

A Mixed-methods Study on the Role of Recent Graduates as Peer Educators in Iraqi Medical Schools: Insights and Implications

Husam M. H. Al Zuwayny^{1,*}, Naseer K. Jawad¹, Umniah Khajori², Mustafa s.l. zubaidi¹,
Amar A. Abdulabbas¹, Jaafar I. Twayej³, Murtadha H. Khudhair³, Hawraa A. Fakhir⁴, Ali H. Al Zuwayny¹

¹University of Wasit College of Medicine - Department of General Surgery

²Baghdad College of Medicine

³Kufa College of Medicine

⁴Al-Iraqia College of Medicine

*Corresponding author: husammajeed1969@gmail.com

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Abstract In recent years, Iraqi medical education has seen the emergence of peer teaching as vital method to enhance learning, addressing the challenge of limited teacher-to-student ratios and professional development. This study aimed to evaluate this approach and compare it with global models. Utilizing a mixed-methods design, the research involved feedback from new graduates and key informants. Results indicated significant improvements in students' academic performance and graduates' teaching skills, with positive feedback on the program's interactive nature. Challenges such as resource limitations were identified. Compared to international standards, the Iraqi model showcased unique strengths in employing recent graduates. Despite limitations like a limited number of participating colleges, this study establishes an essential baseline for understanding and developing peer teaching in Iraq's medical education landscape.

Keywords: Peer teaching, Peer-Assisted Learning, PAL, Peer teaching Program, PTP, medical Education, Small group learning, and integrated curriculum

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1. Introduction

Peer teaching, a method where individuals of similar age, social status, or skill levels educate each other, is increasingly prevalent in both undergraduate and postgraduate medical education worldwide [1,2]. Research indicates that peer-led teaching can be as effective as instruction from expert teachers [3,4]. It offers a psychologically safe learning environment, fosters mutual understanding of challenges, and allows for tailored explanations [5,6,7]. Furthermore, it helps reduce the teaching workload for faculty members [6].

Teaching is a vital skill for health professionals, who must educate both within and across various health disciplines. Skills like supervision, facilitation, assessment, feedback, leadership, and teamwork are essential attributes for graduates in health professions [8,9,10]. Peer-Assisted Learning (PAL) can fill curricular gaps and offers a unique approach compared to traditional faculty teaching [5,11,12]. Vertical integration in health curricula allows

early patient exposure, but clinician availability for teaching is a recognized issue [13,14].

Peer Teaching in Iraqi Medical Colleges

Peer Teaching in medical education, recognized globally for its benefits in enhancing learning experiences, confronts unique challenges in different educational contexts. The Iraqi medical education system, with its specific socio-cultural and institutional dynamics, presents a distinct setting where the conventional model of peer teaching encounters both challenges and opportunities. The literature reveals a gap in the exploration of peer teaching models in contexts like Iraq, particularly in response to local challenges such as employment delays for graduates.

Emergence of Peer Teaching Program (PTP) in Iraq

The idea of utilizing medical students in medical education has been proposed and encouraged for many years by Professors Dr. Nigel Bax and Dr. Deborah Bax from Sheffield Medical School, who conducted several workshops for faculty members and decision makers in different Iraqi medical colleges over a long period [15].

However, the implementation of the idea was hindered by the time constraints of the students.

In Iraq, medical students undergo a rigorous six-year program, leaving them little spare time to engage in teaching lower grades [16]. However, a significant shift in employment dynamics over the last five years has created new opportunities. Traditionally, medical graduates would transition to positions in health ministry hospitals immediately post-graduation. Recent budgetary constraints within the Iraqi government have led to substantial delays in employment, sometimes extending beyond a year [17,18,19]. This situation presented an unforeseen opportunity for colleges, especially those adopting System-Based Integrated Curriculum that focus on small group teaching, to effectively utilize these 'paused' graduates as potential peer educators. These recent graduates, in a transitional phase neither employed in the Ministry of Health nor the Ministry of Higher Education, remained peers to the undergraduates, making them ideal candidates for peer educators.

This shift led to the development of what is called the peer educators or peer teachers, peer teaching experience or modified peer teachers program, which then started to be known as the **Peer Teaching Program (PTP)**, the general term we will use throughout this paper, which is an adaptation of the internationally recognized Peer Assisted Learning model (PAL) tailored to the Iraqi context. Our study is a trial to delve into this uniquely Iraqi iteration of PTP, exploring its adaptation to local educational needs and challenges.

Initial Steps and Study Foundation

On July 21, 2023, a pivotal event in Iraqi medical education took place, the "Basic Course in Medical Education" by the RCP London Iraq Network" within it an interactive online session titled "Career Perspectives in Medical Education," held as part of the activities. [20] This event, serving as an initial exploratory step, involved distributing questionnaires to participants from various Iraqi medical colleges. Responses from 42 participants across 8 colleges helped refine the subsequent comprehensive study on the Peer Teaching Program (PTP). This process identified the most relevant colleges for in-depth study, emphasizing the adaptation of peer teaching methods in response to local educational needs and employment delays.

Study Aim

The study focuses on the implementation, effectiveness, and unique challenges of PTP, comparing it with established peer teaching models from different developed countries to offer recommendations for enhancing the quality and sustainability of PTP in Iraqi medical education.

2. Objectives

The objectives of this paper are to:

1. Describe the design, implementation, and evaluation of the PTP in Iraqi medical schools, identifying its strengths and weaknesses.
2. Explore the perceptions and experiences of both peer teachers and learners, assessing the impact of PTP on their knowledge, skills, attitudes, and behaviors.

3. Compare the Iraqi PTP with international peer teaching models, identifying similarities and differences in effectiveness and efficiency.
4. Provide recommendations for improving the PTP based on best practices from international experiences.

