Original Article

Short Term Effects of Hypopressive Breathing Technique and Conventional Therapy on Pelvic Floor Dysfunction, Anxiety and Quality of Life in Post-Operative Hysterectomy

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Abstract

Background: Hysterectomy is the partial or total surgical removal of the uterus. The symptoms of post-operative hysterectomy include pelvic floor dysfunction, urinary incontinence, anxiety and decreased quality of life. Hypopressive breathing exercises activate deep muscles in the abdomen and pelvic floor. This technique has shown significantly reduced Pelvic floor dysfunction symptoms and enhanced quality of life in women with Pelvic dysfunction, Pelvic organ prolapse & Urinary incontinence. But till date, very few studies focused on postoperative hysterectomy women.

Objective: To compare the effectiveness of hypopressive breathing technique and conventional therapy on pelvic floor dysfunction, anxiety and quality of life in postoperative hysterectomy.

Methods: In this Quasi-experimental study, 128 post operative hysterectomy subjects were obtained from the Department of obstetrics and gynaecology. They were assigned into 2 groups based on convenience sampling, Group A (hypopressive breathing technique with conventional therapy) and Group B (conventional therapy). The eligible subjects were assessed by pelvic floor dysfunction inventory questionnaire (PFDI-20), Hamilton anxiety rating scale (HARS) and WHO quality-of-life questionnaire (QOL). After 2 weeks the post test was done. Data were analyzed using paired – t test, Independent – t test, Wilcoxon signed rank test and Mann Whitney U test.

Results: Both groups showed significant within-group improvements in all outcome measures ($p < 0.05$). Group A's WHO-QOL improved from 56.33 ± 8.21 to 80.14 ± 12.93, and Group B's from 59.19 ± 10.00 to 77.28 ± 15.17. No statistically significant between-group difference was observed ($p > 0.05$), though Group A demonstrated higher mean improvements in pelvic floor function and anxiety reduction.

Conclusion: Hypopressive breathing technique along with conventional therapy showed significant reduction in symptoms of pelvic floor dysfunction, anxiety and improvement in quality of life within the group but there was no significant difference between the groups on post-operative hysterectomy women.

Keywords: Hysterectomy, Hypopressive breathing technique, Pelvic floor dysfunction, Anxiety, Quality of life.

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Back Ground

Hysterectomy is the partial or total surgical removal of the uterus, and with age-specific prevalence of 0.36% among women aged 15-29; 3.59% among women aged 30-39; and 9.20% among women 40-49 years[1]. Hysterectomy is most commonly observed in women aged 45 to 59 years and is more prevalent among married women[1]. The major indication of hysterectomy is abnormal uterine bleeding which is due to myomas and adenomyosis. Other causes which leadto hysterectomy are dysfunctional vaginal bleeding (41.7%), endometriosis (3%), and uterine prolapse (18.2%) [1].

Hysterectomy can be performed in various ways, including: (a) vaginal hysterectomy, (b) laparoscopic hysterectomy, (c) abdominal hysterectomy, and (d) total hysterectomy[9]. Among these, laparoscopic hysterectomy is the most commonly performed procedure. Minor complications associated with hysterectomy include fever, bleeding, and infection. Potential adverse effects include pelvic floor dysfunction, depression, anxiety, urinary tract infections, urinary incontinence, and sexual dysfunction.

Pelvic floor dysfunction can manifest as increased activity (hypertonicity), decreased activity (hypotonicity), or poor coordination of the pelvic floor muscles. When these muscles fail to function properly, individuals may experience distressing symptoms such as urinary incontinence, faecal incontinence, pelvic organ prolapse, and sexual dysfunction. The impact of PFD can significantly affect the quality of life across four dimensions: physical, psychological, social, and financial. Hypotonic pelvic floor muscles may result in symptoms like urinary incontinence and a sensation of heaviness in the vagina[11]. Conversely, hypertonic pelvic floor muscles can lead to constipation, urinary retention, tailbone pain, and bladder pain.

The risk of depression and anxiety is higher among women with gynaecological surgeries because of associated with an uncertain future. However, hospitalization for surgery is associated with increased anxiety and negative effects on postoperative recovery and preoperative anxiety has different impacts on postoperative pain[6]. Disruptions in luteinizing hormone (LH) and oestrogen regulation after a hysterectomy is considered to be the major mechanism that causes these patients to experience increased depression risk. Women who underwent oophorectomy alongside hysterectomy exhibited higher anxiety-related scores, lower scores in sexual function, and weaker partner relationship. These procedures collectively contributed to an increased risk of depression[10].

