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Evaluation of graduate profiles in Peruvian medical schools: Alignment with the MINSA competency framework and the CanMEDS model .

Evaluación de perfiles de egreso en facultades de medicina peruanas: Alineamiento con el marco de competencias MINSA y el modelo CanMEDS.

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Abstract. Introduction: Medical training in Peru faces challenges in defining and effectively fulfilling the graduate profile, which could directly impact the quality of professional training. These profiles must reflect comprehensive competencies aligned with the demands of the health system. The CanMEDS and MINSA frameworks offer solid references for this assessment. **Method:** A descriptive, cross-sectional, and qualitative study was conducted based on documentary analysis of the graduate profiles of 35 Peruvian medical schools, extracted from institutional sources. Two reference frameworks were applied: CanMEDS (7 roles) and the MINSA Competency Profile (8 domains). A profile was considered to "meet the majority of competencies" when it included more than half of the key competencies, if it contained at least one enabling competency (CanMEDS) or one minimum condition (MINSA). **Results:** With CanMEDS, the most represented role was "Expert Physician" (40%), while "Communicator" and "Professional" were less present (8.6% and 22.9% respectively). And with MINSA, the domains with the highest compliance were "Ethics and Professionalism" (85.7%) and "Health System and Care Model" (71.4%), with "Teaching and Research" being the one with the lowest adherence (8.6%). **Conclusion:** The analyzed profiles reveal significant training gaps, especially in transversal competencies, requiring comprehensive curricular reforms aligned with the national context and international standards such as CanMEDS.

Keywords: Competency-based education; Medical education; Professional competence; Medical schools

Resumen. Introducción: La formación médica en Perú enfrenta retos en la definición y cumplimiento efectivo del perfil de egreso, lo que podría impactar directamente en la calidad de la formación profesional. Estos perfiles deben reflejar competencias integrales alineadas con las demandas del sistema de salud. Los marcos CanMEDS y MINSA ofrecen referentes sólidos para esta evaluación. **Método:** Se realizó un estudio descriptivo, transversal y cualitativo basado en el análisis documental de los perfiles de egreso de 35 facultades de medicina peruanas, extraídos de fuentes institucionales. Se aplicaron dos marcos de referencia: el CanMEDS (7 roles) y el Perfil de Competencias del MINSA (8 dominios). Se consideró que un perfil "cumple la mayoría de competencias" cuando incluía más de la

mitad de las competencias clave, si contenía al menos una competencia habilitadora (CanMEDS) o una condición mínima (MINSA). **Resultado:** Con el CanMEDS, el rol más representado fue "Médico experto" (40%), mientras que "Comunicador" y "Profesional" mostraron menor presencia (8,6% y 22,9% respectivamente). Y con MINSA, los dominios con mayor cumplimiento fueron "Ética y profesionalismo" (85,7%) y "Sistema de salud y modelo de cuidado" (71,4%), siendo "Docencia e investigación" el de menor adherencia (8,6%). **Conclusión:** Los perfiles analizados evidencian brechas formativas relevantes, especialmente en competencias transversales, requiriendo reformas curriculares integrales alineadas al contexto nacional y a estándares internacionales como CanMEDS.

Palabras clave: Educación basada en competencias; Educación médica; Competencia profesional; Facultades de Medicina.

1. Introduction

Medical training is a complex process that seeks to develop professionals capable of responding effectively to the demands of the healthcare system. It is not only based on the acquisition of scientific knowledge or clinical skills, but also on the development of professional and personal competencies that guarantee ethical, effective and humanized performance (1) . However, there is a significant gap between the ideal graduation profile and the actual competencies of graduates, which is manifested in perceived deficiencies in competencies such as fine motor skills and handling of equipment or instruments in medical practice, in addition to a misalignment between perceived training and the competency profiles prioritized by the healthcare system for the primary care level (2-3) . Graduates who fail to align their competencies with the needs of the system see their job placement and professional performance negatively affected (1) . Furthermore, this problem is aggravated by the heterogeneity in the evaluation, accreditation, and degree systems between faculties, which directly affects the quality and equity of medical training, generating inequalities in the opportunities and final competencies of graduates (4) . In Peru, training as a general practitioner requires 7 years of undergraduate studies. At the end of the seventh year, students take the National Medical Examination (ENAM): a test that assesses theoretical competencies necessary for professional practice. In this context, an analysis of the results from the 2009-2019 period showed a failure rate of approximately 43%, which would suggest deficiencies in the theoretical training received in the faculties. In addition, it would raise questions about the effectiveness of current educational models and the need to strengthen evaluation mechanisms (5-6).

