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Evaluating The Effectiveness of Relaxation Techniques Combined with the K-Cat Exercises in Managing Urinary Incontinence in Female Population with Pelvic Floor Dysfunctions Through Primitive Reflex Integration

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ABSTRACT

Urinary incontinence, defined as the involuntary loss of urine, is frequently associated with an overactive detrusor muscle. It commonly affects women, especially those over the age of 60, and is often triggered by activities such as coughing or sneezing. While neurological conditions and tumors can cause incontinence, it is most often linked to pelvic floor dysfunction, including excessive activity of the pelvic floor muscles. This study aims to examine the impact of traditional exercises on urinary incontinence along with K-CAT exercises, a modern technique that incorporates coordination between pelvic floor function, breathing, and jaw positioning.[1]

Objective

Evaluating The Effectiveness of Relaxation Techniques Combined with Exercises in Managing Urinary Incontinence in Female Population with Pelvic Floor Dysfunctions Through Primitive Reflex Integration

Keywords: *Urinary Incontinence, jaw & pelvis Concept, Pelvic Floor Dysfunction, Pad Test, Post-Void Residual, Fascial Connections, K-CAT, K-CAT pelvic floor exercise, long exhalation, neural tube, Primitive Reflex Integration.*

1. INTRODUCTION

Urinary Incontinence is the involuntary leakage of urine, which can result from the inability to fully empty the bladder or from sudden urges due to detrusor muscle overactivity.

- **Stress Urinary Incontinence (SUI):** This occurs when urine leaks during activities that increase intra-abdominal pressure, such as coughing, sneezing, or exercise. It is often caused by weakness in the urethral sphincter or pelvic floor muscles and is common in young women engaged in sports, pregnant women, and those who have given birth.

- **Urge Urinary Incontinence (UUI):** This type involves a strong, sudden urge to urinate followed by involuntary leakage. It can result from detrusor overactivity due to bladder irritation or neurological issues, though it may also occur without noticeable urgency.
- **Mixed Urinary Incontinence:** A combination of stress and urge incontinence, where both types of symptoms are present.
- **Overflow Urinary Incontinence:** This occurs when the bladder becomes overdistended due to impaired detrusor muscle contraction or blockage at the bladder outlet. Conditions like spinal cord injuries, multiple sclerosis, diabetes, pelvic organ prolapse, or benign prostatic hyperplasia in men can cause this type.
- **Functional Urinary Incontinence:** This type results from physical or environmental barriers that make it difficult to reach a toilet in time, often referred to as toileting difficulty.[i]

Pelvic Floor Dysfunction (PFD) encompasses a range of symptoms and anatomical changes related to abnormal pelvic floor muscle function. It can involve muscle overactivity (hypertonicity), underactivity (hypotonicity), or poor coordination. PFD also includes **Pelvic Organ Prolapse (POP)**, where the support structures of the pelvic organs are weakened. PFD symptoms can affect urological, gynecological, or colorectal functions and are often interconnected. Issues can be categorized based on the affected area: anterior (urethra/bladder), middle (vagina/uterus), and posterior (anus/rectum).[ii]

Anatomy and Function

The pelvic floor is a group of muscles and ligaments forming a dome-shaped diaphragm across the pelvic outlet. It extends from the pubis at the front to the sacrum and coccyx at the back, spanning between the ischial tuberosities on both sides. The primary muscles are the **levator ani**, which includes the **puborectalis**, **pubococcygeus**, and **iliococcygeus**. The **puborectalis** forms a sling around the anorectal junction, helping maintain the anorectal angle during contraction and playing a key role in fecal continence. The **pubococcygeus** and **iliococcygeus** support the pelvic organs, with the pubococcygeus creating the **levator hiatus**, allowing passage for the urethra, vagina (in females), and anus.

The **bulbospongiosus** and **ischiocavernosus** muscles contribute to the superficial anterior pelvic floor, while the **external anal sphincter** is part of the superficial posterior pelvic floor. The **transverse perineal muscles** cross the midline of the superficial pelvic floor, merging with the bulbospongiosus and external anal sphincter to form the **perineal body**.[iii]

Signs of Pelvic Floor Dysfunction:

- Pain or numbness during intercourse
- Ongoing pelvic, genital, or rectal pain
- Pelvic organ prolapses, felt as a bulge or heaviness in the vagina
- Unintentional urine leakage during exercise, laughing, coughing, or sneezing (stress incontinence)
- Urgency to urinate or frequent bathroom trips
- Difficulty emptying the bladder or bowels, with start-stop urination
- Multiple bowel movements in a short time
- Constipation or straining during bowel movements
- Accidental gas passage
- Unexplained lower back pain[iv]

2. BACKGROUND

Prolapse, caused by weakened pelvic floor muscles, occurs when the uterus, bladder, bowel, or upper vagina shift out of position, causing discomfort. Pelvic floor exercises and lifestyle changes can help. Weak pelvic floor muscles also contribute to urinary incontinence by failing to properly close the bladder-urethra passage, leading to leakage (Dumoulin et al., 2018). Studies show pelvic floor muscle exercises (PFMEs) are effective for stress and mixed urinary incontinence, with better outcomes for those with pure stress incontinence (Bø& Herbert, 2013). PFMEs outperform no treatment, placebo, or inactive controls (Ayeleke et al., 2013; Dumoulin et al., 2018). Cure rates range from 16% to 27%, and improvement rates from 48% to 80.7%. Supervised PFME programs are more effective than unsupervised ones (Hay-Smith et al., 2011; Lee et al., 2017), and age does not affect their success (Betschart et al., 2013). Embryological Development: The connection begins during embryologic development at around day fifteen. In this stage, called gastrulation, two depressions form on the dorsal side of the embryo which become the oropharyngeal membrane (goes on to form the mouth) and the cloacal membrane (goes on to form the openings of the urinary, reproductive and digestive tracts). The spine grows between them and the two remain connected from their early beginnings as one being in the embryo.

Psychomatical Expression: Both the jaw and pelvis serve as anatomical, physiological, physical and emotional expression points. When holding back emotions like anger, fear, or stress, the jaw often responds with clenching or grinding. Similarly, stress can cause tension leads to breathing dissociation which causes loading or over functioning in the area of abdomen and pelvic floor muscles, which leads to tightness sometimes linked to unresolved symptoms and feelings repression held in the body over time.[v]

The Role of Fascia: Fascia, the connective tissue linking muscles, nerves, organs, and more, supports body movement and structure. A continuous fascial line extends from the jaw to the pelvis, illustrating how tension in one area can influence the other.[vi]

Craniosacral Dynamics (Dural tensioning): The jaw and pelvis are also connected through craniosacral biomechanics. The dural tube, a connective tissue sheath housing the brain and spinal cord, links the skull to the sacrum. Tension in the jaw can impact this system, causing imbalances that may lead to pain, dysfunction, and symptoms throughout the body, including the cardiovascular, nervous, musculoskeletal, and digestive systems.[vii]

Embryological Development: The link between structures begins around day 15 of embryonic development, during a critical phase known as gastrulation. At this stage, two depressions form on the dorsal surface of the embryo: the oropharyngeal membrane, which later gives rise to the mouth, and the cloacal membrane, which eventually forms the openings of the urinary, reproductive, and digestive systems. As the spine develops between these two regions, they remain connected through their shared origin, reflecting the embryo's early formation as a unified structure.[viii]

Pad Testing is a non-invasive method used to detect and measure the severity of urine leakage. According to the 4th International Consultation on Incontinence, pad testing is an optional assessment for evaluating urinary incontinence. Various testing durations are reported in the literature, with the **1-hour pad test** having a standardized protocol.[ix]

While longer tests are often considered more reliable, evidence on their accuracy varies. A **24-hour test** is generally more reproducible than a 1-hour test but requires more patient preparation and commitment. In clinical practice, 24-hour testing is typically sufficient, whereas **48- to 72-hour tests** are preferred for research purpose. This study uses a **1-hr pad test** for evaluation.[x]

Ultrasound is a convenient and effective tool for estimating **postvoid residual (PVR)** volume, which is essential for evaluating symptoms related to urinary retention, bladder outlet obstruction, or overflow incontinence. A PVR of less than 50 mL is considered normal, while volumes exceeding 200 mL may indicate incomplete bladder emptying. In this study **pre and post PVR** values are evaluated and compared to conclude the results[xi]

Considering electrode placement varies from clinician to clinician, site identification, and anatomical expertise, it is ironic that surface biofeedback electrical investigations do not yield encouraging results. The primary problem in these areas are the difficulty of performing a fine contraction, and the anxiety brought on by the physical examination, which results in abnormalities in breathing patterns and respiration. The surface biofeedback is changed by both of these things.

