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Correlation between electromyography and perineometry in evaluating pelvic floor muscle function in nulligravidas: A cross-sectional study

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Objective: To correlate the results of electromyography and perineometry in the assessment of PFM function in nulligravidas.

Methods: The cross-sectional observational study was approved by the internal review board of the Instituto de Medicina Integral Prof. Fernando Figueira (IMIP) and was conducted in the Instituto Paraibano de Pesquisa Professor Joaquim Amorim Neto (IPESQ). Thirty-eight nulligravidas aged 18-39 years of age, who had already initiated their sexual life, participated in the study. Exclusion criteria consisted of the presence of genital prolapse, a history of pelvic or urogenital surgery and the presence of neurological disease producing muscle disorders. For the evaluation procedure, the women were submitted to a clinical evaluation of the pelvic floor muscles followed by electromyography. Perineometry was performed 72 h later. Prior to electromyography and perineometry, the women were given standardized training with electromyographic biofeedback to teach them to contract only their pelvic floor muscles.

Results: A highly positive, statistically significant correlation ($r = 0.968$; $P < 0.001$) was found between the electromyographic and perineometric findings.

Conclusions: A strong correlation was found between perineometric and electromyographic findings of pelvic floor muscle function.

KEYWORDS
electromyography, manometer, nulliparous women, pelvic floor muscles

1 | INTRODUCTION

The pelvic floor muscles (PFM), in conjunction with the ligaments and fascia, play a role in sphincter control and sexual function and support the pelvic organs. Contracting the pelvic floor muscles elevates and occludes all the soft tissues of the pelvic floor and closes the pelvic openings.[1]

Various methods are used to evaluate pelvic floor muscle function and diagnose genitourinary and anal tract dysfunction, including vaginal digital palpation, ultrasonography,

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magnetic resonance imaging, perineometry, electromyography, and urodynamic studies.[2,3]

Surface electromyography is a reliable method for evaluating pelvic floor muscle function in healthy women women[4] and provides valuable information for the diagnosis and treatment of PFM dysfunction.[5] This technique is able to capture the sum of all the motor unit action potentials.[6] A greater number of activated motor units is indicative of greater muscle strength.[7,8]

Intravaginal pressure (IVP) can be evaluated using a perineometer (with pressure biofeedback). This is a simple instrument that objectively measures pelvic floor muscle pressure. Together with vaginal digital palpation, this technique is widely used in clinical practice.[1,3,9,10] It is often used in clinical trials and some authors show that is a reliable measurement method.[1,2,7] Nevertheless, studies conducted with manometers have raised doubts with respect to whether the desired parameter alone is being measured,[11] as intra-abdominal pressure may affect the recording of IVP.[12,13]

There are studies that have evaluated the relationship between some PFM evaluation methods. However, the studies used only the verbal command to request the contraction of these muscles[14,15] and some women cannot contract the PFM singly, only with the verbal instruction, associating with the contraction of accessory muscles.[14] As the intensity of PFM contraction may be influenced by the increase in intra-abdominal pressure and the action of other muscle groups, it is important to evaluate the PFM activity, dissociating from the contraction of accessory muscles.

Surface electromyography records the electromyographic activity of the muscles in a sensitive and thorough way, allowing the record of the activity of other muscles simultaneously. However, the electromyographic evaluation presents a high cost, compared to other forms of evaluation, besides requiring more sophisticated equipment and the need to be performed by specialists. Therefore, it is necessary to know if other forms of evaluation may represent the PFM activity evaluation recorded through electromyography, using a systematized method for evaluation.

The objective of this study was, therefore, to correlate electromyographic and perineometric data in the evaluation of pelvic floor muscle function in nulligravidas.

2 | METHODS

This cross-sectional, observational study was conducted in the Instituto Paraibano de Pesquisa Professor Joaquim Amorim Neto in the city of Campina Grande, Paraíba, Brazil. A total of 38 nulligravid women of 18-39 years of age, who had already initiated their sexual life, participated in the study. Exclusion criteria consisted of the presence of genital prolapse, urogenital infection, a history of pelvic or urogenital surgery, intolerance of condom and the presence of neurological disease producing muscle disorders. The study was approved by the internal review board of the Instituto de Medicina Integral Prof. Fernando Figueira (IMIP) (CAAE 02808612.0.0000.5201). All the participants voluntarily agreed to participate in the study and signed an informed consent form prior to admission.

