Soft skills in Health Sciences Education: An overview of their curricular integration.

Habilidades blandas en la Educación en Ciencias de la Salud: Revisión panorámica sobre su integración curricular.

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Summary

Introduction. Soft skills—such as communication, empathy, teamwork, emotional intelligence, resilience, and leadership—are essential for safe, humane, and person-centered healthcare. However, their teaching and assessment in health sciences curricula remain heterogeneous and poorly standardized. **Objective.** To synthesize the evidence from systematic reviews and scoping reviews on how soft skills are developed, taught, assessed and integrated into the curriculum in health sciences education. **Methodology.** A comprehensive review of systematic reviews, mixed-methods reviews, and scoping reviews was conducted, following the PRISMA-ScR guidelines. Studies published between 2020 and 2025 were searched in PubMed, Scopus, ScienceDirect, Cochrane Library, Epistemonikos, Web of Science, and the Virtual Health Library (VHL). Data on intervention characteristics, competencies addressed, pedagogical methods, assessment strategies, and outcomes were extracted. Methodological quality was assessed using the Joanna Briggs Institute (JBI) checklists and AMSTAR-2; the certainty of evidence was assessed using GRADE. **Results.** Nineteen reviews were included, covering clinical communication, empathy, emotional intelligence, interprofessional education, non-technical skills, problem-based learning, resilience, and the use of emerging technologies (virtual reality and artificial intelligence). Most interventions —based on simulation, active methodologies, project-based learning, and supervised practice— reported consistent improvements in soft skills and, in some cases, favorable effects on patient care behaviors. However, quasi-experimental designs, conceptual heterogeneity, and limited standardization of assessment instruments predominated. **Conclusion:** The evidence supports the structured, longitudinal integration of soft skills into health sciences curricula. However, progress is needed toward shared conceptual frameworks, validated assessment instruments, and robust studies that link these competencies to clinical, organizational, and professional well-being outcomes.

Keywords: Social Skills, Curriculum, Health Sciences, Medical Education, Attitude

Resumen

Introducción. Las habilidades blandas —como la comunicación, la empatía, el trabajo en equipo, la inteligencia emocional, la resiliencia y el liderazgo— son esenciales para una atención sanitaria segura, humanizada y centrada en la persona. Sin embargo, su enseñanza y evaluación en los planes de estudio de las ciencias de la salud siguen siendo heterogéneas y poco estandarizadas. **Objetivo.** Sintetizar la evidencia procedente de revisiones sistemáticas y revisiones de alcance sobre cómo se desarrollan, enseñan, evalúan e integran curricularmente las habilidades blandas en la

educación en ciencias de la salud. **Metodología.** Se realizó una revisión panorámica de revisiones sistemáticas, revisiones mixtas y revisiones de alcance, siguiendo la guía PRISMA-ScR. Se buscaron estudios publicados entre 2020 y 2025 en PubMed, Scopus, ScienceDirect, Cochrane Library, Epistemonikos, Web of Science y la Biblioteca Virtual en Salud (BVS). Se extrajeron datos sobre las características de las intervenciones, las competencias abordadas, los métodos pedagógicos, las estrategias de evaluación y los resultados. La calidad metodológica se evaluó con listas de verificación del Joanna Briggs Institute (JBI) y con AMSTAR-2; la certeza de la evidencia se valoró mediante GRADE. **Resultados.** Se incluyeron 19 revisiones sobre comunicación clínica, empatía, inteligencia emocional, educación interprofesional, habilidades no técnicas, aprendizaje basado en problemas, resiliencia y uso de tecnologías emergentes (realidad virtual e inteligencia artificial). La mayoría de las intervenciones —basadas en simulación, metodologías activas, aprendizaje basado en proyectos y práctica supervisada— reportó mejoras consistentes en habilidades blandas y, en algunos casos, efectos favorables en comportamientos vinculados con la atención al paciente. No obstante, predominaron diseños cuasiexperimentales, heterogeneidad conceptual y escasa estandarización de los instrumentos de evaluación. **Conclusión.** La evidencia respalda la integración estructurada y longitudinal de las habilidades blandas en los currículos de las ciencias de la salud. Sin embargo, es necesario avanzar hacia marcos conceptuales compartidos, instrumentos de evaluación validados y estudios robustos que vinculen estas competencias con resultados clínicos, organizacionales y de bienestar profesional.

Palabras clave: Habilidades Sociales, Curriculum, Ciencias de la Salud, Educación Médica, Actitud

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1. Introduction

Health sciences education has undergone a substantial transformation in recent decades, driven by the growing recognition that professional competencies are not limited to technical expertise, but include a complex set of socio-emotional and relational skills necessary for safe, humanized, and person-centered clinical practice. These skills, often referred to as soft skills, encompass dimensions such as clinical communication, teamwork, empathy, emotional self-regulation, ethical decision-making, and adaptability in dynamic clinical environments (1). Various international organizations and curricular experiences have emphasized that soft skills should not be considered complementary or implicit competencies, but rather structural elements of healthcare professionalism. In disciplines such as nursing, medicine, physiotherapy, and dentistry, these skills have demonstrated direct impacts on the quality of care, patient safety, user satisfaction, clinical performance, and professional well-being (1). Despite this, numerous studies document that their instruction remains heterogeneous, insufficient, or relegated to the hidden curriculum, resulting in significant training gaps.

Evidence shows that the absence of systematic curricular integration limits students' ability to apply these competencies in real-world clinical settings. For example, research in medicine and nursing indicates that students possess a conceptual understanding of empathy, communication, and teamwork, but they are not always able to translate this knowledge into clinical practice due to a lack of deliberate training, structured feedback, and situated application opportunities. (2). Recent studies highlight that soft skills are part of a broader set of 21st-century transversal skills, which include critical thinking, emotional intelligence, creativity, leadership, professional ethics, negotiation, and intercultural communication. (2-3). Its relevance is such that even research in clinical simulation, dental education and competency-based programs has shown that structured learning environments—such as simulation, active methodologies or problem-based learning— favor the intentional and assessable development of these skills (2).

Despite these advances, the literature points to persistent difficulties: a lack of conceptual consensus, a scarcity of validated instruments for assessing soft skills, limited teacher training in socio-emotional methodologies, and the absence of regulatory frameworks that guarantee their curricular integration from a longitudinal perspective (3). These challenges reinforce the need for a critical synthesis that allows for a comprehensive understanding of how these competencies are developed, taught, assessed, and integrated into health training programs.

In this context, this overview aims to systematize the available evidence from systematic and scoping reviews on the development, teaching, assessment, and curricular integration of soft skills in health sciences education. By bringing together findings from multiple disciplines and methodologies, it seeks to offer a comprehensive framework to guide teacher training institutions, educators, and policymakers toward a more robust, coherent, and evidence-based integration of these essential competencies for contemporary healthcare practice.
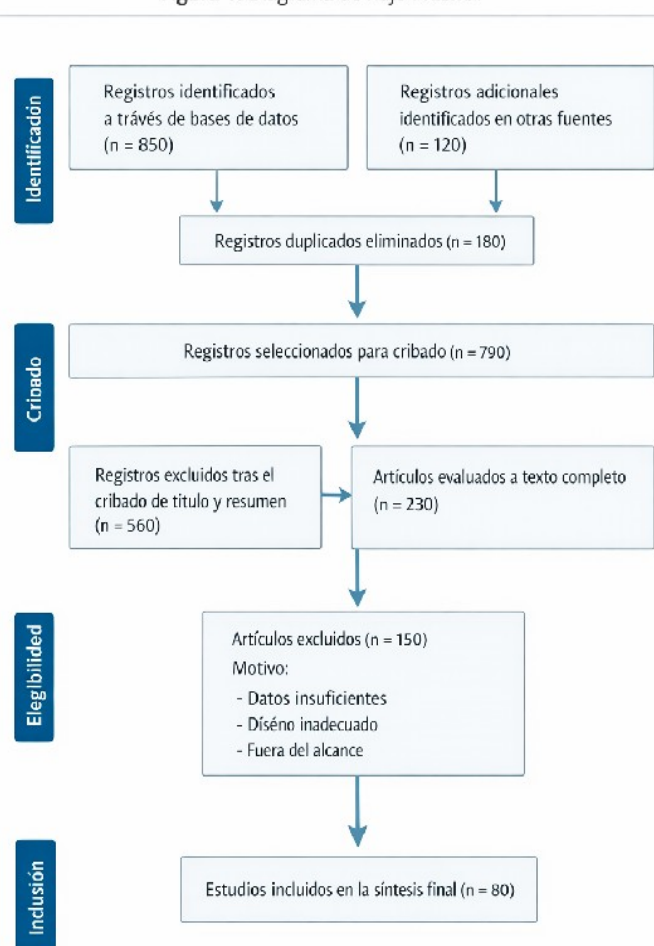
2. Methods

A scoping review was conducted following the PRISMA-ScR guidelines. The literature search was carried out in the PubMed, Scopus, ScienceDirect, Cochrane Library, Epistemonikos, Web of Science, and Virtual Health Library (VHL) databases, covering publications between 2020 and 2025. Search terms included keywords related to soft skills, curriculum, and health sciences. Systematic reviews, mixed-methods reviews, and scoping reviews in the context of health education were considered (Figure 1).

