EFFECTIVENESS OF KEGEL EXERCISE FOR URGE URINARY INCONTINENCE AFTER CHILD BIRTH

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We the undersigned certify that we have carefully read and recommended to the Faculty of Medicine, University of Dhaka, for the acceptance of this dissertation entitled

EFFECTIVENESS OF KEGEL EXERCISE FOR URGE URINARY INCONTINENCE AFTER CHILD BIRTH

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Declaration

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

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CONTENTS

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Acronyms

BHPI	Bangladesh Health Professions institute
BMRC	Bangladesh Medical Research Council
CRP	Centre for the Rehabilitation of the Paralysed
FSFI	Female Sexual Function Index
ICS	International Continence Society
IRB	International Review Board
KHQ	King's Health Questionnaire
MUI	Mixed Urinary Incontinence
MVC	Maximum voluntary contraction
NRS	Numerical Rating Scale
P Value	Probability value
PFM	Pelvic Floor Muscle
PFME	Pelvic Floor Muscle Exercise
PFMT	Pelvic floor muscle training
QOL	Quality of Life
RCT	Randomized Control Trail
SPSS	Statistical Package of Social Sciences
SUI	Stress Urinary Incontinence
UI	Urinary Incontinence
UUI	Urge Urinary Incontinence
VAS	Visual Analogue Scale
WHO	World Health Organization

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Abstract

Purpose: The present study was conducted to identify and analyze the therapeutic effectiveness of kegel Exercise for the treatment of Urge Urinary Incontinence after child birth. *Objectives:* To identify the impact of urinary incontinence on quality of life among woman with urge urinary incontinence after childbirth and thus to measure the effectiveness of Kegel exercise as well as to identify the improvement of pelvic floor muscle strength & bladder control and eventually to increase awareness among woman with urinary incontinence about the effectiveness of kegel exercise. *Methodology*: The study was an experimental design. Total 10 samples were selected conveniently and then randomly assigned for this study from gynecology outpatient department of Musculoskeletal Unit, Physiotherapy Department, Centre for the Rehabilitation of the Paralysed (CRP), Mirpur, Dhaka. The data were collected by Kings Health questionnaires; Numerical Rating Scale (NRS) & Voiding Diary. Quality of life score from KHQ & Numerical Rating Scale was used to assess severity of Urge Urinary Incontinence before and after treatment. Experimental Group did home based Kegel Exercise which was instructed at first by the researcher by given a written protocol as a form of brochure where control group received no treatment for UUI. *Result*: The finding of the study was carried out by using "Mann-Whitney *U* test" to compare the Experimental and Control Group and analysed by interpreting the probability level of significance of *U* value. The results were found to be significant for *U* value at probability level 0.05 for one tail hypothesis. *Conclusion*: The study can be concluded as the Kegel exercise is significantly capable of producing beneficial effects on quality of life for Urge Urinary Incontinence after child birth.

Keywords: Kegel Exercise, Urge Urinary Incontinence, child birth.

CHAPTER I INTRODUCTION

1.1 Background

Urinary incontinence (UI) is a major health & social problem predominantly in women. The prevalence of this problem is of 25-45% all over the world (Milsom et al., 2013). Daily incontinence affects between 5% and 15% of middle aged and older women. Prevalence estimates of urinary incontinence during pregnancy & after child birth are even higher, as it is reported in 42% of pregnant women & 38 % of women post-partum (Morkved & Bo, 2014).

There are three main types of UI: Stress urinary incontinence (SUI), urgency urinary incontinence (UUI) and mixed urinary incontinence (MUI). Among these the most common is Stress Urinary incontinence (SUI) and its prevalence varies at 10-39% (Dumolin et al., 2014). Mixed urinary incidence (MUI) has a prevalence of 7.5-25% (Dumolin et al., 2014). Thus, SUI and MUI constitutes nearly two-thirds of the women with urinary incontinence.

The pregnancy and vaginal delivery have a significant impact on pelvic floor structures, which may lead to pelvic floor dysfunction due to damage to muscles, ligaments, fascias and peripheral nerves (Ahlund et al., 2013). Mode of delivery also seems to have an impact on SUI. Vaginal delivery seems to be associated with an increased risk for lower urinary tract symptoms nine months after birth in primiparous women when compared to women undergone elective cesarean section (Ekstrom et al., 2008). Incontinence problems in two or three months post partum has been reported to be 3-38% (Ahlund et al., 2013).

Groutz et al., (2005) stated that half the women studied reported moderate to severe UI but only 15-18% had consulted a medical professional about the problem. So clearly these issues are under-reported, possibly due to society's prevailing belief that they are "normal" & "to be expected" if they had children. People only seek professional help when feeling very uncomfortable with their condition. Several studies have reported the negative impact of this condition on quality of life, leading to social isolation, concerns, decreased self-esteem and embarrassing situations (de Santos et al., 2014).

Pelvic floor muscle training after child birth has been demonstrated to be effective in prevention and treatment of urinary incontinence. It is recommended to be the first choice of treatment (Abrams et al., 2010) for UI with the aim to improve strength and function of the pelvic floor muscles (Price et al., 2010).

Dr. Arnold Kegel first reported successful outcomes in women with SUI symptoms using pelvic floor muscle exercises in 1948.Kegel exercises strengthen bladders and surrounding muscles that are fundamental therapies for bladder control problems. Since 1948, several physiotherapy methods have been used (biofeedback, electrostimulation, vaginal cones, vaginal ball, individual/ group therapy) in the treatment of UI, with different success rates (Konstantinidou et al., 2007; Kashanian et al., 2011). In a recent review, PFMT has been found to improve UI symptoms in all types of incontinence (Dumoulin et al., 2014). In the literature, most PFMT programmes have been performed under regular control of a physiotherapist in physiotherapy centres, which may not be cost-effective and is time consuming (Konstantinidou et al., 2007; Kashanian et al., 2011).

1.2 Rationale of the study

In perspective of Bangladesh there is no relevant research has been conducted in this field yet. Even there is no evidence of practicing Kegel exercise clinically for urinary incontinence after child birth which is one of the most important treatments of urinary incontinence. The great majority of women in our country have urinary incontinence but they don't take any treatment or share about their problem to any health professional because of their hesitation and conservativeness to express their continence problem or they think it is normal and there is no management for it. Thus we are unable to know the actual percentage of women who have UI after child birth. Since urinary incontinence is one of the most common symptom occur during pregnancy and/or after childbirth, it is also a major cause of prolapse of pelvic organ. It also negatively impacts quality of life. So it is very necessary to make awareness about the physiotherapy management for urinary incontinence by which they can get proper treatment for their urinary incontinence and maintain a normal life. As we already have many evidences all over the world that Kegel exercise is effective for the prevention & treatment of urinary incontinence after child birth, so we should apply this intervention with evidence by which the effectiveness of Kegel exercise can be measured through a research project in the perception of Bangladesh. This study will help to liberate effective treatment for the woman who have SUI during pregnancy and after child birth and thus it will improve their quality of life also prevent them from pelvic organ prolapse.

1.3 Aim of the study

The aim of this study is to identify the effectiveness of Kegel exercise for urge urinary incontinence after child birth.

1.4 Objectives of the study

General Objective

To identify the impact of urinary incontinence on quality of life among woman with urge urinary incontinence after childbirth.

Specific Objective

1. To measure the effectiveness of Kegel exercise.
2. To identify the improvement of pelvic floor muscle strength.
3. To find out the improvement in bladder control.
4. To increase awareness among woman with urinary incontinence about the effectiveness of kegel exercise.

1.5 Hypothesis

Kegel exercise is effective for urge urinary incontinence after child birth.

1.6 Null hypothesis

Kegel exercise is not effective for urge urinary incontinence after child birth.

1.7 List of variables

Independent variable- Kegel exercise

Dependent variable- Urge urinary incontinence

1.8 Operational definitions

1.8.1 Pelvic floor

Pelvic floor consist of a group of 12 straighted muscles arranged in 3 layers. The striated muscle fibres of each muscle run in the same direction to the other muscles of the pelvic floor group. It is the main support structure for the pelvic organs such as: bladder, uterus and bowel (Price et al., 2010).

1.8.2 Pelvic floor muscle

The PFM are a deep muscle group that have some similarities in their neural control as axial muscles. It is important in maintaining urinary and fecal continence as well as in providing support to the pelvic organs. The PFM has two types of muscle fibers- Type I or slow twitch muscle fibers and type II, fast twitch muscle fibers (Price et al., 2010).

1.8.3 Pelvic floor muscle weakness

Risk factors for pelvic floor muscle weakness are: Pregnancy, childbirth, straining to empty the bladder or bowel with or without constipation, persistent heavy lifting, chronic cough (from smoking or any respiratory disease), obesity, lack of general fitness, restricted mobility, menopause, and age (Morkved et al., 2013).

1.8.4 Urinary incontinence

According to International Continence Society (Haylen et al., 2010), UI is defined as "any complaint of involuntary leakage of urine". There are three main types of UI.

1. Stress urinary incontinence (SUI) is defined as" the complaint of involuntary leakage on effort or extortion, or on sneezing or coughing" (Ahlund et al., 2013)
2. Urge urinary incontinence (UUI also known as urgency urinary incontinence) is involuntary leakage accompanied by or immediately preceded by urgency.
3. Mixed urinary incidence (MUI) is urine leakage with a combination of SUI and UUI (Dumolin et al., 2014).

CHAPTER II LITERATURE REVIEW

Urinary incontinence is strongly associated with vaginal child birth in many epidemiological studies. Several studies have shown that the prevalence of SUI increases during pregnancy and declines after delivery. This indicates that the increased pressure from the growing uterus on the bladder may cause temporary leakage during pregnancy. On the other hand, obesity has been mentioned as a possible risk factor for post partum SUI. Initial strength of the pelvic floor muscles (PFM) is another factor that may influence continence status during pregnancy (Morkved et al., 2013) and after delivery. Previous urinary incontinence is a significant risk factor and the results of a 15-year follow-up study support the view that SUI arising during increases the risk of SUI developing in the future (Bo et al., 2014).

Many studies using different techniques have demonstrated neurogenic and structural damage to the PFM and sphincter muscles as a consequence of vaginal delivery. As a consequence; the PFM would become weak; such weakness has indeed been demonstrated. The sphincter mechanisms and pelvic organ support become functionally impaired; with SUI and prolapse being a logical consequence (Hildle et al., 2015).

Although muscle weakness may be a common consequence of childbirth injury, there seem to be further pathophysiological possibilities for deficient PFM function; it is not only the strength of muscle contraction that define it's functional integrity. The reasons for such persisting abnormalities are not clear and are difficult to explain by muscle denervation (which has been amply studied) alone. Although not proven in studies; it is reasonable to assume that motor denervation is accompanied also by sensory denervation of the PFM. In addition to denervation injury there may be some further temporary 'inhibitors' of PFM activity; such as periods of pain and discomfort after child birth (e.g. perineal tears; episiotomy); increased by attempted PFM contraction (Kim et al., 2005).

The association between urinary incontinence and obstetric factors as parity, mode of delivery and weight of the baby have been addressed in several studies.

Statistically significant associations between any incontinence and a birth weight of 4000g or greater has been observed, but others have reported conflicting results.

The first vaginal delivery seems to be a major fisk for developing urinary incontinence. Increased prevalence of urinary incontinence has been associated with increased parity and with women having more than four children (Groutz et al., 2015). It is also found that there is a higher prevalence of urinary incontinence among white in compared to black women (Burgio et al., 2008).

Vaginal delivery has been found to be an adverse risk factor for post partum urinary incontinence. No multivariate association for forceps delivery or vacuum extraction delivery, episiotomy or perineal suturing was found in a large cross-sectional study, but epidural anesthesia has been associated with SUI. Elective caesarean section appears to be protective, though not completely (Eason et al., 2005), but confounding factors may exist. Anatomical structures (the size of mother's pelvis, muscles, connective tissue) may be one reason for offering some women caesarean section. The same anatomical characteristics may also protect against urinary incontinence after child birth.

Two different pathological processes may cause the symptom of SUI in pregnancy and during post-partum period. Vaginal delivery may initiate damage to the continence mechanism by direct injury to the PFM, damage to their motor innervations, or both. Stress urinary incontinence after childbirth has been explained as a consequence of peripheral nerve damage. Rupture of muscle fibres and connective tissue and over stretching of supporting ligaments and fascias during pregnancy and delivery are other risk factors (Morkved & Bo, 2014).

The mechanisms behind pelvic floor damage leading to SUI are often divided into two broad categories; i) denervation injury and ii) support/ anatomical injury (Bo et al., 2014).

Denervation injury

In several studies, manometric and neurophysiological assessments have given evidence of weakness in the pelvic floor, and this weakness is due to partial denervation of the pelvic floor striated muscles. In many women, pudendal

neuropathy due to vaginal delivery persists and may become worse with time. It has been found that during the first year postpartum, vaginal surface electromyography, pressure and palpation measurements were reduced in primiparous women with traumatic delivery. In addition, the risk of developing symptoms from the lower urinary tract during the first year post partum was increased in women with traumatic delivery (41%) compared to women with non-traumatic delivery (25%). Women older than 30 years and with a traumatic delivery had more than double the risk for lower urinary tract dysfunction than those under the age of 30 did (Bo et al., 2014).

Support/anatomical injury

The hormonal (oestrogen, progesterone, endocrine corticoids, relaxin) changes during pregnancy influence the ligaments and smooth muscles and may lead to increased joint mobility and increased mobility in pelvic organs that are stabilized by ligaments. On the other hand, reduced tensile strength in pregnant fascia has been found, which may account for the development of SUI in pregnancy. Normally the fascia regain their previous strength after delivery, but in cases of permanent SUI the occurrence of overstretching may cause irreversible damage. Also rupture of muscle fibres and connective tissue because of overstretching during vaginal delivery has been extensively studied and SUI may be due to a combination of muscular and fascial damage (Bo et al., 2014; Piculo et al., 2015).

Stretching of supporting structures as a result of pregnancy and delivery may lead to changes in the position of the bladder neck and cause damage and weakening of the urethral sphincter mechanisms. Thus urinary incontinence occurs after delivery due to anatomical injury. It is also found that PFM strength (vaginal squeeze pressure) was lower after delivery than during pregnancy (Morkved et al., 2013).

Urinary incontinence can usually be treated by medical or conservative treatment, according to the etiology and severity of the condition and clinical status of the patient (Castro et al., 2015).

Medical treatment consists of medication and surgical treatment and conservative treatment consists of nutritional- hygienic interventions (behavior therapy), physiotherapy/rehabilitation of the pelvic floor such as pelvic floor muscle training,

biofeedback, neuromuscular electrical stimulation and many more (de Santos et al., 2014) . Here we will describe and discuss only the conservative treatments.

Behavioral change is a part of the conservative treatment, consisting of techniques that contribute to restoration of incontinence, especially in the presence of urgency urinary incontinence. In these cases, where the urgency situation itself may lead to anxiety, it is recommended that the individual's ability to retain urine can be increased by delaying micturation, which can be achieved by training on the toilet (de Santos et al., 2014; Dumoulin et al., 2015a). The individual should be instructed to seat on the toilet when feeling urge to micturate and try to retain the passage of feces for 1 minute on the clock. The next step is to increase the contraction duration to 5 minutes then gradually to 10 minutes. After achieving success, the training should be performed in the bedroom far from the bathroom. In this way, the person will also be working at the emotional level (Norton & Chelvanayagam, 2005). This therapies can also be used along with surgical management and/ or drug therapy for urinary incontinence.

It is believed that this muscle is a key factor in maintaining urinary incontinence. Pelvic floor muscle training is the conservative management most commonly used in the management of pelvic floor dysfunctions (Abrams et al., 2010; de Santos et al., 2014). Various types of PFMT have been proposed in urinary incontinence treatment such as biofeedback, electro-stimulation, vaginal cones, vaginal ball etc (Kashanian et al., 2011; Cavkaytar et al., 2014).

The impairment of the sphincter function is the cause of or major contributing factor of urinary incontinence. Exercises for PFMT are a strategy to improve sphincter function (Beyar & Groutz, 2015; Dumoulin et al., 2015b). Many authors believe that repeated contractions of pelvic floor muscle increase the strength, duration and speed of recruitment of the external sphincter and also increases the patient's ability to contract the pelvic floor muscle alone and to maintain it contracted (Norton & Chelvanayagam, 2005). Exercises of pelvic floor muscles is described in the next portion of this chapter.