Current results using needle or surface electrodes lack precision and offer unclear or incomplete examples. To reach a more objective conclusion about patients with urinary incontinence, the study should include a larger population as part of the study design.

Objectives

- Pelvic Floor muscle exercise is well known for treating urinary incontinence and pelvic floor prolapse. Recent advancements establish the connection between jaw and pelvis as they both can affect each other but very few studies conducted the actual protocol considering the connection between jaw and pelvis.
- The K-Cat concept-based exercise establishes a connection between jaw and pelvis, through diaphragms using that concept the training will be done for 12 weeks along with relaxation versus traditional pelvic floor exercises which are very commonly used for decades.
- This study will refresh the concept of the anatomical connection between the jaw and pelvis (neural tube continuity) and also provide a new limelight for treating pelvic floor prolapse and dysfunctions.

Research Question

- Is traditional exercise regime being a gold standard in treating pelvic floor prolapse and dysfunctions in female population.
- Is K-Cat concept being better in treating pelvic floor prolapse and dysfunctions.
- K-Cat concept versus Traditional Exercise Regime which one is better.

Definition of study subjects: female with pelvic floor dysfunction age between 30 to 60 suffering from urinary incontinence with no other comorbities or pathology as mentioned in exclusion criteria. All the subjects will be selected after providing

prior information and obtaining prior consent.

Inclusion Criteria

1. Urinary Incontinence due to pelvic floor dysfunction in female population
2. Age group 30-60
3. Informed consent or volunteer

Exclusion Criteria

1. Cancer
2. Open wound
3. Any systemic inflammatory and progressive neuro conditions
4. Post operative case of continence

Study sample design – purposive sampling method

Sample Size- 60

Parameters used for comparison and statistical analysis used: paired t- test

Duration of study: 3 months

Methodology: total 60 females will be selected between age 30 to 60 suffering with urinary incontinence and pelvic floor dysfunction after obtaining informed consent all females, treated with traditional pelvic floor exercise combined with embryological concept-based K-CAT Exercises with relaxation and tissue awareness in entire embryological connection through the most important factor breathing for 12 weeks with last week for follow up.

Outcome Measure

1-hr PAD Test: By weighing the used pads after using them for whole day and preventing them from evaporating by keeping them into zip lock after use then all the pads are weighed down and according to weight the outcome is measured.

Mild: 5 to 15g

Moderate: 15 to 30g

Severe: 30 to 50g

Pre and post void sonography: sonography is done to assess urinary incontinence and pre PVR values are recorded after the whole treatment post usg is done to evaluate post PVR values.

A PVR (postvoid residual) of less than 100 mL is considered normal.

Up to 200 mL may be acceptable.

A PVR exceeding 200 mL indicates incomplete bladder emptying.

Over 300 mL suggests urinary retention.

More than 400 mL is classified as urinary retention.

Procedure

Traditional exercises

Week 1-2:

- cat cow exercise
- clamshell
- pelvic tilt
- isometrics for rectus abdominus and transverse abdominus
- Swiss ball exercises
- deep breathing

Week 3-4:

- posterior pelvic tilt with Kegel activation

- transverse abdominus march
- transverse abdominus heel drop
- bent knee fall out
- dead bugs
- bird dogs

Week 5-6:

- cycling on level surface
- gentle aerobics
- light weights
- semi squat with wall support
- resisted clamshells
- bridging

Week 7-8:

- brisk jogging
- single leg pelvic bridging
- supine march
- sidestepping with pelvic floor contraction with Thera loop
- squat at 90^0 positions
- Kegel exercises

Week 9-10:

- full squats with wall support
- single leg pelvic bridging with weights
- swimming
- jogging
- cycling
- jumping jacks

Week 11-12:

- full functional activities with assessment and follow ups

Relaxation technique & K-CAT Exercise

We achieve relaxation and awareness by relaxation techniques (the entire dorsal chain influencing same as like facial chain activation in movement science). Along with that we also used generalized K-CAT protocol exercises.

K-CAT protocol progression along with weekly relaxation through jaw-pelvis connection.

Step 1: put one hand on sub-occiput and ask the client to put her hand on perineum and ask the client to inhale exhale slowly and deeply using abdomen

Step 2: put one hand on the occiput and another hand on sacrum again continue with abdominal breathing

Step 3: ask the clint to put her hands on the hip and practioner should put the hands on temporalis with abdominal breathing

Step 4: ask the client to place her hands on illac crest and practioner should place the hands on parietal with abdominal breathing

Step 5: with client in supine place one hand on frontal aspect and another on coccyx with continued breathing

Step 6: ask the client to place one hand on pubic symphysis in supine and practioner should place both hands with finger crawling under the mandible border with continued breathing

Step 7: with client in supine looking straight up, place one hand on the jaw and another just above the pubic symphysis with breathing.

Intervention of awareness through relaxation in entire to influence embryological connection along with K-CAT exercises.

Week 1 – Blowing exercise (K-CAT exercise) on physioball.

Week 2 - Blowing exercise on physioball with integrated awareness of neural tube fascial connection.

Week 3- Forceful blowing exercise with progression on physioball with integrated awareness of neural tube fascial connection.

Week 4 – Above exercise with more control along with sensory cues to involve gluteal muscles.

Week 5 – continue exercise of 4th week with gluteal squeeze in standing position.

Week 6 – same as week 5 with automated squeeze with support.

Week 7 – same as week 6 squat without support.

Week 8 – same as week 7 with 45 degree squat

Week 9 – same as week 8 with 90 degree squat

Week 10- same as week 9 with full squat in functional position (as it varies in Asian population)

Week 11 – increasing more control in functional position in this week.

Week 12 - same as week 11 progressing with increased repetitions (as achieving the master of all maneuvers) until the symptoms resolve.

3. RESULTS & TABLES

Table 1: Age wise Distribution of Cases

	Group I		Group II		Total	
Age group (yrs)	**No.**	**Percentage**	**No.**	**Percentage**	**No.**	**Percentage**
31-40	**11**	**36.67%**	**7**	**23.33%**	**18**	**30.00%**
41-50	**7**	**23.33%**	**11**	**36.67%**	**18**	**30.00%**
51-60	**12**	**40.00%**	**12**	**40.00%**	**24**	**40.00%**
Total	**30**	**100.00%**	**30**	**100.00%**	**60**	**100.00%**

Chi = 1.78; p = 0.41 (NS)

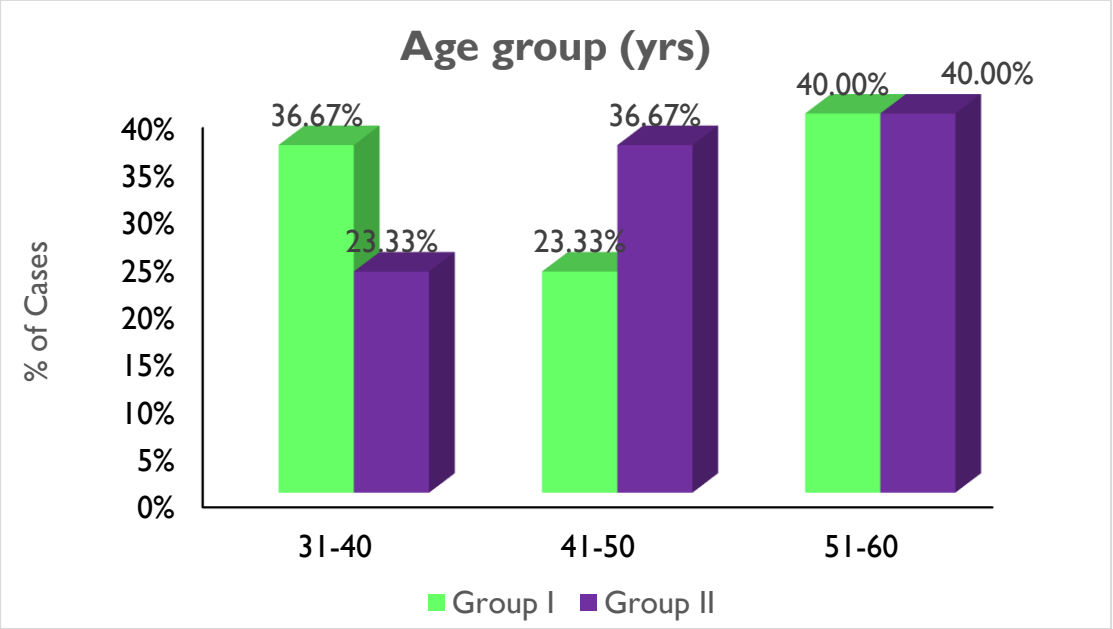


Table 2: Mean Age of Patients in Groups

	Group I		Group II	
	Mean	SD	Mean	SD
Age group (yrs)	46.10	9.39	47.40	8.25
P value	>0.05 (NS)			