The traditional exercise regimen prescribed for patients recovering from a hysterectomy includes a range of targeted movements designed to aid in rehabilitation and enhance overall physical well-being. These exercises typically encompass ankle pumps and rotations to improve circulation and prevent stiffness, active calf stretches to maintain flexibility, and Kegel exercises to strengthen the pelvic floor muscles. Deep breathing exercises are included to promote relaxation and optimize respiratory function. Additionally, alternate knee bending helps to maintain joint mobility, while static straight leg raises (SLR) focus on strengthening the lower extremities. Movements such as the posterior pelvic tilt and pelvic rotation are incorporated to improve core stability and support the recovery of pelvic region functionality. Together, this comprehensive program addresses multiple aspects of post-surgical recovery, fostering strength, mobility, and overall health.

Hypopressive breathing exercises involve the reflex activation of the pelvic floor muscles through specific postures and breathing techniques[3]. There are 33 documented Hypopressive postures, performed in various positions such as standing, kneeling, quadruped, sitting, and supine. During the Hypopressivemaneuver, the patient fully exhales to elevate the diaphragm, closes the glottis, and expands the rib cage and abdomen to reduce intra-abdominal pressure. This reduction in pressure

triggers the automatic activation of postural muscles, including the pelvic floor muscles (PFMs), by combining apnea with changes in intra-abdominal pressure[13].

Hypopressive breathing exercises are designed to engage and activate the core muscles while simultaneously strengthening the pelvic floor[4,5]. These exercises focus on improving the function and tone of the muscles that support the abdomen and pelvis, by using controlled breathing techniques that emphasize breath retention and specific body postures. This combination of breathing and positioning works to increase muscle activation in the core and pelvic region, contributing to enhanced stability, strength, and overall pelvic health. These exercises involve a combination of breath holds and specific postures that create a vacuum effect in the abdomen. The technique focuses on expanding the ribcage laterally while pulling the abdomen inward[3,4,5].

The Hypopressive breathing technique has demonstrated significant benefits in alleviating symptoms of pelvic floor dysfunction (PFD) while improving the quality of life for women experiencing conditions such as pelvic organ prolapse and urinary incontinence. Despite these promising outcomes, there remains a notable gap in research specifically addressing its application and benefits for women recovering from hysterectomy surgery. To date, only a limited number of studies have explored the potential role of Hypopressive breathing techniques in supporting postoperative recovery in this population, highlighting the need for further investigation in this area.

Thus, the present study is therefore undertaken to examine the short-term effect of Hypopressive breathing technique and conventional therapy on pelvic floor dysfunction, anxiety and quality of life in patients who underwent hysterectomy.

Hypotheses

Null Hypothesis (H_0)- There will be no significant improvement in pelvic floor muscle function, reduction in anxiety and in improving quality of life following Hypopressive breathing technique.

Alternative Hypothesis (H_a)-There will be a significant improvement in pelvic floor muscle function, reduction in anxiety and in improving quality of life following Hypopressive breathing technique.

Material and Methods

Materials

Couch, Foot stool, Pillows for support and bed spread **&** Questionnaires for assessing pelvic floor dysfunction, anxiety, and quality of life.

Methodolohy

Study Design: A Quasi-experimental study - pre and post design.

Study Setting: Department of Obstetrics and Gynaecology, PSG Hospitals,Peelamedu, Coimbatore.

Human Participation Protection: The study was reviewed and approved by Institutional Human Ethics Committee at PSG IMSR, Coimbatore. (PSG/IHEC/2023/Appr/Exp/318)

Study Duration: 13 months (During the period between 27, November 2023 – 27, December 2024)

Population: 128 (sample size calculated using G*power 3.1.9.7 software)

Sampling Method: Sampling method by Convenience sampling method

Randomization was not feasible due to the clinical setup and availability of patients within the same postoperative ward, where ethical and logistical constraints limited random allocation. Thus, a quasi-experimental design with convenience sampling was selected to ensure feasibility while maintaining internal validity.