Study selection was conducted in two independent phases by two reviewers. First, titles and abstracts were examined to eliminate duplicates and irrelevant studies. Subsequently, full texts of the shortlisted studies were assessed to confirm compliance with the inclusion criteria (e.g., review studies in health education, focus on soft skills). Discrepancies were resolved by consensus between the reviewers.

Data were extracted from each included review regarding the characteristics of the interventions (duration, educational context, participants), the soft skills addressed, the pedagogical methods used, the reported assessment strategies, and the main results. The methodological quality of the included reviews was assessed using the Joanna Briggs Institute (JBI) checklists according to the type of review (scope review vs. systematic review) and with the AMSTAR-2 tool in the case of systematic reviews with or without meta-analysis. (5) In addition, the GRADE system was used to assess the overall certainty of the evidence presented (6).

The synthesis of the results was carried out using a narrative-thematic approach. Two authors independently read the full texts of the selected reviews and coded the main findings inductively

Figura 1. Diagrama de flujo PRISMA

Identificación

Registros identificados a través de bases de datos (n = 850)

Registros adicionales identificados en otras fuentes (n = 120)

Registros duplicados eliminados (n = 180)

Cribado

Registros seleccionados para cribado (n = 790)

Registros excluidos tras el cribado de título y resumen (n = 560)

Artículos evaluados a texto completo (n = 230)

Elegibilidad

Artículos excluidos (n = 150)
Motivo:
- Datos insuficientes
- Díséño inadecuado
- Fuera del alcance

Inclusión

Estudios incluidos en la síntesis final (n = 80)

and deductively. From this iterative reading, common thematic categories were identified (e.g., outcomes in communication, empathy, interprofessional education, resilience, use of technologies), and an integrated narrative was developed that reflected the conclusions of the reviews examined.

3. Results

The integrated synthesis of systematic and scoping reviews reveals a broad, though methodologically heterogeneous, body of evidence on how soft skills are developed, taught, assessed, and integrated into health sciences education curricula. In total, nine systematic reviews and one mixed-methods review were analyzed, focusing on educational interventions related to clinical communication, emotional intelligence, interprofessional education, workplace resilience, non-technical skills, problem-based learning, and promoting behavior change (7–16), complemented by scoping and rapid reviews covering specific disciplines (medicine, nursing, dentistry, medical radiation science, pharmacy) and curricular approaches such as health/medical humanities, interprofessional education, virtual reality and artificial intelligence (17–25).

The populations included encompass medical and nursing students, residents, physicians in training, practicing clinical professionals, interprofessional teams, and, in some cases, employees from other sectors, providing a cross-cutting view of soft skills development throughout the educational and professional continuum. Consistently, the reviews agree that educational interventions lead to improvements in key soft skills—such as communication, empathy, teamwork, emotional self-regulation, and critical thinking—although there is significant variability in intervention designs, instruments, and methodological quality. Regarding the development and teaching of soft skills, clinical communication is positioned as the most studied competency and is considered core to humanized practice in multiple disciplines (26, 19, 21, 22–24). The review by de Sousa Mata (7) showed that short-term communication skills training programs (4 hours to 2 days), based on a combination of lectures, videos, role-playing, and supervised practice, significantly increase the self-efficacy and communicative performance of healthcare professionals, with better quality evidence in randomized clinical trials and a moderate risk of bias in quasi-experimental studies. Similarly, in oncology, the meta-analysis by Barth and Lannen (27) found that group communication skills courses produce a moderate effect on communicative behavior and a small to moderate effect on professional attitudes, with indications of a positive impact on patient outcomes. Reviews focused on empathy agree that it is a teachable and improveable skill through formal interventions: the rapid review by Robinson et al. (23)—which includes 50 studies, 20 of which were included in the final analysis—documents that more than 80% of programs use active learning strategies (role-playing, simulations, theater, reflective work) and standardized scales such as the Jefferson Scale of Empathy to assess pre-post changes, although significant gaps remain in conceptual standardization and in the long-term sustainability of the effects. Similarly, Deep et al. (8) show that problem-based learning enhances communication, conflict resolution, leadership, teamwork and critical thinking, especially when facilitators are trained and interventions are sustained over time, although the lack of robust evidence in technical and vocational programs is noted.

The curricular integration of soft skills is documented in both formal programs and co-curricular interventions. Orih et al. (10) synthesized 38 studies incorporating interventions from primary education to university, organized into workshops, creative methodologies, and experiential projects; most reported improvements in communication, teamwork, career planning, social-emotional learning, and academic performance, but only three studies were categorized as "best practice" according to CASP and EPHPP, highlighting the limited methodological quality and the scarcity of robust interventions at pre-university levels. In nursing, an imbalance is described between the increasing technification of care and the lack of clarity in the conceptualization and evaluation of soft skills, perceived as a threat to the humanization of care (19). In dentistry, Ortega

et al. (21) report that interventions on intrapersonal and interpersonal skills, communication, ethical values, and management competencies predominate, with an emphasis on the dentist-patient relationship and treatment satisfaction, although gaps persist in the systematic evaluation of these competencies. In medical radiation science, soft skills—communication, empathy, patient-centered care, emotional intelligence, and teamwork—are considered essential for holistic care and a collaborative environment. Health/Medical Humanities programs, for their part, integrate arts, narrative, ethics, history, and visual arts to develop perspective, reflexivity, and person-centered approaches; however, Carr et al. highlight the great variability in objectives, activities, and evaluation methods, which makes it difficult to compare curricula and construct common outcome frameworks (17).

Interprofessional education and soft skills training occupy a central place in the evidence on teamwork, collaboration, and leadership. Spaulding et al. (12) found that 89% of the 19 studies analyzed reported significant improvements in attitudes toward collaboration and teamwork; although changes in collaborative skills were heterogeneous, all studies that measured collaborative behaviors reported improvements after the interventions. Aldriwesh et al. (13) identified simulation, e-learning, and problem-based learning as predominant strategies in teaching interprofessional education at the undergraduate level, while highlighting the scarcity of programs in regions such as the Middle East and the need to evaluate not only implementation but also pedagogical effectiveness. At an organizational level, Medina-Córdoba et al. (20). They document positive effects of interprofessional education on organizational climate and culture, with mixed results in job satisfaction and organizational attachment, while Bookey-Bassett and Espin (28) identify four key functions of interprofessional education for practicing professionals: establishing collaborative work, serving as a building block for integrated care models, acting as a catalyst for change, and promoting concrete modifications in clinical practice. In parallel, Pucer et al. (11) show that simulation experiences in healthcare teams—especially high-fidelity simulation in intensive care and surgical settings—consistently improve non-technical skills such as teamwork, situational awareness, leadership, and problem-solving. The review by Gamborg et al. (18), which includes 203 studies, is particularly relevant: only 46 explicitly examined the correlation between technical (TS) and non-technical (NTS) skills, but 40 of them found a positive correlation, suggesting that mastery of NTS is associated with better technical performance and challenging the rigid curricular separation between "technical" and "non-technical". From a broader perspective, van Kessel et al (25) propose a framework of 21 components of community resilience to health emergencies —10 skills and 11 resources— which, although focused on the community level, offers a complementary model of social and system competencies.

The impact of these interventions on professional well-being, resilience, and patient outcomes is also documented, although with less consistency. Unjai et al. (15) integrated 33 studies into a mixed-methods review on interventions to promote resilience and passion for work in healthcare settings; 21 of 29 quantitative studies showed significant increases in resilience scores, and all qualitative studies reported perceived improvements in psychological well-being and coping, although no interventions specifically focused on "passion for work" were identified, indicating a thematic gap. At the community and systemic levels, van Kessel et al. (25) link resilience skills with institutional and social resources, providing a useful framework for understanding soft skills beyond the classroom. Regarding the impact on patients, Hatfield et al. (9) reviewed 12 studies on skills training to promote health behavior change and observed significant improvements in the quality and fidelity of interventions offered by professionals. The meta-analysis of six studies showed a small but significant effect on patients' health behaviors (SMD = 0.20; 95% CI 0.11–0.28), with better results when programs included supervised practice. Regarding emotional intelligence, Chanda et al. (They analyzed 40 studies in medical students, residents, and attending physicians, reporting consistent increases in EI scores—especially with the EQ-i 2.0 instrument, with average

improvements of 4% to 8%—; however, only two studies showed positive effects on patient satisfaction and three on organizational indicators. Therefore, the authors conclude that, although emotional intelligence can be developed through formal programs, it is still necessary to standardize content, methodologies, and outcome indicators to robustly demonstrate its clinical and organizational impact. The COVID-19 pandemic appears as a critical context: Sancho-Cantus et al. (24) point to a decline in empathy and socio-emotional skills, as well as an increase in stress and burnout among health science students, reinforcing the urgency of systematically integrating emotional intelligence and mental health care into curricula.)

