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Review Article

The Role of Socioeconomic Factors in Medical Education: A Narrative Review

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Abstract

Background: Socioeconomic factors pose serious obstacles against equity and inclusivity in medical education, affecting admissions, retention, and the future composition and diversity of the workforce in delivering health services.

Objectives: Through the use of a narrative review, we aim to illustrate the impact of socioeconomic status on medical education and to outline strategies to alleviate these inequities to promote a more equitable and socially accountable medical workforce.

Methods: International databases (PubMed, Scopus, Web of Science) and regional databases (SID, Magiran) were searched for literature published between the years 2000-2024 for this narrative review. The keywords used were "medical education," "socioeconomic factors," "admissions," and "equity." After application of the exclusion/inclusion criteria and screening against them, 31 studies were included for synthesis.

Results: The findings reveal that admission processes tend to disfavor students from less privileged backgrounds since they usually present very high structural barriers for disadvantaged students. Even after being admitted, they still continue traversing a very difficult academic mile that is exacerbated by financial pressures and experiences of psycho-social alienation. While remedial measures such as scholarships, quotas, and holistic admissions are promising, their effectiveness is hampered by structural inequities, little specific intervention, and inadequate sustained monitoring. Thus, it may call for a paradigm shift into a systemic perspective to have educational objectives accommodated in the overall broader vision set for the health system.

Conclusion: This analysis and proposed work may also be relevant and important for the realization of improved access, better quality in health care, and ultimately health equity.

Keywords: Medical Education; Socioeconomic Factors; Health Equity; Admission Policies

Background

The key challenges presented to medical education in Iran are the effectiveness of educational programs in promoting the social and economic development of the country (1). Social accountability of health higher education is considered a pivotal strategy to implement in order to enhance the quality of medical sciences education (2). Being that students are currently not offered enough comprehensive training to recognize and suggest solutions to economic and social challenges in patient care and health systems, it has been suggested that the aforementioned dimensions be taken into consideration in the respective curricular adjustments (3, 4). Due to the above reasons, graduates are deemed incompetent to assess the socioeconomic status of patients and can recommend treatment options that will

eventually be rejected as a result of the patients' constraints regarding economy and society (5). Socioeconomic factors also have a huge bearing on who gets access to what kind of medical education, as well as on retention and success, and are important determinants of the potential for future healthcare delivery and diversity in the health workforce (6). They include a variety of barriers, namely, the preferential admission processes for rich applicants to universities, financial pressures mostly affect students from lower-income backgrounds, and these ultimately lead to the under-representation of lower socio-economic classes in the medical field. Studies carried out from 2014 to 2019 show that in the United States, the admission rates of applicants from low-income families to medical programs were significantly lower than their wealthier counterparts, indicating the ongoing inequities in medical education (7). The Association of American Medical Colleges (AAMC) initiated a socioeconomic indicator in 2012 to aid admission committees in identifying applicants with disadvantaged socioeconomic backgrounds (8). In 2016 the AAMC recommended that to promote inclusivity, medical schools adopt " holistic admissions" (9). Unfortunately, despite these organized efforts to bring awareness to the issues of socioeconomic inequity, by the year 2023, socioeconomic diversity within the U.S. student population in medicine had still not shown any improvement (10). A similar discrepancy has been observed in the national university entrance examinations held in Iran. The data to the Supreme Council of Cultural Revolution show that 86% of top-ranked candidates (within the top 3,000) and admissions to elite programs and universities come from the upper three economic deciles. For instance, in the academic year of 1399-1400 (2020-2021), 86% of students admitted to pharmacy and dentistry programs belonged to the 8th-10th deciles, while only 14% came from lower deciles, with merely 0.1% from the lowest decile (11). In this review, an economic decile refers to stratification of households into ten income-based categories, where higher deciles represent greater economic resources that shape access to medical education. Research shows that diversity among medical students and physicians enhances educational experiences and makes a difference in health outcomes (12, 13). AAMC's defining point holds that diversity among medical student backgrounds in terms of social, economic, racial, geographic, gender, religious, and cultural issues make contributions that enhance medical education and public health significantly (14). In addition, the graduates' professional prospects and attitudes toward community health are considerably influenced by their socioeconomic background (15). A study from 2018 showed that most African Americans prefer black healthcare providers. It is more evidenced in poor neighborhoods where patients have better faith in physicians who have similar racial or social stratifications (16). The exorbitant charges for medical education combined with a recent trend of dwindling number of enrollments of students from various socioeconomic backgrounds detract many youths from pursuing medicine for careers, thus increasing health inequities to impoverished populations (17). Though there was some effort in 2021 to encourage diverse socioeconomic-related admissions among American medical schools, the results are ambiguous (18).

