Experience report

Application of the Peer-assisted learning model in an infectious diseases outpatient clinic

Aplicação do modelo de instrução entre pares em ambulatório de Infectologia: um relato de experiência

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ABSTRACT | INTRODUCTION: The Peer-assisted learning (PAL) consists in an active learning method between students of different or the same period, supervised by a tutor senior. The literature is quite rich regarding the advantages related to the use of IP, especially in health courses, contributing mainly to the improvement of teaching skills and communication. **OBJECTIVE:** This study aims to relate a successful experience of application of a peer teaching model in an infectology outpatient facility. **METHODS AND MATERIALS:** Students of 2nd to 12th period of a Medical Public School take part in an infectology outpatient facility organized according to peer teaching. In this internship, the students learn how to solve practical problems in addition to searching for medical knowledge in an independent way. First, the student joins as a student-learner, taking part in medical checkups and discussions and, as they acquire knowledge and practice, they become a student-teacher, now responsible for another student-learner, finishing a step of the active learning process. By the end, the interns acquire new competences and skills, becoming more independent in relation to a human medical checkup. **DISCUSSION:** This model of active learning was able to promote the development of social skills, communication and student independence, in addition to significantly improving learning and retention of content. The students were stimulated by their pairs to search for knowledge, in the case of student-teachers, to remember the basic content and for the student-learners to learn more about clinic and social questions involved in the process. **CONCLUSION:** It was observed that the peer teaching is a methodology that promotes knowledge between students and the tutor senior, through the direct insertion of the students, not just in the practice, but in a welcoming and multidisciplinary environment.

KEYWORDS: Medical Education. Learning. Peer-assisted Learning. Active Learning.

RESUMO | INTRODUÇÃO: O modelo de instrução entre pares (IP) consiste em um método de aprendizagem ativo entre alunos de diferentes ou do mesmo período, supervisionados por um orientador. A literatura é bastante rica no que se refere às vantagens relacionadas ao uso da IP, especialmente nos cursos da saúde, contribuindo, principalmente, para a melhoria nas habilidades de ensino e comunicação. **OBJETIVO:** O presente estudo tem como objetivo relatar uma experiência de aplicação do modelo de instrução entre pares em um ambulatório de Infectologia. **MÉTODOS E MATERIAIS:** Alunos do 2º ao 12º período de uma Faculdade de Medicina pública estagiaram em um ambulatório de Infectologia organizado de acordo com o modelo de instrução entre pares. Neste estágio, os discentes aprendem a solucionar problemas práticos, além de buscar o conhecimento médico de forma independente. Inicialmente, o aluno ingressa como um aluno tutorado acompanhando as consultas e participando das discussões e, à medida que adquire conhecimento e prática, torna-se um aluno tutor, agora já responsável por um aluno tutorado, concluindo, assim, uma etapa do processo ativo de aprendizagem. Ao final, os estagiários adquirem novas competências e habilidades, de modo a tornarem-se mais autônomos em relação ao atendimento médico humanizado. **DISCUSSÃO:** Este modelo de ensino ativo foi capaz de promover o desenvolvimento de habilidades sociais, a comunicação e a autonomia do estudante, além de melhorar significativamente a aprendizagem e a retenção do conteúdo. Os alunos são estimulados por seus pares a adquirirem conhecimentos, no caso dos alunos tutores, relembrarem os conhecimentos do ciclo básico e dos alunos tutorados, aprenderem mais sobre a clínica e as questões sociais envolvidas no processo. **CONCLUSÃO:** Foi observado que o modelo de instrução entre pares é uma metodologia que fomenta o conhecimento entre os alunos e os professores, através da inserção direta dos alunos não só na prática médica, como também em um ambiente acolhedor e multiprofissional.

PALAVRAS-CHAVE: Educação Médica. Aprendizagem. Aprendizagem por Associação de Pares. Aprendizado Ativo.

