https://jos.unsoed.ac.id/index.php/jipa

ORIGINAL RESEARCH

Curricula of Addiction Medicine from The Perspective of Medical Students: Towards an Educational Needs Assessment

Atindriya Tri Iswari[1*], Shelly Iskandar[1], Santi Andayani[1], Cornelis A. J. De Jong[2]

ABSTRACT

Introduction: Addiction is a growing global health problem with significant biopsychosocial consequences. Despite frequent encounters in clinical settings with patients with substance use disorders (SUD), medical students report limited addiction medicine training, lacking sufficient clinical exposure and skills development. Strengthening addiction medicine education is therefore essential to prepare future physicians to effectively manage patients with SUD. This study aimed to identify educational needs in Addiction Medicine (ENA-AM) by mapping medical students' perceived learning needs and interests in relation to the CanMEDS competency framework. **Methods:** A qualitative study was conducted by exploring 12 undergraduate medical students from Faculty of Medicine, Padjadjaran University, two years prior to their graduation. Data were collected through semi-structured interview based on explanatory of Arthur Kleinmann. CanMeds questionnaire was used for evaluating medical students' perception of the key competencies of healthcare practitioner. Thematic analysis was performed using Braun and Clarke's six-step method. Appropriate ethical approvals were obtained. **Results:** Participants perceived addiction medicine as a complex field requiring integration of biomedical knowledge, psychosocial understanding and clinical skills. Communication, empathy, advocacy, clinical and rehabilitation skills were strongly emphasized as foundational competencies. Most participants rated full competence across CanMEDS domains as essential for managing patients with SUD, and expressed the needs to explore addiction medicine beyond their curricula. **Conclusion:** The available data can provide a basis for further developing addiction medicine education toward an integrated curricula, combining theoretical and experiential learning to enhance clinical competence and reduce stigma in addiction care.

Keywords: CanMeds, Medical Students, Addiction Medicine, Curricula

1. Department of Psychiatry, Padjadjaran University, Bandung, Indonesia
2. Behavioral Science Institute, Radboud University Nijmegen, Nijmegen, The Netherlands

* ✉ email: atindriyatriiswari@gmail.com

INTRODUCTION

Based on WHO definition, addiction is a condition in which a person has a strong, sometimes uncontrollable, need to use a substance or engage in a certain behavior, despite negative consequences to their physical, mental, and social health.[1] Substance use disorders (SUDs) are now recognized as chronic, multifactorial conditions and represent a major contributor to the global burden of disease as well as to psychiatric morbidity.[2,3] Addiction can involve various substances such as alcohol, drugs, tobacco, or other addictive behaviors such as gambling, social media, or technology addiction. Addiction has the potential to become a global problem because it can have a negative impact on a person's life, both in terms of health, emotions, social life, and finances. In clinical contexts, the term addiction is often used to describe compulsive substance use or behaviors despite harmful consequences.[1,3,4,5,6] Substance use disorder (SUDs) is a diagnostic term defined within standardized classification systems such as the ICD and DSM.

The prevalence of substance use disorders (SUDs) differs across countries, demographic and socioeconomic groups, as tobacco and alcohol use disorders being the highest type of substances used. SUD rates are consistently higher among males than females and are more common in younger populations, with prevalence declining with increasing age.[6] Based on data from the National Narcotics Board (BNN), the prevalence of drug abuse in Indonesia in 2023 reached 1.73%, equivalent to 3.3 million people aged 15-64 years, with the 15-24 age group showing a significant increase in drug abuse. Research conducted by Aryanty et al. in 2021 in 33 provinces in Indonesia found that 19.3% of adolescents were addicted to the internet.[7]

Substance use disorders often comorbid with somatic and mental disorders. Almost every doctor will encounter patients with comorbid conditions such as substance abuse. Information about SUDs may be difficult for the patient to discuss, and a nonjudgmental communication style will elicit more accurate information.[8,9] To act professionally, a doctor requires knowledge, skills, and competence.[10] Most physicians regularly encounter patients with addiction, yet research suggests that healthcare clinicians feel inadequately trained to care for this population. Addiction education in medical school is imperative for training physicians to provide high-quality care.[11,12]

Studies report that undergraduate addiction medicine education is insufficient and fragmented. Gamez et al. (2021) noted only 57% of schools offering electives and 17% providing required clinical exposure, thus medical students only get limited coverage of practical skills. Targeted interventions consistently yield improve outcomes with some studies showed statistically significant gains in knowledge and competence, with exam scores and self-assessed proficiency rising markedly. Brief sessions like Moses et al.'s one-hour opioid overdose training and integrated online and in-person modules also enhanced confidence and attitudes toward managing substance use disorders.[13,14] These findings underscore that while diverse educational formats can produce measurable gains, a more integrated, clinically relevant approach to addiction medicine is widely desired among medical students. examine addiction medicine curricula, training, or educational interventions. assess medical students' perspectives, attitudes, knowledge, or educational needs regarding addiction medicine. Medical students report that current addiction medicine education is insufficient with limited instructional hours and clinical exposure, and expressing the need for a standardized and more comprehensive training.[15,16]