Emerging technologies are establishing themselves as promising tools for soft skills training. The review by Alghanaim et al. (29) indicates that virtual reality applied to interprofessional education is effective in developing non-technical skills—communication, teamwork, and reflection—reaching high levels in Kirkpatrick's model (behavior change), although without directly addressing technical skills. Stamer et al. (30) compiled 12 studies in which artificial intelligence and machine learning were used to train communication skills through text analysis, AI-guided virtual reality, and virtual patients. In these environments, AI was primarily used to provide immediate and individualized feedback, although limitations such as a lack of naturalness, restricted linguistic fluency, and limited-scope scenarios were reported. Dahl (31) explores immersive virtual reality using head-mounted displays for soft skills training in employees of organizations. Although only seven studies were identified, the results suggest that immersive VR can increase the sense of presence, motivation, and experiential learning of skills such as communication and handling complex situations, opening possibilities that can be extrapolated to healthcare settings. In more traditional clinical contexts (21, 24, 26), there is agreement that workshops, clinical simulation, video demonstrations, debates, role-playing, and problem-based learning are the strategies with the strongest evidence of effectiveness for improving communication, empathy, teamwork, and professional self-confidence. Interprofessional communication training follows Miller's pyramid, progressing from "knowing" and "knowing how" to "showing how" and "doing" in authentic clinical settings (32-33).

Finally, the assessment of soft skills and their integration into clinical and curricular evaluation systems appear as one of the main challenges (28). Sixteen studies were identified that incorporate soft skills elements in the clinical evaluation of nursing students, and they conclude that the absence of explicit criteria for communication, self-control, professionalism, and empathy in clinical instruments contributes to the graduation of students with deficiencies in these areas. They propose that these competencies be systematically integrated into evaluation systems. Similarly, Junod Perron et al. (33) identified 70 written communication assessment instruments with significant conceptual heterogeneity and poor psychometric robustness, which limits comparability between studies. Gutiérrez García et al. point out that, while technical competencies are clearly defined in nursing, there is no consensus on which soft skills to prioritize or how to measure them uniformly. A similar pattern is observed in dentistry, with gaps in management and professional ethics competencies (22). Taken together, the 17 reviews show that, although soft skills are critical for quality of care, patient safety, user satisfaction, and professional well-being, their curricular development remains fragmented, poorly standardized, and supported by assessments of uneven quality. The authors agree on the need to move toward integrated conceptual frameworks, validated assessment instruments, and more robust research designs—including controlled trials, longitudinal follow-ups, and studies that explicitly link interventions to clinical, organizational, and professional well-being outcomes—to strengthen the teaching, assessment, and curricular integration of soft skills in the health sciences.

4. Discussion

The evidence synthesized in this review suggests that, although there is a broad body of knowledge on the development, teaching, assessment, and curricular integration of soft skills in health sciences education, this body is methodologically heterogeneous and still incomplete. In general, systematic and scoping reviews agree that competencies such as communication, empathy, teamwork, emotional self-regulation, leadership, and critical thinking can be developed and improved through formal interventions, particularly those employing active methodologies, clinical simulation, problem-based learning, experiential projects, and supervised practice (8, 23, 27). This conclusion aligns with the broader view in the higher education literature, which emphasizes that professional achievement depends largely on transversal skills and not just technical mastery (35, 36).

However, the landscape also reveals significant tensions. First, there is a notable lack of conceptual consensus on what is meant by "soft skills," which taxonomies should be prioritized, and how to differentiate them from other constructs such as professional, generic, or 21st-century skills. Daly (37) emphasizes that this absence of shared definitions and stable conceptual frameworks complicates both curriculum design and the comparison of results between studies, especially in the field of health education. This conceptual heterogeneity translates into a wide variation in the interventions reviewed: brief communication training programs ranging from four hours to two days, intensive courses in oncology, problem-based learning modules, empathy and resilience workshops, entrepreneurship projects, and interprofessional simulation experiences, among others (8, 15, 23, 27). Although most of these interventions report positive results in soft skills indicators, the diversity of designs, populations, contexts, and outcome measures makes it difficult to draw solid conclusions about the true magnitude of the effects and their sustainability over time.

In the specific field of clinical communication, the evidence is particularly consistent. Communication training programs, structured around a combination of lectures, videos, role-playing, supervised practice, and formative feedback, generate significant improvements in the self-efficacy and communicative behavior of healthcare professionals, with effects ranging from small to moderate depending on the intensity and duration of the courses (7). Similarly, reviews on empathy describe this competence as teachable and modifiable through formal interventions based on simulation, role-playing, theater, reflective writing, and narrative activities, with significant increases on standardized scales such as the Jefferson Scale of Empathy, although with less clear results regarding the maintenance of long-term effects and their direct translation into clinical outcomes (23-24). Along a parallel line, emotional intelligence shows consistent improvements after educational programs aimed at students, residents, and practicing physicians, with associated reductions in stress and burnout. However, only a limited number of studies demonstrate an impact on patient satisfaction or organizational indicators, suggesting that the relationship between intrapersonal development and clinical outcomes remains underexplored (16).

The curricular integration of soft skills, however, is characterized more by fragmented experiences than by coherent structural models. At different educational levels, interventions are usually presented as elective courses, one-off workshops, or co-curricular activities, rather than as longitudinal and mandatory components of a spiral curriculum. The review by Orih et al. (10) is illustrative: while it shows that workshops, creative projects, and experiential learning improve communication, teamwork, career planning, and social-emotional learning, it also reveals that only a minority of studies reach methodological "best practice" standards and that the presence of robust programs at pre-university levels is still incipient. In nursing, a growing imbalance is described between the technical sophistication of care and the limited explicitness of relational

skills in guidelines and assessment systems; Thandar's review (14) indicates that clinical assessment rubrics and OSCEs tend to focus on technical performance, with an inconsistent incorporation of criteria for communication, professionalism, and teamwork. In dentistry, the review by Ortega et al. (22) shows a predominance of interventions aimed at intrapersonal and interpersonal skills, communication, and ethical values, but at the same time highlights gaps in leadership, management, and systematic evaluation of these components. In medical radiation science, soft skills—particularly communication, empathy, patient-centered care, emotional intelligence, and teamwork—are recognized as essential for holistic practice, although the presence of comprehensive curricular strategies remains limited (21).

In this context, the general literature on higher education and employability offers a complementary perspective. Karimova (35)and Muammar and Alhamad (38)point out that many graduates perceive universities as overemphasizing technical skills, while their preparation in 21st-century skills—such as communication, problem-solving, flexibility, leadership, and teamwork—is insufficient to meet the real demands of the labor market, particularly in contexts of high economic and technological complexity. Similarly, Aledo Ruiz (39)demonstrates that entrepreneurial projects based on business plans not only enhance entrepreneurial intent but also strengthen transversal skills such as creativity, collaborative work, problem-solving, and decision-making, suggesting that experiential approaches can be an effective vehicle for integrating soft skills into disciplinary training, including in the health field.

Interprofessional education and non-technical skills training are emerging as particularly dynamic areas within the field. Reviews of interprofessional education show that programs designed according to Miller's pyramid—progressing from "knowing" and "knowing how" to "showing how" and "doing"—improve attitudes toward collaboration, understanding of professional roles, and, to a lesser extent, collaborative behaviors observed in real clinical settings (12, 32). Interprofessional simulation studies report consistent improvements in teamwork, situational awareness, leadership, and decision-making, especially in critical care, resuscitation room, and operating room settings. Gamborg's review, which analyzes the relationship between technical (TS) and non-technical (NTS) skills, provides a key finding: in most studies that explicitly measured this correlation, high performance in non-technical skills was associated with better technical performance. This result challenges the curricular dichotomy that usually clearly separates "the technical" from "the non-technical" and suggests that soft skills are, in fact, a structural component of safe and effective clinical performance.

Emerging technologies, such as virtual reality (VR) and artificial intelligence (AI), offer novel opportunities for soft skills training, although the evidence is still in its early stages. Recent reviews show that VR applied to interprofessional education and communication training can increase the sense of presence, intrinsic motivation, and experiential learning of skills such as managing complex situations, teamwork, and communicating with patients in challenging scenarios (29, 31). Similarly, Stamer (30) reports that AI-based systems—including text analysis, conversational agents, and virtual patients—allow for immediate and individualized feedback on communicative performance, although they face limitations in naturalness, linguistic fluency, and the scope of the simulated scenarios. These findings align with the trends identified by Espina-Romero (36), who highlights soft skills in virtual and gamified environments as one of the emerging and underexplored areas with the greatest potential for future research.

Perhaps one of the most critical challenges identified in this synthesis concerns the assessment of soft skills. Reviews show a marked reliance on self-report instruments, conceptual heterogeneity in the available tools, and a lack of rigorous psychometric validation (14,33). In many cases, studies focus on pre-post changes in scale scores without clearly linking these changes to clinical,

organizational, or professional well-being outcomes. This is also reflected in reviews on emotional intelligence, empathy, and resilience, in which the authors conclude that, although improvements are observed in psychological and self-perception indicators, the evidence connecting these improvements to patient satisfaction, patient safety, or quality of care is still limited (9,15,16). In the health sciences, this gap is particularly problematic, as curriculum and accreditation decisions require demonstrating not only changes in declared competencies but also an impact on clinically relevant outcomes.

