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Peer-Assisted Learning (PAL) as a supportive measure for high-risk medical students.

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Abstract:
The purpose of this study was to evaluate the effectiveness of a peer-assisted learning (PAL) program among second-year MD students at the National University of Oman. The program involved optional, scheduled PAL sessions that combined a peer-assisted model with student-led activities. In general, the evaluation revealed that most students were in favour of PAL as a means for enhancing social aspects of learning but did not view PAL as a major factor in developing study skills or assignment preparation. During that jump in satisfaction between stages 1 and 2, very clear yet powerful improvements occurred. The benefits persisted until the 3rd stage, primarily due to the clearer guidance. We have found that PAL enables a productive learning environment. However, it is critical to acknowledge that this type of implementation is not automatic and that learners require guidance to organize their sessions efficiently.
Keywords: Peer-assisted learning, Alternative teaching, Student-led teaching, Education

Introduction:

Peer-assisted learning (PAL) is a method of gaining information and abilities by actively receiving assistance and support from peers (Topping et al., 1998). Medical and paramedical programs are increasingly utilizing this educational intervention, which emphasizes student-cantered tactics (Krych et al., 2005). Health professional courses widely accept and use PAL as an instructional strategy. PAL activities offer a structure that allows students to hone and improve their teaching and healthcare abilities (Burgess et al., 2014). Students learn from and alongside each other using common resources and the contributions of their diverse experiences. The "agency" of the individual students (tutors and tutees), or their willingness to participate, is a crucial component of PAL activities, as is the "affordability" of the activity and the workplace, or the invitational quality offered by the clinical school (Burgess et al., 2016). To define the words used in this work, we define the "tutor" as a student helping them peer who is a student, and the "tutee" as the student receiving assistance from the peer "tutor" in their learning.

Implementing PAL programs with the goal of requiring students to teach in their future occupations and giving them early opportunities to prepare for these responsibilities is a frequent goal (Burgess et al., 2014; Marton et al., 2014). Students participating in tutor training programs learn how to teach and acquire foundational information and skills. Staff members also bear the additional responsibility of ensuring that health professional students have appropriate opportunities to apply these instructional techniques (Burgess et al., 2014; Irby et al., 2003). Peer tutoring is considered a valuable opportunity for students to independently review their own knowledge and abilities (Burgess et al., 2014; Yu et al., 2011). Furthermore, PAL provides hospitals and colleges with resource-saving strategies. Engaging in PAL activities can bridge curriculum delivery gaps and offer extra assistance in preparing for exams (Hurley et al., 2003).

This study for a peer-assisted learning framework in medical undergraduate programs is a forward-thinking solution that addresses the critical need for inclusive and effective educational support. By focusing on the unique challenges of high-risk students, this initiative promises to enhance academic outcomes and reduce dropout rates through collaborative learning and personalized attention. The involvement of key stakeholders, including faculty and student services, is essential in creating a supportive environment that fosters academic excellence and the holistic development of future healthcare professionals. This structured approach to peer learning could set a new standard for medical education, emphasizing the importance of community and shared knowledge in achieving success.

Research methodology:

PAL projects usually involve a collaborative effort, so it's important to identify potential team members and designate a leader. MD 2nd year medical students at National University, Oman, will participate in the PAL program. Tutors and tutees will be second-year MD students who are peers, not professional teachers, and who are also learning themselves through teaching. We offered the opportunity to become voluntary PAL tutors to MD 2nd year students who achieved grades of A+ (93-100%), A (89-92%), and B+ (86-88%) in the Anatomy 1 course of the MD degree program. PAL selects and rewards qualified applicants to serve as tutors. A PAL tutor will lead each interactive session, review the material, provide board-style questions, and suggest learning strategies. We selected second-year MD students who achieved marks of C- (66–69%), D+ (62–65%), D (58–61%), or below in the Anatomy 1 course of the MD degree program as peer tutees and gave them the opportunity to attend the optional PAL sessions. We randomly divided the 80 students in the second year of the MD program into sixteen small groups, each containing approximately five students. During active learning sessions, students will acquire knowledge on the subject matter, exchange effective learning techniques, and evaluate their study habits to enhance their academic performance and overall well-being. The sessions will cover a diverse array of topics. This will enable them to focus on higher-level problems by giving them the opportunity to lead the discussion. We will offer PAL sessions to students as an addition to the curriculum. The PAL facilitators, as faculty, will schedule these sessions, considering their availability and class schedule. Initially, the Anatomy-II course organizers scheduled three PAL sessions, and subsequently encouraged students to arrange additional meetings at convenient times for the group. You can reserve rooms by planning with the course administrator.

