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RESEARCH ARTICLE

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Analysis of Medical Students' Ability in Evaluating Genital Prolapse

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ABSTRACT

Objective: To evaluate the ability to analyze pelvic organ prolapse of the undergraduate students and to infer the inter-examiner agreement (students and preceptor) on POP-Q ICS classification.

Methods: A prospective, randomized observational study that evaluated urogynecology learning by fifth-year students of medicine of Escola Paulista de Medicina/UNIFESP, Brazil using a questionnaire based on the Likert scale before and after Hospital São Paulo Gynecology Sector stage. We also compared the pelvic organ prolapse staging with POP-Q between students and the preceptor after the internship in gynecology.

Results: A total of 85 students and 5 preceptors were included. 94% of the students reported feeling totally uncomfortable or uncomfortable assessing patients with genital dystopia prior to the internship in gynecology, and 42% remained totally uncomfortable or uncomfortable after the stage. Concerning the inter-examiner agreement, it was verified that the students and preceptors presented greater concordance in the stages 0 and 4, but the stages 1, 2, and 3 are presented as points of less agreement. About the general agreement between students and preceptors, we observed that there is regular agreement Kappa 0.206 with p-value <0.001 for 95% confidence interval.

Conclusion: We can conclude that the students are able to perform an evaluation using POP-Q prolapse system however, it is necessary to improve their accuracy. Only a small portion of the students were fully comfortable in this care, the number of women with dystopia effectively attended seems to influence the comfort of students to attend patients.

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Introduction

Despite the technology advancement and the modifications incorporated by medical practice in recent decades, physical examination continues to be a cornerstone for diagnosis and doctor-patient relationship, and its knowledge is paramount in medical education [1]. Gynecological exams are especially sensitive for both the inexperienced students and the woman being examined [2,3]. This makes it imperative to improve the medical students' quality of gynecological and obstetric care in the interpersonal and technical settings. Because of this, innovations are needed in practices adopted to supplement the traditional training. Abraham (1995), in his study to evaluate the medical students' perception of their psychomotor skills and attitudes towards the different gynecological practice teaching methods, observed that the students' first preference was to learn how to perform a pelvic exam under the supervision of a trained physician [4].

Pelvic organ prolapse refers to the descent of female pelvic organs, including the bladder, uterus, or vaginal dome post hysterectomy, and intestine, thus resulting in protrusion of the vagina, uterus, or both. Prolapse development is due to multiple factors, whose most consistent risk factors include vaginal delivery, advancing age, and increased body mass index. Vaginal delivery, hysterectomy, chronic exertion, normal aging, and connective tissue abnormalities may predispose some women to rupture, elongation, or dysfunction of the anus levator complex, vagina connective tissue ligaments, or both, thus resulting in prolapse. Women with symptoms suggesting prolapse should undergo a pelvic examination and medical history check [5].

The International Continence Society, the Society of Gynecologic Surgeons, and the American Urogynecologic Society recommend a standardized prolapse evaluation and description system named Pelvic Organ Prolapse Quantitative Examination (POP-Q). This system uses nine anatomical markers that are measured with the patient in a semi-erect position and, during the maximum Valsalva maneuver, describes the prolapse observed as points from 0 to 4. A qualified professional can

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complete the exam in 2 to 3 minutes. The technique is shown to have high inter-examiner validity and provides a more accurate description of the type and degree of the prolapse found [6].

In addition, it is recommended to use a variety of techniques that must be specified during the genital prolapse quantitative description and ordinal staging, including: patient position; type of examination table or chair used; type of vaginal specula or spreaders used; diagrams of any custom devices used; maneuvers (e.g., Valsalva maneuver, coughing) used to maximally develop the prolapse; filled bladder and, if the bladder was empty, whether it was by spontaneous urination or catheterization; rectum content; method by which any quantitative measurements were performed [6].

According to Parekh [7], there is substantial inter-examiner agreement in the simplified POP-Q system for the global setting in this prospective, randomized, blind study involving urban and rural urogynecologic centers, both academic and non-academic, as well as worldwide. The inter-examiner agreement is almost perfect at all ordinals. A universally accepted and standardized system for genital prolapse classification, that is user-friendly and can be adopted by non-specialist health professionals worldwide, is still required.

We can find several knowledge acquisition theories, one of which is a study line encompassing neurophysiology and recognizing the importance of frequent and repetitive practice to retain skills. This theory involves organization of spatial vision, referring to the ability to construct a three-dimensional image of an object or space. Incorporating this concept into medical education can help increase proprioception and tactile perception, while developing vision orientation, somato-sensory memory, which is the ability to interpret and integrate sensory information from previous experiences, and stress tolerance [5,8], competencies that are very relevant for using different techniques and improving patient care [1].