Equity against medical education is not actually sped up by raising awareness. Sufficient programs have been established to provide need-based support and holistic admissions, but substantial barriers that include structural inequalities and absence of targeted interventions are found inside the gates (19). It is just a matter of continuing the discussion on socioeconomic factors, because a diverse and equitable medical workforce is not just a moral duty but a real necessity in terms of improving access to health and quality of care (13, 16). Ultimately, addressing socioeconomic barriers in medical education requires comprehensive policy reform, institutional commitment, and social will to dismantle barriers and promote inclusivity (20). It continues to be pressing not just for the future of medical education, but also in the broader context of health equity, since diversity in the health workforce will ultimately have a direct influence on the quality of care offered to diverse populations (1).

Objectives

Through the use of a narrative review, we aim to illustrate the impact of socioeconomic status on medical education and to outline strategies to alleviate these inequities to promote a more equitable and socially accountable medical workforce.

Methods

Study Design and Objective: This is a narrative review that attempts to put the existing literature on how socioeconomic factors influence medical education—from admissions to the workforce—into perspective and

present identification of mitigation strategies to combat relevant inequities.

Search Strategy and Information Sources: A thorough review of the literature and policy documents was conducted. Relevant publications from both international and regional databases were selected for the period January 2000 to December 2024, using electronic databases such as PubMed, Scopus, Web of Science, and some databases that are related to the Iranian context (Scientific Information Database [SID], Magiran). Three major areas were combind by combining Medical Subject Headings (MeSH) and free-text keywords: 1) medical education; 2) socioeconomic factors; and 3) equity/access. The main English search terms included: "medical education," "medical school admission,""socioeconomic status," "social class," "financial barrier," "holistic admission," "educational equity," and "health equity." Persian equivalents were used for regional databases.

Eligibility Criteria (Inclusion/Exclusion):

Inclusion Criteria: Studies were included if they (a) original research, review articles or policy analyses; (b) have explicitly concerned the effect of socioeconomic status (income, parental education, wealth decile) on the various stages of medical education, access, admission, academic performance, retention, and graduation; and (c) were published in English or Persian.

Exclusion Criteria: Studies that were excluded from this review include: (a) focused solely on races, ethnicities, or genders, but not to the intersection of socioeconomic status; (b) editorials, letters, or conference abstracts without full texts; or (c) pertain only to liberal higher education outside medicine.

Study Selection Process: The first stage of the database searches yielded 218 hits; removal of duplicates left 165 records for title and abstract screening. Full-text assessment was conducted on 52 articles to evaluate eligibility. Ultimately, 31 studies that satisfied all requirements were included for data extraction and qualitative synthesis. The study selection process was presented in Figure 1.

Data Extraction and Synthesis: In a standardized matrix, data from each of the included studies were extracted in such a way: author(s), year, country, study design, sample/population, and important findings related to socioeconomic factors, and type of evidence (quantitative, qualitative, or mixed methods). A narrative synthesis approach was employed in the integration of findings across studies to identify the overarching themes and gaps. The key studies are collated in Table 1.

The Relationship between Socio-Economic Factors and Medical Education

For several years now, the influence of socioeconomic status on student admission into medical schools has raised a red flag in the broader context: it has implications beyond the student experience alone into the whole health system and society (21). The data are from 2014 to 2019 in the U.S. and reveals a very disappointing trend: applicants from poor households were much less likely to get admissibility than their counterparts from high-income households, revealing a worrisome trend decreasing socioeconomic diversity among medical students (7). Socioeconomic conditions are among the factors that need to be understood and mitigated to create an equitable and inclusive health system that serves all communities (19). Admission procedures in many medical colleges often favor those with affluent backgrounds. Earlier studies show that about 50% of students accepted were actually from families with an income of $100,000 per annum or slightly more.

