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ANALYSIS OF THE IMPACT OF DISTANCE LEARNING ON THE QUALITY OF EDUCATION IN MEDICAL SPECIALTIES

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Abstract*: The rapid transition to online learning during the COVID-19 pandemic significantly impacted medical education in Bulgaria. A survey conducted between 734 students in various medical universities and specialties. The point of the study was to analyze the perceived influence of distance learning on education quality. Among students more than half (53.46%) recognized the benefits of flexible learning and remote access whereas 33.79% have doubts regarding their capabilities to learn practical skills through these methods. Our study highlights the necessity of hybrid learning models that combine digital resources with hands-on training to ensure educational effectiveness in medical disciplines.*
Keywords: *medical education, distance learning, hybrid model*

1. Introduction

Over the past five years, higher education has undergone a dramatic transformation toward digital instruction, particularly in response to the COVID-19 pandemic. Medical education, with its inherent dependence on practical training and clinical exposure, faced profound challenges in adapting to this shift. Institutions were compelled to implement distance learning strategies in short timeframes, often without adequate preparation. In this context, our study explores the perceptions of medical students in Bulgaria regarding the impact of distance learning on the quality of their education. The objective is to identify both strengths and limitations, and to offer recommendations for future educational models.

2. Materials and Methods

A structured questionnaire was distributed between April and June 2024 to 734 students from different medical universities in Bulgaria. The survey included questions on demographic data, participation in online learning, perceptions of quality, financial aspects and practical limitations. Descriptive statistics were used to analyze trends and differences between subgroups.

3. Results

The results showed us that 97.1% of respondents had participated in online education with 53.46% saying that it improved the quality of their education. As shown in Table 1, 30.47% (n=220) responded positively that online learning improved the quality of their education, while 22.99% (n=166) expressed partial agreement. However, 33.79% (n=244) stated that they believed the quality either rather or significantly decreased, and 12.74% (n=92) could not give us a firm answer. Figure II illustrates that 49.18% of respondents approved of the online learning method,

In contrast, 41.12% - representing the combined share of "Rather No," "No," and "Cannot decide" responses-expressed varying degrees of hesitation or outright disapproval.

Table 1. Perception of students on whether distance learning improves education quality

Response	Percentage	Respondents
Yes	30.47%	220
Rather Yes	22.99%	166
Rather No	19.39%	140
No	14.40%	104
Cannot Decide	12.74%	92
Total respondents 734		

Students valued the flexibility, convenience, and accessibility that online education offered, particularly in accessing recorded lectures and learning materials remotely. However, a significant proportion raised concerns about the lack of direct interaction with professors and hospital colleagues, insufficient opportunities for hands-on clinical training, and the difficulty in acquiring practical competencies solely through digital platforms.

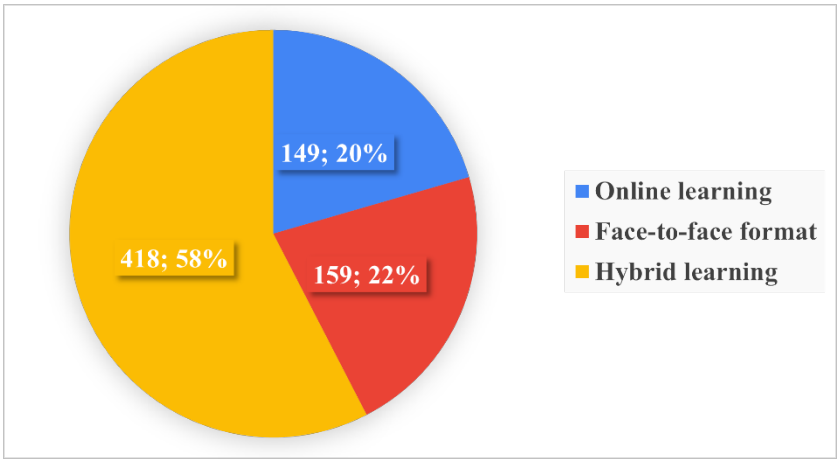

Figure 1. Distribution of student responses to the question: How would you prefer to continue your education in the future?

The majority of respondents, 58% (n=418), showed a clear preference for a hybrid learning model, which combines online theoretical instruction with face-to-face clinical and practical modules. This strong support for hybrid formats highlights students recognition of the flexibility and accessibility of online learning, while also emphasizing the irreplaceable value of direct, in-person training for developing practical skills and professional competencies. Meanwhile, 22% (n=159) of students expressed a preference for the traditional face-to-face format, underscoring the continued

importance of personal interaction, immediate feedback, and hands-on experience in medical education. A smaller proportion, 20% (n=149), favored fully online learning, reflecting appreciation for its convenience and adaptability, but also suggesting that only a minority of students consider it sufficient as a stand-alone approach for medical and healthcare studies. These results further showed us the need for flexible educational strategies that can integrate technological innovation with strong clinical and practical components to ensure comprehensive professional preparation.