Biofeedback in the context of controlling pelvic floor dysfunction, refers to a device inserted into the vagina or anal canal that measures the level of muscle activity generated by a voluntary pelvic floor contraction. This muscle activity can be

detected via the actual pressure produced or the electrical activity created by the muscle contraction. The muscle activity is transmitted to a computerized or mechanical device that produces a visual read out of the strength generated. Additionally, electromyogram (EMG) surface electrodes (similar to those used for recording of electrocardiograms) can be placed on the abdominal wall to record and discourage abdominal activity (de Santos et al., 2014).

A typical biofeedback session lasts 30 minutes and can be performed at home or in an office setting. Biofeedback courses in other country commonly include 10 weekly sessions of 15 minutes of active exercises. The combination of PFMT/ Kegel exercise with biofeedback is also used in the daily practice of the outside countries (Vermandel et al., 2015).

On the other hand, biofeedback therapy is relatively easy and safe to be performed, has no adverse effects, is well-tolerated, stimulates the patient, although it requires a specialist to conduct the program, and may be carried out using several techniques and devices (de Santos et al., 2014).

Vaginal cones provide a form of sensory feedback. A commercial set usually contains 5 cones of varying weights (typically 20 g to 70 g) and, sometimes, of varying sizes (de Santos et al., 2014). The woman inserts the cone well into the vagina, above the levator muscles, with the pointed end toward the introitus, and she contracts the levator muscles to prevent the cone from slipping out. The lightest cone is used first, and once she is able to hold it in for 15 to20 minutes twice daily, for 2 days in a row, she uses the next weight. As training proceeds, cones of increased weight are used. When satisfactory continence is obtained, the cone use can be reduced to 3 times a week to maintain strength. The cones are cleaned with soap and water, and sterilization is not required (Oblasser et al., 2015).

Neuromuscular electrical stimulation is a passive way of exercising and strengthening the pelvic floor using a vaginal device that delivers variable rates of current through a vaginal probe (de Santos et al., 2014). The intent is to stimulate successfully each pudendal nerve to activate the pelvic-floor musculature and thereby improve urethral closure pressure. This is particularly useful in women who

are completely unable to voluntarily contract their levator ani and so cannot perform Kegel exercises or use biofeedback or vaginal cones.

Neuromuscular electrical stimulation of the pelvic floor (NMESPV) is performed by applying electrical current to the pelvic floor muscle. Functional electrical stimulation activates both sensory and motor axons (Norton et al., 2009). A typical protocol consists of a weekly session of 7.5 minutes of stimulation on each side of the pelvis, ata frequency of 50 Hz. The intensity is sufficient to provide a pelvic floor muscle contraction and as high as is comfortable for the women. The muscle is exercised for 2 seconds and allowed to rest for 4 seconds. Treatment usually lasts for 10 weeks.

Contraindications for NESPV are – pregnancy, use of a cardiac pacemaker, recent pelvic or abdominal surgery, hemorrhoids (incase of endo-anal electrical stimulation), radiotherapy to the pelvic region, denervation of the pelvic floor and infection (Brito et al., 2013).

Multiple resistive devices are marketed directly to women, with each manufacturer suggesting their own protocol. Generally, the devices are inserted into the vagina to provide a resistance against which the levator muscles are contracted. Resistive devices do not provide a feedback (Serati et al., 2015; Shivkumar et al., 2015).

A voluntary pelvic floor muscle contraction is often unofficially called a “Kegel” contraction/ Kegel exercise. It is done repetitively on a daily basis, preferably while sitting or standing, to improve muscle strength, and does not involve any intravaginal device to increase resistance or provide feedback on strength. The woman may be coached to contract the pelvic floor in the same manner as she would to interrupt the stream while urinating. However, she is strongly discouraged from continuing to perform Kegels during micturition, as this could potentially affect bladder function. For better effectiveness, the woman can place a finger into her vagina and squeeze on the finger by contracting her pelvic muscles only, taking care not to use other muscles in the abdomen, legs, or buttocks. If she can feel her muscles tighten around her finger, she has identified the correct muscles to be exercised (Bo et al., 2015).

Originally, Dr Kegel proposed that 20 to 40 hours of progressive resistance training while using his pereonometer were required to restore tone and function. These

hours would be best spread over 20 to 60 days, with 20 minutes of exercises 3 times a day. Progressive resistance was assured by gradual increment of pressure by 1 mm to 2 mm of mercury daily. Other recommended regimens include the following:

Contract maximally for 6 to 8 seconds, then rest for a few seconds. Repeat 10 to 12 times for each set, performing 3 sets 3 to 4 times weekly (Bo et al., 2014).

Contract near-maximally for 6 to 8 seconds, with each contraction immediately followed by 3 to 4 fast contractions, followed by a 6-second rest. Repeat 8 to 12 times, twice daily (Bo et al., 2014).

CHAPTER III METHODOLOGY

3.1 Study design

The study was conducted by using Randomized Control Trail (RCT) to evaluate the effectiveness of Kegel exercise urge urinary incontinence after child birth.

This study design was based on an experimental quantitative method. According to Depoy and Gitlin, (2015) the design could be shown by:

Experimental Group	:	r	O_1	X	O_2
Control Group	:	r	O_1		O_2

Flowchart of the phases of randomized controlled trial

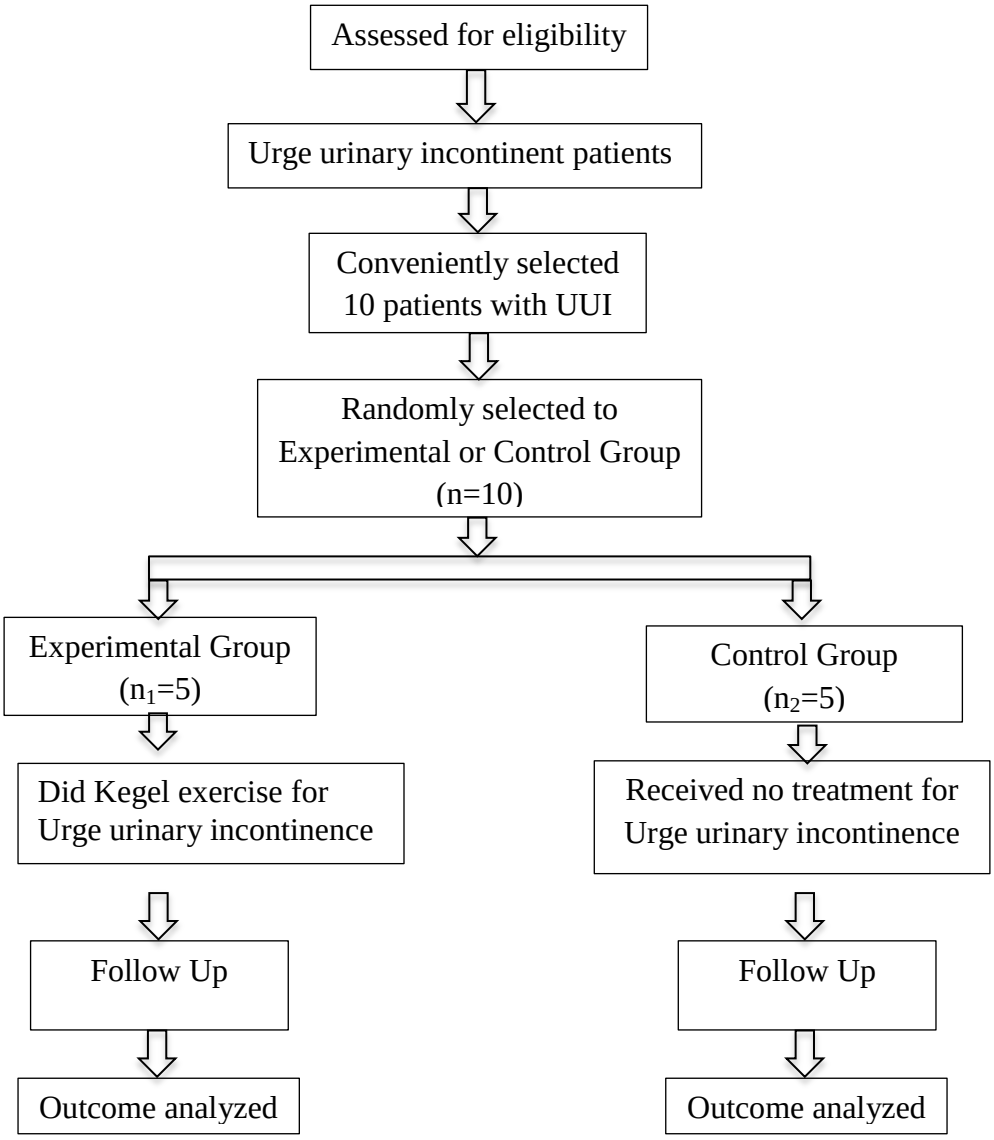


Figure 2 A flowchart for a randomized controlled trial of a treatment program including Kegel exercise for urge urinary incontinence after child birth

3.2 Study site

The study was done in Center for the Rehabilitation of the Paralyzed (CRP), Mirpur. It is a rehabilitation centre for all the conditions which need physiotherapy management. Recently a gynecological department is started for the treatment of the women who have any gynecological problem. The patients came here and take physiotherapy treatment by skilled physiotherapist. Though there is no system to get admitted here but it is very perfect center from which a woman can get her proper services from the trained Physiotherapist.

3.3 Study population

Though in this type of study the population should be for all the postpartum women in Bangladesh but it was too large and also not possible to include them all in the study. The study populations were patient with urinary incontinence came to Gynecology outpatient unit of MS department of Mirpur-CRP after child birth for treatment.

3.4 Sample size

10 patients were conveniently selected from Gynecological outpatient unit of MS department of CRP, Mirpur and then 5 patients were randomly assigned to Experimental group who received Kegel exercise for urge urinary incontinence after child birth and 5 patients in control group who received no treatment for urge urinary incontinence.

3.5 Sampling procedure

As the period of data collection was limited so the researcher had selected 10 postpartum urinary incontinent patients conveniently for this study. The sampling procedure was Non-probability convenience sampling. Convenience sampling is also known as Opportunity Sampling; Accidental Sampling or Haphazard Sampling.

In convenience sampling procedure; sample contains subjects who are simply available in a convenient way to the researcher. However; this method is often only feasible one; particularly for students or others with restricted time and resources; and can legally be used provided its limitations are clearly understood and stated. Convenient sampling system also used while unable to contact an extensive population; for example due to time or cost limits the researcher gave each patient a

code number which made the researcher neutral while lottery. The researcher wrote experimental group in one page while control group on another page. The researcher wrote the code number of the patients in 10 scrap of paper and then folding them and put into experimental and control group one by one randomly. The numbers in the experimental page were considered as control group. Thus the researcher randomly assigned the conveniently selected patients to control group and experimental group by lottery systems (McKenzie & Yang, 2010).

3.6 Inclusion criteria

Women equal to 3 months or more after delivery were included because during this time most of the women experience urinary incontinence (Morkved & Bo, 2014).

Women who had done vaginal child birth were included as women who have had a vaginal deliveries are at much greater risk for developing urinary incontinence (de Santos et al., 2014).

Women who had cesarean delivery were also included because they have also some risk of developing Urinary incontinence.

Women who have passed at least primary level were included as the questionnaire and the exercise instruction was difficult for the illiterate to understand. There is sufficient evidence in case law that healthcare providers may be held responsible for adverse outcomes of low-literate patients who do not understand written consent forms and have not been verbally informed about the risks of medical treatments or surgical procedures.

All age group were included who fulfilled the above inclusion criteria (Morkved & Bo, 2014).

3.7 Exclusion criteria

Women having urinary incontinence from other causes such as complete spinal cord injury, thinning and drying of the skin in the vagina or urethra especially after menopause; neurological cause; not being able to move around, Diabetes patients were excluded as the research was conducted only on postpartum urinary incontinence.

Those who are taking medication that could interfere with their evaluation or treatment were excluded (Dumoulin et al., 2015a).

Women who had previous surgery for Urinary Incontinence (Dumoulin et al., 2014).

Women with neurologic or psychiatric disease (Dumoulin et al., 2014).

Patient with major medical condition such as high blood pressure; asthma, tuberculosis, Cancer, AIDS etc (Dumoulin et al., 2014).

Patient with neurological bladder dysfunction or tumour in the genital area (Ahlund et al., 2013)

3.8 Data collection and materials

Data collection

Samples were selected from the gynecology outpatient unit of CRP, Mirpur. All subjects received same facilities and treatment time which were given to other patients. The participants were given preliminary education about pelvic floor muscle exercises and holding techniques. This was done via demonstration and visualization. The researcher also gave a written instruction in a form of brochure about how to do kegel exercise. Before and after treatment, data was collected regarding some quality of life domains (By KHQ). These were general health perception, Incontinence impact, Role limitation, Physical limitation, Social limitation, Personal limitation, Emotions, Sleep/Energy, Severity measures. Morkved et al., (2014) stated that "Urinary incontinence affects women's physical, social, domestic, occupational, leisure activities, psychological status etc. that means urinary incontinence affects women's quality of life severely".

Data collection materials

The researcher used same materials and same structured questionnaire in pre-test and post-test condition; a quality of life questionnaire (King's health questionnaire) including following domains: General health perception, Incontinence impact, Role limitation, Physical limitation, Social limitation, Personal limitations, Emotions , Sleep/Energy, Severity measures; a visual analogue scale score & voiding diary.

3.9 Measurement Tools

Outcome measures such as voiding diaries, pad tests, Visual analogue Scale score or quality of life questionnaires are recommended for use by the 3rd International Consultation on Urinary Incontinence. The Urodynamic Society and the standardization committee of the International Continence Society have recommended using measures of urinary leakage and self-reports to evaluate treatment effect (Fitz et al., 2012). However, due to time limitation, logistic problems and unfamiliarly with the tools, these are erratically used by clinicians in routine practice. But because of time limitation and lack of available resources in our country the researcher had selected those quality of life domains included questionnaires, NRS Score & Voiding diary as measurement tools to assess whether pelvic floor exercise is effective in decreasing urinary incontinence (Fitz et al., 2012) which could cause improvement in quality of life territory included above. The data was collected for 7 week.

King's health questionnaire

The King's Health Questionnaire (KHQ) was developed at King's College Hospital in London in 1995 as part of a large longitudinal study of quality of life. The questionnaire consists of three parts. The first section contains two questions measuring general health and overall health related to urinary symptoms. The second section includes 19 questions divided into seven domains of quality of life: incontinence impact, role limitation, physical limitation, Social limitations, personal relationships, emotions, sleep and energy, severity coping measures, general health perception and symptom severity. The third section of the questionnaire comprises 11 questions measuring the bother or impact of urinary symptoms. Kings Health Questionnaire can also be used to evaluate the impact of PFM on QOL after the treatment of urinary incontinence (Fitz et al., 2012). It is now available for use in national or international multicenter clinical trials, thus allowing scientific conclusions to be reached regarding the efficacy of such procedures. Kings Health Questionnaire established moderate concurrent validity and strong internal reliability, mainly after treatment. The questionnaire was originally standardized to be self-administered; but it was applied during an interview and questions were read by the examiner as written (Fitz et al., 2012).

Numerical Rating Scale

A Numerical Rating Scale is just like Visual Analogue Scale (VAS) which is a measurement instrument that tries to measure a characteristic or attitude that is believed to range across a continuum of values and cannot easily be directly measured. It is often used in epidemiologic and clinical research to measure the intensity or frequency of various symptoms. In this study; the subject's perceived burden of incontinence was evaluated using a Numerical Scale (NRS) that proved to be valid; reproducible and responsive to treatment for urinary incontinence in women (Jain et al., 2011).

VoidingDiary

A frequency-volume chart, or a micturition bladder diary, is useful to quantify the severity of the problem. It is recommended that the patient complete this for at least three days and nights for precision. Tailored to suit the individual, the diary can provide information on frequency, bladder volumes, incontinence episodes, pad usage, bowel habits, fluid intake and response to treatment. However, a surprising number of patients have difficulty completing these charts properly, even in their simplest form.

3.10 Treatment Regimen

Only the subjects of experimental group received the Treatment. They practice kegel exercise for 7 weeks according to the written protocol/ instruction given by the researcher.

The regime of pelvic floor exercises was 3 sets of 10 contractions 3 times per day depending on their capabilities and stamina after each void. The exercises were to be done while on the toilet or bed or during any daily activities of living. It can be done even during yoga but should not be done while urinate as it can hurt the bladder.

