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REVISIÓN / REVIEW

Enhancing medical training through 360-degree evaluations: A review and Proposal for ICU training

Mejorando la formación médica mediante evaluaciones de 360 grados: una revisión y propuesta para la formación en la UCI

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RESUMEN

La formación de médicos residentes requiere estrategias educativas que desarrollen competencias clínicas, comunicacionales y profesionales de manera integral. En este contexto, las evaluaciones de 360 grados han emergido como una alternativa a los métodos tradicionales, al permitir una valoración más completa del desempeño. Esta revisión narrativa tuvo como objetivo analizar su implementación, efectividad, desafíos y resultados a largo plazo en la educación médica. Se realizó una búsqueda exhaustiva utilizando términos relacionados con "evaluación de 360º", "retroalimentación multisource" y "educación en salud", seleccionándose 34 estudios en distintos entornos formativos.

Los hallazgos indican que las evaluaciones de 360 grados ofrecen una perspectiva holística al integrar opiniones de múltiples actores, incluyendo pares, supervisores, pacientes y la autoevaluación. Su aplicación se asocia con mejoras en competencias clínicas, habilidades de comunicación, profesionalismo y desempeño global. Además, la retroalimentación continua favorece la práctica reflexiva y el desarrollo profesional sostenido, con impacto positivo en la calidad de la atención y la satisfacción de los pacientes.

No obstante, su implementación enfrenta desafíos relevantes, como el sesgo de los evaluadores, las dificultades logísticas y la integración efectiva de los resultados en los programas formativos. Las estrategias más eficaces incluyen la capacitación estructurada de evaluadores, el uso de instrumentos estandarizados, la realización de sesiones periódicas de retroalimentación y el soporte institucional mediante plataformas tecnológicas adecuadas.

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En conclusión, las evaluaciones de 360 grados constituyen un complemento valioso a los métodos tradicionales, proporcionando una evaluación multidimensional del residente. Su adecuada implementación permite maximizar beneficios y fortalecer tanto la formación profesional como la calidad asistencial.

ABSTRACT

The training of medical residents requires educational strategies that foster the comprehensive development of clinical, communication, and professional competencies. In this context, 360-degree evaluations have emerged as an alternative to traditional assessment methods, enabling a more comprehensive appraisal of performance. This narrative review aimed to analyze their implementation, effectiveness, challenges, and long-term outcomes in medical education. A comprehensive literature search was conducted using terms related to "360-degree evaluation," "multisource feedback," and "health education," identifying 34 studies across diverse training settings.

Findings indicate that 360-degree evaluations provide a holistic perspective by integrating feedback from multiple sources, including peers, supervisors, patients, and self-assessment. Their use is associated with improvements in clinical competencies, communication skills, professionalism, and overall performance. Additionally, continuous feedback promotes reflective practice and sustained professional development, contributing to improved quality of care and patient satisfaction.

However, several challenges were identified, including evaluator bias, logistical complexities, and difficulties in effectively integrating feedback into training programs. Successful implementation strategies include structured evaluator training, the use of standardized tools, regular feedback sessions, and strong institutional support supported by appropriate technological platforms.

In conclusion, 360-degree evaluations represent a valuable complement to traditional assessment methods by providing a multidimensional view of resident performance. Careful implementation can maximize their benefits and contribute to both professional development and the quality of healthcare delivery.

INTRODUCTION

Intensive care units (ICU) represent one of the most complex educational environments in graduate medical education, where residents must integrate advanced clinical knowledge with interprofessional teamwork, crisis leadership, and family communication skills under high-stakes conditions. Program directors across critical care, emergency medicine, anesthesiology, and other specialties managing ICU rotations face significant challenges in comprehensively assessing resident performance using traditional evaluation methods that focus primarily on medical knowledge rather than the multidisciplinary competencies essential for effective ICU practice[1,2]. The implementation of 360-degree evaluations within routine ICU clinical activities offers a practical solution for program directors and medical educators, providing a complementary assessment tool that captures real-world performance from multiple healthcare team perspectives while integrating seamlessly into existing educational workflows.

How to evaluate performance is another of the challenges faced in the ICU setting. Traditionally, assessments have focused on written exams and practical simulated tests, which, while important, do not fully capture the overall performance of a healthcare student or professional. These traditional evaluations may overlook critical aspects such as communication, empathy, and teamwork skills, which are vital for effective medical practice[3,4]. In the fast-paced, high-stakes environment of the ICU, these limitations become even more pronounced. This has driven the search for more holistic and representative assessment methods.

