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Original Article

Factors necessary for entrustment decision-making in surgical operating rooms: A modified Delphi study



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المخلص

أهداف البحث: لقد ارتبطت استقلالية الأطباء المقيمين في غرفة العمليات ارتباطاً مباشراً بسلامة المرضى في الرعاية الصحية. ومع ذلك، هناك ندرة في الأبحاث التي تركز على العوامل المتعلقة بالمقيمين لاتخاذ قرارات التكليف الجراحية في غرفة العمليات. كان الهدف من هذه الدراسة هو تحديد العوامل اللازمة لاتخاذ قرارات تكليف المقيمين من وجهة نظر المشرف / الاستشاري ووضع قائمة مرجعية لتقييم استعداد المقيمين للعمل المستقل.

طريقة البحث: استخدمت هذه الدراسة منهج دلفي مختلط الطريقة. في المرحلة الأولى، أنتجت مراجعة شاملة للأدبيات ودراسة استكشافية نوعية قائمة من العوامل المتعلقة بالمقيمين. تضمنت المرحلة الثانية التحقق من صحة المحتوى من قبل لجنة مكونة من خمسة خبراء، تليها دراسة دلفي من جولتين مع 20 خبيراً. وقد أجريت هذه العملية لتحقيق توافق في الآراء بشأن العوامل الرئيسية التي تم تحديدها.

النتائج: تم تحديد إجمالي 49 عاملاً متعلقاً بالإسناد، والتي تم تخفيضها إلى 46 بعد التحقق من صحة المحتوى. خلال جولة دلفي الأولى، تم قبول 17 عاملاً بشكل كامل، وتم رفض 7 عناصر وتم قبول 22 عنصراً جزئياً. من بين 39

عنصراً تم إرسالها إلى جولة دلفي الثانية، تم قبول 23 عنصراً ورفض 16 عنصراً. تم تشكيل قائمة مرجعية نهائية مكونة من 23 عنصراً بناءً على العوامل التالية: 6 عوامل معرفية (المعرفة، مدير المخاطر، الطبيب الآمن، المدير العام، مجال الاهتمام، التواصل)، 5 عوامل نفسية (تأدية العمليات سابقاً، المختص، القدرة على اختيار النتائج الهامة، القدرة على التصرف الطرفي، صانع القرار) و 12 من العوامل العاطفية (المسؤول، القائد، صادق، متعاطف، أخلاقي، متقبل، متواضع، ذكي عاطفياً، متحمس، مسؤول، لاعب فريق، منضبط).

الاستنتاجات: وأسفرت الدراسة عن تكوين قائمة مرجعية تعتمد على العوامل اللازمة لاتخاذ قرار التكليف في غرف العمليات الجراحية. وكانت بعض العوامل السياقية الجديدة هي "المدير العام"، و"مجال الاهتمام"، و"القدرة على اختيار النتائج المهمة"، و"المسؤول"، و"مدير المخاطر"، و"تأدية العمليات سابقاً". يقدم هذا الإطار إرشادات للمشرفين والمقيمين لتقييم التقدم خلال برنامج الإقامة. توضح الأداة المطورة صلاحية جيدة للمحتوى وهي مناسبة لتقييم الاعتماد بعد التحقق من صحة البناء.

الكلمات المفتاحية: إسناد؛ التعليم الطبي؛ بحث مختلط المنهج؛ غرفة العمليات؛ جراحة

Abstract

Objective: Resident autonomy in an operation theatre has been directly linked with patient safety in healthcare. The objective of this study was to identify the factors necessary for making resident-entrustment decisions from the perspective of a supervisor/consultant viewpoint. The second objective was to develop a checklist for assessing resident readiness for independent work.

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Materials and methods: This study employed a mixed-method Delphi approach. In the first stage, a comprehensive literature review and a qualitative exploratory study produced a list of factors related to residents. The second phase involved content validation by a panel of experts, followed by a two-round Delphi study with 20 expert panelists.

Results: A total of 49 resident-related factors for entrustment were identified, which were reduced to 46 after content validation. During Delphi Round I, 17 factors were fully accepted, 7 were rejected and 22 items were partially accepted. Out of the 39 items sent to Delphi Round II, 23 items were accepted and 16 were rejected. A final 23-item checklist was formed based on the following factors; 6 Cognitive (knowledgeable, risk manager, safe doctor, general manager, field of interest, communicator), 5 Psychomotor (past performer, competent, ability to pick critical findings, ability to act situationally, decision maker) and 12 affective (responsible, leader, honest, empathetic, ethical, receptive, humble, emotionally intelligent, motivated, accountable, team player, disciplined) factors.