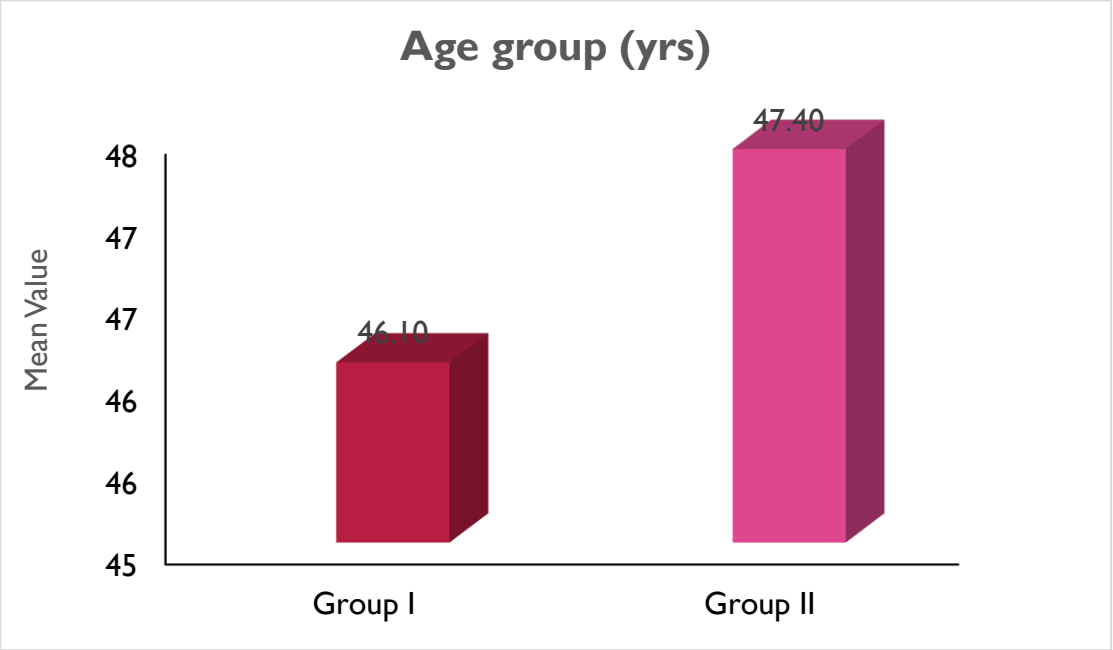


Table 3: Occupation wise Distribution of Cases

	Group I		Group II		Total	
Occupation	No.	Percentage	No.	Percentage	No.	Percentage
Business	1	3.33%	2	6.67%	3	5.00%
Employed	10	33.33%	5	16.67%	15	25.00%
Housewife	17	56.67%	23	76.67%	40	66.67%
Retired	2	6.67%	0	0.00%	2	3.33%
Total	30	100.00%	30	100.00%	60	100.00%

Chi = 4.90; p = 0.17 (NS)

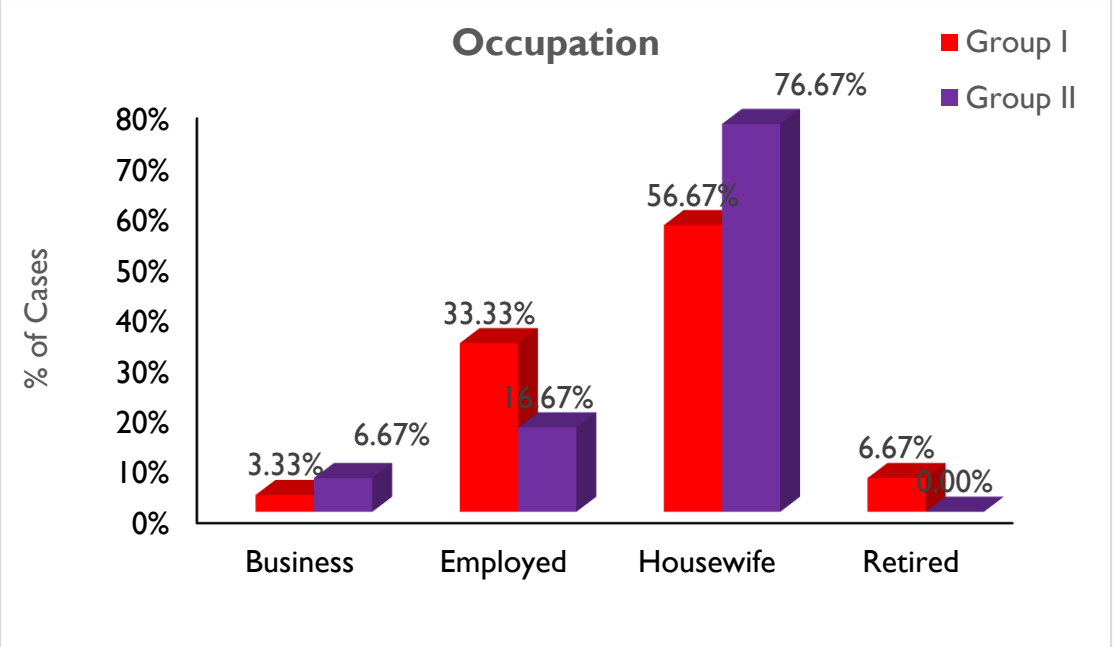


Table 4: Pre and Post PVR Distribution in Group I Patients According to Occupation

	Pre PVR		Post PVR		
Occupation	**Mean**	**SD**	**Mean**	**SD**	**P value**
Business (1)	**273.00**	**-**	**166.00**	**-**	**-**
Employed (10)	**262.50**	**73.26**	**171.20**	**73.31**	**<0.01 (S)**
Housewife (17)	**292.18**	**68.80**	**202.50**	**38.80**	**<0.001 (HS)**
Retired (2)	**231.50**	**2.12**	**146.00**	**28.28**	**<0.05 (S)**
Total	**277.60**	**68.03**	**186.55**	**54.08**	**<0.001 (HS)**

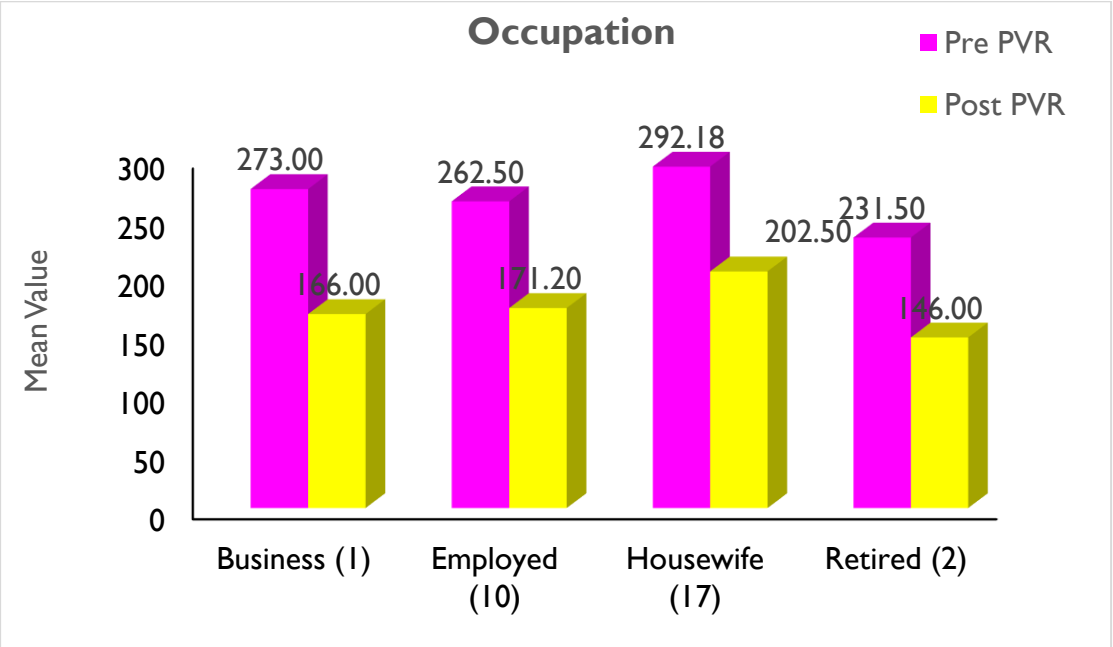


Table 5: Pre and Post PVR Distribution in Group II Patients According to Occupation