Current approaches to addiction

medicine education differ between countries in length, depth, and mode of instruction, ranging from brief lecture-based sessions in undergraduate medical education to psychiatry-based clinical rotations.[17] There is growing recognition that medical students can add value to the healthcare system. However, few academics have explored how students can add value to their own medical curricula. During training to become a doctor or healthcare professional, medical students play an important role in their qualification, subjectification, and socialization as they prepare to become doctors in the future.[18,19]

This study aims to identify educational needs in Addiction Medicine (ENA-AM) by mapping medical students' perceived learning needs and interests in relation to the CanMEDS competency framework. The findings are expected to guide the development of addiction-related content within the medical curricula and contribute to the advancement of educational research in psychiatry.

METHODS

Design

This study is a qualitative exploration of educational wishes and needs of medical students concerning Addiction Medicine in the curricula of their study. We interview medical students in the period or two years before graduation. Collected data was analyzed using Braun and Clarke's six-step method for thematic analysis.

Participant Characteristics

Inclusion criteria:

1. Medical students in the 4th semester up to the semester of the Faculty of Medicine, Padjadjaran University in the academic year of even 2025/2026.
2. Fill in the electronic questionnaire
3. Completing an electronic informed consent form and interview.

Exclusion criteria:

1. Did not complete the research questionnaire.
2. Not willing to be interviewed.

Ethical clearance

The study was conducted ethically following the World Medical Association Declaration of Helsinki, and written informed consent was obtained from all participants for participation in the study before completing the questionnaire. The study project was approved by Padjadjaran University Ethics Committee No: 325/UN6.KEP/EC/2025. This study was not funded by any organization.

Procedures and instrument

- Interview: Prior to interview we ask the participants to answer a few demographic questions regarding gender, age, year of their study and their preference for a specialization after graduation. The semi-structured interview is based on CanMeds set of competencies. A detailed description of the interview will be provided for the interviewers including introduction on the interview, recording details and so on. All interviews are conducted preferably with audio recording. Interviewers keep a hard copy of the interview at hand and write the answers as much they could in a column next to the questions.
- Questionnaire: At the end of the interview the participants are asked to fill in a short questionnaire on the CanMeds competencies (a short explanation of the competencies is given at the end of the questionnaire). These are, besides the role of a medical expert, according to the CanMeds, professional, communicator, collaborator, manager, health advocate and scholar. The focus is on the question how important students believe they need to be competent as a basic medical doctor in the domains of seven competencies as described by the CanMeds. The rating is as follows: not at all competent, slightly competent, adequately competent, fairly competent,

fully competent. Participants are asked to explain their scoring.

Data Collection

Data collected from participants will be anonymized. The audiotapes are transcribed and the written interviews will be aggregated in an anonymized Microsoft Word and Microsoft Excel document. From each next interview the themes emerging from the answers are compared with earlier ones

RESULTS

We explored medical students' perceived earning needs and interestsrelated to Addiction Medicine. Twelve medical students participated in the study. Eight males and four females, aged between 19-22 years old. All of them were medical students from Faculty of Medicine, Padjadjaran University, two years prior to graduation. All obtained data were listed on Microsoft Word. Data collected from semi-interview was analyzed using Braun and Clarke's six-step method for thematic analysis.

Questionnaire Section

Most participants perceived the necessity to be fully competent in each domain as general practitioner to care patients with addiction or SUD. Participants consistently emphasized that full competence in the *medical expert* role is fundamental for physicians, in providing effective care for patients with addiction or substance use disorders. Medical expertise was viewed as essential for establishing professional credibility, as patients tend to regard physicians' explanations and decisions as authoritative. Adequate mastery of basic medical sciences enables doctors to conduct accurate anamnesis and physical examinations, formulate preliminary diagnoses, prescribe medications appropriately, and implement management plans in accordance with clinical standards, while minimizing potential adverse effects. Furthermore, participants highlighted that medical competence allows physicians to clearly explain disease processes and treatment options to patients and their support systems, thereby facilitating understanding and trust. Overall, participants regarded medical competence not only as a core professional obligation but also as a prerequisite for delivering comprehensive, safe, and patient-centered care across preventive, promotive, and curative domains.