Sample size was calculated using the freely available "R" statistical software program, version 3.0.1 (Institute for Statistics and Mathematics, Wirtschafts Universität, Wien, Austria). Considering an alpha error of 5% and a beta error of 80% with an "r" obtained from the first 30 cases for the correlation between intravaginal electromyography and perineometry, 33 women would be required to calculate this correlation. This number was increased to 38 to compensate for any possible losses.

The variables evaluated were: the women's biological characteristics (age, height, weight, body mass index), social characteristics (occupation, marital status), lifestyle habits (smoking, alcohol intake, and practice of physical activity), the characteristics of their sexual life, the clinical characteristics of the pelvic floor muscles (digital vaginal evaluation), and the perineometric and electromyographic activity of the pelvic floor muscles.

Data were collected at two different moments with an interval of 72 h between them. At the first evaluation moment, the participants answered a questionnaire on their biological and social characteristics, their lifestyle habits and the characteristics of their sexual life. Next, they were submitted to clinical evaluation of the pelvic floor and then to electromyography. The second data collection moment occurred 3 days later when perineometry was carried out. The electromyographic and perineometric evaluations were performed by the same evaluator in all cases and always at the same time of the day.

The electromyographic signal was acquired in accordance with the recommendations of the International Society of Electrophysiology and Kinesiology.[16] The electromyography device used in this study was the Miotool 400 USB (Miotec, Porto Alegre, Rio Grande do Sul, Brazil), with 14-bit resolution, four analogic input channels, a sampling frequency rate fixed at 2000 Hz, gain of 400 in all the channels, safety isolation for 3000 volts and common mode rejection ratio (CMRR) of 110 dB. The signal was filtered using a 10-500 Hz dual-pass Butterworth second order digital filter. To process the electromyographic signal, the software package Miograph 2.0 (Miotec, Porto Alegre, Brasil) was used, which is capable of processing the raw signal in the time domain using the root mean square (RMS) and the normalized RMS (%RMS) values and the median frequency (MF). A reference electrode (ground electrode) was used to reduce noise when obtaining the electromyographic signal.

Following the digital filter process, the raw signal was normalized using the automatic mean RMS values obtained from maximum voluntary electrical activity (MVEA) in 5 s triplicates with 10 s rest between them in windows of 1 000 ms (Hamming window). Normalization was performed in accordance with the maximum value obtained during the protocol. The device-patient interface consisted of disposable, circular Ag/AgCl electrodes (silver/silver chloride) (Meditrace Kendall 200, Conviden, Mansfield, EUA) of 10 mm in diameter using conductive hydrogel and a plastic Miotec electromyographic transducer with metal plates. An active interface consisting of a reference cable (ground wire) and differential surface sensors with a ring connection (SDS500) was used to establish contact between the electrodes and the electromyography device.

Perineometry was conducted using a Perina Stim perineometer (Quarck, Piracicaba, São Paulo, Brazil). This device consists of a vaginal probe covered with a thick latex sheath held in place by rubber bands. A non-lubricated condom was placed over the probe, which was then introduced into the vagina and gently inflated until the patient reported feeling the contact of the probe against the vaginal wall and before she reported any sensation of pain. Next, the evaluator pressed the "zero" key to reset the device and variations in pelvic floor muscle pressure were displayed on a linear pressure scale represented by a luminous light-emitting diode (LED) scale.

