



Educational Article

Near-peer-assisted learning for training undergraduate medical students in clinical ophthalmology skills



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Received 20 June 2021; revised 13 September 2021; accepted 7 October 2021; Available online 15 November 2021

المخلص

أهداف البحث: تم إجراء الدراسة لتقييم التعلم بمساعدة الأقران لتدريب المهارات السريرية في طب العيون لطلاب السنة الثانية من طلاب الطب الجامعيين من خلال زملائهم الأطباء المتدربين.

طرق البحث: تم تضمين المتدربين في قسم طب العيون كمعلمين بعد توعية وتقييم أوليين. تم تضمين طلاب المرحلة الجامعية في السنة الثانية كمتعلمين. تم إجراء جلسات للمهارات السريرية المحددة مسبقاً على دفعات من 3-5 طلاب متعلمين في كل مجموعة. تم التقييم من خلال إدراك المعلمين والمتعلمين على سلم قياس ليكرت المكون من 5 نقاط (مستوى كيركباتريك-1). تم تقييم المعلمين من خلال المهارات الإجرائية الخاضعة للمراقبة المباشرة، وتقييم المتعلمين من خلال الدرجات قبل وبعد الجلسة وأداء المهارات السريرية ذات الصلة (مستوى كيركباتريك-2).

النتائج: استجاب ما مجموعه 21 من 24 معلم و82 من أصل 100 متعلم على استبيان التقييم. يرى المعلمون أنفسهم على أنهم على دراية ومقيدون كمعلمين أساسيين؛ كان هناك تحسن كبير في جلسة المهارات الإجرائية الخاضعة للمراقبة المباشرة الثانية بالمقارنة مع الأولى في جميع المهارات السريرية. وجد المتعلمون أن جلسات التعلم بمساعدة الأقران فعالة لتعلم المهارات السريرية؛ وكان هناك تحسن كبير في درجات ما قبل وبعد الاختبار وتم أداء جميع المهارات السريرية بشكل مرضي في نهاية الامتحان.

الاستنتاجات: كان إدراك المتعلمين والمعلمين نحو التعلم بمساعدة الأقران جيداً فيما يتعلق بفعاليتها كطريقة تعليمية للتعلم، وتم تحقيق جميع المهارات السريرية بشكل جيد. يمكن أن يكون التعلم بمساعدة الأقران بمثابة مساعد مفيد للتدريب

التقليدي للتدريب السريري للمجموعات الصغيرة، ويمكن أن يساعد في تخفيف ضغوط التدريس على أعضاء هيئة التدريس السريرية المثقلة بالفعل في الكليات الطبية الهندية.

الكلمات المفتاحية: التعلم بمساعدة الأقران؛ الإدراك؛ التدريب السريري؛ تعليم المجموعات الصغيرة؛ الكفاءة السريرية

Abstract

Objective: This study aims to formally evaluate near-peer-assisted learning (NPAL) for teaching clinical ophthalmology skills to second-year undergraduate medical students through their fellow medical interns.

Methods: Interns posted at the department of ophthalmology were included as tutors after an initial sensitization and assessment. Second-year undergraduate students were included as tutees. Sessions were conducted for pre-identified clinical skills in batches of 3–5 tutees each. Perceptions of tutors and tutees were captured on a 5-point Likert scale (Kirkpatrick level-1) and evaluated. Tutors were assessed by directly observed procedural skills (DOPS) and tutees by pre- and post-session scores and performance of the respective clinical skills (Kirkpatrick level-2).

Results: A total of 21 of 24 tutors and 82 of 100 tutees responded to the evaluation questionnaire. Tutors perceived themselves as knowledgeable and useful as instructors; scores of second DOPS session significantly improved compared to the first ($p = 0.001$) for all clinical skills. Tutees found the NPAL sessions effective for learning clinical skills. Pre- and post-test scores significantly improved ($p = 0.001$), and all clinical skills were satisfactorily performed in the end-of-term exam.

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Peer review under responsibility of Taibah University.



Production and hosting by Elsevier

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Conclusion: NPAL was perceived as an effective teaching-learning method by both tutees and tutors, and all clinical skills were performed successfully. NPAL can serve as a useful adjunct to traditional teaching for clinical training of small groups and can help alleviate teaching pressures on already burdened clinical faculty in Indian Medical colleges.