"As a general practitioner, medical competence should include the ability to conduct anamnesis, physical examinations, determine preliminary diagnoses, and provide therapy in accordance with medical service standards. A competent general practitioner is able to provide comprehensive services to patients, whether preventive, curative, or promotive, and knows when to refer patients to specialists." [Participant 11, male]

Participants underscored that full competence in the *professional* role is essential for physicians, as it governs ethical conduct, patient safety, and the integrity of clinical practice. Professionalism was perceived as fundamental to fostering trust, demonstrating empathy while maintaining appropriate emotional boundaries, and ensuring that patients' health interests are prioritized above all else. Participants emphasized that professional competence enables physicians to adhere to medical ethics, legal frameworks, and established health protocols, thereby minimizing errors and safeguarding patient confidentiality. Participants highlighted that continuous self-regulation and commitment to lifelong learning are integral components of professionalism, ensuring the delivery of high-quality care.

"In my opinion, as doctors, we must be aware of and even practice these things, because, for example, there are laws, codes of ethics, and other regulations that are related to the medical profession. For example, in terms of legislation, as doctors,

we must know the limits of what medical information we can disclose so as not to violate the privacy of our patients." [Participant 10, male]

Participants consistently identified *communication* competence as a core component of effective medical practice, particularly in the care of patients with addiction or substance use disorders. Effective communication was viewed as essential for understanding patients' conditions and etiologies, eliciting accurate clinical information, and educating patients using clear, simple, and accessible language. Participants emphasized that the ability to explain disease mechanisms and management plans appropriately fosters patient understanding, trust, and therapeutic engagement. In addiction care, communication skills were considered especially critical for building rapport, exploring risk factors, and supporting behavioral change, including treatment adherence and cessation efforts.

"…because patients with this addiction are more about how we can build good communication between doctors and patients, so we can explore the risk factors and educate patients to help them quit [substances]." [Participant 8, male]

Participants emphasized that full competence in the *collaborator* role is essential for delivering optimal and comprehensive patient care. Collaboration was perceived as necessary because physicians cannot work in isolation and must coordinate effectively with other healthcare professionals, including nurses, pharmacists, specialists, and other relevant stakeholders. Participants highlighted that interprofessional collaboration facilitates the exchange of knowledge, accurate information transfer, and shared decision-making, thereby enhancing the quality and continuity of care. Additionally, participants noted that collaboration extends to the doctor–patient relationship, where cooperative engagement can strengthen trust, adherence, and discipline within patients' care routines. Overall, the ability to collaborate was viewed as a key competency that amplifies clinical impact and supports integrated, patient-centered care.

"To coordinate with other stake holder that can contribute positively to patient treatment" [Participant 4, female]

Participants highlighted that competence in the *manager/ leader* role is important for ensuring effective guidance, coordination, and continuity of patient care. Physicians were perceived not only as clinical decision-makers but also as leaders responsible for managing patients, coordinating support systems, arranging referrals, and optimizing available resources, particularly in settings with limited facilities or equipment. Participants emphasized that leadership and management skills enable doctors to prioritize care, manage time efficiently, and function effectively in high-pressure clinical environments.

"The field of management will be related to our profession as doctors. In my view, doctors will not only be healers but also leaders. As leaders, we will be the ones to make medical decisions, arrange referrals, evaluate services, and so on." [Participant 10, male]

Participants emphasized that full competence in the health advisor role is essential for maximizing treatment effectiveness and addressing health issues beyond the individual patient level. Physicians were viewed not only as clinicians but also as advisor who promote evidence-based health practices, preventive care, and healthy lifestyle behaviors. Participants highlighted the importance of understanding patients' cultural backgrounds and social networks to support effective advocacy and appropriate referral pathways. Health advisory was also perceived as extending to community and public health engagement, including health

education, participation in preventive programs across primary, secondary, and tertiary levels, and responsible use of social media to counter misinformation.

"General practitioners serve not only as providers of clinical care but also as educators and public health advisors. They promote healthy behaviors, deliver health education, and engage actively in community-based preventive initiatives, including immunization, balanced nutrition, and infectious disease prevention, thereby contributing to increased public awareness and improved community quality of life." [Participant 11, male]

Participants identified competence in the s*cholar* role as fundamental to modern medical practice, emphasizing the necessity of continuous learning and the application of evidence-based medicine. This competency was perceived as essential for understanding evolving disease concepts, critically appraising scientific literature, and integrating valid and up-to-date evidence into clinical decision-making. Participants highlighted that scholarly competence enables physicians to think critically and reflectively, evaluate medical practices, and adapt to new scientific developments, thereby improving the quality of care. Additionally, participants recognized the importance of research literacy for generating and utilizing valid data to inform clinical practice and health policy.