These high amounts of money needed for application processes act as barriers in themselves to students coming from disadvantaged backgrounds (22). As an example of financial burdens, the costs for the AMCAS application are near to $170, plus a fee for every additional program, while AACOMAS charges a fee of $195 for one application plus an additional $45 for each subsequent program. Further, in addition to these costs, extra essays often attract fees ranging from about $75 to $150. Preparation for the MCAT can exceed $3,000 when the cost of professional courses is included (6).

Financial stress can significantly impact medical students' educational experiences and performance. On top of the usual obstacles linked to medical training, quite a few students might additionally feel the burden of financial insecurity, which could be dangerously detrimental to their mental health and psychological status. Financial woes, which are often worsened by the high cost of living in urban settings where most medical schools are located, will usually extend long past graduation (22, 23). While claiming impartiality in admissions, many medical schools across the world prefer rich students over poor students. Consequently, vulnerable populations lack genuine representation in their medical institutions, raising significant issues concerning diversity and fairness in the healthcare

workforce—critical components of equitable healthcare for different patient populations (24-25). Less likely to enter medical programs in the United Kingdom and Canada are students coming from poor areas and public schools. Structural changes need to be implemented to ensure that economic status does not limit access to medical education (26, 27).

Strategies for Reducing Inequality

Some medical schools have introduced programs intended to increase academic preparation and lessen the financial burdens on prospective medical students in order to reduce the admissions inequalities (19). Such programs not only foster the academic competency of student learners, but also introduce newer approaches to enhance their financial literacy, reduce their financial anxiety, and create a more equitable learning environment altogether (19, 28). Hence, these contextual social economic factors could make medical education accessible and ultimately lead to better patient care across various populations (29). Medical schools are stepping up efforts to diversify their student population, some adopting holistic admission policies that take into account socioeconomic status and experience along with academic merit (30). In this review, we define holistic admissions as those in which candidate evaluations depend on criteria other than those based on grades and test scores, including contextual, social, and equity-oriented criteria. Despite these positive changes, severe economic disparities continue; such structural inequities not only maintain a differential impact on the composition of the medical workforce but deeply impact healthcare access and population health equity (Figure 1). This is to promote that the medical schools, which are expected to eliminate barriers that stand in the way of students with low socioeconomic status, should create the much-needed adaptive institutional infrastructures to address very complex financial realities of student life within the next few years (30, 31). In addition, it has also been shown that strengthening mentorship and peer-support networks can increase academic success among students from different backgrounds and narrow opportunity gaps, thus becoming more inclusive (19).

Challenges in Policy Implementation

This basically explains that policymakers should take into account how far-reaching socioeconomic factors go, not only on medical education but also with health equity, since they are basic to achieving an equitable healthcare system that essentially needs to consider social determinants of health (32). Some of the major frameworks proposed at the national level in Iran include the General Health Policies underlining by the Supreme Leader, which is considered as the most progressive and comprehensive. It includes a multivariate statement in which healthcare is defined in addition to the role of medical education in advancing critical public health objectives (33). Socioeconomic factors strongly influence medical education. There are less intensive efforts being made to foster equity and diversity in educational institutions (2). To further complicate matters are constraints arising from faculty-related factors such as ill-preparedness, inadequate time to implement the educational reform, resistance to change, and stagnation of any serious reform efforts. Organizational factors, such as changes in leadership and revolving strategic priorities, affect the coherent implementation of policies in step with health policy objectives. One of the greatest achievements of the health system of Iran has been enlivening medical education within the national health system. However, the greatest challenge the health system is facing today remains a critical lack of systemic perspective, where health shall be viewed as a unifying structure of education, research, health care, public health, food, and pharmaceuticals. Failure to comprehend the interrelation of these components can compromise the entire performance of the system. Therefore, enhancing systemic perspectives clarified health governance and health education governance to connect with each other and achieve strategic coherence (34).

