



## Challenges, Gaps, and Solutions in the Comprehensive Exam of Ph.D. Programs at Iranian Medical Universities: A Narrative Review

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### Abstract

**Background:** The comprehensive exam is a key assessment in Iranian medical Ph.D. programs, intended to evaluate students' academic and research readiness. Despite its significance, concerns about its effectiveness and fairness persist. This review aims to examine the main challenges of the comprehensive exam in Iranian medical universities and suggest practical strategies for its improvement.

**Materials and Methods:** A narrative review was conducted by two independent reviewers, who systematically searched ERIC, PubMed, Web of Science, Scopus, and Google Scholar up to March 2025 using relevant English and Persian keywords. Data extraction and thematic analysis were performed to synthesize findings.

**Results:** Four main domains of challenge were identified: (1) administrative barriers, including fragmented policies, inconsistent procedures, and lack of unified guidelines, leading to variability and reduced fairness; (2) curriculum gaps, such as insufficient training in advanced research methods, academic writing, interdisciplinary integration, and practical skills, leaving students underprepared; (3) student preparedness and support, with high stress, inadequate mentorship, and limited preparatory resources negatively impacting exam outcomes; and (4) contextual and systemic factors, including institutional culture, resource allocation, and resistance to change. The interaction among these domains creates a multifaceted environment that shapes the exam's effectiveness, fairness, and credibility. The review recommends curriculum modernization, standardized policies, enhanced student and faculty support, and the adoption of alternative assessment methods (e.g., portfolios, continuous assessment, formative feedback) to ensure a more holistic and equitable evaluation.

**Conclusion:** The effectiveness of the comprehensive exam in Iranian medical Ph.D. programs is limited by various interconnected challenges. Addressing these through curriculum reform, clearer policies, enhanced support, and innovative assessment approaches can improve fairness, reduce stress, and better evaluate doctoral candidates' abilities.

**Key Words:** Comprehensive exam, Iran, Ph.D. programs, PhD student, Medical education.

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## 1- INTRODUCTION

The comprehensive examination is a cornerstone of doctoral education worldwide, serving as a rigorous assessment of students' mastery of specialized subject matter, research methodologies, and readiness for independent scholarly work (1–3). In Iranian medical universities, this exam plays a pivotal role as a critical milestone, determining doctoral candidates' preparedness to enter the dissertation phase and to fulfill future professional responsibilities (4, 5). Thus, the comprehensive exam functions not only as a measure of individual competence but also as a means to uphold the academic standards and credibility of doctoral programs (6–8).

However, the administration of the comprehensive exam faces diverse challenges that are not unique to Iran and have been reported internationally. Administrative complexities, inconsistent policies, and a lack of alignment between curriculum content and exam expectations are among the primary obstacles (4, 9, 10). Additionally, bureaucratic barriers, ambiguous guidelines, and insufficient emphasis on research methodology and educational scholarship can undermine the exam's fairness and effectiveness (11, 12). These issues are further compounded by a persistent gap between the competencies expected by doctoral programs and those actually developed by students, raising concerns about the adequacy of current training approaches (1, 13).

Moreover, student-related factors such as low academic performance indicators (e.g., GPA) and delays in completing prerequisite courses have been shown to significantly impact comprehensive exam outcomes (14), underscoring the need for robust preparatory mechanisms and academic support.

Given the evolving landscape of medical education and the increasing emphasis on research competencies and educational scholarship, it is essential that comprehensive exams remain rigorous, relevant, and equitable (2, 15). Therefore, this narrative review aims to identify, analyze, and synthesize the main challenges and gaps in both the administration and content of the comprehensive exam for Ph.D. students in Iranian medical universities. By providing an overview of current issues alongside evidence-based recommendations, this study seeks to inform policy development and contribute to the ongoing enhancement of doctoral education quality (3).

## 2- MATERIALS AND METHODS

This narrative review was conducted to synthesize and critically analyze the existing literature on the challenges, gaps, and potential improvements related to the comprehensive examination process in Ph.D. programs at Iranian medical universities.

### 2-1. Search Strategy

A comprehensive literature search was independently performed by two reviewers through March 2025 across five electronic databases: PubMed, Scopus, Web of Science, ERIC, and Google Scholar. The search utilized a combination of keywords and MeSH terms, including “comprehensive exam,” “Ph.D. programs,” “Iranian medical universities,” “medical education,” “doctoral assessment,” “curriculum gaps,” “student preparedness,” and “administrative challenges.” Both English and Persian language publications were included to ensure the scope and relevance of the review.

