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The use of clinical simulation-based teaching as a teaching methodology for clinical consultation competence in primary health care

A utilização do ensino baseado em simulação clínica como metodologia de ensino para competência de consulta clínica na atenção primária à saúde

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ABSTRACT

Introduction: Medical education has undergone significant transformations in recent decades, prioritizing active methodologies, with the student as the central figure in the teaching and learning processes. In this context, simulation-based learning has gained significant strength in undergraduate courses in medicine and health areas.

Method: Qualitative, semi-structured study, with closed and open questions, which interviewed 47 medical students from a private institution who completed the General Family and Community Medicine course in the 3rd year of study.

Results: All participated in simulated consultations in a skills laboratory focused on medical interviews, communication, clinical reasoning and patient record keeping. Twelve 4-h classes were held, each featuring 3 simulated clinical encounters, interspersed with immediate feedback. This approach allowed for the immediate application of learning. Of the students, 76.6% expressed satisfaction with the strategy, considered it useful (95.7%), capable of providing semi-realistic experience in a safe environment (87.2%) and wanted more simulations throughout the course (93.6%). Regarding the structure, 93.6% were familiar with simulation-based learning, the time and facilities of the activities (91.5%), and the importance of collaborative learning with peers (91.5%). They reported practical application of learning, increased content retention (93.6%), improved communication skills (89.4%), and clinical decision-making (83.0%).

Conclusion: The use of realistic simulation activities for learning clinical consultations, with an emphasis on medical interview skills, was satisfactory, with significant improvement in communication skills, clinical reasoning, organization, and maintenance of patient records in the interviewed group.

KEYWORDS: Medical education. Educational assessment. Simulation training. Patient simulation.

Central Message

The relevance of the theme is noted due to the changes in teaching incorporated into technology and the new learning dynamics. As a result, there is a lack of dynamics in medical professional training that simulate reality for the development of skills such as communication and clinical reasoning. In addition, simulation-based teaching also contributes to improving the dynamics and increasing students' interest in medical learning, taking the focus away from an expository class to become something that involves the participation of students.

Perspective

Through simulation-based teaching, it can be concluded that most of the students liked and felt interested in simulation training classes, in addition to feeling comfortable with the simulation environment. Not least, but most students feel more confident to face real care and also to improve communication and clinical reasoning skills.

RESUMO

Introdução: A educação médica passou por transformações significativas nas últimas décadas, priorizando metodologias ativas, com o aluno como figura central nos processos de ensino e aprendizagem. Nesse contexto, a aprendizagem baseada em simulação ganhou força significativa nos cursos de graduação em medicina e áreas da saúde.

Método: Estudo qualitativo, semiestruturado, com questões fechadas e abertas, que entrevistou 47 estudantes de medicina de uma instituição privada que concluíram o curso de Medicina Geral de Família e Comunidade no 3º. ano de estudo.

Resultado: Todos participaram de consultas simuladas em um laboratório de habilidades focado em entrevistas médicas, comunicação, raciocínio clínico e manutenção de registros de pacientes. Foram realizadas 12 aulas de 4 h, cada uma apresentando 3 encontros clínicos simulados, intercalados com feedback imediato. Essa abordagem permitiu a aplicação imediata do aprendizado. Dos alunos, 76,6% manifestaram satisfação com a estratégia, consideraram-na útil (95,7%), capaz de proporcionar experiência semirrealística em ambiente seguro (87,2%) e desejaram mais simulações ao longo do curso (93,6%). Em relação à estrutura, 93,6% estavam familiarizados com a aprendizagem baseada em simulação, o tempo e as instalações das atividades (91,5%) e com a importância da aprendizagem colaborativa com os pares (91,5%). Relataram aplicação prática do aprendizado, aumento na retenção de conteúdo (93,6%), melhora nas habilidades de comunicação (89,4%) e tomada de decisões clínicas (83,0%).

Conclusão: A utilização de atividades de simulação realística para aprendizado de consultas clínicas, com ênfase nas habilidades de entrevista médica, mostrou-se satisfatória, com melhora significativa nas habilidades de comunicação, raciocínio clínico, organização e manutenção de registros de pacientes no grupo entrevistado.