In 2002, Einarsson et al. applied questionnaires to residents in the fourth year of Gynecology and Obstetrics, in order to evaluate residency programs in the United States [8]. The Likert Scale (from 1 - uncomfortable to 5 - comfortable) was applied for laparoscopic and hysteroscopic procedures. Residents exposed to a formal curriculum felt significantly more competent in performing various procedures when compared to those non-exposed [9]. Most practitioners emphasized the need to increase the number of trainings in their study program, and that the ability to perform the procedure is important for a successful clinical practice. According to the study, a formal curriculum should be applied with specific guidelines and clear objectives [6].

Much of medical education in Brazil, even in large university teaching centers, follows the traditional model of first observing and then performing procedures under the direct supervision of a more experienced professional. In addition, according to the National Curriculum Guidelines (DCN) for Medicine Undergraduate Programs [10], the skills required for medical professionals include: being able to optimize the use of the propaedeutic resources, valuing all aspects of the clinical method, properly using semiological and therapeutic resources based on scientific evidence. Therefore, understanding and mastering the medical propaedeutics, diagnosis, prognosis, and therapeutic conduct are required. The DNC also provides for mandatory curricular training in Obstetrics and Gynecology residency under the direct supervision of the School/College teachers [1]. However, there are no resolutions or consensuses in specialty society, gynecology and obstetrics teachers' associations, or medical residency councils informing what objectives and contents must be reached by the training end — something that can be found in the United States, for example [11-13]. Moreover, we were not able to find any publications in Latin America with specific training models to be followed nor validated tools for evaluating the Gynecology medical students' ability regarding pelvic examination and genital prolapse classification in curricula applied to medical undergraduate programs in the Gynecology and Obstetrics area in Brazil.

The present study is based on the need to improve the teaching and evaluation of gynecology propaedeutics and techniques applied by medical undergraduate students in Brazil. Its intent is to follow the DNC guidelines and guide professionals so that, after graduation, they are able to learn continuously, both through training and in practice. Thus, they must take active part in the teaching-learning process, which is proposed by the present study. This way, the researchers were expected to learn the learning process, to have responsibility and commitment to their education and to the training/residency of future professional generations, mutually benefiting future professionals and those professionals already in service [1].

Objectives

To evaluate the fifth-year medical undergraduate students' (in São Paulo Medical School) ability to assess genital prolapse after being trained in the São Paulo Hospital Gynecology ward. To check the inter-examiner agreement (students and preceptor) on a classification examination for describing genital prolapse (POP-Q). To serve as a basis for development studies about medical training simulators, with the purpose of improving and reducing the medical education cost.

Methods

A prospective, randomized, observational study — randomized using the Randomizer software — for evaluating the fifth-year medical undergraduate students' urogynecology knowledge, from 2015 to 2016.

The inclusion criteria for patients, preceptors, and students were being over 18 years of age and able to sign an Informed Consent Term, while students had to be fifth-year medical undergraduate students, regularly enrolled in the institution where the study was applied, and attending at least 85% of residency hours. All those patients with pelvic floor dysfunction were included when they had such complaints as: feeling that something descends or exits the vagina, feeling a bulge out of the vagina, urinary incontinence, fecal or anal incontinence, feeling a filled bladder or pelvic pressure, particularly when standing, need to manually reduce the vaginal bulge to urinate or defecate.

The exclusion criteria were the students who did not attend more than 15% of the fifth-year Gynecology residency hours, students who were absent on the test day for genital dystopia skill evaluation, pregnant patients or those whose last delivery had occurred less than 6 months before.

The following evaluation instruments were used:

A. A questionnaire based on the Likert scale for global gynecology knowledge assessment, as well as to quantify the students' comfort in evaluating patients with genital prolapse. Each question was evaluated by a 5-point Likert Scale, as follows: 1 (uncomfortable) to 5 (comfortable), 1 (no interest) to 5 (a lot of interest) or 1 (unimportant) to 5 (very important). A 1.5-point increase in the Likert Scale was considered an improvement parameter. The questionnaire was applied by a researcher and filled by fifth-year medical undergraduate students after their residency in the Gynecology ward of São Paulo Hospital and in the Urogynecology and Vaginal Surgery Outpatient Clinic. The questionnaire contains demographic data on genital dystopias, medical education, interesting for anatomical model training, and, during the gynecology residency, on interest, performance, and competence in performing the POP-Q test, current medical skills, and factors influencing training application during graduation, based on a questionnaire developed for groups in Brazil, the United States, and the Netherlands [6,8,14].