3.11 Rigor

During the period of data collection & analysis, investigator always tried not to influence the process by his own perspectives, values and biases. When conducting the study the investigator took help from the supervisors and physiotherapists.

3.12 Ethical consideration

The whole process of this research project was done by following the Bangladesh Medical Research Council (BMRC) guidelines and World Health Organization (WHO) Research guidelines. The proposal of the dissertation including methodology was presented to the Institutional Review Board (IRB).

Then the proposal of the dissertation including methodology was approved and obtained permission from the concerned authority of ethical committee of Bangladesh Health Professions Institute (BHPI).

When the researcher had received an approval letter from the ethical committee and obtained permission from department of Gynecological physiotherapy then data collection was started.

The aims and objectives of this study should be informed to the subjects verbally. The women should asked to return a signed consent form if they wanted to participate in the study (Morkved et al., 2013). The researcher should given the consent form (see appendix A) to the subjects and explained them. The subjects have the rights to withdraw themselves from the research at any times. If the subject thinks that the treatment would not be enough to control his or her condition he/she could reject to receive the treatment. The name or address would not be use. The information of the subjects might be punished in any normal presentation or seminar or writing but they would not be identified. The participant or subject will also be informed or given notice that the research result will not be harmful for them; but in future participants will be benefited. Every participant has the rights to discuss about his or her problem with the senior authority. The participants were ensured that their comments would not affect their occupational life. If patients experience any negative effect of treatment then the treatment will be stopped and would be referred to the doctor.

3.13 Data analysis

To find out the effectiveness of Kegel exercise for Urge urinary incontinence after child birth data were collected and analysed by SPPS version 20 and Microsoft office excel 2010. In this study there were two different group where one was experimental group who did Kegel exercise and another group was control group who received no

treatment for Urge urinary incontinence after child birth .There were ordinal data that was obtained by Kings Health Questionnaire and Visual Analogue Scale. Statistical comparison between the groups was made using the *U* test for non-parametric statistics.

3.14 Statistical test

For the significance of the study, a statistical test was carried out. Statistical analysis refers to the well-defined organization and interpretations of the data by systemic and mathematical procure and rules (Depoy & Giltin, 2013). The *U* test was done for the analysis the effectiveness of home based Kegel Exercise for 7 weeks practice among experimental group. Mann-Whitney *U* test is a non-parametric test that is simply compares the result obtained from the each group to see if they differ significantly.

According to Hicks, (2009), experimental studies with the different subject design where two groups are used and each tested in two different conditions and the data are either ordinal and interval/ratio should be analysed with Mann-Whitney U test. This test is used when the experimental design compares two separate or different unmatched groups of subjects participating in different conditions. When calculating the Mann-Whitney U test, we find the value called U which we then look up in the probability tables associated with the Mann-Whitney U test to find out whether the U value represents a significant difference between the results from two groups.

As it was experimental and had unmatched groups of different subjects, who was randomly assigned to experimental group who did Kegel exercise and another group that is control group who received no treatment for Urge urinary incontinence after child birth and the measurement of the outcome came from considering ordinal data;

The formula of Mann-Whitney *U* test:

$$U = \mathrm{n}_1\,\mathrm{n}_2\,\frac{\mathrm{n}_\mathrm{x}(\mathrm{n}_\mathrm{x}+1)}{2} - \mathrm{T}_\mathrm{x}$$

n_1 = the number of the subjects in experimental group

n_2= the number of the subject in control group.

n_x= the number of the subjects of the group with larger rank total.

T_x= the larger rank total

3.15 Significant level

In order to find out the significance of the study, the researcher calculated the “p” value. The p values refer the probability of the results for experimental study. The word probability refers to the accuracy of the findings. A p value is called level of significance for an experiment and a p value of <0.05 was accepted as significant result for health service research. If the p value is equal or smaller than the significant levels, the results are said to be significant.

CHAPTER IV RESULTS

Types of Delivery

There were total 10 patients. Among them 6 patients had their 1st delivery by vaginal delivery and 4 patient's 1st delivery was done by cesarian section. So percentage of vaginal child birth is greater than cesarean delivery. It is shown by the following pie chart (Figure 2).

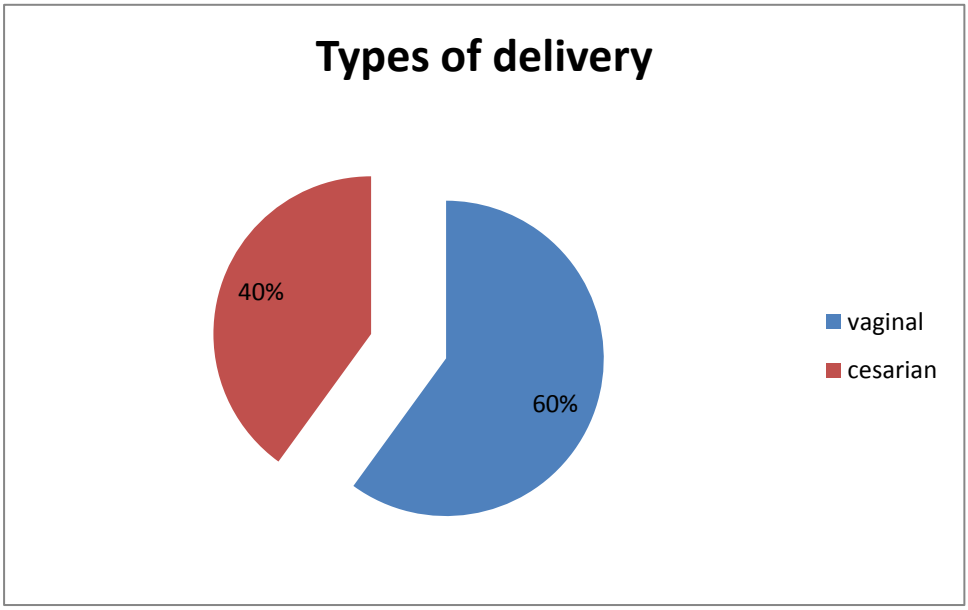


Figure 2 Percentage of types of delivery in both experimental & control group

Other percentages of the 9 domains of quality of life according to Kings Health Questionnaire including Numerical Rating Scale Score to describe the perceived burden or severity of urinary incontinence after child birth of both experimental & control group are given below by following bar diagram. Here we can see the condition of the patient before treatment after treatment and can compare the chances between experimental group & control group.

General health perception

Here (Figure 3) in experimental group 40% patient said fair, 40% poor and 20% said very poor about general health perception whether after treatment 60% said good; 20% fair and 20% said poor. On the other hand in control group 60% said fair & 40% said poor in pre-test but 20% said fair and 80 % said very poor in post-test.

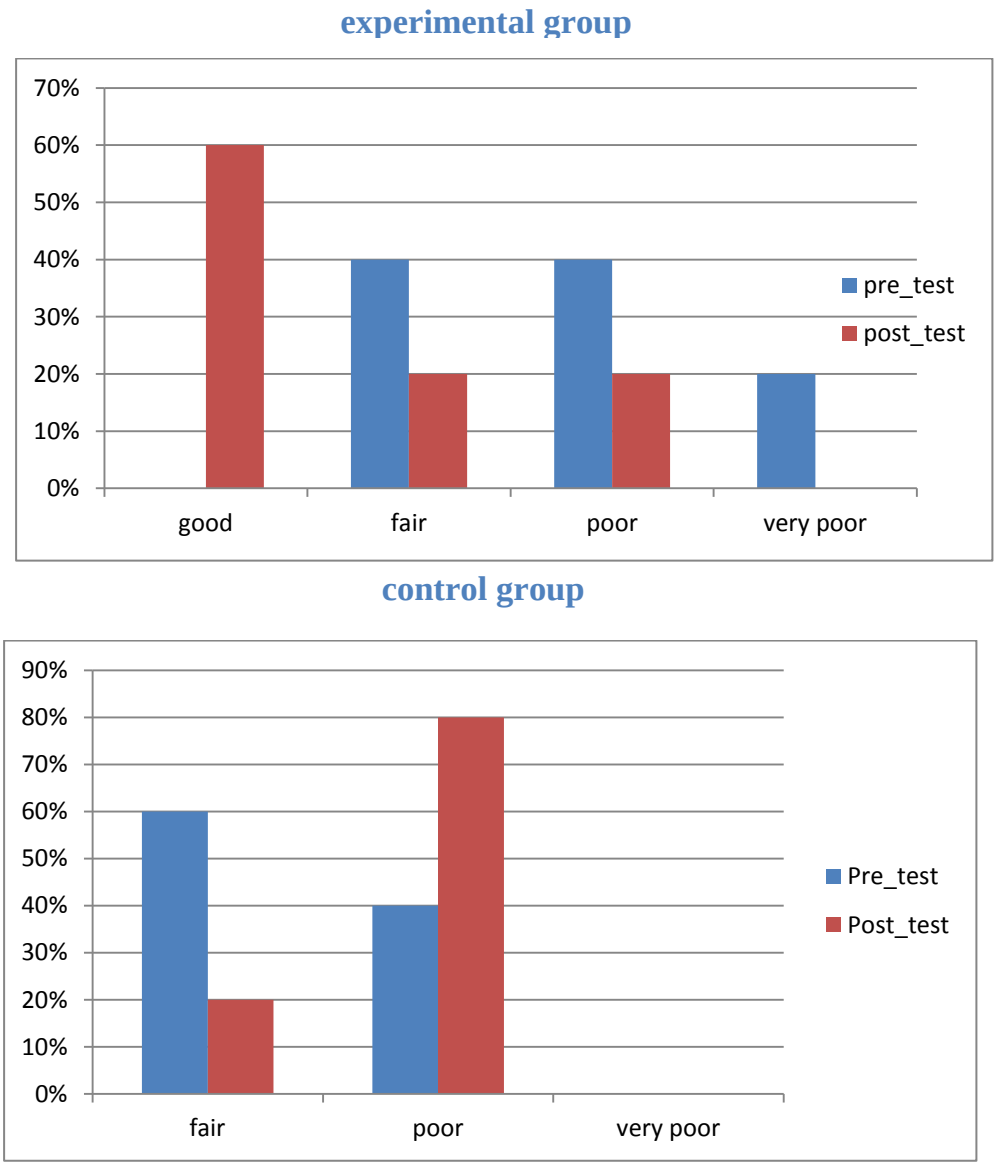
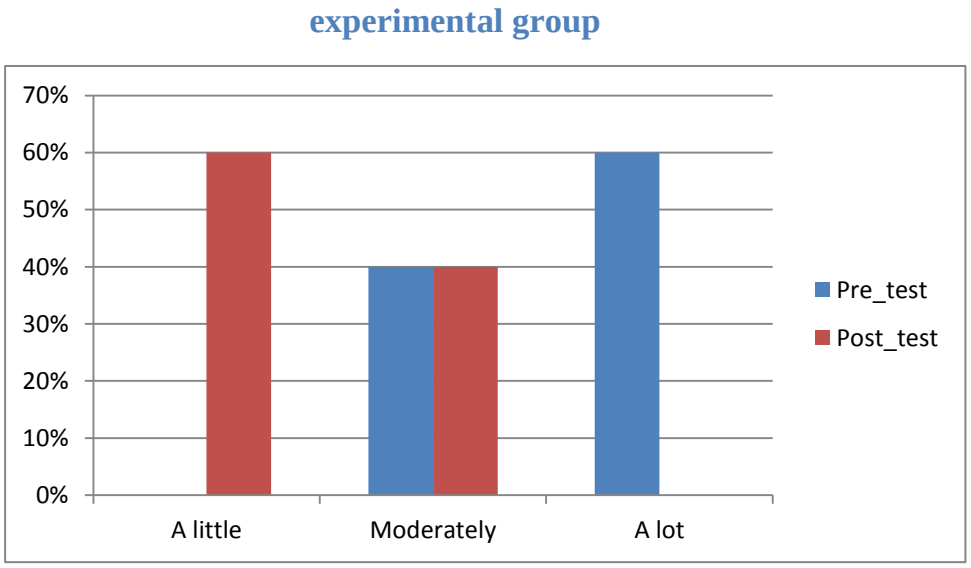


Figure 3 Percentage of general health perception in both experimental & control group (Pre & post test)

Incontinence impact

Here (Figure 4) in experimental group 40% patient had moderate & 60% had a lot of incontinence impact before treatment whether after treatment 60% said a little & 40% had moderate impact. On the other hand in control group 60% said A little & 40% said moderate in pre-test but 20% said A little and 80 % said about a lot of incontinence impact in post-test.



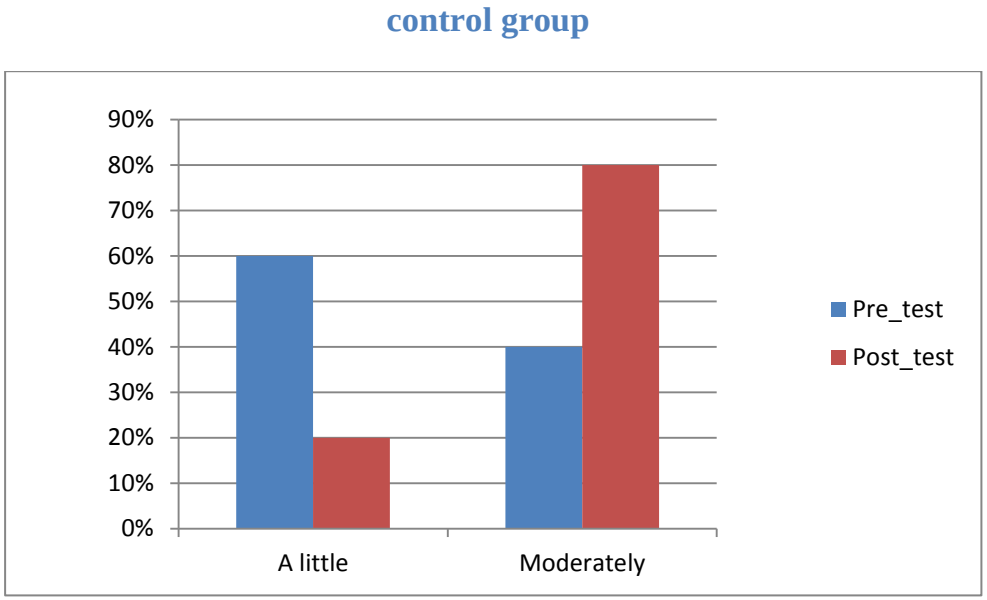


Figure 4 Percentage of incontinence impact (How much patient think that her bladder problem affects her life) in both experimental & control group (Pre & post test)

Role limitations

Here (Figure 5) in experimental group 60% patient had moderate & 40% had a lot of role limitations before treatment whether after treatment 60% had a slight, 20% moderate & 20% had a lot. On the other hand in control group 40% said slight & 60% said moderate role limitation in pre-test but 20% said A little and 80 % said about a lot of role limitation in post-test.

