Comparative effects of Bebo concept and Diaphragmatic Breathing technique on stress incontinence in females after vaginal birth

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Abstract

Objective: To compare the effects of Bebo concept and Diaphragmatic Breathing technique on stress incontinence in females after vaginal birth.
Study design: It is a descriptive cross sectional hospital based study.

Place and duration of study: A Six-month study was carried out in Jinnah Hospital Lahore and Bahria International Hospital Lahore. (March 2022 to September 2022)

Material and Methods: The study design was RCT (Randomized control trial). Duration of the study was 6 months, March 2022 to September 2022. The total sample size of this study was 66. Out of which 33 candidates were allocated in each of the two groups. During this study, the Non probability purposive Sampling technique was used to select the sample and then randomly allocated into groups through Lottery Method. Group.1 was assigned for the receiving of Bebo Concept as intervention plan whereas the Group.2 was applied with the Diaphragmatic. Breathing exercises. Treatment plan consisted of 6-weeks for the females with stress urinary incontinence after vaginal birth. Palpation perfect test was used to measure

Results: Man Whitney U Test was for between group analysis of palpation perfect test, which indicated significant difference observed in posttest palpation perfect test results in both the interventions (p=0.001) and significant difference was observed in posttest palpation perfect test results in both the interventions (p=0.001) showing better results with Bebo.

Conclusion: Bebo concept showed more statistically significant improvement Urinary Distress Inventory, Short Form UDI-6 and Palpation perfect test but Quality of Life (ICIQ-US SF) remained same in both the groups, according to UDI-6 and ICIQ.

Keywords: Vaginal birth, Urinary stress incontinence, Physical Therapy techniques

1. Introduction

Nowadays seen as a disease that is social, incontinence of urine affects almost 20-60% of those women who are over 18 years in age.[1] In 2010, was known by the word "symptom", which mainly meant the Urinary Leakage that is involuntary in regards to person. First child birth, more importantly if it's a natural birth, undoubtedly has an impact on the structure and operation of the pelvic floor muscles (PFM) to a great extent. PFM dysfunction is increased by maternal features during delivery, such as age and a higher BMI, although birth circumstances also play a role.[2] Women who have experienced considerable perineal trauma are found to possess PFM dysfunction symptoms soon after giving birth.[4] Majority of these symptoms include urinary incontinence (UI), POP known as pelvic organ prolapse, and LAM- avulsion known by the term Levator Ani Muscle avulsion.[4] Moreover, natural birth may put the pelvic floor tissue under more stress than it can withstand, causing irreversible alterations in tissue characteristics that are crucial to the urethral support continence mechanism.[5]

In rare circumstances, injuries to the perineal muscles that are mechanical in nature can be irreparable.

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According to research, some women's PFM strength did not return within 8 months of birth, and 34% of them six weeks after giving birth, suffered from the loss of ability to contract the perineal muscles voluntarily.[5] Limited antepartum pelvic organ mobility have a higher incidence of developing postpartum vaginal wall prolapse.[6] Those with postpartum urinary incontinence due to stress had a substantially more flexible bladder neck than women who could contain their urine. After the first birth, the pelvic floor muscles' strength and endurance deteriorate dramatically. According to studies, 65 percent of women who have urinary incontinence recall the first time they suffered from an involuntary loss of urine was either during pregnancy or puerperium.[3]

The BeBo pelvic floor training, or BeBo Gesundheits training in German, was founded in Switzerland and is taught in group seminars. The approach is one of the ideas now utilised in order to avoid the dysfunction of PFMs. It's also utilized to treat urological and gynecological conditions in both men and women.[4] This therapy has the advantage of using a holistic perspective when studying the human body, paying close attention to the perineal muscles' activity as well as the pelvic floor muscles' activation.[5] Every respondent is required to complete a health survey form at the start of the workshop, which includes the data regarding any conditions which can be categorized as clinical in nature, symptoms related to UI, and other topics. Technique's Premises are based upon five basic types of exercises: 1st. Awareness, 2nd Movement, 3rd Strengthening, 4th Relaxation, and 5th Incorporating muscles of pelvic floor into activities of everyday.[5]

