Ethical and Semiotecchnique Skills Gain for Medical Students: an Intensive Course

ORIGINAL

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Abstract

Aims: To evaluate ethical and semiotecchnique skills gain with intensive semiotecchnique course to graduate medical students.

Methods: Semiotics course was drawn up to 64 students of four medical courses of Belem, Para, Brazil. The course took place in two stages: the first for 32 students starting the third semester of the medical course, and the second for 32 students that started the internship. The course was taught intensively in two weekends, with didactic material prepared by the researchers. Pre-and post-training assessment was performed for verification of ethical skills needed in the doctor-patient relationship and the practical knowledge and skill in the technical implementation of the physical examination.

Results: The students of 2nd year, in the eight proposed stations, have an average gain of 85.84%, reaching individually in some stations an improvement up to 120% as "Precordium" and "painful maneuvers of the abdomen" stations. The students of the 5th year initial notes average was 6.06, evolving to 9.21, with average percentage of 54.42% gain. For matters of ethical principles in dealing with the patient was observed initial average 5.05 that after the course has evolved to 9.36 to students of 2nd year and 6.16 to 9.60 in fifth year. In the evaluation of performance in implementing the semiotecchnique maneuvers were observed initial notes of 4.76 and 5.95 to 8.51 and 8.82 respectively for students of 2nd and 5th year.

Conclusion: The intensive course implemented proved to be effective in semiotecchnique skills gain, both in improving ethical attitudes in dealing with the patient, as well as on the playing technique of physical examination.

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Introduction

Billions of dollars are spent on unnecessary exams in the world [1]. Changes in the practice of Internal Medicine have played an important role in the devaluation of anamnesis and physical examination's skills. The immediate availability of high tech technology in the search for the diseases' diagnosis in school hospitals tends to obscure the importance of clinical history and physical examination, considered low tech procedures by training students and some graduated doctors [2].

In the last decades, there has been a remarkable decline in the technical capacity of physicians during physical examination, with a greater tendency to replace clinical examination with laboratory and imaging tests [3].

It is part of the medical appointment the act of "placing your hand on the patient", from both technical and symbolical point of view. An urologist's appointment without prostatic touch or a gynecological examination without breast palpation are unallowable since this is the patient's fair expectation, even though there is low sensitivity and specificity for the clinical exam. Physicians usually end up requesting laboratory and imaging tests more accurate for diseases' screening, such as mammography, breast ultrasound, pelvic ultrasonography and Prostate-Specific Antigen (PSA) dosing [4].

However, a well-done semiologic examination makes it unnecessary to request complementary exams, most of them expensive and sometimes inaccessible. Researches show that a well-documented anamnesis accounts for around 60% accurate clinical diagnoses. It increases up to 80% when associated with adequate physical examination. This association has the advantage of correctly indicating the best complementary exams to be requested, with immediate economic repercussions, specifically for the public health care sector [5].

A study performed at a university hospital outpatient clinic (Salvador, Brazil) presents a practical

example of excessive complementary exam's demand. According to this study, only 46.5% of the requested chest radiographs presented clinically significant abnormalities. On the other hand, in a survey in England, this percentage was much lower (23%). Requests, in large part, come from unsatisfactory medical care, in which physicians do not value the doctor-patient relationship and adequate medical history [6].

In this context, another important factor is the poor quality of medical semiotechnique teaching during graduation. In a study carried out with 159 students who had previously studied medical semiotechnique and clinical skills, only 65% considered themselves able to examine the patient, but without the necessary skills, and 18.5% did not perceive important signs at physical examination [7].

According to this, there has been an increasing in the number of complaints against physicians in Brazilian Medical Councils due to poor medical attention. One of the side effects of a deficient and not very communicative doctor-patient relationship is a lawsuit that can cause serious consequences to the professional, whom can even lose the license to practice Medicine; In addition, it costs money and time, spent from both sides. The precarious doctor-patient relationship can lead to the medical error and eventual physical and moral damages to the patient [8].