B. Evaluation of genital prolapse patients by undergraduate students and urogynecology preceptors with subsequent analysis of the inter-examiner agreement of POP-Q classification performed by both groups.

In order to know if a given object characterization/classification is reliable, this object must be characterized or classified several times, for example by more than one evaluator. In order to describe the agreement intensity between two or more evaluators, or between two classification methods (e.g., two diagnostic tests), we used in this study the Kappa measure, based on the number of responses in agreement, that is, the number of case results that are identical among evaluators. Kappa is an inter-examiner agreement measure, which determines an agreement degree beyond which agreement could only be expected due to chance. This agreement measure has a maximum value of 1, and this value (1) represents total agreement while values close to and below 0 indicate no agreement, or agreement exactly as expected by chance [15].

All students received theoretical information on the POP-Q (pelvic organ prolapse quantification) classification at the beginning of the residency and in routine training at the Gynecology outpatient clinics throughout the residency.

The students performed the POP-Q classification in patients at the Urogynecology and Vaginal Surgery Outpatient Clinic at the end of their Gynecology ward residency.

The technique for conducting the POP-Q exam was the one recommended by the International Continence Society. Patients were instructed to empty their bladder prior to examination. The patient was placed in the dorsal lithotomy position, instructed to apply downward force or to perform a Valsalva maneuver by the investigator. When the patient was not able to comply, she was instructed to cough deeply.

The areas examined include the anterior and posterior vaginal walls, the dome, and cervix of uterus. In case of patients who had previously undergone hysterectomy, then only three measurements will be made: anterior and posterior vaginal walls and apex. For examining the anterior and posterior segments, the Sim's speculum was adapted to the examination as a spreader. For analyzing the anterior vaginal segment, one speculum valve was placed inside the vagina and the posterior vaginal wall was retracted to allow full visualization of the anterior vaginal wall. An anterior vaginal wall spot at 3 cm from the proximal hymenal caruncula was identified. The patient was instructed to perform a strong Valsalva or coughing maneuver, and where that point went down towards the hymenal caruncula, it was recorded as the Aa point of the anterior vaginal wall. The posterior segment was examined in a similar way. The point chosen to represent the posterior vaginal segment was similarly identified. The cervix of uterus was assessed by placing the speculum into the vagina and directly observing its descent during the Valsalva maneuver or coughing to determine its position relative to the hymenal caruncula. Care was taken to make sure that the cervix of uterus was not inadvertently supported by the speculum during the examination. The apical scar or vaginal dome was viewed in a similar fashion. If the cervix of uterus or dome went beyond the hymenal caruncula with the Valsalva maneuver or coughing, then a speculum was not used during its evaluation. The patient cervix of uterus, posterior vaginal fornix, or apex were described separately.

The stage given by the preceptor — a physician specialized in gynecology — was considered as the gold standard in prolapse staging. Based on the stage established by the preceptor, the examined patient, and the stage verified by the students, the number of times that the students agreed with the stage given by the preceptor was statistically analyzed [16,17], in addition to selecting the stages with greater discrepancy in order to try to detect the stages in which the students would potentially have greater difficulties to learn. These values were analyzed as percentages.

We finally asked the students to assign a grade to evaluate their satisfaction with their gynecology residency. The grade ranged from 0 to 10 and was divided as follows: 0 to 4.9 (unsatisfactory); 5 to 6.9 (average); 7 to 8.9 (satisfactory); 9 to 10 (fully satisfactory).

The study was approved by the ethics committee, which issued the following opinion: 044697/2015 CAAE: 45252315.0.0000.5505

Results

This study included 5 preceptors, 40 patients, and 85 students.

Among the students, 94% reported feeling totally uncomfortable or uncomfortable in assessing patients with genital dystopia prior to the gynecology ward residency, while only 42% remained totally uncomfortable or uncomfortable after that residency.

The students were asked about the importance of theoretical classes and practical training, and 46% of them reported being important or very important to receive such training prior to assisting dystopia patients and 58% reported being very important or important to attend theoretical classes before the practical training.

In addition, 76% of the students reported to be relatively important, important, or very important to receive previous training in anatomical models.

Regarding the number of cases discussed, 48% of the students evaluated it as sufficient, however, in relation to the number of cases in which the students examined the patients and applied the POP-Q classification, only 20% reported it as being sufficient or totally sufficient.

About satisfaction with gynecology care, 80% reported being satisfied or totally satisfied, however, the average score given to knowledge on prolapse was 6.18, which according to the initial classification designed by this study demonstrates average satisfaction with knowledge, leaving room for teaching improvement.