	Pre PVR		Post PVR		
Occupation	**Mean**	**SD**	**Mean**	**SD**	**P value**
Business (2)	**249.00**	**24.04**	**154.00**	**80.61**	**0.25 (NS)**
Employed (5)	**221.60**	**73.78**	**106.80**	**32.93**	**0.01 (S)**
Housewife (23)	**293.65**	**71.46**	**115.52**	**27.44**	**<0.001 (HS)**
Retired (0)	**-**	**-**	**-**	**-**	**-**
Total	**278.67**	**73.79**	**116.63**	**32.54**	**<0.001 (HS)**

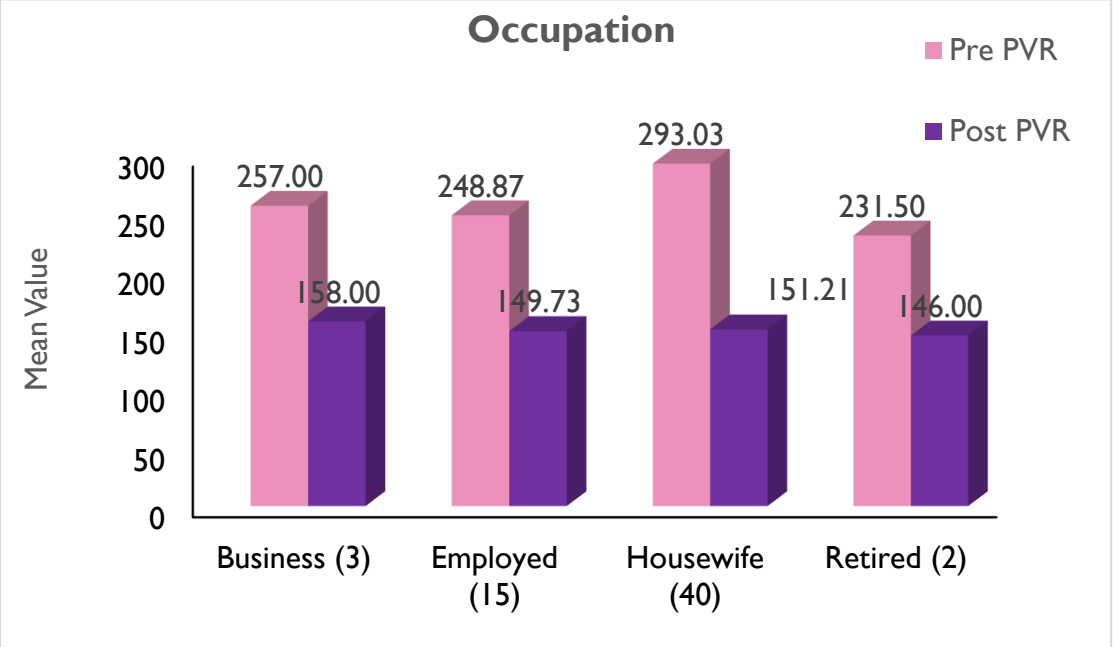


Table 6: Total Pre and Post PVR Distribution According to Occupation

	Pre PVR		Post PVR		
Occupation	**Mean**	**SD**	**Mean**	**SD**	**P value**
Business (3)	**257.00**	**21.93**	**158.00**	**57.42**	**<0.001 (HS)**
Employed (15)	**248.87**	**73.51**	**149.73**	**68.94**	**<0.001 (HS)**
Housewife (40)	**293.03**	**69.45**	**151.21**	**53.93**	**<0.001 (HS)**
Retired (2)	**231.50**	**2.12**	**146.00**	**28.28**	**<0.001 (HS)**
Total	**278.13**	**70.36**	**151.00**	**56.43**	**<0.001 (HS)**

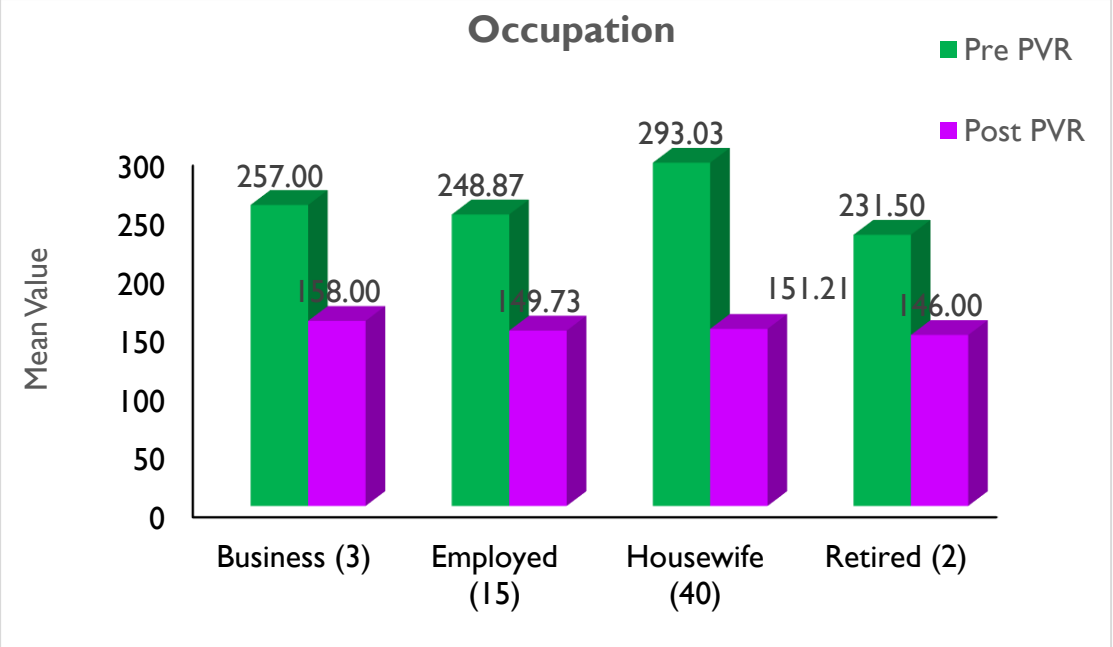


Table 7: Pre and Post PVR Distribution in Group I Patients According to Age Distribution

	Pre PVR		Post PVR		
Age Group	**Mean**	**SD**	**Mean**	**SD**	**P value**
31-40 (11)	**232.18**	**64.56**	**159.82**	**53.50**	**<0.01 (HS)**
41-50 (7)	**315.43**	**52.38**	**189.00**	**20.58**	**<0.001 (HS)**
51-60 (12)	**297.17**	**59.36**	**209.83**	**57.81**	**<0.001 (HS)**
Total	**277.60**	**68.03**	**186.55**	**54.08**	