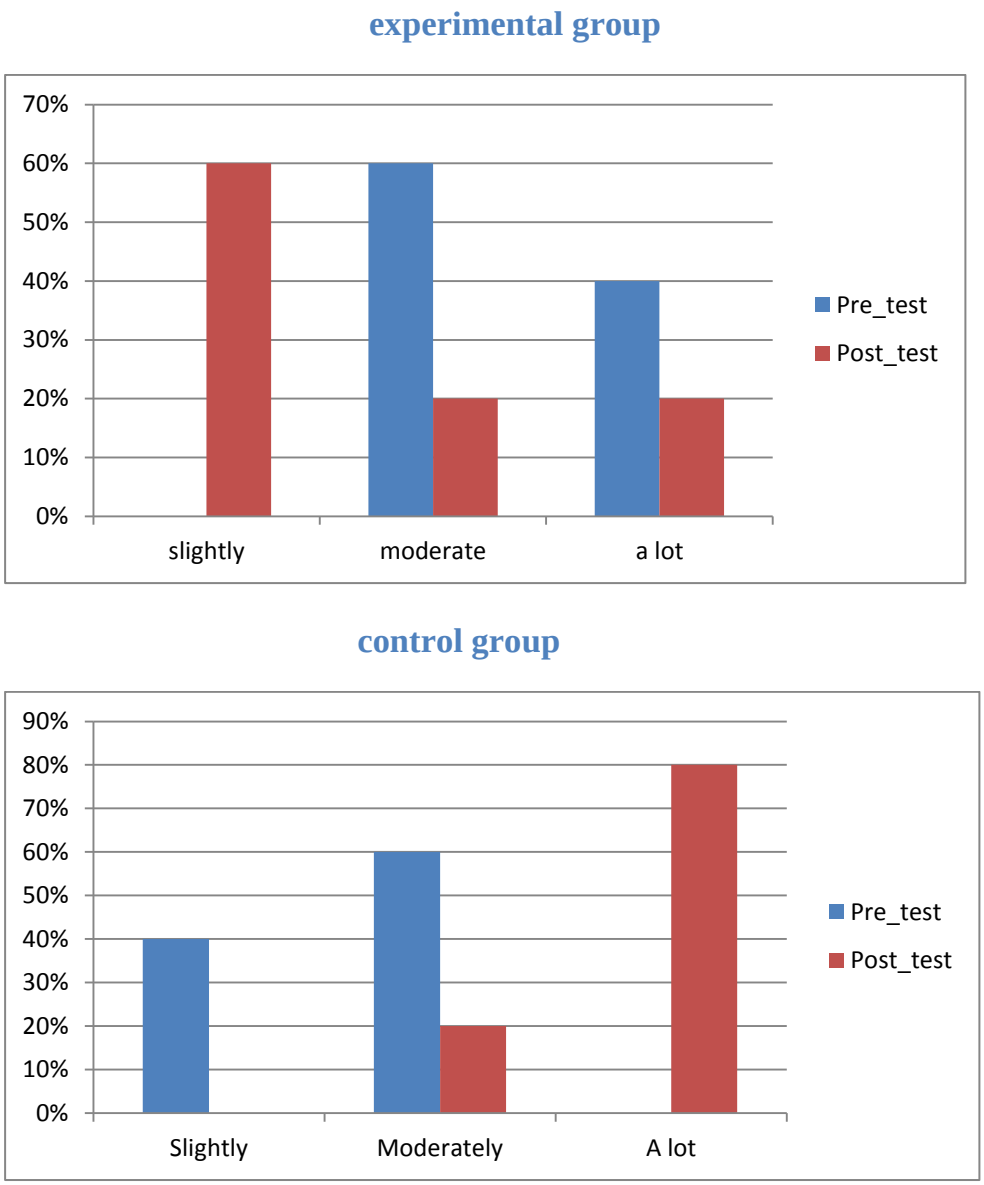


Figure 5 Percentage of role limitations in both experimental & control group (Pre & post test)

Physical limitations

Here (Figure 6) in experimental group 100% patient had slight physical limitation before treatment but after treatment 80% had a slight & 20% had moderate physical limitation. On the other hand in control group 60% said slight & 40% said moderate limitation in pre-test whether 40% said A little and 60 % said about a lot of physical limitation in post-test.

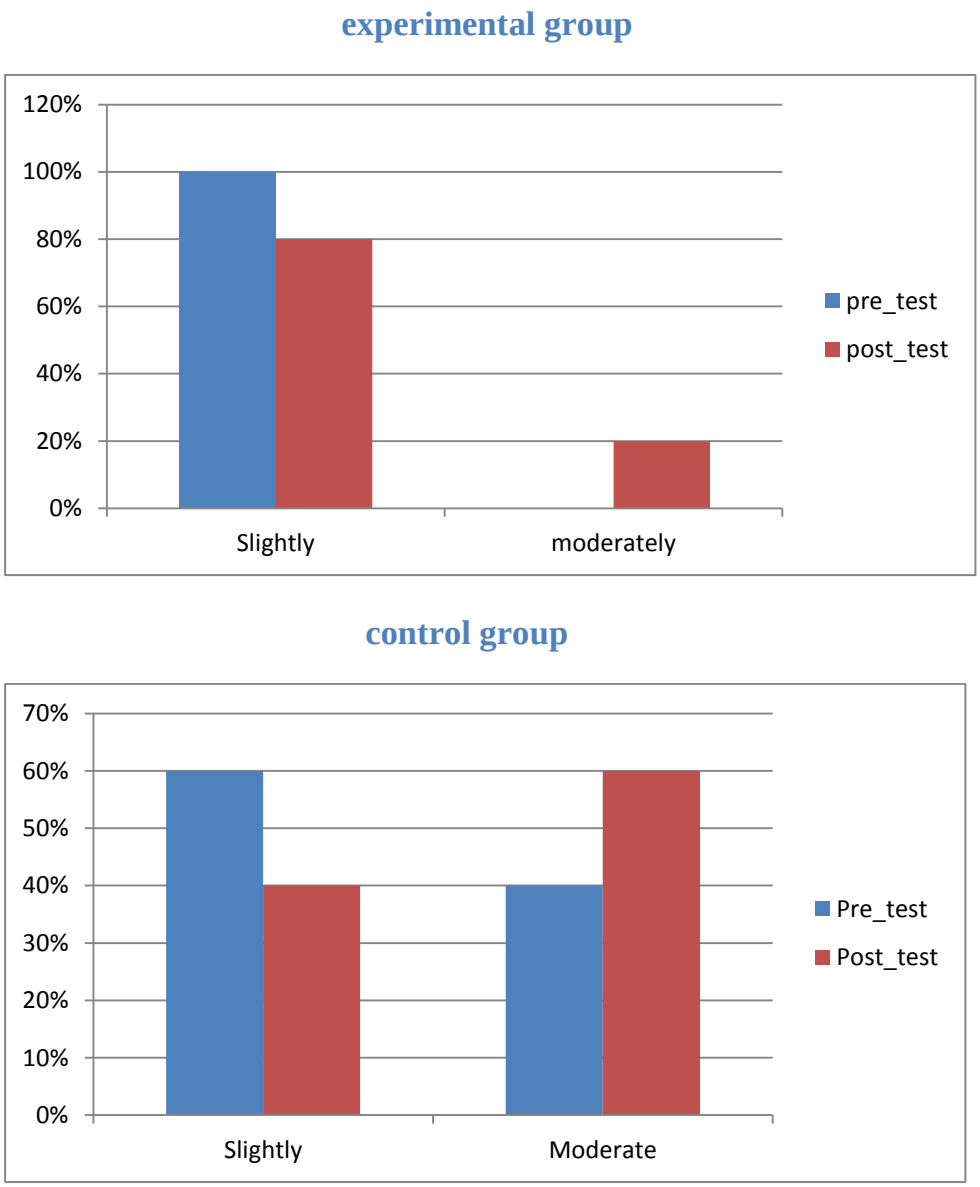


Figure 6 Percentage of physical limitations in both experimental & control group (Pre & Post test)

Social limitations

Here (Figure 7) in experimental group 80% patient had slight & 20% had a lot of social limitation before treatment whether after treatment 60% had a slight, 20% had moderate & 20% had a lot of social limitation. On the other hand in control group 20% had no limitation, 60% said slight & 20% said moderate limitation in pre-test where 20% moderate and 80% patient said about a lot of social limitation in post-test.

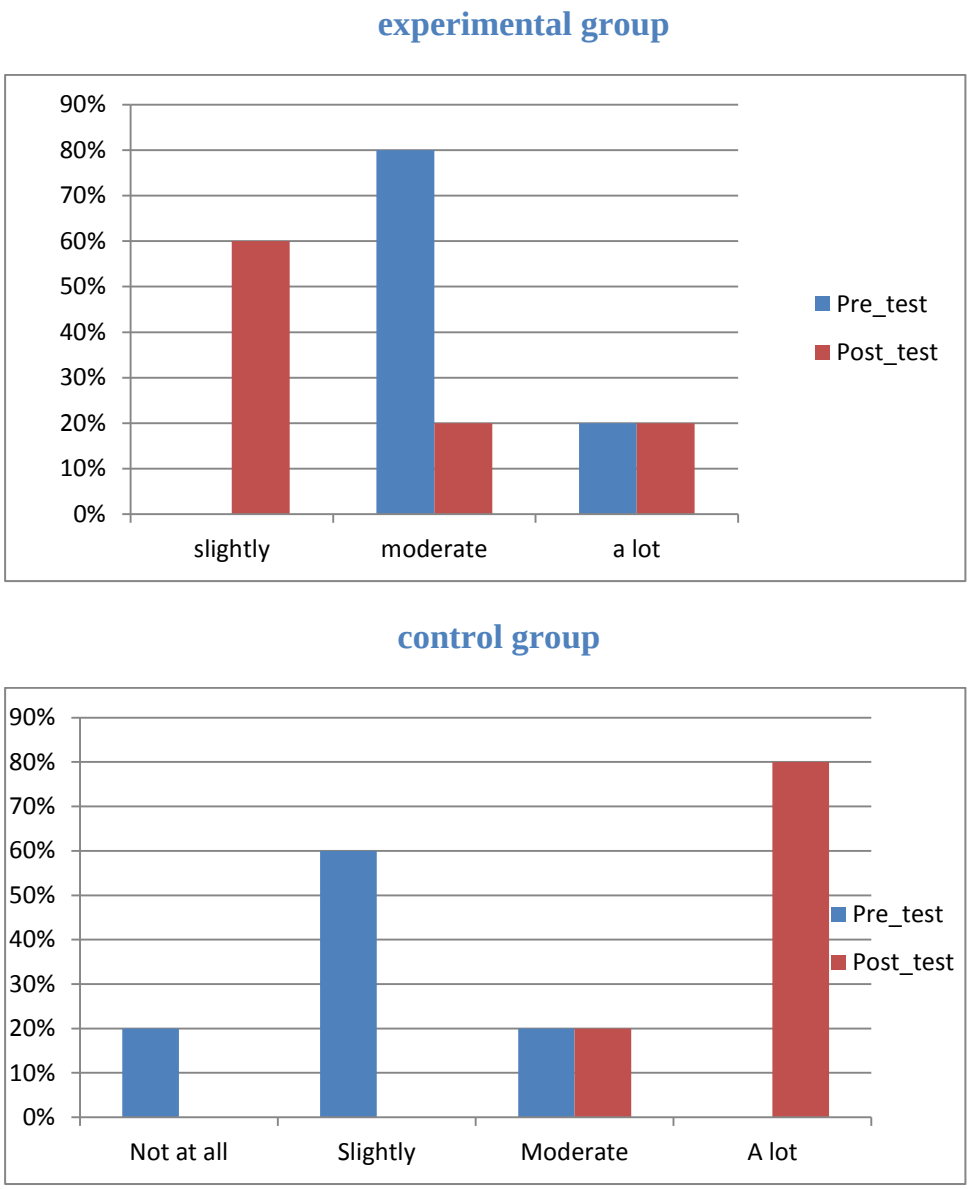


Figure 7 Percentage of social limitations in both experimental & control group (Pre & post test)

Personal relationship with husband

Here (Figure 8) in experimental group 20% patient had no problem, 60% had slight & 20% had moderate problem in personal relationship with husband before treatment where after treatment 80% had no problem & 20% had a slight problem. On the other hand in control group 40% had no problem; 60% said slight problem in pre-test where 40% had no problem 20% slight and 40% patient had moderate problem in post-test.

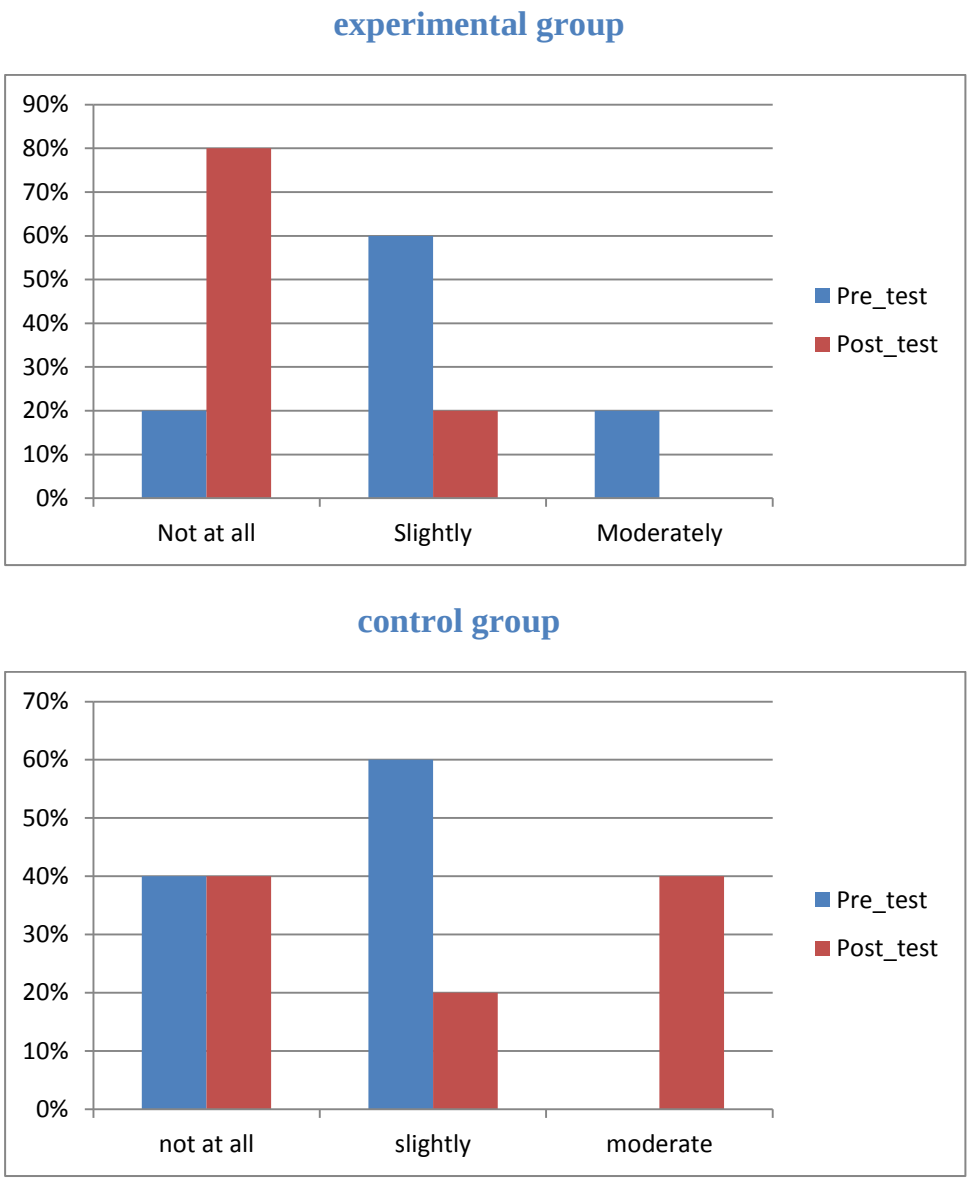


Figure 8 Percentage of personal relationship (Does patient's bladder problem affect her relationship with her husband?) in both experimental & control group (Pre & post test)

Emotional status

Here (Figure 9) in experimental group 20% patient had moderate depression, 80% had very much depression before treatment where after treatment 80% had slight depression & 20% had moderate depression. On the other hand in control group 80% slight depression & 20% said moderate deepression in pre-test where 20% had no depression 60% slight and 20% patient had moderate depression in post-test.