Treatment Duration

GROUP A(n=64)	**GROUP B**(n=64)
Hypopressive breathing exercise[3,4] & conventional therapy	Conventional therapy
Hypopressive exercise for 10 minutes and conventional therapy for 55 minutes **Treatment duration on POD 2:** 65 minutes per session, 2 times a day which is given for alternate days for 2 weeks.	Conventional therapy for 55 minutes **Treatment duration on POD 2:** 55 minutes per session, 2 times a day which is given for alternate days for 2 weeks.

The two-week intervention period was chosen to coincide with the immediate postoperative phase, during which pelvic floor reactivation and anxiety management are essential for optimal recovery. Extended intervention periods were not feasible due to early hospital discharge of the patient.

Criteria for Sample Selection

Inclusion Criteria:

- Females between 35-50 years
- Hysterectomy (vaginal and laparoscopic)
- Pelvic Floor Dysfunction grading (score 16-34)
- Hamilton Anxiety Rating Scale (score from severe – very severe)
- Pain score ranges from mild to moderate
- Informed consent and subjects willing to participate in the study.

Exclusion Criteria

- Urinary tract infection immediately after surgery
- Neurological disease
- Uncontrolled Hypertension
- Hiatal hernia
- Cardio respiratory disease

Instruments and Tools for Data Collection

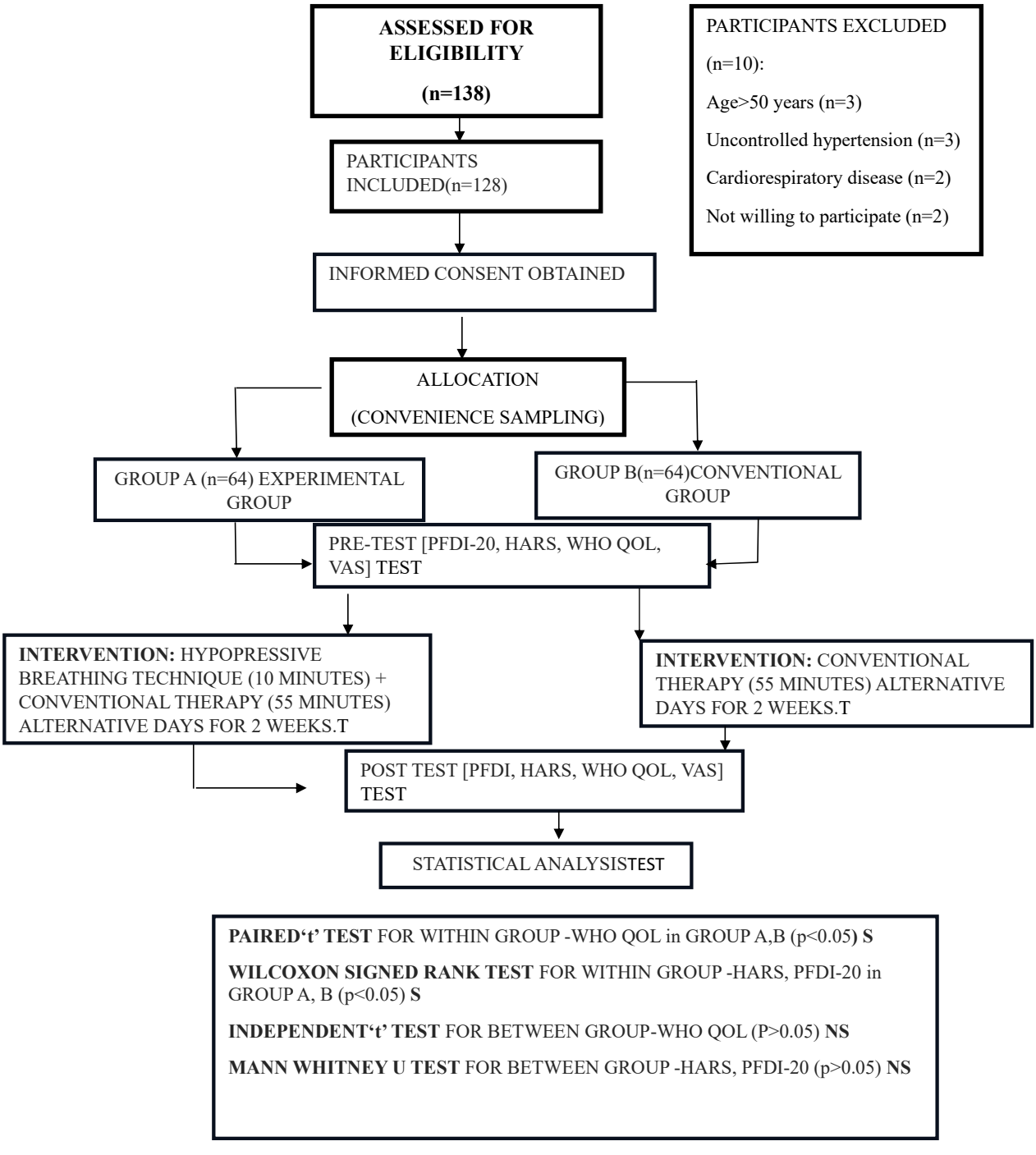
- Pelvic floor distress inventory questionnaire (PFDI-20) to assess pelvic floor muscle strength.
- Hamilton anxiety rating scale to rule out the anxiety the patient experienced.
- WHO Quality of life (WHO QOL) to evaluate the well-being of the patient.
- Visual analogue scale (VAS) to grade the pain.