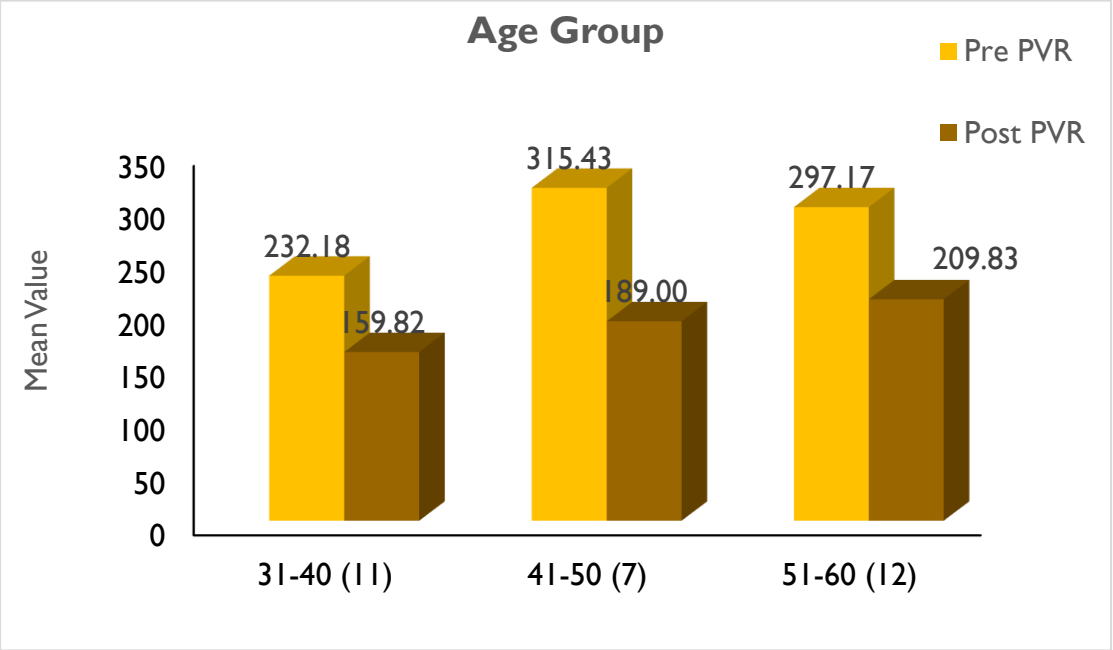


Table 8: Pre and Post PVR Distribution in Group II Patients According to Age Distribution

	Pre PVR		Post PVR		
Age Group	**Mean**	**SD**	**Mean**	**SD**	**P value**
31-40 (7)	**241.86**	**65.11**	**99.14**	**19.37**	**<0.001 (HS)**
41-50 (11)	**258.27**	**73.96**	**110.18**	**21.53**	**<0.001 (HS)**
51-60 (12)	**318.83**	**63.48**	**132.75**	**40.56**	**<0.001 (HS)**
Total	**278.67**	**73.79**	**116.63**	**32.54**	

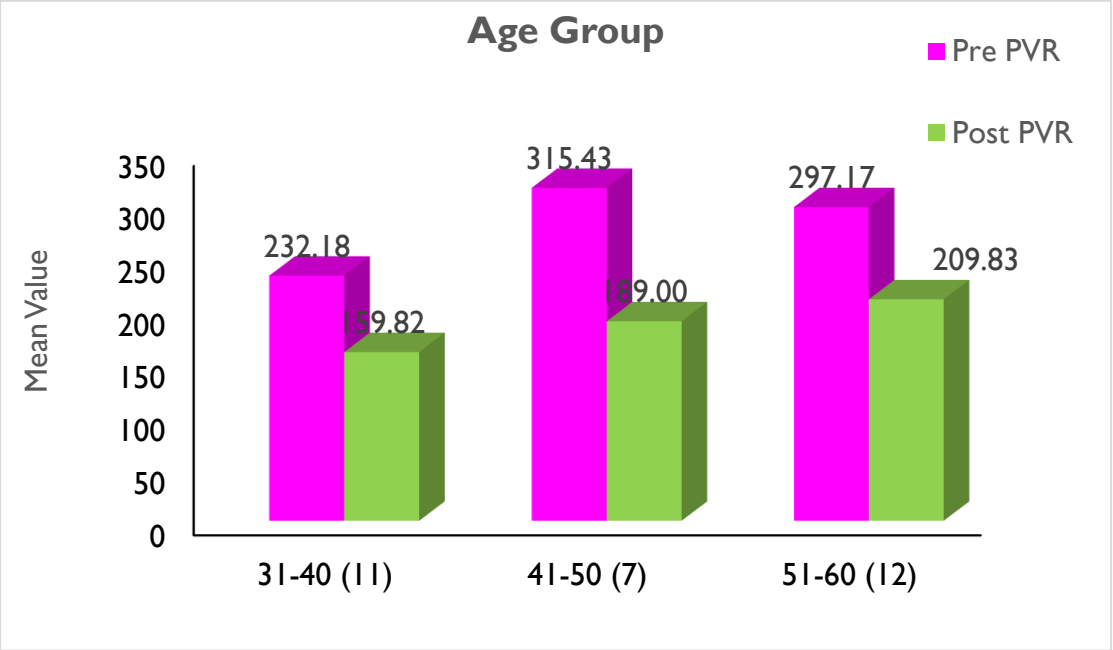


Table 9: Total Pre and Post PVR Distribution According to Age Distribution

	Pre PVR		Post PVR		
Age Group	**Mean**	**SD**	**Mean**	**SD**	**P value**
31-40 (18)	**235.94**	**63.02**	**136.22**	**52.37**	**<0.001 (HS)**
41-50 (18)	**280.50**	**70.77**	**138.00**	**43.92**	**<0.001 (HS)**
51-60 (24)	**308.00**	**61.12**	**171.29**	**62.73**	**<0.001 (HS)**
Total	**278.13**	**70.36**	**151**	**56.42**	**<0.001 (HS)**

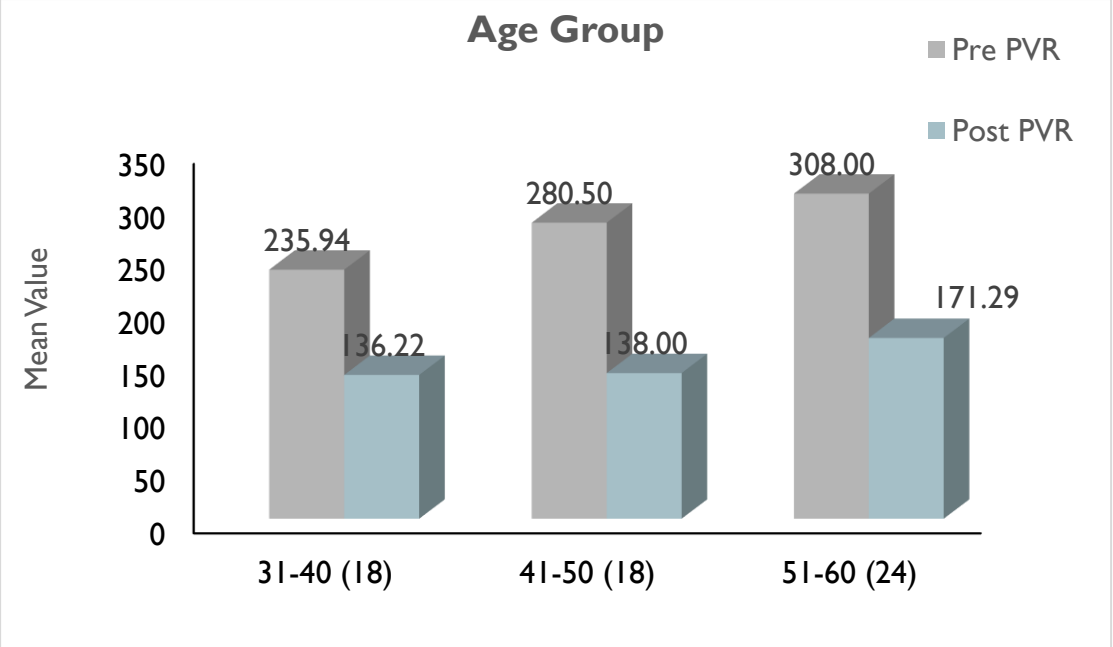


Table 10: Pre and Post Pad Weight Distribution in Group I Patients According to Age Distribution

	Pre Pad Weight		Post Pad Weight		
Age Group	**Mean**	**SD**	**Mean**	**SD**	**P value**
31-40 (11)	**23.82**	**10.35**	**14.18**	**7.89**	**<0.001 (HS)**
41-50 (7)	**35.71**	**7.99**	**19.21**	**4.68**	**<0.001 (HS)**
51-60 (12)	**32.58**	**8.67**	**22.29**	**7.63**	**<0.001 (HS)**
Total	**30.10**	**10.19**	**18.60**	**7.83**	**<0.001 (HS)**