Keywords: Clinical competence; Clinical training; Near-peer-assisted learning; Perception; Small group teaching

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Introduction

The small group mode of teaching with opportunities for hands-on practice is desirable for clinical training to achieve the desired learning outcomes. The recently introduced competency-based curriculum for undergraduate medical education further emphasises small group teaching of clinical skills.¹ Considering the existing faculty-to-student ratio in most Indian medical colleges and the teaching-time constraints of clinical faculty in teaching hospitals, there is an impending need to explore potentially effective alternative teaching-learning methods for clinical training.

The term ‘near-peer-assisted learning’ (NPAL), introduced by Whitman in 1988, is now often used interchangeably with the term ‘peer-assisted learning’ and refers to a trainee one or more years senior to another trainee on the same level of medical education training.^{2,3} The literature highlights the concepts of cognitive and social congruence for understanding the presumed effectiveness of NPAL. Cognitive congruence, first investigated by Schmidt and Moust,⁴ and later described by Lockspeiser et al. at a medical program,⁵ conceptualises that close proximity of age and similar experiences in the recent past of near-peer tutors make them better appreciate the knowledge of their junior peers, thus being able to target teaching at an appropriate level.⁶ In addition, sharing the same knowledge framework creates a social congruence wherein near-peer teachers are often perceived by junior students as more approachable and are likely to be more empathetic, thus offering a greater sense of safety and a comfortable learning environment.^{4–6} There are also possible benefits for the senior tutors, including the improvement of teaching skills and solidifying one’s own knowledge.⁷

Though medical faculty have a significant role in clinical teaching, NPAL may provide a unique perspective and approach and is a rapidly expanding area in medical educational research.^{8,9} Researchers in this field have argued that in clinical training, NPAL has often occurred intentionally or unintentionally to supplement the roles of clinical faculty through residents, demonstrators, and

others but has not been documented formally. In an extensive systematic review of peer teaching in clinical education, the authors concluded that peer teaching and learning in clinical practice have pragmatic implications of not only developing students’ knowledge, skills, and attitudes, but also assisting with clinicians’ workload.⁸ The authors emphasised that peer teaching in the clinical education of health science students is multifaceted but under-researched.

The present study aimed to introduce the near-peer approach for teaching pre-identified clinical skills to second-year medical students through their fellow medical interns at the department of Ophthalmology. The competency-based curriculum has been recently made available for the department of Ophthalmology, and we decided to take a unique competency-based approach for identifying the clinical skills. We also planned to evaluate the near-peer approach for its effectiveness: first, through perceptions of tutors and tutees, and second, by assessing students for the respective clinical skills to confirm that the desired learning objectives have been achieved. To the best of our knowledge, it is the first time that the near-peer approach has been formally implemented and evaluated for clinical training in Ophthalmology. We hypothesised that learning from near peers proves effective for the development of clinical skills of undergraduate medical students and is beneficial to near-peer tutors too. We hope that this innovative approach justifies small group teaching with limited faculty resources and supports the department in approaching the competency-based undergraduate curriculum.

Materials and Methods

An extensive literature review was conducted, and a framework was finalised in accordance with the typology of PAL suggested by Topping and Ehly in 1998, and the planning and implementation framework for PAL suggested by Ross MT and Cameron HS in 2007.^{10,11} The study was approved from the Institutional Ethical Committee. In compliance with the ethical guidelines, prior to final evaluation, students were provided electronic information regarding how the results of the study would be used for research (ensuring confidentiality) and they electronically agreed to the terms.

Identification of competencies and defining the learning objectives

The new ‘competency-based curriculum’ by the National Medical Council provides a list of sixty desired competencies in ophthalmology for undergraduates.¹ From the list, five specific core competencies targeting clinical skills (psychomotor) were identified, ensuring relevance for the participating students as well the interns (Table 1). Respective learning objectives were defined, and small group interactive teaching was identified as the teaching-learning modality.

Preparing the near-peer tutors (Medical Interns)

After passing final professional year, MBBS students have to complete one year of compulsory rotatory internship where they are posted in the department of ophthalmology in groups of 3–5 for a duration of 15 days. For each batch of interns, an initial session was undertaken to familiarise them with the basic concepts of NPAL; thereafter, they were guided by the faculty regarding the basic guidelines of teaching and keeping students engaged. All of them were provided the relevant academic material related with the desired competencies and were explained about the mechanics of the sessions. All the interns were briefed on all five competencies; thereafter, their clinical competence was assessed by workplace-based assessment (WPBA) in the form of directly observed procedural skills (DOPS) and due feedback was provided after each cycle of DOPS.