In this way, the low quality of the teaching of semiology for undergraduate students; an increasing number of claims for the Medical Councils; an increasingly strong tendency of a "complete check-up" culture regardless of the necessity of complementary exams and lower remuneration for medical appointments contributed to a disordely breakdown of good patient-physician relationship.

Thus, the present study sought to evaluate the gain of ethical and semiotechnique skills with an intensive course developed for medical students, addressing the techniques used during physical examination, ethical and behavioral principles

during contact with the patient, contributing to the improvement of Knowledge fixation by students.

Methods

This research was carried out according to the precepts of the Nuremberg Code and Declaration of Helsinki, following the Norms for Research on Human Beings of the National Health Council (Resolution number 466/2012 Brazilian National Health Council). It was submitted to the analysis and posterior approval by the Research Ethics Committee of the State University of Pará (CAAE: 42957715.7.0000.5174).

The sample consisted of 64 students from four medical schools (two of them public and the other, private schools) of Belém, Pará, Brazil. Of these, 32 were in the 2nd year of graduation while the others were in the 5th year of the course.

After signing the informed consent, a theoretical and practical course of medical semiotecnic was given with a programmatic content elaborated by the researchers, addressing knowledge in general physical examination, chest, precordium, abdomen (and its' painful maneuvers), bone and joint apparatus and neurological reflexes.

Pre and post-training assessments were performed to verify the level of ethical attitudes in the patient's treatment and the knowledge and practical ability in the physical execution of the physical examination, to assess the possible subject's improvement in those topics. For this purpose, eight practical stations were elaborated, such as general qualitative physical examination, general quantitative physical examination, bone and joint apparatus, chest, precordium, abdomen, painful maneuvers of abdomen and neurological reflexes. In each practical station, the students were assessed with a questionnaire composed of ten questions, similar to the Objective Structured Clinical Exam (OSCE).

Of these, the first five were related to ethical attitudes in the treatment of the patient:

1. Was the student adequately dressed to perform the physical examination?
2. Did the student introduce him/herself to the patient and ask his/her name?
3. Did the student maintain good posture and spoke with a good tone of voice and security?
4. Did the student explain the maneuver that would be executed and its possible discomforts for the patient?
5. Did the student inform the patient that he/she would interrupt the examination if there was pain / discomfort for the patient?

The following questions concern the technique of performing the physical examination:

1. Did the student clean his/her hands and instruments before starting the exam?
2. Have the student examined in correct positions for him/herself and his/her patient?
3. Have the student performed the maneuvers with delicacy and elegance?
4. Was the semiotecnic maneuver performed correctly?
5. Did the student finally explain the findings to the patient and describe the maneuver correctly?

Eight groups of four students were constituted, with each group rotating between the eight proposed stations. Within each station, each student had 4 minutes to perform the semiotecnic maneuver requested by the station assessor, being observed by the other students in the group. The assessor of each station was always the same for the two tests, pre and post-course. Every four minutes, a beep was emitted and the next student was assessed. Every 16 minutes of assessment, the beep was emitted, pointing a change of stations by the groups, so that all the students could be assessed in all stations.

The students did not have prior knowledge of the contents of the assessment form applied in each station, which was composed of ten questions, five

questions related to ethical attitudes and five questions with technical content. The form was applied to each student in each of the assessment stations, in the pre and post-course times.

The course took place through intensive practical training on two weekends with 8-hour class schedules in four days, two at the weekend, in two 4-hour steps each day. After a 32-hour course, the students performed a practical test, the same way as the initial assessment, in order to analyze the acquired knowledge regarding ethical attitudes in the patient's treatment as well as the technique of performing the physical examination (**Table 1**).

Data from the two evaluations were stored in Excel® 2010 spreadsheets and then compiled and statistically analyzed in BioEstat® 5.3. All the data collected were statistically compiled and analyzed and due to the nature of variables, ANOVA 1 criteria test was performed with confirmation by the Bonferroni and Kolmogorov-Smirnov tests. The rejection

index of the null hypothesis was adopted as 0.05 or 5%, with significant values being marked with asterisks.

