Perception of medical students about problem-based learning at Jouf University

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Abstract

Objective: To evaluate students' perceptions of problem-based learning tutorial sessions.

Methods: The cross-sectional study was conducted at the College of Medicine, Jouf University, Al-Jawf Saudi Arabia, from March to May 2019, and comprised medical students in their clinical phase. Data was collected using an electronic questionnaire about students' perceptions of problem-based learning sessions, tutors' session facilitation, and tutors' student evaluation fairness. Data was analysed using SPSS 21.

Results: Of the 66 students approached, 51(77.27%) completed the questionnaire; 23(45%) males and 28(55%) females. The agreement mean perception score was 4.73±2.13 regarding various statements characterising problem-based learning sessions. Lesser mean score of agreement 1.33±1.07 was observed regarding tutors' facilitation of the sessions and their students' evaluation.

Conclusion: Students perceived problem-based learning sessions as effective and interactive, but did not positively perceive tutors' evaluations.

Keywords: Problem-based learning, Interactive sessions, Collaborative learning, Tutor feedback, Self-directed learning. (JPMA 71: 1152; 2021)

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Introduction

Problem-based learning (PBL) was conceived as a "whole curriculum", and not a teaching strategy to augment the other strategies in practice.[1] Over time, a large number of medical schools around the globe adopted PBL in their curricula. However, preferences and prevailing situations in these schools led to the development of a variety of PBL species: full PBL, near-full PBL, hybrid PBL, and partial PBL.[2] The pure form of PBL is a tutor-guided small group interaction that examines and resolves clinical problems, stimulates earlier knowledge to generate a hypothesis, identifies problem-related knowledge gaps and encourages self-searching across disciplines to grasp the problem.[3] PBL is student-centred and activity-based learning plan[4,5] that emphasises the active role of learners.[6]

Conventional lectures, labs and clinical skills covering topics on the same theme improve the hybrid PBL instructional strategy.[7] In such dual mechanisms, additional lectures are usually incorporated, which is in direct conflict with the PBL philosophy of student-centeredness and independence in learning. If the problem addressed in the active inquiry is solved in the supporting lectures, independent learning is discouraged and the purpose of PBL instructional teaching becomes futile.[2] Medical schools adopting a hybrid PBL often train teaching faculty on its process rather than its whole philosophy, resulting in a misunderstanding on the part of tutors and

may lead to the development of faulty problem scenarios that are not open-ended. A dysfunctional hybrid PBL curriculum can arise in such a situation. It is important to gather evidence on the curriculum's potential dysfunctional elements to manage hybrid curricula effectively. In either variant of PBL systems, a number of factors can affect the effectiveness of PBL sessions, including the tutorial's presented problem, student and tutor characteristics and the processes involved in the running of these sessions.[8] Studies on the hybrid PBL strategy show encouraging results across medical schools in Saudi Arabia that have adopted the PBL instructional teaching strategy.[7,9,10] Other reports have deemed PBL to be an effective teaching strategy for students in preclinical years.[2]

The current study was planned to evaluate students' perceptions of problem-based learning tutorial sessions.

Subjects and Methods

The cross-sectional study was conducted from March to May 2019 at the College of Medicine, Jouf University, Al-Jawf Saudi Arabia, where the implemented instructional strategy is an integrated hybrid PBL that forms an integral part of preclinical years. The PBL sessions are held on the first and last days of the week, and supported by conventional lectures, skill labs and laboratory sessions covering the same theme. It is noted that, there has been no changes in the PBL implementation since its inception at the college.

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bioethics, the sample size was calculated using the online Raosoft calculator with 95% confidence level and 5% margin of error.[11]

Those included were fifth year male and female medical students in the clinical phase. The clinical phase comprises students of fourth and fifth year's students who are no longer part of the PBL sessions, but to minimise bias, only fifth-year students, who were a few months away from graduation, were targeted. Those who did not volunteer to participate were excluded.

Data was collected using a well-structured pre-validated electronic questionnaire.[7] The participation was voluntary and its advertisement was announced at the end of a lecture one day before its commencement. The questionnaire link was shared on the university's notice board. The first page of the questionnaire contained the consent form, instructions and estimated time for completion. The consent page also mentioned that the only collected personal information would be the year of education and gender. The questionnaire had to be answered on a five-point Likert scale from complete agreement to no agreement. Only the students agreeing to the consent page were able to move on to the next page, which had eight questions evaluating perceptions of PBL tutorial sessions. The students were able to proceed to the following page once they responded to all questions on a page. If they failed to do so, they got a prompt before proceeding to the next page. The second page contained three questions that evaluated opinions on the tutors' facilitation of sessions and fairness in their students' evaluations.