Ui-jae Hwang et al. in 2021 examined females with stress urine incontinence, the impact of pelvic floor electrical stimulation on tidal diaphragm excursion and rib cage movement, and forceful breathing and coughing. Since pelvic floor musces play a part in the respiratory function, this study used electrical stimulation of the pelvic floor muscles in women with stress urine incontinence exhibit diaphragmatic excursion, upper rib cage movement during tidal, as well as vigorous breathing and coughing (SUI). A randomised control trial was used in this investigation. This study found that in women with stress urinary incontinence (SUI), pelvic floor electrical stimulitation (PFES) significantly increased pelvic floor muscle (PFM) strength and diaphragm excursion during coughing, tidal and vigorous breathing, and coughing. This training could help the body maintain intra abdominal pressure, which can counter excessive urthral pressure compared to vesicular pressure and prevent urine leakage or stress urinary incontinence in women, particularly when they sneeze or cough.[6]

This study aimed to understand role of different techniques for the improvement of QOL and severity of stress incontinence and provide best possible treatment options and further ease the patients after viginal delivery.

2. Materials & Methods

The study design of this study was a Randomized clinical trial, non-probability purposive sampling technique was used to select the sample and then randomly allocated into groups through Lottery Method. Total sample size of this study was 66, randomly divided into 2 groups, 33 patients in each group.

Study duration was 6 Months (March 2022 to September 2022). Following was the Sample selection criteria, Inclusion criteria was Females that are primiparous and have only one pregnancy, 20–40 years old, Delivery between 37 and 42 weeks of pregnancy, 6 to 8 weeks after natural childbirth, No contraindications to exercise stated by an obstetrician.[5] and exclusion criteria was Multiple pregnancy, Caesarean delivery, Postpartum complications in the form of Pubic symphysis and sacroiliac joint separation, Thrombophlebitis, 3rd and 4th degree of perineal rupture, Diseases or infections of the urinary tract or vaginal tract during the experiment, 3rd and 4th degree of pelvic organ prolapse, 3rd degree of stress urinary incontinence or overactive bladder diagnosed before pregnancy, Gynecological surgeries, spine operations, Pelvic and spine fractures, injuries, Operations on the lower limbs 12 months or less previous to the study, Diseases of the nervous system, e.g. MS, stroke, Respiratory diseases, Diabetes, Cancer &rheumatic diseases.[5] Measuring tools used was UDI-6 (Urinary distress inventory, short form), International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form (ICIQ-SF) and palpation perfect test. Data collection procedure was well defined, after the approval of ethical, consent was taken from Patient as well as from department, allocation was

through lottery method in two groups, Group A and the other was Group B. Baseline assessment was noted for each patient.

The data analysis involved conducting a Normality Test initially. Subsequently, non-parametric Mann-Whitney tests were applied using SPSS version 21. Parametric tests were utilized for both between-groups and within-group analyses. Specifically, the Mann-Whitney test was employed for between-group analyses, while the Friedman test was used for within-group analyses.

3. Results

Since the study was an RCT, the participants were randomly allocated into 2 groups that are, Group 1 (Group A) and group 2 (Group B). There are 66 participants in this research among which 33 participants were in Group A (50%), that received bebo concept and 33 participants in Group B (50%) that received diaphragmatic breathing.

Many female patients suffer from urinary incontinence after giving birth. The data collected in this study illustrates that 6 month was the maximum duration reported by participants with frequency of 17 out of 66 participants. 15 participants suffered from urinary incontinence for about 7 months after giving birth that makes about 20% ratio out of 66 participants in total. 13 participants suffered from urinary incontinence for about 8 months after giving birth that makes about 20% ratio out of 66 participants in total. On the other hand 10 participants suffered from urinary incontinence for about 10 months after giving birth that makes about 15% ratio out of 66 participants in total.