Socioeconomic Barriers and Students' Experiences

Because representation across various economic strata within an academic institution is minimal, students from low-income backgrounds usually feel isolated by the academic environment. That sense of isolation, further compounded by daily financial hardships and subtle class-based mechanisms of discrimination, could erode their sense of belonging and professional confidence. These experiences create profound internal doubts about their presence in the medical profession and question the value of their educational investment. Such structural barriers would heighten these challenges to the point that students may become emotionally detached from their peers and the institution itself and make their academic journeys more complex (6, 9). Hence, schools should go beyond their academic criteria of measuring success and consider other criteria such as sense of belonging, social involvement, and how satisfied the students are with

their educational choices (Figure 2) in order to evaluate educational success.

Scholarships and Quotas

Financial aid programs are major mechanisms for assisting disadvantaged students. For instance, the subsidization of medical schools in the U.S. is done through the provision of scholarships to full-time financially needy students by the Department of Health. Besides financial considerations, universities also go ahead and apply admission quotas based on athletic, regional, racial, or even artistic qualities to ensure the growth of diversity within specific academic disciplines. In India, the Reservation Policy tries to correct for historical inequalities and promote social justice by giving about 49% of university seats to some underprivileged sections. Also, some European countries like France provide priority admission to students from economically deprived areas. In this context, universities should maintain transparency regarding the policies governing the structure and packaging of institutional scholarships and financial aid in order to maximize the benefits they are providing to students (35-37).

External forms of financing, both government and non-government grants, besides the scholarship systems and quota-based admission, can act as a source of academic resilience and stress reduction for students (38-40). Regional quotas, if implemented with integrity, can also potentially achieve higher representation from the underprivileged areas while, in this case, they have not been much successful in Iran. If properly put in place, regional quota systems could significantly improve representation of deprived regions; the damage appears to have been done by improper application. The success of such programs depends on continued partnerships between educational institutions and the many funding bodies, both public and private. Therefore, there is the need for an ongoing evaluation of the programs so that they fulfill the requirements of society and students. For example, the UK's national scholarship scheme has shown, in the short term, to improve retention rates among disadvantaged students, long-term impacts on academic progress and psychological well-being are yet to receive rigorous scrutiny (41). Given the ample evidence for an interrelationship between these socioeconomic factors and the educational outcomes in medicine, thorough institutional commitment for the refinement of these support systems—with sustained monitoring is crucial for making meaningful progress.

Health Insurance and Social Support

Only the strategic investment of the basic elements of the health system could improve treatment equity. Some key options are to expand health insurance coverage and ensure the requisite funding for community-based social health centers (42). On their part, some countries have instituted policy frameworks to enhance insurance accessibility. Such was the case with the Affordable Care Act (ACA) in the U.S., which was intended to lessen insurance coverage gaps, but many still experience considerable additional out-of-pocket costs (43). Thus, fortification and enhancement of insurance systems and provision of healthcare services target vulnerable populations to gain leverage on health equity.

Health Literacy and E-Health

Processing health literacy is a prime prerequisite for enhancement of health behaviors, mostly among marginalized sections. Education and financial empowerment interventions can enable communities in accessing health services on time and effective management of health resources (44). Prevalent initiatives among preventive health practice would often lead to a considerable reduction in the incidence of diseases which are preventable. Moreover, widening access of education especially for those non-traditional students could probably result in a decrease in dropping out and assistance in long-term academic achievement to complete healthy populations for the future (45).With the growth of new digital and social media platforms, which are now being used to enhance accessibility to electronic health systems, there is a need for e-health literacy to improve the overall health outcomes and alleviate health inequalities (46, 47). Graduates adequately versed in all the local climatic, social, and cultural conditions would have a significant role to play. This review refers to health literacy as the capacity of persons to access, understand, and utilize health information in making more informed health decisions, which is shaped by education and socioeconomic inequity. Thus, certain facilitative measures must be taken into account to facilitate the admission of students from different classes (22). However, health equity should not realize at the expense of educational equity. The holistic well-being and satisfaction of students with their environments for learning should be paramount in priority (48, 49). The most important condition for sustainable development should be systemic thinking

about the health sector in all of its dimensions and, therefore, needs special consideration.