The questionnaire was devoid of a 'back' button. Thus, students had to complete each page without access to the previous pages. The sequence of questions under each section appeared randomly to each student completing the questionnaire. To prevent duplication, students were not able to retake the survey. Only the researchers were able to access the results.

Data was analysed using SPSS 21. The data was coded before entry and, to simplify the presentation, the responses were merged under 'agree', 'neutral', and 'disagree' categories. A score of 1 was given to the statements that students responded as 'agree' or 'disagree', and 0 was allotted to 'neutral'. The maximum score for agreement or disagreement was 8. The overall mean agreement score was calculated by summing up the agreement score of each participant divided by the number of participants. Chi-square test was used to measure variations between the male and female students. Results were considered significant at $p<0.05$.

Table-1: Clinical phase students' perception of problem-based learning (PBL) sessions.

Questions	Categories	Total Participants n (%)	Male n (%)	Female n (%)	P-value
PBL can substitute lectures	Agree	26 (51.0)	12(52.2)	14(50.0)	0.82
	Neutral	6 (11.8)	2(8.7)	4(14.3)	
	Disagree	19(37.2)	9(39.1)	10(35.7)	
There is proper students' training before starting the PBL session	Agree	26(51.0)	13(56.6)	13(46.4)	0.55
	Neutral	15(29.4)	5(21.7)	10(35.7)	
	Disagree	10(19.6)	5(21.7)	5(17.9)	
PBL is an interactive method of learning	Agree	37(72.5)	16(96.6)	21(75.0)	0.50
	Neutral	8(15.7)	3(13.0)	5(17.9)	
	Disagree	6(11.8)	4(17.4)	2(7.1)	
There is a repetition between PBL and lectures	Agree	34(66.7)	16(69.6)	18(64.3)	0.82
	Neutral	11(21.5)	5(21.7)	6(21.4)	
	Disagree	6(11.8)	2(8.7)	4(14.3)	
Students contribute equally in PBL session	Agree	21(41.2)	7(30.4)	14(50.0)	0.34
	Neutral	14(27.4)	7(30.4)	7(25.0)	
	Disagree	16(31.4)	9(39.1)	7(25.0)	
I give feedback to the others	Agree	24(47.1)	8(34.8)	16(57.2)	0.27
	Neutral	22(43.1)	12(52.2)	10(35.7)	
	Disagree	5(9.8)	3(13.0)	2(7.1)	
I contribute in group discussions Students contribute equally in PBL session	Agree	36(70.6)	17(74.0)	19(67.9)	0.73
	Neutral	9(17.6)	3(13.0)	6(21.4)	
	Disagree	6(11.8)	3(13.0)	3(10.7)	
I attend PBL session on time	Agree	37(72.5)	16(69.6)	21(75.0)	0.73
	Neutral	11(21.6)	6(26.1)	5(17.9)	
	Disagree	3(5.9)	1(4.3)	2(7.1)	

Table-2: Tutors' facilitation of problem-based learning (PBL) sessions and their fairness in students' evaluation.

Questions	Categories	Total Participants n (%)	Male n (%)	Female n (%)	P-value
Tutors are prepared to run the session	Agree	25(49.0)	9(39.1)	16(57.1)	0.13
	Neutral	11(21.6)	4(17.4)	7(25.0)	
	Disagree	15(29.4)	10(43.5)	5(17.9)	
Tutors evaluate students in fair way	Agree	17(33.3)	6(26.1)	11(39.3)	0.12
	Neutral	21(41.2)	8(34.8)	13(46.4)	
	Disagree	13(25.5)	9(39.1)	4(14.3)	
Tutors feedbacks were helpful to improve students' performance	Agree	26(51.0)	9(39.1)	17(60.7)	0.30
	Neutral	16(31.4)	9(39.1)	7(25.0)	
	Disagree	9(17.6)	5(21.8)	4(14.3)	

Results

Of the 66 students approached, 59(89.3%) accessed the questionnaire, and 56(84.8%) students agreed to participate. However, the questionnaire was completed by 51(77.27%) students; 23(45%) males and 28(55%) females. The mean perception score of agreement on the various statements regarding the procedures of PBL sessions was 4.73±2.13. Students offered a 50/50 verdict on statements questioning whether PBL sessions can substitute lectures and whether students receive proper training in these sessions. The majority 37(72.5%) of the students considered PBL sessions interactive, but 34(66.7%) students noticed similar content in lectures. Another 16(31.4%) students disagreed that students contributed equally in PBL sessions. In the gender comparison, female students demonstrated a higher agreement than male students on statements addressing equal contribution, giving feedback, and attending PBL sessions on time, but the gender difference was non-significant (p >0.05) (Table-1).