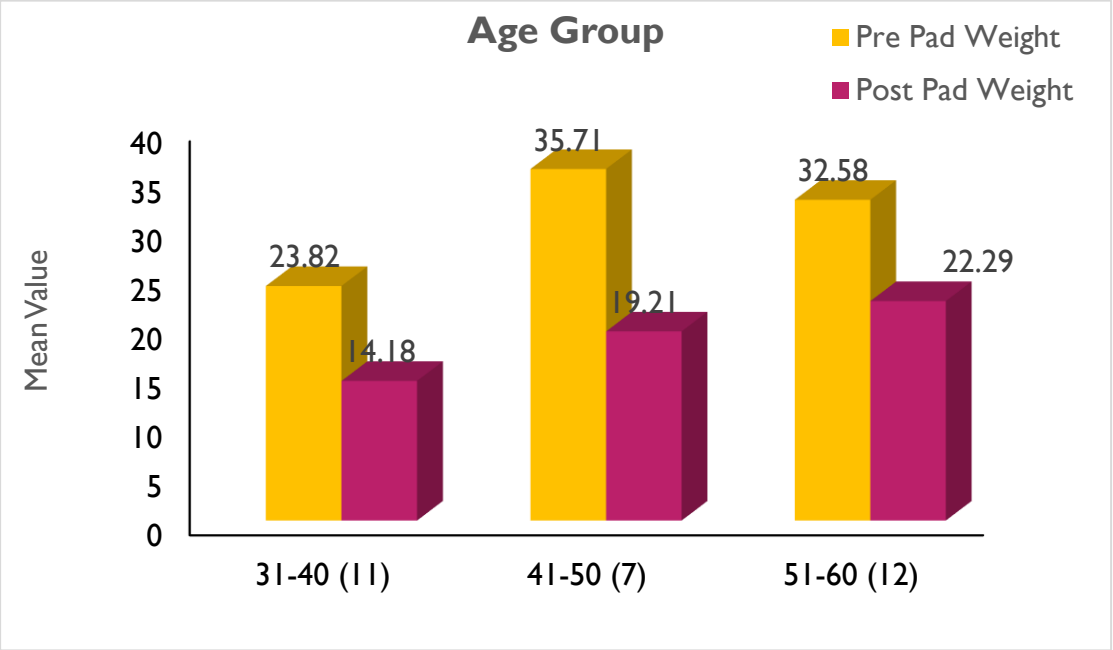


Table 11: Pre and Post Pad Weight Distribution in Group II Patients According to Age Distribution

	Pre Pad Weight		Post Pad Weight		
Age Group	**Mean**	**SD**	**Mean**	**SD**	**P value**
31-40 (7)	**25.00**	**8.82**	**5.29**	**2.06**	**<0.001 (HS)**
41-50 (11)	**28.94**	**10.43**	**6.91**	**2.78**	**<0.001 (HS)**
51-60 (12)	**37.04**	**9.60**	**9.38**	**5.80**	**<0.001 (HS)**
Total	**31.26**	**10.67**	**7.52**	**4.37**	**<0.001 (HS)**

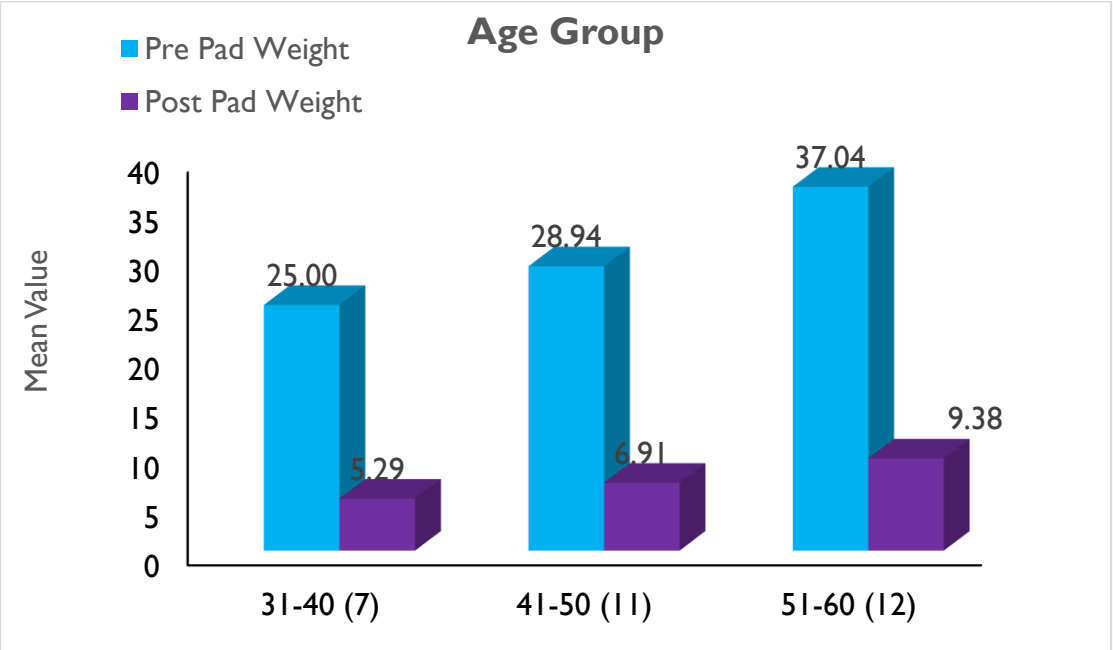


Table 12: Total Pre and Post Pad Weight Distribution According to Age Distribution

	Pre Pad Weight		Post Pad Weight		
Age Group	**Mean**	**SD**	**Mean**	**SD**	**P value**
31-40 (18)	**24.28**	**9.53**	**10.72**	**7.62**	**<0.001 (HS)**
41-50 (18)	**31.57**	**9.90**	**11.69**	**7.10**	**<0.001 (HS)**
51-60 (24)	**34.81**	**9.23**	**15.83**	**9.35**	**<0.001 (HS)**
Total	**30.68**	**10.36**	**13.06**	**8.41**	**<0.001 (HS)**

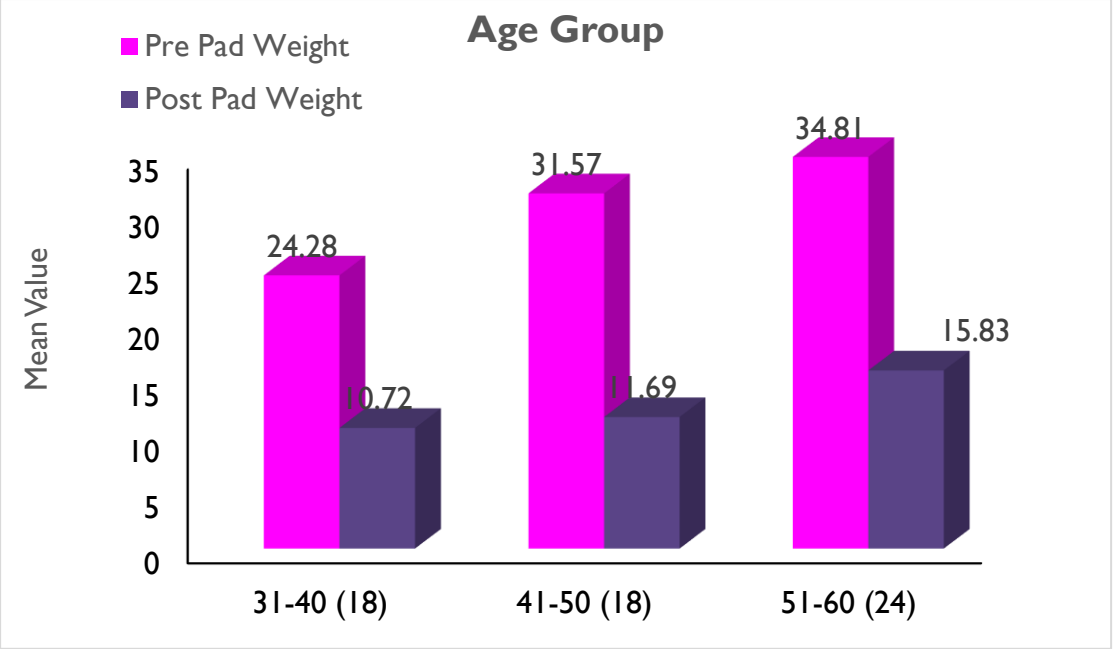


Table 13: Pre and Post Pad Weight Distribution in Group I Patients According to Occupation

