



## Exploring educational and research ideals of Iranian medical students: A pathway to reclaiming scientific authority

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### ABSTRACT

**Introduction:** Scientific authority is crucial for nations shaping global knowledge and innovation. For Iran, achieving this goal aligns with Vision 1404, which aspires to position the country as a regional and global leader in science and technology. Despite advancements in fields like nanotechnology and medical sciences, challenges such as limited international collaboration and resource constraints impede progress. This study explores the educational and research ideals of Iranian medical students, who are pivotal in advancing scientific authority.

**Materials and Methods:** This cross-sectional study was conducted during 1402–1403 across Iranian medical universities. A total of 180 students were invited to participate, with 135 completing the survey (response rate: 75%). A two-part questionnaire evaluated participants' access to resources and perceptions of scientific authority. Data were analyzed using SPSS (version 22) with descriptive and inferential statistics. Ethical approval was granted by the National Strategic Research Center for Medical Education (Approval Code: IR.NASRME.REC.1403.033), and informed consent was obtained from participants.

**Results:** Of the 135 respondents, 100 were master's students, 10 doctoral, and 25 undergraduates. No significant demographic associations were found with responses. Alarming, 90% of participants were unaware of the criteria for achieving scientific authority in Iran, and 81% did not prioritize it in their academic or professional goals.

**Discussion:** The findings reveal a critical need for cultural shifts and strategic interventions to integrate scientific authority into Iran's academic and research frameworks. By fostering awareness, innovation, and interdisciplinary collaboration, Iran can reclaim its leadership in global science and technology, aligning educational priorities with national ambitions.

#### Keywords:

research ideals, scientific authority, Iran, progress.

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### INTRODUCTION

Scientific authority reflects a nation's capacity to significantly impact global knowledge and innovation, cementing its position in international academic and research landscapes (1-3). Hafezi *et al.* emphasize that understanding and defining scientific authority is crucial, revealing that it can be realized at both institutional and individual levels (4). In Iran, achieving scientific authority is not just an academic goal but a cornerstone of its strategic vision for development, as outlined in the 1404 outlook document. This ambition underscores the central role of science and technology in fostering sustainable growth and securing Iran's position as a regional and global

leader. The importance of scientific authority in Iran lies in its potential to address critical national challenges while elevating global competitiveness. With a rich intellectual heritage and a substantial pool of young, talented researchers, Iran has already made impactful contributions, particularly in fields like nanotechnology, medical sciences, and engineering. However, achieving true scientific authority requires a comprehensive integration of robust educational frameworks, innovative research ecosystems, and effective international collaborations. Despite notable progress, challenges such as limited international partnerships, sanctions, and resource constraints

persist (5). Overcoming these obstacles demands innovative strategies, including developing a research culture that prioritizes quality, relevance, and ethics. Stronger connections between academia, industry, and policymaking are also essential to ensure that research outcomes address societal needs and drive economic growth (6).

Medical students and young academics are pivotal to this vision, as their training and aspirations shape the country's scientific trajectory. Empowering these individuals with access to global research standards, interdisciplinary approaches, and innovation opportunities can catalyze progress toward scientific leadership. Moreover, Iran's pursuit of scientific authority also bolsters its soft power, fostering international collaboration to tackle shared challenges like healthcare, climate change, and technological advancement. In medical sciences, the pursuit of scientific authority aligns with Iran's broader vision of becoming a global leader. Medical students' educational and research ideals provide the foundation for a vibrant scientific community capable of addressing complex health issues and contributing to global advancements. This study evaluates these students' perspectives, motivations, and barriers to inform strategies for strengthening Iran's position in the global scientific landscape. Understanding their aspirations and challenges highlights education's role as a cornerstone of scientific leadership.

## MATERIALS AND METHODS

This cross-sectional study explored the educational and research ideals of medical students within the framework of Iran's pursuit of scientific authority. Conducted during the 1402–1403 academic years across various Iranian medical universities, the study utilized a sample of 180 students selected through random sampling. Data collection was carried out using a two-part questionnaire that assessed students' access to educational resources and their perceptions of scientific authority. The questionnaire included demographic questions and specific items on educational ideals and research goals, offering both quantitative and qualitative insights. Students with incomplete responses or those unwilling to provide consent were excluded. Additionally, institutional and academic facilities relevant to scientific authority were reviewed. Data analysis was performed using SPSS software (version 22). Descriptive statistics such as frequencies, percentages, and means summarized the data, while inferential analyses, including Pearson correlation

and independent t-tests, examined relationships and compared responses across demographic strata. Questionnaires were distributed electronically via an online platform to ensure broad accessibility. Participants were fully informed of the study's purpose, confidentiality measures were implemented, and all responses were anonymized and securely stored. This study was approved by the National Strategic Research Center for Medical Education's Ethics Committee (Approval Code: IR.NASRME.REC.1403.033), and informed consent was obtained from all participants.

## Validation and Reliability

The content validity of the questionnaire was assessed by a panel of experts, including medical educators and researchers. A pilot study involving 30 students tested the questionnaire's reliability, achieving a Cronbach's alpha of 0.7, indicating acceptable internal consistency. Inferential statistics, such as t-tests and ANOVA, were applied to analyze differences across demographic groups, with a significance level of  $p < 0.05$  throughout the study.

## RESULTS

Out of the 180 individuals initially invited to participate in this study, 135 individuals completed the survey, reflecting a response rate of 75%. The demographic breakdown of respondents revealed that 100 participants were pursuing master's degrees, 10 were doctoral students, and 25 were enrolled in undergraduate programs (see Figure-1). Among the 100 master's students, 75 were female. Statistical analysis found no significant association between the demographic characteristics of the participants and their responses to the survey questions.

