Research innovative assistive technologies and adaptive equipment to enhance independence and safety during toileting tasks, assessing their impact on functional outcomes for stroke survivors.
- Develop and evaluate specialized caregiver training programs focused on toileting assistance techniques and communication strategies to enhance caregiver competence and well-being while supporting stroke survivors.
- Conduct comparative studies to evaluate the relative effectiveness of multidisciplinary rehabilitation approaches versus single-discipline interventions in optimizing toileting task performance and overall functional outcomes in stroke survivors.

6.3 Conclusions

The results of the study highlight the significance of balance and cognitive function in predicting sub-acute stroke patients' success on the toileting task. These variables showed strong predictive power, emphasizing their critical importance in functional outcomes following a stroke. The variability in functional outcomes, as indicated by the standard deviation, highlights the need for personalized intervention strategies tailored to

individual needs and capabilities. More efficient rehabilitation techniques can be developed by taking into account the connections between balance, cognitive function, and the completion of toileting tasks. For stroke survivors, interventions aimed in these areas may result in increased functional independence and quality of life. Further research need to analyzing how balance and cognitive therapies affect stroke survivors' ability to use the toileting independently over time.

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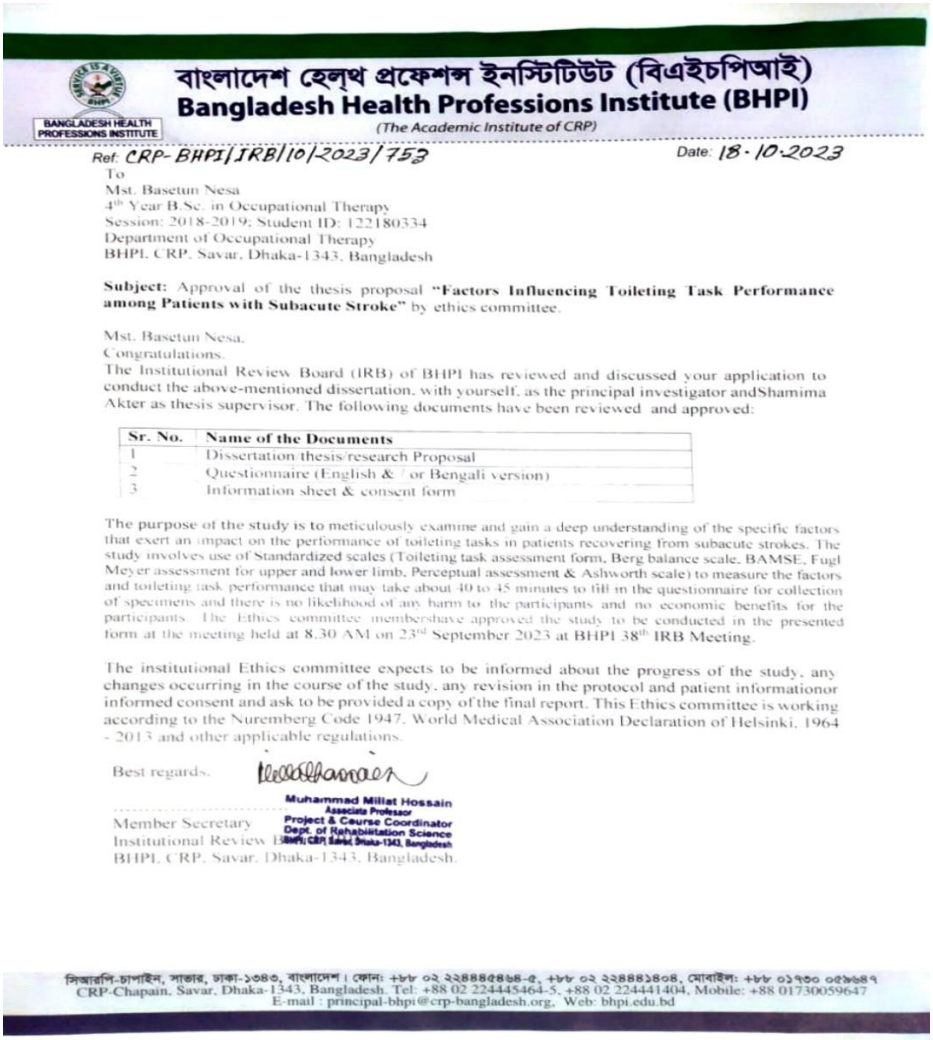
APPENDICES

Appendix A: Approval and Permission Letter

IRB Approval Letter



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

BANGLADESH HEALTH PROFESSIONS INSTITUTE

Ref: CRP-BHPI/IRB/10/2023/753 Date: 18-10-2023

To
Mst. Basetun Nesa
4th Year B.Sc. in Occupational Therapy
Session: 2018-2019; Student ID: 122180334
Department of Occupational Therapy
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Subject: Approval of the thesis proposal **"Factors Influencing Toileting Task Performance among Patients with Subacute Stroke"** by ethics committee.