	Pre Pad Weight		Post Pad Weight		
Occupation	**Mean**	**SD**	**Mean**	**SD**	**P value**
Business (1)	**31.00**	**-**	**16.00**	**-**	**NA**
Employed (10)	**27.20**	**11.42**	**15.75**	**11.10**	**0.035 (S)**
Housewife (17)	**32.59**	**9.83**	**21.03**	**5.12**	**0.000 (HS)**
Retired (2)	**23.00**	**0.00**	**13.50**	**2.83**	**0.042 (S)**
Total	**30.10**	**10.19**	**18.60**	**7.83**	**<0.001 (HS)**

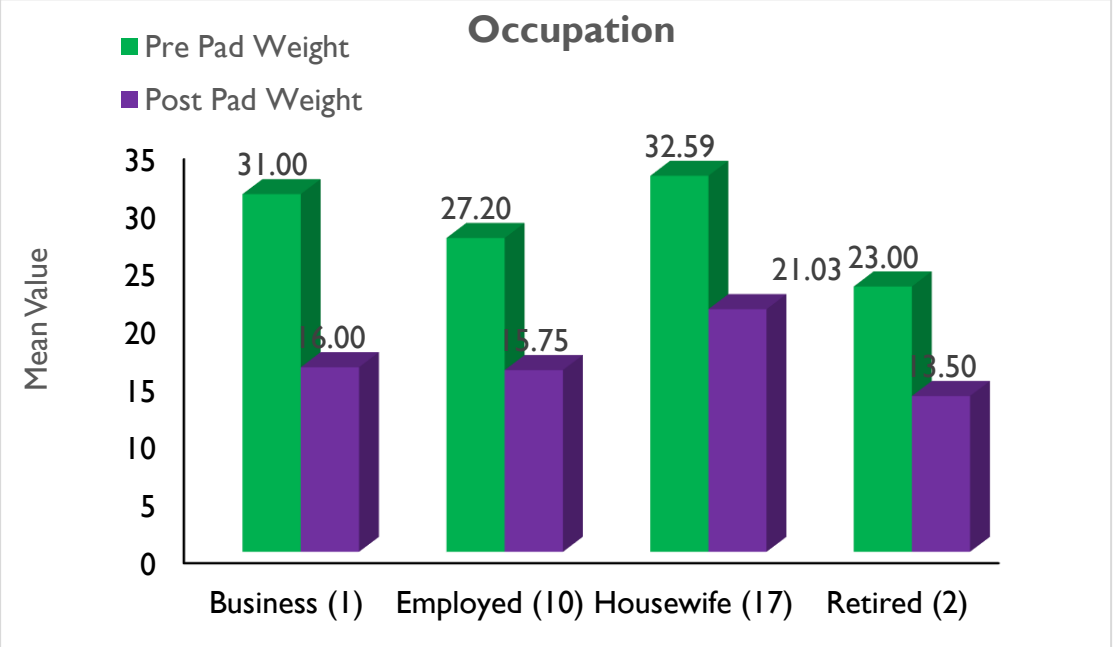


Table 14: Pre and Post Pad Weight Distribution in Group II Patients According to Occupation

	Pre Pad Weight		Post Pad Weight		
Occupation	**Mean**	**SD**	**Mean**	**SD**	**P value**
Business (2)	**26.50**	**4.24**	**12.00**	**11.31**	**0.232 (NS)**
Employed (5)	**22.30**	**9.72**	**7.00**	**4.06**	**0.012 (S)**
Housewife (23)	**33.62**	**10.29**	**7.24**	**3.79**	**0.000 (HS)**
Retired (0)	**-**	**-**	**-**	**-**	**-**
Total	**31.26**	**10.67**	**7.52**	**4.37**	**<0.001 (HS)**

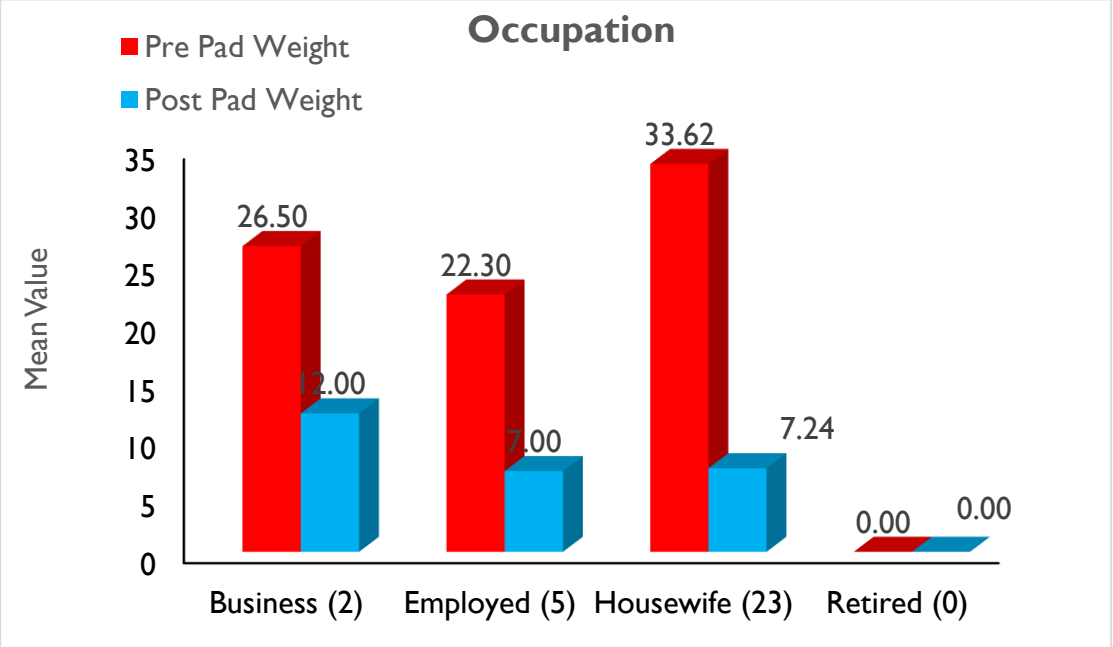
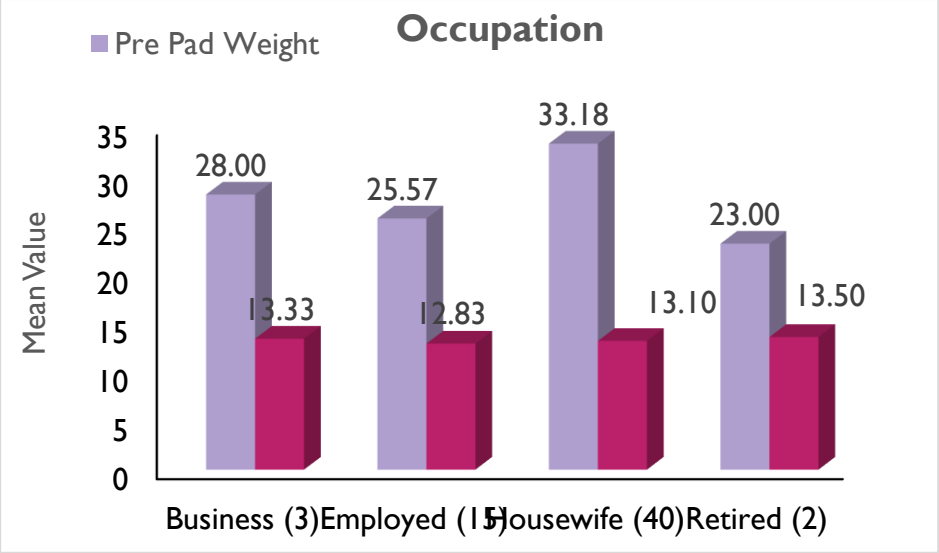