For the digital vaginal evaluation, the examiner, using a previously lubricated medical examination glove, introduced her second and third fingers 2-3 cm into the vaginal canal. Next, the participant was instructed to contract only the pelvic floor muscles, and the intensity of the contraction was classified as absent, weak, moderate or strong, according to Messelink et al.[17]

Participant in the supine position with flexed hips and knees, with feet resting on the table, pubic hair was removed from the vulval/perineal area, and the skin was cleaned with alcohol immediately prior to the electrodes being placed on the skin surface.The adhesive electrodes were attached to the right rectus abdominis muscle, the adductor muscle of the right thigh and the right surface region of the perineumin accordance with the sites proposed by Criswell[18] (Figure 1):

- Rectus abdominis muscle: the electrodes were placed parallel to the muscle fibers, approximately 2 cm laterally from the umbilical scar.
- Adductor muscle of the thigh: the electrodes were placed at an oblique angle on the medial aspect of the thigh, 4 cm from the pubis. The muscle was palpated while the patient performed isometric contractions of hip adduction.
- Perineal muscle: the electrodes were placed on the vaginal labia, longitudinally to the vulva, along the rim of the vaginal canal.

After the adhesive electrodes were placed in position, the electromyographic probe was inserted into the vagina (Figure 1) using lubricating gel. The reference electrode was placed on the right malleolus.

Prior to recording myoelectrical activity, training with electromyographic biofeedback was provided to teach the participant to contract her pelvic floor muscles alone. The women were asked to carry out two series of six contractions of the pelvic floor muscles, each contraction lasting for 5 s with a 10 s resting period between them. In the first series, the first three contractions were performed using the pelvic floor muscles and the adductor muscles simultaneously. Another three contractions were then performed, this time using only the pelvic floor muscles. In the second series, the initial three contractions were performed using the pelvic floor muscles and the abdominal muscles simultaneously, after which another three contractions were performed using only the pelvic floor muscles.

The participant was instructed to contract the pelvic floor muscles by pressing the vaginal walls and pulling inside. For contraction of the adductor muscles during training, it was asked the adduction movement against a resistance offered by the evaluator, being held isometric contraction of the adductor muscles. For the abdominal muscles, the participant should raise the trunk to eliminate contact of the lower angle of the

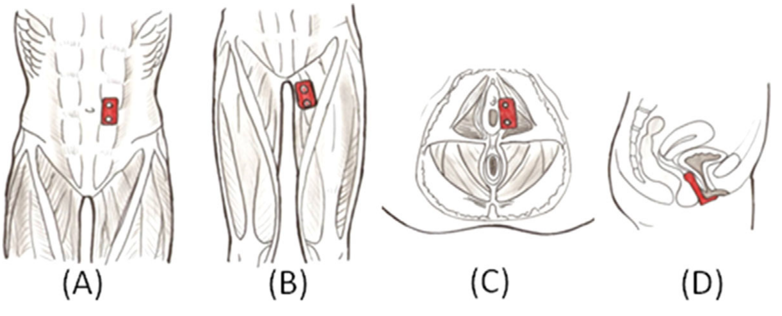

FIGURE 1 Electromyographic electrode placement for the (A) rectus abdominis muscle; B, adductor muscle of the thigh; C, perineum muscle; and D, the electromyographic probe inserted into the vagina

scapula with the table, remaining in that position for the isometric contraction of the abdominal muscles.

Electromyographic activity was recorded 5 min after training was complete, with each woman being asked to perform three maximal voluntary pelvic floor muscle contractions in succession at a verbal command from the investigator. Each contraction lasted for 5 s, with a 10 s resting period between them. The electromyographic activity of the pelvic floor muscles was recorded using the vaginal probe (PFM_{INT}) and using a surface electrode situated externally on the surface region of the perineum (PFM_{EXT}).

Three days later, the participant returned to the research center and was placed in the same position (supine position, with her knees and hips flexed). The adhesive electrodes were placed in position and the electromyographic probe was inserted to repeat the training protocol applied at the initial evaluation. After training was complete, pelvic floor muscle pressure was then evaluated by perineometry. For that, the electromyographic probe was removed immediately following training and the manometry probe was inserted. The probe was inflated up to the comfort limit reported by the patient. The device was reset by pressing the "zero" key and the participant was then asked to perform three maximal voluntary pelvic floor muscle contractions in succession following a verbal command from the investigator. The correct perineal contraction was confirmed based on the visual observation of the perineum and the probe's movement. Each contraction lasted for 5 s, with a 10 s resting period between them. To analyze the results we used the average of the three pelvic floor muscle contractions.