From a critical perspective, the findings of the included reviews—both those focused on healthcare contexts and those from higher education and staff training—converge on several points. First, soft skills are essential elements of contemporary professional practice and overall career success, both in clinical services and other sectors, reinforcing the need for training institutions to consider their development a central, rather than an incidental, objective (38). Second, the available evidence indicates that soft skills can be developed through well-designed educational interventions, especially those based on active methodologies, authentic experiences, simulation, and interdisciplinary projects (8, 11, 27, 39). Third, curricular integration remains fragmented, with a tendency to offer isolated modules instead of longitudinal and spiral frameworks that support the student throughout the entire learning continuum (10, 37). Fourth, the evaluation represents the weakest link in the system, with poorly standardized instruments, limited psychometric robustness and little articulation with clinical and organizational outcomes (14, 16, 33).

In this context, evidence suggests that active methodologies such as service-learning and project-based learning are particularly relevant strategies for the intentional development of soft skills in health sciences education, as they place students in front of authentic problems from clinical and community contexts. These approaches promote the integration of disciplinary knowledge and socio-emotional competencies and have been associated with improvements in interpersonal communication, collaborative work, critical thinking, leadership, and professionalism (40-41). In nursing, medicine, and public health programs, service-learning is also linked to greater social responsibility, ethical reflection, and the strengthening of communication and self-directed learning skills (42-43). Taken together, these findings are consistent with the literature that warns that the teaching and assessment of soft skills in health remains heterogeneous and requires explicit, structured, and evaluable strategies for their longitudinal curricular integration (37).

Implications: It is necessary to move towards explicit, longitudinal, and assessable curricula that integrate soft skills across the curriculum as core competencies in health sciences education. This requires research of higher methodological quality—including controlled trials, longitudinal studies, and impact measurement on clinical, organizational, and professional well-being outcomes—as well as sustained institutional strategies to support its implementation. Only through coherent training models and rigorous assessments will it be possible to cultivate professionals capable of combining technical excellence with the human, relational, and ethical competencies essential for safe, efficient, and truly humanized healthcare practice.

Conclusions

- This overview shows that there is a broad and expanding body of evidence on the development, teaching, assessment, and curricular integration of soft skills in health sciences education. Systematic and scoping reviews agree that competencies such as communication, empathy, teamwork, emotional intelligence, resilience, and non-technical skills can be strengthened through well-designed educational interventions, especially those based on active methodologies, clinical simulation, problem-based learning, interprofessional experiences, and supervised practice.

- Significant gaps persist in how these competencies are incorporated into curricula. Isolated, one-off, or co-curricular interventions predominate over longitudinal proposals integrated into the formal curriculum. Furthermore, the assessment of soft skills continues to rely heavily on self-report instruments with limited psychometric validity and little correlation between observed improvements in competencies and clinical or organizational outcomes. Methodological heterogeneity and a lack of consensus on definitions, taxonomies, and theoretical frameworks hinder comparisons between studies and limit the formulation of robust and generalizable recommendations.
- The available evidence suggests, however, that the systematic integration of soft skills into healthcare training is not only feasible but essential to meet the challenges of person-centered care, patient safety, and working in complex clinical settings. Emerging technologies such as virtual reality, virtual patients, and artificial intelligence offer a promising field for enriching teaching and personalizing feedback, although more rigorous studies are still needed to confirm their effectiveness and applicability in real-world contexts.

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References

1. Szönyi V, Marquillier T, Tenenbaum A, Blaizot A. Soft skills in dental student curricula: an evidence and gap map. *BMC Med Educ* **2025,** 25(1). https://doi.org/10.1186/s12909-025-07664-z
2. Aridi M, Ahmad M, Ghach W, Charifeh S, Alwan N. Development and validation of the Soft Skills Questionnaire for Nurses. *SAGE Open Nurs* **2023,** 9. https://doi.org/10.1177/23779608231159620
3. Van Staden C, Joubert P, Pickworth G, Roos J, Bergh AM, Krüger C, et al. The conceptualization of "soft skills" among medical students before and after curriculum reform. *Int J Appl Basic Med Res* **2006.** https://doi.org/10.4314/ajpsy.v9i1.30205
4. Mohammed ZJ, Alsadaji AJ, Al-Saadi SF, Al-Fayyadh S. Components of soft skills for university students in the 21st century: an overview of literature review. *Med Edu Bull* **2023,** 4(11). http://medicaleducation-bulletin.ir
5. Olugbenga M. Future curriculum and 21st century soft skills. AGPE The Royal Gondwana *Research Journal of History* **2022,** 3(3). https://www.researchgate.net/publication/360201803_Future_curriculum_and_21st_century_soft_skills#:~:text=Abstract,debate%2C%20group%20work%20and%20writing
6. de Vries AH, Schout BMA, van Merriënboer JJG, Pelger RCM, Koldewijn EL, Muijtjens AMM, et al. High educational impact of a national simulation-based urological curriculum including technical and non-technical skills. *Surg Endosc* **2017,** 31(2). 928–936. https://doi.org/10.1007/s00464-016-5060-1

7. Campbell F, Tricco AC, Munn Z, Pollock D, Saran A, Sutton A, et al. Mapping reviews, scoping reviews, and evidence and gap maps (EGMs): the same but different—the "Big Picture" review family. *Syst Rev* **2023,** 12(1). https://doi.org/10.1186/s13643-023-02178-5

8. Shea BJ, Wells G, Thuku M, Hamel C, Moran J, Moher D, et al. AMSTAR 2: a critical appraisal tool for systematic reviews that include randomized or non-randomised studies of healthcare interventions. BMJ 2017, 358. https://doi.org/10.1136/bmj.j4008

9. Guyatt GH, Rennie D. Users' guides to the medical literature. *JAMA* **1993,** 270(17). PMID: 8411578.

10. de Sousa Mata ÁN, de Azevedo KPM, Braga LP, de Medeiros GCBS, de Oliveira Segundo VH, Bezerra INM, et al. Training in communication skills for self-efficacy of health professionals: a systematic review. *Hum Resour Health* **2021,** 19(1). https://doi.org/10.1186/s12960-021-00574-3

11. Deep S, Ahmed A, Suleman N, Abbas MZ, Nazar U, Razzaq HSA. The problem-based learning approach towards developing soft skills: a systematic review. *Qualitative Report* **2020,** 25. https://doi.org/10.46743/2160-3715/2020.4114

12. Hatfield TG, Withers TM, Greaves CJ. Systematic review of the effect of training interventions on the skills of health professionals in promoting health behavior, with meta-analysis of subsequent effects on patient health behaviors. *BMC Health Serv Res* **2020,** 20(1). https://doi.org/10.1186/s12913-020-05420-1

13. Orih D, Heyeres M, Morgan R, Udah H, Tsey K. A systematic review of soft skills interventions within curricula from school to university level. *Front Educ* **2024,** 9. https://doi.org/10.3389/feduc.2024.1383297

14. Pucer P, Martinović K, Karnjuš I, Renko J. Development and improvement of non-technical skills in interprofessional healthcare teams through simulation-based experiences: a systematic review. *Clin Simul Nurs* **2025,** 102. https://doi.org/10.1016/j.ecns.2025.101726

15. Spaulding EM, Marvel FA, Jacob E, Rahman A, Hansen BR, Hanyok LA, et al. Interprofessional education and collaboration among healthcare students and professionals: a systematic review and call for action. *J Interprof Care* **2021,** 35(4). 612–621. https://doi.org/10.1080/13561820.2019.1697214

16. Aldriwesh MG, Alyousif SM, Alharbi NS. Undergraduate-level teaching and learning approaches for interprofessional education in the health professions: a systematic review. *BMC Med Educ* **2022,** 22(1). https://doi.org/10.1186/s12909-021-03073-0

17. Jamaludin TSS, Nurumal MS, Ahmad N, Muhammad SAN, Chan CM. Soft skill elements in structured clinical nursing assessment for undergraduate nursing students: a systematic review. *Enferm Clin* **2021,** 31. S58–S62. https://doi.org/10.1016/j.enfcli.2020.10.019

18. Unjai S, Forster EM, Mitchell AE, Creedy DK. Interventions to promote resilience and passion for work in health settings: a mixed-methods systematic review. *Int J Nurs Stud Adv* **2024,** 7. https://doi.org/10.1016/j.ijnsa.2024.100242

19. Chanda V, Buchireddy S, Sawant A, Yarrabolu S, Bhalala U. Systematic review of healthcare curriculum for training in emotional intelligence among physicians, residents, and medical students. *J Med Educ Curric Dev* 2025, 12. https://doi.org/10.1177/23821205251380030

20. Carr SE, Noya F, Phillips B, Harris A, Scott K, Hooker C, et al. Health Humanities curriculum and evaluation in health professions education: a scoping review. *BMC Med Educ* **2021,** 21(1). https://doi.org/10.1186/s12909-021-03002-1

21. Gamborg ML, Salling LB, Rölfing JD, Jensen RD. Training technical or non-technical skills: an arbitrary distinction? A scoping review. *BMC Med Educ* **2024,** 24(1). https://doi.org/10.1186/s12909-024-06419-6

22. García DJG, Molina DSO, Tienda DMR, Félix-Alcántara DMP, González DMÁL, Fernández Muñoz JJ. Assessment of soft and hard skills in nursing and nursing students: a scoping review. *Nurse Educ Pract* **2025,** 89. https://doi.org/10.1016/j.nepr.2025.104613