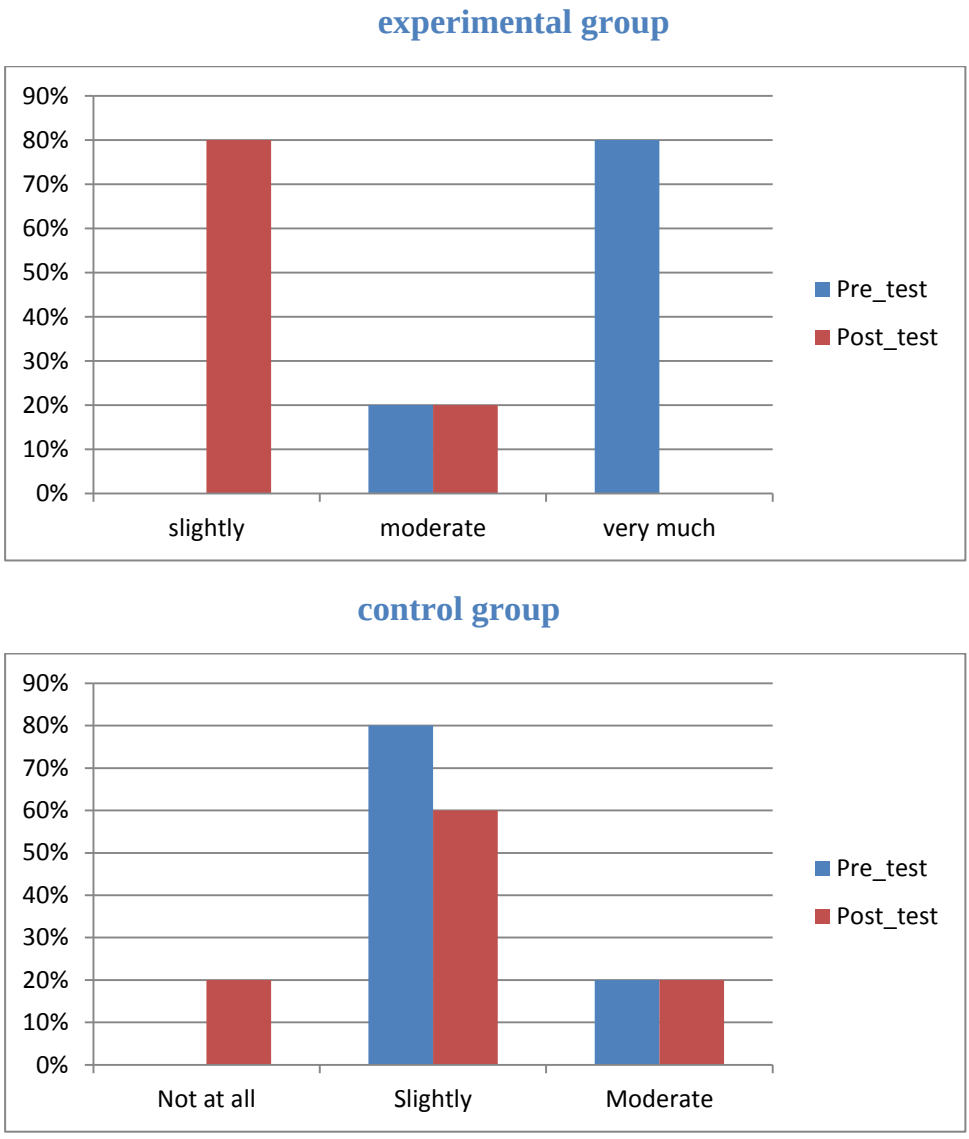


Figure 9 Percentage of emotional status (Does patient's bladder problem make her feel depressed?) in both experimental & control group (Pre & post test)

Sleep/Energy

Here (Figure 10) in experimental group 80% patient had often and 20% had sleep/ energy problem all the time before treatment where after treatment 40% had never, 40% had sometimes and 20% had often sleep problems. On the other hand in control group 60% sometimes sleep/energy problem & 40% had sleep/energy problems often in pre-test where 40% had sometimes and 60% slight patient had sleep/energy problems often in post-test.

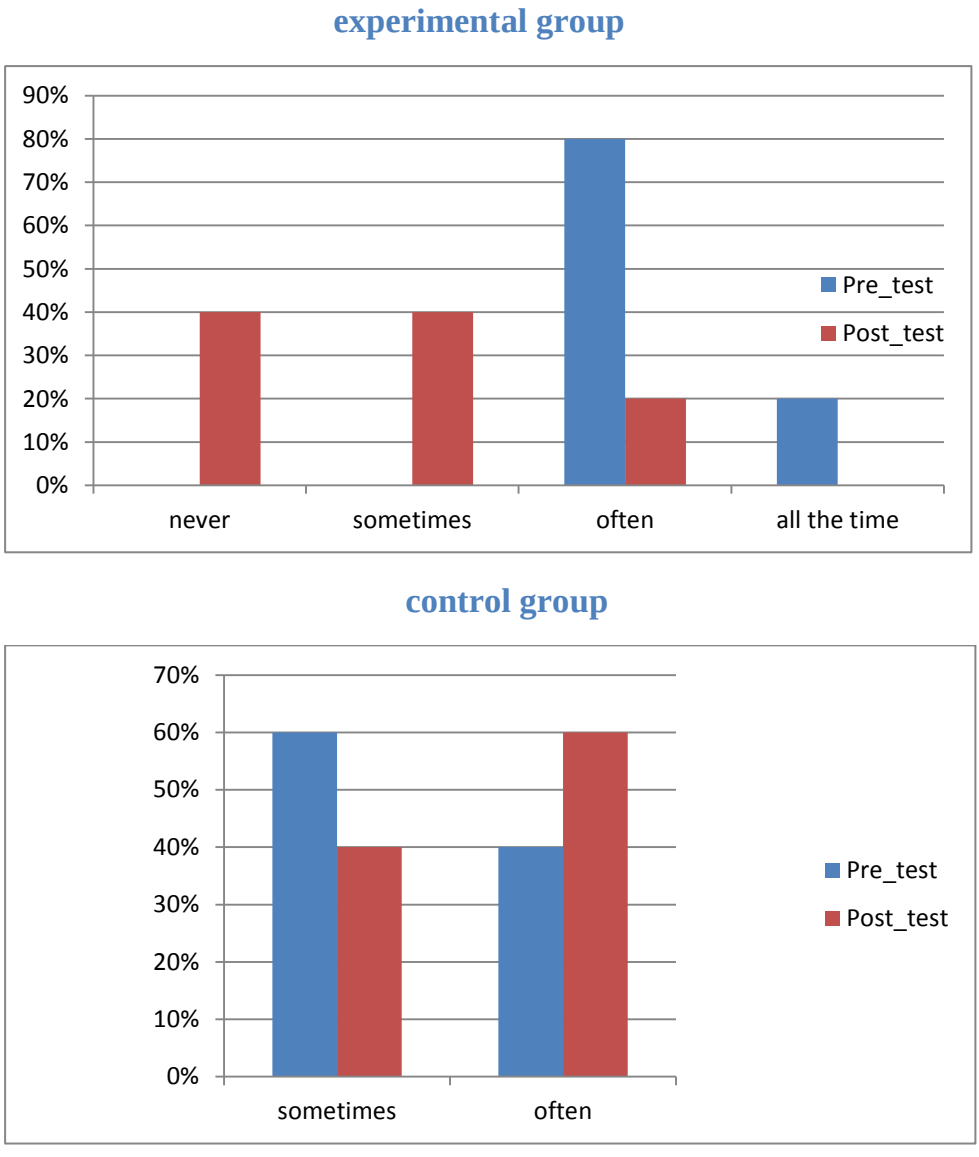


Figure 10 Percentage of sleep/energy problem in both experimental & control group (Pre & post test)

Severity measure

Here (Figure 11) in experimental group 20% patients were sometimes, 20% often and 60% patient were more concern about drinking water/wearing incontinence product before treatment where after treatment 40% were never, 40% were sometimes and 20% were often concern. On the other hand in control group 60% were sometimes & 40% were often concern in both pre-test and post-test.

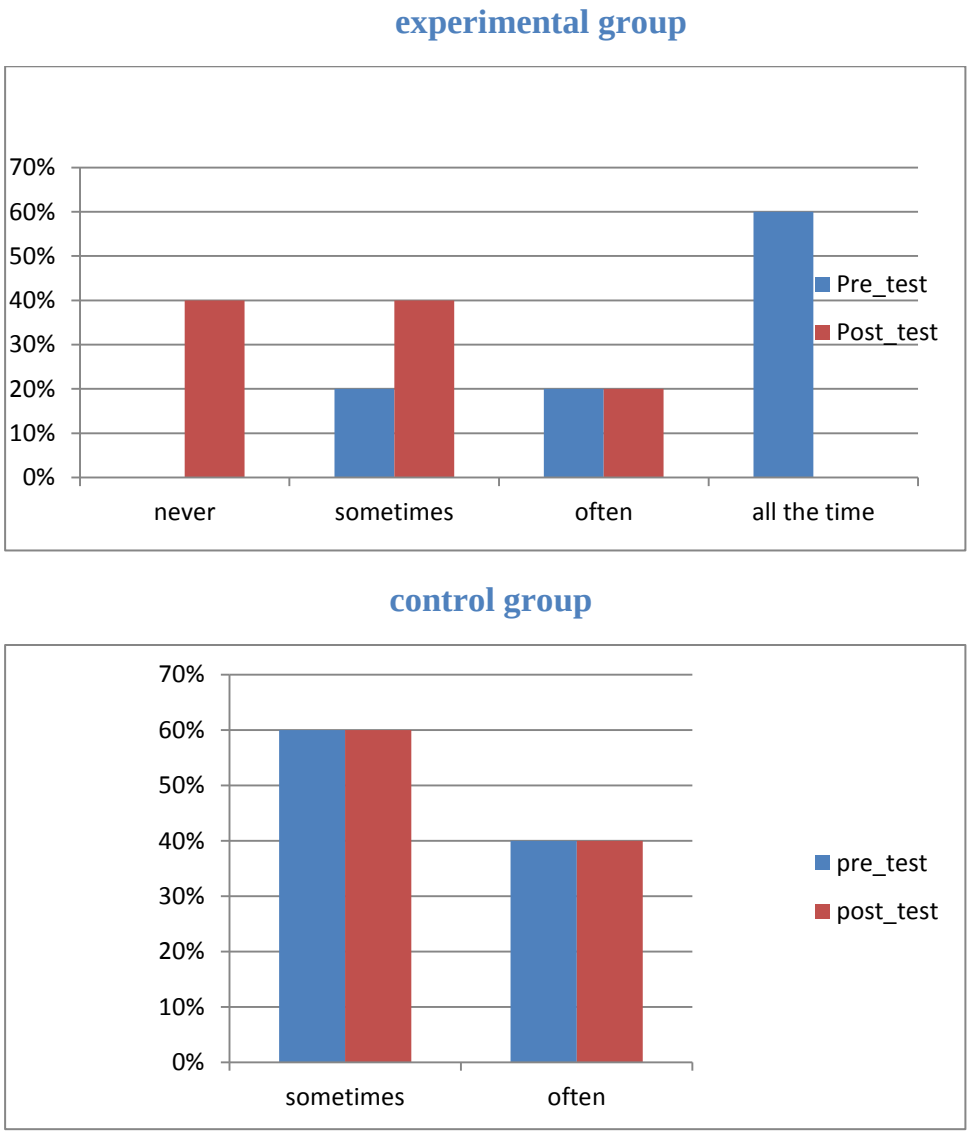


Figure 11 Percentage of severity measure (How many times patient use incontinence product/ become aware of drinking water?) in both experimental & control group (Pre & post test)

Numerical Rating scale score

Here (Figure 12) in experimental group 40% scored 6 & 60% scored 8 in pre-test where 40% scored 3, 20% scored 4 and 40% scored 6 after treatment in Numerical Rating scale. On the other hand in control group 40% patient scored 6, 40% scored 7 and 20% scored 8 in pre-test but 20% scored 6 and 80% scored 7 in Numerical Rating scale in post-test stage.

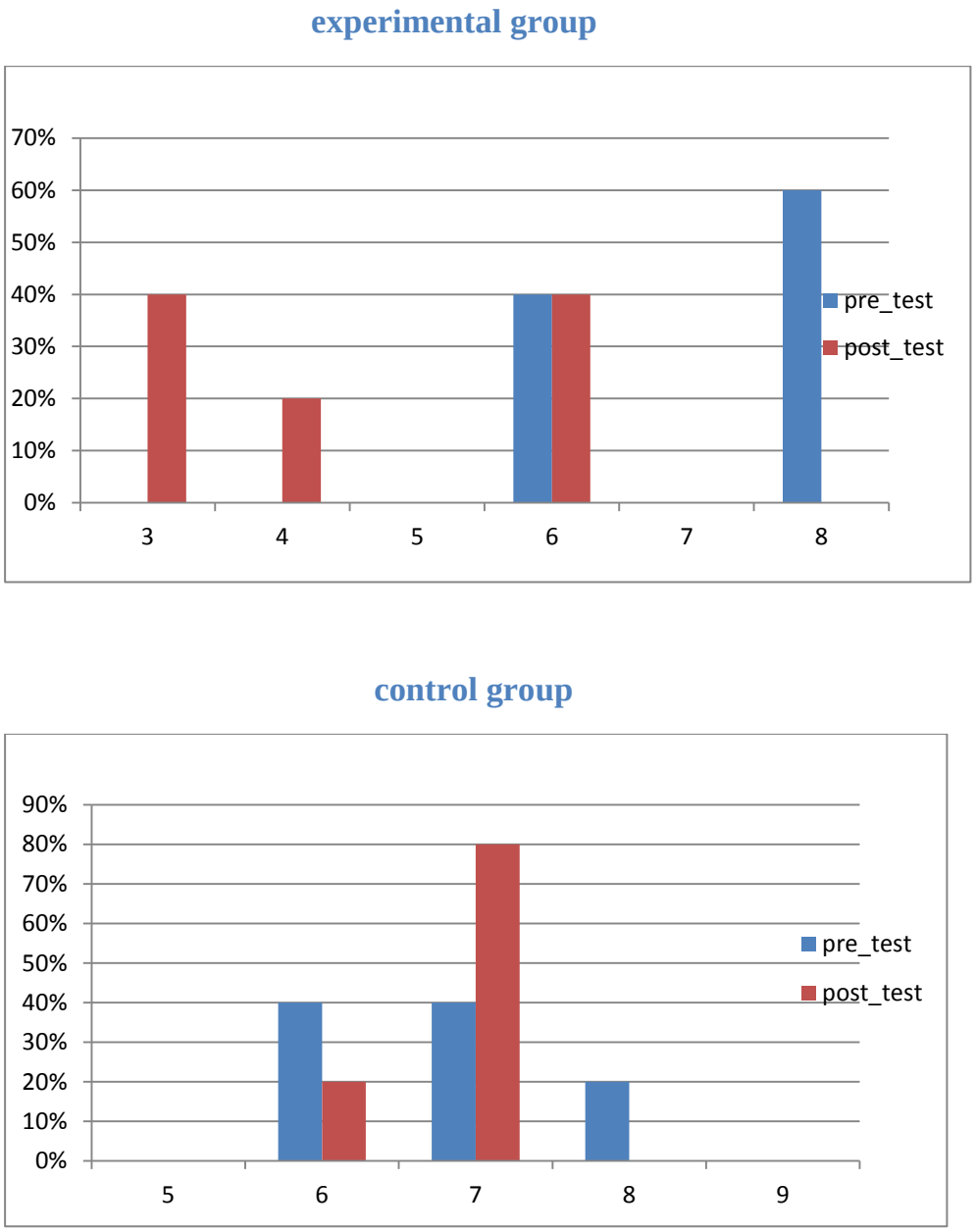


Figure 12 Percentage of Numerical Rating scale score to describe severity of incontinence in both experimental & control group (Pre & post test)

Response rate of voiding diary

Here (Figure 13) among 10 patients 8 patients respond in maintaining voiding diary and 2 patients did not response . So the percentage will be 80% positive response who fill up the chart and 20% under negative response who did not fill the chart. The percentage is showed below in a form of pie chart.

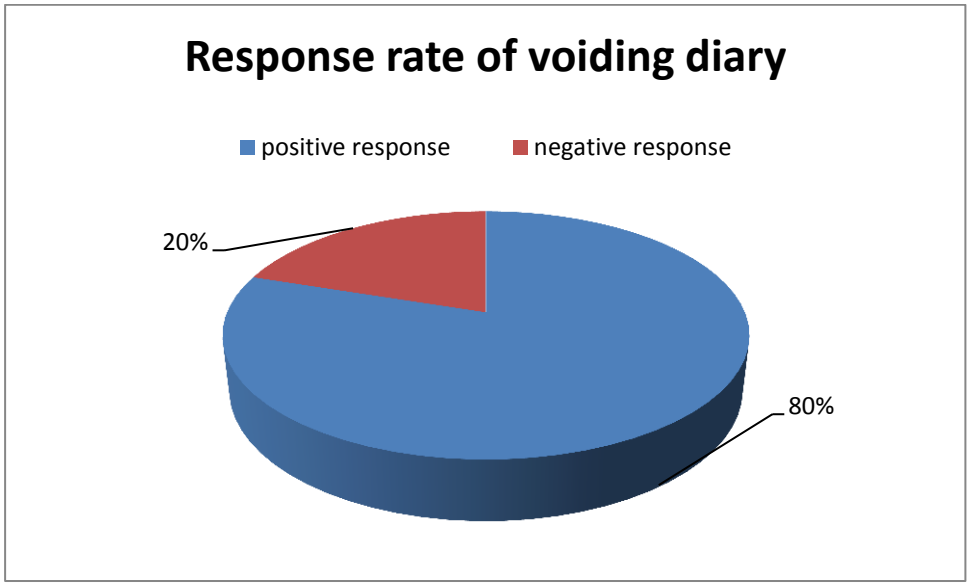


Figure 13 Percentage of response rate of voiding diary

Domains or variables in the study statistically significant or not significant according to observed 'U' value are showed in the table

No	Domains	Observed 'U' value	Observed 'p' value	Significance (Value)
1	General Health Perception	3.5	p<0.05	Significant
2	Incontinence Impact	1	p<0.05	Significant
3	Role Limitation	3.5	p<0.05	Significant
4	Physical Limitation	7.5	p>0.05	Not Significant
5	Social Limitation	3.5	p<0.05	Significant
6	Personal Relationship	2.5	p<0.05	Significant
7	Emotion	13	p>0.05	Not Significant
8	Sleep	5.5	p>0.05	Not Significant
9	Severity measure	7	p>0.05	Not Significant
10	Severity measure by Numerical Rating Scale	1	p<0.05	Significant

Table no. 1 *U*-value at various level of probability**.**

CHAPTER V DISCUSSION

After 7 weeks of treatment program the result of this study reported that Kegel exercise is effective for urge urinary incontinent patients after child birth.