Man Whitney U Test was for between group analysis of palpation perfect test, which indicated no significant difference in pretest values (p=0.14) but there were significant difference observed in posttest palpation perfect test results in both the interventions (p=0.001) and also Man Whitney U Test was for between group analysis of palpation perfect test, which indicated no significant difference in pretest values (p=0.14) but there were significant difference observed in posttest palpation perfect test results in both the interventions (p=0.001) but Independent sample T test was used for between group analysis of ICIQ-US SF to check quality of life. There was no significant difference observed in pretest (p=0.067) as well as posttest (p=0.083)

Paired Sample T test was used for with in group analysis of UDI-6, ICIQ-US SF and Palpation perfect Test, all the variables showed significant difference in pre-post test results having the P value= 0.000.

Table 1 Mean and standard deviation for Baseline measures

Variable	Bebo Concept (n=33) Mean ± SD	Diaphragmatic (n=33) Mean ± SD
Age (years)	26.51 ± 4.24	27.78 ± 4.87
Gestational weeks	39.63 ± 1.67	39.90 ± 1.68
Duration after child Birth (Months)	7.69 ± 1.42	7.75 ± 1.41

SD= Standard Deviation, n= Sample Population

DIAPHRAGMATIC EXERCISE GROUP

- Diaphragmatic exercise will include 1set each day with 30rep for 6 weeks
- Patient lie on his or her back on a flat surface or in bed, with the head supported and the knees bent. The patient's legs can be supported by placing a pillow under his or her knees. Place a hand on the person's upper chest and a second hand beneath the ribs. As it will enable you to feel the patient's breathing move the diaphragm
- Slowly inhale through their nose so that their stomach will slide outward against the caregiver's hand. As much as possible, the hand should not move from its position on the chest.
- Contract his or her stomach muscles, then ask him or her to let them relax as they exhale through pursed lips. The hand that is on the upper chest needs to stay as still as possible(5)

BEBO CONCEPT GROUP

Total 6 Weeks Physical Therapy Program according to Bebo Pelvic floor training concept, 60mins of single meetings twice a week for 6 weeks, 10 min of theoretical part, 50mins of practical, Set of home exercise plan

- **1st Week**
- Meeting 1&2: Home plan of sitting on a chair-10x, supine lying with leg bended and with expiration Pelvic floor muscle stimulation
- Inspiration-expiration-10x, Balance exercise, 1 leg standing for 10sc on each leg
- **2nd Week**
- Meeting 3&4: In addition to the previous week plan, up to 50% of PFM Max Strength and maintain the contraction for 1 cycle of breathing-5x, Each rep. will have 5 sec interval
- **3rd Week**
- Meeting 5&6: All task repetition with prolonged time of single leg standing to 20sec. 4th Week
- **4th Week**
- Meeting 7&8: Repetition of all previous tasks, up to 50% of PFM Max Strength and maintain the contraction for 2 cycle of breathing-5x, with interval of 5sec.
- **5th & 6th Week**
- Meeting 9,10,11,12: All Previous tasks, Single leg standing prolonged to 30Sec, Breathing Exercise, Postural training with the help of different sized ball, balance board, roller. It will include different starting positions i.e. kneeling, standing, side lying, prone lying

Table 2 Man Whitney U Test was applied for between Groups
analysis of Palpation perfect Pre Test and Post Test

Variable	Bebo Concept (n=33) Median (IQ)	Diaphragmatic (n=33) Median (IQ)	P Value (Man-Whitney U test)
Palpation Perfect Pre Test	2 (1)	2 (0.5)	0.14
Palpation Perfect Post Test	4 (1)	4 (1)	0.001