23. Medina-Córdoba M, Cadavid S, Espinosa-Aranzales AF, Aguía-Rojas K, Bermúdez-Hernández PA, Quiroga-Torres DA, et al. The effect of interprofessional education on the work

environment of health professionals: a scoping review. *Adv Health Sci Educ* **2024,** 29. 1463–1480. https://doi.org/10.1007/s10459-023-10300-4

24. Ofori-Manteaw B, Nelson T, Barry K, Al Mousa D, Nabasenja C, Frame N, et al. Beyond technical proficiency: a scoping review of the role of soft skills in medical radiation science. *Radiography* **2025,** 31. https://doi.org/10.1016/j.radi.2025.102924

25. Ortega ACBM, Nascimento DGD, Grande AJ, Cunha IP. Dentists' soft skills: a scoping review. *Discover Educ* **2024,** 3. https://doi.org/10.1007/s44217-024-00281-w

26. Robinson R, Meluski K, Hellem T, Hedwig T, Hansen N, Adams J, et al. Rapid scoping review: empathy in health sciences curriculum. *Healthcare (Basel)* **2023,** 11. https://doi.org/10.3390/healthcare11101429

27. Sancho-Cantus D, Cubero-Plazas L, Botella Navas M, Castellano-Rioja E, Cañabate Ros M. Importance of soft skills in health sciences students and their repercussion after the COVID-19 epidemic: scoping review. *Int J Environ Res Public Health* **2023,** 20. https://doi.org/10.3390/ijerph2006490

28. Van Kessel G, Milanese S, Dizon J, De Vries DH, Macgregor H, Abramowitz S, et al. Community resilience to health emergencies: a scoping review. *BMJ Glob Health* **2025,** 10(4). https://doi.org/10.1136/bmjgh-2024-016963

29. Widad A, Abdellah G. Strategies used to teach soft skills in undergraduate nursing education: a scoping review. *J Prof Nurs* **2022,** 42. https://doi.org/10.1016/j.profnurs.2022.07.010

30. Barth J, Lannen P. Efficacy of communication skills training courses in oncology: a systematic review and meta-analysis. *Ann Oncol* **2011,** 22, 1030–1040. https://doi.org/10.1093/annonc/mdq441

31. Bookey-Bassett S, Espin S. The role of interprofessional education in training healthcare providers for integrated healthcare: a scoping review. *Int J Integr Care* **2022,** 22(S1). 154. https://ijic.org/articles/10.5334/ijic.ICIC21090

32. Alghanaim N, Hart J, Finn G. Scoping review: the effectiveness of interprofessional virtual reality simulation. *J Med Educ Curric Dev* **2025,** 12. https://doi.org/10.1177/23821205251346327

33. Stamer T, Steinhäuser J, Flägel K. Artificial intelligence supporting the training of communication skills in the education of health care professions: scoping review. *J Med Internet Res* **2023,** 25. https://doi.org/10.2196/43311

34. Dahl TL. A preliminary scoping review of immersive virtual soft skills learning and training of employees. *In: Proceedings of 2021 7th International Conference of the Immersive Learning Research Network* **2021.** https://doi.org/10.56198/

35. Bok C, Ng CH, Koh JWH, Ong ZH, Ghazali HZB, Tan LHE, et al. Interprofessional communication (IPC) for medical students: a scoping review. *BMC Med Educ* **2020,** 20(1). https://doi.org/10.1186/s12909-020-02296-x

36. Perron NJ, Pype P, van Nuland M, Bujnowska-Fedak MM, Dohms M, Essers G, et al. What do we know about written assessment of health professionals' communication skills? A scoping review. *Patient Educ Couns* **2022,** 105. 1188–1200. https://doi.org/10.1016/j.pec.2021.09.011

37. Yepes-Nuñez JJ, Urrútia G, Romero-García M, Alonso-Fernández S. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *Rev Esp Cardiol* **2021,** 74(9). 790–799. https://doi.org/10.1016/j.recesp.2021.06.016

38. Mwita K, Kinunda S, Obwolo S, Mwilongo N. Soft skills development in higher education institutions. Int J Res Bus Soc Sci 2023, 12(3). 505–513. https://doi.org/10.20525/ijrbs.v12i3.2435

39. Espina-Romero LC, Aguirre Franco SL, Dworaczek Conde HO, Guerrero-Alcedo JM, Ríos Parra DE, Rave Ramírez JC. Soft skills in personnel training: report of publications in Scopus, topics explored and future research agenda. *Heliyon* **2023**, 9. https://doi.org/10.1016/j.heliyon.2023.e15468

40. Daly S, McCann C, Phillips K. Teaching soft skills in healthcare and higher education: a scoping review protocol. *Social Science Protocols* **2022**, 5(1). https://doi.org/10.7565/ssp.v5.6201

41. Muammar OM, Alhamad KA. Soft skills of students in universities: how do higher education institutes respond to 21st century skills demands? *J Educ Soc Res* **2023,** 13(2). https://doi.org/10.36941/jesr-2023-0041

42. Ruiz MDA. Development of soft skills and entrepreneurial intention in university students. *TECHNO Review Int Technol Sci Soc Rev* **2022,** 11. https://doi.org/10.37467/revtechno.v11.4468

Table 1. Main characteristics and results of the included studies.

Table 1A.- Scope revisions.

No	Author(s), year, title	Study objective	Study setting / participants	Method included: study design	Main results	Main strengths and limitations	Joanna Briggs Institute (JBI methodology)
1	**Gamborg ML et al., 2024.**	Explore the **association between technical (TS) and non-technical (NTS) skills** in medical education and how they correlate with each other.	Medical education studies (mainly surgery and procedural specialties) with trainees and specialists; 203 studies included.	**Scoping review** of four databases; identification and synthesis of studies that measure TS and NTS, and include correlation analysis between both.	203 studies; 46 explicitly assessed the TS–NTS correlation, of which 40 showed **a positive correlation** : those who score high on NTS tend to perform better on TS. OSATS was the most frequently used instrument for TS and NOTSS for NTS. They point out insufficient methodological depth in many studies.	**Strengths:** comprehensive and up-to-date review, specific analysis of the TS–NTS relationship, identifies the most commonly used assessment tools. **Limitations:** significant heterogeneity of designs, predominance of interventional studies with limited methodological quality, and an abundance of unvalidated self-assessment tools.	**Moderate** Overall quality comment: Recent scoping, clear and transparent method; good reproducibility
2	**Ortega et al., 2024.**	Mapping the literature on **soft skills in dental practice** from the perspective of dentists.	Dental professionals in different contexts (public and especially private sector; non-public ≈60% of studies).	**Scoping review** following the JBI Manual and PRISMA-ScR; search in BVS, MEDLINE/PubMed, APA PsycNET, Scopus and Capes Portal (2012–2022).	**Two hundred and sixty-six articles** were included ; a **sustained increase in publications** was observed over the last decade. The most researched dimension was **intrapersonal skills (37%)**, followed by interpersonal skills, communication, ethical values, and management skills. Gaps were identified in certain soft skills and in their integration into continuing education.	Strengths: large number of studies, comprehensive view of soft skills in dentistry, useful for curriculum redesign. Limitations: emphasis on perception rather than clinical outcomes; conceptual heterogeneity of "soft skills", insufficient attention to some competencies (e.g., leadership, management).	**High** Overall quality comment: Very good methodological standard, excellent for use as a model
3	**Azzouzi Widad**	Mapping the **soft skills teaching**	Bachelor's degree nursing programs;	**Scoping review** in PUBMED, Scopus,	**Twelve studies** were identified that employed strategies such as	**Strengths:** Systematizes active and practical	**Low** Overall quality

		strategies implemented in undergraduate nursing programs.	nursing students in various schools and university contexts.	ScienceDirect and Web of Science (2010–2020); selection of studies on educational interventions in soft skills.	simulation-based learning (5 studies), soft skills "camp" programs, an emotional intelligence model, educational escape rooms, blended learning, debate, action learning, and etiquette and personal presentation courses. Twenty soft skills emerged, with communication, teamwork, critical thinking, confidence, and situational awareness being the most prominent.	strategies, shows that experiential teaching improves soft skills in nursing. **Limitations:** Small number of studies, significant methodological variability, lack of a unified framework, and lack of long-term follow-up.	comment: Acceptable methodology, but the report does not explicitly follow current checklists
4	**Ofori-Manteaw B et al., 2025.**	To investigate the **role, importance, and teaching strategies of soft skills** in medical radiation science (MRS) practice and training.	Professionals and students of diagnostic radiography, radiotherapy and nuclear medicine; 25 studies with diverse designs.	**Scoping review** in Scopus, PubMed, Web of Science, Emcare and CINAHL (2014–2023); data extraction by independent reviewers.	Communication was the most frequently reported soft skill (17 articles), followed by **empathy** (10). Twelve studies described training strategies (workshops, videos, simulations). These interventions showed improvements in communication, empathy, teamwork, and patient-centered care.	**Strengths:** First specific map of soft skills in MRS, identifies key competencies and examples of good teaching practices. **Limitations:** Heterogeneous quality and designs, varied outcome measures, and a scarcity of studies with patient outcomes.	**Low** Overall quality comment: Good level of transparency and detail in the report, especially in search and selection.
5	**Bok C et al., 2020.**	Describe the **characteristics of interprofessional communication (IPC) training programs** for medical students.	Medical students in programs that include learning with other health professions (nursing, physiotherapy, social work, etc.); 73 articles included.	**Scoping review** guided by the SEBA approach; search (2000–2018) in PubMed, ScienceDirect, JSTOR, Google Scholar, ERIC, Embase, Scopus and PsycINFO; thematic and content analysis.	Clinical practice training (CPT) programs were identified, organized around **Miller's pyramid** (knowledge, know-how, demonstration, practice), with multiple modalities (simulation, workshops, interprofessional clinical rotations). The study concludes that CPT training is a **phased, competency-based process** supported by spiral, learner-centered curricula.	**Strengths:** clear conceptual framework (Miller + SEBA), maps indications, content, assessment, and challenges of IPC in undergraduate studies. **Limitations:** high variability in programs and assessment tools, lack of standardization, and limited longitudinal	**Low** Overall quality comment: Scoping is well-structured, but somewhat idiosyncratic in its framework.