PALAVRAS-CHAVE:- Educação médica. Avaliação educacional. Treinamento por simulação. Simulação de paciente.

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INTRODUCTION

Medical education has undergone significant transformations in recent decades, prioritizing active methodologies where the student becomes a central figure in the teaching and learning processes.[1] This transformation can be said to have begun with Problem-Based Learning (PBL), which emerged in the late 1960s and early 1970s at McMaster University in Canada, followed by Maastricht University in the Netherlands. This was one of the first active teaching methods to gain access to the medical academy.[2] Subsequently, other student-centered methodologies began to gain ground, such as Team-Based Learning (TBL), proposed by Larry Michaelsen in the 1970s3,4 and the Flipped Classroom.[5-7] These teaching modalities involve moments in which students study alone before the meeting with the teacher or between sessions, significantly expanding the possibilities of learning during the class, which has become an environment for discussion, problem solving, reflection and maturation of the content. Practical applications of knowledge, such as through methodologies as PBL and TBL, including simulated exercises, provoke excitement, greater engagement, and more effective learning, allowing teachers to truly educate rather than just present knowledge.[8]

These methodologies, which place the student as the main agent of their own learning, have proven to be significantly more effective in improving the quality of vocational training. Teachers, once the only holders of knowledge and, above all, of the power to educate, have moved from the role of exhibitors to that of mediators and facilitators of the learning process.[9,10]

For this change to occur, several didactic resources are needed, especially digital resources for their ease of access, multiplicity and portability. This is possible thanks to rapid technological advances, allowing the integration of this new reality. Printed books and periodicals are rarely used today. Portable technologies have a short lifespan and quickly become obsolete. In the late 1990s, Personal Digital Assistants (PDAs), also known as Palm-Tops, were introduced, but they were soon replaced by smartphones and tablets. Laptops and mobile devices are becoming increasingly lighter, portable, fast, and powerful, capable of multitasking and making simultaneous connections.

In the 1960s, the Bethel National Training Laboratory (NTL Institute For Applied Behavioral Science, 1954) published a widely known study that included a learning pyramid. Although it lacks scientific rigor, the pyramid seems to reflect the hierarchy of learning. The study noted that individuals can retain only 10% of what they read, 20% of what they hear, and 30% of what they see in diagrams, games, or images. When individuals observe and listen simultaneously, such as when watching demonstrations, videos, or during a technical visit to a real environment, knowledge retention increases by 50%. The highest retention rates were achieved when individuals wrote down or talked about what they learned, reaching 70%, while 90% was only achieved when individuals performed the task in a real or simulated environment, explaining what they were doing while performing the task.

Another approach to knowledge consolidation is Kolb and Fry's theory of experiential learning, which defines 4 essential practices for learning. According to the authors, doing something concrete about the subject, reviewing it or reflecting on it, drawing conclusions or abstracting the knowledge learned and testing it again after the initial 3 steps is the step-by-step to increase mastery of the subject. One training workshop was held for the AAMC (Association of American Medical College), in which the 4 stages were applied. It aimed to teach theatrical techniques for later application in the classroom by medical students. Participants reported that their confidence in using theatrical techniques as an educational tool increased from low or medium to high and cited some acquired qualities, including empathy, active listening, and communication skills. Successful medical training requires students to have communication skills that are rarely taught but are often needed in medical practice. In addition, despite being well thought out, structured and practiced, medical consultations always present novelties, as each patient is a unique and subjective individual. Thus, competent physicians must be flexible to provide individualized and comprehensive care to their patients. Simulation as a teaching method for medical students aims to develop 3 fundamental areas: procedural knowledge, which involves putting into practice what has been learned; basic scientific knowledge, which relates to the "why" of what is being done; and clinical reasoning for interpretation of the findings of the history and physical examination.[11,12] Simulating real clinic, students learn by observing, doing, and receiving feedback from their peers after the simulations, characterized by a more dynamic and diversified learning approach covering visual, practical, and theoretical aspects, achieving a score of 90% in Miller's stratification pyramid.[13]

The active methodology not only limits the student to reproduce the knowledge transmitted by the teacher, but also encourages him to think and develop early skills in patient management, thus improving interaction in future consultations. Students also develop other skills, such as formulating diagnostic hypotheses, considering differential diagnoses, and, most importantly, seeing the patient as a whole. The simulation focused on Family and Community Medicine aims to understand this biopsychosocial being. In this context, students are exposed to a wide range of cases that are diverse not only in terms of diseases, but also in their behaviors (angry, sad, anxious, silent) and contexts (patients without family support, with a low level of education, presenting with non-specific complaints).