Historically, Peru has implemented educational quality assurance systems. The Accreditation Committee of Faculties and Schools of Medicine (CAFME) established seven core competencies for physicians until 2007, which was later replaced by the National System for the Evaluation, Accreditation and Certification of Educational Quality (SINEACE), which allows each university to define its graduation profile in accordance with national health policies. However, flexibility in these criteria can generate variability in the quality of the professionals trained (7–9) . The Canadian Medical Education Directives for Specialists (CanMEDS), an international competency assessment model developed by the Royal College of Physicians and Surgeons of Canada in 1996 and subsequently updated in 2005 and 2015, offers a comprehensive framework that defines essential roles of the physician (10) . This approach, adopted by multiple institutions globally, emphasizes transversal competencies such as leadership and communication, complementing traditional technical training (10) . Similarly, the Ministry of Health of Peru (MINSA) has described the set of characteristics that a Peruvian physician must have in 2022, which include competencies in knowledge, skills and values necessary to practice medicine adequately (11) .

In this context, this study aims to analyze the graduate profiles of Peruvian medical schools by comparing them with the international CanMEDS framework and the MINSA competency profile, in order to identify areas for improvement in medical training.

2. Methods

The present study was designed as a descriptive, cross-sectional, and qualitative study. Two instruments were used to analyze the profiles of graduates from Peruvian medical schools. The first contains the competencies established in the CanMEDS (National Institute of Medical Sciences), and the second is composed of the competencies outlined in the Competency Profile developed by the Ministry of Health (MINSA). The CanMEDS competencies are grouped into the roles of "Expert Physician," "Communicator," "Collaborator," "Leader," "Health Promoter," "Academic," and "Professional." These roles represent unique and interdependent thematic groupings that structure the physician's capabilities. Each role is composed of a variable number of key competencies, which constitute essential skills based on knowledge, skills, and attitudes fundamental to medical practice. These key competencies are, in turn, broken down into enabling competencies, which describe in greater detail the specific components required to fulfill the key competency, according to the corresponding thematic role (10) .

Furthermore, the MINSA competencies are included in the domains of "Comprehensive and integrated health care for the individual, family, and community," "Health system and comprehensive health care model by life course for the individual, family, and community," "Teaching and research," "Technology and research," "Ethics and professionalism," "Communication," "Leadership," and "Teamwork." The first three domains are classified as "Technical competencies" and the other four as "Behavioral competencies." These domains represent structural categories that allow for the organization and guidance of identifying fundamental competencies for professional performance in health, based on the needs of the population, the transversal approaches of the health system, and current trends in the sector. Each domain includes a different number of competencies, understood as the set of key traits and capabilities that a professional must acquire. In turn, each competency is composed of multiple minimum conditions for achievement, which represent the essential criteria that allow for verifying the effective fulfillment of said competency (11) .

Sample.

Convenience sampling was used to obtain the profiles. Official documents and websites from each university were used, searching for information related to the terms "graduate profile," "graduate profile," "professional profile," or other terms referring to achievements after completing undergraduate studies. If more than one version of the graduate profile was found, the most recent document or website with the most information was considered. The search began on May 13, 2025, and ended on June 2, 2025.