					evidence on impact in clinical practice.	
6	**"Sancho-Cantus D et al., 2023."**	Analyze the evidence on **soft skills in health science students (especially nursing)** and explore changes after the COVID-19 pandemic.	Health science students, with a focus on nursing students; studies that address social, emotional and communicative skills and their evolution after COVID-19.	**Scoping review** following PRISMA-ScR; selection of studies on social skills and pandemic-related changes in health students.	**importance of emotional competencies** (communication, self-awareness, coping) for future professional performance is highlighted. Their influence on **academic achievement, mental health, and coping strategies is observed,** and it is suggested that the pandemic has strained and, in some cases, impaired these skills, underscoring the need to strengthen emotional intelligence in education.	**Strengths:** Novel approach to considering the impact of COVID-19 on soft skills; integrates academic and mental well-being outcomes. **Limitations:** Does not systematically include aspects such as compassion or empathy (acknowledged by the authors); evidence on post-pandemic changes is still incipient and heterogeneous.	**High** Overall quality comment: Excellent combination of PRISMA-ScR + JBI; very good for your theoretical framework
7	van Kessel G et al., 2025.	Identify the **core components of community resilience to health emergencies** to guide policy and practice.	Review of reviews (38 evidence reviews) on community resilience in contexts of health emergencies and disasters (polio, Ebola, Zika, COVID-19, etc.).	**Scoping review of evidence reviews** with systematic search in PubMed, EMCARE, Scopus, Web of Science, PTSDpubs, APO and ProQuest (since 2014); qualitative meta-synthesis.	It identifies **10 skills** (adapting, transforming, absorbing, anticipating, preparing, preventing, self-organizing, including, connecting, and coping) and **11 types of resources** (social, economic, environmental, governance, physical infrastructure, institutional, communication, human capital, health, emergency management, and socioeconomic resources). It proposes 21 components to operationalize and measure community resilience.	**Strengths:** Mature conceptual synthesis of the community resilience construct, useful for modeling and measurement; focus on capacities and resources. **Limitations:** Based on secondary reviews (may miss nuances from primary studies), primarily focused on disaster management; lacks testing of these components in different types of health emergencies.	**Low-Moderate** Overall quality comment: Conceptually very sound, but the report could be more explicitly aligned with PRISMA-ScR/JBI
8	Gutiérrez García J et al., 2025.	Conceptualize nursing education and practice through the **evaluation of**	Nursing students and nurses in clinical practice; 11 studies included out of a total of	**Scoping review** registered in PROSPERO; search in PubMed, CENTRAL, EMBASE, Web of	There is **consensus on the technical skills (hard skills)** that students and professionals should master, but **there is no agreement on the definition of soft skills.**	**Strengths:** It highlights a critical gap in the definition and evaluation of soft skills in nursing, integrating historical	

		hard and soft skills and synthesize definitions and strategies for evaluating soft skills.	1182 references.	Science, CINAHL and PsycINFO.	Various strategies and interventions for developing these skills are described, but there is no standard framework or unified assessment system. The article underscores the need to balance technology and the humanization of care. Gutiérrez	models of care. **Limitations:** Few studies included, high conceptual and methodological heterogeneity, lack of a consensus framework, and limited evidence on impact on patient outcomes.	High Overall quality comment: Probably one of the best quality scopings in the set (registry + PRISMA-ScR + JBI).
9	**Medina-Córdoba M et al., 2024.**	Explore the literature on the **effect of interprofessional education (IPE)** on the work environment of health professionals (climate, organizational culture, organizational attachment and job satisfaction).	21 studies with professionals from medicine, nursing, psychology, occupational therapy, physiotherapy, social work, among others, in academic and non-academic hospitals, mental health institutions and community settings.	**Scoping review** guided by the PCC format. Search in multiple databases; 407 works were identified and 21 were included that evaluated IPE interventions and their impact on the organizational environment.	The IPE showed **positive effects on organizational climate and culture,** improving collaboration and the work environment. Results regarding job satisfaction and organizational attachment were mixed (positive effects and no effect, according to the study).	**Strengths:** It fills a specific gap by linking IPE and the work environment; it includes diverse contexts and professions. **Limitations:** A relatively small number of studies, high heterogeneity of designs and measures, and a scarcity of robust studies that allow for causal inferences.	**High** Overall quality comment: Very good methodological standard; the combination of IPE + organizational environment is well supported
10	**Alghanaim N et al., 2025.**	To evaluate the **effectiveness of virtual reality simulation in interprofessional education (VR-Sim IPE),** especially for the development of non-technical skills.	12 studies with students from different health professions (undergraduate and, in some cases, postgraduate) who participated in IPE activities in virtual reality environments.	**Scoping review** following PRISMA-ScR and the Arksey & O'Malley framework. Search in Web of Science, ProQuest, Ovid, Scopus, CINAHL Plus and British Educational Index (2010–2025). Quality assessment with MERSQI, CASP and MMAT.	Most studies showed that VR-Sim IPE achieves **intermediate-to-high levels of learning effectiveness** (level 4 and some up to level 6 on the scale used). The interventions were mapped to IPE domains (ethical practice, interprofessional work, reflection) and Bloom's Taxonomy. No study assessed technical skills, only non-technical ones.	**Strengths:** updated synthesis of an emerging field; integrates several assessment frameworks (Bloom, Kirkpatrick, IPE domains). **Limitations:** few studies, heterogeneity of interventions and outcomes, and lack of evidence on impact on clinical or patient outcomes.	**Low-Moderate** Overall quality comment: Recent and well-reported scoping, very useful for the VR + IPE axis.

11	**Junod Perron N et al., 2022.**	Investigate the published literature on **written assessment of communication skills** in the education of health professionals.	74 articles describing 70 written assessment instruments, applied to students and professionals from different health disciplines.	**Scoping review.** Search in PubMed, Embase, CINAHL and PsycINFO (1995–2020). Extraction of data on study characteristics, instrument, items and psychometric properties.	**large number of written instruments** were identified, most of which were created ad hoc by the authors and frequently used to measure training effects. The type of knowledge assessed was rarely specified. The psychometric properties and development process of the instruments were incompletely reported.	**Strengths:** broad overview of available written instruments; provides useful information for clinical communication instructors. **Limitations:** heterogeneity of tests, poor quality of psychometric reporting, and lack of comparability between instruments; as a scoping review, it does not formally assess methodological quality.	**Low** Overall quality comment: Important and careful review, but without the formal framework of current guidelines.
12	**Robinson R et al., 2023.**	Identify, compare and contrast **empathy training programs** in health science curricula (especially nursing, nurse practitioners and pharmacy).	21 studies (mostly non-randomized quasi-experimental, 2012–2021) with nursing students, nurse practitioners, pharmacists, and other health students. Most interventions were implemented in the classroom.	**Rapid scoping review.** Search in six databases (MEDLINE, EMBASE, PubMed, CINAHL, EBSCOhost, ERIC) in the last 10 years, plus search in Google Scholar and specific journals.	Over 80% of empathy training programs used **active learning strategies** (role-playing, discussions, simulations, narratives). In general, **short-term improvements in empathy, as measured by scales, were observed** ; however, there is little standardization and limited evidence regarding long-term maintenance or the best pedagogical approach.	**Strengths:** Quickly and comprehensively maps recent interventions; highlights the role of active learning. **Limitations:** Predominance of non-randomized studies, significant variability in designs and empathy measures; insufficient evidence on sustained effects and clinical outcomes.	**Low** Overall quality comment: Useful for a quick overview; some loss of methodological depth due to the "rapid" design.
13	**Carr SE et al., 2021.**	Explore **how and why the humanities in health are used** in health professions education and how these curricula are evaluated.	24 articles describing integrated "health humanities" curricula in undergraduate programs of various health professions.	**Focused scope review,** centered on qualitative and mixed studies with outcome assessment. Search in CINAHL, ERIC, PubMed and Medline over a 5-year period.	Health humanities curricula are primarily focused on developing **perspective, reflexivity, self-reflection, and person-centered communication approaches.** However, learning outcomes and assessment strategies are described inconsistently, making it difficult to compare programs and gather	**Strengths:** It provides a conceptual synthesis of desired learning outcomes in the humanities and health; it identifies the need for generic competency frameworks. **Limitations:** Limited number of	**Low-Moderate** Overall quality comment: Solid review, although the evaluation