3. Methodology Overview

This mixed-methods study was conducted in Iraqi medical colleges during (August to December 2023), it is designed to evaluate the Peer Teaching Program (PTP) in selected Iraqi medical schools, drawing comparisons with international practices and models. By combining quantitative survey data with qualitative insights from key informants, we aimed to provide a comprehensive understanding of the role and potential of the PTP in enhancing medical education in Iraq.

In our study, the decision to use Google Form surveys for newly graduated peer teachers and direct interviews for key informants (KIs) was made with careful consideration of the nature of information expected from each group and their relative experience levels.

For the newly graduated peer teachers, Google Form surveys were deemed most appropriate due to several factors. As recent graduates, they are likely more accustomed to and comfortable with digital communication platforms, making an online survey a natural fit. Additionally, given that their experiences with the Peer Teaching Program are fresh but perhaps not yet fully processed or reflected upon deeply, the structured format of Google Form surveys is advantageous. It provides them with predefined options and multiple-choice questions (MCQs), which can help in articulating their thoughts more clearly. This format also allows for gathering standardized data across a broad participant base efficiently, essential for quantitative analysis.

On the other hand, direct interviews were chosen for key informants (KI), faculty and staff members, due to their depth of experience and potential to offer nuanced thoughts and insights. Key informants, with their rich background and involvement in the program, are more likely to provide detailed, complex responses that can uncover subtleties and intricacies of the Peer Teaching Program. Direct interviews allow for a conversational approach where follow-up questions can delve deeper into topics, exploring areas that a structured survey might not reveal. This method aligns with qualitative research goals, where understanding the richness and depth of individual experiences is paramount.

By employing Google Form surveys for the newly graduates and direct interviews for the KIs, the research methodology leverages the strengths of both groups. This approach ensures that the data collected is not only comprehensive but also appropriate to the level of detail and type of insight each group can best provide. It results in a balanced and thorough exploration of the Peer Teaching Program from both quantitative and qualitative perspectives.

Our study focused on peer teachers and key informants (KIs) to evaluate the operational and strategic aspects of the Peer Teaching Program (PTP). As recent graduates, peer teachers offer unique dual-perspective insights. They

understand the student mindset, having recently transitioned from that role, and also embody the teaching perspective, giving them a comprehensive view of the program's workings, challenges, and benefits. While KIs provide a broader institutional perspective. The choice to not directly include student feedback was a deliberate scope limitation, aimed at understanding the PTP's structure and implementation. This approach sets a foundation for future research incorporating student perspectives for a holistic program assessment.

Method of Quantitative Study part

Survey Design and Content

The methodological approach for our study involved a Google Form survey, designed to gather quantitative data from newly graduated peer teachers. The survey was structured into two main sections, encompassing a total of 20 questions. These questions were carefully curated to extract meaningful insights into the experiences, motivations, and perceptions of the peer teachers regarding the Peer Teaching Program (PTP). The survey was completely anonymous, allowing participants to share their experiences and opinions freely and candidly.

Section 1 focused on basic demographic and participatory information, including the respondents' university affiliation, the number of academic years they participated in teaching, and the range of subjects they were involved in. This section aimed to establish the background context of each respondent's involvement in the PTP.

Section 2 delved deeper into the qualitative aspects of their experiences. It covered a wide range of topics, from motivations for participating in PTP and preparation methods for teaching roles to the delivery and assessment of teaching, feedback mechanisms, and personal reflections on their performance as medical educators. Additionally, this section sought insights into the perceived impact of PTP on students' academic performance and learning experiences, as well as comparative evaluations against traditional faculty-led teaching.

The diversity of questions, ranging from multiple-choice to open-ended formats, was designed to capture a comprehensive view of the peer teachers' experiences, while also allowing for nuanced feedback on specific aspects of the PTP.

Data Analysis: The data extracted from the Google Form were systematically analyzed using SPSS software (IBM SPSS statistics 26) for descriptive statistical analysis. This approach allowed for a detailed examination of the data, aiding in identifying key trends and patterns that emerged from the responses of the peer teachers. The results, along with descriptive statistics, are presented in the Results and Discussion section of the study.

Methodology of Qualitative part:

Qualitative Analysis

Our qualitative research component focused on analyzing interview transcripts from key informants (KIs) at four medical colleges. The interviews were conducted and transcribed by two researchers, with the discussions translated from Arabic to English. To ensure confidentiality and data integrity, all transcripts were securely stored in a centralized Google Drive, with exclusive access granted only to the principal investigator.

For each college - Baghdad, Kufa, Wasit, and Al-Iraqia - specific sub-folders were created, housing a total of 23 transcripts (5 from Baghdad, 5 from Kufa, 6 from Wasit, and 7 from Al-Iraqia).

Participant Selection: Our selection criteria focused on individuals involved in the Peer Teaching Program (PTP) or those in decision-making capacities. The participants included 2 Deans, 2 Dean Assistants for Scientific Affairs, 4 Dean Assistants for Administrative Affairs, 4 Directors of Medical Education units, 3 Heads of Departments, 1 Head of Module, 5 Faculty members, and 2 Administrative staff. This diverse group ensured a comprehensive representation of various perspectives and roles within the PTP.

Interview Process: The interviews were predominantly conducted face-to-face, with a few exceptions where video calls were utilized. This approach allowed for more personal and in-depth discussions, although geographical constraints led to the occasional use of virtual meetings.

Researcher Role and Background: The interviews were carried out by two recent graduates from each college, who also had experience as peer teachers. Their familiarity with the PTP and ability to reach key informants across different regions of Iraq were advantageous, although this may have introduced some bias given their personal involvement in the program.