Mst. Basetun Nesa,
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 and Shamima Akter as thesis supervisor. The following documents have been reviewed and approved:

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

The purpose of the study is to meticulously examine and gain a deep understanding of the specific factors that exert an impact on the performance of toileting tasks in patients recovering from subacute strokes. The study involves use of Standardized scales (Toileting task assessment form, Berg balance scale, BAMSE, Fugl Meyer assessment for upper and lower limb, Perceptual assessment & Ashworth scale) to measure the factors and toileting task performance that may take about 40 to 45 minutes to fill in the questionnaire for collection of specimens and there is no likelihood of any harm to the participants and no economic benefits for the participants. The Ethics committee membershave approved the study to be conducted in the presented form at the meeting held at 8.30 AM on 23rd September 2023 at BHPI 38th 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 informationor informed consent and ask to be provided a copy of the final report. This Ethics committee is working according to the Nuremberg Code 1947, World Medical Association Declaration of Helsinki, 1964 - 2013 and other applicable regulations.

Best regards.

Muhammad Millat Hossain
Associate Professor
Project & Course Coordinator
Dept. of Rehabilitation Science
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Member Secretary
Institutional Review Board
BHPI, CRP, Savar, Dhaka-1343, Bangladesh.

সিআরপি-চাপাইন, সাভার, ঢাকা-১৩৪৩, বাংলাদেশ। ফোন: +৮৮ ০২ ২২৪৪৪৫৪৬৪-৫, +৮৮ ০২ ২২৪৪৪১৪০৪, মোবাইল: +৮৮ ০১৭৩০ ০৫৯৬৪৭
CRP-Chapain, Savar, Dhaka-1343, Bangladesh. Tel: +88 02 224445464-5, +88 02 224441404, Mobile: +88 01730059647
E-mail : principal-bhpi@crp-bangladesh.org, Web: bhpi.edu.bd

Permission Letter from Savar, CRP

Date: 29.10.2023

Tauhidul Islam
Jr. Consultant and Acting Head
Occupational Therapy Department
Centre for the Rehabilitation of the paralysed (CRP)

Subject: **Application for permission to collect data for the research project.**

Sir,
With due respect, I would like to draw your kind attention that I am a 4th year student of B.Sc. in Occupational Therapy at Bangladesh Health Professionals Institute (BHPI). I have to submit a research paper to the University of Dhaka in partial fulfilment of the degree of Bachelor of Science in Occupational Therapy. My research title is "Factors influencing toileting task performance among patients with subacute stroke " The aim of this study is to meticulously examine and gain a deep understanding of the specific factors that exert an impact on the performance of toileting tasks in patients recovering from subacute strokes. As it is a cross sectional study, Quantitative research. I would like to take interviews with subacute Stroke patients at CRP, Savar. That is why I need permission to start my research project. I assure you that anything of my project will not be harmful for the participants, and any data collected will be kept confidential.
So, I look forward to having your permission to start data collection to conduct a successful study as a part of my course.

Sincerely yours,

Mst.Basetun Nesa
4th Year B.Sc. in Occupational Therapy
Session: 2018-2019, Student ID: 122180334
Bangladesh Health Professions Institute (BHPI)
CRP-Savar, Dhaka-1343, Bangladesh

Signature and comments of The Head of The Department

Sk. Moniruzzaman 04.10
Head of the Department 29/10/2023
Department of Occupational Therapy
Bangladesh Health Professions Institute (BHPI)
CRP-Savar, Dhaka-1343, Bangladesh

1860
04/11/2023
Md. Tauhidul Islam
Junior Consultant & Acting Head
Occupational Therapy Department
CRP, Savar, Dhaka-1343

Permission Letter from Mirpur, CRP

Date: 9.12.2023

Tauhidul Islam
Jr. Consultant and Acting Head
Occupational Therapy Department
Centre for the Rehabilitation of the paralysed (CRP)

Subject: **Application for permission to collect data for undergraduate research.**

Sir,
With due respect, I would like to draw your kind attention that I am a 4th year student of B.Sc. in Occupational Therapy at Bangladesh Health Professionals Institute (BHPI). I have to submit a research paper to the University of Dhaka in partial fulfilment of the degree of Bachelor of Science in Occupational Therapy. My research title is "Factors influencing toileting task performance among patients with subacute stroke " The aim of this study is to meticulously examine and gain a deep understanding of the specific factors that exert an impact on the performance of toileting tasks in patients recovering from subacute strokes. As it is a cross sectional study, Quantitative research, I would like to take interviews with subacute Stroke patients at CRP. That is why I need permission to start my research project. I assure you that anything of my project will not be harmful for the participants, and any data collected will be kept confidential.
So, I look forward to having your permission to start data collection to conduct a successful study as a part of my course.

Sincerely yours,

Basetun
Mst.Basetun Nesa
4th Year B.Sc. in Occupational Therapy
Session: 2018-2019, Student ID: 122180334
Bangladesh Health Professions Institute (BHPI)
CRP-Savar, Dhaka-1343, Bangladesh

Signature and comments of The Head of The Department

Sk. Moniruzzaman
Head of the Department 09/12/2023
Department of Occupational Therapy
Bangladesh Health Professions Institute (BHPI)
CRP-Savar, Dhaka-1343, Bangladesh

1560
10/12/2023
Md. Tauhidul Islam
Junior Consultant & Acting Head
Occupational Therapy Department
CRP, Savar, Dhaka-1343

Appendix B: Information Sheet & Consent Form

Information Sheet

The name of the researcher is Mst.Basetun Nesa. She is a student in her 4th year of B.Sc in Occupational Therapy at Bangladesh Health Professions Institute (BHPI), the academic institute in the Centre for the Rehabilitation of the Paralysed (CRP). The study was entitled**: "Factors influencing toileting task performance among patients with subacute stroke "**