This study aimed to understand the perceptions and opinions of medical students regarding the use of simulation as an active teaching methodology for the training of medical consultation skills at the level of primary health care in the discipline of Family and Community Medicine of a medical course.

METHOD

A qualitative methodology was used with the objective of understanding the perceptions and opinions of medical students about the use of simulation as an active teaching method for the training of medical consultation skills. Medical students from Positivo University, Curitiba, PR, Brazil, who attended the discipline of Family and Community Medicine and participated in simulation activities in 2021 and 2022, were invited to participate.

The inclusion criteria were as follows: being a medical student, having completed the Family and Community Medicine discipline during the period of use of the simulation (2021–2022), being 18 years of age or older, and consenting to participate in the study by signing the Informed Consent Form (ICF). Students who did not meet the criteria mentioned above or who, at some point, wished to withdraw from the study, even after initially agreeing to participate, were excluded (Table).

TABLE — Questionnaire used for research

Socioeconomic questionnaire
1 – How old are you? ( ) 18-21 ( ) 22-25 ( ) 26-29 ( ) over 30 years old
2 – What is your family income?
3 – What period of college are you in?
4 – Do you agree to answer the questionnaire on the OSCE teaching method?
OSCE teaching method questionnaire
Answer Choice: Correct or incorrect.
1 – Do the teachers explain the dynamics clearly?
2 – Are training laboratories adequate?
3 – Are the skill rooms adequate?
4 – Is the time of the curriculum allocated to the laboratory adequate?
5 – Would you like more simulator training?
6 – Are you used to the concept of simulation-based teaching?
7 – Is simulation-based teaching effective for learning with strategy?
8 – Does simulation make the clinical case more interesting?
9 – Does simulation help you apply your knowledge?
10 – Should simulations be implemented more in undergraduate courses?
11 – Does simulation help you retain new knowledge?
12 – Does simulation-based teaching provide you with a more realistic experience?
13 – Does simulation help you improve your communication skills?
14 – Do you feel comfortable in the simulated environment?
15 - Did the simulation help you develop your clinical decision-making skills?
16 – Is cooperation between students important during the development of the simulation?
Questionnaire on the use of simulation-based teaching in the discipline of family and community medicine
Open-ended responses
1 – Comment on your perception of the use of simulation as a teaching methodology for the communication skills and clinical consultation in primary health.
2 – What makes you like or dislike this type of teaching?
3 – Does feedback after simulations make you understand your weaknesses and strengths?
4 – Did you feel a difference in your medical behavior after starting classes with simulation?
5 – Are you able to face your day-to-day life as a doctor after simulation-based training?
6 – Has the training made you safer to face real care? Why?
7 – Has the training made you more confident to face the service on a daily basis? Why?

The research instrument included a brief description of the study, presentation of the Informed Consent Form (ICF) with date and confirmation of participation, socioeconomic profile questionnaire, year of completion of the Family and Community Medicine course. The questionnaire about the experience with simulation in this specific discipline is in Table and the answers analyzed.

All information was kept anonymous, and the participants were identified by letter and number, with the letter representing the institution to which he belonged and the number based on the numerical sequence of receipt of the response. The research materials were kept confidential and archived for a period of 5 years, following CNS Resolution No. 466/12. The answers were read and prepared for analysis, eliminating non-specific passages and language biases, with the aim of limiting the text to information related to the participants' experiences and perceptions. Similar accounts were grouped together to organize the information.