Preparing the tutees (third professional year undergraduate students)

Undergraduate students of the third professional year are posted in the department of ophthalmology for four weeks (3–4 hours per day) in batches of 25 students each; they were briefly explained the concept of NPAL by the faculty.

NPAL sessions

A group of 3–5 tutees was randomly allotted to the tutors for pre-identified clinical-skill training through interactive small group teaching. Each session, covering one competency, lasted 2–3 hours and was conducted in department during the routine clinical posting duration. As a safety measure, all the sessions conducted on a day were supervised by one faculty member who was also available to answer all queries during the session.

Assessment of competency

Immediately at the end of each session designated for one particular competency, students self-reported their respective pre- and post-session scores for the specific clinical skill on a Likert scale of 1–5, stating whether the desired learning objectives were achieved. The assessment of the particular clinical skills was linked to the end-of-term exam through standard rating scales/checklists (OSCE).

Evaluation

The survey questionnaire targeted level-1 of the Kirkpatrick model through perceptions of both tutors and tutees, while level-2 was targeted through the assessment of particular clinical skills. The evaluation questionnaire was developed by the authors in compliance with the available literature and consisted of five self-administered questions each for tutors and tutees about the effectiveness of sessions marked on a 5-point Likert scale, with 1 as the lowest and 5 as the highest level of effectiveness; the questionnaire was validated by the institutional medical education unit. The questionnaire was administered electronically to the tutees after the conclusion of their clinical postings; tutors

responded to the questionnaire at the end of their 2-week posting; all responses were kept anonymous. Tutors self-evaluated their effectiveness as teachers on a 5-point Likert scale and identified the possible benefits derived from the sessions. Tutees reported their self-perceived effectiveness of the sessions on a 5-point Likert scale and evaluated the near-peer tutors as teachers.

Data analysis

DOPS 1 and 2 overall ratings of tutors, as awarded by the assessor based on how competent candidates performed each skill correctly, were analysed quantitatively using the R-statistical software and compared using the student t-test; a p-value ≤ 0.05 was considered significant. For perceptions of tutors and tutees, data were analysed for the number and percentage of students answering each choice, and the mean score was documented. Improvement in the particular clinical skills of tutees through their respective pre- and post-test scores on a 5-point Likert scale were analysed by their mean values (\pm SD) and compared using the student t-test.

Results

Demography: In total, 24 interns serving their compulsory rotational internship in the department of ophthalmology were included as tutors and 100 second-year students serving their clinical postings in the department of ophthalmology were included as tutees. As it is an all-girl medical college, all tutors and tutees were females. The study was conducted over a duration of four months at the department of ophthalmology at BPS Government Medical college for Women, Haryana, India in 2019. Faculty supervisors included one each from the department of ophthalmology (author-2), from the institutional Medical Education Unit (author-3), and from both (author-1).

Evaluation questionnaire: Data collected from the responses of near-peer tutors and tutees are summarised in [Tables 2 and 3](#). A total of 21 tutors (response rate 87.5%) and 82 tutees (response rate 82%) responded to the survey. Both tutors and tutees perceived workshops as effective and that intended learning objectives for all individual sessions were achieved. Tutees widely agreed about the effectiveness of the NPAL sessions in learning particular clinical skills and found the intern tutors to be

Table 1: Clinical skills (Competencies as given in NMC document) identified for the study.

Competency (Number as given in the document)
Demonstrate the steps in performing the visual acuity assessment for distance vision, near vision, colour vision, the pin hole test and the menace and blink reflexes (OP1.3)
Demonstrate the correct technique of instillation of eye drops in a simulated environment (OP3.9)
Demonstrate correct technique of removal of foreign body from the eye in a simulated environment (OP3.8)
Demonstrate the correct technique of ocular examination in a patient with a cataract (OP7.3)
Demonstrate the correct technique to examine extra ocular movements (Unocular & Binocular) (OP9.1)

Table 2: Perceptions of tutees (in percentage) (n = 82) regarding effectiveness of NPAL sessions.