Conclusion: The study resulted in the formation of a checklist based on the factors necessary for entrustment decision-making in surgical operating rooms. Some of the novel contextual factors were 'general manager', 'field of interest', 'ability to pick critical findings', 'accountable', 'risk manager', and 'past performer'. This framework offers a guideline for supervisors and residents to evaluate progress throughout the residency program. The developed tool demonstrates good content validity and is suitable for entrustment assessment following construct validation.

Keywords: Entrustment; Medical education; Mixed-method research; Operation theatre; Surgery

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Introduction

Entrustment decision-making is characterized as a supervisor's determination of the extent to which they can trust trainees to execute a specific task within the workplace environment.¹ The recent emergence of the concept of Entrustable Professional Activities (EPAs) in competency-based education has steered clinical educators towards examining the processes by which supervisors assess trustworthiness in trainees and decide to grant autonomy in the workplace.² This inquiry also extends to exploring the factors influencing these decisions.

Assessing the readiness of surgical residents to safely execute clinical care tasks on their own is a complex and often unclear process.³ Educators face difficulties in developing effective methods to gauge trainees' readiness for unsupervised patient care. Allowing trainees to progressively

engage more and assume greater responsibility in the workplace is essential for building the competence needed for future practice.⁴ The extensive range of knowledge and skills necessary to be a competent and safe physician, combined with a demanding workload, adds to this challenge. It's important to recognize that technical proficiency alone does not equate to the clinical judgment required to treat patients independently.⁵

Several elements play a role in determining the level of autonomy supervisors grant to trainees. These elements include the trainee's current knowledge base, their training stage, and their perceived trustworthiness.⁶ Additionally, elements related to the specific task, the context of the surgical operation, and the attributes of the supervisors in the operating theatre also influence these decisions. The factors that allow the supervisors to trust the trainee for a task are still being explored by researchers.⁷ With more emphasis on competency-based education and the introduction of entrustable professional activities, the abstract element of trust can be gauged and measured by identifying the factors that promote it.

Much of the studies have focused on the overall general factors leading to entrustment decisions by supervisors that can be used in any of the workplace settings. Olle Ten Cate discussed five main factors influencing entrustment decisions revolving around "*the trainee, the supervisor making that decision, the context or circumstances, the task or activity and the relationship between trainee and supervisors*".^{8,9}

Moreover, in summative entrustment assessments of the residents, the aim of focus remains resident-related factors that can be discussed with the residents for corrective feedback. On the other hand, in other situations like incident reporting, other factors like supervisor and context may come into play.^{10,11} An example of this is a study that identified the 'behaviors' of both trainees and faculty that facilitate entrustment decisions classifying them as; policies and regulations affecting the role of residents in the operating room, context-specific variables, optimizing faculty intraoperative feedback, flexible faculty teaching strategies, leadership opportunities for resident in the case; and safe struggle for resident when appropriate.¹²

South-East Asian countries lag behind the rest of the world in resident selection and resident autonomy criteria. A study identified 'inadequate objective assessment', 'lack of patient's trust' and 'non-uniform training of residents' as the biggest challenges in surgical training in India.^{13,14} A recent study in Sri Lanka found difficult for supervisors to form EPAs for surgical residents due to lack of consensus amongst supervisors, cultural and individual variability, and lack of objectively structured resident assessment.¹⁵ In another study, 92.3% of residents self-reported deficits in their preparation for independence work in the operation theatre.¹⁶ There is no objective measure to determine a residents' readiness in the operating theatre and thus, we suffer from where surgical procedures are provided at low-cost.^{17,18}

Therefore, to ensure patient safety and effectively assess surgical trainees, it is crucial to understand the resident-related factors that influence supervisors' trust in granting autonomy to residents within workplace settings in a South-East Asian context, such as in Pakistan. Thus, the objective of this study was to identify the factors necessary for making

resident-entrustment decisions from the perspective of a supervisor/consultant viewpoint. The second objective was to develop a checklist for assessing resident readiness for independent work.