"…general practitioners must have critical, reflective, and evidence-based thinking skills. We must be able to evaluate medical practices, keep up with the latest scientific developments, and apply themin clinical decision-making. This demonstrates the responsibility for continuous improvement of healthcare quality." [Participant 11, male]

Table 1. Participants' Perspectives on the Importance of Competency Domains Based on the CanMEDS Framework for the Care of Patients with Addiction or Substance Use Disorders

Domain	Level of Competency				
	Not at all competent	Slightly competent	Adequately competent	Fairly competent	Fully competent
Medical expert	-	-	-	2	10
Professional	-	-	1	1	10
Communicator	-	-	-	-	12
Collaborator	-	-	-	3	9
Manager/ leader	-	-	2	4	6
Health advisor	-	-	1	2	9
Scholar	-	-	2	5	5

Interview Section

Data from twelve medical students were analyzed using Braun and Clarke's six-step method for thematic analysis: familiarization, initial coding, generating and reviewing themes, defining and naming themes, and reporting. Students' responses were analyzed with specific attention to their perceived educational needs regarding *knowledge*, *skills* and *acquirement of knowledge and skills* in addiction medicine.

Knowledge

From the analysis of participants' answers in the knowledge section, six themes emerged, reflecting multidimensional learning needs across biomedical and scientific foundation of addiction, social and environmental influences, psychosocial and behavioral aspects, clinical skills, rehabilitation, as well as social and economic impact of addiction.

1. Biomedical and Scientific Foundation of Addiction

Participants emphasized the importance of understanding the biomedical basis of addiction, including pharmacology, neurobiology, and pathophysiological mechanisms. Knowledge of how substances interact with the body, the

chemical processes underlying dependence, and the biological basis of withdrawal and craving was viewed as essential for explaining why addiction occurs and persists. They highlighted the need for both basic and in-depth scientific knowledge to support accurate diagnosis, rational treatment selection, and evidence-based clinical reasoning.

"…how a substance works in the body and causes addiction…" [Participant 2, male]

2. Social and Environmental Influences

Participants consistently identified social and environmental factors as key contributors to the development and progression of addiction. Peer pressure, family dynamics, exposure within the social environment, and cultural norms were perceived as major influences on substance use initiation and maintenance. Participants also highlighted the role of stigma and environmental exposure (e.g., smoking, drugs, pornography) in worsening addiction if left unaddressed, underscoring the importance of contextual understanding in patient care.

"Addiction begins with environmental influences (peer pressure and the influence of others)" [Participant 1, male]

3. Psychosocial and Behavioral Aspects

Participants described the need to understand psychological and behavioral factors of addiction, including stress, curiosity, emotional regulation, mood changes, and behavioral withdrawal from social environments. Recognizing patients' psychosocial functioning, family relationships, and coping mechanisms was considered very important for understanding addiction, motivating behavioral change, and supporting adherence to treatment recommendations.

"It is important to recognize the signs of addiction, such as mood swings, withdrawal from one's environment and family, and economic factors." [Participant 2, male]

4. Clinical Skills in Addiction Care

Participants emphasized knowledge related to core clinical competencies, including recognizing signs of acute intoxication and withdrawal, conducting comprehensive patient assessments, and identifying comorbid conditions. Understanding contraindications to treatment and adjusting management to patient conditions were viewed as critical for safe and effective care. Participants also highlighted the importance of knowing how to position oneself professionally with patients to facilitate trust and compliance.

"Recognizing signs [of addiction] that appear during physical examinations" [Participant 7, female]

5. Rehabilitation and Recovery

Participants highlighted rehabilitation as a crucial component of addiction medicine knowledge. This included understanding recovery pathways, long-term management strategies, and how patients can reintegrate into society without functional impairment. Knowledge of reducing patient distress, addressing underlying causes of addiction, and supporting sustained recovery was viewed as central to improving patient productivity and quality of life.

"How patients can return to normal and socialize in society…" [Participant 1, male]

6. Social and Economic Impact of Addiction

Participants emphasized broader societal consequences of addiction, including reduced productivity, economic decline, deterioration in quality of life, and long-term impacts on human resources and even national development. They viewed knowledge of addiction-related societal and economic burdens as important for appreciating addiction as a public health issue rather than solely an individual medical condition, reinforcing the physician's role in prevention and advocacy.

"The goal is to reduce addiction, prevent relapse, improve mental and physical health, restore the patient to their previous life, communicate with family members to

avoid pressuring the patient, provide understanding about quality of life to offer hope and motivation" [Participant 12, female]

Skills

From the analysis of participants' answers in the skill section, the responses were categorized into communication, empathy, advocacy, and professional development.

1. Effective Communication Skills

Participants consistently emphasized communication as the most essential skill in addiction care. This included choosing words carefully to avoid causing stress, explaining medical information in layman's terms, using key points, and adopting a constructive, non-confrontational approach. Attention to tone, clarity, and appropriateness of language was viewed as critical for effective patient engagement.