The analysis of significance was carried out by using non-parametric Mann-Whitney U-test to measure the effectiveness of Kegel exercise than no treatment on QOL of the patients with urge urinary incontinence after child birth.

By using a non-parametric Mann-Whitney U test on the data, the results were found to be significant ($p<0.05$ for a one-tailed hypothesis) and significance value ≤ 4. The null hypothesis can therefore be rejected. This means that Kegel exercise is effective for urge urinary incontinence after child birth.

The study assessed patient's quality of life in nine domains of QOL and also the severity of incontinence by NRS scale. Among them including NRS Score, Six domains showed significant result in experiment group in compared to control group. Significant improvement were found in General Health Perception, Incontinence Impact, Role limitation, Social limitation, Personal relationship and Numerical Rating Scale. Physical limitation, Emotion, Sleep and Severity measure did not show significant result. On the other hand, Fitz et al., (2011) did a research to evaluate the impact of pelvic floor muscle training (PFMT) on the quality of life (QOL) in women with stress urinary incontinence (SUI) where he used Kings Health Questionnaire (KHQ) and a voiding diary to evaluate the impact of PFMT on QOL among patients with urinary incontinence. Results showed significant in six domains- Incontinence impact, Role limitations, Physical limitations, Social limitations, Emotions and Severity measures. General health perception, Personal relationships, Sleep- these 3 domains did not show significant results. But as the majority shows significant result so it was proved that Pelvic floor muscle training is effective for stress urinary incontinence. Like that way; in this research the majority of QOL domain shows significant result so we can say that Kegel exercise is effective for urge urinary incontinence after child birth.

Ahlund et al, (2013) conducted another research in which the design was RCT and the study was done among one hundred women with UI who had undergone normal term singleton vaginal delivery. Maximum voluntary contraction (MVC) and

endurance were measured with a pereonometer. Statistical Test the Mann Whitney *U*-test was performed to find out the effectiveness of the treatment where there was a significant ($p<0.05$ for one tail hypothesis) result. Here we could not use pereonometer to measure the maximum voluntary contraction and endurance as pereonometer is still not available in Bangladesh but Mann Whitney *U*-test was used to find out the significance of the result.

Another RCT was found by Dumolin et al., (2014) in which they used Visual Analogue Scale to describe the perceived burden of incontinence. They also used a modified 20-minute pad test for primary outcome measurement of SUI before and after treatment. Result showed significant 'p' value ($p<0.002$) for VAS score and also for Pad Test. Here Pad Test was not done but VAS score was used to measure the severity of urge urinary incontinence before and after treatment in which the result was significant and the score indicates that after treatment the severity of incontinence is reduced. Thus we can ensure that Kegel exercise is effective for urge urinary incontinence after child birth.

A recent experimental study by Cavkaytar et al., (2014) on "Effect of home-based kegel exercises on quality of life in women with Stress urinary incontinence and mixed urinary incontinence" in which 72 women were divided into two groups according to SUI & MUI. The women were told to continue kegel exercises for at least 8 weeks. After that the home-basd Kegel exercises have been found effective in women with SUI and MUI. Here in this research the patients continued Kegel exercise for 7 weeks due to time limitation. The results were significant as the severity of incontinence reduces after practicing Kegel exercise but it will be more significant if it is practiced for more than 8 weeks.

The study had some limitations while conducted the research project. Those limitations were as follows:

This study was done with 10 patients with urge urinary incontinence after child birth to evaluate the effectiveness of kegel exercise. 5 patients were assigned for 'Control group' & 5 patients were assign for 'Treatment group'. But this was very small number of sample size in both groups; as it was not possible to generalize the result for a wider population due to lack of incontinence patients at the study site.

On the other hand; there was no available research has done on this area in Bangladesh. As a result relevant information on kegel exercise for urge urinary incontinence after child birth even on urinary incontinence information were limited related to this study.

All the patients did not maintain the voiding diary so the researcher could not find the condition before and after treatment according to voiding diary for all the participants. It was also a limitation of this study.

As there should have adequate assessment relevant to urinary incontinence which would have helped the researcher to get more accurate information about patient; but there was no assessment available on urinary incontinence thus the researcher confirm those patients as being urinary incontinent only by asking some urinary incontinence related questions to the patients.

CHAPTER VI CONCLUSION & RECOMMENDATION

6.1 Conclusion

A more aggressive attitude in urinary incontinence management is necessary in order to improve the rehabilitation & QOL for urge urinary incontinent women after child birth. The objectives were to identify the impact of urinary incontinence on quality of life among woman with urge urinary incontinence after childbirth and thus to measure the effectiveness of Kegel exercise as well as to identify the improvement of pelvic floor muscle strength & bladder control and finally to increase awareness among woman with urinary incontinence about the effectiveness of kegel exercise. In this study 9 Quality of life domain and one Visual Analogue scale were used to evaluate the effectiveness of Kegel Exercise for urge urinary incontinence after child birth. Six values (General Health Perception; Incontinence Impact; Role limitation; Social limitation; Personal relationship with husband; severity measure by numerical rating scale) had showed significant result & four (Physical limitation; Emotion; Sleep/Energy) of these did not show. As the majority of these domains had showed significant level, so the hypothesis of this study is 'Accepted' and the null hypothesis is 'Rejected'. So, the researcher can conclude the study with the result that kegel exercise may be effective for urge urinary incontinence after child birth. On the other hand; this study seemed to be the first study about effectiveness of Kegel exercise for urge urinary incontinence after child birth in Bangladesh which will be helpful for further studies about this.

6.2 Recommendation

In this study, the researcher measured the reduction of urge urinary incontinence through improvement in quality of life which included nine domains of quality of life & one visual analogue scale. But there are other measurement tools present which can be used to measure the reduction of urinary incontinence & improvement of pelvic floor muscle power and give more accurate indication of incontinence such as using pad test, oxford muscle grade scale by vaginal palpation , pereonometer etc. So the further study in this area is recommended to use these tools as outcome measurement. Kegel exercise has been showed to increase the muscle strength and decrease the symptoms of urinary incontinence.

There are also another two types of urinary incontinence they are mixed urinary incontinence and stress urinary incontinence. It is also recommended to study among these two types of incontinent patients also whether Kegel exercise is effective for these types of urinary incontinence or not.

Finally for the same research a further study is recommended to investigate the long lasting effects of kegel exercise of incontinence management with large sample size to get more valid result.

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Appendix A: Consent Form

Treatment place: Centre for the Rehabilitation of the Paralysed, Mirpur, Dhaka.

Title: Effectiveness of kegel exercise for urge urinary incontinence after child birth.

Researcher: Tasnuva Shamarukh Proma; 4th year, B.Sc. in Physiotherapy

This is the part of the researcher's academic education. The women who have Urinary incontinence after child birth can participate in this study after reading the information below:

The aim of the study is to identify the effectiveness of Kegel exercise for Urinary incontinence after child birth. The researcher's outcome of the result can help to develop physiotherapy treatment procedure and the physiotherapist use this treatment for patient's better improvement. Women who have urinary incontinence after child birth can get better physiotherapy treatment.

10 patients will be required for this study. Participants having urinary incontinence will participate in a questionnaire session at the beginning and at the end of session. The participants are required to attend 1 session of instruction for intervention & maintain regular home exercise protocols for 15 days. The study will follow experimental procedure with application of treatment and recording the outcome. All participants should be in contact up to the end of the data collection period after being discharge from the centre.

Though the patient will get the proved and safe treatment they have no chance to fall any dangerous situation. The researcher will try for best of them. If any patient falls any unpleasant situation the patient can stay out from the study by discussing with other medical professionals & researcher. During the time of study the participants will not get any financial facilities.

It's hopeful that the outcome of the study will be great helpful for the women with urinary incontinence and it will play a vital role in physiotherapy treatment procedure. Outcome of participants' research information must be kept confidential and personal identification of the patients will also be kept confidential and personal identification of the patients will also kept confidential.

I…….agree to participate in this study after approving all the terms and conations above.

Participant's name:…….

Researcher's name:……..

Witness signature:…….

সম্মতি পত্র

চিকিৎসা কেন্দ্র: সি.আর.পি.মিরপুর, ঢাকা।

গবেষনার বিষয়:

“সন্তান জন্মের পরে নিয়ন্ত্রণহীন মূত্রসমস্যার চিকিৎসার ক্ষেত্রে কেজেল থেরাপির প্রভাব।”

গবেষক: তাসনুভা শামারুখ প্রমা

৪র্থ বর্ষ বি.এস.সি. ইন ফিজিওথেরাপি

বি এইচ পি আই, সাভার, ঢাকা।

এই গবেষনা তার অধ্যয়নের অংশ।

এই অধ্যয়নের লক্ষ্য হল সন্তান জন্মের পরে নিয়ন্ত্রনহীন মূত্রসমস্যার চিকিৎসার ক্ষেত্রে কেজেলথেরাপি অনুশিলনের মাধ্যমে এর একটি উন্নতমানের চিকিৎসা উদ্ভাবন করা। এই গবেষনা বাংলাদেশের ফিজিওথেরাপী চিকিৎসা ব্যবস্থাকে আরও উন্নত করতে সাহায্য করবে এবং বাংলাদেশে ফিজিওথেরাপী চিকিৎসা সেবা প্রধানরত ফিজিওথেরাপিস্টরা এই গবেশষনার ফলাফল কে ব্যবহার করে সন্তান জন্মের পরের নিয়ন্ত্রনহীন মূত্র সমস্যায় আক্রান্তকারীদেরকে আরও উন্নত চিকিৎসা প্রদান করতে পারবেন। এই গবেষনায় অংশগ্রহনকারীগণ অর্থাৎ সম্প্রতি সন্তান জন্ম দিয়েছেন এমন মায়েরা তাদের নিয়মিত অন্যান্য চিকিৎসাযথা নিয়মে গ্রহন করবেন এবং পাশাপাশি গবেষনা প্রকল্পের জন্য তথ্য সংগ্রহের এক মাসের শুরুতে একবার একটি অনুশীলন নির্দেশণা ‘কেজেল থেরাপির নিয়মসমুহ’ পাঠ এবং একটি সাক্ষাৎকার এক মাসের শেষে আরেকটি সাক্ষাৎকারে অংশগ্রহন করবেন। মাসের মাঝামাঝি সময়টুকুতে গবেষক অংশগ্রহণকারীদের অনুশীলনের নিয়মানুবর্তীতার ব্যাপারে খোঁজ় নিবেন। এই গবেষণা পরিক্ষামূলক পদ্ধতিসহ চিকিৎসাপ্রণালী এবং তার ফলাফল অনুসরণ করবে।

যেহেতু প্রমানিত এবং নিরাপদ চিকিৎসা পদ্ধতি প্রয়োগ করা হবে এবং নতুন কোন চিকিৎসা পদ্ধতি প্রয়োগ করা হবেনা সেহেতু এই অধ্যয়নের অংশগ্রহণকারীদের কোন ঝুঁকি নেই। তারপরও গবেষক এই গবেষনায় যে কোন ধরনের ঝুঁকি এড়ানোর জন্য সর্বাত্মক চেষ্টা করবে। এরপরও কোন অনাকাংখিত ঘটনার উদ্ভব হলে অংশগ্রহণকারী গবেশনার তত্ত্বাবধানকারী ফিজিওথেরাপিস্টের সাথে আলোচনা সাপেক্ষে নিজেকে এই গবেষনা থেকে প্রত্যাহার করতে পারবেন। এছাড়াও অংশগ্রহণকারী অধ্যয়নের যেকোন সময় তার সম্মতি প্রত্যাহার ও গবেষনায় অংশগ্রহনের পূর্ণ অধিকার সংরক্ষন করেন। এই গবেশনায় অংশগ্রহণকারীদের কোন আর্থিক সহায়তা কিংবা কোন ভাতা প্রদান করা হবেনা।

আশা করা হচ্ছে এই অধ্যয়নের ফলাফল সন্তান জন্মের পরে মূত্র সমস্যায় আক্রান্ত রোগীদের চিকিৎসা নির্ণয়ের ক্ষেত্রে উল্লেখযোগ্য ভুমিকা রাখবে এবং একইসাথে প্রসব পরবর্তি নিয়ন্ত্রনহীন মূত্র সমস্যায় আক্রান্ত রোগী এবং ফিজিওথেরাপি চিকিৎসা প্রনালির উপকারিতায় বিশেষ ভুমিকা পালন করবে। এই গবেষনায় প্রাপ্ত তথ্যাবলীর গোপনীয়তা রক্ষা করা হবে এবং গবেষনার ফল প্রকাশের সময় অংশগ্রহণকারীদের ব্যক্তিগত পরিচয় প্রকাশ করা হবেনা।

আমি..... ঘোষনা করছি যে; উপরোক্ত সব তথ্যাবলী বিসদভাবে জ্ঞাত হয়ে আমি এই অধ্যয়নে অংশগ্রহন করছি।

অংশগ্রহণকারীর স্বাক্ষর.....

গবেষকের স্বাক্ষর.....

স্বাক্ষীরস্বাক্ষর.....

Appendix B: Questionnaire

Kings Health Questionnaire

Patients code no:

Date:

Types of delivery:

1. **How would you describe your health at the present?**

Please tick one answer

- Very good 1
- Good 2
- Fair 3
- Poor 4
- Very poor 5

2. **How much do you think your bladder problem affects your life?**

Please tick one answer

- Not at all 1
- A little 2
- Moderately 3
- A lot 4

Below are some daily activities that can be affected by bladder problems. How much does your bladder problem affect you?

We would like to answer every question. Simply tick the box that applies to you.

	1	2	3	4
3. Role Limitations	**Not at all**	**Slightly**	**Moderate**	**A lot**
A. Does your bladder problem affect your household tasks? (cleaning, shopping etc.)	⬭	⬭	⬭	⬭
B. Does your bladder problem affect your job or your normal daily activities outside the home?	⬭	⬭	⬭	⬭

	1	2	3	4
4. Physical /Social limitation	**Not at all**	**Slightly**	**Moderately**	**A lot**
A. Does your bladder problem affect your physical activities (eg. going for a walk, running, sport, gym etc.)?	⬭	⬭	⬭	⬭
B. Does your bladder problem affect your ability to travel?	⬭	⬭	⬭	⬭
C. Does your bladder problem limit your social life?	⬭	⬭	⬭	⬭
D. Does your bladder problem limit your ability to see and visit friends?	⬭	⬭	⬭	⬭

	1	2	3	4	5
	Not Applicable	**Not at all**	**Slightly**	**Moderately**	**A lot**
5. Personal Relationships					
A. Does your bladder problem affect your relationship with your partner?	⬭	⬭	⬭	⬭	⬭
B. Does your bladder problem affect your sex life?	⬭	⬭	⬭	⬭	⬭
C. Does your bladder problem affect your family life?	⬭	⬭	⬭	⬭	⬭

	1	2	3	4
6. Emotions	**Not at all**	**Slighty**	**Moderately**	**Very much**
A. Does your bladder Problem make you feel depressed?	⬭	⬭	⬭	⬭
B. Does your bladder problem make you feel anxious/nervous?	⬭	⬭	⬭	⬭

C. Does your bladder problem make you feel bad about yourself? ⬭ ⬭ ⬭ ⬭

7. Sleep/ Energy

	1 Never	2 Sometimes	3 Often	4 All the time
A. Does your bladder problem affect your sleep?	⬭	⬭	⬭	⬭
B. Does your bladder problem make you feel worn out and tired?	⬭	⬭	⬭	⬭

8. Do you do any of the following? If so how much?

	1 Never	2 Sometimes	3 Often	4 All the time
A. Wear pads to keep dry?	⬭	⬭	⬭	⬭
B. Be careful how much Fluid you drink?	⬭	⬭	⬭	⬭
C. Change your underclothes because they get wet?	⬭	⬭	⬭	⬭
D. Worry in case you smell?	⬭	⬭	⬭	⬭

With thanks

Tasnuva Shamarukh Proma
4th year BSc. in Physiotherapy
BHPI, Savar, Dhaka- 1343.