Materials and Methods

This qualitative exploratory study was conducted from 1st May 2022 to 31st Dec. 2022. The study population consisted of expert surgeons conducting post-graduate training of surgery; FCPS Surgery (Fellow of College of Physician & Surgeon Pakistan) and MS (Master in Surgery) for more than five years in the following teaching hospitals of Lahore i.e., Services Institute of Medical Sciences, King Edward Medical College and Mayo Hospital, Allama Iqbal Medical College and Jinnah Hospital, Fatima Jinnah Medical University and Sir Ganga Ram Hospital, Ameer u Din Medical College and Lahore General Hospital and Shaikh Zaid Medical College and Shaikh Zaid Hospital. Written and verbal invitations were extended to surgeons for their participation in the study.

This study was carried out in 3 phases. The first phase comprised of extensive literature review followed by a qualitative exploratory study to identify key “resident-related factors” for supervisor entrustment in operation theatres in phase two. Phase three consisted of content validation and two rounds of modified Delphi study with predetermined criteria to achieve consensus for the resident-related factors.

Phase one: literature review

The primary aim of this phase was to identify existing factors related to the trainee for entrustment in the operation theatre. Literature search was conducted following the best evidence medical education (BEME) guide no. 3.¹⁹ The studies published within the last ten years, studies with full access, studies conducted in the English language, studies involving surgery department, and the studies involving either postgraduate trainees or consultants were included in the literature search. Only the original articles fulfilling the literature review criteria were selected from research database including PubMed, Science Direct, and ERIC and grey literature (GL) in order to retrieve a wider range of articles.

Phase two: qualitative exploratory study

The second stage was meant to explore the opinions of supervisors and consultants working in the surgical department, via pre-designed semi structured interviews (Appendix A). All the interviews were audio-recorded and stored in a secure folder accessible only to the principal investigator. The identity of the participants was kept anonymous by giving their profile codes. Each interview lasted for about 45–60 min. One colleague, impartial to the research, was invited to be the timekeeper and one to act as a scribe at these group meetings while the principal investigator was the main facilitator of the study.

Transcription of the recordings was done by using Otter.ai software. The transcript was sent to participants to ensure accuracy. All the data was organized in folders in local

computers as well as an online cloud system. Thematic analysis was done using NVivo software to generate themes related to resident-related factors. Common codes were identified via apriori coding on an already existing framework. After identification of codes, sub-categories were defined via selective coding leading to the formation of categories and themes. Creswell’s six steps for data analysis were used for data analysis in this study.²⁰ The data from the literature review and qualitative exploratory study was used to identify a set of “resident related factors” for entrustment in operation theatre.

Phase three: content validation & Delphi study

The main aim of content validation was to establish clarity and relevance of resident-related factors for entrustment in operation theatre. An expert panel with professional experience in the surgical field with an additional degree in Master of Health Professions Education were invited via official emails. Out of the 15 invitees, 8 consented to participate in the study. In the qualitative domain of content validation, experts were requested to provide information on the ‘representativeness’ and ‘clarity’ of factors and provide recommendations for the improvement in the developing tool regarding the ‘language’, ‘grammar’, ‘spelling’, ‘sentence structure’. An open-ended question was also added for any additional recommendations by the expert panel. In the quantitative domain, the expert panel was requested to rate each item for ‘clarity’ as well as the ‘representativeness’ on a four-point Likert scale (Appendix B.1 and B.2). The Likert scale was deliberately kept 4-point to allow four options without a “neutral choice” or a “forced”. Main outcomes for this study were calculation of I-CVI (item-level content validity index) along with suggestions provided by the experts for rephrasing of stated resident related factors.

The modified Delphi had two iterative rounds of consensus for the above resident related factors.²¹ A panel of 20 experts (those with supervision experience in the field) participated in the study. The following pre-defined criteria were used

1. Percentage agreement (80% or more)
2. Median (≥ 3.2 ($80/100 \times 4.0$) for the 4-point Likert scale), and
3. Interquartile range for analysis of response (0.75 ($(4 - 1 = 3) \div 4 = 0.75$) for the 4-point Likert scale.).
4. The conclusion of the study would be to achieve the above-mentioned agreement via two or three rounds, where applicable.

The experts in the panel were requested to rate each item regarding the level of importance of the identified factors for resident entrustment in operation theatres via online google forms.

Results

Phase one & two

A total of 6 male and 2 female surgical experts participated in phase two. Out of these, 2 were full Professors, 4

Associate Professors, and 2 Assistant Professors. Among the participants, 6 worked in public sector, and 2 worked in private sector. All of them had experience of more than 5 years.