Technique of Data Collection

128 subjects who had undergone hysterectomy were obtained from the Department of obstetrics and gynaecology, based on inclusion and exclusion criteria. The informed consent was obtained from them. They were assigned into two groups based on convenience sampling, Group A (Hypopressive breathing technique with conventional therapy) and Group B (conventional therapy). The eligible subjects were assessed for pelvic floor dysfunction by pelvic floor dysfunction inventory questionnaire (PFDI-20), anxiety by Hamilton anxiety rating scale, quality of life by WHO quality-of-life questionnaire (WHO QOL) and Pain by visual analogue scale (VAS). After 2 weeks the post test was done. Data was collected and analysed by using Paired't' test & Independent 't' test for normally distributed variables and Wilcoxon signed rank test & Mann Whitney U test for non-normally distributed variables.

SCHEMATIC REPRESENTATION OF FLOW OF THE STUDY

POST-OPERATIVE HYSTERECTOMY WOMEN



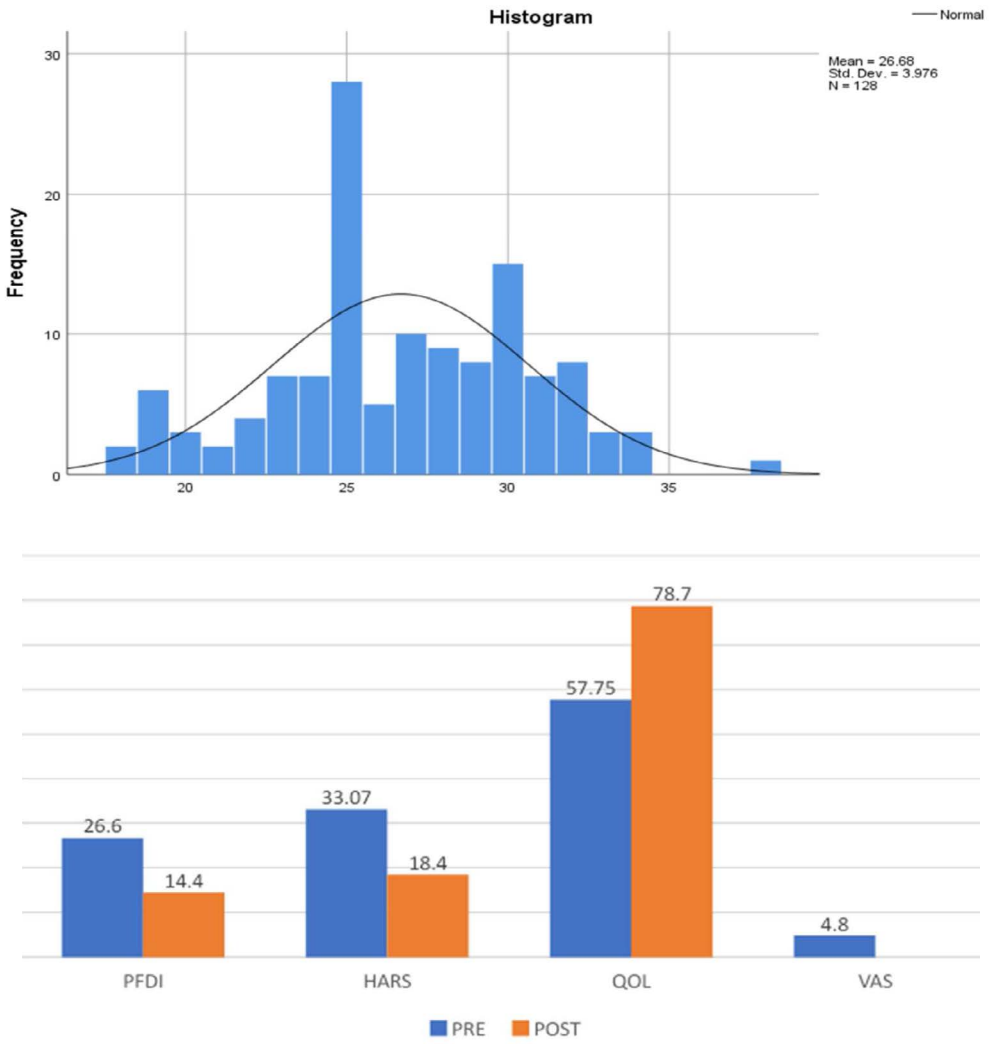
PAIRED't' TEST FOR WITHIN GROUP -WHO QOL in GROUP A,B ($p<0.05$) **S**