For the analysis, we utilized "**Dedoose online software**" and adopted a hybrid coding strategy that combined both **inductive and deductive** methods. This dual approach was designed to harness the strengths of each coding style. **Inductively**, we allowed new themes and codes to naturally emerge from the data. This approach ensured that our analysis remained grounded in the actual responses of the participants, thereby capturing their unique and nuanced perspectives. It was particularly effective in unveiling unforeseen insights that spontaneously arose during the interviews.

Concurrently, our analysis also incorporated a **deductive** component. The eight structured interview questions served as initial coding categories, guiding our examination of the data along specific lines of inquiry pertinent to our study's objectives. This deductive element ensured a focused and systematic analysis, aligning closely with the pre-established research goals.

Our qualitative data analysis began with a detailed coding process using "**Dedoose online software**", resulting in 405 distinct codes. These codes were then consolidated into main themes to simplify and clarify the analysis.

By integrating inductive and deductive coding, our methodology offered a balanced and comprehensive exploration of the qualitative data. This approach allowed us to delve deeply into the emergent themes while remaining aligned with the overarching research questions. Such a methodological framework was instrumental in conducting a thorough and insightful analysis of the interview transcripts, reflecting the authentic experiences and opinions of the key informants regarding the Peer Teaching Program.

Data Security and Confidentiality: Strict measures were implemented to secure all data collected. In our reporting, specific details have been generalized to avoid attributing information to particular colleges or individuals, maintaining confidentiality and anonymity.

Q4: Motivation for Participating PTP_MT						
Options	Improve knowledge & skills	Help peers learn & succeed	Experience in medical education	Financial income	Two options selected	Three or more options selected
%	1.9	7.7	21.2	1.9	34.6	32.6
Q5: Preparation for the Role: PTP_PRP						
options	Attended training sessions & workshops	Reviewed objectives & materials	Consulted for guidance and feedback	Practiced with friends	Did not prepare	Two or more options selected
%	3.8	32.7	5.8	1.9	7.7	48.1
Q6: Teaching Delivery Methods: PTP_TD						
options	Large group lectures	Small group & discussion	Demonstration or simulation format	Problem-based format	Combination of 2 options	Small group & discussion
%	0	20	2	6	45	27
Q7: Learning Assessment Methods: PTP_LA						

options	Written test or quiz	Oral or practical skill test	Observation or checklist	Self-assessment or reflection	Did not use any formal method	Two options or more
%	17.3	7.7	3.8	3.8	13.5	53.8
Q8 - Feedback Provision: PTP_FB						
options	give positive FB on strength & weakness	asked them to give FB to each other	encourage them to ask questions	Do not provide any FB	Two options	Three options or more
%	5.8	3.8	36.8	7.7	26.9	19.2
Q9 - Self-Evaluation: PTP_SE						
options	students give me feedback	Peer teachers give me FB	faculty members give me FB	recording & review my session	Do not evaluate	Two options or more
%	23.1	5.8	3.8	5.8	19.2	42.3

Table 3. Peer Educator Reflections on Benefits, Challenges, and Aspirations

Q10 - Benefits: PTP_BN						
options	Improve knowledge & skills	Develop communication	Enhance confidence as a teacher	collaboration with faculty member	Two options	Three options
%	5.8	17.3	9.6	10	23	40
Q11 - Challenges: PTP_CH						
options	Difficulty in planning session	Difficulty in managing the session	Difficulty in assessing after session	Difficulty in balancing time / responsibility	Two options or more	
%	19.1	8.5	19.1	38.3	14.9	
Q12 - Future Hopes: PTP_FH						
options	Continue teaching	Receive more training	Pursue a career in education	Influence education curriculum	Two options	Three options or more
%	25.0	7.5	1.9	11.5	17.3	36.5
Q13- Satisfaction: PTP_ST						
	Very satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied	
	36.5	48.1	13.5	0	1.9	
Q14a-Design Quality: PTP_DQD						
	Excellent	Good	Fair	Poor	Very poor	
	15.4	65.4	15.4	3.8	0	
Q14b- Implementation Quality: PTP_DQI						
	Excellent	Good	Fair	Poor	Very poor	
	5.8	59.6	30.8	3.8	0	
Q14c- Evaluation Quality: PTP_DQE						
	Excellent	Good	Fair	Poor	Very poor	
	9.6	44.2	23.1	19.2	3.8	

- Table 3 demonstrate: Perceived Benefits (Q10): 40% selected three options or more of (Improve knowledge & skills, Develop communication, Enhance confidence as a teacher, collaboration with faculty member).

- Challenges Faced (Q11): The major challenge was balancing time and responsibilities, indicated by 38.3%.

- Future Hopes (Q12): The focus on three or more options of (Continue teaching, Receive more training, Pursue a career in education, influence education curriculum) was 36.5%, The Continuing teaching and influencing the curriculum of medical education were notable aspirations, both cited by 25% of respondents.

Satisfaction with the Program (Q13): A combined 84.6% reported being satisfied or very satisfied, while only 1.9% expressed very high dissatisfaction.

- Quality of Program Design, Implementation, and Evaluation (Q14): The design quality was rated 'good' and 'excellent' by 15.4 and 65.4) Implementation was rate as ('good and excellent' by 5.8% and 59.6%). However, the evaluation aspect received lower ratings, with 9.6% and 44.2% for 'good' and 'excellent' respectively.

As can be seen in the tables 4 and the summary of survey responses below as shown in the Figure 1, it is evident that:

- Academic Impact (Q15): Most Significant Impact: 50% observed moderately improved academic performance. Least Impact: 5.8% reported no effect.

- Performance Indicators (Q16): Most Used Indicator among (Scores, Attendance rates, Feedback from peers, or Instructors feedbacks)an 28.8% selected a combination of two options. Least Used was Instructor feedback at 1.9%.

