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The Contribution of Simulated Patients to Undergraduate Medical Education: A Pathway to Educational Excellence

O Contributo dos Doentes Simulados na Educação Médica Pré-Graduada: Um Caminho para a Excelência Educacional

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ABSTRACT

The aim of this narrative review is to explore the state of the art in using simulated patients' methodology, highlighting its benefits and advocating for its widespread adoption as a cornerstone of excellence in training. The use of patients in undergraduate medical education is essential and recommended at an early stage of medical training. However, using real patients is accompanied by several difficulties, such as patient privacy and the unpredictability of patient conditions. Simulated patients are now an integral part of medical school faculty. They should be viewed as some of their most valuable collaborators as their spectrum of activity has been progressively expanding, and they are taking on new challenges and responsibilities. Its efficient use leads to the development of technical competence in performing procedures and the ability to make decisions about diagnosis or treatment. They are also essential in training the ability to communicate efficiently with patients and work as a team. The use of simulated patients to teach physical examination has dramatically expanded its use, with emphasis on training in gynecological or breast examination in women or genital and rectal examination in men. The possibility for the student to receive feedback from the simulated patient during or after the simulation represents a unique opportunity for the student to understand the 'patient's' point of view and reflect on their limitations and opportunities for improvement. Using simulated patients in medical assessment ensures that students are exposed to the same clinical scenario and evaluated according to the same criteria. The simulated patient, acting as a performance evaluator, provides a level of reliability identical to that of clinical evaluators, enhancing the credibility of the assessment process. The development of hybrid scenarios allows the combined use of simulated patients and simulators to increase the realism of the simulation scenario. From an administrative perspective, using simulated patients in medical education involves recruitment and training, and the biggest challenge is the financial resources it requires. In the ever-evolving landscape of medical education, the use of simulated patients is no longer a mere complement to traditional teaching methods but an indispensable tool for preparing future physicians.
Keywords: Clinical Competence; Education, Medical, Undergraduate/methods; Patient Simulation

RESUMO

Este artigo de revisão narrativa procura revelar o estado na arte do contributo dos doentes simulados para a educação médica e incentivar as escolas médicas a adotar esta metodologia como um pilar essencial da formação de excelência. A utilização de doentes no ensino médico pré-graduado é considerada fundamental. No entanto, a utilização de doentes reais é acompanhada por diversas dificuldades, como as relacionadas com a sua privacidade e a grande variedade de apresentações clínicas. Os doentes simulados são atualmente parte integrante do corpo docente das faculdades de medicina e devem ser encarados como sendo dos seus colaboradores mais valiosos. O seu espectro de atuação tem vindo progressivamente a alargar-se, assumindo novos desafios e responsabilidades. A sua utilização conduz de uma forma eficiente ao desenvolvimento de competência técnica no desempenho de procedimentos e na capacidade de tomar decisões sobre o diagnóstico ou tratamento. Igualmente são imprescindíveis no treino da capacidade de comunicar com os doentes e na capacidade de trabalhar em equipa. A utilização de doentes simulados para o ensino do exame físico, veio expandir enormemente a sua utilização, com destaque para o treino do exame ginecológico ou da mama na mulher ou do exame genital e rectal no homem. A possibilidade de o aluno receber *feedback* do doente simulado durante ou após a simulação representa uma oportunidade única de o aluno se aperceber do ponto de vista do 'doente' e de poder refletir sobre as suas limitações e oportunidades de melhoria. A utilização de doentes simulados na avaliação médica permite igualmente comparações adequadas de diversos alunos. Em determinados casos é o próprio doente simulado que desempenha o papel de avaliador, com uma fiabilidade idêntica à de avaliadores clínicos, de que resulta uma maior credibilidade do processo de avaliação. O desenvolvimento de cenários híbridos permite o uso combinado de doentes simulados e simuladores com o objetivo de aumentar o realismo do cenário de simulação. Do ponto de vista administrativo, a utilização de doentes simulados no ensino médico envolve múltiplas atividades sendo o maior desafio para a sua implementação os recursos financeiros necessários. A adoção da metodologia de doentes simulados é hoje uma ferramenta fundamental e indispensável para o treino dos futuros médicos.
Palavras-chave: Competência Clínica; Doentes Simulados; Educação de Graduação em Medicina/métodos

INTRODUCTION

"For the junior student in medicine and surgery, it is a safe rule to have no teaching without a patient, and the best teaching is that taught by the patient himself."