						evidence.	studies, variability in designs and methods, and a focus on a limited time period (5 years).	and reporting of results could be more standardized.
14	**Bookey-Bassett S et al., 2021.**	Analyze the **role of interprofessional education (IPE)** in training professionals to work in integrated care models.	32 documents on health professionals already practicing (post-bachelor's degree) in different sectors: 16 primary studies, 10 reviews and 6 reports/position papers.	**Scoping review** using the Arksey & O'Malley method. Search in CINAHL, MEDLINE, ProQuest Nursing and Allied Health and Scholars Portal (2000–2020) with terms on IPE and integrated care.	Four key themes were identified regarding the role of IPE: **(1) laying the groundwork,** (2) serving as a **building block,** (3) acting as a **catalyst,** and (4) **generating changes in practice** within integrated care models. It is concluded that IPE has a unique role, but is only one part of a broader training program. Sue Bookey-Bassett	**Strengths:** Integrates evidence from multiple document types; highlights the need for ongoing workplace IPE. **Limitations:** No formal quality assessment was conducted, and only English texts were included; the conference abstract nature limits methodological detail.	**Low** Overall quality comment: Conceptually useful, but insufficient for a formal quality assessment; best cited as supplementary evidence.
15	**Stamer T et al., 2023.**	Summarize the current state of the use of **artificial intelligence (AI) and machine learning (ML)** in the training of communication skills in students of health professions.	12 studies with undergraduate students in health professions (medicine, other health careers) using AI/ML in communication training.	**Scoping review** following PRISMA-ScR. Search in PubMed, Scopus, Cochrane Library, Web of Science Core Collection and CINAHL; inductive classification of studies into thematic categories.	The studies are grouped into three categories: (1) AI/ML for **text analysis and information extraction,** (2) AI/ML combined with **virtual reality,** and (3) AI-powered **virtual patients.** AI is used to provide feedback, support individualized practice, and reduce training costs. The main barriers are the **lack of authenticity and natural fluency of the language,** as well as the limited variety of scenarios.	**Strengths:** First specific synthesis of the use of AI/ML in communication training; identifies facilitating factors and obstacles. **Limitations:** Small number of studies, applications restricted to a few clinical contexts and technical limitations of the systems (naturalness, accessibility).	**Low-Moderate** Overall quality comment: Very current and well presented review; good quality report for your AI and education section.
16	**Dahl TL, 2021.**	To offer a preliminary view of **soft skills training through immersive virtual reality (IVR) with HMD** in employees of organizations.	Employees in organizations (labor sector), in the few studies identified on soft skills training with immersive VR; the article highlights that empirical	**Preliminary scoping review** based on the Arksey & O'Malley framework. Search for studies on the use of immersive VR with headsets (HMDs) for soft skills training in companies.	There is a **growing interest from the market** and companies offering immersive soft skills training, but the **scientific literature and empirical studies are very limited.** This highlights the need for more research on effectiveness, transferability, and results measurement.	**Strengths:** pioneer in systematizing an emerging field (soft skills + IVR + employees) and setting the research agenda. **Limitations:** very few empirical studies available, preliminary results, and	**Low** Overall quality comment: Useful for showing "evidence

| | | | | | | no systematic quality assessment; does not allow for firm conclusions about effectiveness. | gap", but of limited methodological quality as formal scoping. | |

Table 1B.- Systematic reviews

No.	Author(s), year, title	Study objective	Study setting / participants	Method included: study design	Main results	Main strengths and limitations	AMSTAR 2
1	Unjai et al. (2024).	To evaluate the characteristics and effectiveness of interventions to promote resilience and passion for work in health professionals.	33 studies with health workers (mainly nursing and other professionals) in various international clinical contexts.	Systematic review of mixed methods (quantitative and qualitative studies) with convergent synthesis.	Interventions based on mindfulness, psychoeducation, stress management, and coaching showed significant improvements in resilience and well-being; no interventions specifically targeting 'passion for work' were identified.	Strengths: broad search and mixed methods approach. Limitations: high heterogeneity of interventions, duration, and measures; scarcity of studies on 'passion for work'.	Critically low
2	Orih et al. (2024).	Review soft skills curricular interventions at all educational levels and evaluate their characteristics, design quality, and results.	38 studies with primary, secondary and university students; predominance of university population in different countries and disciplines.	Systematic review registered in PROSPERO; quality assessment with CASP and EPHPP.	The interventions (workshops, creative activities, projects) were associated with improvements in soft skills, employability, career planning, social-emotional learning and academic performance, as well as reductions in violence, drug use, depression and bullying.	Strengths: first review to integrate all educational levels; use of two quality tools. Limitations: scarcity of studies at the primary and secondary levels; moderate methodological quality; heterogeneity that prevents meta-analysis.	Low

3	Chanda et al (2025).	To characterize the impact of emotional intelligence training programs on the performance of physicians, residents, and students.	40 studies (2373 participants: medical students, residents and doctors), mainly from the United States.	Systematic review of interventions in emotional intelligence; 7 randomized trials; classification of results with the Kirkpatrick model.	Most studies showed improvement in emotional intelligence levels and reduction of stress/burnout; few measured outcomes in patient satisfaction or organizational results.	Strengths: Includes multiple levels of training and uses a theoretical framework (Kirkpatrick). Limitations: High variability in programs and tools; few studies with clinical or organizational outcomes; lack of standardization in content and duration.	Critically low
4	Thandar, (2021).	Synthesize the evidence on the inclusion of soft skills elements in the structured clinical assessment of undergraduate nursing students.	17 studies with nursing students and teachers/preceptors in university and hospital clinical settings.	Systematic review following PRISMA of quantitative and qualitative studies on clinical competency assessment.	It was identified that clinical assessment usually focuses on technical skills, with variable incorporation of communication, professionalism and teamwork; the need to explicitly integrate soft skills into rubrics and OSCE is emphasized.	Strengths: specific focus on clinical assessment and use of PRISMA criteria. Limitations: heterogeneity of instruments, predominance of observational designs, and local context that limits generalizability.	Critically low
5	Pucer et al. (2025).	Explore how simulation contributes to the development of non-technical skills in interprofessional health teams.	22 studies with interprofessional teams (mainly doctors and nurses) in critical patient, operating room and other clinical contexts.	Systematic review (2013–2023) of simulation interventions; bias risk assessment using CASP lists.	Simulation was associated with improvements in teamwork, cooperation, situational awareness, leadership/management, and decision-making in most studies.	Strengths: specific focus on interprofessional teams, frequent use of high-fidelity simulation, and clear categorization of non-technical skills. Limitations: heterogeneity of designs and assessment tools, lack of long-term follow-up and clinical outcomes.	Critically low
6	Spaulding et al. (2021).	Evaluate the impact of interprofessional education on attitudes, collaborative skills, and collaborative behaviors.	19 studies with students from different health professions and practicing professionals; university and clinical contexts.	Systematic review with search in multiple databases (PubMed, CINAHL, Embase, ERIC) and quality	Most studies showed significant improvements in attitudes towards other disciplines and in the appreciation of teamwork; studies that assessed	Strengths: updated synthesis of interprofessional education programs and use of an outcomes framework. Limitations: predominance of self-reported measures, variability in the duration and content of interventions, and limited evidence	Critically low

				assessment with Joanna Briggs tool.	collaborative behavior also reported positive changes.	on patient-centered outcomes.	
7	Aldriwesh et al. (2022).	Describe the teaching and learning approaches used to implement interprofessional education in undergraduate health curricula.	16 studies from universities in Western, Asian and African countries with students from different health professions.	Systematic review (2010–2019) with search in PubMed, ScienceDirect and Cochrane; analysis of types of programs and approaches (simulation, e-learning, PBL, etc.).	Most programs combine several approaches, highlighting simulation, e-learning and problem-based learning; a shortage of programs is observed in some regions and a lack of evidence on the comparative effectiveness of the different approaches.	Strengths: detailed map of 'how' interprofessional competence is implemented at the undergraduate level and coverage across multiple regions. Limitations: few studies per region, primarily descriptive or quasi-experimental designs, and a lack of standardized measures of interprofessional competence.	Critically low
8	Hatfield et al. (2020).	Identify and evaluate the effect of health professional training on the quality of delivery of behavior change interventions and on patients' health behaviors.	12 trials (many by clusters) with doctors, nurses and other professionals offering interventions to modify behaviors (diabetes, smoking, breastfeeding, asthma, hypertension) in several countries.	Systematic review and meta-analysis following the Cochrane Guide; comparison of additional training vs. minimum/usual training.	The training improved the quality of communication and content delivery in about half of the outcomes; the meta-analysis showed a small but significant positive change in patients' health behaviors (SMD ≈ 0.20).	Strengths: broad search, bias risk assessment, and meta-analysis of behavioral outcomes. Limitations: heterogeneity of interventions and measures, high overall risk of bias in some outcomes, and few studies with long-term follow-up.	Low
9	Mata et al. (2021).	Identify the available evidence on communication skills training programs to improve attitude, behavior, and self-efficacy in health professionals.	8 studies (trials and quasi-experimental studies) with physicians and/or nurses, mostly in primary care and hospitals; small sample sizes.	Systematic review registered in PROSPERO; search in 8 databases; use of RoB, ROBINS-I and GRADE.	The programs, which combine theoretical content and experiential learning (role-play, video, feedback), showed significant improvements in communication performance and self-efficacy in most	Strengths: robust methodology, detailed program descriptions, and use of GRADE. Limitations: few studies and small samples, heterogeneity of contexts and strategies that hinders meta-analysis, and variability in measurement instruments.	Low