RESULT

In total, 47 students participated, and most reported having had a positive experience with the class model in question. However, although 95.$^{7\%}$ of them considered simulation a useful learning strategy and 95.$^{7\%}$ stated that the classes helped them to apply what they learned in practice, only 76.$^{6\%}$ felt satisfied with the simulations. According to the interviewees, the strengths of the class structure included good instructor guidance (85.$^{1\%}$ satisfied), adequate learning environments (91.$^{5\%}$ satisfied) and learning in a semi-realistic environment (87.$^{2\%}$ satisfied). On the other hand, only 66.$^{0\%}$ considered the duration of the classes adequate. Regarding learning, 87.$^{2\%}$ felt comfortable in the simulated environment, 93.$^{6\%}$ stated that the classes helped in the retention of knowledge and 83.$^{0\%}$ reported improvement in clinical decision-making. Despite this, 19.$^{1\%}$ of the students did not want to be trained with this strategy.

When asked what they liked or disliked about the simulations, the positive responses focused primarily on the benefit of a safe environment, with no real, harmful consequences: "I really like this type of class because I can be exposed to situations in a controlled way. I can make mistakes in diagnosis, treatment, or procedures, and they won't have harmful consequences because it's just a simulation; not so much pressure to get it right, but to learn." Other students mentioned that they were able to apply what they learned in the simulations to their clinical practice and that training with common cases prepared them to deal with patients with complaints already found in simulation: "Yes, having scenarios of possible everyday events in clinical practice helps us prepare for when they happen in real life." In addition, when asked if the feedback helped them, they expressed significant improvement in the communication domain: "Yes, especially for unconscious things we do, such

as the way we approach something or point out language quirks and use language that is appropriate to the patient's profile." Finally, 91.5% stated that they noticed changes in their behavior after the training: "Yes, in addition to having more confidence to attend to a real patient, I became more efficient in writing down relevant points of the consultation in the medical record. In addition, general patient care is increasingly organized."

Regarding negative opinions, most students reported a lack of preparation or interest in simulating a real medical office environment, making it impossible to build a doctor-patient relationship and properly manage the case. They said: "Having our own colleagues, usually the same ones, as actors for a while wears down the dynamic. It would be better to use simulation monitors after a while" and "we, as students, are not prepared to act like patients". Another common demand from students was the absence of a teacher observing the simulation to provide more individualized and coherent evaluation and feedback. They said: "Sometimes the simulations are incomplete and there is a lack of individual evaluation of the step-by-step process, leading to the students' neglect"; and "I believe that there should be feedback from teachers after the simulations. Many times we don't know what we did wrong or right." Many also expressed their frustration with the lack of real practice in doctors' offices due to the COVID-19 pandemic: "I think fewer simulations and more visits to community health centers would be more interesting". I would like to have more real encounters with patients" and "Performing an imaginary consultation is not the same thing as a real consultation."

This study included 47 3rd and 4th year medical students, none of whom were excluded and more than half attending classes in 2022. The results are grouped into 3 domains: structure of the simulation class, application of learning in practice, and satisfaction with the learning process.

Regarding the structure of the classes, most reported being familiar with the concept of simulation-based learning, clear explanations of the activities by the instructors in charge, adequate duration of the activities and adequate simulation laboratory facilities. They also considered it important to learn collaboratively with co-workers (colleagues such as simulated patients and evaluators). In the domain of the application of learning in practice, most reported an increase in the retention of theoretical knowledge, improvement in communication skills and in clinical decision-making. They reported that feedback at the end of each simulated service helped improve verbal and nonverbal communication and clinical reasoning: "Feedback helped me, especially in relation to unconscious things we do, such as the way we approach something, or by warning about language addictions and by using language that is more accessible to the patients' profile." But 4 students found that throughout the classes, the feedback structure used by the teachers ended up being worn out and repetitive: "I consider that the weak point of the simulations is the lack of effective feedback. After a while, my colleagues started to do it anyway, so it would be more effective to always have the teacher present or a monitor for the simulations." The main behavioral changes perceived by the students were improved communication skills: "in addition to being more confident to attend to a real patient, I became more agile in writing down relevant points of the consultation in the medical record. Also, the service itself is increasingly organized", in the organization of the consultation and recording in the medical record, fix the content more: "Yes, I think that after we apply what we learned in these simulations we can fix the content better", in addition to increasing confidence to perform real care. Only 4 students reported not feeling in a semi-realistic environment.