The 360-degree evaluation or Multisource Feedback (MSF) emerges as an alternative to address these challenges. This assessment method includes multiple perspectives, incorporating feedback from colleagues, supervisors, patients, and self-assessments. The 360-degree evaluation offers a comprehensive and balanced view of residents' performance, allowing identification of strengths and areas for improvement from different angles[5,6]. The evaluators involved span various roles, from doctors and nurses to patients and the residents themselves, providing a rich diversity of opinions and experiences. This multifaceted approach is particularly well-suited to the complex, team-based nature of ICU care.

This narrative review aims to analyze the implementation, effectiveness, and challenges of 360-degree evaluations in graduate medical education and propose a comprehensive framework for integrating MSF into routine ICU clinical activities as a complementary assessment tool for residency training programs.

METHODOLOGY

This narrative review was conducted to synthesize existing evidence and inform the development of a practical implementation framework for 360-degree evaluations in ICU residency training. Given the objective of generating an evidence-based proposal rather than providing a quantitative synthesis of outcomes, articles were analyzed qualitatively and included based on their content relevance and contribution to understanding implementation strategies, challenges, and best practices.

A comprehensive literature search was conducted in December 2025 using Google Scholar and PubMed databases, focusing on articles published within the last 16 years (2009-2025) to capture contemporary approaches to MSF in medical education. The search strategy employed the keywords "360º evaluation," "360-degree evaluation," "multisource feedback," and "health education." The search was supplemented by citation tracking and related article searches, including articles published outside the defined timeframe when they provided foundational insights relevant to implementation strategies and theoretical frameworks.

Two independent reviewers evaluated each identified article for inclusion. Articles were included if they: (1) described implementations or evaluations of 360-degree evaluation or MSF in health or medical education settings; (2) were published in English or Spanish; and (3) had full-text availability. Articles were excluded if full-text access was unavailable or if they did not address assessment of learner performance in clinical or educational health settings. The final selection was based on content relevance and contribution to understanding implementation strategies, challenges, and best practices, with emphasis on diversifying the elements analyzed qualitatively to capture varied perspectives, implementation contexts, and educational settings.

The qualitative analysis focused on extracting information regarding implementation strategies, effectiveness outcomes, identified challenges, and long-term impacts across different medical specialties and educational contexts. Particular attention was given to identifying practical considerations for program directors and medical educators seeking to implement MSF systems.

Thirty-four articles were included for the qualitative analysis (Table 1)[1,2,6-36].

IRB Statement: This narrative review was exempt from institutional review board approval as it involved analysis of published literature only, as determined by Clinica Las Condes Hospital academic review board in 2024.

RESULTS

1. Effectiveness of 360-degree evaluations

The effectiveness of 360-degree evaluations in medical education has been reported across various clinical settings and specialties, with particular emphasis on three key domains: learning clinical competencies, communication skills, and professionalism[11,16,17,29]. Studies have shown significant improvements in clinical performance when this comprehensive evaluation method is implemented[16,17]. For instance, Azami et al. (2024) demonstrated marked improvement in emergency medical students' clinical performance, particularly in leadership and management skills, while Neumann et al. (2021) observed enhanced clinical skills among obstetrics and gynecology residents[1,32]. An improvement also seen as general overall clinical performance by González-Gil et al. (2020)[30]. Notably, Orgun et al. (2025) found that self-assessment and peer evaluation showed stronger mutual correlations than evaluations from external assessors, suggesting that different evaluator sources capture distinct dimensions of performance and should not be considered interchangeable[35].

When examining specific competency domains, communication skills and professionalism have shown particularly strong improvements using 360-degree evaluations. The multi-source nature of these assessments, incorporating feedback from peers, supervisors, patients, and other healthcare professionals, provides a uniquely comprehensive view of resident performance. Tariq et al. (2014) reported significant enhancement in communication and interpersonal skills among medical residents, while Zhao et al. (2013) noted improved professionalism among surgery residents following implementation of 360-degree evaluations[15,18]. The value of this comprehensive approach is further supported by Cormack et al. (2018), who found that the 360-degree evaluation model provided faculty with critical information for assessing student competencies and analyzing cohort trends[28].

While these findings are promising, it is important to acknowledge that the evidence base remains heterogeneous, and observed benefits are largely dependent on the quality of feedback, evaluator training, and the degree of institutional support provided[28,30,32,35].

Table 1. Summary of articles included in the narrative review (year ascending order).