"Communication, interpreting patient expressions, adjusting communication style to the each patient" [Participant 4, female]

2. Empathy and Interpersonal Relationship

Students highlighted the importance of interpreting body language, facial expressions, and speech patterns, as well as demonstrating empathy. Empathic communication was perceived as essential for understanding patients' experiences, identifying underlying causes of addiction, and fostering a sense of safety and trust, particularly in vulnerable patient populations. Effective communication combined with empathy was viewed as fundamental to establishing therapeutic relationships, improving patient openness, and supporting adherence to treatment recommendations. Participants identified skills related to rehabilitation as important, including maintaining connections with patients' family environments, conducting regular supervision, and monitoring progress over time. Collaboration with families was viewed as essential for supporting recovery and ensuring continuity of care.

"Empathetic communication, explaining without judging, building trust, motivating, affirmation" [Participant 9, male]

3. Clinical Observation and Physical Examination Skills

Students expressed the need for hands-on clinical skills, including physical examination, direct observation of patients, and exposure to diverse addiction cases. Visiting hospitals and engaging in real clinical settings were seen as necessary for developing practical competence and contextual understanding of patient conditions. These skills also needed to recognize signs of addiction and related health issues that the patients may experience. Participants stated that observing case variations is necessary to improve clinical assessment when encountering addiction patients.

"Direct observation of patient condition with case variations…" [Participant 3, male]

4. Advocacy, Public Speaking, and Stakeholder Engagement

Students highlighted the need for advanced skills such as critical thinking, advocacy, lobbying, and relationship-building with officials or institutions to facilitate therapy. These skills were perceived as important for addressing barriers to care, coordinating resources, and supporting patients beyond direct clinical encounters. Participants also feel that these skills contribute to promote access to treatment and reducing stigma towards patients with addiction.

"Communication skills with family for therapy, stress triggers, advocacy with social services for therapy, and things to note/be aware of" [Participant 4, female]

5. Critical Thinking and Supervision

Participants highlighted ongoing professional development as an essential component of becoming a competent physician. They emphasized the application of critical thinking in clinical decision-making to ensure that patient management is

thoughtful, evidence-based, and responsive to complex clinical situations. Regular supervision was regarded as important for continuous improvement of clinical skills, allowing learners to receive feedback, correct mistakes, and refine their skills. In addition, participants underscored the value of reflective practice and mentorship, viewing these processes as key mechanisms for professional growth, self-awareness, and the ongoing development of competence throughout medical training.

Acquirement of Knowledge and Skills

From the analysis of participants' answers in the acquirement of knowledge and skills section, the answers were categorized into traditional academic learning, practical skills development, social and interpersonal skills, and organizational and soft skills.

1. Traditional Academic Learning

Participants highlighted the significance of obtaining foundational knowledge through formal educational methods, including lectures, tutorials, and curriculum-based teaching. These approaches were viewed as foundational for acquiring theoretical knowledge, understanding core concepts, and establishing a systematic framework for addiction medicine. Lectures repeatedly mentioned as primary source of theoretical knowledge. Some participants mentioned other resources such as textbooks, journals and YouTube were considered essential supplementary materials for comprehensive understanding and supporting evidence-based learning.

2. Practical Skills Development

Students consistently highlighted the importance of direct exposure to clinical settings through hospital visits, patient encounters, and skills laboratories involving standardized patients. Experiential learning was perceived as critical for translating theoretical knowledge into practical skills. Through skills laboratories with standardized patients, participants were trained to practice communication, clinical examination, and counseling skills. However, participants also acknowledged ethical considerations, particularly the need to respect patient privacy and obtain informed consent during direct patient interactions.

3. Social and Interpersonal Skills

Socializing with peers, patients, and broader social networks mentioned as an important way for interpersonal skill acquisition. Participants viewed interpersonal interaction as a means of developing communication skills, empathy, teamwork, enhancing abilites to interact compassionately with patients, families, and colleagues. Informal learning through social engagement was perceived as complementary to formal education.

4. Organizational and Soft Skills

Participants underscored self-directed learning through independent study, online platforms (e.g., educational videos), and engagement in organizational activities. These experiences were viewed as important for developing soft skills including leadership, time management, professionalism, team coordination, as well as fostering lifelong learning habits.