WILCOXON SIGNED RANK TEST FOR WITHIN GROUP -HARS, PFDI-20 in GROUP A, B ($p<0.05$) **S**

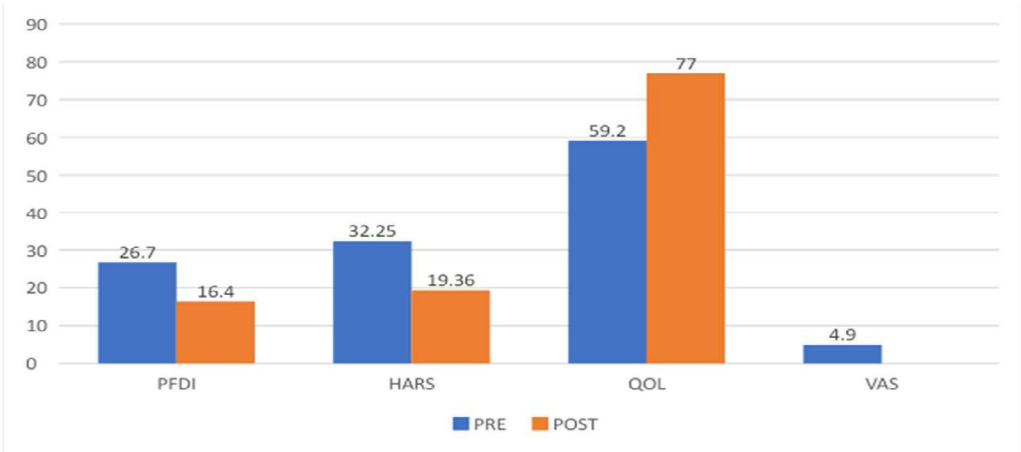
INDEPENDENT't' TEST FOR BETWEEN GROUP-WHO QOL ($P>0.05$) **NS**