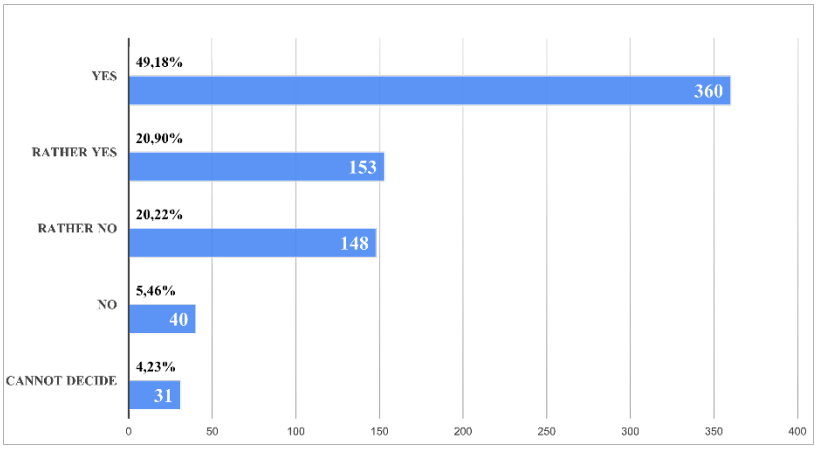

Figure 2. Distribution of student responses to the question: "Do you approve the online method of learning?"

While a near majority (49.18%) expressed clear approval of the method, a considerable portion of the respondents demonstrated uncertainty or disapproval. Specifically, 20.90% responded with "Rather Yes," suggesting conditional support that likely depends on contextual or disciplinary factors. In contrast, 20.22% reported "Rather No," reflecting hesitation rooted perhaps in dissatisfaction with specific elements of the online format such as interactivity or feedback mechanisms. A smaller but still noteworthy proportion-5.46%-completely rejected the online model, whereas 4.22% were undecided, suggesting either limited exposure or mixed experiences. These findings underscore a lack of consensus among students and point toward the need for more personalized or discipline-specific approaches within online education frameworks.

4. Discussion

Our findings are in line with international studies showing that, while online learning brings flexibility and independence in higher education, it cannot fully replace in-person training in fields that depend on hands-on experience. In medical education, students need not only theoretical knowledge but also practical skills and direct interaction with patients and teachers. These are essential components difficult to reproduce through digital platforms alone. As such, distance learning, when applied exclusively, risks neglecting core aspects of clinical training, including the development of diagnostic reasoning in real-time, communication with patients, and hands-on procedures. The partial support for distance learning among Bulgarian students highlights both its advantages and limitations. Many students appreciate the convenience, better time management, easier access to materials, and the chance to watch recorded lectures again. Nevertheless, it equally reveals serious weaknesses mainly, in the form of perceived insufficiency of gaining practical skills. Similar sentiments can be observed in other similar researches elsewhere in Europe as they all point out that despite the value of virtual simulation and case-based e-learning, the results cannot

effectively imitate true patient interaction or the tactile nature of medical practice and procedure. Moreover, our results suggest that student engagement and motivation can vary greatly depending on the teaching method. Some students mentioned feeling isolated and lacking academic support, especially when asynchronous formats were used without enough feedback from instructors or interaction with peers. These psychological and educational challenges show the need for better structured online interactions and more consistent feedback. The endorsement of hybrid models suggests an emerging consensus on the optimal approach moving forward. By integrating asynchronous and synchronous online tools with clinical simulations, laboratory work, and in-hospital practice, educational institutions can ensure continuity and resilience while preserving the rigor and comprehensiveness of medical training. The hybrid model also facilitates adaptive learning strategies, offering flexibility for theoretical modules while safeguarding the irreplaceable value of in-person training for clinical proficiency and interpersonal development.

5. Conclusions

Our research demonstrates that Bulgarian students in healthcare fields hold balanced and nuanced views on online education. While they appreciate the convenience and flexibility of digital learning, they also strongly value face-to-face interactions and practical experiences. The widespread support for hybrid models among respondents reflects a collective understanding of the need to combine the best aspects of both approaches. Based on these findings, we recommend that medical universities and faculties develop and implement structured hybrid curricula that integrate digital tools with in-person training. Such programs should emphasize flexibility in delivering theoretical knowledge while ensuring robust opportunities for clinical skill acquisition and direct patient engagement. By aligning technological innovation with pedagogical integrity and clinical standards, institutions can enhance educational quality, strengthen professional readiness, and ultimately contribute to better patient care outcomes. This balanced approach not only offers solutions to existing issues but also enhances the long-term stability and adaptability of medical education, making universities prepared for potential future challenges. Investing in hybrid strategies today will help cultivate a generation of healthcare professionals who are both technologically competent and clinically proficient.

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