

[INSTRUMENT REVIEW]**Perineometer– An Equipment used for measuring the Strength of Voluntary Contractions of the Pelvic Floor Muscles- A Review****Dr. Shyam D. Ganvir (PT)¹, Dr Aboli Deshmukh (PT)²**¹Prof &HOD, 2Ph.D. Scholar, Department of Community Physiotherapy, D.V.V.P.F's College of Physiotherapy, Ahmednagar**ABSTRACT :**

Pelvic floor dysfunction is an umbrella term used collectively for disorders like, Urinary Incontinence, Pelvic Organ Prolapse, and Urgency etc. There are many evaluation and treatment tools available for pelvic floor muscle function assessment. The purpose of this review was to know the effectiveness and usage of perineometer for the evaluation and treatment of pelvic floor dysfunction in women, with a particular focus on the usage of this equipment in current clinical practice. Following electronic databases were searched- Pub Med, Google scholar and Cochrane Search Terms used were- Perineometer, pressure manometer, pelvic floor muscle trainer, clinical application

Method and Methodology- Inclusion criteria- Study used Perineometer as evaluation or treatment method for any form of pelvic floor dysfunction in female population, Full text articles, – case study, case control study, cross sectional, RCTs paper published within period of 2000-2022 were analyzed for this review. Articles in languages other than English were excluded.

Conclusion: Perineometer is an ineffective tool for evaluation and treatment of pelvic floor dysfunction but its usage in clinical practice needs to be enhanced for better objectivity of evaluation and treatment.

Keywords: Perineometer, pressure manometer, pelvic floor muscle trainer, Physical therapy.

Background :

Pelvic floor dysfunction is a wide term which includes many disorders such as Urinary incontinence, prolapse, urgency etc.⁽¹⁾ Pelvic floor dysfunction prevalence is about 9%-72% from the women aged 17 years to 79 years. And 27.3 % women experience minimum one pelvic floor dysfunction.⁽²⁾ There are many factors responsible for dysfunction like, Pregnancy, Labor 2nd stage, perineal Trauma, genetic factors, age, obesity, altered pelvic floor muscle function.etc.⁽³⁾ Among all these, lack of pelvic floor muscle strength and endurance contributes to greater extent. An important role of the pelvic floor muscles (PFM) is to maintain urine continence and support the pelvic organs.⁽⁴⁾ Determining pelvic-floor muscle (PFM) strength and endurance is necessary for correct

evaluation, effective treatment and appropriate feedback to the patient.

Voluntary PFM contraction is evaluated by assessing pelvic floor elevation, muscle strength, endurance, and coordination. Vaginal pressure measurement is a commonly used quantitative evaluation to measure PFM strength.⁽⁵⁾ It is also used as a teaching tool and as motivation for conducting training exercises.⁽⁶⁾

Pelvic floor muscle training has been part of rehabilitation protocol in Chinese Taoism for over 6000 years (Chang 1984).⁽⁷⁾ In modern medicine it got inculcated in 1936. Pelvic floor rehabilitation includes behavioral modifications and advice on everyday life hygiene, intravaginal manual re-education, strengthening exercises for pelvic floor muscles (SEPFM), electrical stimulation, biofeedback and vaginal cone.

*Corresponding author

Dr. Shyam D. Ganvir(PT)

E-mail: shyam.ganvir@gmail.com

D.V.V.P.F's College of Physiotherapy, Ahmednagar

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Active exercises include SEPFM, intravaginal manual reeducation, vaginal cones and biofeedback, while passive exercise refers to electrical stimulation.⁽⁸⁾ PFMT as a prevention and treatment method for urinary and fecal incontinence was established in the British physiotherapy profession (Morris 1936) where a paper describing tensing and relaxing of the pelvic floor muscles got published.⁽⁹⁾ Pelvic floor muscle training program has various methods and equipment for evaluation and treatment of Pelvic floor dysfunction.[10] There are methods like digital palpation, observation, vaginal assessment, assessment using perineometer, assessment using Surface EMG, Vaginal cones etc.

PFMT as a treatment method was introduced in the mid-1900s when Arnold Kegel -a gynecologist noted the successful treatment of 64 cases of female Stress Urinary Incontinence, using pelvic floor muscle exercises with a pressure biofeedback perineometer (Kegel 1948).⁽¹¹⁾ Perineometer has been documented as a tool of assessment as well as treatment. Perineometry is a valid strength training device which measures accurate results for strength of pelvic floor muscles and also can be used as an assistive device for improving pelvic floor muscle strength.⁽¹²⁾

The purpose of this review was to assess the effectiveness and usage of perineometer for the treatment of pelvic floor dysfunction in women, with a particular focus on the usage of this equipment in current clinical practice.