MANN WHITNEY U TEST FOR BETWEEN GROUP -HARS, PFDI-20 ($p>0.05$) **NS**

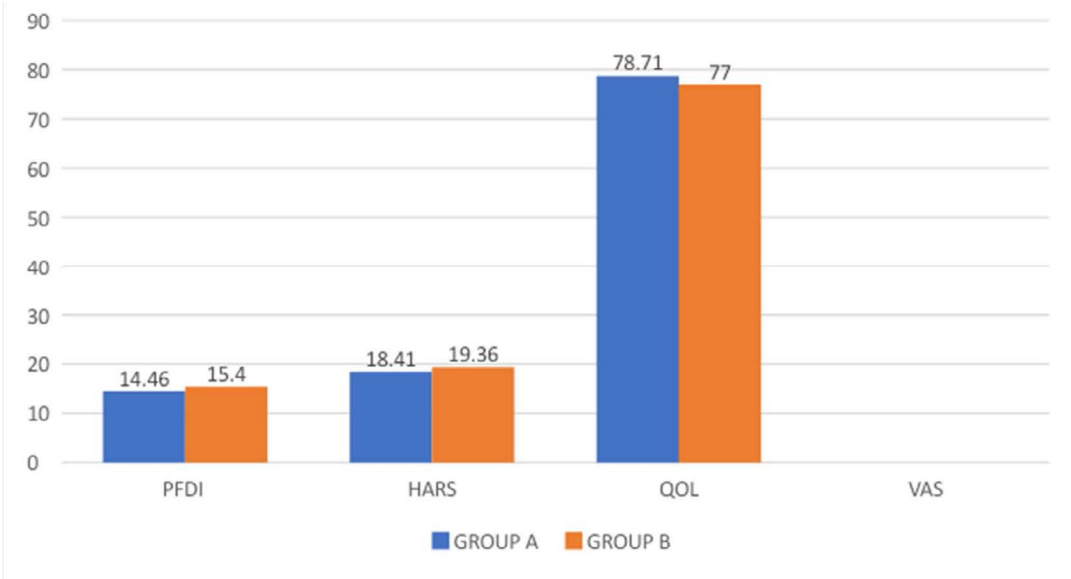
HISTOGRAM



GRAPH 1: Within Group Analysis of Pfdi-20, Hars, Who Qol and Vas in Group A



GRAPH 2: Within Group Analysis of Pfdi-20, Hars, Who Qol and Vas in Group B



GRAPH 3: Between Group Analysis of Pfdi-20, Hars,Who Qol and Vas of Group A & Group B

Results

A total of 128 post-operative hysterectomy women participated in the study, with 64 subjects in Group A (Hypopressive breathing technique with conventional therapy) and 64 subjects in Group B (conventional therapy alone).

Demographic Characteristics

The majority of participants were aged between 46–50 years (51.6%), followed by 41–45 years (37.5%). Abnormal uterine bleeding was the most common indication for hysterectomy (54.7%). Total laparoscopic hysterectomy with or without bilateral salpingo-oophorectomy was the most frequently performed surgical procedure (55.4%). The demographic distribution was comparable between both groups (Table 1).

Table 1. Demographic Characteristics of Participants (n = 128)

Variable	Category	n (%)
Age (years)	35–40	14 (10.9)
	41–45	48 (37.5)
	46–50	66 (51.6)
Indication for Surgery	Abnormal uterine bleeding	70 (54.7)
	Multiple fibroids	25 (19.5)
	Leiomyoma	11 (8.6)
	Dysmenorrhoea	7 (5.5)
	UV prolapse	6 (4.6)
	Others	9 (7.1)

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Type of Surgery	TLH ± BSO	71 (55.4)
	TAH ± BSO	38 (29.7)
	Vaginal/Robotic	19 (14.9)

TLH – Total laparoscopic hysterectomy; TAH – Total abdominal hysterectomy; BSO – Bilateral salpingo-oophorectomy

Distribution of Outcome Measures

Normality testing revealed that WHO Quality of Life (WHO-QOL) scores were normally distributed ($p > 0.05$), while Pelvic Floor Distress Inventory-20 (PFDI-20), Hamilton Anxiety Rating Scale (HARS), and Visual Analogue Scale (VAS) scores were not normally distributed ($p < 0.05$). Accordingly, parametric tests were used for WHO-QOL, and non-parametric tests were applied for PFDI-20, HARS, and VAS (Table 2).

Table 2. Distribution and Normality of Outcome Measures (n = 128)

Outcome measure	Mean ± SD	Normality (p value)
PFDI-20	14.46 ± 3.90	<0.001*
HARS	18.41 ± 5.41	<0.001*
WHO-QOL	78.71 ± 12.84	0.200
VAS	0.00 ± 0.00	<0.001*

Shapiro–Wilk test; *p < 0.05 indicates non-normal distribution

Within-Group Analysis

Quality of Life (WHO-QOL)

Within-group analysis using the paired t-test showed a statistically significant improvement in WHO-QOL scores in both groups following the two-week intervention. Group A demonstrated an increase in mean WHO-QOL scores from 56.33 ± 8.22 to 80.14 ± 12.93 ($p < 0.05$). Similarly, Group B showed an improvement from 59.19 ± 10.00 to 77.28 ± 15.17 ($p < 0.05$) (Table 3).

Table 3. Within-Group Comparison of WHO-QOL Scores (Paired t-test)

Group	Pre-test Mean ± SD	Post-test Mean ± SD	Mean difference	p value
Group A	56.33 ± 8.22	80.14 ± 12.93	23.81	0.037*
Group B	59.19 ± 10.00	77.28 ± 15.17	17.99	<0.001*

p < 0.05 statistically significant

Pelvic Floor Dysfunction, Anxiety, and Pain

Wilcoxon signed-rank test analysis revealed statistically significant improvements in PFDI-20, HARS, and VAS scores in both groups following intervention ($p < 0.05$). This indicates that both hypopressive breathing combined with conventional therapy and conventional therapy alone were effective in reducing pelvic floor dysfunction symptoms, anxiety levels, and pain in post-operative hysterectomy women (Table 4).