- Engagement Level (Q17a): the rates were as follow: Very High 25%, High 55.8% and Moderate 19.2%

- Motivation Level (Q17b): the rates were as follow: Very High 28.8%, High 40.4%, and Moderate 28.8

- Confidence Level (Q17c):the rates were as follow: Very High 11.5%, High 51.9% and Moderate 36.5%,

- Learning Experience Impact (Q18): Enhanced significantly 42.3%, Enhanced moderately 53.8%, and No effect 3.8%.

- Program Recommendation to other peers(Q19):was as: Very likely 51.9%, Likely 38.5%, and Neutral 9.6%

- Peer vs Faculty Teaching (Q20): Those who find the PTP is Much better 51.9%, Somewhat better 42.3%, While those who find it Same as 3.8%, Somewhat worse was 1.9%.

Table 4. Peer Educator Reflections on: Academic Impact, Learning Experience Impact, Program Recommendation, And Peer vs Faculty Teaching)

Q15- Academic Impact: PTP_AI (How much it improved)						
options	Significantly improved	Moderately	No effect	Worsen moderately	Worsen severely	
%	42.3	50	5.8	1.9	0	
Q16- Performance Indicators: PTP_PI						
options	Scores	Attendance rates	Feedback from peers	Instructors feedback	Two options	Three or more
%	11.5	7.7	5.8	1.9	28.8	19.2
Q17a - Engagement Level: PTP_ENG						
options	Very High	High	Moderate	Low	Very low	
%	25	55.8	19.2	0	0	
Q17b - Motivation Level: PTP_MTV						
options	Very High	High	Moderate	Low	Very low	
%	28.8	40.4	28.8	0	0	
Q17c - Confidence Level: PTP_CNF						
options	Very High	High	Moderate	Low	Very low	
%	11.5	51.9	36.5	0	0	
Q18 - Learning Experience Impact: PTP_LEI (How much it enhanced Learning)						
options	Enhanced significantly	Enhanced moderately	No effect	diminished moderately	diminished significantly	
%	42.3	53.8	3.8	0	0	
Q19 - Program Recommendation to others: PTP_PR						
options	Very likely	Likely	Neutral	Unlikely	Very unlikely	
%	51.9	38.5	9.6	0	0	
Q20 - Peer vs Faculty Teaching: PTP_PvF						
options	Much better	Somewhat better	Same as	Somewhat worse	Much worse	
%	51.9	42.3	3.8	1.9	0	

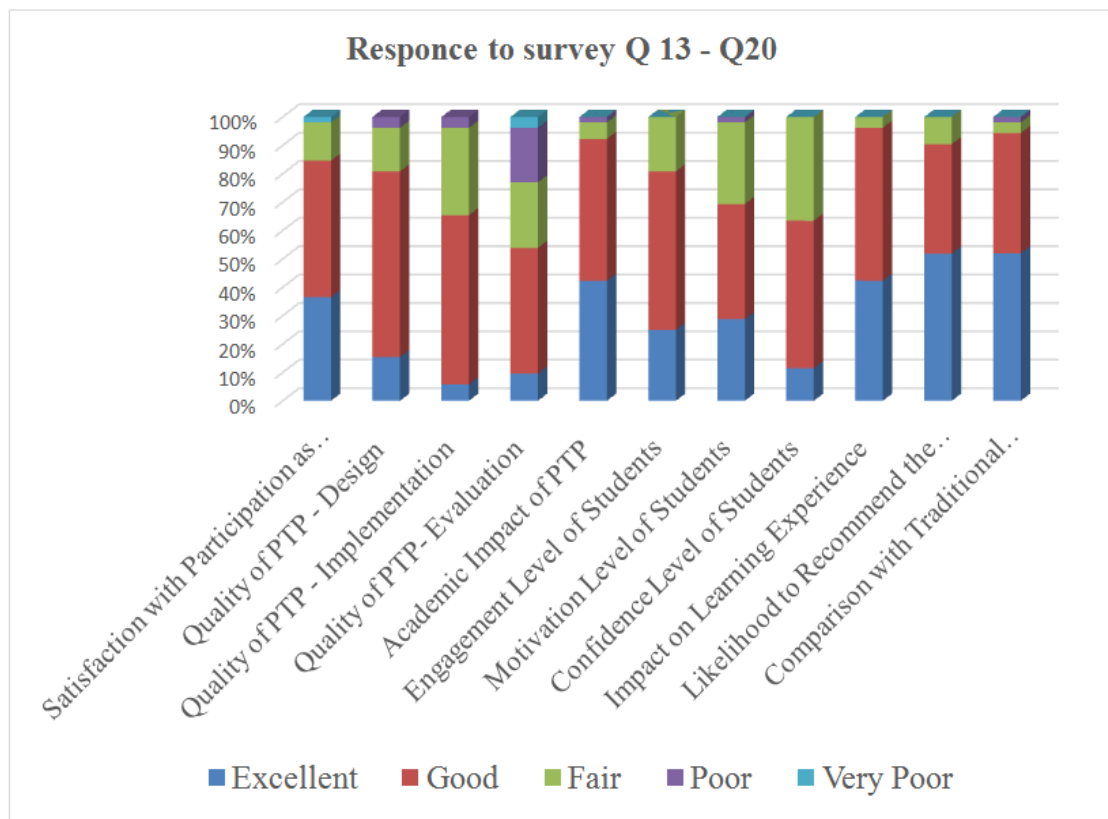


Figure 1. summary of response to survey questions Q13- Q20

Qualitative Results

Participant Demographics

As in Table 5: Our qualitative study involved 23 key informants from four major Iraqi medical colleges: Al Iraqi, Baghdad, Wasit, and Kufa. The participants' roles varied, offering diverse perspectives on the Peer Teaching Program (PTP).