Table 15: Total Pre and Post Pad Weight Distribution According to Occupation

	Pre Pad Weight		Post Pad Weight		
Occupation	**Mean**	**SD**	**Mean**	**SD**	**P value**
Business (3)	**28.00**	**3.97**	**13.33**	**8.33**	**<0.001 (HS)**
Employed (15)	**25.57**	**10.79**	**12.83**	**10.10**	**<0.001 (HS)**
Housewife (40)	**33.18**	**9.98**	**13.10**	**8.15**	**<0.001 (HS)**
Retired (2)	**23.00**	**0.00**	**13.50**	**2.83**	**<0.001 (HS)**
Total	**30.68**	**10.36**	**13.06**	**8.41**	**<0.001 (HS)**



4. RESULTS

1. **Age-wise Distribution of Cases:**
   - The age distribution of patients in Group I and Group II shows that the highest proportion of cases in both groups falls within the 51-60 years age range (Group I: 40%, Group II: 40%). The age group 31-40 years had 30% of total cases, and 41-50 years accounted for 30%. The chi-square test revealed no significant difference in age distribution between the two groups (Chi = 1.78, p = 0.41, NS).
2. **Mean Age of Patients:**
   - The mean age of patients in Group I was 46.10 years (SD = 9.39), and in Group II, it was 47.40 years (SD = 8.25). The p-value (>0.05) indicates no significant difference in the mean age between the groups.
3. **Occupation-wise Distribution of Cases:**
   - In Group I, the majority of patients were housewives (56.67%), followed by employed individuals (33.33%). In Group II, the majority were housewives (76.67%), with employed individuals making up 16.67%. The chi-square test yielded no significant difference in occupation distribution (Chi = 4.90, p = 0.17, NS).
4. **Pre and Post PVR in Group I by Occupation:**
   - The pre and post-void residual (PVR) values showed a significant reduction in all occupation categories ($p < 0.01$ for employed, $p < 0.001$ for housewives, $p < 0.05$ for retired), with the total PVR decrease being highly significant ($p < 0.001$). The greatest decrease was observed in housewives, with a reduction from 292.18 mL to 202.50 mL.
5. **Pre and Post PVR in Group II by Occupation:**
   - Group II also showed significant reductions in PVR across all occupations, with housewives showing the most significant reduction ($p < 0.001$), from 293.65 mL to 115.52 mL. The total PVR decrease in Group II was also highly significant ($p < 0.001$).
6. **Total Pre and Post PVR Distribution by Occupation:**
   - Across both groups, significant reductions in PVR were observed in all occupations ($p < 0.001$). Housewives showed the highest decrease in PVR, from 293.03 mL to 151.21 mL.
7. **Pre and Post PVR by Age Group:**
   - In Group I, the PVR decreased significantly across all age groups ($p < 0.01$ for 31-40 years, $p < 0.001$ for 41-50 years and 51-60 years). Similarly, in Group II, significant reductions in PVR were noted across all age groups ($p < 0.001$ for all). The total PVR decrease was highly significant in both groups ($p < 0.001$).
8. **Pre and Post Pad Weight by Age Group:**
   - Both Group I and Group II showed significant reductions in pad weight across all age groups ($p < 0.001$),

indicating improved outcomes after intervention. In Group I, the total pre-pad weight was 30.10 g, which decreased to 18.60 g ($p < 0.001$). In Group II, the total pre-pad weight was 31.26 g, which decreased to 7.52 g ($p < 0.001$).

9. **Pre and Post Pad Weight in Group I by Occupation:**
    - Significant reductions in pad weight were observed in all occupations in Group I ($p < 0.05$ for employed and retired, $p < 0.001$ for housewives). Housewives showed the greatest decrease in pad weight, from 32.59 g to 21.03 g.
10. **Pre and Post Pad Weight in Group II by Occupation:**
    - Significant reductions in pad weight were also observed in Group II ($p < 0.01$ for employed, $p < 0.001$ for housewives). Housewives in Group II showed the most significant reduction in pad weight, from 33.62 g to 7.24 g.
11. **Total Pre and Post Pad Weight by Occupation:**
    - Significant reductions in pad weight were observed in all occupations across both groups ($p < 0.001$). Housewives demonstrated the greatest decrease in pad weight, from 33.18 g to 13.10 g
    - groups ($p < 0.001$), particularly in housewives.

We used the pad test but because of the different geography and climates it affects drying and soaking capacity, we added ultrasonography to the technique for a more objective result. Additionaly, it was seen that the bladder's overall capacity increased after the session (the primary goal of the ultrasonography is to improve future results by improving the contractility of the bladder muscles).

5. DISCUSSION

Urinary incontinence (UI) is a prevalent condition characterized by the involuntary leakage of urine, with various subtypes, including stress, urge, mixed, overflow, and functional incontinence. Stress urinary incontinence (SUI) often results from weakened pelvic floor muscles, commonly seen in women post-childbirth or during physical exertion. Urge urinary incontinence (UUI) is associated with detrusor overactivity, leading to a sudden, intense need to urinate. Mixed incontinence combines features of both SUI and UUI, while overflow incontinence occurs due to bladder outlet obstruction or impaired detrusor contractility, often linked to neurological conditions or benign prostatic hyperplasia in men. Functional incontinence arises from environmental or physical barriers that hinder timely access to a toilet.[xii]

Pelvic floor dysfunction (PFD) plays a significant role in the development of UI, encompassing a range of symptoms and anatomical changes due to muscle weakness, hypertonicity, or improper coordination. The pelvic floor's anatomy, primarily composed of the levator ani group (puborectalis, pubococcygeus, iliococcygeus), provides structural support and facilitates urinary and fecal continence. Dysfunctional pelvic floor muscles can lead to conditions like pelvic organ prolapse (POP), characterized by the descent of pelvic organs into the vaginal canal, causing discomfort and urinary issues.[xiii]

Research highlights the efficacy of pelvic floor muscle exercises (PFME) in managing SUI and mixed incontinence. Supervised PFME programs show better outcomes compared to unsupervised ones, with cure rates ranging from 16% to 27% and improvement rates from 48% to 80.7%. Age does not significantly impact the effectiveness of PFME, suggesting its applicability across different age groups.[xiv]

Furthermore, emerging studies explore the intricate connections between the jaw and pelvis through fascial lines and craniosacral biomechanics. These connections suggest that emotional stress and physical tension in the jaw can influence pelvic floor tension or vice versa, potentially contributing to UI and PFD. This highlights the importance of holistic approaches in managing UI, considering both physical and emotional health.

Overall, understanding the complex interplay between pelvic floor anatomy, neurological control, and emotional factors is crucial for effective prevention and management of urinary incontinence.

In the previous studies or protocol for pelvic floor rehabilitation is not addressing the real time lacunas and not also been considering the psychosomatic involvement along with secondary physiological dysfunction which is causing a loop and also the traditional exercises for pelvic floor are tough to achieve the optimum result outcomes. The exercises which have been in practice is ironically suggesting the problem which is suffering by sufferer like suggesting holding in between stream during micturition it is ill practical because already he/she is suffering with urinary incontinence.

Same as the exercises which is having too many of instructions followed by steps. The first issue is communication barrier of the terminology along with the idea of area which is explained by therapist because language barrier, literacy and variance in rural & urban population, secondly the exercises required assistance and supervision is required which is again practically not possible for proper rehabilitation outcomes.

In conclusive, the practical method of exercise is also not in a functional position that is necessary to fill the real-time application result for the same, which makes it inconclusive. It is as if we are teaching separate subjects and expecting explanations of different subjects. Overall, understanding the complex interplay between pelvic floor anatomy, neurological control, and emotional factors is crucial for effective prevention and management of urinary incontinence.

6. CONCLUSION

This study clarifies the connection between jaw and pelvis along with breathing by clearly showing significant changes in **GROUP 2.** Integration of techniques which focuses on the body as a whole simultaneously putting emphasis on the physical nutritional and emotional aspects will always be a better approach. Embryological connections can be used as a guide to navigate in future studies. As **K-CAT concept** exercises are proven to be effective in managing **Urinary Incontinence** significantly with lesser effort and a greater reduction is seen in time taken to achieve the same goal with conventional physiotherapy exercises. Thus, one of the many benefits of K-CAT over traditional intervention is its simplicity. It is functional and requires no equipment. The patient is capable of performing exercises on their own without much dependence on the therapist. Future studies are needed to study more deeper connections which will help in managing the condition more precisely and efficiently.

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