The graduate profiles of the faculties of human medicine of the selected universities were evaluated based on the following inclusion criteria : Universities with a current institutional license issued by the National Superintendence of Higher Education (SUNEDU) and Faculties of Human Medicine that have a representative member in the Peruvian Association of Faculties of Medicine (ASPEFAM) as a full member, associate-adherent member or guest. Universities whose faculties of medicine do not have publicly accessible graduate profiles, either as an institutional document, a section on their official website or incorporated into their curricular plan were excluded .

Information Analysis

Each competency was scored by groups of two authors. In the event of disagreement, a third author was included for the evaluation and subsequent agreed-upon final score. The assessment consisted of identifying explicit or implicit references to the competencies and roles defined in said documents, considering both their direct presence and conceptual correspondence. Furthermore, the degree of consensus was quantified using Aiken's V coefficient using R studio, establishing an acceptance criterion of $V \geq 0.80$. Using the CanMEDS model, we defined a profile as "Meets the majority of competencies" for a *role* when it met more than half or all of the *key competencies* . These competencies were considered met if the profile presented at least one of the *enabling competencies* . Otherwise, the profile was concluded as "Does not meet the majority of competencies." Similarly, with the MINSA document, a profile was considered to "Meet the Majority of Competencies" in a *domain* when more than half or all of its *competencies were met* . These competencies were met if the profile met at least one of the *minimum*

conditions for achievement . Otherwise, the profile was considered to "Do Not Meet the Majority of Competencies."

After evaluating the roles and domains, universities were classified as "Majority Meets" if they met more than half or all of *the roles* or *domains* (separately according to CanMEDS and MINSA, respectively) or as "Does Not Meet Majority" if they did not meet the indicated criterion. For example, when reviewing a graduate profile that describes the physician as a professional "capable of communicating effectively with patients, families, and healthcare teams," this statement was compared with the role of Communicator in the CanMEDS model. This *role* is structured into five *key competencies* , such as establishing therapeutic relationships and sharing clinical information, which are in turn broken down into more specific *enabling competencies* . When it was evident that the profile explicitly reflects the capacity for effective interaction, it was considered to meet at least one *enabling competency* , within the *key competency* , and therefore meet the *key competency* . Thus, if the profile meets at least *three key competencies* (since three is more than half of five), it was concluded that this profile "meets most of the competencies" of the Communicator *role* . The use of the previously described instruments is available in the supplementary material.

Data Analysis

The data were processed using descriptive and inferential statistics. To characterize the sample, absolute and relative frequencies (percentages) were calculated for the categorical variables: university type (public/private) and department. For departments, locations were grouped into "Lima" and "Provinces" due to the small number of faculties in most departments outside the Peruvian capital.

3. Results

Thirty-five medical schools were selected from a total of 39. Four medical schools were excluded due to the lack of public access to the graduate profile. Fifty-one percent (n=18) were public universities. Regarding geographic distribution, Lima was found to be the location of the majority of the schools, accounting for 31.4% of the total (Table 1).

Table 1. Characteristics of the selected human medicine faculties.

Type of University	No.	Percentage (%)
Public	18	51.4%
Private	17	48.6%
Total	35	100%
Location		
Lime	11	31.4%
Provinces	24	68.6%
Total	35	100%

According to the CanMEDS assessment (Table 2), the role with the highest compliance rate was “Expert Physician” with 40.0% (n=14), followed by “Health Promoter” and “Collaborator” with 37.1% (n=13) and 31.4% (n=11) compliance, respectively. In contrast, the role with the lowest compliance rate was “Communicator” with 8.6% (n=3), followed by “Professional” with 22.9% (n=8), and “Leader” with 25.7% (n=9).

Regarding the MINSA competency framework, the domain with the highest compliance was "Ethics and Professionalism," with 85.7% of profiles (n=30) meeting the assessment gap. The next domains with the highest compliance were "Health System and Care Model" and "Comprehensive and Integrated Healthcare," with 71.4% (n=25) and 54.3% (n=19), respectively. It is noteworthy that the domain with the lowest compliance rate was "Teaching and Research," with only 8.6% of profiles (n=3) adhering to the competencies outlined by MINSA (Table 3).

Table 2. Comparison of compliance according to CanMEDS. Data are absolute number and percentage (No., %).