Submitted Feb. 16th, 2025, Accepted Apr. 28th, 2025,
Published July 10th, 2025
Inter. J. Educ. Health, Salvador, 2025;9:e6136
http://dx.doi.org/10.17267/2594-7907ijeh.2025.e6136 | ISSN: 2594-7907
Assigned editors: Iêda Aleluia, Ana Cláudia Costa Carneiro

How to cite this article: Peluso LGP, Peluso LFP, Amaral Neto AC, Moura MA, Vianna NA. Application of the Peer-assisted learning model in an infectious diseases outpatient clinic. Inter J Educ Health. 2025;9:e6136. http://dx.doi.org/10.17267/2594-7907ijeh.2025.e6136

1. Introduction

The 2014 National Curriculum Guidelines for Undergraduate Medical Courses[1] establish the need to adopt methodologies that prioritize active student participation in the construction of knowledge and in the integration of content. Throughout history, various teaching methodologies have been reported, with 21st-century education being the product of an evolution influenced by numerous thinkers.[2]

In recent years, prominent trends in the field of health education have emphasized the study of active methodologies, which favor student-centered learning. In this model, students become the protagonists of the educational process, transitioning from a merely passive stance to an active, independent, and critical role.[3]

These active methodologies aim to overcome historical gaps left by traditional teaching methods, which are often based on passive, uncritical, and hierarchical transmission of knowledge from teacher to student. Furthermore, they seek to meet the demands of a society in need of professionals with new competencies and skills, such as teamwork, interpersonal relationships, and autonomy to solve real-world problems.[4]

Among active methodology strategies, the peer-assisted learning (PAL) model is a teaching pedagogy increasingly adopted by educational institutions around the world. An integrative review concluded that PAL has a high potential to foster self-reflection and self-awareness processes, from basic areas to different stages of higher education in health fields. However, more reports of its use in Brazil are still needed.[5]

Topping and Ehly[6] define this model as one in which "people from similar social groups who are not professional teachers help each other to learn, and in the process, learn by teaching themselves."

The literature presents some confusion regarding the correct terminology related to "peer instruction," highlighting the need to standardize terms.[7] In this experience report, we will use the term "peer-assisted learning" as an umbrella term to refer to a general mode of teaching in small groups as a form of organization.

Peer-assisted learning presents three dimensions of categorization[8]: a) the distance between the students who teach and those who are taught; b) the size of the group being taught; c) the formality of the teaching arrangement.

Regarding the first category, distance is a key factor to consider. Near-peer teaching occurs when students in more advanced stages (clinical cycle or internship) teach those in earlier stages (basic cycle)[9], while peer teaching happens when students at the same level teach and learn from each other, with the roles of tutor and tutee being interchangeable among students of the same academic year and educational level.[6]

Group size can be divided into small or large groups, a relevant factor because, as Ten Cate exemplifies, "one-on-one peer tutoring can benefit from counseling skills, whereas effective group teaching requires understanding group dynamics".[10]

The formality of the arrangement can vary depending on the strategy used, the goals set, and the development environment.[10]

The literature suggests numerous advantages related to the use of PAL, especially in health-related courses. Ten Cate[10] outlines twelve reasons to adopt peer teaching, including: relieving teaching pressure from faculty, offering education at the students' cognitive level, enhancing motivation for learning, and providing an alternative study methodology. Tolsgaard[11] adds that, in some cases, student-teachers may be just as proficient—or even more so—than associate professors in teaching less complex clinical skills.

Moreover, in contrast to traditional methods, peer-assisted learning promotes effective teaching strategies that foster critical thinking among students and develop skills in teamwork and communication—crucial for addressing the real-life demands of modern society, particularly in doctor-patient interactions.

Given the above, the present study aims to report on an experience of applying the peer-assisted learning model in an Infectology outpatient clinic.

2. Methods

This article refers to a descriptive study with a qualitative approach, in the form of an experience report, carried out by undergraduate medical students from the Federal University of Juiz de Fora (UFJF) in a teaching outpatient clinic. The construction of this report complies with the criteria described in item VIII of article one of Resolution No. 510, dated April 7, 2016, of the National Health Council[12], and does not require submission to the Research Ethics Committee involving Human Beings. The internship was developed at the Specialized Care Service (SAE), which assists people living with HIV (PLHIV) undergoing treatment. The clinic receives students from the 2nd to the 12th academic period, with a weekly workload of eight hours. Selection is based on interest and affinity with the topic, through contact with the supervising professor or students already participating in the service, who may also refer to other potential participants.