Reference	Population studied	Key elements of 360-degree evaluation	Main findings
Lockyer (2003)[6]	Physicians	Multisource feedback in physician competencies	Importance of supportive organizational context
Wood et al. (2006)[7]	Various healthcare professionals	Design of multi-source feedback systems	10 tips for successful design of 360-degree evaluations
Massagli and Carline (2007)[8]	Medical residents	Reliability of 360-degree evaluations	Nurses' evaluations particularly useful for interprofessional skills
Overeem et al. (2007)[9]	Physicians	Perceptions of 360-degree feedback effectiveness	There is substantial potential to assess performance of doctors in routine practice
Davidson (2007)[10]	Podiatrics students	Multisource feedback characterization	5-days evaluation strategy with delayed feedback
Brinkman et al. (2007)[11]	First-year pediatric residents	Randomized controlled trial of augmenting standard feedback on residents	Multisource feedback intervention positively affected communication skills and professional behavior
Wilkinson et al. (2009)[12]	Systematic review of professionalism	Integration of 360° evaluation in multiparameter evaluation	Professionalism can be assessed using a combination of observed clinical encounters, multisource feedback, and others
Meng et al. (2009)[13]	Anesthesiology residents	360-degree evaluation for post anesthesia care unit	Provides formative feedback to residents regarding their professionalism and interpersonal and communication skills
Holmboe et al. (2010)[2]	Competency-based medical education recommendations	Role of assessment in competency-based education	Importance of comprehensive evaluator training
Hemalatha and Shakuntala (2013)[14]	Nursing Students	Core competencies, self-assessment, peer and patient evaluations	Enhanced communication with patients and peers
Zhao et al. (2013)[15]	Surgery residents in China	Professionalism, interpersonal and communication skills	Improved evaluation of professionalism and interpersonal skills
Al Alawi et al. (2013)[16]	Systematic review of pediatric residents and practicing pediatricians	Feasibility of multisource feedback in residents and recertification tests	Multisource feedback is a feasible, reliable, and valid method to assess pediatricians in practice
Al Khalifa et al. (2013)[17]	Systematic review of surgery residents and practicing surgeons	Feasibility of multisource feedback in residents and practicing specialists	MSF is a feasible, reliable, and valid method to assess surgical practice, particularly for non-technical competencies
Tariq et al. (2014)[18]	Internal medicine residents in Pakistan	Communication, interpersonal skills, multidimensional feedback	Enhanced evaluation of communication and interpersonal skills
Donnon et al. (2014)[19]	Systematic review of various medical professionals	Reliability, validity, and feasibility of multisource feedback	Need for specific strategies for different evaluators and goals
Ferguson et al. (2014)[20]	Meta-analysis of multisource feedback for Medical doctors	Factors influencing effectiveness of multisource feedback	Variable evidence of professional performance influence
Hageman et al. (2015)[21]	Orthopaedic surgeons	Impact in patient satisfaction from physicians participating in 360° evaluation	360-degree survey process may directly impact practice reimbursement, reputation and patient satisfaction
Nurudeen et al. (2015)[22]	Surgeons	Implementation of a 360° evaluation with focus in quality	Provide a practical, systematic, and subjectively accurate assessment of surgeon performance without undue reviewer burden
Alofs et al. (2015)[23]	Medical residents	Online evaluation, accessibility, cost reduction	Benefits of online platforms for 360-degree evaluations
Sargeant et al. (2015)[24]	Various medical professionals	Facilitated reflective performance feedback	Developed R2C2 model for effective feedback

Reference	Population studied	Key elements of 360-degree evaluation	Main findings
Riveros et al. (2016)[25]	Anesthesiology residents	Multisource feedback questionnaire validation	The MSF increased the self-assessment score
Lee et al. (2016)[26]	Medical students in Taiwan	Multisource feedback comparison between self and peer reviews	Discrepancies found between self and peer evaluations
Oktay et al. (2017)[27]	Emergency medicine residents	360-degree evaluation tool	Instruments meet expectations of evaluator group but doing a 360 evaluation is time and effort consuming
Cormack et al. (2018)[28]	Nursing students	Pilot implementation to assess competency	360 Degree Evaluation Model provided a comprehensive evaluation of the student and critical information for the faculty
Awdishu et al. (2018)[29]	Multiple disciplines health students	Feedback given to 72 teams from 108 facilitators	Applying the 360-degree performance model is feasible and provides multidimensional, qualitative feedback to enhance student learning
Vazquez Cid de Leon et al. (2020)[5]	University students and professors	Multidimensional feedback, educational quality improvement, fair assessment	Positive impact on professional behaviors and interpersonal skills
Gonzalez-Gil et al. (2020)[30]	Third-year nursing students	Comprehensive evaluation of clinical placement performance	Identified overestimation in grades and performance in supervised settings
Neumann Fabricio et al. (2021)[1]	Obstetrics and gynecology residents	Clinical competencies, professionalism, teamwork, communication	Improved clinical skills and reasoning as residents progressed
Mousavi et al. (2021)[31]	Last year nursing students	Self-efficacy impact of 360° evaluations	Increased self-efficacy perception compared to conventional evaluation
Azami et al. (2024)[32]	Emergency medical students in Iran	Leadership, management, clinical and communication skills, integrity	Marked improvement in clinical performance, especially in leadership and management skills
Furtado de Souza and Ceriotti Toassi (2025)[33]	Family medicine residents, preceptors and citizen-users	Patient/user participation in resident evaluation, interprofessional teamwork	360° evaluation valued as participatory tool; time constraints identified as key implementation barrier in high-demand settings
Nisar et al. (2025)[34]	Medical residents, multiple specialties	Awareness and readiness for multisource feedback	Most residents unfamiliar with MSF concept; time management and over-criticism identified as primary barriers
Orgun et al. (2025)[35]	Senior nursing students	Correlations between evaluator sources in 360° assessment	Self and peer evaluations showed strongest mutual correlation; different evaluator sources capture distinct performance dimensions
Soelling et al. (2025)[36]	Attending surgeons, multiple specialties	Intraoperative 360° feedback using start/stop/keep framework	Workflow-integrated feedback captured actionable non-technical skills; leadership and communication most frequently addressed domains