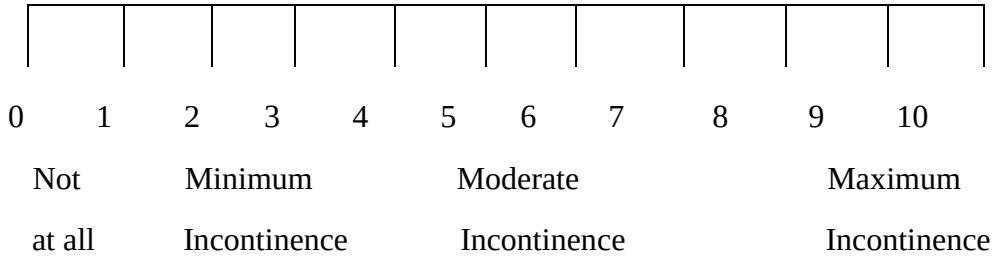
Numerical Rating Scale

Patients code no:

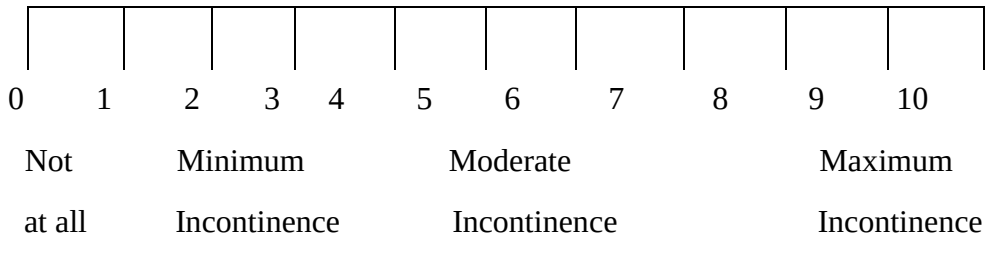
Date:

Here is a scale for measuring your severity of urinary incontinece. It is named as Numerical Rating Scale. In this scale there is a long line. The line represents your severity of incontinence. The left hand end represents no incontinence . As you move along the line the problem you feel due to incontinence is increasing. At the right hand end the problem due to incontinence is the worse.Please mark a (X) on the line where you feel it shows how severe your incontinence is.

Pre-Treatment:



Post-Treatment:



Urinary Incontinence Assessment in women after child birth

Voiding Diary/Record-Track a 24 Hour Time Period for Several Days

Time Interval	**Fluid Intake (ml)**	**Volume of urine (ml)**	**Aware Urge to Void?**	**Episodes of leaking Urine?** **S = Slightly Wet.** **M =Wets most of catheters/pad.** **L = Outside clothing wet.**	**Product Use**	**Incontinence Product Changed**
12-1AM			Yes No	S M L	Yes No	Yes No
1-2 AM			Yes No	S M L	Yes No	Yes No
2-3 AM			Yes No	S M L	Yes No	Yes No
3-4 AM			Yes No	S M L	Yes No	Yes No
4-5 AM			Yes No	S M L	Yes No	Yes No
5-6 AM			Yes No	S M L	Yes No	Yes No
6-7 AM			Yes No	S M L	Yes No	Yes No
7-8 AM			Yes No	S M L	Yes No	Yes No
8-9 AM			Yes No	S M L	Yes No	Yes No
9-10AM			Yes No	S M L	Yes No	Yes No
10-11AM			Yes No	S M L	Yes No	Yes No
11-12PM			Yes No	S M L	Yes No	Yes No
12-1 PM			Yes No	S M L	Yes No	Yes No
1-2 PM			Yes No	S M L	Yes No	Yes No
2-3 PM			Yes No	S M L	Yes No	Yes No
3-4 PM			Yes No	S M L	Yes No	Yes No
4-5 PM			Yes No	S M L	Yes No	Yes No
5-6 PM			Yes No	S M L	Yes No	Yes No
6-7 PM			Yes No	S M L	Yes No	Yes No
7-8 PM			Yes No	S M L	Yes No	Yes No
8-9 PM			Yes No	S M L	Yes No	Yes No
9-10 PM			Yes No	S M L	Yes No	Yes No
10-11 PM			Yes No	S M L	Yes No	Yes No
11-12AM			Yes No	S M L	Yes No	Yes No

"সন্তান জন্মের পরে নিয়ন্ত্রণহীন মূত্রসমস্যার ক্ষেত্রে কেজেল থেরাপির প্রভাব"

কিংস হেলথ প্রশ্নপত্র

সনাক্তকরণ নম্বরঃ

তারিখ: প্রসবের ধরনঃ

পর্ব ক

১. আপনি কিভাবে আপনার স্বাস্থ্যের বর্তমান অবস্থা বর্ণনা করবেন ?

একটি উত্তরে টিক চিহ্ন দিন

- খুব ভাল ১
- ভাল ২
- মোটামুটি ৩
- খারাপ ৪
- খুব খারাপ ৫

২. মূত্র সমস্যা আপনার জীবনকে কতটুকু প্রভাবিত করেছে বলে আপনি মনে করেন ?

একটি উত্তরে টিক চিহ্ন দিন

- মোটেও না ১
- সামান্য ২
- বেশি ৩
- খুব বেশি ৪

পর্ব খ

নিচের দৈনন্দিন কাজকর্মগুলো মূত্রসমস্যা দ্বারা প্রভাবিত হতে পারে।

মূত্রসমস্যা আপনাকে কতটা প্রভাবিত করে ?

আমরা প্রতিটি প্রশ্নের উত্তর চাই। শুধু আপনার জন্য প্রযোজ্য বক্সে টিক চিহ্ন দিন।

	১	২	৩	৪
	মোটেওনা	সামান্য	বেশি	খুববেশি
৩. সীমাবদ্ধতা				
ক) আপনার মূত্রসমস্যা কি গৃহস্থলি কর্মকান্ডকে প্রভাবিত করে ?	○	○	○	○
খ) আপনার মূত্রসমস্যা কি আপনার চাকরি অথবা বাড়ির বাইরে স্বাভাবিক কাজকর্মকে প্রভাবিত করে ?	○	○	○	○

	১	২	৩	৪
	মোটেও না	সামান্য	বেশি	খুববেশি
৪) দৈহিক/ সামাজিক সীমাবদ্ধতা				
ক)আপনার মূত্রসমস্যা কি আপনার শারীরিক কাজকর্মকে প্রভাবিত করে (হাঁটা, দৌড়ানো, খেলাধুলা ইত্যাদি)	○	○	○	○
খ) মূত্রসমস্যা কি আপনার ভ্রমনের ক্ষমতাকে প্রভাবিত করেছে ?	○	○	○	○
গ) মূত্রসমস্যা কি আপনার সামাজিক জীবনকে সীমাবদ্ধ করেছে ?	○	○	○	○
ঘ) মূত্রসমস্যা কি আপনার বন্ধু-বান্ধবীদের সাথে দেখা করাকে ব্যাহত করছে?	○	○	○	○

	১	২	৩	৪
	মোটেওনা	সামান্য	বেশি	খুববেশি

৫. ব্যক্তিগত সম্পর্ক

ক) মূত্রসমস্যা কি আপনার স্বামীর সাথে সম্পর্ককে প্রভাবিত করেছে ? ○ ○ ○ ○

খ) মূত্রসমস্যা কি আপনার যৌনজীবনকে প্রভাবিত করেছে ? ○ ○ ○ ○

গ) মূত্রসমস্যা কি আপনার পারিবারিক জীবনকে প্রভাবিত করেছে ? ○ ○ ○ ○

৬) অনুভূতি

ক) মূত্রসমস্যা কি আপনাকে বিষন্ন করেছে? ○ ○ ○ ○

খ) মূত্রসমস্যা কি আপনাকে উদ্বিগ্ন করে ? ○ ○ ○ ○

গ) মূত্র সমস্যার জন্য কি আপনার নিজের সম্পর্কে খারাপ বোধ করেন ? ○ ○ ○ ○

৭) ঘুম/ শক্তি

ক) মূত্র সমস্যা কি আপনার ঘুমকে প্রভাবিত করে ? ○ ○ ○ ○

খ) মূত্রসমস্যা কি আপনাকে জরাজীর্ণ এবং ক্লান্তবোধ করায় ? ○ ○ ○ ○

৮) আপনি নিম্নলিখিত যেকোনো একটিও করেছেন কি ? যদি করে থাকেন তাহলে কতটুকু ?

	১	২	৩	৪
	কখনওনা	মাঝেমাধ্যে	প্রায়ই	সবসময়
ক) শুষ্ক থাকার জন্য প্যাড পড়েন ?	⬭	⬭	⬭	⬭
খ) কতটুকু পানি পান তার জন্য কি সতর্ক থাকেন ?	⬭	⬭	⬭	⬭
গ) ভিজে যাওয়ার কারনে অন্তর্বাস পরিবর্তন করেন ?	⬭	⬭	⬭	⬭
ঘ) দুর্গন্ধ বের হয় কিনা সেজন্য চিন্তিত থাকেন ?	⬭	⬭	⬭	⬭

ধন্যবাদান্তে

তাসনুভা শামারুখ প্রমা

বি. এস. সি ইন ফিজিওথেরাপি

সি আর পি, সাভার, ঢাকা-১৩৪৩।

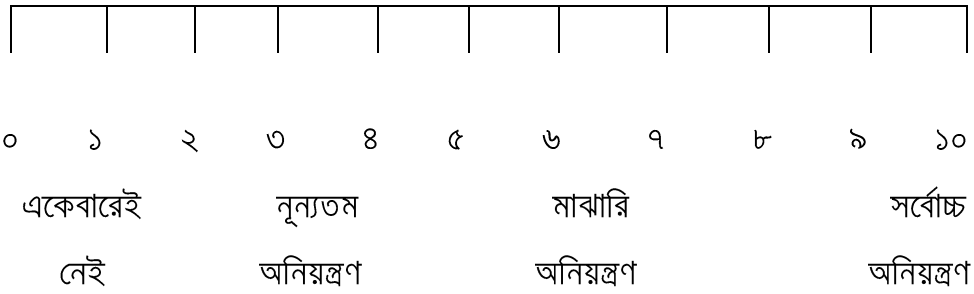
নিউমেরিকাল রেটিং স্কেল

রোগীর কোড নং :

তারিখঃ

এটি আপনার মূত্র অনিয়ন্ত্রণের তীব্রতা পরিমাপের একটি পরিমাপক। একে **‘নিউমেরিকাল রেটিং** স্কেল’ হিসাবে নামকরণ করা হয়েছে। এই স্কেলের মধ্যে একটি দীর্ঘলাইন আছে। লাইনটি আপনার মূত্র অনিয়ন্ত্রণের তীব্রতা প্রকাশ করে থাকে। বামপ্রান্ত বুঝায় কোন অনিয়ন্ত্রণ নেই। আপনি রেখা বরাবর সরে গেলে মনে করবেন আপনার অনিয়ন্ত্রণের সমস্যা বেড়ে যাচ্ছে। ডানপ্রান্তে অনিয়ন্ত্রণের তীব্রতা সবচেয়ে বেশী। আপনার অনিয়ন্ত্রণের তীব্রতা যতটুকু গুরুতর মনে হয় সেখানে (X) দিয়ে চিহ্নিত করুন।

প্রাক চিকিৎসাকালীনঃ



চিকিৎসা পরবর্তীঃ

“সন্তান জন্মের পরে মায়েদের নিয়ন্ত্রণহীন মূত্রসমস্যার পর্যবেক্ষন”

দৈনিক ২৪ ঘন্টার মূত্রথলির ক্রিয়া সম্পর্কিত তথ্যাবলি

সময়ের ব্যবধান	তরল খাবার গ্রহনের পরিমাণ (মি.লি.)	মূত্রের পরিমাণ (মি.লি.)	মূত্রের বেগের অনুভূতি	মূত্র নিয়ন্ত্রণকারী পদ্ধতি বা সামগ্রীর ব্যবহার	মূত্র নিয়ন্ত্রণকারী পদ্ধতি বা সামগ্রীর পরিবর্তন
রাত১২:০০-১:০০			হ্যাঁ না	হ্যাঁ না	হ্যাঁ না
রাত১:০০-২:০০			হ্যাঁ না	হ্যাঁ না	হ্যাঁ না
রাত২:০০-৩:০০			হ্যাঁ না	হ্যাঁ না	হ্যাঁ না
রাত৩:০০-৪:০০			হ্যাঁ না	হ্যাঁ না	হ্যাঁ না
রাত৪:০০-৫:০০			হ্যাঁ না	হ্যাঁ না	হ্যাঁ না
ভোর ৫:০০-৬:০০			হ্যাঁ না	হ্যাঁ না	হ্যাঁ না
ভোর ৬:০০-৭:০০			হ্যাঁ না	হ্যাঁ না	হ্যাঁ না
সকাল ৭:০০ -৮:০০			হ্যাঁ না	হ্যাঁ না	হ্যাঁ না
সকাল ৮:০০ -৯:০০			হ্যাঁ না	হ্যাঁ না	হ্যাঁ না
সকাল ৯:০০ -১০			হ্যাঁ না	হ্যাঁ না	হ্যাঁ না
সকাল ১০-১১			হ্যাঁ না	হ্যাঁ না	হ্যাঁ না
সকাল ১১-১২			হ্যাঁ না	হ্যাঁ না	হ্যাঁ না
দুপুর ১২:০০-১:০০			হ্যাঁ না	হ্যাঁ না	হ্যাঁ না
দুপুর ১:০০- ২:০০			হ্যাঁ না	হ্যাঁ না	হ্যাঁ না
দুপুর ২:০০- ৩:০০			হ্যাঁ না	হ্যাঁ না	হ্যাঁ না
দুপুর ৩:০০- ৪:০০			হ্যাঁ না	হ্যাঁ না	হ্যাঁ না
বিকাল ৪:০০-৫:০০			হ্যাঁ না	হ্যাঁ না	হ্যাঁ না
বিকাল ৫:০০-৬:০০			হ্যাঁ না	হ্যাঁ না	হ্যাঁ না
সন্ধ্যা ৬:০০-৭:০০			হ্যাঁ না	হ্যাঁ না	হ্যাঁ না
সন্ধ্যা ৭:০০-৮:০০			হ্যাঁ না	হ্যাঁ না	হ্যাঁ না
রাত ৮:০০-৯:০০			হ্যাঁ না	হ্যাঁ না	হ্যাঁ না
রাত ৯:০০-১০:০০			হ্যাঁ না	হ্যাঁ না	হ্যাঁ না
রাত১০:০০-১১:০০			হ্যাঁ না	হ্যাঁ না	হ্যাঁ না
রাত১১:০০-১২:০০			হ্যাঁ না	হ্যাঁ না	হ্যাঁ না

APPENDIX-3: Calculating of *U* test

General Health Perception

Experimental group			Control group		
Subjects	**QOL Score**	**Rank**	**Subjects**	**QOL Score**	**Rank**
E1	2	2	C1	4	8
E2	2	2	C2	4	8
E3	2	2	C3	4	8
E4	3	4.5	C4	3	4.5
E5	4	8	C5	4	8
Total Score	**13**	**18.5**	**Total Score**	**19**	**36.5**

Table 2 QOL Score in General Health Perception

Where,

n_1 =5, the number of the trail group. n_2=5, the number of the control group.

n_x=5, the number of the group with larger rank total.T_x=36.5, the larger rank total.

Now *'U'* formula

$$U = n_1 n_{2+} \frac{n_x(n_x + 1)}{2} - T_x$$

$$= 5\times 5 + \frac{5(5+1)}{2} - 36.5$$

$$= 25+15-36.5$$

$$= 3.5$$

Incontinence Impact

Experimental group			Control group		
Subjects	**QOL Score**	**Rank**	**Subjects**	**QOL Score**	**Rank**
E1	2	2	C1	4	8.5
E2	2	2	C2	4	8.5
E3	2	2	C3	4	8.5
E4	3	5	C4	3	5
E5	3	5	C5	4	8.5
Total Score	**12**	**16**	**Total Score**	**19**	**39**

Table 3 QOL Score in Incontinence Impact

Where,

n_1 =5, the number of the trail group. n_2=5, the number of the control group.

n_x=5, the number of the group with larger rank total.T_x=30, the larger rank total.