Statistical analysis was performed using the SPSS statistical software package, version 20. The Shapiro-Wilk test was used to assess the normal distribution of the perineometric and electromyographic findings of the pelvic floor muscles. Levene's test evaluated the homogeneity the electromyographic registers from the four channels of the electromyography device. Since the variances differed between the groups and distribution was not normal, medians were used, together with the ranges and interquartile intervals (IQI), to describe the perineometric and electromyographic findings of the pelvic floor muscles.

The Kruskal-Wallis nonparametric test, followed by Dunn's post hoc test, was used to evaluate differences between the groups. Spearman's correlation coefficient was used to determine the degree of correlation between the perineometric and electromyographic findings.

3 | RESULTS

The study sample consisted of 38 nulligravidas women with a mean age of 23.9 ± 3.2 years, mean weight of 62.1 ± 8.3 kg, mean height of 1.63 ± 0.1 m and mean body mass index (BMI) of 23.2 ± 2.2 kg/m^2.The majority of the participants (65.7%) were university students, while the remaining 34.3% had already graduated from university. In this sample, 94.7% were single and 5.3% married. In relation to lifestyle habits, none of the participants smoked, 21.1% drank alcohol and 42.1% practiced physical exercise.

All the participants had already initiated their sexual life; however, 15.7% were currently sexually inactive. In addition, 21.1% reported dyspareunia and 7.9% reported leaking urine during sexual intercourse. At physical evaluation, pelvic floor muscle contractions were present in all the participants in the sample and at digital palpation the majority of the participants (84.2%) had moderate and strong contraction. The data on pelvic floor muscle function showed heterogeneity (Table 1).

Dunn's post hoc test revealed no statistically significant differences between the contraction of internal and external pelvic floor muscles or between the rectus abdominis or adductor muscles (P refers to the critical value of $Q = 3.588$, $\alpha = 0.001$, $k = 4$). Nevertheless, statistically significant differences were found between the pelvic floor electromyographic activity (internally and externally captured) and the accessory muscles (rectus abdominis and adductor). The pelvic floor muscles were thus considered responsible for the contractions detected by electromyography (Figure 2). A very strong positive and statistically significant correlation was found between the perineometric and electromyographic data ($r = 0.968$; $P < 0.001$) (Table 2, Figure 3).

TABLE 1 Perineometric and electromyographic evaluation of pelvic floor muscles

	Pressure (cmH_2O)	RMS_EMG PFM_{INT} (%)	RMS_EMG PFM_{EXT} (%)	RMS_EMG RAM (%)	RMS_EMG AD (%)
Median	16.5	57.9	65.3	38.8	38.4
Minimum value	5.0	42.1	45.5	34.1	31.3
Maximum value	31.0	80.0	87.5	47.6	78.1
IQI	10.2	20.6	12.5	2.7	4.6

RMS, root mean square; PFM_{INT}, internal pelvic floor muscle; PFM_{EXT}, external pelvic floor muscle; RAM, rectus abdominis muscle; AD, adductor muscle of the thigh; IQI, interquartile intervals.

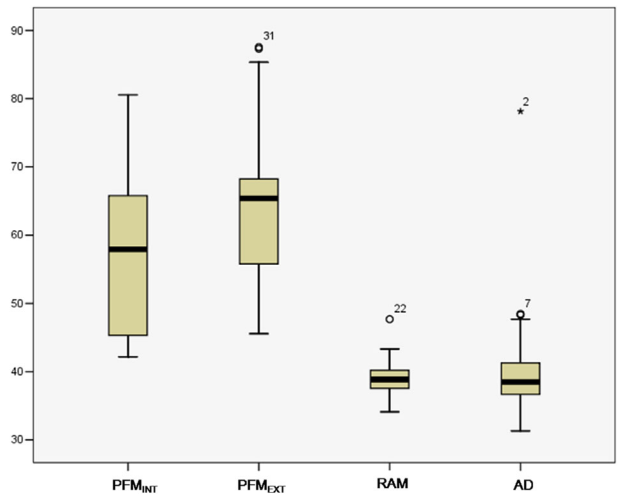

FIGURE 2 Electromyographic record in internal pelvic floor muscles (PFMINT), perineum muscle (PFMEXT), rectus abdominis (RAM), and adductor muscle (AD)

4 | DISCUSSION

These results show a strong correlation ($r = 0.968$) between the perineometric and electromyographic findings in the functional evaluation of the pelvic floor muscles, following appropriate training. It is, therefore, reasonable to affirm that 93% (0.968^2) of the variation in pelvic floor muscle pressure is explained by the variation in the electromyographic activity of these muscles.