MSF = Multisource Feedback; CCM = Critical Care Medicine

2. IMPLEMENTATION STRATEGIES AND CHALLENGES

2.1 Successful implementation strategies:

2.1.1. Standardized evaluation tools:

A key theme across studies is the importance of using standardized, validated tools[8]. Azami et al. (2024) emphasized the need for setting-specific instruments, highlighting that tools must be tailored to the unique context of each medical specialty[32]. This finding is also described by Donnon et al. (2014), who stress the importance of aligning evaluator groups with specific competencies to ensure the most accurate and useful feedback[19].

2.1.2. Comprehensive training for evaluators:

Holmboe et al. (2010) underscores the critical role of evaluator training. Their work suggests that training should cover not only the mechanics of using evaluation tools but also the objectives of the evaluation and techniques for providing constructive feedback[2]. This comprehensive approach to training appears to enhance the quality and consistency of feedback across different evaluators.

2.1.3. Technology integration:

The integration of technology emerges as a significant facilitator

of successful implementation. Alofs et al. (2015) demonstrated that online platforms can streamline the evaluation process, making it more accessible and efficient[23]. However, their study also noted that the initial setup and training for these systems can be resource-intensive, suggesting a trade-off between long-term efficiency and short-term investment[23].

2.1.4. Regular feedback sessions:
Multiple studies, including work by Sargeant et al. (2015), highlight the importance of regular, structured feedback sessions. These sessions provide opportunities for residents to reflect on their performance, set goals, and develop action plans for improvement[24,37].

2.1.5. Organizational culture:
Lockyer (2003) and Wood et al. (2006) emphasize the role of organizational culture in successful implementation. Their findings suggest that a supportive institutional context that values open communication, and continuous improvement is crucial for the success of 360-degree evaluations[6,7].

2.2 Challenges:

2.2.1. Evaluator bias:
A persistent challenge identified across studies is evaluator bias[14,26]. Vázquez Cid de León et al. (2020) highlighted how personal prejudices can lead to inconsistent assessments[5]. This issue is compounded by findings from González-Gil et al. (2020), who reported overestimation of grades in some supervised settings, potentially limiting the ability to distinguish between different levels of performance[32].

2.2.2. Logistical complexities:
The logistical demands of implementing 360-degree evaluations emerge as a significant challenge. Alofs et al. (2015) discussed the considerable effort required to coordinate multiple evaluators and manage the evaluation process[23]. Azami et al. (2024) noted the associated costs for implementation and development, which can be a barrier, particularly in resource-constrained settings[32].

2.2.3. Time constraints:
Oktay et al. (2017), highlight the time-consuming nature of these evaluations, both for evaluators and those being evaluated[27]. This can lead to resistance from busy clinicians and potentially compromise the quality of feedback if rushed. This challenge is particularly pronounced in high-demand clinical settings, such as those common in Latin American healthcare systems, where the tension between service delivery and educational commitment is especially acute. Furtado de Souza and Ceriotti (2025) documented how preceptors in primary care residency programs reported significant difficulty conducting 360-degree evaluations within their clinical routine, often delegating the process to other team members who were equally overloaded[33]. Similarly, Nisar et al. (2025) found that time management concerns were among the primary barriers identified by residents when considering participation in MSF processes[34]. In contrast to models used in some high-income countries, where dedicated EPA assessors with no clinical duties perform evaluations, most Latin American and Spanish ICU settings lack such infrastructure, making workflow-integrated assessment strategies — as proposed in this review — particularly relevant.

2.2.4. Integration of feedback:
González-Gil et al. (2020) pointed out the challenge of integrating heterogeneous information obtained through feedback. Their work suggests that adequate integration needs to consider the interaction between different criteria as well as the relevance of the evaluators, a complex task that requires careful planning and execution[30].