Regarding the inter-examiner agreement, it was found that, when the examiner considered the patient as stage 0, 44.4% of the students reported the same stage as the gold standard; in stage 1, only 18.2% of the students, when evaluating and staging the prolapse patients, reported the same stage as the one determined by the gold standard. It was also noted that students and preceptors showed higher agreement in stages 0 and 4 while stages 1, 2, and 3 showed the least agreement between the examiners (students/preceptors). It is also observed that the students tended to underestimate the stage of the patients in their evaluation, as shown in table 1.

Table 1: Table with Kappas by prolapse staging and inter-examiner agreement (students and preceptors).

	Stage 0	Stage 1	Stage 2	Stage 3	Stage 4
Kappa	0,536	0,153	0,096	0,05	0,361
Kappa P-value	<0,001	0,15	0,201	0,634	0,001
Kappa 95% confidence interval	Sup: 0,739 Inf: 0,334	Sup: 0,362 Inf: -0,055	Sup: 0,243 Inf: -0,051	Sup: 0,258 Inf: -0,157	Sup: 0,574 Inf: 0,149

When evaluating the general agreement between students and preceptors, we observed average agreement with Kappa 0.206 and a p-value <0.001 for a 95% confidence interval, as shown in table 2.

Table 2: Table of overall Kappa and overall inter-examiner agreement (students and preceptors).

Overall Kappa	0,206 – Average agreement
Overall P-value	<0,001
Kappa 95% confidence interval	Sup: 0,319 Inf: 0,093

Discussion

A priori, the data allows us to infer that, as a rule, students are satisfied with their gynecological care after their ward residency.

Their comfort in caring for patients with genital prolapse after their ward residency and training with patients showed a slight improvement, however, only a small portion of the students were totally comfortable with this care. We detected a demand for training in anatomical models and simulators prior to the patients' care.

The structure and cases discussed were not identified as deficient, however, the number of genital dystopia patients effectively cared for is reduced, which seems to influence the students' comfort in caring for such patients. Theoretical classes and training in simulators and anatomical models are points that seem to be very important for the students' learning process. Satisfaction was achieved regarding general gynecology; however, the students assessed the genital prolapse evaluation as average.

In view of this, as also noted by Hammoud, et al. [18], the capacity and expertise acquired by the students may vary greatly, depending on the type and number of cases each of them is involved with. In the same residency in a gynecology ward, differences may occur in the number of cases involved. In addition, with teaching variations and in the acquisition of technical skills, it is difficult to ensure that all students are exposed to the same procedures and assess their skills. In addition, with the development of new techniques and equipment, a better foundation is necessary to acquire propaedeutic skills. Studies show that students benefit from standardized teaching and from the combination of teaching classes and practical experiences. Technique training exercises give students more confidence and greater ability to work in their professional lives [19].

As for inter-examiner agreement, we noted that students and preceptors showed higher agreement in stages 0 and 4 while stages 1, 2, and 3 showed the least agreement. So their explanation, discussion, and number of cases could be improved for these students' residencies. Please see Table 3, which shows these findings and allows us to realize the students' difficulty in evaluating stage 1, 2 and 3 prolapses.

Table 3: Clinical stages and their inter-examiner agreement.

Kappa Values	Interpretation	Stage
<0	No agreement	-
0-0,19	Poor agreement	1, 2, 3
0,20-0,39	Average agreement	4
0,40-0,59	Moderate agreement	0
0,60-0,79	Substantial agreement	-
0,80-1,00	Perfect agreement	-

Adapted from Landis JR, Koch GG. *The measurement of observer agreement for categorical data.* Biometrics 1977; 33: 159-17

Finally, the evaluation demonstrates that the students' knowledge in assessing genital prolapse is deficient. Therefore, this could be improved in the gynecology residency for the

evaluated service. Although this study does not represent a global situation, due to its restricted population, it can provide points that may be common to other institutions that have a medicine undergraduate course.

Acknowledgements

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Data Availability

The data used to support the findings of this study are included within the article.

A version of the preliminary results of this research was published at the 45th IUGA Annual Meeting on June 23, 2017 175292; 241, The Hague, Netherlands, please access the following link:

https://academy.iuga.org/iuga/2017/42nd/175292/marair.sartori.analysis.of.the.ability.of.medi cal.students.in.the.evaluation.html?f=listing%3D3%2Abrowseby%3D8%2Asortby%3D1%2A media%3D1

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This article is about a study conducted at a medical teaching institution to assess the ability of undergraduate students in the examination of genital prolapse. This work is extremely important because it raises aspects of great relevance for students' learning in the area of gynecology such as physical examination, number of patients evaluated, use of simulators and other resources aimed at improving medical education.

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