Table 4. Within-Group Comparison of PFDI-20, HARS and VAS (Wilcoxon Signed Rank Test)

Outcome	Group A p value	Group B p value
PFDI-20	<0.001*	<0.001*
HARS	<0.001*	<0.001*
VAS	<0.001*	<0.001*

p < 0.05 statistically significant

Between-Group Analysis

Between-group comparison of post-test WHO-QOL scores using the independent t-test showed no statistically significant difference between Group A and Group B ($p > 0.05$) (Table 5).

Table 5. Between-Group Comparison of WHO-QOL Post-test Scores (Independent t-test)

Group	Mean ± SD	Mean difference	p value
Group A	80.14 ± 12.99	2.86	0.254
Group B	77.28 ± 15.17		

p > 0.05 – Not statistically significant

Similarly, Mann–Whitney U test analysis demonstrated no statistically significant differences between the groups for post-test PFDI-20, HARS, and VAS scores ($p > 0.05$) (Table 6).

Table 6. Between-Group Comparison of PFDI-20, HARS and VAS Post-test Scores (Mann–Whitney U Test)

Outcome	Group A Mean Rank	Group B Mean Rank	p value
PFDI-20	58.84	70.16	0.082
HARS	60.07	68.93	0.175
VAS	64.50	64.50	1.000

p > 0.05 – Not statistically significant

Both intervention protocols resulted in significant improvements within groups across all outcome measures. However, no statistically significant differences were observed between Group A and Group B at post-test. Despite the lack of statistical significance, Group A consistently demonstrated greater mean improvements in pelvic floor function, anxiety reduction, pain, and quality of life compared to Group B.

Discussion

The purpose of this Quasi Experimental study was to determine the short-term effects of Hypopressive breathing technique on symptoms of pelvic floor dysfunction, anxiety, and quality of life in women after hysterectomy.

Out of the 138 samples evaluated for the study, 128 patients who fulfilled the inclusion criteria took part. The age group with the highest prevalence in this study was 46–50 years old, followed by 41–45 years old. In accordance with this study, dysmenorrhea, numerous fibroids, leiomyoma of the uterus, and abnormal uterine bleeding were the most common reasons for hysterectomy. The most commonly carried out surgical procedures in this study were total laparoscopic hysterectomy with bilateral salphingo-oopherectomy and total abdominal hysterectomy with bilateral salphingo-oopherectomy.

The Hypopressive breathing technique is designed to trigger a reflexive activation of the pelvic floor muscles through specific adjustments in posture and breathing patterns. This method was found to generate a substantially higher intravaginal force compared to voluntary pelvic floor muscle contractions. Notably, the Hypopressivemaneuver, which combines apnea (breath-holding) with a rib cage lift, elicited a significantly greater intravaginal closure force. This suggests that the technique effectively stimulates pelvic floor muscle contraction, surpassing the activation required merely to counteract gravitational forces and stabilize the pelvic and abdominal regions. The interplay between breath control and postural modifications appears to enhance the engagement of these muscle groups, contributing to their strengthening and functional improvement[2].

During the Hypopressive exercise, the neuromuscular activation of the pelvic floor and abdominal muscles is likely driven by the need to stabilize the lumbopelvic region. In this study, it was observed that the specific posture adopted during the Hypopressive exercise inherently stimulated the pelvic floor muscles, the rectus abdominis, and the lateral abdominal wall muscles. This activation appears to be influenced by intra-abdominal pressure, which plays a critical role in maintaining spinal stability. Furthermore, the deliberate effort to decrease intra-abdominal pressure—achieved through techniques such as expanding the rib cage while maintaining the Hypopressive posture—may lead to a compensatory response. This response involves increased engagement of the abdominal and pelvic floor muscles to support stabilization and maintain proper alignment during the exercise[2].