DISCUSSION

The findings of this study highlight a strong perceived need among participants for a structured, comprehensive, and practice-oriented approach to addiction medicine education. Students emphasized the importance of a solid biomedical foundation, including pharmacology, neurobiology, pathophysiology, withdrawal mechanisms, and treatment contraindications. This aligns with prior literature indicating that insufficient grounding in addiction science may reduce physicians' confidence and competence in managing substance use disorders (SUDs).[20] A clear understanding of biological mechanisms was considered

essential not only for clinical decision-making but also for effectively explaining disease processes to patients and applying evidence-based treatments. Moreover, exposure to addiction medicine training has been shown to improve students' attitudes toward patients with addiction, reinforcing the need to address both cognitive and attitudinal domains within the curriculum.[21] Early exposure to addiction medicine education is associated with sustained positive attitudes toward individuals with substance use disorders, supporting the importance of introducing addiction-related content early in medical training.[22]

Beyond biomedical knowledge, participants perceived addiction medicine as inherently integrative, encompassing biological, psychological, and social dimensions. They highlighted the importance of understanding clinical manifestations, psychosocial determinants, societal consequences, and stigma in patient care. This supports the need for curricula grounded in a biopsychosocial framework that connects foundational science with patient-centered and sociocultural perspectives. Recommendations from Ayu et al. further emphasize the importance of developing a core undergraduate addiction medicine curriculum that includes both foundational knowledge and essential clinical skills, including communication, screening, brief intervention, referral to treatment, and prevention, with attention to local addiction-related issues.[23]

In addition to diagnosis and treatment, harm reduction emerged as an important educational component. Literature suggests that harm reduction is a realistic and patient-centered strategy, particularly for individuals who are not ready or able to achieve complete abstinence. It helps mitigate the health, social, and economic consequences of addiction while strengthening therapeutic relationships. Early exposure to harm reduction principles is therefore crucial in fostering empathy, reducing stigma, and equipping future physicians with practical and adaptable clinical skills.[24]

Despite its recognized importance, addiction medicine education remains limited and fragmented in many medical curricula. Teaching often prioritizes theoretical knowledge over the development of clinical skills and professional attitudes. This gap is concerning, as undergraduate medical education is a critical period for shaping professional identity, empathy, and attitudes toward patients with addiction. Consequently, there is a need for early and integrated, addiction medicine education that incorporates evidence-based treatments, communication skills, and attitude formation to address increasing clinical demands and reduce stigma, morbidity, and mortality associated with SUDs.[25] Experiential learning was consistently identified as a key component of effective education.

Evidence from Klimas et al. demonstrates that structured and supervised clinical exposure, such as elective rotations in addiction medicine, significantly improves students' knowledge, clinical readiness, and confidence.[26] Similarly, participants in this study emphasized the importance of early and structured exposure that integrates biomedical knowledge with clinical and patient-centered approaches. Practical learning modalities, including direct patient encounters, skills laboratories, and supervised clinical experiences were considered essential for translating theoretical knowledge into real-world competence.

Participants also underscored the importance of social and environmental influences on addiction, including peer pressure, family dynamics, stigma, and broader societal factors. This reinforces the need to incorporate social science perspectives into addiction medicine education and further supports the

conceptualization of addiction as a biopsychosocial condition.

In terms of competencies, communication and empathy were identified as critical skills. Participants emphasized the importance of explaining conditions in accessible language, using non-confrontational approaches, interpreting body language, and building trust. These findings are consistent with existing evidence highlighting the central role of effective communication in addiction care, particularly for reducing stigma and improving patient engagement and adherence.

Clinical and rehabilitation-related skills were also considered essential. Students highlighted the value of physical examination, direct patient observation, and exposure to real clinical cases to contextualize theoretical knowledge. At the same time, they acknowledged the importance of ethical considerations, including patient privacy and informed consent. Furthermore, participants emphasized rehabilitation competencies such as long-term monitoring, family involvement, and coordination with the patient's social environment, reflecting an understanding that addiction management requires continuity of care and multidisciplinary collaboration.

Ongoing professional development was another key theme. Participants recognized the importance of critical thinking, supervision, reflective practice, and mentorship in developing competence in addiction medicine. This aligns with the CanMEDS scholar role, which emphasizes lifelong learning and evidence-based practice.

Participants described a variety of learning modalities that contribute to competency development, including lectures, tutorials, skills laboratories with standardized patients, hospital visits, independent study, academic journals, and social interactions. While lectures and tutorials provide foundational knowledge, experiential learning methods such as skills laboratories, patient encounters, and community engagement were viewed as essential for developing clinical skills and professional attitudes. These findings highlight the need for a comprehensive and ethically grounded educational approach.

Overall, the findings of this study are consistent with previous literature, demonstrating that medical students perceive addiction medicine education as a critical component of their training. Participants emphasized the importance of understanding addiction not only from a biomedical perspective but also through patient-centered and pragmatic approaches, including harm reduction. They also highlighted the need to recognize patients' social contexts, reduce stigma, and adopt flexible strategies when abstinence is not immediately achievable. This alignment suggests that integrating harm reduction and biopsychosocial principles into undergraduate curricula may enhance students' competencies, empathy, and readiness to manage SUDs in diverse clinical settings.