William Osler, 1903[1]

Miller's work in the sixties was decisive in making medical teaching more efficient by redefining what is expected when assessing student's clinical competence, focusing on performance rather than the volume of knowledge.[2] As a consequence, and similarly to what occurred in other areas of knowledge, medical teaching stopped being teacher-centered to being student-centered and focused on the efficiency of the learning process and the need for alignment between the learning objectives, the teaching methodology,

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and the assessment methods.[3-5]

With the advent of patient-centered medicine, clinical performance began to be centered not on the professional but on the sick person. This meant changing roles traditionally attributed to both the doctor and the patient.[5-9] Although undergraduate medical training had always been associated with contact with patients,[1,10] this new focus led the General Medical Council in the United Kingdom and the Association of American Medical Schools to recommend early contact of medical students with patients[11,12] and the World Health Organization to choose the teaching of communication skills as one of the essential clinical skills of undergraduate medical education.[13]

This paradigm shift, centered on the patient and performance, was responsible for developing medical simulation as the preferred method for teaching and assessment. In this way, the learning curve, traditionally followed by the inexperienced student when taking advantage of training opportunities with real patients through trial and error, was no longer acceptable and was gradually replaced by teaching through simulation.[14] This was also the main reason for the appearance of simulated patients (SP) in medical education.

Simulated patients are people trained to realistically perform a specific role in which they simulate being ill.[15,16]

The first records of the use of simulated patients in medical teaching come from the neurologist Howard Barrows, who introduced this methodology (which he called "programmed patients") in 1963 to improve the efficiency of teaching physical examination in neurology.[15,17] This approach was later adopted by professionals in other fields, such as gynecologist Robert Kretzschmar[18] and pediatrician Paula Stillman.[19]

The aim of this narrative review is to explore the state of the art in using simulated patients in medical education, highlighting its benefits and advocating for its widespread adoption as a cornerstone of excellence in training.

METHODS

A literature review on the simulated patient methodology was performed in the PubMed database until October 1st, 2024. Medical Subject Headings (MeSH) terms used in the search included: 'simulated patient', 'standardized patient' and 'undergraduate medical education'. Additionally, reference books and the reference lists of the identified studies were manually reviewed to identify complementary publications.

RESULTS

Scientific evidence

The use of patients in undergraduate medical education is considered fundamental and recommended at an early stage of medical training.[10-12,20] However, the use of real patients, allowing greater realism, is accompanied by several difficulties, such as the number of patients available, the characteristics of each patient and their illness, or issues related to the privacy, safety, and comfort of these patients. Furthermore, some patients may present significant complexity or be seriously ill, making their use in teaching impossible.[10]

On the contrary, simulated patients are readily available and can be trained to perform multiple scenarios, which can be done multiple times, providing the student with multiple opportunities for training. Additionally, their performance can be adapted to the experience level of each student.[21] These simulated patients can also be used in situations where the use of real patients would be inappropriate, such as training to deliver bad news or genitourinary physical examination.[21,22] The provision of feedback by the simulated patient throughout or at the end of each scenario is an essential instrument for the student's continuous improvement in the development of their clinical skills.[15,20,21,23]

Using simulated patients allows the student to train multiple skills in a safe environment where error is permitted and repetition is encouraged.[5,14,20,21,24] Several studies show that a well-trained simulated patient is not distinguishable from a real patient[15,21,25] and that its use is identical in efficiency to that of real patients.[26]

There is robust evidence that simulation is an efficient way of training students to develop technical competence in performing procedures and in the ability to make decisions about diagnosis or treatment,[14,27-29] in the ability to communicate efficiently with patients, family members, and other professionals[9,13,20,28-30] and the ability to work as a team.[14,29] Special emphasis has been placed on training communication skills resulting in more satisfied patients[20] with a better prognosis.[30,31] Several studies have demonstrated that the use of this methodology results not only in an improvement in clinical skills but also in better efficiency and greater satisfaction with learning by the student when compared to traditional teaching methods.[20,24,27,32] This includes studies that compare this methodology with the use of other students to simulate diseases,[33] the use of virtual reality[28] or the use of simulation mannequins in scenarios where the patient is conscious and invasive procedures are unnecessary.[25,29]