Surgical experts identified resident-related factors that are essential for granting autonomy. After a detailed analysis, these factors were categorized into two primary themes

(Table 1). The first theme focused on the hard skills and competencies of residents, which are critical for supervisors to make entrustment decisions in operating rooms. The second theme revolved around the personal and interpersonal attributes of residents, which play a significant role in influencing supervisors' trust in residents within the operating room setting.

Table 1: Perceived factors of exiting Residents in Surgical department at the end of four years of training.

Theme	Subthemes	Resident-related factors	Quotes reflecting open codes	
Hard Skills	Cognitive	Knowledgeable (LR) (GL) ¹⁵	S7: "Having adequate and safe surgical skills is an important factor for me to put trust on my trainee to perform a procedure."	
		Safe Doctor	S1: ".... for trusting my resident, he should be a safe doctor and pose no harm to the patients."	
		Communicator	S4: "... knows the protocols of the department, where to report, what to report etc"	
		Risk management (LR)	R5-1: 'has knowledge of finances, how to manage difficult cases, patient's and their relative's concerns'	
		Safety profile	S5: "It is important for the trainee to be disciplined with good time management skills."	
		Field of interest	S2: "... .. among the important factors is the competency of the resident, whether he can perform the procedure or not."	
		Managerial skills	R2-4: "I need to learn the skills for operating by observing and assisting first so my supervisor can allot me the case."	
	Psychomotor	Competent	Skilful (LR)	R3-1: "I feel that trainees should have good decision-making skills, like what incision to give, whether to prolong it or not, whether to put drain or not ..."
			Past performance	
			Decision Maker	
			Confidence in surgical skills	
			Good clinical approach	
			Able to foresee complications	
			Ability to pick critical findings	
Soft Skills	Personal	Ability to perform according to situations		
		Humility & humbleness	S5: "It is important for the trainee to be disciplined with good time management skills."	
		Conscious	S8: "The resident should demonstrate that he is reliable in handling the case and its related postoperative care for me to give him a case."	
		Reliability (LR)	R4-2: ". especially in the emergency operation rooms, the resident should keep control of his nerves and be brave emotionally."	
		Attitude	R4-1: "I would like to see my residents dedicated and hardworking."	
		Honesty (LR)	S6: "The trainee should have the heart to accept his mistakes and learn from them"	
		Receptivity	S1: "The OT is a tough space, the resident should never stop working hard if he wants to succeed"	
		Responsible	R2: "Resident should put patient first and must be aware of the OT conditions and any complications that might occur"	
		Adaptable	R3-1: "I like to see motivated residents in my OT, who love the discipline and are always ready for any challenge that comes their way"	
		Disciplined (LR)		
		Humane		
		Hard-working (LR) (GL) ¹⁵		
		Concerned about patient (LR)		
		Compassionate		
Interpersonal	Interpersonal	Increased patient care		
		Brave		
		Motivated		
		Empathetic (LR)	S2: "It is important for the trainee to be a good assistant first to allow me to give him the case to operate in the future."	
		Leader (LR)	R2-4: "Often the trainees forego the element of the relationship between the supervisor and resident himself. Trust comes when you have a healthy relationship with your supervisor."	
		Team player	R3-3: "Being in theatre demands other skills like being a team player as well as demonstrating leadership skills."	
		Administrative skills	S4: "Like other fields, surgery can not be done alone, a surgeon must know how to take every one on board, and should know how to deal with difficult patients or troubled family members"	
		Team builder	S5: "Sometimes it becomes difficult to convey one's message across the board, but a surgeon needs to remain calm and friendly and should not over react at difficult situation"	
		Guide to juniors		
		Communication skills (LR) (GL) ¹⁵		
		Ability to handle conflict (LR)		
		Flexible		
		Patience with others		
		Openness		
Diversity				
Emotional intelligence (LR)				
Persuasive				
Friendly				

Note: LR denotes factors collected from Literature review.

GL denotes factors collected from grey literature

The literature review and qualitative exploratory study led to identification of 49 resident related factors for supervisor entrustment in operation theatre under two themes: (1) Hard Skills (cognitive and psychomotor) and (2) Soft Skills (personal and interpersonal). These factors were then put forward for content validation.

Phase three

A total of 49 items were sent to 15 experts fulfilling selection criterion, of which 8 consented to the study and only 5 participated in content validation (One Assistant Professor and Four Associate Professors). Content Clarity and relevance were calculated for the five experts on a 4-point Likert scale. Overall clarity for the items was calculated to be 92%. 18/49 items were marked to be of little relevance (Appendix C).