According to the Indonesian National Standards for Medical Professional Education issued by the Indonesian Medical Council in 2019, mental and behavioral disorders due to psychoactive substance use are classified at competency level 2, indicating that general practitioners should be able to perform these competencies under full or direct supervision and possess basic knowledge and skills.[27] At Padjadjaran University, addiction-related psychiatric education is currently delivered within the eight-week Neurobehavior and Special Senses System (NBSS) block. This block integrates biomedical sciences, clinical sciences, bioethics, humanities, and public health, alongside medical skills training and professional development. Teaching methods include integrated discussions, self-paced learning modules, seminars,

clinical decision-making training, and elective programs.

Although the curriculum appears comprehensive, participants reported variability in their learning experiences, particularly regarding the quantity of psychiatric case exposure, especially in relation to SUDs. These findings suggest the need for improvements in tutor guidance, student learning resources, and continuous assessment to ensure more consistent and effective competency development.

CONCLUSION

Medical students perceive addiction medicine as a complex field, requiring not only biomedical knowledge but also communication, collaboration, leadership, advocacy, and learning skills. Participants perceived competence in addiction medicine as highly dependent on interpersonal and clinical level skills. Communication and empathy emerged as foundational, enabling trust-building and effective patient engagement. Experiential clinical exposure, combined with critical thinking and advocacy skills, was viewed as necessary to manage the complexity of addiction care, support rehabilitation, and navigate broader healthcare and social aspects. These findings highlight the importance of skills-based, experiential learning approaches in addiction medicine education.

This study suggest that undergraduate addiction medicine education should move beyond fragmented content delivery toward integrated curriculum that balances theory, skills training, and cases exposure. Aligning educational strategies with the CanMEDS framework may help ensure that future physicians are not only clinically competent but also effective communicators, collaborators, leaders, health advocates, and scholars in the field of addiction medicine. The available data can provide a basis for further developing addiction medicine education toward an integrated curricula, combining theoretical and experiential learning to enhance clinical competence and reduce stigma in addiction care.

ACKNOWLEDGEMENTS

Cornelis A. J. De Jong, MD, PhD, for his help in drafting the protocol for this study.

CONFLICT OF INTEREST

The authors report no conflicts of interest. The authors are responsible for the content and writing of the publication.

FUNDING

This research received no specific grant from any public, commercial or not-for-profit sector funding.

REFERENCES

1. World Health Organization (WHO), “International Classification of Diseases 11th Revision (ICD-11).” [Online]. Available: https://www.who.int/classifications/icd/en/
2. C. A. J. DeJong, G. Welle-Strand, E. Hanafi, L. Pinxten, R. Bhad, and S. Arunogiri, “Global Assessment of Training Needs in Addiction Medicine,” *Eur. Addict. Res.*, vol. 31, no. 1, pp. 75–85, 2025, doi: 10.1159/000542182.
3. J. Rehm and K. D. Shield, “Global burden of alcohol use disorders and alcohol liver disease,” *Biomedicines*, vol. 7, no. 4, pp. 1–10, 2019, doi: 10.3390/biomedicines 7040099.
4. N. Masaeli and H. Farhadi, “Prevalence of Internet-based addictive behaviors during COVID-19 pandemic: a systematic review,” *J. Addict. Dis.*, vol. 39, no. 4, pp. 468–488, 2021, doi: 10.1080/10550887.2021.1895962.
5. M. W. R. Stevens, D. Dorstyn, P. H. Delfabbro, and D. L. King, “Global prevalence of gaming disorder: A systematic review and meta-analysis,” *Australian and New Zealand Journal of Psychiatry*, vol. 55, no. 6, pp. 553–568, 2021, doi: 10.1177/0004867420962851.
6. N. D. Volkow and C. Blanco, “Substance use disorders: a comprehensive update of
7. classification, epidemiology, neurobiology, clinical aspects, treatment and prevention,” *World Psychiatry*, vol. 22, no. 2, pp. 203–229, 2023, doi: 10.1002/wps.21073.
8. N. Aryanty and I. Maria, “Adiksi Internet: Studi pada Remaja SMA Kota Jambi,” *Jambi Medical Journal*, vol. 10, no. 4, pp. 493–504, 2022.
9. M. L. V. Robert Boland, *Kaplan & Sadock’s Synopsis of Psychiatry*, Twelfth. Wolters Kluwer, 2022.