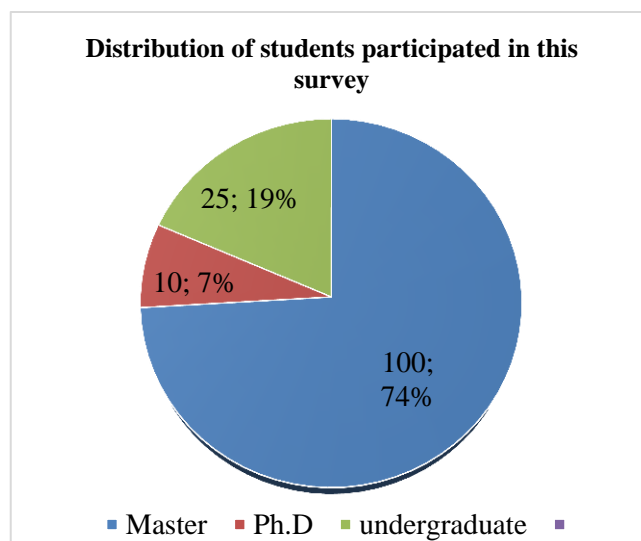


Figure 1: Diverse participation of students in our study

A key finding of the study was the lack of prioritization of scientific authority across all groups. No specific age group demonstrated a notable preference for selecting a pathway toward achieving scientific authority. Similarly, the pursuit of scientific authority was not identified as a primary priority among participants in any of the educational levels, including undergraduate, master's, and doctoral programs.

One striking result was that a significant majority of the respondents (121 out of 135) were unaware of the criteria required to achieve scientific authority in Iran. This highlights a widespread knowledge gap regarding this important concept. Moreover, 110 of the 135 respondents did not perceive any urgency or necessity for pursuing scientific authority in their academic or professional journeys. The findings also underscore a broader issue: the limited awareness and motivation among academic participants to engage with the framework of scientific authority. This lack of awareness was consistent across all groups studied, indicating that the concept of scientific authority has not been sufficiently emphasized or integrated into the educational priorities of students at various academic levels.

## **DISCUSSION**

By the year 1435, achieving scientific authority in Iran necessitates cultivating a strong, self-confident generation dedicated to academic excellence and responsibility in the competitive global landscape. Strategic human resource planning and the education of talented, committed, and hopeful youth with vitality demand both a unified national effort and sufficient resources (2, 7, 8). The findings of this study highlight a profound gap in the awareness and prioritization of scientific authority among Iranian students' at all academic levels. This issue is particularly concerning given the critical role scientific authority plays in fostering national development and positioning Iran as a regional and global leader in scientific innovation. Unfortunately, the lack of understanding of its significance is further compounded by recent declines in Iran's scientific standing, including the loss of its top regional rank in publication output for 2023 and the rising number of article retractions associated with Iranian institutions (9). These trends underscore the urgent need for a

cohesive and strategic response to reverse this trajectory. Currently, the concept of scientific authority holds limited significance within academic and research communities, primarily due to its inadequate integration into educational and research frameworks. Additionally, the lack of effective communication about its advantages has hindered its prioritization among students and faculty members. Bridging this gap necessitates a comprehensive, two-pronged approach focused on reshaping academic culture and implementing actionable, policy-driven strategies. Firstly, academic institutions must embed the concept of scientific authority into their cultural fabric. At present, the concept of scientific authority holds limited significance within academic and research communities, primarily due to its insufficient incorporation into educational and research structures. Additionally, the lack of clear communication about its benefits has hindered its prioritization among students and faculty. Bridging this gap necessitates a comprehensive, two-pronged approach focused on reshaping academic culture and implementing practical, results-oriented policies. Secondly, government bodies such as the Ministry of Science, Research, and Technology, and the Ministry of Health and Medical Education, must develop structured, outcome-oriented policies. These should focus on fostering international collaborations, setting clear benchmarks for achieving scientific authority, and incentivizing high-quality research outputs. Additionally, initiatives that encourage interdisciplinary research and reward impactful innovations can serve as strong motivators for students and faculty alike to engage with the broader goals of scientific authority. The study's results emphasize a troubling lack of motivation and knowledge regarding the pathways to achieving scientific authority. Embedding this concept within educational programs and creating a national dialogue on its importance are vital steps in addressing this issue. Iranian academic institutions must prioritize fostering a culture of scientific excellence to enable transformative progress in this area. Achieving scientific authority in Iran is challenging yet attainable. The first step involves raising awareness among young researchers to ignite initial motivation and foster a sense of purpose. This generation represents the cornerstone of research and scientific production in Iran (10), making their

active and meaningful engagement crucial for advancing toward the goal of scientific authority. Their contributions will serve as the foundation for future progress in establishing Iran's presence in the global scientific community. Establishing Iran's presence in the global scientific community requires addressing significant challenges while recognizing the opportunities for growth. Although the current state reflects a general lack of understanding and insufficient prioritization of scientific authority, these hurdles can be overcome. Achieving scientific authority is both a responsibility and a unique opportunity for Iran. By reforming academic culture, implementing well-structured strategies, and fostering international collaborations, Iran can create a clear pathway toward reclaiming its status as a scientific leader. Investments in education, promotion of innovation, and raising public and institutional awareness are crucial steps in aligning academic and research objectives with aspirations for regional and global leadership. This transformation has the potential to not only enhance the nation's academic and research landscape but also to tackle critical global challenges effectively. Ultimately, these efforts will showcase the immense potential of Iranian intellect and resilience, positioning the country as a key contributor to global scientific progress.

### CONFLICT OF INTEREST

None.

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