Quality Management and Continuous Monitoring in Medical Education

The management of educational quality in medical sciences is one of the most important pillars for effective and skill-based education (50). Since 1990, the Iran Ministry of Health Medical Education has put into action several programs regarding this subject, all contributing to the betterment of medical sciences' education quality (1). One of the key strengths of the medical education system in Iran is based on the accreditation of medical schools, which includes continuous monitoring of educational quality across Iranian universities of medical sciences. The recent uncontrolled increase in the intake capacity of students by medical schools has posed significant challenges to medical education because such increases occurred without adequate provision for the necessary infrastructure. There is indeed a well-established inverse relationship between student cohort size and the quality of education (51). The adverse effects of such expansion become more compelling if such increases in capacity do not lead to improved access for students from lower socioeconomic deciles, thus warranting a critical evaluation of all its possible positive and negative dimensions.

Limitations: A limitation of this review is the variability in conceptualization and classification of socioeconomic advantage and disadvantage in different countries, as such perceptions are culturally embedded and may differ across contexts. Furthermore, as a narrative review, this synthesis does not follow a systematic, reproducible protocol with dual screening and risk-of-bias assessment, which may introduce selection bias. This relativity, of course, does not alter the broad analytical focus of this review and does not compromise the central argument.

Conclusion

Addressing the health needs of societies and ensuring the social accountability forms the basis of the cardinal principles of health governance. In this regard, the role of graduates who understand the actual needs of their communities becomes indispensable. When admissions to universities tend to favor upper deciles of socioeconomic status, disadvantaged groups may have poorer representation in medical institutions. Accordingly, moving forward, future doctors may be inherently disinclined towards serving in disadvantaged areas or may simply lack a keen sense of awareness concerning the difficulty-levels of the communities mentioned. In this review, educational justice is used to indicate an equitable access to medical education, fair distribution of opportunities, and representation of lower socioeconomic groups among those ranked for training and workforce pathways. Some countries have adopted quotas as part of their admissions policy to include candidates belonging to a specific geographic region or demographic category to increase the diversity of their current students while ensuring the physician workforce responds to the healthcare needs of population trends that incorporate their social, economic, and cultural realities. Dimensions of medicine and future medical education must be influenced in national policy documents like General Health Policies declared by the Supreme Leader, Statement on the Second Step of the Revolution, and the Seventh Development Plan in Iran. A systemic vision of health and education must be viewed because the two systems, health and higher education in Iran, could only fulfill their common goal of advancing social justice, human development, and national well-being through such systemic integration.

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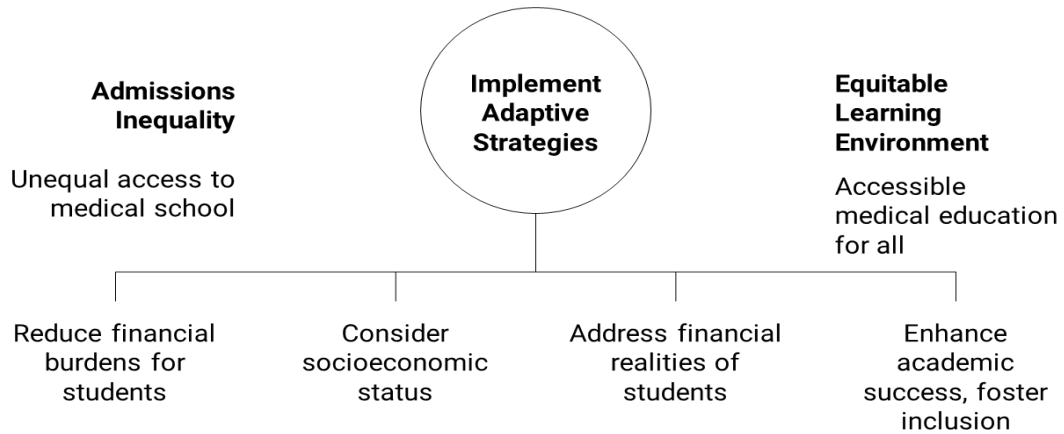