Role Distribution: Deans (2 participants): Provided strategic insights. Dean Assistants (6 participants): Discussed operational and academic challenges.

Directors of Medical Education Units (4 participants): Focused on curriculum design and program evaluation. Faculty Members (5 participants): Shared academic impacts of PTP. Heads of Departments and Modules (4 participants): Offered administrative and curricular perspectives. Administrative Staff (2 participants): Highlighted logistical aspects of PTP.

Table 5. Academic position for the Participants

Role	Total Count
Dean	2
Dean Assistant for Scientific Affairs	2
Dean Assistant for Administrative Affairs	4
Director of Medical Education unit	4
Head of Department	3
Head of Module	1
Faculty member	5
Administrative staff	2

The study included a balanced gender representation, with 7 female and 16 male participants, ensuring a wide range of views from various administrative and educational positions.

Participant confidentiality was maintained throughout the study, offering a well-rounded understanding of PTP from multiple administrative and educational viewpoints.

Description of Qualitative Results: As in Table 6 and Figure 2:

Design and Implementation of PTP (48 instances): Analysis across four colleges revealed diverse practices in

PTP's design. Critiques focused on planning clarity (5 instances), limited tutor teaching scope (3 instances), and a need for further program requirements (14 instances). However, there was positive feedback on PTP methods and goals (26 instances).

Strengths of PTP (97 instances): The program was credited for updating teaching methods (26 instances), providing curriculum insights (4 instances), filling staff gaps (12 instances), career preparation (16 instances), and reducing hierarchical barriers (39 instances).

Weaknesses of PTP (38 instances): Concerns included inconsistent peer teacher performance (9 instances), insufficient support (13 instances), the impact of temporary teaching roles (9 instances), and unstable regulatory processes (7 instances).

Challenges in PTP (49 instances): Identified challenges included administrative and financial hurdles (27 instances), boundary issues (7 instances), increased student numbers (2 instances), lack of structured training (10 instances), and faculty skepticism (3 instances).

Impact of PTP on Academic Performance (46 instances): The program enhanced student engagement (21 instances) and improved grades and scores (13 instances), though there was a lack of comprehensive effectiveness data (1 instance) and positive student feedback post-PTP (11 instances).

Opinion on Peer Teachers in Assessment (28 instances): The role of peer teachers in assessment was debated, with some limitations noted (17 instances), opposition to their involvement (1 instance), and strong endorsements for their participation (10 instances).

Comparison with International Models (25 instances): Participants showed a knowledge gap about international models (15 instances), recognized advancements in the UK's PTP (7 instances), and noted unique aspects of the Iraqi PTP (3 instances).

Suggestions for Improvement (70 instances): enhancing training (32 instances), facilitating administrative processes (17 instances), extending and diversifying PTP (9 instances), and standardizing practices (12 instances).

Table 6. Main Themes, codes and their frequency

Theme No.	Code Frequency	Themes and codes	Theme No.	Code Frequency	Themes and codes
1	48	Design and Implementation of PTP	5	46	Impact of PTP on Academic Performance
	5	Critique of Planning and Clarity		21	Enhanced Student Engagement
	3	Limited teaching scope for Tutors		13	Improvement in Grades and Scores
	14	Needs further requirements		1	Lack of Data on PTP's Educational Effectiveness
	26	Positive Evaluation of PTP Methods and Goals		11	Positive Student Feedback Post-PTP
2	97	Strengths of PTP	6	28	Opinion on Peer Teachers in Assessment
	26	Compensation for Outdated Teaching Methods		17	Limited Peer Teacher Role in Assessment
	4	Curriculum Insight Through Peer Feedback		1	Opposition to Tutors in Assessment
	12	Filling Staff Gaps and Curriculum Coverage		10	Strongly endorse participation in Assessment and Evaluation
	16	PTP as Career Preparatory Experience	7	25	Comparison with International Models
	39	Reduced Hierarchical Barriers		15	Lack of Comparative Knowledge
3	38	Weaknesses of PTP		7	UK's Similar but More Advanced PTP
	9	Inconsistency in Peer Teacher Performance		3	Unique aspects of Iraqi PTP
	13	Insufficient Support	8	70	Suggestions for Improvement

Theme No.	Code Frequency	Themes and codes	Theme No.	Code Frequency	Themes and codes
	9	Lack of Experience		32	Enhancing Training through M.E Workshops
	7	Unstable Regulations and Contracting Processes		17	Facilitate Administrative and Financial Processes
4	49	Challenges in PTP		9	Proposals for PTP Extension and Diversification
	27	Administrative and Financial Challenges		12	Standardization of PTP
	7	Boundary Issues in Peer Relationships			
	2	Challenge of Increased Student Numbers			
	10	Scarcity of Structured training pre-PTP			
	3	Skepticism from Senior Faculty			