An introductory lecture presented the structure, goals, benefits, role selection, topic selection, and session management of PAL. For each classroom session, students elected a leader and scribe from their group. We stressed teamwork, cooperation, and active problem-solving. In the first session, a case study demonstrated the benefits of small group discussion to the students. Students could continue the case study in the second session, or they could choose self-selected learning issues from recent lectures or practical sessions. The course team encouraged lecturers to suggest topics for PAL sessions, but primarily, the students led the sessions. A PAL coordinator on the course team received a handout from the students, asking them to create a session plan and summary for each session. We employed a survey to gather the students' perceptions, skills, knowledge, and feedback regarding the PAL session. The questionnaire underwent validation by a panel of three internal and three external medical education specialists. We partitioned the questionnaire into two distinct portions. Initially, we instructed the students to rate each of the 12 assertions against the question, 'If you have attended any PAL sessions, do you concur or disagree that they had an impact on the following?' ' On a five-point scale, the options are strongly disagreed, disagree, don't know, agree, and strongly agree. The next component of the questionnaire asked about the number of sessions attended and, if students had not attended, their reasons for abstaining. Another component of the questionnaire inquired about the factors that students believed would enhance the effectiveness of PAL sessions. We instructed students to complete the PAL questionnaire, which evaluated their peer learning experience. We gather, process, and analyse the data from the PAL sessions. The primary phase of the action study employed descriptive statistics to assess the initial PAL sessions and provide insights for potential adjustments in the future.

We employed descriptive statistics to reassess the PAL sessions in the second and third phases. We also used inferential statistics to compare the three phases. The data are categorical, with counts of the number of responses in each group. To find links between the groups, χ^2 tests, also known as Fisher's exact test, were used, even though the expected

numbers in many of the cells are very small. We conducted statistical tests using the SAS package. Throughout, the null hypothesis held that there was no association between the phases and responses. If the resulting p-value was less than 0.05, we rejected the null hypothesis, concluding that there is some association between phases and responses.

Results:

We arrange the results chronologically based on the three cycles of the PAL session. It begins with the initial evaluation in phase 1, followed by reflections and revisions, subsequent evaluations, and so forth.

Evaluation Phase 1: A total of 58 students, out of 80, completed the questionnaire in phase 1, resulting in a response rate of 72%. We instructed the students to document their attendance at the sessions. We also instructed students to express their concurrence or dissent with 12 statements. Figure 1 presents the distribution of student responses for each of the twelve assertions, indicating the percentages for each category. Most students, above 50%, expressed agreement or strong agreement with the claims that the PAL sessions provided them with the chance to clarify fundamental concepts and discuss concerns outside the presence of teaching professionals. Furthermore, more than 50% of the participants believed that PAL had a positive impact on the social components of learning, such as collaborative learning with others and gaining different perspectives on the course. In most cases, namely 8 out of 12 statements, there was a prevalence of either more than 50% disagreement or uncertainty, as indicated by students selecting the 'don't know' response. These factors included assessing the effectiveness of PAL sessions in improving comprehension of intricate concepts, understanding of course requirements, and the cultivation of effective study techniques. Most students did not perceive PAL sessions as beneficial for emotional factors such as reassurance, confidence, or enjoyment of studying.

Table-1:Response acquired from Peer Learners regarding Peer-Assisted Learning (PAL) sessions-1; (n=52)

S.No.	Questions	Agree/ Strongly Agree	Don't know	Disagree / Strongly Disagree
1	Enjoy the process of learning	36%	22%	42%
2	Helpful to learn different viewpoints about the course	64%	2%	34%
3	Other perspectives help me fully understand the topic	60%	20%	20%
4	Learn the subject matter of this course with clarity	42%	6%	52%
5	Ability to make difficult ideas more understandable	22%	4%	74%
6	Potential to explain fundamental ideas	58%	4%	38%
7	Confident in learning how to learn	5%	0%	95%
8	Sessions enhanced my assignment preparation	10%	5%	85%
9	Understanding the expectations of the course	22%	10%	68%
10	Seeking assurance regarding concerns relating to the course	26%	2%	72%
11	Strengthening of my self-confidence	25%	12%	63%

12	Chance to express issues without the presence of educational staff	54%	4%	42%

Reflection and modifications for phase 2: Although most had the skills to find 'learning with others' and 'obtaining others' perspectives' adequate, many did not receive enough emotional support from their peer group, suggesting they needed additional direction and tutor help. The academic team and students discussed improvements. The induction program emphasized role selection and rotation, and the PAL group had its first minor icebreaking exercises. This method encouraged students to analyse the data and identify their and the group's learning needs. The PAL coordinator provided email support throughout the term, encouraging students to choose other themes for discussion after group members described their work in their teams.