Overall, 25(49%) students perceived tutors as well-prepared for the PBL sessions, and 26(51%) students perceived tutor feedback on PBL sessions as helpful in improving performance. Overall, a lesser mean of agreement 1.33±1.07 was observed on tutors' facilitation of sessions and their student evaluations. (Table-2).

Discussion

Globally, many medical schools have accepted and implemented PBL as an innovative, effective and interactive method of successful learning. The skills acquired from the pedagogy of the PBL strategy, such as interpersonal dimensions, cognitive skills and collaborative skills, potentially impact the development of physician competency after graduation.[12] Medical schools in Saudi Arabia are keeping pace with innovative educational strategies to assure an advanced medical practice for the nation. In accordance with this vision, the Ministry of Higher Education has initiated hybrid PBL mechanism in most medical schools. In the current study, the students (72%) positively perceived PBL as an interactive learning method, which is in line with an earlier studies.[7,13] However, a study conducted in Malaysia reported PBL as a time-consuming educational strategy with no impact on interpersonal skills and knowledge.[14] These contradictory statements suggest the need for an appropriate curriculum evaluation during preclinical to clinical transitions to limit the consequences of dysfunctional PBL implementation.

Student participation in group discussions during PBL sessions varies and depends on the level of students' preparation. The current study found positive opinions (>70%) on students' involvement during PBL group discussions in the preclinical phase. On the other hand, a few students stated dissatisfaction with these group discussions. This variation on the perception of group discussions might depend on the level of difficulty required during self-directed learning (SDL) that can vary with the PBL sessions.

Motivational and cognitive skills influence the success of a study group. In addition, the interactions and SDL knowledge gained through sharing among peers in PBL sessions also impact the successful implementation of an unbiased session in any medical school.[15] The possible explanation regarding the above variation is probably reflective of a student's motivational and cognitive skills, attitudes and level of preparation prior to PBL sessions. Hence, developing an appropriate educational strategy that triggers students' motivational and cognitive skills is important for better collaborative PBL group discussions.

Tutor training on PBL facilitation processes is not the only necessity for effective PBL implementation. Student training is also vital to avoid a dysfunctional

PBL curriculum. It enhances effective group discussions and student skills to evaluate group productivity.[16] In the current study, more than 50% students agreed that proper student training is needed before starting PBL sessions. The existing PBL literature that discusses the positive impact of student training prior to PBL sessions[17] supports these results. Accordingly, a study done in Saudi Arabia reported a lack of proper PBL orientation and training before the sessions which resulted in poor performance during the sessions.[7]

In the current study, more than 50% students agreed that PBL could substitute lectures. Furthermore, the results showed that most students (66.7%) reported a repetition of content in PBL and lectures during their preclinical phase. The possible explanation for this perception is students' time paucity for the development of SDL skills that would contribute to better discussions during PBL sessions. This emphasises the need for medical education expertise and enough resources to monitor the pitfalls of hybrid PBL pedagogy implementation in medical schools. Furthermore, the discrepancies in staff-student ratio, lack of tutorial rooms, and tutor training workshops results in dysfunctional hybrid PBL learning practices compared to the pure PBL that is a whole-curriculum philosophy.[2]

Many factors negatively affect a successful PBL implementation in any educational institution. The key factors for PBL success depend on the tutor, learner attitudes, the educational environment, PBL scenarios, the student PBL group structure, and apt assessment criteria. The current study revealed that less than 50% students were satisfied with their tutor's performance. An earlier study reported that tutor's experience and positive attitude play an important role in unbiased PBL pedagogy implementation.[18]

Tutor feedback during sessions is important in the improvement of student learning outcomes. Compared to the male students in this study, female students were highly satisfied with the tutor feedback. Overall, about 51% students benefited from this tutor feedback directed towards improved performance even though only 33.3% students agreed that their sessions were fairly evaluated by the tutors. One study from Saudi Arabia also reported the same student perception regarding tutor fairness in PBL sessions.[7]

The strength of the current study lies in the sample characteristics, instituting no compulsion for positive perception responses, thus minimising bias. Also, the students were in a position to provide better insights retrospectively after previously participating in the PBL system. The limitations of the study include its single-centre nature, possible recall bias and a questionnaire-based data collection with no personal interaction.

Future studies should include focused group discussions (FGDs) on the implementation issues with the students and should also include opinions of tutors to maximise the promise of PBL strategy.

Conclusion
Students perceived PBL sessions as effective and interactive, but a mechanism needs to be established to avoid the repetition of content in PBL and lectures, and to circumvent a direct transfer of problem-related knowledge to maintain students' SDL. Besides, tutors' student evaluations are still an issue of concern.

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