Your participation is voluntary in this study. You can withdraw your participation. There is no facility to get any pay for this participation. The study will never be any harm to you. Studying what makes it easier or harder for subacute stroke patients to use the bathroom can help both the patients and the healthcare workers. For patients, this can mean getting better help in recovering, feeling better in their daily lives, understanding their challenges, and avoiding problems like infections. Healthcare workers can use this information to give more personalized care, use resources wisely, follow the best research, work together better, and improve their skills. Confidentiality of all records will be highly maintained. The gathered information from you will not be disclosed anywhere except the researcher and supervisor. The study will never publish the name of the participant anywhere. If you have any queries regarding the study, please feel free to ask for the contact information stated below:

Mst. Basetun Nesa

Student of 4th year

B.Sc. in Occupational Therapy

Department of Occupational Therapy

Bangladesh Health Professions Institute (BHPI)

Centre for the Rehabilitation of the Paralysed (CRP),

Chapain, Savar, Dhaka- 1343

Consent Form

This research is a part of the Occupational Therapy course and the name of the researcher is Mst.Basetun Nesa. She is a student in 4th year B.Sc in Occupational Therapy at Bangladesh Health Professions Institute (BHPI), the academic institute of the Centre for the Rehabilitation of the Paralysed (CRP). The study was entitled **" Factors influencing toileting task performance among patients with subacute stroke."**

The purpose of the study is to investigate and understand the factors that influence the ability of subacute stroke patients to perform toileting tasks. This research aims to identify what makes it easier or harder for these patients to use the bathroom effectively. In this study, I am ……..…….. a participant and I have been informed about the purpose and aim of the study. I will have the right to refuse to take part at any time at any stage of the study. I will not be bound to answer to anybody.

Studying what makes it easier or harder for subacute stroke patients to use the bathroom can help both the patients and the healthcare workers. For patients, this can mean getting better help in recovering, feeling better in their daily lives, understanding their challenges, and avoiding problems like infections. Healthcare workers can use this information to give more personalized care, use resources wisely, follow the best research, work together better, and improve their skills. The field notes and answers will be not shared or discussed with others except the supervisor. I have been informed about the above-mentioned information and I am willing to participate in the study with giving consent.

Signature of the Participant:	Date:
Signature of the researcher:	Date:
Signature of the witness:	Date:

তথ্য পত্র

রিসার্চারের নামঃ বাছিতুন নেছা। তিনি বাংলাদেশ হেলথ প্রফেশনস ইনস্টিটিউট (বিএইচপিআই) এর সেন্টার ফর দি রিহ্যাবিলিটেশন অফ দি প্যারালাইজড (সিআরপি) এ অকুপেশনাল থেরাপি বিভাগে চতুর্থ বর্ষে অধ্যয়নরত। গবেষণার শিরোনামঃ "**সাব এ্যাকিউট স্ট্রোক রোগীদের মধ্যে টয়লেটিং টাস্ক পারফর্মেন্স প্রভাবিত করতে সাহায্যকারী ফ্যাক্টরগুলী**"।

এই গবেষণায় আপনার অংশগ্রহণ স্বেচ্ছায়। আপনি এই গবেষণা থেকে প্রত্যাহার নিতে পারবেন। এই অংশগ্রহণের জন্য আপনাকে কোনো মূল্য প্রদানের সুযোগ থাকবে না। এই গবেষণা আপনার কোনো ক্ষতি করবে না। এই গবেষণার প্রাথমিক উদ্দেশ্য হলো সাব এ্যাকিউট স্ট্রোক রোগীদের টয়লেটিং কাজের কার্যকরিতার উপর প্রভাব ফেলে যে নির্দিষ্ট ফ্যাক্টরগুলী আছে তা একটি বিশদ অনুসন্ধান করা । সমস্ত রেকর্ডের গোপনীয়তা রক্ষা করা হবে। আপনার থেকে সংগৃহীত তথ্যটি গবেষক এবং সুপারভাইজার ছাড়া অন্যকোনো জায়গায় প্রকাশ করা হবে না। গবেষক কখনোই অংশগ্রহণকারীর নামটি কোথাও প্রকাশ করবে না। অধ্যয়ন সংক্রান্ত আপনার কোন প্রশ্ন থাকলে, অনুগ্রহ করে নিচে উল্লেখিত যোগাযোগের তথ্য নির্দ্বিধায় জিজ্ঞাসা করুন:

বাছিতুন নেছা

৪র্থ বর্ষের ছাত্রী

অকুপেশনাল থেরাপি বিভাগ

বাংলাদেশ হেলথ প্রফেশনস ইনস্টিটিউট (বিএইচপিআই)