Figure 1. Questionnaire analysis PAL-1 sessions
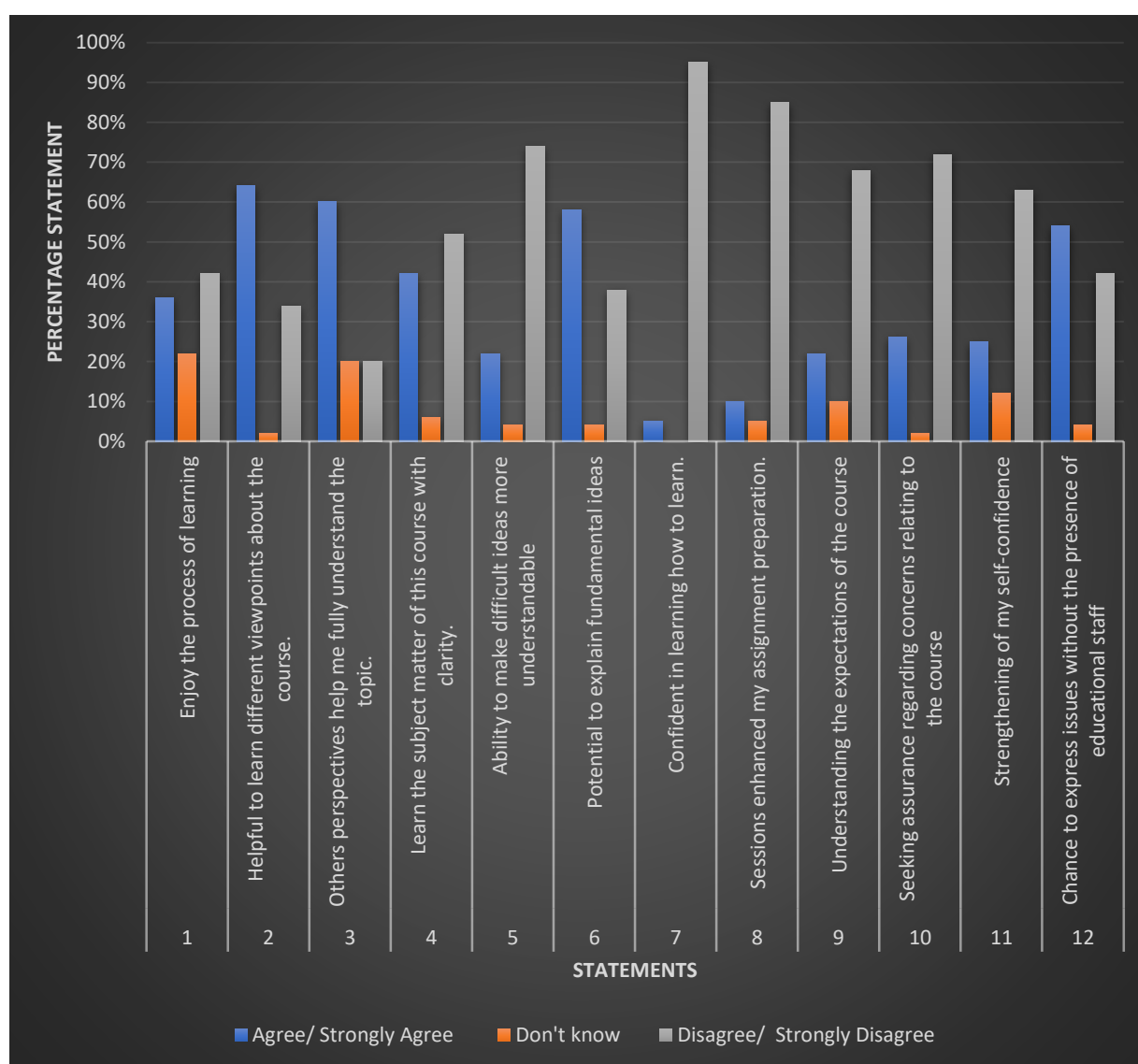
Evaluation Phase 2: Of the 80 students invited to participate in phase 2 of the study, 76 completed the questionnaire, yielding a 95% response rate. Figure 2 displays the analysis of the questionnaire responses for the 12 statements. The results indicate that there was a higher level of consensus in all 12 statements compared to the previous phase 1, and an improvement in overall satisfaction with the PAL sessions in phase 2. This modification attained statistical significance in several phase-1 statements with more than 50% disagreement or ambivalence. In phases 1 and 2, association tests revealed significant differences in students' responses for statements about 'understanding subject matter of the course', 'enjoyment of learning', 'opportunity to clarify complex concepts', 'development of my study skills', 'better assignment preparation', and 'reassurance about course-related concerns'. The expressions 'development of my study skills', 'better preparation for assignments', and 'awareness of course expectations' were still more contentious. We questioned students who completed PAL questionnaires about their reasons for not attending additional sessions. In phase 1, 53.3% of respondents thought the sessions would not be useful, whereas in phase 2, 27.5% did. Students in Phase 2 were more likely to skip class for convenience. We also asked Phase-2 students what they believed would improve PAL sessions. Most students thought linking PAL groups to their instructor (68%) and adding structure (70%) would help. Over 40% of students thought having a second or third-year student there or questions to answer would help every session. Six students (15%) thought a PAL-related evaluation could benefit the group.