Table 1. Ethical and semiotechnique course schedule.

1 st weekend	Friday	Saturday	Sunday
Morning	-	Qualitative physical exam	Bone and joint apparatus
Afternoon	-	Quantitative physical exam	Chest
Evening	Pre-course assessment	-	-
2 nd d	Saturday	Sunday	
Morning	Precordium	Abdomen painful maneuvers	
Afternoon	Abdomen	Neurological reflexes	
Evening	-	Post-course assessment	

Results

Results in Tables: 2 & 9

Table 2. Averages, by station, of the 1st and 2nd assessment for the students of the 2nd year of Medical Courses in Belém do Pará - 2016.

	Qualitative PE	Quantitative PE	Bone and joint	Chest	Precordium	Abdomen	Painful maneuvers	Reflexes
1 st assessment	4.38	6.20	5.40	5.07	4.16	5.34	3.90	4.71
2 nd assessment*	8.58	9.08	8.25	9.36	9.26	9.17	8.68	8.95

1st assessment < 2nd assessment. *: P<0.001 (ANOVA 1 criteria).

Table 3. Averages, by station, of the 1st and 2nd assessment for the students of the 5th year of Medical Courses in Belém do Pará - 2016.

	Qualitative PE	Quantitative PE	Bone and joint	Chest	Precordium	Abdomen	Painful maneuvers	Reflexes
1 st assessment	5.38	7.15	6.05	6.59	5.32	6.40	4.83	6.76
2 nd assessment*	9.25	9.20	8.24	9.48	9.17	9.37	9.35	9.63

1st assessment < 2nd assessment. *: P<0.001 (ANOVA 1 criteria).

Table 4. Percentage gain per station between the 1st and 2nd assessment for the students of the 2nd year of Medicine Courses in Belém do Pará - 2016.

	Qualitative PE	Quantitative PE	Bone and joint	Chest	Precordium	Abdomen	Painful maneuvers	Reflexes
%	96.0*	46.6	52.7	84.6	122.6*	71.5	122.7*	90.0

*: P<0.005 (Kolmogorov-Smirnov).

Table 5. Percentage gain per station between the 1st and 2nd assessment for the students of the 5th year of Medicine Courses in Belém do Pará - 2016.

	Qualitative PE	Quantitative PE	Bone and joint	Chest	Precordium	Abdomen	Painful maneuvers	Reflexes
%	72*	29	36	44	72*	47	93*	42

*: P<0.005 (Kolmogorov-Smirnov).

Table 6. Averages by item assessed in the 1st and 2nd assessment for students of the 2nd year of Medicine Courses in Belém do Pará – 2016.

	Clothing	Introduction	Posture and voice	Interruption to pain/discomfort	Explained maneuver	Hygienized hands and instruments	Correct positions	Execution with elegance	Maneuver executed correctly	Correct description
1 st assessment	4.61	6.94	5.72	3.86	4.09	5.14	5.37	4.70	4.44	4.14
2 nd assessment*	9.93	9.83	9.48	8.58	8.97	9.50	9.27	8.15	7.61	8.00

1st assessment < 2nd assessment. *: P<0.001 (ANOVA 1 criteria).

Table 7. Averages by item assessed in the 1st and 2nd assessment for students of the 5th year of Medicine Courses in Belém do Pará – 2016.

	Clothing	Introduction	Posture and voice	Interruption to pain/discomfort	Explained maneuver	Hygienized hands and instruments	Correct positions	Execution with elegance	Maneuver executed correctly	Correct description
1 st assessment	6.12	7.70	7.43	4.78	4.75	6.22	7.22	5.74	5.56	5.01
2 nd assessment*	9.88	9.75	9.73	9.03	9.62	9.80	9.42	8.48	8.05	8.33

1st assessment < 2nd assessment. *: P<0.001 (ANOVA 1 criteria).

Table 8. Percentage of gain in the block of questions of ethical attitudes in dealing with the patient and technical principles, between the 1st and 2nd assessment for the students of the 2nd year of Medical Courses in Belém do Pará - 2016.