সি. আর. পি, চাঁপাইন, সাভার, ঢাকা

সম্মতি পত্র

আসসালামুয়ালাইকুম

আমি বাছিতুন নেছা, আমি ঢাকা বিশ্ববিদ্যালয়ের চিকিৎসা অনুষদের অন্তর্ভুক্ত বাংলাদেশ হেলথ প্রফেসনস ইনস্টিটিউট (বিএইচপিআই এর বি.এস.সি ইন অকুপেশনাল থেরাপি কোর্স এ অধ্যয়নরত ৪র্থ বর্ষের ছাত্রী। আমার পড়াশোনার একটি অংশ হিসেবে আমি একটি গবেষনা পরিচালনা করতে যাচ্ছি। গবেষনার বিষয় "সাব এ্যাকিউট স্ট্রোক রোগীদের মধ্যে টয়লেটিং টাস্ক পারফর্মেন্স প্রভাবিত করতে সাহায্যকারী ফ্যাক্টরগুলী"। গবেষনার উদ্দেশ্য হলো সাব এ্যাকিউট স্ট্রোক রোগীদের টয়লেটিং কাজের কার্যকরতার উপর প্রভাব ফেলায় যে নির্দিষ্ট ফ্যাক্টরগুলী আছে তা অনুসন্ধান করা । আমার গবেষণাটি সম্পূর্ন করার জন্য আপনার থেকে কিছু তথ্য নেওয়া প্রয়োজন ।

আমি আপনাকে অনুগত করছি যে, এটা আমার অধ্যয়নের অংশ এবং যা অন্যকোন উদ্দেশ্যে ব্যবহৃত হবে না। এই গবেষনায় আপনার অংশগ্রহণ আপনার জীবন যাত্রায় এবং আপনার বর্তমান ও ভবিষ্যৎ চিকিৎসায় কোন প্রকার প্রভাব ফেলবে না। আপনি যে সব তথ্য প্রদান করবেন তার গোপনীয়তা বজায় থাকবে এবং আপনার প্রতিবেদনের ঘটনা প্রবাহে এটা নিশ্চিত করা হবে যে এই তথ্যের উৎস অপ্রকাশিত থাকবে। এই গবেষণাতে আপনার অংশগ্রহণ স্বেচ্ছাপ্রণোদীত এবং আপনি যে কোন সময় এই অধ্যয়ন থেকে প্রত্যাহার করতে পারেন।

অনুগ্রহ করে নিম্নলিখিত বিবৃতিগুলো পড়ুন যাতে আপনি তথ্য পত্রের বিষয়বস্তু বুঝতে পারেন এবং আপনি উপরোক্ত গবেষণায় অংশ নিতে সম্মত হন।

আমি নিশ্চিত করছি যে, আমি গবেষণায় অংশগ্রহণকারীদের তথ্য পত্রটি পড়েছি এবং এর লক্ষ্য এবং উদ্দেশ্য সম্পর্কে বুঝতে পেরেছি। তথ্য পত্রটি আমাকে ব্যাখ্যা করা হয়েছে এবং আমি প্রশ্ন করার সুযোগ পেয়েছি।আমি নিশ্চিত করছি যে উপরোক্ত গবেষনাতে আমি সেচ্ছায় অংশগ্রহন করার সম্মতি দিচ্ছি।

এই গবেষণা নিয়ে যদি আপনার কোন প্রশ্ন থাকে তাহলে গবেষক বাছিতুন নেছা অথবা / এবং সুপারভাইজার, শামিমা আক্তার (অ্যাসোসিয়েট প্রফেসর অকুপেশনাল থেরাপি বিভাগ, বিএইচপিআই সিআরপি, সাভার, ঢাকা) এর সাথে যোগাযোগ করতে পারেন।

অংশগ্রহনকারীর স্বাক্ষর ও তারিখ.....

গবেষকের স্বাক্ষর ও তারিখ.....

Appendix C: Questionnaire

Perceptual Assessment From

Name: Age:
Diagnosis: Sex:
Date of Incidence: Date of Assessment:

1.BODY SCHEMA
Scale : 1.Absent , 2.Impaired , 3.Normal

A. Somatognosis:
Point to body on command : (Show me your…….)

Body Part	**Initial**	**Discharge**
Knee		
Mouth		
Shoulder		
Hair		
Human Figure Puzzle		
Two hand		
One hand		
One trunk		
Two legs		

B.Unilateral Neglect

	Initial	**Discharge**
Simultaneous Stimulation-Visual		
Simultaneous Stimulation-Tactile		
Simultaneous Stimulation-Auditory		
Letter cancellation		
Anosognosia		
Copy a House		
Copy a Flower		

C. Right/Left Discrimination:

	Initial	**Discharge**
Show me your left hand		
Show me your right eye		
Show me your right hand		
Touch your right eye with your left hand		

Touch your left eye with your left hand		
Touch your left ear with your right hand		
Point to my right hand		
Put your hand to my right shoulder		

D. Finger Agnosia:

Therapist asks which finger I am touching…..

With vision	**Initial**	**Discharge**
Right second finger		
Left third finger		
Right thumb		
Left forth finger		
Occluded vision		
Left second finger		
Right third finger		
Left thumb		
Left first finger		

AGNOSIA

A. Visual Agnosia

Object Recognition		**Initial**	**Discharge**
Pencil			
Key			
Coin			
Button			
Colour Recognition			
Red			
Green			
Blue			
Yellow			

B.Tactile Agnosia

Stereognosis (Occluded Vision)	**Initial**	**Discharge**
Comb		
Teaspoon		
Toothbrush		
Key		
Texture Agnosia		
Sand Paper		
Foam		
Silk		

Wool		

C.Spatial Relation

Figure Ground	**Initial**	**Discharge**
Pickup White Square block on to a white sheet		
Can you find toothbrush from table		
Can you identify button or button hole while dressing		
Form Constancy		
Can he/she identify picture from unusual view e.g. upside down		
Can he/she identify object from unusual angle e.g.comb,toothbrush		
Depth Perception		
Can you pouring a glass of water		
Can you differentiate the amount of water between two glasses?		
Topographical Orientation		
Can you find the door of OT dept.		
Can find way back to room from OT dept.		
Position in space		
Blocks-which block is nearest to you		
Is in the meddle		
Tower-which block is on the of the tower		
Is under the red block		