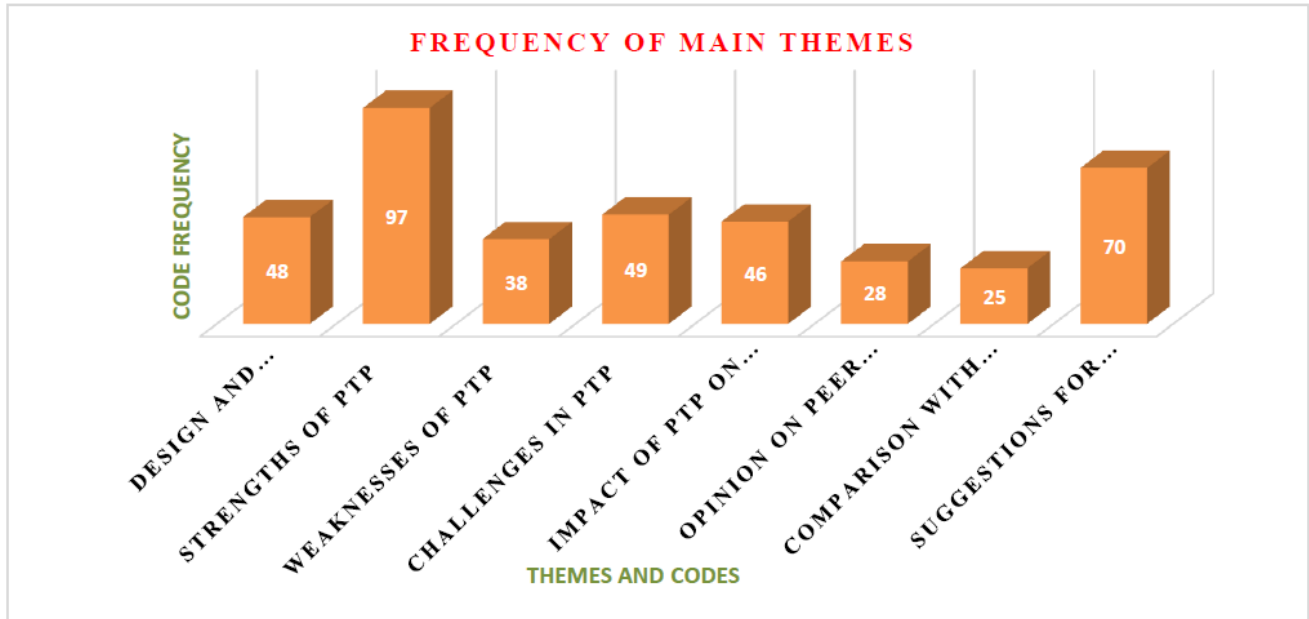


Figure 2. Distribution of the main themes, codes, and their frequency

5. Discussion

Quantitative part: analysis of the above results of the questions revealed:

***Participation Patterns in PTP Survey:** Kufa College's high participation (34.60%) suggests robust PTP engagement and possibly reflects an encouraging educational environment for peer-led teaching. In contrast, lower participation rates in other colleges point to potential barriers, such as logistical issues or lack of awareness about PTP's value.

***Subject Engagement and Tenure of Peer Teachers:** A majority of peer teachers (40.4%) concentrated on teaching a single subject, indicating a strategic focus or a limitation in program scope. Most peer teachers (82.7%) served for only one year, aligning with the typical career path post-graduation. This short tenure necessitates a consistent recruitment and training strategy to ensure PTP continuity and quality.

***Motivations for Participation:** Peer teachers are primarily motivated by a mix of altruistic goals and professional development, rather than financial incentives. This underscores the importance of addressing these diverse motivations to maintain engagement and effectiveness.

***Preparation, Teaching Delivery, and Assessment:** There's a preference for varied preparation methods and a

blend of teaching formats, showing adaptability to different learning styles. However, a gap in structured preparatory support and reliance on traditional assessment methods indicate areas for improvement.

***Feedback and Self-Evaluation:** The focus on interactive learning and critical thinking is evident, though there's a need for more structured training in feedback techniques. Diverse methods of self-evaluation are used, suggesting a need for more formalized feedback mechanisms.

***Program Benefits and Challenges:** Peer teaching shows benefits in educational development and interpersonal skills, with high satisfaction levels among participants. However, challenges in time management and balancing responsibilities highlight the need for more structured support.

***Future Aspirations and Program Recommendation:** A strong interest in continuing teaching and influencing curriculum design indicates the PTP's potential for long-term impact. The overwhelming recommendation of the program and preference for peer teaching over traditional faculty-led methods suggest its effectiveness and alignment with student preferences.

***Academic Impact and Evaluation:** The program is perceived to significantly enhance student learning outcomes, with varied impacts influenced by different teaching styles. However, the need for more nuanced

understanding and diverse assessment strategies is highlighted.

***Performance Indicators:** The use of diverse indicators like grades, attendance, and peer feedback reflects a comprehensive approach to evaluating academic performance. This multi-dimensional strategy aligns with modern educational philosophies advocating for holistic assessment.

***Engagement, Motivation, and Confidence Levels:** High engagement and motivation levels among students indicate the effectiveness of the peer teaching format. This approachability of peer educators likely fosters a conducive learning environment, enhancing student confidence in medical concepts.

***Learning Experience Impact:** The majority reported a significant enhancement in learning experience, affirming the value of peer teaching in medical education. However, the variation in responses suggests a need for further optimization to cater to diverse learning styles.

***Program Recommendation:** The strong likelihood of recommending the program highlights its perceived value and effectiveness, suggesting general satisfaction with the program's outcomes. This positive reception underscores the program's potential for wider adoption.

***Peer vs Faculty Teaching:** The preference for peer teaching over traditional faculty-led methods reveals its effectiveness and appeal. This endorses the relevance of peer-led models, which might offer more engaging and effective learning experiences, influencing future educational strategies.

Qualitative part: Relation to Research Questions

***Design and Implementation of PTP:** The Peer Teaching Program (PTP) is recognized for effectively addressing specific educational challenges. While positively evaluated for aligning with its goals, it faces criticisms about planning clarity and the limited scope for tutors. Enhancements in structure and operations, including better personal evaluations for peer teachers, are suggested.

***Strengths of PTP:** PTP's role in modernizing medical education is significant, offering career development for graduates and reducing hierarchical barriers, thus creating a collaborative learning environment. It effectively fills staff gaps and brings updated teaching methods.