	Strongly disagree	Disagree	Not sure	Agree	Strongly agree	Score (mean ± SD)
Did you find the near peer tutors useful as an instructor/tutor?	1.20	7.30	14.06	35.36	41.46	4.09 ± 0.98
Did you find the near peer tutors sufficiently knowledgeable to be able to teach?	Nil	4.80	10.97	36.58	47.56	4.27 ± 0.85
Did you enjoy the sessions of NPAL?	1.20	6.09	9.75	30.48	52.43	4.27 ± 0.9
Did you feel more comfortable with near peer tutors in discussing your doubts about the session?	2.40	7.30	9.75	31.70	48.78	4.17 ± 1.04
Do you feel NPAL sessions have helped you to learn identified clinical skills?	Nil	3.65	10.97	37.80	47.56	4.29 ± 0.81

Table 3: Self perceived perceptions of tutors (in percentage) (n = 21) regarding their effectiveness of near peer approach.

	Strongly disagree	disagree	Not sure	agree	Strongly agree	Score (mean ± Sd)
Did you feel yourself useful as an instructor/tutor	4.76	4.76	14.3	28.6	47.6	4.10 ± 1.14
Did you feel sufficiently knowledgeable to be able to teach as tutor	Nil	4.76	19.1	23.8	52.3	4.24 ± 0.94
Did you enjoy teaching in your NPAL sessions	Nil	4.76	23.8	23.8	47.6	4.14 ± 0.96
Do you feel more knowledgeable about the topic after the NPAL session	Nil	Nil	9.5	33.3	57.1	4.48 ± 0.68
Do you feel NPAL sessions have helped in improving your teaching skills	Nil	Nil	4.7	38.2	57.1	4.52 ± 0.60

Table 4: Scores of DOPS-1 and 2 of tutors in pre-identified competencies.

	DOPS-1 score (mean ± SD)	DOPS-2 score (mean ± SD)	P-value
Demonstrate the steps in performing the visual acuity assessment for distance vision, near vision, colour vision, the pin hole test and the menace and blink reflexes	2.65 ± 0.81	7.20 ± 0.41	0.001
Demonstrate the correct technique of instillation of eye drops in a simulated environment	2.45 ± 0.51	7.10 ± 0.31	0.001
Demonstrate correct technique of removal of foreign body from the eye in a simulated environment	2.45 ± 0.51	7.30 ± 0.47	0.001
Demonstrate the correct technique of ocular examination in a patient with a cataract	2.25 ± 0.64	7.15 ± 0.37	0.001
Demonstrate the correct technique to examine extra ocular movements (Unioocular & Binocular)	2.15 ± 0.49	7.25 ± 0.44	0.001

knowledgeable, approachable, and useful as teachers (Table 2). Tutors perceived themselves as knowledgeable and useful as instructors and found the sessions effective (Table 3).

Assessment of competency of tutors and tutees: Two cycles of DOPS were conducted per intern for each clinical skill

with a gap of 2 days. There was significant improvement of DOPS scores in the second cycle as compared to the first for all competencies (Table 4); p-value in all categories was 0.001. Self-reported respective pre- and post-test scores of tutees for the specific clinical skills also showed significant improvement (p-value 0.001 for all competencies) (Table 5).

Table 5: Self perceived improvement in clinical skills of tutees in the respective clinical skills.

Competency	Pre score (Mean \pm SD)	Post score (Mean \pm SD)	P-value
Demonstrate the steps in performing the visual acuity assessment for distance vision, near vision, colour vision, the pin hole test and the menace and blink reflexes	1.83 \pm 0.66	6.43 \pm 0.74	0.001
Demonstrate the correct technique of instillation of eye drops in a simulated environment	1.18 \pm 0.39	5.95 \pm 0.70	0.001
Demonstrate correct technique of removal of foreign body from the eye in a simulated environment	1.52 \pm 0.50	6.09 \pm 0.80	0.001
Demonstrate the correct technique of ocular examination in a patient with a cataract	1.56 \pm 0.63	6.20 \pm 0.92	0.001
Demonstrate the correct technique to examine extra ocular movements (Unioocular & Binocular)	1.57 \pm 0.52	6.34 \pm 0.63	0.001

In the end-of-term clinical exams, all tutees performed the clinical skills satisfactorily; the overall score on standard rating scales for individual clinical skills was more than 7 (out of 10).