When evaluating the applicability of learning in the daily life of medical students, they reported that the activities helped to prepare for situations of real care: "Having scenarios of possible events in the day-to-day of clinical practice helps us prepare for when it occurs in real life", by correctly passing the case to the preceptor: "During the simulations and when receiving feedback, the service becomes increasingly organized/standardized. Also, the simulations are of common situations in the office, so when we come across a real patient, we are not so nervous since we have already conducted similar care previously and we still receive feedback with guidance for improvement, in addition to improving communication and clinical reasoning". Most report that this type of training increases their confidence for real care, by noticing and correcting mistakes they could make in real situations: "Yes, simulations have given me great familiarity with the sequence and dynamics of a medical consultation, making the transition from simulations to real practice much smoother. I have already carried out some real consultations with situations very similar to those in class, and because of this, I already knew some management, dialogue and conduct strategies", by practicing the clinical interview more under supervision, by reflecting on the practice itself with the feedbacks and by simulating real and common situations. Even so, some continue to feel insecure to perform real services: "I like the ease of applying the theme in a controlled environment, which prepares us very well for real service. However, some negative points can be easily adjusted. Not all students take the simulation seriously, which harms those who are there to really learn, I think it would be easily circumvented if a teacher was supervising during the simulation."

As for the students' satisfaction with learning, most felt satisfied, considered the theoretical framework more interesting when contextualized, the useful strategy, living a semi-realistic experience in a comfortable environment for learning and would like to have more simulated experiences throughout their training.

When reflecting more on what makes them enjoy this type of class, most attribute the satisfaction to the opportunity to apply and practice the knowledge by simulating it in real situations: "I like the classes, but I'm learning to deal with criticism from colleagues! In my group everything is going well after we talk, but sometimes it seems like it's personal, because it's in these moments that people take the opportunity to express what they feel! But I know that throughout our medical career we need to deal with all kinds of setbacks, so maybe it's a good way to exercise resignation and patience and understand each one's side!"; "It is important to have the opportunity to put our theoretical learning into practice in a safe environment, where we do not run the risk of taking wrong conduct, for example. In addition, I also learn a lot by playing the role of the patient, when I already know what should be done by the doctor, in a safe environment to make any mistakes, and to practice clinical reasoning helping in decision making"; "I really like this type of class because it allows me to face situations in a controlled way. I can make mistakes in the diagnosis, treatment, or procedure, and it will not cause any harm since it is only a simulation. Therefore, there is not so much pressure to get it right, but to learn. In addition, we can specifically choose what will be simulated, rather than relying on luck to find different cases each time."

DISCUSSION

Most like this type of class because they consider it an opportunity to apply, practice and consolidate theoretical content, because it simulates real situations, is a safe learning environment and helps to improve decision-making. The students felt that the feedback at the end helps to improve the consultation. Those who reported not liking it attributed this fact to the lack of seriousness of some colleagues during the dynamics, missing the teacher's support during the consultations and thinking that these activities do not replace the class with patients.

For 91.5% of the students, the feedback helped to perceive strengths and points to improve, especially in verbal and non-verbal communication, as well as to individualize the service protocols. Students would like to receive more feedback throughout the training, while others believe that, over time, this feedback format has become worn out.

The simulation provided behavioral changes for 89.4% by increasing confidence to learn, improving communication skills, fixing content, and organizing consultations and records in medical documents. Four students opined that the simulation cannot simulate the practice of medical consultations.

Most students (87.2%) were able to apply what they learned during the training in their day-to-day care as medical students, especially when preparing for difficult care situations, to correctly pass the case on to the preceptor, as well as to better communicate with the patient and better articulate theory and practice.

When evaluating the increase in confidence to perform real care, 83% mentioned it as a positive aspect to perceive that the error in real care can be reduced with simulation training, and, also, to train anamnesis and communication skills. Using themes from real and common situations and reflection through feedback was pointed out as a contributing factor to this. On the other hand, 3 students continued to reinforce that these activities do not simulate practice.

CONCLUSION

The use of realistic simulation activities for learning clinical consultations with emphasis on medical interview skills was satisfactory, with significant gains in communication skills, clinical reasoning, organization and recording of the consultation in the medical records in the interviewed group.

Authors' contributions

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