Various studies conducted to evaluate pelvic floor muscle function compared or established an association between vaginal digital evaluation and perineal pressure evaluation with the use of a perineometer,[2,3,11,19–22] while other studies have compared vaginal digital palpation with electromyographic evaluation[7,23] and still there are some studies that related the digital palpation, IVP, electromyography, and ultrasonography.[14,15] According to a search of the existing literature (*PubMed/MEDLINE* 1966-2016; *Lilacs/SciELO* 1982-2016; *CINHAL* 1976-2016; *Cochrane* 1993-2016), this is the first study to investigate primarily the correlation between electromyography and perineometry for pelvic floor muscle evaluation, through devices available in clinical practice, using a systematized method to promote the dissociation of the accessory muscles during the evaluation of the PFM activity in the researched sample.

A study that had the main objective to assess the synergistic action of pelvic floor and abdominal muscles, secondarily showed the relationship between the variation of pressure with the vaginal electromyographic activity of pelvic floor muscle. In this study, the probe used was adapted, and registered the pressure variation of pelvic floor muscle and EMG simultaneously. It was found that the EMG signal began to increase when the lower vaginal pressure reached 43% of its maximum and found a correlation ($r^2 = 0.4163$) between the electromyographic evaluation of PFM and lower vaginal pressure.[24] It was not possible to find this type of correlation in the current study,

TABLE 2 Correlation between electromyographic and perineometrics findings the PFM

		Pressure (cmH_2O)	RMS_EMG PFM_{INT}(%)	RMS_EMG PFM_{EXT}(%)	RMS_EMG RAM (%)	RMS_EMG AD (%)
Pressure (cmH_2O)						
	r	1.000	0.968*	0.903*	0.305	−0,007
	Sig.		0.000	0.000	0.062	0.967
RMS_EMG PFM_{INT} (%)						
	r	0.968*	1.000	0.896*	0.300	−0.008
	Sig.	0.000		0.000	0.068	0.960
RMS_EMG PFM_{EXT} (%)						
	r	0.903*	0.896*	1.000	0.228	0.044
	Sig.	0.000	0.000		0.168	0.795
RMS_EMG RAM (%)						
	r	0.305	0.300	0.228	1.000	0.047
	Sig.	0.062	0.068	0.168		0.779
RMS_EMG AD (%)						
	r	−0.007	−0.008	0.044	0.047	1.000
	Sig.	0.967	0.960	0.795	0.779	

PFM_{INT}, internal pelvic floor muscle; PFM_{EXT}, external pelvic floor muscle; RAM, eectus abdominis muscle; AD, adductor muscle of the thigh.
*Correlation significant at 0.01 level.

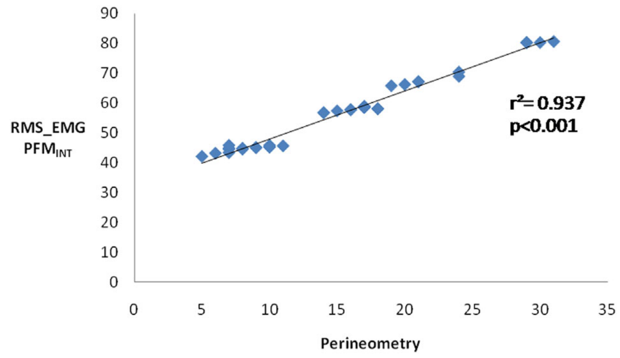

FIGURE 3 Correlation between electromyographic and perineometrics findings the PFM (PFMINT)

as the electromyography and the perineometry were evaluated separatedly, as it happens in the clinical practice.