Discussion

The competency-based curriculum by the National Medical Council has been recently introduced across medical colleges in India, and the first batch under the new curriculum is expected to start ophthalmology training next year. As we started preparing the department for the competency-based approach, we realised that limited faculty resources could be a major limitation in addressing the augmented demand of small group teaching under the new curriculum. To overcome this challenge, we started exploring alternative and innovative teaching-learning methods, discovering literature justifying the use of NPAL in medical education. Ten Cate O et al. elaborated twelve distinct reasons to consider the introduction of peer teaching as an explicit element in medical curriculum and concluded that it is beneficial for student-teachers and learners, as well as organizations.⁹

The concept of students teaching students is not new in medical education; Burke et al. highlighted that the term 'doctor' in Latin means 'teacher'.³ Vertical transmission of knowledge and skills from peers and near-peers, either incidentally or purposefully, has contributed to acquiring many clinical skills, though in an informal manner.^{7,12} Ten Cate O et al. had a very interesting observation that peer teaching, though practiced often, does not lead to peer-reviewed journals.⁹ A probable reason can be the fact that though frequently used, most of the teaching is performed in informal settings.¹² Ross ML et al. highlighted the importance of a formal approach towards designing new PAL initiatives. Proposing a comprehensive framework for design and implementing the same, the authors emphasised that many difficulties and pitfalls can be avoided with careful consideration in the planning stage.¹¹ When we, the authors, reflect on our teaching journey, we are in

complete agreement with these authors. NPAL is used commonly in one or the other way for clinical teaching in ophthalmology: be it residents teaching clinical skills to undergraduate students, or one- or two-year senior surgical residents teaching surgical skills to their junior fellows. However, there is no formal documentation or evaluation of the same. In this study, we tried to overcome all these by adopting a planned and formal approach to introduce and evaluate the near-peer approach.

Ten Cate and S. Durning, also proposed a very interesting analogy of near-peer teachers called the 'journeyman': an intermediate stage between an 'apprentice' and 'master' who has learning as well as teaching tasks and is a valuable but under-recognised resource in medical education.⁹ We agree to this analogy and appreciate the medical interns in our study as the 'intermediate trainees', who, as suggested by authors, can be purposely entrusted with teaching responsibilities. Having recently passed the final undergraduate exam, they are trusted to be ideal and distinct as teachers compared to other senior undergraduate students or residents in the department. The literature highlights that teaching preparation does lead to enhanced learning; the students not only 'learn twice' but also learn in a different way that could possibly provide better retention of knowledge and skills.^{9,13} Moreover, teaching experience can help in the development of leadership skills since the students need to handle many managerial tasks simultaneously.⁹ We expected that the participation in NPAL sessions in our study would be advantageous to tutors in many ways. It would provide the interns some form of formal teaching experience and by the time they leave the institute and join as residents, they would be better equipped for their expected teaching responsibilities. Moreover, the new competency-based curriculum emphasises the 'perform' level of the Miller's pyramid during internship; we assumed that by giving the interns an opportunity to teach, we also provided them an opportunity to perform, practice, and reinforce their clinical skills.

There is evidence in the literature that the quality of teaching imparted by student-teachers is comparable to that

of medical teachers.^{14,15} Tolsgaard MG et al. performed a randomised controlled trial to compare the quality of teaching of clinical skills of student-teachers with that of associate professors and concluded that student-teachers were not just as proficient, but in some cases, even better than associate professors in teaching procedural skills.¹⁴ Possible explanations could include the fact that in comparison to 'experts' having a more integrated approach, student teachers are like 'advanced beginners' having a more step-by-step approach of teaching procedural skills.¹⁶ The authors concluded student-teachers to be safe for teaching skills in laboratory settings.¹⁴ At this point, it is important to deliberate whether the respective skills of tutors should be evaluated. Many studies have not formally assessed the tutors; however, there is evidence for the validation of the competence of tutors through formal assessments and training.^{11,17} Sethi S et al. reported significant improvement in the clinical skills of interns through repeated DOPS, concluding that internship can be utilised for improving clinical skills.¹⁸ We thus decided to validate the competency of tutors by formal assessment through repeated DOPS and, to our surprise, in the first DOPS cycle, the scores were lower than expected for all competencies. A possible explanation can be the fact that by the time students start their rotatory clinical postings, two years have passed since their last exposure to ophthalmology clinical skills. Moreover, during internship, there is no formal teaching and assessment of clinical skills. DOPS targets the 'perform' level of the Miller's pyramid and thus, when performance of a particular skill is assessed in a real-life situation, performance may be below the expected. It was interesting and relieving to see that just one formal cycle was needed and by the next one, performance was satisfactory; no competency required more than two DOPS cycles.