2.2.5. Emotional Impact on residents:
Vázquez Cid de León et al. (2020) noted that the comprehensive nature of 360-degree evaluations can have a significant emotional impact on residents. The process can touch on sensitive areas, potentially affecting self-esteem and morale, especially if not managed carefully[5]. This is further supported by Nisar et al. (2025), who found that residents in Saudi Arabia expressed concerns about over-criticism and the perceived complexity of involving multiple stakeholders, highlighting that emotional readiness and conceptual familiarity with MSF processes cannot be assumed and must be explicitly addressed during implementation[34].

2.2.6. Ensuring anonymity and confidentiality:
Maintaining evaluator anonymity while providing specific, actionable feedback emerges as a delicate balance. Davidson (2007) describes strategies such as delayed feedback to focus on the evaluation process rather than individual evaluators, but this approach may reduce the immediacy and specificity of feedback[10].

3. IMPACT ON PROFESSIONAL DEVELOPMENT AND LONG-TERM OUTCOMES

360-degree evaluations demonstrate significant influence on professional development, particularly in enhancing self-awareness and reflective practice among medical trainees[13,31]. Research shows increased self-efficacy in nursing students compared to conventional methods[31], while studies have noted improved self-assessment of professionalism among residents receiving monthly faculty feedback[30]. The implementation of structured reflection models has proven instrumental in fostering professional growth through enhanced self-awareness and reflective

capacity, leading to more targeted self-improvement efforts and potentially establishing lifelong learning habits[24,25].

The impact extends into career advancement and the development of essential professional competencies. Meta-analyses have revealed that MSF significantly influences various areas crucial for career progression, particularly in communication and interpersonal skills[6,31]. Studies consistently document improvements in professional behavior among medical residents following MSF[25]. These enhancements in professional competencies appear to have a cumulative effect, potentially shaping long-term career trajectories and leadership capabilities in healthcare settings, as seen by Nurudeen et al., with surgeons in their clinical practice[22].

4. COMPARATIVE ANALYSIS WITH TRADITIONAL ASSESSMENT METHODS

Traditional assessment methods

Traditional medical education assessments primarily focus on measuring explicit knowledge and technical skills through standardized examinations and controlled practical tests. These evaluations typically rely on single-source feedback, usually from supervisors or examiners, occurring at specific timepoints during training. While these methods benefit from established psychometric properties and standardized implementation processes, they often fail to capture the nuanced aspects of clinical practice. Their controlled environment, though providing reliable measurements of core competencies, may not reflect the complexities of real-world healthcare settings[3,4].

360-Degree evaluation approach

In contrast, 360-degree evaluations provide a comprehensive assessment framework incorporating multiple perspectives from peers, supervisors, allied health professionals, and patients. This method excels in evaluating non-technical competencies such as communication skills, professionalism, and interpersonal abilities in authentic clinical settings. The ongoing nature of these evaluations promotes continuous professional development through regular feedback and self-reflection. However, their implementation requires substantial institutional resources, careful evaluator training, and robust validation processes. Despite these challenges, research indicates that residents prefer this method for evaluating most competencies, except medical knowledge, appreciating its holistic approach to professional development[6,12,15].

The comparison of both strategies is synthetized in figure 1.

A COMPREHENSIVE PROPOSAL FOR 360-DEGREE EVALUATION IN ICU RESIDENCY TRAINING

The unique challenges and multidisciplinary nature of ICU practice necessitate a robust and comprehensive evaluation system for residents. Drawing on the synthesized findings from our literature review, we propose integrating the 360-degree evaluation model, within one of the crucial processes of critical care activity, the daily multidisciplinary visit for patient management.

Core Components of the ICU 360-Degree Evaluation Model

1. Multidisciplinary Evaluation Team:
    - -Resident self-Assessment
    - -ICU attending physicians
    - -Fellow icu residents
    - -Nursing staff (icu nurses, charge nurses)
    - -Allied health professionals (respiratory therapists, pharmacists, physiotherapists)
    - -Patients and family members (when appropriate)
    - -Junior learners (medical students, junior residents)