Apraxia

Intransitive Gesture (symbolic)	**Initial**	**Discharge**
Waving good bye		
Stooping		
Salute		
Transitive Gesture		
Use a comb		
Use a toothbrush		
Use a glass		
Non-symbolic Gesture		
Touch Opposite shoulder		

with hand		
Touch Opposite ear with hand		
Ideational Apraxia		
Take a pencil and draw a line on paper		
Fold a sheet of paper and put it in an envelop		
Open a bottle, pour water into a glass and drink		

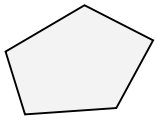
Modified Ashworth scale

scoring
0 = No increase in tone
1 = slight increase in tone giving a catch when slight increase in muscle tone, manifested by the limb was moved in flexion or extension.
1+ = slight increase in muscle tone, manifested by a catch followed by minimal resistance throughout (ROM)
2 = more marked increase in tone but more marked increased in muscle tone through most limb easily flexed
3 = considerable increase in tone, passive movement difficult
4 = limb rigid in flexion or extension

Bangla Adapted Mini-mental state Examination (BAMSE)

Patient Name: Age: Sex: ID:

Items		**BAMSE(Total score)**	**Score**
Orientation	1. Orientation to time	Season; month; day; date; time of day (5)	
	2. Orientation to place	Country; district; village/city; area/street/neighborhood; house/place (asked in the reverse order). (5)	
Registration	3. Three objects registration	Mango; Flower; Fish. (3)	
Attention & Calculaton	4. A. Calculation (Alternatively, 4. B)	"A man has 20 taka for rickshaw fare. Every day, he spends 3 taka for rickshaw fare. After spending the first day's rickshaws fare, he will be left with 17 taka. How much money will be left after the next day's rickshaw fare, and the next day's	

		fare…and so on, five times. (5)	
	4. B. Attention/Days backward	Name the days of the week backwards (e.g., before Sunday comes Saturday and before Saturday comes…?) (5)	
Recall	5.Recall	Name the three objects learned earlier. (3)	
Language	6.Naming	Glass and Spoon. (2)	
	7.Repetation	'Neither this nor that' in Bangla. (1)	
	8.Lanuage/comprehension	The individual is asked to follow the interviewer's who will raise his/her right hand. (1).	
	9.Three-step task	The individual is asked to follow the interviewer's instruction: 'Take the paper in your right or left hand. Fold the paper in half. Put the paper on the floor' (3)	
	10. Sentence construction	The individual is asked the question: 'If you did not know my name how would you find out my name?' (1)	
Copying	11. Copying a figure 	The individual is asked to construct a figure with sticks following a laid-out construction of overlapping pentagons. (1)	
		Total Score:	

Berg Balance scale

Name: _____ **Date:** _____

Location: _____ **Rater:** _____

Item Description	**Score (0-4)**
Sitting to standing	
Standing unsupported	
Sitting unsupported	
Standing to sitting	
Transfers	
Standing with eyes closed	
Standing with feet together	
Reaching forward with outstretched arm	

Retrieving object from floor	
Turning to look behind	
Turning 360 degrees	
Placing alternate foot on stool	
Standing with one foot in front	
Standing on one foot	
Total	

Berg Balance Rating

- 45 or more usually indicates the patient is less likely to fall, safe ambulator w/ o device.
- 35 to 44 usually indicates the patient has a slightly increased risk for falls, safe ambulator with device.
- 34 or less usually indicates that the lower the # the greater the risk for falls, patient may be able to ambulate with a device with the physical assistant of another due to safety concerns.

Toileting Task Assessment Form (TTAF)

Patient name:
Assessor: Date:
Time of the day:
Toilet: ☐ Toilet in the ward ☐ Portable toilet

General comments

Score: A. independent B. requires supervision or verbal assistance
C. requires assistance N. not applicable

		Task	Score	Comments
Wheelchair to the toilet seat	Approach to the toilet	1.Open and close the door		
		2.Maneuver the wheelchair towards the appropriate place for transfer to the toilet seat		
	Transfer	3.Lock the wheelchair brakes		
		4.Press the nurse call button		
		5.Take the foot off the footrest and place it on the ground		
		6.Stand up from the wheelchair		
		7.Tum while standing		
	Pull the lower garments down	8.Maintain a standing position		
		9.Pull the lower garments down		
Performance on toilet seat	Transfer	10.Sit on the toilet seat		
		11.Maintain a sitting position on the toilet seat		
	Clean up	12.Dispose incontinence pad /sanitary		

		items		
		13.Clean up after urination and/or defecation		
		14.Flush the toilet		
		15.Press the nurse call button		
Toilet seat to the wheelchair	Transfer	16.Stand up from the toilet seat		
	Pull the lower garments up	17.Maintain a standing position		
		18.Pull the lower garments up and adjust them		
	Transfer	19.Turn while standing		
		20.Sit on the wheelchair seat		
		21Put the foot on the foot rest		
		22.Unlock the wheelchair brakes		
	Get out of the toilet	23.Open and close the door		
		24.Exit the toilet room		