Meets most of the competencies according to domain		Type of university	
		Public	Private
Medical Expert	Yeah	10 (55.6%)	4 (23.5%)
	No	8 (44.4%)	13 (76.5%)
Communicator	Yeah	2 (11.1%)	1 (5.9%)
	No	16 (88.9%)	16 (94.1%)
Collaborator	Yeah	9 (50.0%)	2 (11.8%)
	No	9 (50.0%)	15 (88.2%)
Leader	Yeah	7 (38.9%)	2 (11.8%)
	No	11 (61.1%)	15 (88.2%)
Health Promoter	Yeah	10 (55.6%)	3 (17.6%)
	No	8 (44.4%)	14 (82.4%)
Academic	Yeah	8 (44.4%)	3 (17.6%)
	No	10 (55.6%)	14 (82.4%)
Professional	Yeah	7 (38.9%)	1 (5.9%)
	No	11 (61.1%)	16 (94.1%)

Table 3. Comparison of compliance according to MINSA (Ministry of Health of Peru).

Meets most of the competencies according to the domain		Type of university	
		Public No. (%)	Private No. (%)
Comprehensive and integrated health care for the individual, family and community	Yeah	12 (66.7%)	7 (41.2%)
	No	6 (33.3%)	10 (58.8%)
Health System and Comprehensive Health Care Model for the Life Course for the Individual, Family and Community	Yeah	12 (66.7%)	13 (76.5%)
	No	6 (33.3%)	4 (23.5%)
Teaching and research	Yeah	2 (11.1%)	1 (5.9%)
	No	16 (88.9%)	16 (94.1%)
Technology and innovation	Yeah	10 (55.6%)	5 (29.4%)
	No	8 (44.4%)	12 (70.6%)
Ethics and professionalism	Yeah	16 (88.9%)	14 (82.4%)
	No	2 (11.1%)	3 (17.6%)
Communication	Yeah	5 (27.8%)	2 (11.8%)
	No	13 (72.2%)	15 (88.2%)
Leadership	Yeah	13 (72.2%)	3 (17.6%)
	No	5 (27.8%)	14 (82.4%)
Teamwork	Yeah	11 (61.1%)	5 (29.4%)
	No	7 (38.9%)	12 (70.6%)

Regarding the comparison by university type according to compliance with the CanMEDS and MINSA competency frameworks, it was evident that public universities had a higher compliance rate for both. In this group, 33.3% (n=6) of the profiles met most of the competencies of the CanMEDS model,

while 50.0% (n=9) met the MINSA framework. In contrast, private universities showed lower percentages, with only 5.9% (n=1) of the profiles meeting most of the competencies of both the CanMEDS and MINSA models (Table 4).

Regarding the 2015 CanMEDS competency framework, after evaluation by judges, the Aiken V coefficient was estimated. The value obtained was V = 0.831, indicating acceptable content validity and supporting the relevance and adequacy of the items. On the other hand, regarding the MINSA competency framework, after evaluation by judges, the Aiken V coefficient was V = 0.805. This value reflects acceptable content validity, confirming the relevance of the items according to MINSA guidelines.

Table 4. Comparison of compliance between CanMEDS and MINSA

Meets most competencies	Type of university			
	Private University		Public University	
	CanMEDS Framework	MINSA Framework	CanMEDS Framework	MINSA Framework
	No. (%)	No. (%)	No. (%)	No. (%)
Yeah	1 (5.9%)	1 (5.9%)	6 (33.3%)	9 (50.0%)
No	16 (94.1%)	16 (94.1%)	12 (66.7%)	9 (50.0%)

4. Discussion

This study shows that most medical schools in Peru lack graduate profiles that include the competencies required by the international CanMEDS framework and the national MINSA framework for medical professionals. This discrepancy is more noticeable in private universities compared to public ones. This observation is important considering that these competency frameworks not only constitute guiding models but also represent tools to ensure medical training in line with the needs of the health system and the population it serves.