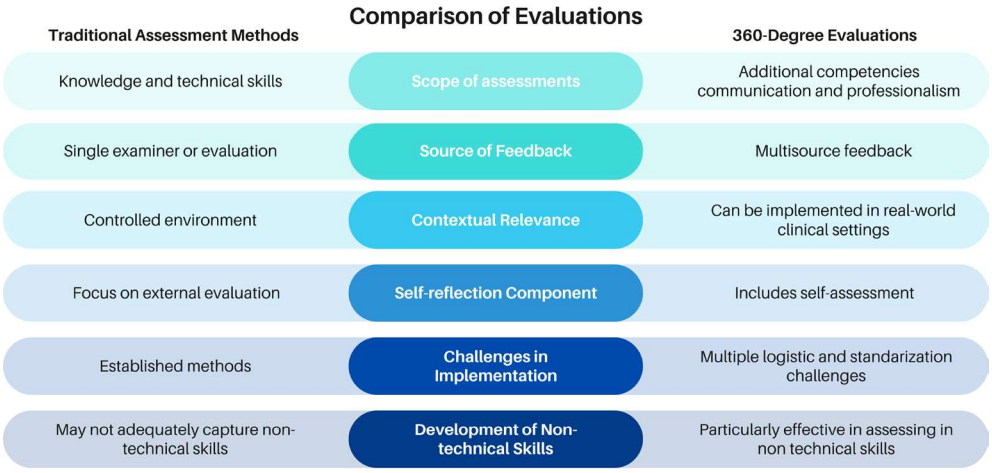

Figure 1. Comparison between 360-Degree Evaluations and Traditional Assessment Methods in key elements.

2. Competency domains: Based on the critical care milestones outlined by Dorman et al. (2004) and incorporating insights from our review, we propose evaluating the following domains[38]:

-Clinical knowledge and decision making
-Procedural skills
-Communication and teamwork
-Leadership and crisis management
-Professionalism and ethical conduct
-Teaching and mentorship
-Patient and family-centered care

3. Making the multidisciplinary clinical round an MSF multistage evaluation

Daily critical care routine involves the evaluation of each patient, with best practice recommendations emphasizing a team-based approach to enhance patient care in ICU, integrating evaluation with performance assessment[9]. This established workflow creates a natural environment for implementing 360-degree evaluation, as it already incorporates all key participants in their defined roles. Rather than requiring extensive evaluator training, this approach focuses on adapting assessment tools to capture critical observations during rounds and is a space to build collective interpretations about residents' performance as illustrated in Figure 2.

While general ICU physicians typically oversee 5-14 patients, the evaluation process should not interfere with clinical care delivery. We propose selecting 2-4 patients for in-depth evaluation during daily rounds, where the CCM resident under assessment leads the discussion.

The attending physician maintains three key roles during evaluations: 'assessing residents' clinical knowledge, probing understanding through targeted questions, and ensuring patient safety. Allied healthcare professionals, including nurses, therapists, and pharmacists, evaluate the resident's leadership and team coordination abilities within their domains. Fellow residents and students provide insight into educational aspects and teaching effectiveness. Patient-centered care evaluation occurs during rounds and afterward when residents communicate clinical plans to families under ICU staff supervision.

Self-assessment is a core component of 360-degree evaluation frameworks, as it fosters reflective practice and metacognitive awareness. Orgun et al. (2025) demonstrated that self-evaluation scores showed the strongest correlation with peer evaluations among all evaluator sources, reinforcing their value as a meaningful and complementary data point in multisource assessment systems[35].