***Weaknesses of PTP:** Concerns arise about the inconsistency of peer teacher performance and temporary nature of roles, impacting the program's stability and effectiveness. The need for enhanced support, clearer assessment methods, and stable regulations is emphasized.

***Challenges in PTP:** Key challenges include administrative and financial constraints, scalability issues, and faculty skepticism. Addressing these through strategic planning, funding, and faculty engagement is crucial.

***Effectiveness on Academic Outcomes:** Though the PTP is seen as positively impacting student engagement and motivation, there is a lack of robust data to conclusively measure its effectiveness. More empirical research and data collection are needed.

***Role of Peer Teachers in Assessment:** The program needs a more structured approach for peer teacher involvement in assessments. Providing specific training focused on assessment techniques can enhance their contribution while maintaining evaluation integrity.

***International Perspectives:** Comparisons with international models reveal both admiration for and ambitions to reach global standards, with an emphasis on adapting best practices to the unique Iraqi context.

***The suggestions for improvement in the Peer Teaching Program (PTP), several key strategies emerge:**

- **Enhancing Training:** The necessity of specialized workshops is evident. These workshops could focus on modern educational methodologies and assessment techniques, ensuring that peer teachers are well-equipped to handle the complexities of teaching and evaluating students effectively.

- **Administrative and Financial Streamlining:** Addressing the administrative and financial aspects of the program is crucial. By simplifying processes and ensuring adequate support, the program can boost both the motivation of peer teachers and the overall stability of the PTP.

- **Program Expansion and Diversification:** There's a clear opportunity to broaden the scope of the PTP. Expanding into new areas and diversifying teaching methods could cater to a wider range of educational needs, enhancing the program's overall effectiveness.

- **Standardization of the Program:** Consistency across various institutions is important. By standardizing aspects like tutor selection and training, the PTP can achieve a level of quality and fairness that benefits all stakeholders.

***Focused Themes in Quantitative and Qualitative Parts that emerged from the results:**

- **Quantitative Focus:** Individual perspectives of peer teachers, their motivations, teaching methods, and personal benefits.

- **Qualitative Focus:** Structural and operational aspects of the PTP, including financial, administrative challenges, and strategic improvements.

For a nuanced understanding of the PTP's impact and areas for improvement, we need to explain the agreement and disagreement between the two parts of the study:

***Patterns of Agreement between the two parts of the study:**

- **Common Ground on PTP's Academic Impact:** Both quantitative and qualitative parts converge on the view that the PTP positively affects academic performance, with an emphasis on enhanced student engagement, improved grades, and overall satisfaction. This agreement underscores the effectiveness of the PTP in promoting active learning and academic excellence.

- **Consensus on Multifaceted Benefits:** Participants from both study parts recognize the broad benefits of the PTP, including career preparation, skill development, and increased student motivation. This consensus highlights PTP's role in fostering not just academic skills but also professional growth and personal development.

***Patterns of Disagreement between the two parts of the study:**

- **Satisfaction vs. Implementation Challenges:** While quantitative data indicates high satisfaction levels among peer teachers, qualitative insights bring to light challenges in program implementation, including inconsistent teaching quality and limited roles for tutors. This divergence suggests a difference in perception based on roles within the program - peer teachers might focus on

immediate benefits, whereas key informants consider broader institutional effectiveness.

- **Assessment and Evaluation Methods:** There's a disparity in views regarding PTP's assessment methods. Quantitative data generally rates these positively, implying satisfaction with current approaches. Conversely, qualitative data indicates a need for more structured and comprehensive evaluation, pointing to a potential gap in ensuring standardized and effective assessment practices.

Interpreting the Discrepancies:

The differences observed may stem from the distinct perspectives of the respondent groups. Peer teachers, responding to the survey, are likely to reflect on their personal gains and experiences, whereas key informants in interviews provide a macro view, focusing on institutional and structural aspects.

These discrepancies highlight the importance of a multi-dimensional approach to evaluating and enhancing the PTP. While individual experiences are positive, there is a clear need for addressing structural challenges to ensure the program's long-term efficacy and integration into the broader educational framework.

***Prominent Issues in PTP:**

- **Administrative and Structural Challenges:** Inconsistencies in the PTP's implementation point to the need for a clearer framework, impacting tutor performance and program delivery.

- **Financial Constraints and Incentives:** Limited financial support for peer teachers raises concerns about motivation and sustainability.

- **Educational Effectiveness:** The absence of objective data questions PTP's academic impact.

- **Faculty Skepticism and Resistance:** Some faculty members are skeptical about the PTP's value, potentially affecting its broader acceptance.

***Unexpected Insights:**

- Despite no formal evaluation data, there's a positive perception of the PTP's impact on academic performance.

- Internal advocacy for better compensation and career opportunities for peer teachers suggests recognition of their role's importance.

- The contrast between reported educational successes and administrative challenges highlights a complex dynamic requiring strategic support.

Methodology Reflection: The mixed-methods approach offered comprehensive insights but also highlighted the potential inclusion of student perspectives for a more complete understanding of the PTP's impact.

Comparing the Iraqi PTP with international peer teaching models:

In our study's discussion, we compared our Peer Teaching Program (PTP) with global experiences, revealing both parallels and contrasts. Alzaabi et al. (2020) [21] reported a positive reception of PTP similar to ours, improving students' performance and confidence. Their findings align with our observations of student satisfaction and academic enhancement. House et al. (2017) [22] also found that students perceived peer teaching as interactive and beneficial, echoing our results of engaging and effective peer-led sessions. Brierley et al. (2021) [23]

highlight PAL's value in clinical training, which corresponds with our findings of improved practical skills among students. Tanveer MA et al. (2023) [24] emphasize the role of peer teaching in shaping future physicians, a sentiment mirrored in our study, noting the professional development of peer teachers. Rees EL (2015) [3] and Yu et al. (2011) [4] reinforce peer teaching's effectiveness, comparable to faculty-led methods. However, unique to our context are challenges like resource constraints and the need for structured training, highlighting the necessity for adaptations in PTP implementation within the Iraqi medical educational setting.