The CanMEDS framework has proven useful in diverse educational settings, guiding the design and assessment of transversal medical competencies. Our study, based on a documentary review of graduate profiles, revealed a scarce explicit incorporation of these roles, which could reflect a limited institutional priority for certain transversal competencies. Although the actual performance of graduates was not evaluated, the absence of these components in the profiles may suggest an opportunity to align medical education with international standards. An example of this is the implementation of the CanMEDS model in Canada, which has managed to standardize medical training by defining curricular and assessment guidelines, thus aligning education with social and professional expectations (12) . Furthermore, studies conducted in high-income countries show that the success of the competency-based curriculum requires alignment between regulation, education and practice, as well as a prepared institutional environment (13) . Although there are precedents in the region, such as a Chilean study on medical education in residents (14) and Brazilian educational policies oriented towards competency-based learning (15) , which highlight the CanMEDS model and promote its implementation, the available literature remains limited. Until our last review, no international studies were identified that contrasted graduation profiles with competency frameworks such as CanMEDS or national studies with the MINSA model.

International experiences contrast with the findings obtained in Peru, where curricula still prioritize theoretical content over transversal competencies. A review conducted through 2022 revealed several key aspects regarding how the professional competencies of Peruvian physicians were assessed, which mainly focused on competencies related to medical knowledge and health problem-solving, using reference frameworks such as that of the Accreditation Council for Graduate Medical Education (ACGME) and MINSA criteria from previous years. However, there was a marked lack of research addressing behavioral competencies such as ethics, professionalism, and communication, which suggests a partial and reductionist view of formative assessment. This omission may result in physicians

receiving solid technical training, but with limitations in soft skills essential for comprehensive clinical practice (16) .

These findings reinforce the importance of moving toward comprehensive training models. In this regard, another Peruvian study highlighted the need to abandon traditional curriculum design models that hinder the development of essential competencies such as communication, critical thinking, and problem-solving, the former being one of the competencies with the lowest rate of achievement in our study. Traditional curricula were more focused on the theoretical transmission of content than on the holistic development of physicians, so instead, a competency-based education approach should be adopted that integrates clinical learning, teamwork, research, and ethics, so that knowledge, skills, and attitudes are comprehensively articulated in relation to the country's social and healthcare context (17).

This study presents limitations that should be considered when interpreting the results. First, the approach is based exclusively on documentary analysis of the graduate profiles declared by universities, which does not allow for the assessment of graduates' actual performance or the effective implementation of competencies in the curriculum. Regarding the analysis, there was no standardized qualitative analysis framework. Furthermore, significant heterogeneity was identified in the length and depth of profile descriptions; while some universities presented detailed and specific documents, others offered minimal or general descriptions, which may have limited the assessment of competencies. It should be noted that the research did not analyze university variables or aspects, such as resource constraints or institutional priorities, which could be related to the wide variety in competency descriptions. Another potential limitation is access to primary sources: by relying on documents published online, university profiles that have not been updated in a timely manner may have been omitted, either due to a lack of transparency in their dissemination or limitations in their public accessibility. Due to the sampling technique used, there is a potential selection bias, which means the findings may not be generalizable to all medical schools, especially those not included in the sample. Finally, a potential social desirability bias in the profiles evaluated cannot be ruled out, as the institutions may present theoretical ideals that do not necessarily reflect the reality of their medical training. Future studies could complement this analysis with practical assessments, such as surveys of employers or graduates, to validate the effective implementation of competencies among professionals.

5. Conclusions

- This study identifies that the graduate profiles of Peruvian medical schools show an uneven adoption of key competencies according to the CanMEDS and MINSA frameworks.

- Considering that the study focuses on declarative resources and does not evaluate the actual performance of graduates, the results should be interpreted as an approximation of the need for curricular reforms that prioritize a comprehensive approach aligned with both the demands of the Peruvian health system and global standards.

- Future research could complement this analysis with evaluations of graduates' actual performance and the applicability of these competencies in clinical settings.

Supplementary Material : Analysis matrix of the graduation profiles (Annex I).

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