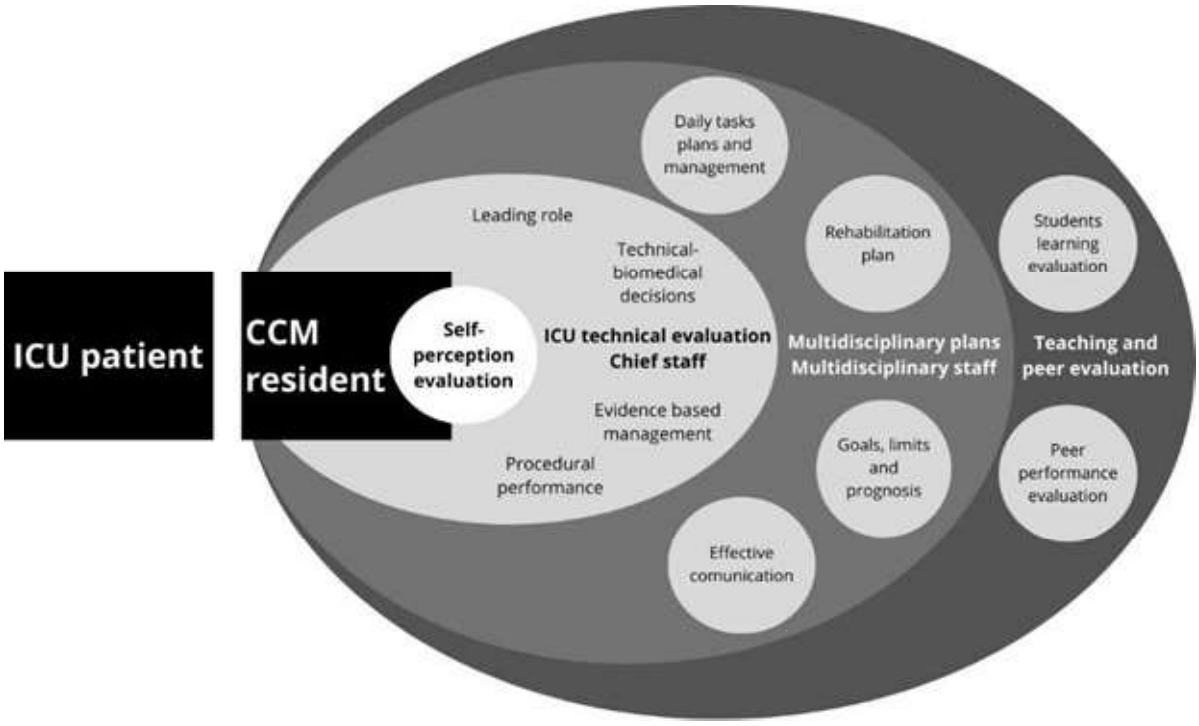

Figure 2. Multilayer 360-degree evaluations evaluation of critical care medicine (CCM) resident, considering self-evaluation, medical staff technical evaluation, allied professionals leadership performance evaluation and peer and junior evaluations of teaching and humanistic performance.

This integration of MSF into daily clinical work preserves normal ICU operations while maximizing existing role definitions. The result is a complementary, comprehensive, and multimodal evaluation system for CCM residents that builds naturally upon established workflows.

Implementation strategy

1. Phased roll-out:

- Phase 1: Pilot program with a small group of residents
- Phase 2: Full implementation with ongoing refinement

2. Comprehensive evaluator training: Develop a structured training program for all evaluator groups, addressing potential biases and ensuring consistent application of evaluation criteria, as emphasized by Holmboe et al.[2]. Nonetheless, the emphasis on standardization should not annulate the authenticity of the assessor's criteria, and in a more modern perspective, training should focus on taking just decisions, without the fear of providing negative feedback or taking fail decisions[39].

3. Regular feedback sessions: Implement monthly feedback sessions to facilitate reflective practice and action planning[24].

4. Integration with existing curriculum: Align the 360-degree evaluation with ICU rotation objectives and overall residency program goals, as suggested by Ferguson[20].

5. Continuous improvement cycle: Establish a quarterly review process to assess the effectiveness of the evaluation system and make necessary adjustments.

Innovative Elements

1. Crisis simulation integration: Incorporate high-fidelity simulation scenarios to assess crisis management skills, with multidisciplinary team evaluations.

2. Longitudinal progress tracking: Implement a digital system that tracks resident progress across multiple rotations, allowing for assessment of long-term growth, using learning analytics[40].

3. Audio and video analysis: Implement the systematic recording of visits that allows for deferred analysis not only of the knowledge process, but also of the dynamics of the visit, spatial distribution and functioning of the participants. This approach is analogous to the intraoperative 360-degree evaluation model described by Soelling et al. (2025), who demonstrated that structured qualitative feedback during real clinical workflows — using a start/stop/keep framework — effectively captured non-technical skills including leadership, communication, and stress response among attending surgeons[36]. Adapting this format to ICU rounds could provide actionable, structured feedback while minimizing disruption to clinical care.

4. Technology integration: Implementing a secure, user-friendly digital platform for real-time feedback collection, but delayed analysis[23].

The implementation of audio and video recording in ICU settings requires careful attention to ethical and governance considerations. Patient privacy must be protected through informed consent from patients, families, and all staff involved, prior to any recording. Recorded material should be stored in secure, access-restricted platforms, used exclusively for educational purposes, and permanently deleted following a defined retention period. Given the vulnerability of critically ill patients, institutional ethics committee approval and compliance with applicable data protection regulations are prerequisite conditions for any recording-based assessment initiative.

Addressing potential challenges

1. Evaluator fatigue: Implement a structured rotation system whereby each evaluator is assigned defined assessment periods, distributing the workload equitably across the team. Faculty and staff participation in the evaluation process should be formally recognized as part of their academic responsibilities, preventing disproportionate burden on individual evaluators. Technology can further streamline the process, minimizing time demands without compromising feedback quality.

2. Maintaining anonymity: Utilize aggregated feedback reports and implement a delayed feedback system to protect individual evaluator anonymity[10].

3. Dealing with discrepancies: Develop a structured process for reconciling discrepancies between different evaluator groups, possibly involving facilitated discussions or external moderation.

4. Ensuring fairness: Regularly analyze evaluation data for potential biases and adjust the process accordingly. Provide residents with opportunities to respond to their evaluations.