FUGL-MEYER ASSESSMENT **UPPER EXTREMITY (FMA-UE)** **Assessment of sensorimotor function**	**ID:** **Date:** **Examiner**:

A. UPPER EXTREMITY, sitting position				
I. Reflex activity		none	Can be elicited	
Flexors: biceps and finger flexors (at least one) **Extensors**: triceps		0 0	2 2	
Subtotal **I (max 4)**				
II. Volitional movement within synergies, without gravitational help		**none**	**partial**	**full**
Flexor synergy: Hand from contralateral knee to ipsilateral ear. From extensor synergy (shoulder adduction/ internal rotation, elbow extension, forearm pronation) to flexor synergy (shoulder abduction/ external rotation, elbow flexion, forearm	Shoulder retraction Elbow elevation abduction (90°) external rotation Elbow flexion Forearm supination	0 0 0 0 0 0	1 1 1 1 1 1	2 2 2 2 2 2
	Shoulder adduction/internal rotation Elbow extension Forearm pronation	0 0 0	1 1 1	2 2 2

supination). **Extensor synergy:** Hand from ipsilateral ear to the contralateral knee				

Subtotal II (max 18)				
III. Volitional movement mixing synergies, without compensation		**none**	**partial**	**full**
Hand to lumbar spine hand on lap	cannot perform or hand in front of ant-sup iliac spine hand behind ant-sup iliac spine (without compensation) hand to lumbar spine (without compensation)	0	1	2
Shoulder flexion 0°- 90° elbow at 0° pronation-supination 0°	immediate abduction or elbow flexion abduction or elbow flexion during movement flexion 90°, no shoulder abduction or elbow flexion	0	1	2
Pronation-supination elbow at 90° shoulder at 0°	no pronation/supination, starting position impossible limited pronation/supination, maintains starting position full pronation/supination, maintains starting position	0	1	2
Subtotal III (max 6)				
IV. Volitional movement with little or no synergy		**none**	**partial**	**full**
Shoulder abduction 0 - 90° elbow at 0° forearm pronated	immediate supination or elbow flexion supination or elbow flexion during movement abduction 90°, maintains extension and pronation	0	1	2
Shoulder flexion 90° - 180° elbow at 0° pronation-supination 0°	immediate abduction or elbow flexion abduction or elbow flexion during movement flexion 180°, no shoulder	0	1	2

	abduction or elbow flexion			
Pronation/supination elbow at 0° shoulder at 30°- 90° flexion	no pronation/supination, starting position impossible limited pronation/supination, maintains start position full pronation/supination, maintains starting position	0	1	2
Subtotal IV (max 6)				
V. Normal reflex activity assessed only if full score of 6 points is achieved inpart IV; compare with the unaffected side		**Hyper 0 (IV),**	**lively**	**normal**
biceps, triceps, finger flexors	2 of 3 reflexes markedly hyperactive or 0 points in part IV 1 reflex markedly hyperactive or at least 2 reflexes lively maximum of 1 reflex lively, none hyperactive	0	1	2
Subtotal V (max 2)				
Total A (max 36)				

B. WRIST support may be provided at the elbow to take or hold the starting position, no support at wrist, check the passive range of motion prior testing		**none**	**partial**	**full**
Stability at 15° dorsiflexion elbow at 90°, forearm pronated shoulder at 0°	less than 15° active dorsiflexion dorsiflexion 15°, no resistance tolerated maintains dorsiflexion against resistance	0	1	2
Repeated dorsifexion / volar flexion elbow at 90°, forearm pronated shoulder at 0°, slight finger flexion	cannot perform volitionally limited active range of motion full active range of motion, smoothly	0	1	2
Stability at 15° dorsiflexion elbow at 0°, forearm pronated slight shoulder flexion/abduction	less than 15° active dorsiflexion dorsiflexion 15°, no resistance tolerated maintains dorsiflexion against resistance	0	1	2
Repeated dorsifexion / volar	cannot perform	0	1	2

flexion elbow at 0°, forearm pronated slight shoulder flexion/abduction	volitionally limited active range of motion full active range of motion, smoothly			
Circumduction elbow at 90°, forearm pronated shoulder at 0°	cannot perform volitionally jerky movement or incomplete complete and smooth circumduction	0	1	2
Total B (max 10)				

C. HAND support may be provided at the elbow to keep 90° flexion, no support at the wrist, compare with unaffected hand, the objects are interposed, active grasp		**none**	**partial**	**full**
Mass flexion from full active or passive extension		0	1	2
Mass extension from full active or passive flexion		0	1	2
GRASP				
a. Hook grasp flexion in PIP and DIP (digits II-V), extension in MCP II-V	cannot be performed can hold position but weak maintains position against resistance	0	1	2
b. Thumb adduction 1-st CMC, MCP, IP at 0°, scrap of paper between thumb and 2-nd MCP joint	cannot be performed can hold paper but not against tug can hold paper against a tug	0	1	2
c. Pincer grasp, opposition pulpa of the thumb against the pulpa of 2-nd finger, pencil, tug upward	cannot be performed can hold pencil but not against tug can hold pencil against a tug	0	1	2
d. Cylinder grasp cylinder shaped object (small can) tug upward, opposition of thumb and fingers	cannot be performed can hold cylinder but not against tug can hold cylinder against a tug	0	1	2
e. Spherical grasp fingers in abduction/flexion, thumb opposed, tennis ball, tug away	cannot be performed can hold ball but not against tug can hold ball against a tug	0	1	2