In this experience report, the term "student-teachers" refers to students in the clinical cycle or internship (from the 5th to the 12th academic period), and "student-learners" refers to students in the basic cycle (from the 2nd to the 4th academic period). The "senior tutor" is the infectious disease physician responsible for mentoring the students.

Initially, interns are welcomed to the service, where they receive an introduction to the general functioning of the clinic, including guidance on conducting consultations and accessing medical records and related documents. During this phase, the senior tutor also performs an initial assessment of each intern to understand their stage in medical training (basic cycle, clinical cycle, or internship) and their current skills and competencies (e.g., whether they have completed the infectious and parasitic diseases course). This stage is crucial, as the clinic continuously receives students from various academic periods and learning levels. From this point on, the new intern assumes the role of a student-learner.

This initial phase is followed by a theoretical discussion of the cases scheduled for the day. Interns are also provided with a consultation guide containing instructions on how to conduct anamnesis, taking into account the specific aspects of infectology, HIV/AIDS, and the individual context of each patient. At this point, the skills of the student-teacher come into play as they guide the student-learner through the most relevant information in the medical records, helping focus on the case and encouraging the development of essential clinical reasoning for the next steps.

In the second phase, consultations begin in a near-peer model, in one-on-one groups. The student-teacher conducts the anamnesis with the patient while being observed by the student-learner, both under the supervision of the responsible professor. During this moment, students engage directly with the practical environment, experiencing elements of the profession that go beyond the theoretical understanding of pathology and include the patient's biopsychosocial reality.

Next, after the consultation ends, the case is discussed between the student-teacher and the student-learner and later with the senior tutor to define diagnostic hypotheses, observations, unresolved issues, and appropriate treatment strategies. At this stage, the tutor performs a secondary assessment of the student-learner's skills and competencies, offering continuous feedback.

Finally, the students resume care in pairs and complete the consultation by establishing the clinical approach, reinforcing the doctor-patient relationship, and emphasizing the importance of treatment adherence. In the next visit, the steps are repeated, but this time the student-learner, under the supervision of the student-teacher, leads the consultation, developing autonomy and gaining real clinical experience.

By the end of these stages, interns acquire new competencies and skills, becoming more autonomous in providing care not only for people living with HIV but also for other clinical complaints. Depending on motivation, accumulated experience, interest in the subject, and academic stage, each intern will require a specific amount of time to progress in the service, moving from the role of student-learner to student-teacher, thus completing a learning cycle. Later, that student will also be capable of mentoring new interns, continuing the active learning process.

This entire process was monitored by the tutor, and documentation was based on feedback between the tutor and interns, tutor and students, and student-teacher and student-learner. No quantitative method was used to measure the data.

3. Results and discussion

The active methodology of "peer-assisted learning," used in the Specialized Care Service (SAE) and described in this experience report, is an expanding method of knowledge transmission capable of contributing to a solid and transformative professional training process. Based on this, it becomes evident that practice-based teaching helps in understanding theoretical knowledge, promoting better information retention and greater student engagement.

In this model, theoretical knowledge is pursued by the students themselves, driven by the need to solve practical problems as they arise, regardless of clinical specialty. This is because, beyond HIV-related demands, it is understood that as patients age, they will present other complaints and comorbidities. Aware of their own shortcomings and the need to broaden their knowledge, the interns actively seek out recommended references—including from other medical and non-medical specialties such as pharmacy, psychology, and social work—which fosters comprehensive patient care and interdisciplinary training. The professor then assumes the role of tutor, becoming a support figure rather than a central one, lecture-based agent in the students' knowledge construction. Thus, throughout the process, the student is confronted with real problems, upon which they will have the opportunity to reflect, formulate hypotheses, and apply them directly — adopting a Problem-Based Learning (PBL) approach.