DISCUSSION

360-degree evaluations offer substantial benefits over traditional assessment methods by providing a multidimensional view of resident performance. While results across studies are heterogeneous and context-dependent, the evidence consistently points to improvements particularly in communication, professionalism, and non-technical skills[5,15,30,32,36]. Soelling et al. (2025) reinforced this in a surgical setting, demonstrating that workflow-integrated 360-degree evaluations successfully identified actionable behaviors across all non-technical skills domains, with leadership and communication emerging as the most frequently addressed competencies[36]. The continuous feedback fostered by these evaluations promotes ongoing professional development and reflective practice[10].

Despite these advantages, 360-degree evaluations face several challenges. The implementation involves considerable logistical complexities, including coordinating multiple evaluators and

managing the evaluation process[23,32]. Evaluator bias can affect the reliability and validity of the assessments[5,30]. Effectively integrating feedback into the educational curriculum and ensuring consistency remain as significant challenges[30]. Additionally, the comprehensive nature of these evaluations can have an emotional impact on residents[5].

Feedback effectiveness in other educational contexts has been described as a process dependent on actionable information exchange[41,42], evaluators time to provide meaningful feedback[43], constructivist focus of feedback[41,44], all areas that should be part of evaluators feedback programs.

Implementation strategies need to include comprehensive evaluator training, standardized tools, regular feedback sessions, and robust support systems. Considering the 2020 recommendations of the Ottawa Conference, web placed assessment should be organized "to make holistic judgements", and in that sense, in 360-degree evaluations more than standardize the different evaluators, interpretation of multiple observations in the workplace and in coherence with a robust assessment system provides strengths to the assessment process[39,40]. The long-term benefits, including cultural shifts towards continuous improvement and enhanced healthcare quality, suggest that 360-degree evaluations are a valuable addition to medical education assessment methods. Another important topic to consider is how to inform decisions in 360-degree evaluations methods. Who or what opinions are most important? How to define pass or fail criteria? How does 360-degree evaluations assessment correlate to other tools used in the academic program? Are questions to address to provide coherence to the assessment program[39,40].

The theoretical justification for 360-degree evaluations in residency training is well-grounded in Miller's pyramid of clinical competence, a foundational framework that organizes assessment according to four progressive levels: 'Knows', 'Knows How', 'Shows How', and 'Does'[45]. Traditional assessment methods — including written examinations and simulated practical tests — primarily evaluate the lower levels of this pyramid, capturing declarative and applied knowledge but rarely reaching the apex level of authentic performance in real clinical contexts. For ICU residents in particular, the critical competencies of leadership, teamwork, communication, and crisis management belong firmly at the 'Does' level and can only be meaningfully assessed through workplace-based tools. 360-degree evaluation, by capturing MSF during actual clinical activity, is precisely the instrument designed to operate at this highest tier of the pyramid, complementing rather than replacing traditional methods that address lower competency level[13,39].

Furthermore, implementation efforts must account for residents' baseline familiarity with MSF concepts. Nisar et al. (2025) found that many residents had never encountered the term ' MSF ' prior to their study, underscoring the need for preparatory educational strategies before deployment[34]. Equally, the active participation of patients and families in the evaluation process — while culturally sensitive — has been shown to be feasible and valued by both users and educators in primary care residency settings in Latin America, adding a meaningful social dimension to the assessment process[33].

This narrative review has several limitations. As a narrative review, it may be subject to selection bias in the articles included and interpretation of results. The review focused on a specific set of studies and may not capture the full spectrum of 360-degree evaluation practices in different contexts. The absence of a meta-analysis limits our ability to quantify the effectiveness of 360-degree evaluations across different studies. Additionally, the review may be influenced by publication bias, and the variability in implementation methods across studies makes direct comparisons challenging.

Our research team will implement this 360-degree evaluation framework in a Latin American healthcare setting to identify implementation challenges, assess stakeholder perceptions, and evaluate benefits and barriers of integrating MSF into ICU workflows. This implementation study will provide evidence of the framework's effectiveness in diverse contexts; particularly examining adaptations needed for resource-constrained environments.

CONCLUSION

In conclusion, while 360-degree evaluations present both opportunities and challenges, their potential to enhance medical education and ultimately improve healthcare delivery makes them a promising avenue for further development and implementation in residency training programs. The comprehensive nature of these evaluations, when properly implemented, can significantly contribute to the development of well-rounded, competent healthcare professionals, ultimately benefiting patient care and healthcare systems as a whole.

KEY MESSAGES

- Multisource 360-degree evaluations provide a comprehensive assessment framework that captures critical non-technical competencies often missed by traditional methods, including communication, teamwork, and professionalism in authentic clinical settings.
- Integration of 360-degree evaluations into daily ICU multidisciplinary rounds offers a practical, workflow-integrated approach for residency programs to implement holistic competency assessment without disrupting clinical care delivery.

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