Table-2:Response acquired from Peer Learners regarding Peer-Assisted Learning (PAL) sessions-2; (n=72)

S.No.	Questions	Agree/ Strongly Agree	Don't know	Disagree/ Strongly Disagree
1	Enjoy the process of learning	72%	8%	20%
2	Helpful to learn different viewpoints about the course	70%	20%	10%
3	Other perspectives help me fully understand the topic	80%	10%	10%
4	Learn the subject matter of this course with clarity	67%	13%	20%
5	Ability to make difficult ideas more understandable	46%	20%	34%
6	Potential to explain fundamental ideas	62%	20%	18%
7	Confident in learning how to learn	22%	23%	55%
8	Sessions enhanced my assignment preparation	28%	20%	52%
9	Understanding the expectations of the course	29%	21%	50%
10	Seeking assurance regarding concerns relating to the course	58%	18%	24%
11	Strengthening of my self-confidence	42%	20%	38%
12	Chance to express issues without the presence of educational staff	62%	8%	30%

Reflection and modifications for phase 3: Despite the positive results and increased student contentment, the assessment yielded valuable data for the faculty. We continued the PAL sessions into the next phase, making some adjustments based on the previously mentioned

findings and recommendations. Every student received a locally created PAL manual as part of the improvements. We also assigned each group a personal tutor who could provide both troubleshooting and pastoral advice. Additionally, we established a discussion board inside the virtual learning environment to facilitate student communication regarding session organization and comments.