The opportunity for the student to receive feedback from the simulated patient during or after the simulation represents a unique opportunity for the student to understand the 'patient's' point of view and reflect on their limitations and opportunities for improvement.[20,24,30,34] Using simulated patients in medical assessment also allows adequate comparisons between students exposed to the same clinical scenario and evaluated according to the same criteria.[23,24]

DISCUSSION

Implementation

The development of scenarios represents the first and one of the most critical aspects related to the use of simulated patients.[23,35] Scenarios must be simple, in a language understandable by simulated patients, and include the learning objectives, context, role to play, and particular aspects of the feedback that should be provided to the student.[36] Scenarios are usually created by a dedicated team, which includes professionals from the respective medical field, the person responsible for the simulation program, and the simulated patients themselves.[37] Whenever possible, real patients must also be consulted before making the final version.[37] The complexity of the tasks required of the student must increase throughout the curriculum. Complex tasks must be deconstructed into several more straightforward tasks and distributed across different scenarios, allowing gradual and progressively more complex training until the presentation of more complicated scenarios.[4,38]

Simulated patient training essentially involves two components: role play and offering feedback to students. Role-play training enables the simulated patient to play their character realistically and assumes the teaching of general representation techniques. In addition to training representation skills, it is essential to review the clinical aspects of each scenario, including the clinical context, the patient's personality and emotional state, complaints, fears, and expectations regarding the disease. Relevant aspects of personal and family clinical history must also be reviewed, as well as the social context, habits, lifestyle, and usual medications.[37] The simulated patient must also be trained about the complaints that must be present during the physical examination done by the student.

Equally important to artistic performance is the simulated patient's ability to provide structured feedback to the student. This represents the most important activity in simulation scenarios and contributes the most to learning efficiency.[34,38] The simulated patient can provide feedback on multiple aspects such as taking the clinical history, carrying out the physical examination, verbal and non-verbal communication skills, as well as aspects related to empathy, professionalism and the confidence level demonstrated by the student during the consultation as well as how the information was transmitted and perceived by the patient.[34,39,40]

The fact that this feedback relates to the patient's perspective and the way they experienced the consultation in that particular scenario and with that specific student, valuing not only the technical aspects but also, and mainly, the emotional aspects, is the main advantage of using simulated patients in medical education.[34,39,40] The main objective should be to make the students reflect on their performance during the scenario and how their attitudes impacted that particular patient. To achieve this, the simulated patient must highlight the positive aspects and identify opportunities for improvement, always from the perspective of the 'patient' and using concrete examples taken from the scenario they have just experienced.[34,39]

Feedback time is the most crucial phase in any scenario and the one to which most of the time should be devoted when preparing simulated patients.[41] This training could be with other more experienced simulated patients or the person responsible for the simulation program. It may involve observing previous videos from the same or other simulated patients.[41] A training program is essential for simulated patients to continually improve the authenticity of their role-play and the quality of feedback they provide to the student.[42]

In situations where simulated patients play a role in assessing students, specific training is essential to ensure that the simulated patient knows the assessment's nature, context, and objectives.[36,39]

In all programs, there must be someone in charge of training the simulated patients (SP educator or SP practitioner) and assessing their continuous performance of the role-play and the quality of the feedback provided to the students.[39] Providing feedback to simulated patients regarding these two aspects is essential to ensure the quality of their use in medical education.[39,42,43] This feedback can be provided by the SP educator and other simulated patients, teachers and even students, allowing the simulated patient a broad view of their performance. The Maastricht assessment of Simulated Patients (MaSP) scale, developed to evaluate the authenticity of the role play and the quality of the feedback provided by the simulated patient, has shown to have adequate validity and reliability and is currently used in different centres.[43]