Figure 1. Achieving Equity in Medical Education

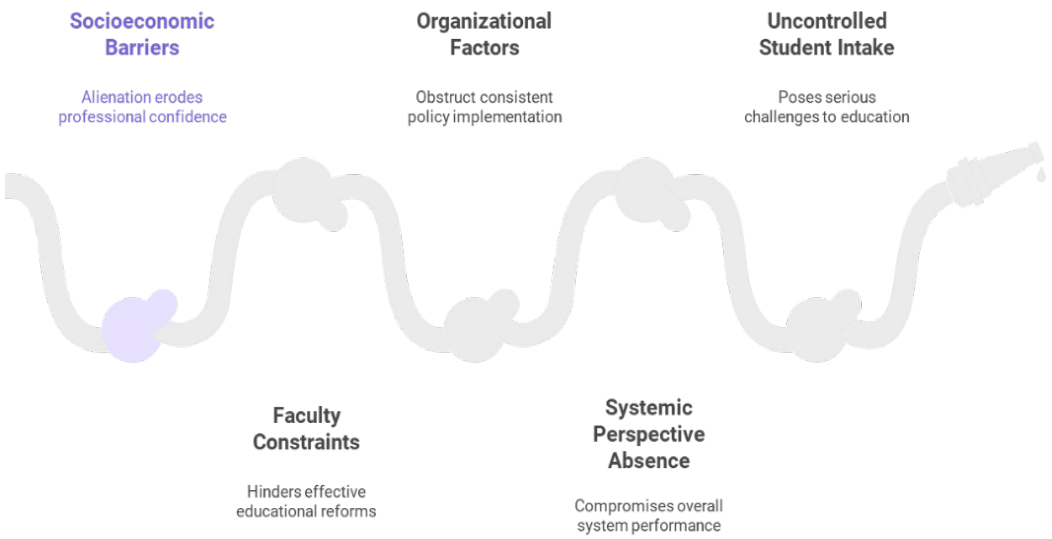

Figure 2. Addressing Health Equity Challenges in Iran

Table 1. Summary of Key Studies on Socioeconomic Factors in Medical Education

Author(s), Year	Country	Study Design	Key Focus/Population	Main Findings Related to Socioeconomic Factors
Suzuki et al., 2023 (6)	Japan	Web-based Survey	Medical School Applicants	Family income significantly influenced application patterns, admission success, and career migration post-graduation.
Nguyen et al., 2024 (7)	USA	Retrospective Cohort	MD-PhD Applicants (2014-2019)	Applicants from low-income backgrounds had significantly lower admission rates compared to high-income peers.
Grbic et al., 2015 (8)	USA	Validation Study	Medical School Applicants	Developed and validated a socioeconomic status indicator tool for use in medical school admissions processes.
Youngclaus & Roskovensky, 2018 (10)	USA	Descriptive Analysis	US Medical Students	Reported persistent lack of economic diversity among matriculating medical students despite policy awareness.
Christophers et al., 2022 (22)	USA	Policy Analysis	Medical School Admissions	Argued that admission structures (high fees, test costs) create formidable financial obstacles for low-income applicants.
Jaber et al., 2024 (23)	Sudan	Cross-sectional	Medical Students	Found a negative correlation between socioeconomic disadvantage and academic attainment (GPA) among students.
Steven et al., 2016 (25)	UK	Retrospective Analysis	UK Medical School Applicants	Students from lower socioeconomic neighborhoods were underrepresented in medical school applicant and admit pools.
Pitre et al., 2020 (26)	Canada	Retrospective Cohort	Canadian Medical School Applicants	Demonstrated a significant independent association between higher household income and likelihood of admission.
Ghojazadeh et al., 2014 (20)	Iran	Descriptive Analysis	National Olympiad Participants	Highlighted disparities in access to elite academic tracks, reflecting broader resource inequities in pre-medical preparation.