	Ethical attitude		Technical principles	
	Grades	%	Grades	%
1 st assessment	5.05		4.76	
2 nd assessment*	9.36	85.35	8.51	78.78
1 st assessment < 2 nd assessment. *: P<0.001 (ANOVA 1 criteria).				

Table 9. Percentage of gain in the block of questions of ethical attitudes in dealing with the patient and technical principles, between the 1st and 2nd assessment for the students of the 5th year of Medical Courses in Belém do Pará - 2016

	Ethical attitude		Technical principles	
	Grades	%	Grades	%
1 st assessment	6.16		5.95	
2 nd assessment*	9.6	55.84	8.82	48.24
1 st assessment < 2 nd assessment. *: P<0.001 (ANOVA 1 criteria).				

Discussion

It was observed that the students of the 2nd year obtained as an average of the grades in the first assessment 4.90 in the eight proposed stations, evolving to 8.92 in the second, that is, an average gain of 85.84% in the knowledge that they had initially. Some stations reached individual improvements up to 120%, such as "Precordium" and "Painful maneuvers of the abdomen" (**Table 2**).

Analyzing the 5th year students, the mean of the initial grades was 6.06, increasing to 9.21, with an average percentage gain of 54.42% (**Table 3**).

As expected, 5th year students scored higher than the 2nd year students on the first evaluation, and a lower percentage gain, since they already had a

higher degree of initial knowledge, translated by the content seized in the 3 years of the course that separate the two groups.

Alternatively, when the two groups are statistically compared both for the first and the second assessment, respectively, it is verified that the difference in the scores obtained between them in the 1st evaluation was only 1.16 points. It was expected that three years of medical training would have brought them a higher score as difference.

This deficiency in the practice of the physical examination was also verified by Kahwage Neto study carried out with 31 students attending internship in medical graduation. The vast majority was not able to perform a complete semitechnique maneuver when requested, presenting values such as: only 35.48% performed the complete examination of the lymph nodes, 22.5% performed the appropriate neurological examination and only 16.13% correctly examined the thyroid [9].

Difficulties in learning acquisition were also demonstrated by Silva and Rezende in a study carried out with undergraduate students in which 65% of the students considered themselves apt to examine the patient, but without the necessary skills, and that 18.5% reported not perceiving signs Important to physical examination [7].

This self-perception of competences in the physical examination was evidenced among the students who participated in this study after the first assessment. The "reality shock" contributed to their engaging throughout the training.

Analyzing the results obtained in the 2nd assessment of the present course, a difference of only 0.29 points was observed among the students of the 2nd when compared to 5th year students.

The global analysis of the two assessment in both study groups indicates that the content and / or its transfer in these 3 years of course were insufficient to raise the ethical skills in the patient's treatment and the technical skills of the students. Although, it

was observed, at least in the short term, with the application of this course.

It should be emphasized that the assessment was carried out immediately after the programmed content was taught for 32 hours. Further studies should be performed with the same group of the students to assess the degree of knowledge fixation in the medium and long term.

When analyzing the content of the individual stations, the presence of similar curves in knowledge is clear, both in students of the 2nd and 5th years, and this curve is slightly higher in the 5th year group.

The shape of these curves shows that contents such as "Qualitative physical examination", "Examination of the precordium" and the examination of the "Painful maneuvers of the abdomen and ascites" for some reason obtained the greatest difficulty uniformly on the part of the students. Both 2nd and 5th year students, prior to the course, did not have adequate knowledge on these topics, pointing to a possible failure in the four medical courses in Belém to provide this content during graduation.

This finding may be due to the fact that most of the teachers responsible for teaching such content are professors in at least two of the four institutions analyzed and/or the fact that these professors had background graduation in common and may have brought this lack of knowledge since then. And this deficiency now is being perpetuated in the current students [10].

Other causes for such findings, besides those proposed here may have other reasons, which should be the subject of further analysis.