The groups formed for patient care followed the near-to-peer teaching model, composed of pairs in which the student-teacher was from the professional cycle, while the student-learner was from the basic cycle. However, in some situations, the reverse was also possible, as certain students brought with them experiences from other internships or coursework, as well as personal or emotional experiences, which contributed to better clinical conduct and empathy with the patient. Thus, the basic cycle was also equipped to tutor professional cycle students in aspects beyond diagnosis and treatment. In other words, it was common for interns to tutor clinical cycle students, who in turn would tutor those in the basic cycle, ensuring a two-way learning model in which tutors also learn through teaching.

In this context, given the direct interaction between students at different stages of medical training, this active teaching model was able to promote the development of social and communication skills, as well as student autonomy. It also significantly improved learning and content retention. This model allowed students to exchange knowledge and revisit content learned throughout their training cycles, complementing one another during consultations and learning from each other in a less formal environment. In general, basic cycle students contributed to patient rapport, clinical cycle students conducted anamnesis and physical exams, while interns proposed the clinical management.

The near-to-peer teaching model requires students to continuously update themselves on topics related to the internship and on other gaps in their training. In this regard, practical experiences—whether clinical, ethical, communicative, or empathetic—acted as strong motivators in the search for new theoretical knowledge. The Medical Clinic Day allowed interns to distinguish between the skills they felt confident in and those they needed to improve through further study and refinement.

As a fundamental part of medical training, clinical reasoning is particularly emphasized. This is a problem-solving model based on the ability to formulate various hypotheses from a given clinical scenario, using theoretical knowledge and practical application.[13] Throughout the internship, students are encouraged by their peers and the tutor to develop this reasoning autonomously, based on the interaction between basic cycle students and those in the professional cycle.

This entire process of growth is closely monitored by the tutor, who, especially through feedback, helps both student-teachers and student-learners identify shortcomings and recognize achievements, thereby gaining more autonomy in patient care. “It is also the tutor’s role to promote relevant discussions on race/color, gender, sexuality, and sustainability in medical practice”.[14] It is also worth noting that throughout this educational process, the tutor must acquire new mentoring skills, becoming increasingly effective in their role.[15]

In summary, throughout the semesters of internship, there was a notable evolution in the professional authenticity of students undergoing the described model, in line with the application of Miller’s Pyramid of Knowledge Construction.[16] In this model, the highest level of knowledge retention is achieved through real, practical experience and teaching others. Similar experiences have been reported in the literature, with an integrative review concluding that peer-assisted learning provides both tutors and learners with the opportunity to review and reflect on the knowledge and skills they have acquired.[5]

The students completed the proposed pedagogical journey by assuming the role of student-teacher once they not only knew "how to do it," but could also teach others how it should be done. This perspective aligns with the concept of peer-assisted learning, characterized by students learning with and from each other.[17]

4. Final considerations

The peer-assisted learning method applied in this model has proven to be an innovative teaching methodology capable of optimizing the teaching-learning process, while also providing students with the ability to actively construct and consolidate their own knowledge. This potential is particularly evident in its capacity to foster collaborative learning, both between the tutor and the tutees, and among the students engaged in the cooperative educational process.

In this modern educational context, the model demonstrated great learning potential, meeting students’ demands for earlier and more integrated exposure to medical practice across various specialties offered by the service. This method stands out for its ability to promote a more concrete and well-established learning experience when compared to traditional methodologies, in which students tend to play a passive role in the educational process. Furthermore, by the end of the internship, students are expected to be capable of developing clinical reasoning skills beyond infectology, progressing through various levels of medical competencies as proposed by Miller’s Pyramid.[15]

Further studies are necessary to qualitatively and quantitatively evaluate the impact and relevance of peer-assisted learning in the professional training of interns, ensuring the reproducibility of this methodology in other outpatient settings.

Authors’ contributions

The authors have declared that they made substantial contributions to the work in terms of the conception or design of the research; the acquisition, analysis, or interpretation of data for the study; and the drafting or critical revision of the manuscript for important intellectual content. All authors approved the final version to be published and agreed to be publicly accountable for all aspects of the study.

Competing interests

No financial, legal, or political conflicts involving third parties (such as governments, companies, or private foundations) have been declared in relation to any aspect of the submitted work (including, but not limited to, grants and funding, advisory board participation, study design, manuscript preparation, statistical analysis, etc.).

Indexers

The International Journal of Education and Health is indexed by DOAJ and EBSCO.

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