There are studies that evaluated the relationship between various methods of PFM evaluation (vaginal palpation, IVP, electromyography, and ultrasonography), they used the verbal command to request and record the contraction of pelvic floor muscles, finding a moderate correlation between electromyography and perineometry.[14,15] It is known that only verbal instruction does not improve the ability to perform adequate contractions of the PFM[25] and some women cannot contract the PFM singly, associating it with the contraction of accessory muscles.[14] Due to this, our study conducted a training with electromyographic biofeedback so that the participants could dissociate the contraction of the PFM from other accessory muscles, thus evaluating the contraction of the PFM themselves, both in electromyography and perineometry.

In a study conducted with 206 nulliparous women in early pregnancy, it was found that around half were unable to satisfactorily contract their pelvic floor muscles without prior instructions.[26] Similar results were reported in another study with 125 participants, with examination showing that less than a quarter of the women were able to contract their muscles adequately.[25] Therefore, the type of training provided in this study is important and highlights the careful methodology required to measure the electrical activity of the pelvic floor muscles.

The data presented in our study show that the electrical activity of pelvic floor muscles was higher compared to the accessory muscles evaluated (rectus abdominis and adductor thigh) regardless of the form of signal capture (internal or external). Voluntary contraction of the pelvic floor muscles, in association with contraction of the abdominal muscles[24,27,28] and the adductor muscles[14] may affect the strength of pelvic floor muscle contraction. For this reason, in the present study, participants were trained to contract their pelvic floor muscles by associating these contractions with abdominal and adductor muscle contractions and then disassociating them to enable the participants to learn to contract the pelvic muscles alone without any interference from the other muscle groups.

A study conducted to evaluate the effect of contracting the pelvic floor muscles alone or together with other muscle groups (abdominal, adductor, and gluteal muscles) revealed no statistically significant results with respect to the concurrent activation of these muscles.[14] Nevertheless, the authors explained that their results should be interpreted with caution and suggested that the use of electromyographic evaluation techniques may indeed be capable of recording a degree of co-activation that was not found in their study.

In the present study, electromyography showed that abdominal and adductor muscle contraction was inhibited during pelvic floor muscle contraction. During the contraction of the PFM, in the electromyographic evaluation, the internal and external pelvic floor muscles did not present significant differences between each other ($P > 0.05$). And the accessory muscles (rectus abdominis and thigh adductor) also did not present significant differences between each other ($P > 0.05$). However, significant differences were found between the electrical activity of the PFM and the accessory muscles one ($P < 0.001$), so that the accessory muscles activity was minimized while the pelvic floor muscles were in maximal voluntary electrical activity. It is believed that the training protocol performed prior to the pressure evaluation had the same effects on the PFM contraction efficiency, as for both evaluations (electromyographic and perineometric) the same protocol of training and muscular evaluation was obeyed. Previous training may have been responsible for the high and positive correlation between electromyography and perineometry found in this study and not found in other correlation studies that used only the verbal command to request the contraction of PFM.[14,15]

The evaluation is simpler with perineometry, as with electromyography, the electromyographic signal must be treated and analyzed to decode the data in order to determine the normalized values of the contractions. Our results agree with the literature that vaginal squeeze pressure is a clinically useful measurement technique when used with careful instructions to the patient and visual observation of the perineum by the physical therapist.[7]

The result found in our study has great importance in terms of public health, as the perineometer is cheaper than the electromyograph, and the evaluation of the PFM function can be performed at low cost for the public health system. In addition to being more financially available, the evaluation with the perineometer is done in a simplified way, as the electromyographic evaluation requires the treatment and analysis of the electromyographic signal.