10. S. Schoicket, R. A. MacKinnon, and R. Michels, *The Psychiatric Interview in Clinical Practice*, vol. 23, no. 2. 2016. doi: 10.2307/581746.
11. J. Frank, L. Snell, J. Sherbino, and Editors, *CanMEDS 2015 - Leader*. 2015. Available: http://www.royalcollege.ca/portal/page/portal/rc/common/documents/canmeds/framework/canmeds2015_framework_series_IV_e.pdf
12. I. B. Crome and C. M. Goodair, "Undergraduate Medical Training in Substance Misuse," in *Textbook of Addiction Treatment*, Cham: Springer International Publishing, 2021, pp. 869–881. doi: 10.1007/978-3-030-36391-8_61.
13. K. Hostetter, B. Thakkar, C. Edwards, and C. E. Martin, "Addiction curriculum design for medical students," *Clin. Teach.*, vol. 19, no. 1, pp. 29–35, Feb. 2022, doi: 10.1111/tct.13438.
14. F. Lowry, "Brief Overdose Training for Med Students Delivers Lasting Benefits." [Online]. Available: https://www.medscape.com/viewarticle/942899#vp_2
15. T. E. H. Moses, J. S. Chou, J. L. Moreno, L. H. Lundahl, E. Waineo, and M. K. Greenwald, "Long-term effects of opioid overdose prevention and response training on medical student knowledge and attitudes toward opioid overdose: A pilot study," *Addictive Behaviors*, vol. 126, 2022, doi: 10.1016/j.addbeh.2021.107172.
16. S. Rudrakumar, N. Varshney, and R. D. Taylor, "Medical student perspectives on substance misuse education in the medical undergraduate programme: a grounded theory approach," *BMC Med. Educ.*, vol. 23, no. 1, pp. 1–13, 2023, doi: 10.1186/s12909-023-04145-z.
17. J. Klimas *et al.*, "What Are the Self-Assessed Training Needs of Early Career Professionals in Addiction Medicine? A BEME Focused Review," *MedEdPublish*, vol. 9, p. 62, 2020, doi: 10.15694/mep.2020.000062.1.
18. A. P. Ayu, A. F. A. Schellekens, S. Iskandar, L. Pinxten, and C. A. J. De Jong, "Effectiveness and Organization of Addiction Medicine Training Across the Globe," *Eur. Addict. Res.*, vol. 21, no. 5, pp. 223–239, 2015, doi: 10.1159/000381671.
19. J. R. Geraghty *et al.*, "Empowering medical students as agents of curricular change: a value-added approach to student engagement in medical education," *Perspect. Med. Educ.*, vol. 9, no. 1, pp. 60–65, 2020, doi: 10.1007/s40037-019-00547-2.
20. B. G, *The Beautiful Risk of Education*. Boulder, Colorado: Paradigm Publishers, 2014.
21. A. Cernasev, K. M. Kline, R. E. Barenie, K. C. Hohmeier, S. Stewart, and S. S. Forrest-Bank, "Healthcare Professional Students' Perspectives on Substance Use Disorders and Stigma: A Qualitative Study," *Int. J. Environ. Res. Public Health*, vol. 19, no. 5, 2022, doi: 10.3390/ijerph19052776.
22. A. P. Ayu *et al.*, "Improving Medical Students' Attitude toward Patients with Substance use Problems through Addiction Medicine Education," *Subst. Abus.*, vol. 43, no. 1, pp. 47–55, Dec. 2022, doi: 10.1080/08897077.2020.1732512.
23. R. Malinowski, C. Poland, J. K. Alan, and M. O. Walsh, "A Novel Approach to Addiction Medicine Education for Undergraduate Medical Students," *Med. Sci. Educ.*, vol. 33, no. 6, pp. 1319–1322, Oct. 2023, doi: 10.1007/s40670-023-01907-8.
24. A. P. Ayu *et al.*, "Core addiction medicine competencies for doctors: An international consultation on training," *Subst. Abus.*, vol. 38, no. 4, pp. 483–487, 2017, doi: 10.1080/08897077.2017.1355868.
25. K. R. Smith, N. K. Shah, A. L. Adamczyk, L. C. Weinstein, and E. L. Kelly, "Harm reduction in undergraduate and graduate medical education: a systematic scoping review," *BMC Med. Educ.*, vol. 23, no. 1, pp. 1–22, 2023, doi: 10.1186/s12909-023-04931-9.
26. A. Ram and M. S. Chisolm, "The time is now: Improving substance abuse training in medical schools," *Academic Psychiatry*, vol. 40, no. 3, pp. 454–460, 2016, doi: 10.1007/s40596-015-0314-0.
27. J. Klimas *et al.*, "Impact of a brief addiction medicine training experience on knowledge self-assessment among medical learners," *Subst. Abus.*, vol. 38, no. 2, pp. 141–144, 2017, doi: 10.1080/08897077.2017.1296055.
28. Kementerian Kesehatan Republik Indonesia, "Standar Pendidikan Profesi Dokter Indonesia," *Konsil Kedokteran Indonesia*, p. 169, 2019.