Total C (max 14)	

D. COORDINATION/SPEED, sitting, after one trial with both arms, eyes closed, tip of the index finger from knee to nose, 5 times as fast as possible			**marked**	**slight**	**none**
Tremor		at least 1 completed movement	0	1	2
Dysmetria at least 1 completed movement		pronounced or unsystematic slight and systematic no dysmetria	0	1	2
			≥ 6s	**2 - 5s**	**< 2s**
Time start and end with the hand on the knee		at least 6 seconds slower than unaffected side 2-5 seconds slower than unaffected side less than 2 seconds difference	0	1	2
Total D (max 6)					

TOTAL A-D (max 66)				
H. SENSATION, upper extremity eyes closed, compared with the unaffected side		**anesthesia**	Hypoesthesia or dysesthesia	**normal**
Light touch	upper arm, forearm palmary surface of the hand	0 0	1 1	2 2
		less than 3/4 correct or absence	**3/4 correct or considerable difference**	**correct 100%, little or no difference**
Position small alterations in the position	shoulder elbow wrist thumb (IP-joint)	0 0 0 0	1 1 1 1	2 2 2 2
Total H (max12)				

J. PASSIVE JOINT MOTION, upper extremity, sitting position, compare with the unaffected side				**JOINT PAIN during passive motion , upper extremity**		
	only few degrees (less than 10° in shoulder)	decreased	normal	pronounced pain during movement or very marked pain at the end of the	some pain	no pain

				movement		
Shoulder Flexion (0° - 180°) Abduction (0°-90°) External rotation Internal rotation	0 0 0 0	1 1 1 1	2 2 2 2	0 0 0 0	1 1 1 1	2 2 2 2
Elbow Flexion Extension	0 0	1 1	2 2	0 0	1 1	2 2
Forearm Pronation Supination	0 0	1 1	2 2	0 0	1 1	2 2
Wrist Flexion Extension	0 0	1 1	2 2	0 0	1 1	2 2
Fingers Flexion Extension	0 0	1 1	2 2	0 0	1 1	2 2
Total (max 24)				**Total** (max 24)		

A. UPPER EXTREMITY	/36
B. WRIST	/10
C. HAND	/14
D. COORDINATION / SPEED	/ 6
TOTAL A-D (motor function)	/66

H. SENSATION	/12
J. PASSIVE JOINT MOTION	/24
J. JOINT PAIN	/24

FUGL-MEYER ASSESSMENT **LOWER EXTREMITY (FMA-LE)** **Assessment of sensorimotor function**	**ID:** **Date:** **Examiner**:

LOWER EXTREMITY				
I. Reflex activity, supine position		None	Can be elicited	
Flexors: knee flexors		0	2	
Extensors: patellar, Achilles		0	2	
	Subtotal I	/4		
II. Volitional movement within synergies, supine position		None	Partial	Full
Flexor synergy: Maximal hip flexion (abduction/external rotation), maximal flexion in knee and ankle joint (palpate distal	Hip flexion	0	1	2
	Knee flexion	0	1	2
	Ankle dorsiflexion	0	1	2

tendons to ensure active knee flexion).				
Extensor synergy: From flexor synergy to the hip extension/adduction, knee extension and ankle plantar flexion. Resistance is applied to ensure active movement, evaluate both movement and strength	Hip extension	0	1	2
	Hip adduction	0	1	2
	Knee extension	0	1	2
	Ankle plantar flexion	0	1	2
Subtotal II		/ 14		
III. Volitional movement mixing synergies, sitting position, knee 10 cm from the edge of the chair/bed		None	Partial	Full
Knee flexion from actively or passively extended knee	no active motion no flexion beyond 90°, palpate tendons of hamstrings knee flexion beyond 90°, palpate tendons of hamstrings	0 1 2		
Ankle dorsiflexion compare with unaffected side	no active motion limited dorsiflexion complete dorsiflexion	0 1 2		
Subtotal III(max 4)				
IV. Volitional movement with little or no synergy, standing position, hip at 0°		None	Partial	Full
Knee flexion to90° hip at 0°, balance supportis allowed	no active motion/ immediate and simultaneous hip flexion less than 90° knee flexion or hip flexion during movement at least 90° knee flexion without simultaneous hip flexion	0 1 2		
Ankle dorsiflexion compare with unaffected side	no active motion limited dorsiflexion complete dorsiflexion	0 1 2		
Subtotal IV(max 4)				
V. Normal reflex activity supine position, evaluated only if full score of 4points achieved on earlier part IV, compare with unaffected side		None	Partial	Full

Reflex activity knee flexors, Achilles, patellar	0 points on part IV or 2 of 3 reflexes markedly hyperactive 1 reflex markedly hyperactive or at least 2 reflexes lively maximum of 1 reflex lively, none hyperactive	0 1 2
Subtotal V (max 2)		
Total(max 28)		

F.COORDINATION/SPEED, supine, after one trial with both legs, eyes closed, heel to knee cap of the oppositeleg, 5 times as fast as possible		marked	slight	none
Tremor		0	1	2
Dysmetria	Pronounced or unsystematic Slight and systematic No dysmetria	0	1	2
		≥ 6s	**2 - 5s**	**< 2s**
Time	6 or more seconds slower than unaffected side 2-5 seconds slower than unaffected side Less than 2 seconds difference			
Total F (max 6)				