The literature has discussed various methods of evaluation, and several studies have utilised questionnaire-based feedback. Researchers in this field have argued that such feedback will be almost invariably positive and might not truly represent actual benefits to participants and the accomplishment of targeted objectives.^{11,19} In our study, we planned a comprehensive evaluation by not only targeting Kirkpatrick level-1 (analysing perceptions) but also level-2 (assessing learning from the sessions). We believe that gaining a particular skill is a more objective assessment of improved outcome. However, assessment of the particular competencies that were included in the study was a challenging task. At the end of clinical postings in ophthalmology, all the students undergo routine clinical assessment by pre-decided and validated checklists (OSCE); these five competencies were included as a part of the assessment. Though the scores can be well indicative of students' achievement of the respective competency, we agree that it could be biased and influenced by many other factors, such as a time-lapse between the session and the end-of-term exam. We thus decided to analyse their self-perceived respective pre- and post-test scores obtained immediately after conducting the sessions, which we feel would be less accurate but also less biased. Interestingly, the difference in scores was significant for all competencies.

Feedback obtained from most of the students at the end of the sessions was highly positive, and only a very small

proportion of tutors and tutees were not satisfied with one or more aspects of the program. We feel that ensuring the clinical competence of tutors by DOPS and the self-perceived improvement of clinical skills of tutees is the strength of our study, and very few studies have ensured Kirkpatrick level-2 for both tutors and tutees. We do agree that having a control group with randomisation could have provided more reliable results. However, it was purposely decided not to have a control group since the skills identified were essential for undergraduates during their clinical posting, and we wanted to keep it uniform for all students. Moreover, researchers have emphasised practical challenges in randomised controlled trials for peer-assisted learning including multiple variables affecting learning outcomes and confounding factors, such as self-selection and difficulty in blinding.¹¹

We now deliberate on a few challenges that we came across during the study, which are also the study's limitations. Assessment of interns through repeated DOPS was time-consuming since each DOPS cycle had to be undertaken by a different faculty member. Moreover, in our set-up, students reported for their posting at the outpatient department itself and there was only one demonstration room dedicated for undergraduate students. With the batch of 25–30 students further divided into small groups of 3–5, simultaneous availability of space and the required number of patients, at least one for each group, was also challenging. Appropriate training and planning of peer-assisted sessions, feedback, and targeting higher levels of evaluation may enhance the successful implementation of such programs. Furthermore, participants' reflections, if added, would provide a more subjective measure of the underlying factors for cognitive achievement.

Conclusion

The results of our study have been promising for the day-to-day clinical teaching of undergraduates, subject to a cautious approach of subjecting the tutors to assessment cycles, whenever needed. In the long-term, we need to ensure its sustainability, and we plan to incorporate teaching responsibilities as a part of core internship curricula at the department. We agree that the results of our study may not be generalisable. As a pilot study, it included only a few clinical skill competencies and the possibility that the results may not be the same for certain more complicated skills cannot be completely ruled out. However, the method was well perceived regarding its effectiveness as a teaching-learning method by tutees as well as tutors, and the competencies were achieved successfully. We hope that the near-peer approach can be formally included as an adjunct to traditional teaching to justify small group teaching in an already disturbed faculty-student ratio in the Indian scenario.

Recommendations

The findings of this study reveal many opportunities for implementation and further research. We would be especially interested in including more difficult competencies and comparing whether difficulty levels affect the outcomes of near-peer assisted sessions. We came across another

interesting concept where the authors utilised fourth-year students enrolled in radiology electives as teachers to first-year anatomy small group sessions.²⁰ The concept appears very promising; the new competency-based curriculum has provision for electives and early clinical exposure and will definitely require alternative methods of teaching. Studies have also compared outcomes of near peer-sessions with outcomes of classes by medical college faculty. It would be interesting to develop it further to understand the true effect of the concept of cognitive congruence on the teaching-learning process.

Source of funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict of interest

The authors have no conflicts of interest to declare.

Ethical approval

This research has received clearance from the institutional ethical committee via letter no. BPSGMC/RC 508/IEC/19 dated 25.11.19.