IQ: Inter-Quartile, n: Sample population, *P Value*: Probability of Findings

4. Discussion

Man Whitney U Test was for between group analysis of palpation perfect test, which indicated significant difference observed in posttest palpation perfect test results in both the interventions (p=0.001) and significant difference was observed in posttest palpation perfect test results in both the interventions (p=0.001) showing better results with Bebo. Urinary incontinence is a common condition that has affected women of all the ages. Incontinence of Urine was also termed as a "Symptom" of the involuntary leakage of urine. During the natural births, structure and the functions of PFMs has been impacted greatly. The Bebo pelvic floor training was founded as an approach utilized to prevent the PFM Dysfunctions. The pelvic floor supports the female body's urethral, anal, and vaginal orifice constrictor and continence processes.[1]

Diaphragmatic breathing (DB) exercises as well as Bebo Concept has significantly lowered the UDI-6 score. Similarly, in 2021, the study {Toprak N, S. Sen, et al. (2021)} discussed the significant improvements where the score of the UDI-6 was significantly decreased when only the DB exercises were applied.[7]

As per the results measured in the study accomplished, the p-value was <0.05 for Palpation Perfect Test which was Non-Significant. A previous study done in 2021 shows the results from Perfect Test statistically significant improvements which were noticed through all the parameters. During study completed by the researcher, the progression was implied in both subjective and objective measurement values in both groups using UDI-6 & ICIQ-SF. Self-regeneration of Pelvic Floor Muscles i.e. PFM. Similarly, the previous study quoted above, suggested the observable progression for both of the measurement values as ours along with depiction of increased expectation to achieve self-regeneration to take place within 3 months, post the natural childbirth, when significant gains in strength were observingly demonstrated by both groups including differed improvement in the quality of life was greatly observed when analyzed through the ICIQ-SF showing high difference factor in improvement ratio.[5]

while the results achieved through this study calculated the p-value to be finalized at <0.05, however, during a previously completed study Colla, C., L. L. Paiva, et al. in 2018 suggested the same as with value to be P-value <0.05. On the other hand, as discussed in the information presented above, it was concluded that natural childbirth impacts the pelvic floor muscles which turns out as PFD i.e. Pelvic Floor Dysfunction which causes Urinary Incontinence. But during the previously completed same quoted study, the ICIQ-SF and Jorge-Wexner, along with the usage of visual analogue scale concluded for this very study that no significant or induced differences were observed despite of the type in regards to the method of delivery chosen by the female.[8]

Current study concluded that the pelvic floor muscle training has great positive impact on the condition of Urinary Incontinence with greatly observed improvement in the quality of life when calculated through the ICIQ-SF. Moreover, the Bebo Concept also proved to imply the similar improvements in improving the condition of Urinary Incontinence after the child birth. Similarly, when going through the previously done literature, a study Zarawski M, Kołomańska D, Maj M, Panicz D, Opławski M, et al. in 2017 on almost a similar approach, same changes were obsesrved i.e. PFM training exercises improved the condition of UI which was considered to be imposed by PFD, Postpartum, etc. As per our study, it was shown that there was a ratio of 20% cases recorded suffering from Urinary Incontinence after the child birth took place despite of the method of delivery taken under consideration. On the other hand, opposite to our study, 45% of women were assessed and considered to be suffering from Urinary Incontinence. as discussed in our current study, it was suggested that Pelvic Floor disorders or dysfunctions participated greatly in the presence of Urinary Incontinence. While analyzing the same recent literature, the same point of

consideration was observed depicting that disorder with Pelvic Floor Muscles do contribute as a causative factor for Urinary Incontinence.[9]

During our study, we observed a significantly difference was observed in the form of improvement during before and after the intervention plans were applied with improvement in the p-value of less than 0.05 with similar results applying any of the 2 opted plans i.e. DB exercises and Bebo Concept. Considering the literature, a study was done by El Nahas, E. M., M. A. Mohamed, et al. in 2017, implimenting the same results mentioning the training of PFMs i.e. Pelvic Floor Muscles training improved the condition with significant improvement in the p-value which was less than 0.001 previously with improvement and end calculated p-value of less than 0.05.[10]

No physiological aspect was measured, which may be able to lead changed perception. Sample size of our study was small and only women after virginal child birth were included. Also our study did not measure pre conception level of physical activity which can vary results.