From an administrative point of view, using simulated patients in medical education involves multiple activities, including recruitment, selection, training, schedule management, dissemination of support materials, and remuneration for simulation activities.[39] Recruitment can be done through an advertisement to the general public in healthcare institutions[15,22,39] or through more experienced simulated patients.[15] This role can also be played by clinicians (doctors, nurses, psychologists), students, medical education professionals, or professional actors.[15,41,44] The use of professional actors seems to have an advantage when the role played is emotionally more demanding, such as in scenarios of psychiatric illness.[44] Demographic aspects such as sex, age, race or ethnicity must be considered in the selection to ensure that simulated patients can be adapted to the different scenarios.[39] In addition to initial training, which focuses on artistic performance and the ability to provide feedback, regular training sessions must occur before performing

each particular scenario.[39] The main limiting factor of using simulated patients is the cost, as these programs involve significant human and financial resources.[10,15,22,23,32]

In recent years, several associations have been created to develop guidelines, share experiences, promote training and encourage research related to the use of simulated patients in medical education, such as the Association of Standardized Patient Educators (ASPE),[45] the Society for Simulation in Healthcare (SSH)[46] or the Society in Europe for Simulation Applied to Medicine (SESAM).[47] Other associations were created with the primary objective of training communication in healthcare, such as the European Association for Communication in Healthcare (EACH).[48]

Ethical considerations

Simulated patients must be informed about the objectives and methodology used, provide informed consent for their participation and be aware of the duty of confidentiality concerning all activities, as they cannot disclose, by any means, the content of the scenarios or aspects of the interaction developed between the simulated patient and the student.[39]

Conversely, it must be ensured that the participation in any simulation scenario respects their privacy and that any sound or image recording is only viewed and commented on by those directly involved in the teaching and learning process, whether teachers or students.[39]

It must be ensured that they receive adequate training and that their activity is monitored and evaluated regularly, receiving feedback not only on the positive aspects but also on opportunities for improvement concerning their role play and the quality of the feedback offered to the students.[42,43]

Several studies show that, from the point of view of the simulated patient, this is a rewarding activity, mainly due to the opportunity to contribute to the training of future healthcare professionals.[49]

Practical applications

Using scenarios with simulated patients allows the student to practice the different phases of a medical consultation.[15] The student must ensure that the patient understands the structure of the consultation while establishing an empathetic doctor-patient relationship and training different forms of verbal and non-verbal communication in a patient-centered environment.[15,20,23,32]

For more experienced students, these consultations can also allow training in their ability to summarize to the patient the main problems encountered during the consultation, clinical reasoning skills, the ability to communicate to the patient their diagnostic impression, and the need to carry out diagnostic tests or a therapeutic proposal.[15,23]

The ability to develop empathy, in its cognitive, affective, and behavioral components, is considered one of the essential characteristics of medical activity as it is a fundamental component of the doctor-patient relationship with an impact on patient satisfaction and prognosis.[50] Despite its importance, the degree of empathy demonstrated by students in clinical rotations, if not explicitly trained, is often not acceptable,[51] and the use of simulated patients contributes meaningfully to empathy training in undergraduate medical education.[50]

The use of scenarios with simulated patients can also help train more complex skills, for which the use of real patients would be inappropriate, such as delivering bad news, dealing with patient dissatisfaction or aggression, or addressing more sensitive topics such as sexual history or signs of domestic violence, for example.[15,23]

Simulated patients can also be used to train physical examination skills.[23,52] Although, in most cases, simulated patients are healthy individuals, physical examination techniques can be trained on the simulated patient, regardless of the findings found. Furthermore, this training must also include other aspects such as obtaining the patient's consent to be examined, an explanation of what will occur at each phase of the observation, the ability to give the patient clear and precise instructions throughout the physical examination process, and constant monitoring of any sign of discomfort expressed by the simulated patient. This way, the technical performance and the student's communication skills can be trained and tested. The same is valid for training in some procedures, such as measuring blood pressure or venipuncture for blood collection.[15,53]

The introduction of assessment through observation of student performance in several simulated clinical situations, globally known as Objective Structured Clinical Examination (OSCE), emerged in the 1970s due to the need to evaluate student performance in simulated clinical scenarios.[54] In this context, the use of simulated patients makes the scenario more real and allows its standardization and adaptation to the desired degree of difficulty while enabling the simultaneous assessment of the student's communication skills, empathy and professionalism.[23,39]