Gottlieb et al. (2016) [25] and Naeger (2013) [26] highlight the mutual benefits of near-peer teaching (NPT) for both junior and senior medical students, emphasizing the educational value for both groups. This aligns with our study's findings on the reciprocal advantages of peer teaching. Silbert Benjamin (2013) [27] emphasizes the need for varied, contextual assessments of student tutors, aligning with our observations on the importance of multi-faceted evaluation methods in PTP. Moreover, the suggestion to introduce PAL early in medical curricula for maximizing benefits resonates with our study, underscoring the versatility and applicability of PAL across different stages of medical education.

In the UK, peer teaching in medical schools is diverse. Bowyer (2021) [28] categorizes it into three types: (1) university-organized sessions aiding in clinical exams with resources and trained volunteers, (2) independent student society-led sessions, and (3) informal peer agreements, particularly effective when there's a large knowledge gap. This mirrors our study's findings on the benefits of structured peer teaching. In the USA, peer teaching often involves near-peers (students a class or more ahead) and actual peers (same class), as found in 75.8% of medical schools (Moore-West et al., 1990) [29]. Australia's approach, like UWA's PAL program, emphasizes vertical integration, leading to deep learning and leadership development (Silbert Benjamin, 2013; Scicluna, 2015) [30]. These international practices align with our findings on the effectiveness of peer teaching, and introduce concepts like 'far peer teachers,' which could be explored in our context for further innovation in peer teaching models.

The Iraqi Peer Teaching Program (PTP) is distinctive because it harnesses the fresh knowledge and enthusiasm of new medical graduates who are not yet employed. This approach allows them to teach across all grades, leveraging their recent and comprehensive understanding of the curriculum. Their immediate transition from students to teachers provides a unique perspective, making the Iraqi PTP an innovative model in medical education.

Limitations:

Our study, while providing valuable insights into the Iraqi Peer Teaching Program (PTP), has several limitations. First, as a pioneering study in this region, it faced challenges in gathering a diverse and representative sample. The reliance on new graduates as peer teachers, while innovative, may introduce bias due to their limited teaching experience. Additionally, the study's focus on recent graduates may not fully capture the perspectives of more seasoned educators. Resource constraints and

cultural factors unique to Iraq may also limit the generalizability of our findings to other contexts. These limitations highlight the need for further research, encompassing a broader range of participants and settings to fully understand the implications and potential of the PTP in different educational landscapes.

The scope was confined to a relatively small number of colleges, although a substantial number of transcripts were reviewed. This limitation might affect the breadth of perspectives captured. Despite these constraints, our study serves as a foundational document in the history of peer teaching in Iraq. It provides a baseline understanding and data about the subject from the viewpoints of recent graduates and key informants. This makes it a valuable resource for future researchers and policymakers interested in the evolution and impact of peer teaching in the region.

6. Conclusion

Our study's exploration of the Iraqi Peer Teaching Program (PTP) reveals a significant stride in medical education, leveraging the fresh perspectives and recent knowledge of new graduates. The program has demonstrated notable success in enhancing student academic performance and building the pedagogical skills of recent graduates. However, challenges such as resource allocation and the need for structured pedagogical training emerged, indicating areas for strategic improvement. Comparing our PTP with international models highlights its uniqueness, particularly in utilizing 'far peer' teachers. The study underscores the potential of adapting peer teaching to various educational and cultural contexts, advocating for a model that not only enhances learning outcomes but also contributes to the professional development of new medical graduates. This innovative approach suggests a promising future for medical education in Iraq, aligning with global educational trends while catering to specific local needs.

7. Recommendations

1. **Enhancing Graduate Instructor Training:** Invest in comprehensive training programs for new graduates who serve as peer teachers, ensuring they are well-equipped with teaching, assessment, and feedback skills.
2. **Systematic Evaluation Framework:** Implement a robust evaluation system for the Peer Teaching Program (PTP) to monitor effectiveness and identify areas for improvement.
3. **Resource Allocation:** Allocate necessary resources to support the sustainability and expansion of PTP, including funding for training materials and technological aids.
4. **Cross-Institutional Collaboration:** Foster collaborations with international medical schools to exchange best practices and innovative teaching methods in peer teaching.
5. **Policy Integration:** Incorporate PTP into national medical education policy, recognizing its role in

enhancing medical training and professional development.

6. **Research and Development:** Encourage research initiatives to continuously assess the impact of PTP on both student learning outcomes and the professional growth of peer teachers.
7. **Adaptation and Flexibility:** Adapt the PTP model to suit evolving educational needs and feedback, ensuring it remains relevant and effective in Iraqi medical education.
8. **Program Renaming for Clarity:** Given the program's focus on utilizing recent medical graduates, we recommend renaming it to "Graduate-Led Peer Teaching Program (GLPTP)" or "Recent Graduate Peer Teaching Initiative (RGPTI)." This modification will more accurately reflect the unique structure of the program, emphasizing the involvement of 'far peer' teachers and distinguishing it from traditional peer teaching models. This name change could enhance the program's visibility and recognition among stakeholders, including policymakers, educators, and students.

Conflict of Interest

The authors declare that there are no conflicts of interest in relation to this study.

Ethical Considerations

This study was conducted in accordance with the ethical standards of the institutional research committee. Verbal consent was obtained from all individual participants included in the study. Participants were assured of their anonymity and the confidentiality of their responses.

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