Figure 2. Questionnaire analysis PAL-2 sessions
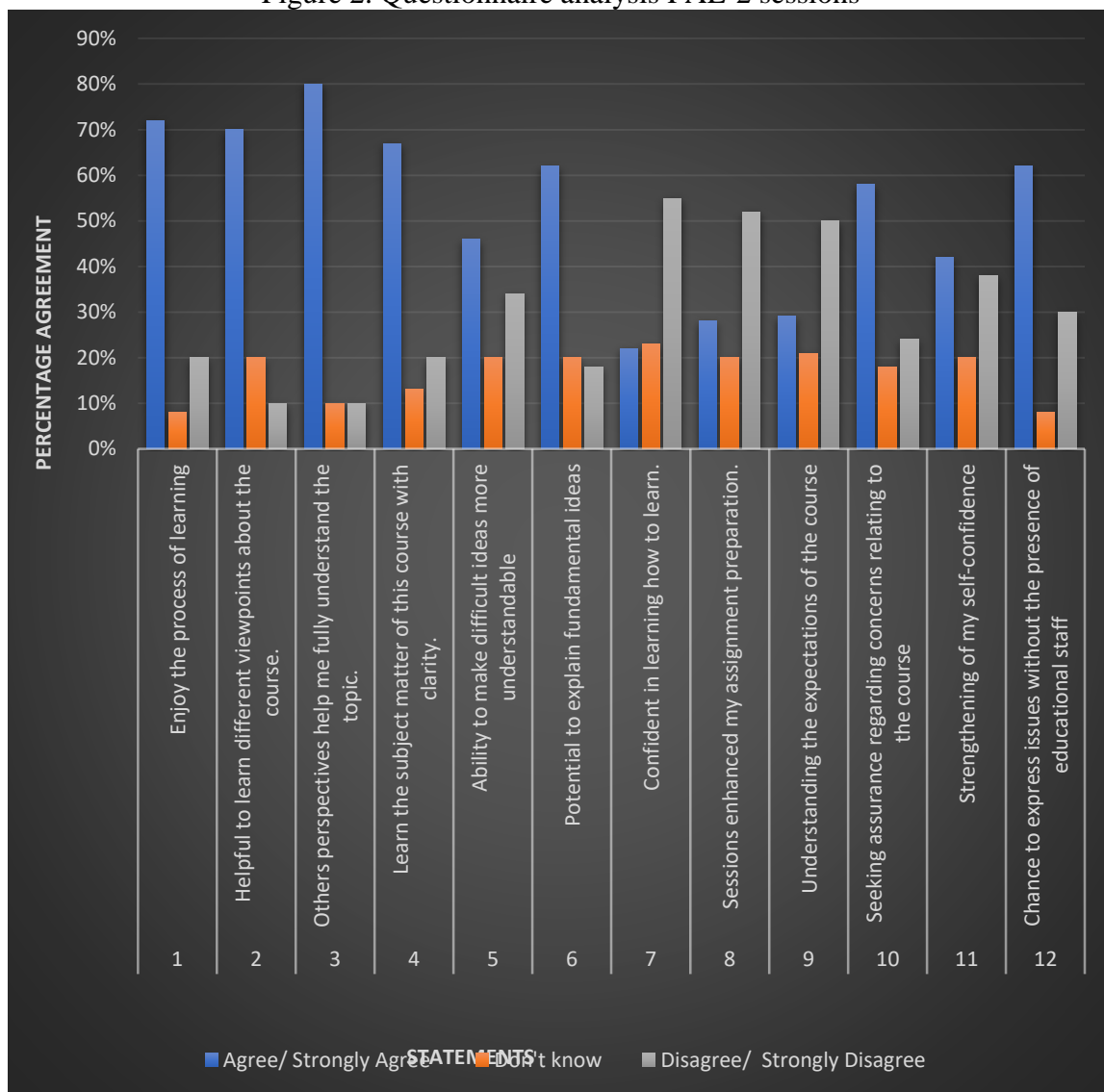
Evaluation Phase 3: A total of 52 students out of 80 (n = 80) completed the questionnaire, resulting in a response rate of 65%. The findings in phase 3 were comparable to those in phase 1. The attendance levels remained encouraging (see Table 1). Figure 3 presents the analysis of the questionnaire responses for the 12 statements. The association tests indicated that there was no statistically significant disparity in the students' replies between phases 2 and 3 for any of the items. Nevertheless, it is evident that in phase 3, students displayed less ambivalence, as there was a decrease in the number of students who chose the 'don't know' group.

Table-3:Response acquired from Peer Learners regarding Peer-Assisted Learning (PAL) sessions-3; (n=52)

S.No.	Questions	Agree/ Strongly Agree	Don't know	Disagree/ Strongly Disagree
1	Enjoy the process of learning	68%	10%	22%
2	Helpful to learn different viewpoints about the course	78%	2%	20%
3	Other perspectives help me fully understand the topic	80%	10%	10%
4	Learn the subject matter of this course with clarity	70%	0%	30%
5	Ability to make difficult ideas more understandable	48%	2%	50%
6	Potential to explain fundamental ideas	70%	0%	30%
7	Confident in learning how to learn	30%	10%	60%
8	Sessions enhanced my assignment preparation	30%	20%	50%
9	Understanding the expectations of the course	38%	18%	44%
10	Seeking assurance regarding concerns relating to the course	42%	6%	52%
11	Strengthening of my self-confidence	50%	20%	30%
12	Chance to express issues without the presence of educational staff	70%	2%	18%