In the present study, the same evaluator performed the electromyographic and perineometric evaluations, as recommended in the literature.[21] A study published in 2011 involving 19 women, in which the inter-evaluator reliability of the modified Oxford scale and the perineometer were evaluated, recommended that when assessing the reliability of tools used to evaluate pelvic floor muscle function, the participants should be evaluated and reevaluated by a single examiner.[21]

Designed to control a confounding factor, a study conducted in 2011[22] used a 5-day interval between the different evaluation days to assess the reliability of pelvic floor muscle function evaluation by electromyography, justifying that a long recovery time between evaluations may minimize the effects of fatigue on retest reliability. In the present study, a 3-day interval was established between evaluations, since 72 h was considered the necessary time to recover from skeletal muscle fatigue.[29]

Although it is more expensive compared to other evaluation techniques, electromyography should continue to be used in scientific research and in clinical practice, as it represents a sensitive and thorough way of recording the electrophysiological behavior of the muscles. Furthermore, the electrical activity of various muscles can be recorded simultaneously, thus helping control the quality of the pelvic floor muscle contractions.

It is important, however, that standardized methodology be developed for the use of electromyography in evaluating pelvic floor muscle function,[5] thus assuring the reproducibility and reliability of studies.[23] To the best of our knowledge, no standardization parameters for the use of electromyography in evaluating pelvic floor muscle function have been defined by the International Society of Electrophysiology and Kinesiology (ISEK)[16] or in the Surface Electromyography for the Non-Invasive Assessment of Muscles (SENIAM).[30] Nevertheless, the present study provides a detailed description of the sites at which to place the electrodes on the pelvic floor and on the accessory muscles in accordance with the sites proposed in the literature[18] and may serve as a methodological parameter for future studies.

As the purpose of training, prior to the evaluation itself, was to separate the simultaneous contraction of the abdominal and adductor muscles by contraction of the PFM, to monitor the contraction of the abdominal muscles, the electrodes were placed in the rectus abdominis muscle and not in the transverse muscles or internal abdominal obliques. Voluntary contraction of PFM causes activation of the deep abdominal muscles (transversus abdominis and internal obliques) therefore a complete dissociation is not possible, as in the contraction of the PFM and activation of the rectus abdominis.

To reach the results found in this study and to control intervening variables, various methodological parameters were obeyed. However, in the perineometric evaluation the insufflation volume of the manometry probe was not measured with the pelvic floor muscles at rest. This volume varies in accordance with the comfort limit reported by each participant. However, although varying with individual tolerance, the fact of not measuring the initial volume of insufflation was considered a limitation in our study, we suggest that in future studies these volumes should be recorded to enable this variable to be controlled.

On the other side, the fact of insufflating the probe until the participant reports the sensation of contact against the vaginal walls is one more way of standardizing the evaluation, respecting the individual anatomy of each participant, as there are broader and narrower vaginal canals that give an individual characteristic in the size and anatomic shape of the vaginal canal in each woman. This standardization was only possible with the use of perineometer Perina Stim, which can be considered an advantage in the use of that instrument compared to other perineometers.

The positive correlation found in the present study between perineometry and electromyography confirms that perineometry may substitute electromyography in the evaluation of pelvic floor muscle activity in clinical practice, provided the perineometry is performed by women that have a good perception of the isolated activity of the PFM and a good recruitment of this musculature. And in scientific research, perineometry can be used in large-scale clinical trials, which requires rapid registration of a large sample, for example.

This information is of particular importance for future studies in the field of pelvic physiotherapy, as it provides data that may serve as parameters for comparison in future research. This is a preliminary study, which can be followed by further research into the uses of perineometer for pelvic floor muscle identification and training. Further studies can be performed comparing the evaluation made through electromiography and perineometry with different models of perineometers, and studies that include in their samples women with trained PFM and women with potentially weak and untrained muscles.

Further studies should be carried out to evaluate pelvic floor muscle function during pregnancy and in the postpartum period, taking the mode of delivery into consideration as well as whether episiotomy was performed. The importance of conducting studies involving women with sexual dysfunction, urinary disorders, and pelvic floor dysfunction in accordance with the methodological parameters adopted and recommended should also be emphasized.

5 | CONCLUSIONS

These results show a strong correlation between the perineometric and electromyographic findings in the functional evaluation of the pelvic floor muscles in women who performed a previous training to isolate the contraction of the pelvic floor muscles and have a good capacity of recruiting that musculature. The findings of this study also contribute scientifically to the field of women's healthcare, as electromyography was compared with perineometry in nulligravidas and these findings represent new data on this subject.

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CONFLICTS OF INTEREST

None declared.

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