H. SENSATION, lower extremity Eyes closed, compare with the unaffected side		anesthesia	Hypoesthesia or dysesthesia	normal
Light touch	Leg Foot sole	0 0	1 1	2 2
		less than 3/4 correct or absence	**3/4 correct or considerable difference**	**correct 100%, little or no difference**
Position Small alterations in the position	Hip Knee Ankle Great toe (IP-joint)	0 0 0 0	1 1 1 1	2 2 2 2
Total H (max 12)				

I. PASSIVE JOINT MOTION, lower extremity supine position, compare with the unaffected side	J. JOINT PAIN during passive motion, lower extremity

	Only few degrees (< 10 degrees hip)	decreased	normal	Pronounced pain during movement or very marked pain at the end of the movement	Some pain	No pain
Hip Flexion	0	1	2	0	1	2
Abduction	0	1	2	0	1	2
External rotation	0	1	2	0	1	2
Internal rotation	0	1	2	0	1	2
Knee Flexion	0	1	2	0	1	2
Extension	0	1	2	0	1	2
Ankle Dorsiflexion	0	1	2	0	1	2
Plantar flexion	0	1	2	0	1	2
Foot Pronation	0	1	2	0	1	2
Supination	0	1	2	0	1	2
Total (max 20)				Total (max 20)		

E. LOWER EXTREMITY	/28	H.SENSATION	/12
F. COORDINATION/SPEED	/6	I. PASSIVE JOINT MOTION	/20
TOTAL E-F (motor function)	/34	J. JOINT PAIN	/20

Bangladesh Health Professions Institute
Department of Occupational Therapy
4th Year B. Sc in Occupational Therapy
OT 401 Research Project

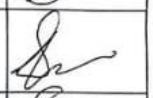
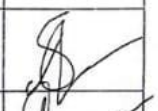
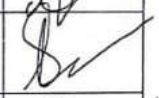
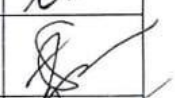
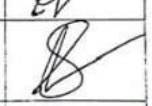
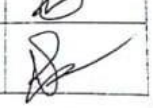
Thesis Supervisor- Student Contact; face to face or electronic and guidance record

Title of thesis: Factors Influencing Toileting Task Performance Among Patients with Subacute Stroke: A Cross-Sectional Study

Name of student: Mst. Basetun Nesa

Name and designation of thesis supervisor: Shamima Akter, Associate Professor
Department of Occupational Therapy, BHPI

Appointment No	Date	Place	Topic of discussion	Duration (Minutes/ Hours)	Comments of student	Student's signature	Thesis supervisor signature
1	8.8.23	OTD (2) BHPI	Proposal Presentation	40 minutes	Instruction to write the proposal	Basetun	
2	11.08.23	OTD (2) BHPI	Proposal (Method)	1 hour	Learned about writing of method	Basetun	
3	16.08.23	OTD (2) BHPI	Proposal (Questions)	20 minutes	get clear idea about Proposal	Basetun	
4	18.09.23	OTD (2) BHPI	Data Collection Procedure, Questionnaire	1 hour	Received a proper guideline	Basetun	
5	27.09.23	OTD (2)	Questionnaire discussion	20 minutes	get clear idea	Basetun	

		BHPI					
6	19.10.23	OTD (2) BHPI	Author Contact, review	10 minutes	Helpful for the thesis	Baseton	
7	28.10.23	OTD (2) BHPI	Overall guideline	30 minutes	got a structured guideline	Baseton	
8	2.11.23	OTD (2) BHPI	Data collection guideline Questionnaire discussion	1 hour	got clear idea about Data collection	Baseton	
9	1.12.23	OTD (2) BHPI	Data collection questio- -nnaire discussion	45 minutes	Problem solved about the questionnire	Baseton	
10	17.12.23	OTD (2) BHPI	Assessment form teaching	1 hour	clear concept about how to fill the form	Baseton	
11	23.12.23	OTD (2) BHPI	Checking Scoring System of assessment form	30 minutes	got structured guideline	Baseton	
12	30.12.23	OTD (2) BHPI	Data management	45 minutes	Helpful to solve some issue	Baseton	
13	20.1.24	OTD (2) BHPI	Discussion about SPSS & Data input	50 minutes	Thought about Data input	Baseton	
14	18.2.24	OTD (2) BHPI)	Feedback on data input and data analysis	35 minutes	got clear idea about this	Baseton	
15	9.3.24	OTD (2) BHPI	Feedback on the first draft	1 hour	Learnt about my mistake	Baseton	
16	30.3.24	OTD (2) BHPI	Feedback on second draft with discussion and conclusion	1 hour	Got Proper guideline	Baseton	

17	12.03.24	BHPI OTD Waiting room	Feedback of thesis 2nd draft	1 hour	got a structured feedback	Basetun	Ngyl
18	15.04.24	BHPI OTD waiting room	Feedback of Presentation	15 minutes	got clear idea about Presentation	Basetun	Ngyl
19	22.04.24	BHPI OTD waiting room	Discussion about defence feedback	20 minutes	Learnt about my mistake	Basetun	Ngyl
20	09.05.24	BHPI Library	Final feedback	30 minutes	Helpful to solve Some Issue	Basetun	Ngyl

Note:

1. Appointment number will cover at least a total of 40 hours; applicable only for face to face contact with the supervisors.
2. Students will require submitting this completed record during submission your final thesis.