Deepening the analysis to the questions of ethical skills in the treatment of the patient was observed an initial average score of 5.05 which after the course evolved to 9.36 for students in the 2nd year and from 6.16 to 9.60 in the 5th year. That is, there was a failure in the formation and/or acquisition and/or

establishment of ethical skills in the treatment of the patient, which, with explicitation, exemplification and intensive collection as performed during this course, provided a statistically significant evolution in both groups.

At this point, the greatest deficiencies observed were: not informing the patient what would be done and not informing that the maneuver would be interrupted in case of pain and/or discomfort.

In that way, it is believed that the excessive practice of physical examination training in electronic manikins, with no explanation and collection in dealing with patients, may in some way be detrimental to the establishment of fundamental ethical principles.

In this context, the teaching of Medical Semiology needs to be adapted to the new methodologies, but it cannot lose the great importance, which is the teaching at the bedside. The study with the patient is an activity with educational potential, which continues to merit the encouragement of medical schools. Thus, the patient at the bedside becomes an inexhaustible source of teaching and learning, exercising fundamental medical skills, such as the development of clinical reasoning, the practice of approaching the patient in the bed, as well as the ability to see, hear and "feel" a patient [11].

It is necessary that a change in the current paradigm in medical courses be implemented, starting with the presentation of ethical attitudes in dealing with patients. And it should be reinforced and charged with greater vehemence throughout the students' training phase and not only in a punctual way by some teachers who are more closely related to the importance of ethical training as a whole [10].

Regarding the performance in the execution of the semiotechnique maneuvers, it was observed in both the 2nd and 5th year students a significant gain in the ability to execute and describe the findings in

the requested maneuvers, passing the initial grades of 4.76 and 5.95 to 8.51 and 8.82 respectively for 2nd and 5th year students (**Tables 8 & 9**).

As with ethical skills, technical difficulties were also observed in the technical analysis, with the most difficult points being: the maneuver itself, as well as the lightness, safety and elegance of the maneuver, and its description at the end.

Perhaps because of an excessive memorization of these maneuvers, students are learning to execute them in a "mechanical" way, decorating at most a description for them, and in many situations, the description has nothing to do with the finding of the actual examination. There is, still, a great difficulty in correlating the findings of the maneuvers performed, with a health state or with the severity of the clinical condition.

Through the above, active teaching methodologies have much to contribute to the training of students in the acquisition of medical skills.

The course conducted in the study used small groups with a maximum of four students during the training, facilitating the perception of the technical difficulties presented by the participants, which could be corrected immediately. Adequate scenarios for learning with patient actors or even the students themselves in the role of patient in some moments also contributed to the understanding by the students of the importance of a technically well-conducted examination and with the appropriate ethical behavior by the examiner [12, 13].

At the same time and at all times, ethical principles were worked out, showing the importance of building a solid relationship between the patient and the student. Other factors, such as professors showing how to perform an adequate appointment and to "do the right thing" in relation to the patient had a positive influence on the students, evidencing the need for good technical and ethical training of professors [14, 15].

Thus, the course applied contributed to the improvement of the quality of the training of students

having an impact on the population that will be served by these students in the future, when they graduate. In addition, it was important by providing data to the managers of the Medicine Courses regarding the quality of teaching of the Semiology and ethical attitudes in the treatment of patients.

The implemented Intensive Course proved to be effective in gaining semiotechnique skills, both in improving ethical attitudes in the patient's treatment and in the technique of performing the physical examination.

The gain in ethical skills was 85.35% for students in the 2nd year and 55.84% for those in the 5th year.

The gain in the physical examination was 78.78% for students in the 2nd year and 48.24% for those in the 5th year.

Contribution

Carolina Ribeiro Mainardi, Wescley Miguel Pereira da Silva and Fabrício Maués Santos Rodrigues: literature review, data interpretation, writing, translation and concept of the manuscript.

Ana Paula Santos Oliveira Brito, Edson Yuzur Yasojima and Marcus Vinicius Henriques Brito: concept and orientation regarding the manuscript, data acquisition and methodological review of the manuscript.

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Conflict of interest disclosures

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