Authors' contributions

SS and RD conceived and designed the study, conducted research, provided research materials, and collected and organised data. RD analysed and interpreted the data. All authors wrote the initial and final drafts and provided logistic support. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

References

1. Competency based Undergraduate Curriculum [Internet]. National Medical Council [accessed 2018 January 23]. Available from: <https://www.nmc.org.in/information-desk/for-colleges/ug-curriculum>.
2. Whitman NA. *Peer Teaching: To Teach Is to Learn Twice*. Washington: ASHE-ERIC Higher Education Reports; 1988.
3. Bulte C, Betts A, Garner K, Durning S. Student teaching: views of student near-peer teachers and learners. *Med Teach* 2007; 29(6): 583–590.
4. Schmidt HG, Moust JH. What makes a tutor effective? A structural equations modelling approach to learning in problem-based curricula. *Acad Med* 1995; 70(8): 708–714.

5. Lockspeiser T, O'Sullivan P, Teherani A, Muller J. Understanding the experience of being taught by peers: the value of social and cognitive congruence. *Adv Health Sci Educ* 2008; 13: 361–372.
6. Loda T, Erschens R, Loenneker H, Keifenheim KE, Nikendei C, Junne F, Zipfel S, Herrmann-Werner A. Cognitive and social congruence in peer-assisted learning—A scoping review. *PLoS One* 2019 Sep 9; 14(9):e0222224.
7. Sonagara VJ, Santhirakumaran S, Kalkat HS. The value of near-peer teaching in the medical curriculum. *Adv Med Educ Pract* 2018 Jan 22; 9: 63–64.
8. Secomb J. A systematic review of peer teaching and learning in clinical education. *J Clin Nurs* 2008 Mar; 17(6): 703–716.
9. Ten Cate O, Durning S. Peer teaching in medical education: twelve reasons to move from theory to practice. *Med Teach* 2007 Sep; 29(6): 591–599.
10. Topping K, Ehly S. *Peer-assisted learning*. Mahway, New Jersey: Laurence Erlbaum Associates Inc; 1998.
11. Ross MT, Cameron HS. Peer assisted learning: a planning and implementation framework: AMEE Guide no. 30. *Med Teach* 2007 Jan 1; 29(6): 527–545.
12. Nestel D, Kidd J. Peer tutoring in patient-centred interviewing skills: experience of a project for first-year students. *Med Teach* 2003 Jan 1; 25(4): 398–403.
13. Gregory A, Walker I, McLaughlin K, Peets AD. Both preparing to teach and teaching positively impact learning outcomes for peer teachers. *Med Teach* 2011; 33(8): e417–e422.
14. Tolsgaard MG, Gustafsson A, Rasmussen MB, Høiby P, Müller CG, Ringsted C. Student teachers can be as good as associate professors in teaching clinical skills. *Med Teach* 2007 Sep; 29(6): 553–557.
15. Burke J, Fayaz S, Graham K, Matthew R, Field M. Peer-assisted learning in the acquisition of clinical skills: a supplementary approach to musculoskeletal system training. *Med Teach* 2007 Sep; 29(6): 577–582.
16. HI D, Dreyfus SE. *Mind over machine: the power of human intuition and expertise in the era of the computer*. New York Free Pr; 1986. pp. 1–51.
17. Blatt B, Greenberg L. *The TALKS manual: a guide to teaching senior students in the health professions to be educators*. George Washington University; 2000.
18. Sethi S, Badyal DK. Clinical procedural skills assessment during internship in Ophthalmology. *J Adv Med Educ Prof* 2019; 7(2): 56–61.
19. Silbert BI, Lake FR. Peer-assisted learning in teaching clinical examination to junior medical students. *Med Teach* 2012 May 1; 34(5): 392–397.
20. Rodrigues J, Sengupta A, Mitchell A, Kane C, Kane C, Maxwell S, Cameron H, Ross M, Ford M. The South-east Scotland Foundation Doctor Teaching Programme—is “near-peer” teaching feasible, efficacious and sustainable on a regional scale? *Med Teach* 2009 Jan 1; 31(2): e51–e57.

How to cite this article: Sethi S, Dabas R, Garg R. Near-peer-assisted learning for training undergraduate medical students in clinical ophthalmology skills. *J Taibah Univ Med Sc* 2022;17(1):105–111.