Method and Methodology:

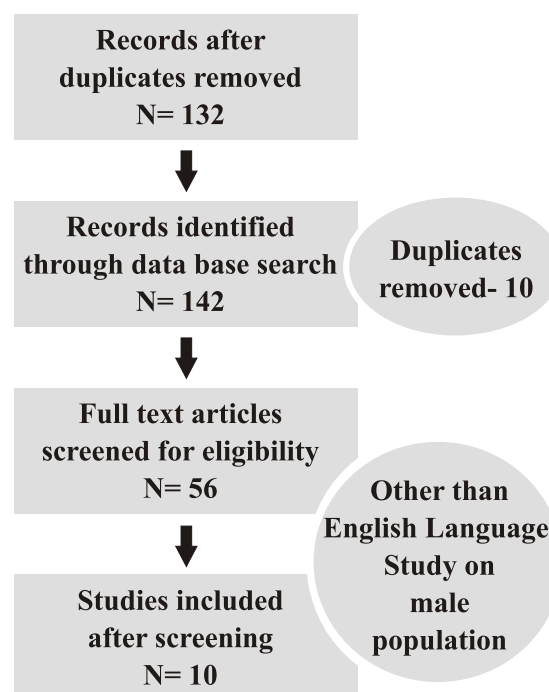
Literature search-

- Search engines: Pub Med, Google scholar, Cochrane
- Search Strategy- Boolean terms- 'AND' 'OR'
- Keywords- Perineometer, pressure manometer, pelvic floor muscle trainer, physical therapy
- Inclusion and exclusion criteria:
- Types of studies- case study, case control, cross sectional, RCT

Languages- English

Time period- 2000-2022

Flow chart-



Discussion

Pelvic floor muscles have basic functions as Contraction and inward-upward lift. PFMT program involves evaluation and treatment of PFM strength and endurance and functions.

There are many health care workers who still practice verbal commands as a method of choice for evaluation and treatment of PFM.

Verbal commands only- It does not give good biofeedback, women if done wrong can lead to more straining of PFM, women may breath hold, may use compensatory muscle groups for activation of PFM, it is difficult with verbal commands to differentiate between PFM, Gluteal muscle, Abdominal core muscles etc. so such type of practice should not be encouraged for further practice in this field to yield effective rehabilitation outcomes.

Through this review we summarized most commonly available method of evaluation and treatment methods and noted down its scope and limitation.

Method of assessment	PFM Functions assessed	PFM Functions cannot be assessed
Clinical observation	Only contraction	Lift and quantitative measurements
Digital Palpation	Only contraction	Strength, endurance quantitatively
Ultrasound/MRI	Contraction and lift	Strength, endurance and high sensitivity to use
Surface EMG	Electrical Activity	Quantification of strength and endurance
Manual muscle test, Vaginal palpation	Qualitative grade	Quantification
Perineometer	Force, Strength, Endurance	Responsiveness
Vaginal cones	Strength	Less evidence based

From the table above it puts our attention towards use of perineometer as a method of evaluation and tool for treatment purpose.

Perineometer⁽¹³⁾

Method of Use-

1. Pressure probe should be different for each individual. Probe sensor should be placed 3.5 cm inside the vagina where it co-insides with PFM bulk.
2. It has 2 programs-Manual and Pre-set depending upon the requirements of rehabilitation program.
3. Patient should be made familiar with the readings display. For treatment purpose it can be used in different functional positions.
4. Lubricating gel can be applied on probe for easy insertion. Maintain hygiene before and after the use.

Advantages-

1. Perineometer has good reliability and validity for clinical use. It is an objective method of evaluation as compared to all other methods of pelvic floor evaluation and treatment.
2. It is cheaper than other equipment available and more handy to use. Till date it is been concluded as a reliable and valid tool.
3. It gives more objective outcomes and hence provided motivation to the patient to do better.
4. Patient can use the tool by themselves once understood its application.

Limitations-

1. It is still not been used frequently by the health care practitioner due to lack of knowledge of its

application part and willingness of patients to get evaluated per vaginally.

2. It may have errors if it is not been placed 3.5cm inside the vagina where pelvic floor muscle (levator Ani) bulk is present.

Precautions-

1. Practitioner needs to take hygiene precautions for the use to avoid any infections. It should be taught to the patient for visual feedback.
2. Health care worker should have thorough knowledge of pelvic floor anatomy and palpation methods for correct evaluation and guidance.

Barriers in Clinical Practice to use Perineometer-

1. Lack of knowledge of female pelvic floor anatomy
2. Ignorance towards more objective evaluation and treatment methods in practice
3. Willingness of therapist and patient to assess per vaginally.
4. More emphasis on hygiene as compared to other methods of evaluation and treatment.

Conclusion

This review concludes that Perineometer is an effective tool for evaluation and treatment of pelvic floor dysfunction but use in clinical practice needs to be enhanced for better objectivity of evaluation and treatment.

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