The benefits of Hypopressive abdominal breathing exercise protocols can be viewed as an intervention that attempts to maintain or improve the overall psychophysical condition, the proper functioning of an overloaded body, or full recovery following illnesses, injuries, or respiratory fatigue states, according to earlier research on the subject conducted by Maria del Carmen Herena-Funes[20]. Hypopressive breathing technique could help women maintain their physical condition and general wellness. These findings were in accordance with our research, which revealed that post-operative hysterectomy women's quality of life significantly improved.

This study shows that there was a significant reduction in pelvic floor dysfunction after performing Hypopressive exercise with a significant value $p<0.05$ when comparing pre-test and post-test in Group AHypopressive breathing exercise. This was supported by Beatriz Navario Brazalaz, et al., (2020) who concluded that pelvic floor muscles, abdominals, gluteal, and adductor muscles are activated during the performance of Hypopressive breathing exercise[3]. Jyothi Parlae, et al., (2021) also showed the reduction of symptoms in pelvic organ prolapse Grade (1 & 2) with help of Hypopressive breathing exercise[2].

This study also shows that there was significant reduction in the anxiety with a significant value $p<0.05$ after performing Hypopressive breathing exercise. These findings came in the same line with Wafaa Mostafa Ahmed Gamil, etal., (2022) who revealed that early ambulation and deep breathing exercise among the women undergoing abdominal hysterectomy may serve as an effective intervention to improve pain, minimizing anxiety and enhance of physiological outcome mainly oxygen saturation which helps in promoting patient's relaxation and enhance the post operative recovery and tissue healing[7].

In this study, there was also a significant improvement in quality of life with $p<0.05$, when performing within the group analysis after performing Hypopressive breathing exercise. It was supported by a case report which was conducted in 2021 by Neha N. Bhagdewani, et al., who emphasized the effect of combination of different exercises for pelvic floor muscles allowing the patients to recover early and return to daily activities[21].

Thus, with the reference to the statistical analysis done from the collected data, there was a significant reduction in symptoms of pelvic floor dysfunction, anxiety and pain and improvement in quality of life within the group analysis in Group A and B and there was no significant difference between the group analyses.

Although between-group differences were statistically non-significant, the greater mean improvement in the hypopressive group indicates potential clinical relevance. In early post-hysterectomy rehabilitation, small functional and psychological gains can expedite recovery, improve confidence, and enhance patient adherence. The non-significance might be attributed to short intervention duration, limited sample heterogeneity, and the quasi-experimental design rather than a lack of physiological effect.

Limitations

- This study was limited by the absence of randomization and short-term intervention, which restricts long-term interpretation
- External factors (visitors time, immediately after food intake) extended the time taken for each sample
- The participants found it uncomfortable to answer a few of the questions asked in Hamilton Anxiety Rating Scale and WHO Quality of Life questionnaires since they had questions about their personal life.
- There was delay in picking up the call by the patient for tele-rehabilitation.
- The participant's capacity of understanding exercise has some influence on performance.
- The participant's motivation for carrying out the exercises would have a distinct impact on the effects.
- The use of self-reported questionnaires may introduce response bias.
- The study sample was confined to a single hospital, limiting generalizability.

Suggestions

- Adherence to exercise program in home setting can be assessed in the future studies
- Preoperative assessment can be added in future studies.
- Along with Hypopressive breathing technique, other pelvic floor strengthening techniques can be included in the protocol for better results.
- Future research could look into whether scheduling periodic follow-up of treatment sessions would improve benefits obtained.
- Future research should employ randomized controlled trials with extended follow-up, larger sample sizes, and combined pelvic floor strengthening strategies to confirm these findings.

Conclusion

- The study was conducted to compare the effect of Hypopressive breathing technique along with conventional therapy on pelvic floor dysfunction, anxiety and quality of life in post-operative hysterectomy.
- With the reference to the statistical analysis done from the collected data of Pelvic floor dysfunction inventory questionnaire, Hamilton anxiety rating scale, quality of life questionnaire and visual analogue scale there was a significant reduction in symptoms of pelvic floor dysfunction, anxiety and pain and improvement in quality of life within the groups and there was no significant difference between the groups in post-operative hysterectomy women. But, when comparing the post-test mean values, Group A (Hypopressive breathing technique along with conventional therapy) shows higher improvement than the Group B (Conventional therapy).

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Ethical Clearance: (Institutional Human Ethics Committee, PSG Institute of Medical Sciences & Research. Ref. No. : PSG /Il-IEC/2023/ Appr / Exp/318. Approval date: 27.11.2023

Declaration of Conflicts of Interest Statement: Nil

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