Figure 3. Questionnaire analysis PAL-3 sessions
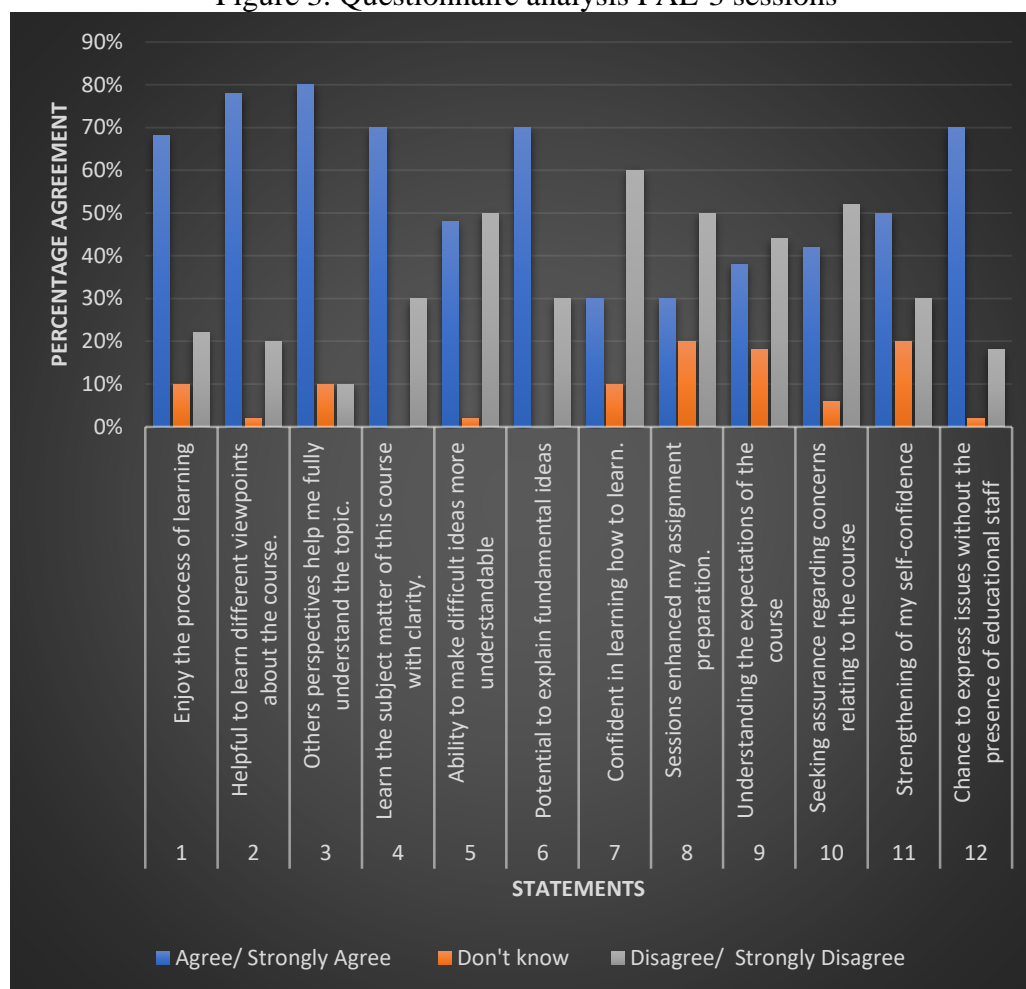
Discussion and conclusion:

This study found that students preferred peer learning's social features. Students enjoyed 'obtaining other people's perspectives', 'learning with others', and 'opportunity to vent difficulties away from teaching staff', making learning entertaining. While peer learning helped students understand course content and explain fundamental concepts, they were less likely to agree that it clarified sophisticated themes. Most students did not think the sessions helped them understand course requirements, study skills, or assessment preparation and performance. This research provides a unique perspective on the field of peer learning research. This evaluation focuses on a peer-assisted learning (PAL) scheme, which stands out from most other peer learning schemes by not incorporating a tutor from a higher phase level (Boud et al., 2001; Capstick et al., 2004; Falchikov et al., 2001). Many PAL evaluations compare data before and after an intervention, or from the first and second rounds.