Using simulated patients to assess students led to the need for greater standardization of scenarios and the simulated patients themselves, resulting in the designation of standardized patients.[15,16,39,55,56] These are simulated patients from which greater consistency is required in their role-play, with less individual freedom in performing a certain character. Gender, age, physical characteristics, attitude, previous experience, and communication skills must be considered in their selection and training.[15,16,55]

A clinical observer or the simulated patient can evaluate the student's performance, including completing an evaluation grid and providing oral or written feedback.[55] In several

centers, postgraduate medical evaluation and access to clinical practice is carried out through OSCE with the presence of simulated patients.[57,58] In some instances, the simulated patient plays the role of performance evaluator,[59] with reliability identical to that of clinical evaluators.[60]

Recent innovations

Using simulated patients to teach physical examination (Physical Examination Teaching Associate, PETA) has dramatically expanded its use. In this modality, the presence of the tutor is not always needed, and this role is assumed by the simulated patient, who, at the end of the session, can provide the student with feedback on the mastery of different observation techniques not only from a technical point of view but also in terms of the patient's perspective. This technique is as efficient as the use of clinicians as tutors,[61] allows for greater standardization of physical examination education[62] and is associated with a reduction in costs,[61] but requires a greater complexity in the recruitment and training of simulated patients.[62,63]

Training gynecological or breast examination in women or genital and rectal examination in men raises additional difficulties. The repeated use of real patients for this purpose is neither acceptable nor efficient, and student training with peers has proven inadequate.[64] The use of simulated patients for this purpose (Genitourinary Teaching Associate, GUTA) is growing[62,63,65] both for the breast and gynecological examination (Gynecological Teaching Associate, GTA) and for the genitourinary, rectal, and prostate examination (Male Teaching Associate, MTA).

Hybrid scenarios refer to the combined use of simulated patients and simulators to increase the realism of the simulation scenario. In these scenarios, the student can train skills in executing procedures integrated with communication skills and professionalism.[66] An area that is growing in the use of these scenarios is obstetrics.[67] A recent development in the use of hybrid scenarios consists of the physical transformation of the simulated patient with special suits or physical characterization, making possible the simulation of more complex patients such as elderly patients, obese patients, and victims of stroke, among others.[68]

In some scenarios, simulated patients can play the role of other family members, laboratory technicians, paramedics, medical students, or doctors.[21,53,69]

Alternatively, real patients who receive training in simulation and feedback can be used. This is especially useful in scenarios involving chronic diseases where knowledge of the disease and previous experiences of contact with healthcare professionals can be presented to the student more realistically.[5,53,70-72]

A recent development is the use of simulated patients in sequential consultations, allowing the evolution of chronic disorders such as Alzheimer's disease to be simulated. In these scenarios, arranged to simulate consultations years apart and always using the same simulated patient, the student can witness the evolution of the disease and be confronted with new difficulties in each session.[15,73] The main difficulty in implementing these scenarios is the logistical aspects associated with them.[15]

New areas of development include the use of adolescents, older adults or transgender people as simulated patients.[7] The need for undergraduate training in adolescent medicine has led to the recruitment of adolescents for training and subsequent use in teaching and assessing students. The results show that adolescents can be trained to perform some roles realistically and provide quality feedback.[74]

Future perspectives

Simulated patients are now a part of the medical school faculty and should be considered some of their most valuable collaborators.[53] Its use is growing, and currently, they are used not only in medical education but also in other related areas such as nursing, dietetics, pharmacy, or physiotherapy.[15,42,74]

As its spectrum of activity has been progressively expanding, taking on new challenges and responsibilities, this increase in functions must be accompanied by a growing involvement of the rest of the teaching staff in their training and development without forgetting the ethical aspects in which their collaboration must be framed.

To maximize the potential of these collaborators, it will be essential to carry out multicenter studies that identify ways to improve their efficiency.[7] An effort to standardize their use among different medical schools will be desirable, while the possibility of sharing resources must be explored.

Undoubtedly, the lack of creativity and not the lack of resources will be the fundamental limitation to developing new functionalities for simulated patients.

COMPETING INTERESTS

The author has declared that no competing interests exist.

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