

LETTER TO THE EDITOR

Medical education after COVID-19: Students' perspectives on determinants of educational quality

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To the editor,

The coronavirus disease 2019 pandemic resulted in substantial disruption to medical education systems globally (1). Infection control measures, including suspension of in-person instruction, reduction of clinical exposure, and rapid implementation of online learning modalities, altered the structure and delivery of undergraduate medical education (2). Although digital platforms enabled continuity of instruction, these adaptations raised concerns about the adequacy of clinical skill acquisition, student engagement, and institutional capacity to sustain educational quality (3). Given the practice-based nature of medical training, systematic evaluation of factors influencing educational quality in the post-pandemic period is necessary to inform educational reform and preparedness for future public health emergencies. Medical students constitute a key stakeholder group in evaluating educational quality, as they are directly affected by instructional strategies, institutional resources, and clinical training environments (4). Student perspectives provide critical information regarding the effectiveness of

educational processes and outcomes. Prior studies have identified suboptimal teaching methods, insufficient faculty readiness for online instruction, limited institutional resources, and misalignment between curricula and clinical practice as factors that adversely affect educational quality (5). However, evidence examining these factors in the post-COVID-19 context remains limited, particularly in low and middle-income countries. This study aimed to explore medical students' perspectives on internal and external factors associated with the quality of medical education following the COVID 19 pandemic. A qualitative phenomenological study was conducted between 2022 and 2023 among undergraduate medical students from several medical schools in Yogyakarta, Indonesia. Ethical approval was obtained from Universitas Negeri Yogyakarta, and written informed consent was secured from all participants prior to data collection. Purposive sampling was used to recruit students who had completed at least two academic semesters and were actively engaged in medical training. Students who declined participation or were unable to complete clinical learning requirements were excluded. Recruitment continued



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until thematic saturation was achieved, yielding a final sample of 20 participants, comprising 13 females and 7 males aged 20 to 25 years. Data were collected using semi-structured, in-depth interviews designed to elicit participants' experiences and perceptions regarding education quality in the post-pandemic context. Interviews were conducted in a private setting, lasted approximately 30 to 45 minutes, and were audio recorded with participant consent. The interview guide was developed based on study objectives and relevant literature, addressing internal factors such as teaching practices and student engagement, as well as external factors including institutional support, clinical training, and educational policy (Table 1).

Audio recordings were transcribed verbatim. Data analysis was conducted using content analysis with MAXQDA version 10. The analysis followed phenomenological principles, including repeated transcript review, systematic coding, categorisation, and theme development. Two primary themes emerged from the analysis, representing internal and external factors associated with education quality. Internal factors included professors and students. Participants consistently identified faculty-related variables as central determinants of education quality. Teaching methods, adaptability to post-pandemic learning environments, and communication skills were reported to influence instructional effectiveness. Participants indicated that faculty members who employed interactive teaching strategies, integrated digital learning tools, and utilised clinical case-based

discussions facilitated improved comprehension and engagement. Adaptation to hybrid and blended learning formats was perceived as particularly relevant in the post-pandemic period. Additionally, timely feedback, accessibility, and clear communication were associated with enhanced learning experiences. Student related factors were also identified as significant contributors to education quality. Participants emphasized the role of motivation, self-regulation, and active engagement in learning activities. Students who demonstrated responsibility for independent learning, participated in academic discussions, and sought supplementary educational resources reported more favorable educational experiences. Adaptability to evolving learning modalities introduced during and after the pandemic was considered essential for maintaining academic performance. These findings underscore the importance of self-directed learning competencies in contemporary medical education. External factors included universities, hospitals, and the broader educational system. Institutional support provided by universities was described as a critical determinant of education quality. Participants highlighted the importance of access to updated learning resources, reliable digital infrastructure, effective learning management systems, and academic support services. Curriculum relevance was also emphasized, with participants expressing the need for systematic curriculum updates aligned with current medical knowledge, clinical guidelines, and healthcare system demands. Hospitals were identified as essential settings for developing clinical competence. Participants reported variability in the quality of clinical training experiences across hospital sites. Hospitals offering structured clinical training programs, experienced supervisors, adequate patient exposure, and consistent mentorship were perceived as providing higher quality education. Supervised hands on practice and constructive feedback during clinical rotations were considered fundamental to the acquisition of clinical skills and professional confidence. At the level of the educational system, national policies, curriculum frameworks, and assessment strategies were identified as influential external factors. Participants expressed concerns regarding reliance on traditional examination-based assessments that emphasise theoretical knowledge over practical competence. There was strong support for competency-based assessment approaches that

Table 1. Interview guide for factors associated with quality of education in post pandemic

1. How is the teaching method in your college?
2. How do you evaluate and define the quality of current education/
3. What are the weakness of the current education?
4. What factors caused these weakness? Explain different dimensions
5. In your opinion, what dimensions play more significant roles in your education?
6. In your opinion, strengthening of which factors will improve the quality of education
7. In your opinion, what factors play more significant roles in post pandemic periods?

evaluate clinical skills, critical thinking, communication, and problem-solving abilities (6). Alignment between assessment methods and real world clinical practice was considered necessary to optimize graduate preparedness. This study provides post-pandemic evidence regarding factors associated with the quality of medical education from the perspective of medical students. The findings indicate that education quality is shaped by the interaction of faculty instructional practices, student engagement, institutional resources, clinical training environments, and educational policies. These results are consistent with existing literature emphasising the importance of faculty development, student-centred pedagogical approaches, and integration of competency-based assessment models in medical education. Several limitations warrant consideration. The study was conducted in a single geographic region with a limited sample size, which may limit the transferability of findings. The qualitative design may be subject to participant recall bias and researcher interpretation. Furthermore, the cross sectional nature of the study does not allow assessment of changes in perceptions over time. In conclusion, this study identifies key internal and external factors associated with the quality of medical education in the post COVID 19 era. Strategies aimed at enhancing faculty adaptability, strengthening student engagement, improving institutional infrastructure, optimizing clinical training environments, and reforming assessment systems may contribute to improved educational outcomes. These findings may inform evidence-based policy and curricular interventions to strengthen medical education following large-scale public health disruptions.

Conflict of interest: Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article.

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