Individual Items were analyzed for content validity (I-CVI). Out of 49 items, 34 were accepted having an I-CVI value of >0.79 , whereas two items with <0.70 were eliminated. There were 13 items in the borderline zone, which were revised as per the suggestions of the panelists (Appendix D).

Delphi Rounds

a. Round I

The total number of items presented to the expert panel after content validation and needed revisions was 46/49. A total of 20 out of the invited 28 experts (7 Senior Registrars, 2 Assistant Professors, 3 Associate Professors and 8 full Professors) filled and returned the form (71.4 % turnover). Out of 46 items, 17 items were accepted as such in Delphi Round I and seven were eliminated. The remaining 22 items had intermediate acceptance.

The fully accepted items (17) and the partially accepted items (22) were sent to Delphi Round II ($17 + 22 = 39$) after modifications. The median value for each item was calculated for each item.

b. Round II

Out of the 39 accepted items in round I, 16 were eliminated in round II, and 23 were accepted. Out of 20 panelists, 18 returned the form within the given time frame, hence making a turnover rate of 90 percent. Table 2 shows the final ranking of items by the panelists based on agreement level in the Delphi Study ($n = 23$).

Discussion

Previous research has extensively examined the context of operation theatres and the expected performance and learning experiences of trainees within them. Talat et al.

Table 2: Final Checklist for Assessing Resident Readiness for Independent Work.

Sr. No.	Item Statement	Assessment		Domain of learning	Agreement Level %
		Yes	No		
1	The trainee is open to corrective feedback from the supervisor	Yes	No	Affective	95%
2	The trainee is keen to learn	Yes	No	Affective	90%
3	The trainee accepts his mistakes	Yes	No	Affective	90%
4	The trainee demonstrates sufficient sterilization techniques in the theatre	Yes	No	Cognitive	90%
5	The trainee knows whom to call for help	Yes	No	Affective	90%
6	The trainee exhibits sufficient knowledge about the complications of the procedure	Yes	No	Cognitive	88.9%
7	The trainee knows when to stop in an operation	Yes	No	Affective	85%
8	The trainee knows when to call for help	Yes	No	Affective	85%
9	The trainee exhibits critical thinking skills	Yes	No	Psychomotor	85%
10	The trainee is open to corrective feedback from fellow trainees	Yes	No	Affective	85%
11	The trainee is honest about his work	Yes	No	Affective	85%
12	The trainee exhibits ethical practice	Yes	No	Affective	85%
13	The trainee is humble.	Yes	No	Affective	85%
14	The trainee can analyse situations/cases/contexts well	Yes	No	Psychomotor	85%
15	The trainee is emotionally intelligent person	Yes	No	Affective	85%
16	The year of trainee is appropriate for the case to be given to him/her	Yes	No	Cognitive	85%
17	The trainee has effective TRIAGE management	Yes	No	Cognitive	85%
18	The trainee can appropriately perform in the given context (elective, emergency, etc)	Yes	No	Psychomotor	85%
19	The trainee exhibits sufficient background knowledge about the procedure	Yes	No	Cognitive	83.3%
20	The trainee has sufficient post-operative management skills	Yes	No	Psychomotor	83.3%
21	The trainee is an effective team leader	Yes	No	Affective	83.3%
22	The trainee keeps the supervisor informed about the patient's progress	Yes	No	Cognitive	83.3%
23	The trainee exhibits situational judgment skills	Yes	No	Psychomotor	83.3%

(2019) utilized a validated tool to investigate trainees' perceptions of learning opportunities, the learning climate, and the level of supervision in operation theatres.²² Existing literature predominantly focuses on the development of entrustable proficient activities across various clinical training domains.²³ Nevertheless, the supervisor-supervisee relationship is inherently intricate and subject to contextual variations. Utilizing a quantitative tool might fall short in capturing the entirety of entrustment decision-making facets. The strength of this study is its qualitative exploration of both the soft and hard skills essential for entrusting a surgical trainee with decision-making responsibilities in the operating theatre. Through contextual interviews with seasoned surgical supervisors, our study presents a comprehensive inventory of requisite skills.