Using action research, we successfully completed three phases of implementation and enhancement, showcasing sustained initial progress. Like peer learning pioneers and scholars, students evaluated the social aspects of learning positively, indicating that they enjoyed studying together (Boud et al., 2001; Capstick et al., 2004; Falchikov et al., 2001). The seminars allowed students to share their thoughts without feeling ashamed or evaluated by academics, who are considered experts, according to Baldry Currens (Baldry et al., 2003). Some may claim that students already have plenty of informal chats outside of class, but PAL sessions formalize this communication and promote collaborative learning. Most students in this review didn't think PAL sessions helped them understand course expectations. According

to Baldry Currens, same-year PAL tutoring can be more relaxed but lacks precise guidance. This study provided generic objectives to students, but the peer learning sessions lacked specific objectives (Baldry et al., 2003). This may explain the lack of consensus on course requirement awareness. The following two phases of the program showed that most students preferred organized PAL sessions.

Research on self-regulated learning shows that motivation, planning, and self-evaluation are key and suggest that personal goals guide learning (Boekaerts et al., 1999; Schunk et al., 2005; Kolb et al., 1994). This may make a strong case for letting students choose their own peer learning goals rather than over guiding them. Others suggest linking peer learning to evaluation assignments (Capstick et al., 2004; Falchikov et al., 2001). Connecting peer learning to evaluation remains an issue for educators. Our experience suggests that we should link these sessions to the curricular learning outcomes. This gives students a clear reason for attending these sessions.

Research suggests that peer learning deepens learning (Falchikov et al., 2001; Ladyshewskyet al., 200; Topping et al., 1996). This investigation casts doubt on these claims. To better understand complex topics, students should actively explore for meaning, make connections between ideas, and use a variety of cognitive capacities that support a profound approach to learning. The survey's two statements about understanding basic and complex concepts can discriminate between 'superficial' and 'deep' learning. However, it is unclear if students found the sessions helpful in understanding complex subjects. Thus, we must examine if PAL promotes deep learning, especially when the material or preparation for the sessions is lacking. In peer learning sessions, our findings may reflect different group techniques. Yan and Kember found two main student learning patterns outside of class (Yan et al., 2003; Yanet al., 2004). An 'engager' method involves students working together to understand difficulties or concepts, while an 'avoider' technique involves students working together to lessen burden. Each group's 'engager' or 'avoider' mindset may also explain our study's results.

Our findings may be due to students' perception that PAL sessions were extra and inconvenient, which is consistent with earlier research. Therefore, we concur that we should carefully plan and integrate PAL sessions into the students' timetable and curriculum, rather than viewing them as supplements. The examination found that most students did not think peer learning improved their study skills or assignment preparation. Previous research has demonstrated that study skills programs, especially in higher education, are ineffective (Hattie et al., 1996). According to our expertise, peer learning goals and constraints must be clearly defined.

Limitation:

The students initially attended one health professional program, so the findings may not apply to other institutions or fields. Additionally, the 2nd year MD program conducted the assessment, potentially revealing the students' proficiency and learning style. We should exercise caution when drawing conclusions from this study, as it compared different student groups, and the sample technique might not accurately represent each PAL group. Other factors may impact any significant changes in student opinions from phase 1 to phase 3, given the practical nature of the peer learning sessions. The paper only includes changes that support the 12 statements. The questionnaire did not cover aspects of group dynamics that may have influenced student attitudes. The obligation for students to participate can appear forced, especially when evaluation provides less motivation. According to Sadlo, some scholars believe organizations take time to become effective (Sadlo et al., 1994). The first two meetings included a case scenario to ease tensions, but participation was minimal, and the number of scheduled sessions was limited. These factors may have affected the results.

Further Research:

Does learning style (surface, deep, or accomplished) affect peer learning attendance, satisfaction, and other factors? We decide on the learning process during peer learning sessions. How do group peer learning methods affect engagement and satisfaction? Finally, does PAL support group activities outside of class? Research on peer learning restricts qualitative inquiry, which is essential for answering many of the previously mentioned questions. While this research is ongoing, we propose doing action research to evaluate peer learning.

Assessing and refining same-year peer learning sessions can enhance results, although they may not be obvious after a few attempts. Educators should explain PAL's pros and cons. We discovered that same-year peer learning sessions are challenging and may require as many resources as tutor-led sessions. Program planners should carefully organize and arrange sessions to align with the curriculum and learning objectives, instead of treating them as separate entities. We should also fund student help to enhance group collaboration. Workshops, guiding remarks, and ongoing coaching can help.

Ethics Statement:
Ethical approval was granted by an Institutional research and ethics committee (IREC). The registration number for the ethical approval is NU/COMHS/ EBC006/ 2024.

Conflicts of interest
The authors declare no conflict of interest.

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