Conclusion:

Based on the study findings it is concluded that physiologically both Bebo concept and Diaphragmatic breathing technique have effects on stress urinary incontinence but Bebo concept showed more statistically significant improvement UDI-6 and Palpation perfect test but Quality of Life (ICIQ-US SF) remained same in both the groups. According to UDI-6 and ICIQ. However, the patient ease of adherence was observed to be more significant with Bebo concept. Hence it is implied that it is safe to incorporate Bebo concept for the treatment of stress incontinence in females after vaginal birth

Further large-scale studies on this topic using rigorous research methods are recommended, so that the findings of current trial may be validated for generalization.

Disclosure/Conflict of interest:

Authors declared no conflict of interest.

References:

1. Wiśniewska B, Marciniak A, Rutkowska-Nawrocka J, Ciećwież M, Szydłowska I, Starczewski A. Urinary stress incontinence-one of basic diseases of modern society. Polski Merkuriusz Lekarski: Organ Polskiego Towarzystwa Lekarskiego. 2015;38(223):51-4.
2. Zhang Y, Zhou Z, Wei D, Jiao Y, Zhu Q, Shi Y, et al. Efficacy and safety of moxibustion in the treatment of female stress urinary incontinence: A protocol for systematic review and meta-analysis. Medicine. 2022;101(7):e28893.
3. Leng B, Zhou Y, Du S, Liu F, Zhao L, Sun G, et al. Association between delivery mode and pelvic organ prolapse: a meta-analysis of observational studies. European Journal of Obstetrics & Gynecology and Reproductive Biology. 2019;235:19-25.
4. Moradi M, Niazi A, Shariat Moghani BS, Mohammadzadeh F, Afiat M, Mazloumi E. The relationship between mode of delivery and pelvic organ prolapse in women: A cross-sectional study. The Iranian Journal of Obstetrics, Gynecology and Infertility. 2022;24(13):41-50.
5. Śnieżek A, Czechowska D, Curyło M, Głodzik J, Szymanowski P, Rojek A, et al. Physiotherapy according to the BeBo Concept as prophylaxis and treatment of urinary incontinence in women after natural childbirth. Scientific Reports. 2021;11(1):1-9.
6. Hwang U-J, Lee M-S, Jung S-H, Ahn S-H, Kwon O-Y. Effect of pelvic floor electrical stimulation on diaphragm excursion and rib cage movement during tidal and forceful breathing and coughing in women with stress urinary incontinence: A randomized controlled trial. Medicine (Baltimore). 2021;100(1):e24158-e.
7. Toprak N, Sen S, Yigit B. The role of diaphragmatic breathing exercise on urinary incontinence treatment: A pilot study. Journal of Bodywork and Movement Therapies. 2021.
8. Colla C, Paiva LL, Ferla L, Trento MJ, de Vargas IM, Dos Santos BA, et al. Pelvic floor dysfunction in the immediate puerperium, and 1 and 3 months after vaginal or cesarean delivery. International Journal of Gynecology & Obstetrics. 2018;143(1):94-100.
9. Zarawski M, Kołomańska-Bogucka D, Maj M, Panicz D, Opławski M, Mazur-Biały A. The impact of pelvic floor exercises on the quality of life of women with urinary incontinence: analysis of pregnancy and the postpartum period. Journal of Novel Physiotherapy and Physical Rehabilitation. 2017;4(2).
10. El Nahas EM, Mohamed MA, Kamal HM. Postnatal rehabilitation of pelvic floor muscles using aerobic and Kegel exercises. Bulletin of Faculty of Physical Therapy. 2017;22(2):67-73.