Now *'U'* formula

$$U = n_1 n_{2+} \frac{n_x(n_x + 1)}{2} - T_x$$

$$= 5\times 5 + \frac{5(5+1)}{2} - 39$$

$$= 25+15-39$$

$$= 1$$

Role Limitation

Experimental group			Control group		
Subjects	**QOL Score**	**Rank**	**Subjects**	**QOL Score**	**Rank**
E1	2	2	C1	4	8
E2	2	2	C2	4	8
E3	2	2	C3	4	8
E4	3	4.5	C4	3	4.5
E5	4	8	C5	4	8
Total Score	**13**	**18.5**	**Total Score**	**19**	**36.5**

Table 4 QOL Score in Role limitation

Where,

n_1 =5, the number of the trail group. n_2=5, the number of the control group.

n_x=5, the number of the group with larger rank total.T_x=36.5, the larger rank total.

Now *'U'* formula

$$U = n_1 n_{2+} \frac{n_x(n_x + 1)}{2} - T_x$$

$$= 5\times 5 + \frac{5(5+1)}{2} - 36.5$$

$$= 25+15-36.5$$

$$= 3.5$$

Physical Limitation

Experimental group			Control group		
Subjects	**QOL Score**	**Rank**	**Subjects**	**QOL Score**	**Rank**
E1	2	3.5	C1	3	8.5
E2	2	3.5	C2	3	8.5
E3	2	3.5	C3	2	3.5
E4	2	3.5	C4	3	8.5
E5	3	8.5	C5	2	3.5
Total Score	**11**	**22.5**	**Total Score**	**13**	**32.5**

Table 5 QOL Score in Physical Limitation

Where,

n_1 =5, the number of the trail group. n_2=5, the number of the control group.

n_x=5, the number of the group with larger rank total.T_x=32.5, the larger rank total.

Now *'U'* formula

$$U = n_1 n_{2+} \frac{n_x(n_x + 1)}{2} - T_x$$

$$= 5\times 5 + \frac{5(5+1)}{2} - 32.5$$

$$= 25+15-32.5$$

$$= 7.5$$

Social Limitation

Experimental group			Control group		
Subjects	**QOL Score**	**Rank**	**Subjects**	**QOL Score**	**Rank**
E1	2	2	C1	4	8
E2	2	2	C2	4	8
E3	2	2	C3	4	8
E4	3	4.5	C4	3	4.5
E5	4	8	C5	4	8
Total Score	**13**	**18.5**	**Total Score**	**19**	**36.5**

Table 6 QOL Score in Social Limitation

Where,

n_1 =5, the number of the trail group. n_2=5, the number of the control group.

n_x=5, the number of the group with larger rank total.T_x=36.5, the larger rank total.

Now *'U'* formula

$$U = n_1 n_{2+} \frac{n_x(n_x + 1)}{2} - T_x$$

$$= 5\times 5 + \frac{5(5+1)}{2} - 36.5$$

$$= 25+15-36.5$$

$$= 3.5$$

Personal Relationship

Experimental group			Control group		
Subjects	**QOL Score**	**Rank**	**Subjects**	**QOL Score**	**Rank**
E1	2	5.5	C1	4	5.5
E2	2	5.5	C2	4	5.5
E3	2	5.5	C3	2	1.5
E4	2	5.5	C4	3	9.5
E5	3	9.5	C5	2	1.5
Total Score	**11**	**31.5**	**Total Score**	**15**	**37.5**

Table 7 QOL Score in Personal Relationship

Where,

n_1 =5, the number of the trail group. n_2=5, the number of the control group.

n_x=5, the number of the group with larger rank total.T_x=37.5, the larger rank total.

Now *'U'* formula

$$U = n_1 n_{2+} \frac{n_x(n_x + 1)}{2} - T_x$$

$$= 5\times 5 + \frac{5(5+1)}{2} - 37.5$$

$$= 25+15-37.5$$

$$= 2.5$$

Emotion

Experimental group			Control group		
Subjects	**QOL Score**	**Rank**	**Subjects**	**QOL Score**	**Rank**
E1	2	4.38	C1	2	4.38
E2	2	4.38	C2	2	4.38
E3	2	4.38	C3	1	1
E4	2	4.38	C4	3	9.5
E5	3	9.5	C5	2	4.38
Total Score	**11**	**27.02**	**Total Score**	**10**	**23.64**

Table 8 QOL Score in Emotion

Where,

n_1 =5, the number of the trail group. n_2=5, the number of the control group.

n_x=5, the number of the group with larger rank total.T_x=27.02, the larger rank total.

Now *'U'* formula

$$U = n_1 n_{2+} \frac{n_x(n_x + 1)}{2} - T_x$$

$$= 5\times 5 + \frac{5(5+1)}{2} - 27.02$$

$$= 25+15-27.02$$

$$= 13$$

Sleep

Experimental group			Control group		
Subjects	**QOL Score**	**Rank**	**Subjects**	**QOL Score**	**Rank**
E1	1	1.5	C1	3	8.5
E2	2	4.5	C2	3	8.5
E3	2	4.5	C3	2	4.5
E4	1	1.5	C4	3	8.5
E5	3	8.5	C5	2	4.5
Total Score	**9**	**20.5**	**Total Score**	**13**	**34.5**

Table 9 QOL Score in Sleep

Where,

n_1 =5, the number of the trail group. n_2=5, the number of the control group.

n_x=5, the number of the group with larger rank total.T_x=34.5, the larger rank total.

Now *'U'* formula

$$U = n_1\, n_{2+} \frac{n_x(n_x+1)}{2} - T_x$$

$$= 5\times 5 + \frac{5(5+1)}{2} - 34.5$$

$$= 25+15-34.5$$

$$= 5.5$$

Severity measure

Experimental group			Control group		
Subjects	**QOL Score**	**Rank**	**Subjects**	**QOL Score**	**Rank**
E1	1	1.5	C1	2	5
E2	2	5	C2	3	9
E3	2	5	C3	2	5
E4	1	1.5	C4	3	9
E5	3	9	C5	2	5
Total Score	**9**	**22**	**Total Score**	**12**	**33**

Table 10 QOL Score in Severity measure

Where,

n_1 =5, the number of the trail group. n_2=5, the number of the control group.

n_x=5, the number of the group with larger rank total.T_x=33, the larger rank total.

Now *'U'* formula

$$U = n_1\, n_{2+} \frac{n_x(n_x + 1)}{2} - T_x$$

$$= 5\times 5 + \frac{5(5+1)}{2} - 33$$

$$= 25+15-33$$

$$= 7$$

Severity measure by Numerical Rating Scale

Experimental group			Control group		
Subjects	**NRS Score**	**Rank**	**Subjects**	**NRS Score**	**Rank**
E1	3	1.5	C1	7	8.5
E2	6	5	C2	7	8.5
E3	4	3	C3	7	8.5
E4	3	1.5	C4	7	8.5
E5	6	5	C5	6	5
Total Score	**22**	**16**	**Total Score**	**34**	**39**

Table 11 NRS Score for severity of incontinence

Where,

n_1 =5, the number of the trail group. n_2=5, the number of the control group.

n_x=5, the number of the group with larger rank total.T_x=39, the larger rank total.

Now *'U'* formula

$$U = n_1\, n_{2+} \frac{n_x(n_x + 1)}{2} - T_x$$

$$= 5\times 5 + \frac{5(5+1)}{2} - 39$$

$$= 25+15-39$$

$$= 1$$

Permission letter

August 5, 2015

Head

Department of Physiotherapy

Centre for the Rehabilitation of the Paralysed (CRP)

Chapain, Savar, Dhaka-1343.

Through: Head, Department of Physiotherapy, BHPI.

Subject: Seeking permission of data collection to conduct my research project.

Dear Sir,

With due respect and humble submission to state that I am Tasnuva Shamarukh Proma, student of 4th Professional B.Sc. in Physiotherapy at Bangladesh Health Professions Institute (BHPI). The ethical committee has approved my research project titled on **" Effectiveness of Kegel exercise after child birth on treatment of Urinary Incontinence"** under the supervision of Md. Millat Hossain, lecturer, Department of Physiotherapy, CRP. Conducting this research project is partial fulfillment of the requirement for the degree of B.Sc. in Physiotherapy. I want to collect data for my research project from the patients of CRP. So, I need permission for data collection from the Gynecology outpatient unit of Physiotherapy department of CRP-Mirpur. I would like to assure that anything of my study will not be harmful for the participants.

I, therefore, pray & hope that you would be kind enough to grant my application & give me permission for data collection and obligue thereby.

Sincerely Yours

Tasnuva Shamarukh Proma

Tasnuva Shamarukh Proma

4th Professional B.Sc. in Physiotherapy

Roll-16, Session: 2010-2011

Bangladesh Health Professions Institute (BHPI)

CRP, Chapain, Savar, Dhaka-1343.

To, PT, Head, CRP

Forwarded & Recommended

05/08/15

Md. Shariful Haque
Associate Professor & Head of the Department
Department of Physiotherapy
Bangladesh Health Professions Institute (BHPI)
CRP, Chapain, Savar, Dhaka-1343

Forwarded by Millat Hossain 05/08/15

Given permission
Colleague of the Dept. PT Dept.
06/08/15

Permission letter

August 9, 2015

Incharge

Department of Physiotherapy

Centre for the Rehabilitation of the Paralysed (CRP)

Mirpur, Dhaka-1216.

Subject: Seeking permission of data collection to conduct my research project.

Dear Sir,

With due respect and humble submission to state that I am Tasnuva Shamarukh Proma, student of 4th Professional B.Sc. in Physiotherapy at Bangladesh Health Professions Institute (BHPI). The ethical committee has approved my research project titled on **" Effectiveness of Kegel exercise on treatment of Urinary Incontinence after child birth"** under the supervision of Md. Millat Hossain, lecturer, Department of Physiotherapy, CRP. Conducting this research project is partial fulfillment of the requirement for the degree of B.Sc. in Physiotherapy. I want to collect data for my research project from the patients of CRP. So, I need permission for data collection from the Gynecology outpatient unit of Physiotherapy department of CRP-Mirpur. I would like to assure that anything of my study will not be harmful for the participants.

I, therefore, pray & hope that you would be kind enough to grant my application & give me permission for data collection and obligue thereby.

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Tasnuva Shamarukh Proma

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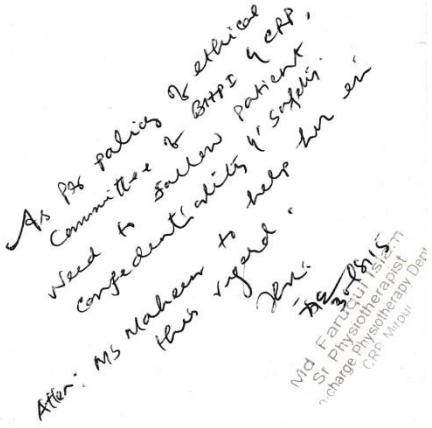
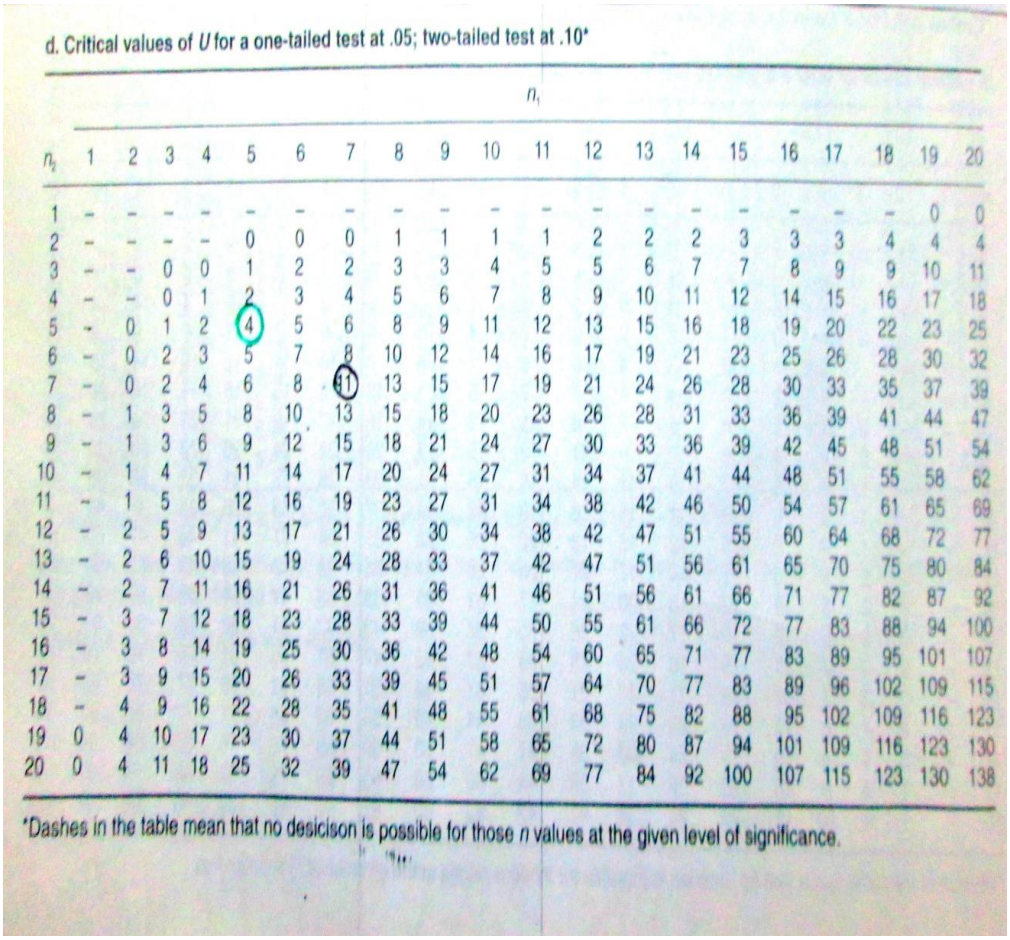
4th Professional B.Sc. in Physiotherapy

Roll-16, Session: 2010-2011

Bangladesh Health Professions Institute (BHPI)

CRP, Chapain, Savar, Dhaka-1343.





d. Critical values of *U* for a one-tailed test at .05; two-tailed test at .10*

n_2 \ n_1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0	0
2	–	–	–	–	0	0	0	1	1	1	1	2	2	2	3	3	3	4	4	4
3	–	–	0	0	1	2	2	3	3	4	5	5	6	7	7	8	9	9	10	11
4	–	–	0	1	2	3	4	5	6	7	8	9	10	11	12	14	15	16	17	18
5	–	0	1	2	4	5	6	8	9	11	12	13	15	16	18	19	20	22	23	25
6	–	0	2	3	5	7	8	10	12	14	16	17	19	21	23	25	26	28	30	32
7	–	0	2	4	6	8	11	13	15	17	19	21	24	26	28	30	33	35	37	39
8	–	1	3	5	8	10	13	15	18	20	23	26	28	31	33	36	39	41	44	47
9	–	1	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54
10	–	1	4	7	11	14	17	20	24	27	31	34	37	41	44	48	51	55	58	62
11	–	1	5	8	12	16	19	23	27	31	34	38	42	46	50	54	57	61	65	69
12	–	2	5	9	13	17	21	26	30	34	38	42	47	51	55	60	64	68	72	77
13	–	2	6	10	15	19	24	28	33	37	42	47	51	56	61	65	70	75	80	84
14	–	2	7	11	16	21	26	31	36	41	46	51	56	61	66	71	77	82	87	92
15	–	3	7	12	18	23	28	33	39	44	50	55	61	66	72	77	83	88	94	100
16	–	3	8	14	19	25	30	36	42	48	54	60	65	71	77	83	89	95	101	107
17	–	3	9	15	20	26	33	39	45	51	57	64	70	77	83	89	96	102	109	115
18	–	4	9	16	22	28	35	41	48	55	61	68	75	82	88	95	102	109	116	123
19	0	4	10	17	23	30	37	44	51	58	65	72	80	87	94	101	109	116	123	130
20	0	4	11	18	25	32	39	47	54	62	69	77	84	92	100	107	115	123	130	138

*Dashes in the table mean that no desicison is possible for those *n* values at the given level of significance.

Table 12 Critical values of U for a one-tailed hypothesis