| 10 | Deep et al. (2020). | Review the role of problem-based learning (PBL) in the development of soft skills. | 32 studies (conceptual, review and empirical) from multiple disciplines (TVET, medicine, social sciences, engineering) and countries. | Qualitative systematic literature review with search in several databases and thematic analysis. | PBL contributes to the development of communication, leadership, conflict resolution, teamwork, critical thinking, and interpersonal skills; no negative effects were reported. | Strengths: comprehensive synthesis and integration of conceptual and empirical evidence; identifies contextual factors that influence the impact of PBL. Limitations: predominance of non-experimental and heterogeneous studies, scarcity of specific empirical evidence on TVET, and absence of quantitative meta-analysis. | Critically low |

Table 2.- Level of evidence and grade of recommendations GRADE.

No	Article	Type of review / main intervention	Main outcomes summarized	GRADE* level of certainty	Summary justification (GRADE)	Grade of recommendation (what would you do with this evidence?)
1	**Orih et al., 2024**	Systematic review of 38 studies (workshops, projects, creative approaches) at all educational levels.	Soft skills interventions improve communication, employability, career planning, SEL, academic performance and reduce violence, drug use and bullying.	**Moderate**	There is a mix of RCTs and quasi-experimental studies; quality assessment (CASP and EPHPP); consistent results, but high heterogeneity in contexts and measures → downgrades from high to moderate.	**Strong recommendation in favor** of integrating structured soft skills programs into the curriculum (with local adjustment), because there are broad benefits and few identified harms.
2	**Spaulding et al., 2021**	Systematic review of 19 studies on interprofessional education (IPE) in students and professionals.	17/19 studies show significant improvements in attitudes towards collaboration and appreciation of teamwork; 7/7 studies show improvement in collaborative behavior.	**Moderate**	Predominance of quasi-experimental designs, but very high consistency in the direction of the effect; quality assessment with the JBI tool; moderate indirectness regarding patient outcomes.	**Strong recommendation in favor** of implementing longitudinal IPE to improve collaborative attitudes and behaviors, with the caveat that solid evidence on direct clinical impact is lacking.
3	**Aldriwes**	Systematic	It describes that	**Low**	Primarily descriptive studies, without	**Weak/conditional recommendation**

	h et al., 2022	review of 16 studies on how IPE is implemented in undergraduate studies (simulation, e-learning, PBL, etc.).	simulation, e-learning and PBL are the most frequent approaches; most studies focus on implementation, not comparative effectiveness.		robust comparators; little information on the relative effect of each approach; high heterogeneity and no meta-analysis.	**in favor** of using simulation, e-learning and PBL as core IPE strategies, but the choice should be based on resources and context because evidence of superiority is limited.
4	Pucer et al., 2025	Systematic review of 22 simulation studies for non-technical skills (NTS) in interprofessional teams.	Improvements in teamwork and cooperation (in all studies), situational awareness, leadership, decision making, usually measured pre-post.	**Moderate**	Observational/pre-post studies, but very high consistency and biological plausibility; some validated instruments, although without large RCTs; moderate risk of bias.	**Weak-strong recommendation in favor** of using high-fidelity simulation to train NTS in interprofessional teams, especially in critical environments (ICU, operating room).
5	**Deep et al., 2020**	Qualitative systematic review (SLR) of studies on PBL and development of soft skills in TVET, medicine, humanities, engineering.	It concludes that PBL promotes communication, conflict resolution, leadership, and interpersonal skills; it notes that the number of empirical studies in TVET is limited.	**Low**	Based on heterogeneous observational studies, many without control groups; qualitative thematic synthesis; possible publication bias; but the direction of the effect is consistent.	**Weak/conditional recommendation in favor** of using PBL to enhance soft skills, especially as a complement to traditional methods, with a need for more well-designed RCTs.
6	**Unjai et al., 2024**	Systematic review of mixed methods (33 studies) on interventions for resilience (mindfulness, psychoeducation, coaching, stress management) in	21/29 quantitative studies show significant improvement in resilience; all qualitative studies report improvements in psychological well-being; no specific interventions were found for "passion for	**Moderate**	Variety of designs (many pre-post), but large sample size, homogeneous results in direction, and methodological evaluation with MMAT; moderate indirectness versus hard results (rotation, clinical events).	**Strong recommendation to** implement resilience programs (including brief/online options) in healthcare institutions, with local monitoring of effects and feasibility.

		health professionals.	work".			
7	**Thandar et al., 2021**	Systematic review of 17 studies on soft skills elements in the clinical assessment of nursing students.	It identifies that, if soft skills are not integrated into clinical assessment instruments, graduates may not be prepared for work; it is urgent to incorporate communication, professionalism, and teamwork into the rubrics.	**Low**	Studies that are mostly descriptive and focused on instrument development; absence of RCTs or robust comparisons; strong indirection regarding clinical outcomes.	**Weak/conditional recommendation to** review and modify nursing clinical assessments to explicitly include soft skills, while better impact studies are being developed.
8	**Hatfield et al., 2020**	Systematic review + meta-analysis of 12 RCTs on training professionals to promote behavioral changes in patients.	Training improves delivery quality (≈54–55% of communication and content outcomes with improvement) and produces a small but significant effect on patient health behaviors (SMD 0.20; 95% CI 0.11–0.28).	**Moderate**	Randomized trials but with risk of bias in measuring "delivery quality"; low heterogeneity in behavioral outcomes; acceptable precision; no clear signs of publication bias.	**Strong recommendation to** offer systematic training in behavior change skills to health professionals, as part of chronic disease prevention and management programs.
9	**Chanda et al., 2025**	Systematic review of 40 studies (7 RCTs, the rest quasi-experimental) on IE training programs in students, residents and doctors.	Most studies report an increase in EI scores (4–8% on EQ-i 2.0) and a reduction in stress/burnout; few show effects on patient or organizational satisfaction.	**Moderate (for EI/wellbeing outcomes) – Low (for patient/organizatio n outcomes)**	A good number of studies, several with experimental design and validated tools; variability in programs and duration; limited evidence for organizational or patient-level outcomes.	**Weak-strong recommendation in favor** of including EI training in leadership and medical education programs, especially to improve well-being and interpersonal performance; more robust studies are needed to demonstrate organizational and patient benefits.
10	**de Sousa Mata et al., 2021**	Systematic review of 8 studies (RCT +	Significant improvements were observed in self-	Moderate	Mixture of RCTs and quasi-experimental studies with low-moderate risk of bias; consistent results; robust self-efficacy	Strongly in favor of implementing structured and experiential CSTs as part of mandatory professional

		quasi-experimental with control). Communication training for physicians and nurses.	efficacy, communication skills, performance assessed by OSCE/video, and the use of empathic techniques. Short programs (4 hours–2 days) with an experiential focus showed a positive impact.		measures; validated instruments; heterogeneity in duration and content.	training.

Table 3. Classification Grading of Recommendations Assessment, Development and Evaluation. GRADE by outcome of scope reviews.

Outcome	Evidence reviews	Global effect	GRADE certainty	Recommendation
Clinical communication	Hatfield 2020; from Sousa Mata 2021	Consistent improvement in verbal and non-verbal communication skills	**Moderate**	**Strong support** for structured CST
Self-efficacy in communication	de Sousa Mata 2021	It increases between 8–37% depending on the instrument.	**Moderate**	**Strong in favor**
Observed communicative performance (OSCE/video)	de Sousa Mata 2021	Observable, though variable, performance improvements	**Low-Moderate**	**Weak-strong in favor**
Communication for behavior change	Hatfield 2020	Small but significant effect (SMD 0.20)	**Moderate**	**Strong in favor**
Empathy and effective communication	de Sousa Mata 2021	Improved confidence and empathic skills	**Low-Moderate**	**Weak-strong in favor**
Global soft skills	Orih 2024; Deep 2020; Thandar 2021	Improvements in interpersonal soft skills	**Low-Moderate**	**Weak-strong in favor**
Teamwork / IPC	Spaulding 2021; Aldriwesh 2022; Pucer 2025	Improvement of collaborative attitudes and behaviors	**Moderate**	**Strong in favor**
Resilience / well-being	Unjai 2024; Chanda 2025	Stress reduction / burnout	**Moderate**	**Strong in favor**
Results in patients	Hatfield 2020	Modest but significant effect on behavior	**Moderate**	**Strong in favor**