The top-most agreed factor was the resident being 'open for corrective feedback from the supervisor'. Research reveals that both residents and supervisors agree that corrective feedback during training enables the promotion of critical thinking skills and allows the resident to achieve its expected outcomes from the task.²⁴ In a recent study, surgical residents complaint of receiving inadequate perioperative feedback from their supervisors.²⁵ Multiple barriers may account for this including lack of a respectful learning environment, no defined schedule for providing feedback, and failure to get a commitment from the trainees'.²⁶ The panelist also agreed on receiving feedback from fellow trainees is an important factor to entrust them with a task in the operation theatre. Studies show that being able to receive feedback allows improved communication and allows the formation of an effective team in the working environment.²⁷

The next rated factors included *keenness to learn*, knowing whom to call for help, accepting one's limitations and mistakes, and demonstrating effective sterilization skills in the operation theatre. A recent study reveals that surgical residents are willing to learn but believe they are not provided with sufficient guidance and support.²⁸ Being keen to learn also encourages the supervisors to involve the trainee in more tasks. Hence learning in postgraduate settings should be student-directed and student-regulated.²⁹ Knowing one's limit and knowing when to stop and call for help depicts the trainee's ability to analyze the situation, and act in the welfare of the patient. This represents an important aspect of patient safety, to which most of the supervisors agreed in this study.^{7,30}

The third most agreed factor was "*the trainee knowing anticipated complications of the procedure*". This is a unique factor explored in this study. Research shows that despite considerable technological advancements in surgical procedures, a lack of experience has led to decreasing autonomy for residents in procedures such as laparoscopic inguinal hernia repair.³¹ It is well known that around half of the complications of the procedure are avoidable. Hence not only do the supervisors expect the trainee to know the steps of the procedure, but they will also be more comfortable in entrusting the residents who are aware of the complications of the procedure and anticipate them well before time.^{32,33}

Another important factor discussed by both supervisor and resident in this study was the ability of the residents to know "*when to stop*" and call for help. Another researcher

delineated the discernment of residents' limitations as one of the key domains for trustworthiness.³⁴ Having a trainee who is aware of his limitations and is confident to ask for help has proven to be an enabling factor in enhancing safe clinical practices at the workplace. An important point was the contextual nature of the case allotment according to the level of the training year as mentioned above. Another important factor was the element of a healthy relationship with the supervisor. Having a relationship with the supervisor is a two-way process with both positive and negative implications on entrustment development. Having a preconceived view about the resident may affect the entrustment factor of the supervisor for allotting tasks.

Our study had certain limitations. One of the most important limitations was the lack of appropriate time to validate all aspects of the checklist although only content validity could be achieved. We aim to conduct exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) of the resident-related factor checklist in the follow-up study. Additionally, the scope of the study was confined to general surgery, excluding specific sub-specialties such as pediatric surgery, cardiovascular surgery, plastic surgery, and others. Given its qualitative nature, the study was also potentially influenced by subjective biases from the panelists. To mitigate this, panelists were encouraged to propose additional items for the checklist, rather than solely recommending omissions. Future research could focus on further validation studies and practical testing of this checklist in real-world settings.

Conclusion

Resident-related factors for entrustment comprise a set of traits related to the resident's hard and soft skills, enabling supervisors to trust their trainees for independent work at the end of their training years. The study resulted in the formation of a checklist based on the factors necessary for entrustment decision-making in surgical operating rooms. Some of the novel contextual factors were 'general manager', 'field of interest', 'ability to pick critical findings', 'accountable', 'risk manager', and 'past performer'. This framework offers a guideline for supervisors and residents to evaluate progress throughout the residency program. The developed tool demonstrates good content validity and is suitable for entrustment assessment following construct validation.

Source of funding

The study is not financially supported by any profit or non-profit organization or any funding body.

Conflict of interest

The author(s) have no conflict of interest to declare.

Ethical approval

Ethical approval was obtained from the Institutional Review Board of Services Institute of Medical Sciences (Ref no: IRB/2021/916/SIMS, dated: 20-08-2021) and the Ethical Review Board of University College of Medicine and

Dentistry (Ref no: ERC 48/21/07, dated: 12-08-2021). All participants provided informed consent before being enrolled in the study. The entire study was conducted in accordance with the declaration of Helsinki and using the standards for reporting qualitative research (SRQR guidelines).

Author's contribution

AF, QAA conducted the qualitative study to collect data; QAA and KW analyzed and interpreted the data and generated themes; UM and RAK developed the study protocol; AF and QAA contributed to the drafting and writing of the manuscript. RAK and UM critically reviewed and revised the manuscript. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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Data availability statement

The raw data file may be available upon reasonable request from the first author.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jtumed.2024.05.001>.

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