### 2-2. Inclusion and Exclusion Criteria

#### 2-2-1. Inclusion criteria:

- Studies focusing on comprehensive exams in Ph.D. or doctoral programs, particularly within Iranian medical universities or comparable international contexts.
- Articles addressing challenges related to exam administration, curriculum content, student preparedness, or assessment methods.
- Original research articles, review papers, policy documents, or relevant reports published up to March 2025.
- Publications in English or Persian.

#### **2-2-2. Exclusion criteria:**

- Studies limited to undergraduate or non-medical doctoral programs.
- Publications not addressing the comprehensive exam or its related challenges.
- Articles lacking empirical data or substantive discussion relevant to the review objectives.

#### **2-3. Study Selection**

Two reviewers independently screened the titles and abstracts of all retrieved records for relevance. Full texts of potentially eligible studies were then assessed against the inclusion and exclusion criteria. Any disagreements were resolved through discussion, and, if necessary, a third reviewer was consulted to reach consensus.

#### **2-4. Data Extraction**

Data extraction was independently performed by the two reviewers using a researcher-designed extraction form. Extracted information included study characteristics (author, year, setting, methodology), identified challenges (administrative, curricular, student-related), contextual factors, and any proposed solutions or recommendations.

#### **2-5. Data Synthesis**

Thematic analysis was used to identify and organize the main challenges and gaps reported in the literature. Themes were developed by identifying common patterns across studies and refined through ongoing discussions among the review team. A narrative synthesis approach was employed to integrate findings from both qualitative and quantitative studies, providing a comprehensive overview of the topic.

#### **2-6. Ethical Considerations**

This study is a narrative review based solely on the analysis of published literature. No human participants or unpublished primary data were involved. All sources have been properly cited to ensure academic integrity and avoid plagiarism. The review process adhered to ethical standards for scholarly research, including transparency, accuracy in reporting, and respect for intellectual property.

### **3- RESULTS**

This narrative review identified a complex and interconnected set of challenges that significantly affect the administration, content, and outcomes of the comprehensive exam in Iranian medical Ph.D. programs. These challenges are categorized into four main thematic domains: administrative barriers, curriculum gaps, student preparedness and support, and contextual/systemic factors. The interaction among these domains creates a multifaceted environment shaping the exam's effectiveness, fairness, and credibility. A summary of the main domains, key challenges, impacts, and recommended solutions is presented in **Table 1**.

#### **3-1. Administrative and Policy Barriers**

Administrative barriers pose significant challenges to the effective administration of comprehensive exams in medical Ph.D. programs. Fragmented policies and

inconsistent procedures across institutions—stemming from the absence of unified national guidelines—result in variability that undermines exam reliability and fairness (4). Weak regulatory frameworks and institutional resistance contribute to uneven enforcement and reduced accountability (12). Additionally, bureaucratic delays, poor coordination, and inefficient resource management heighten student anxiety and diminish trust in the examination process (10, 16).

Despite months of preparation, students frequently criticize the exams as repetitive and lacking added value, while delays outside their control further exacerbate stress (4). Similar administrative issues have been reported internationally, highlighting the need for clear regulations and constructive faculty-student interactions (9, 11). Addressing these barriers requires the implementation of standardized guidelines, improved coordination, and more efficient resource allocation to enhance exam validity and better support doctoral candidates' development.

### **3-2. Curriculum Gaps and Educational Alignment**

A significant gap exists between doctoral curricula and the competencies required to successfully pass the comprehensive exam. Essential skills—including advanced research methods, academic writing, and educational scholarship—are inadequately addressed, leaving students underprepared (1, 5). Poor curriculum planning and limited experiential learning opportunities further hinder the development of critical thinking and research abilities (17). Additionally, the lack of interdisciplinary integration and weak foundational knowledge contribute to discrepancies between students' self-assessments and faculty evaluations (8). Compared to international programs, Iranian curricula tend to emphasize coursework completion

over competency development and often lack elective courses and practical components (3, 6). Insufficient prerequisite courses and limited faculty supervision further weaken the curriculum's effectiveness. Cultural influences and hidden curricula also impact learning outcomes and should be considered in future reforms (4). Audits indicate that Iranian Ph.D. programs fall short of European standards, underscoring the need for curriculum modernization and alignment with global best practices (1).

### **3-3. Student Preparedness and Support**

Student-related factors such as low academic performance indicators (e.g., GPA), delays in completing prerequisite courses, and psychological stress significantly affect readiness for the comprehensive exam. Research highlights a widespread lack of structured preparatory mechanisms—including mentorship, academic counseling, and targeted workshops—that are essential for building student confidence and competence (14, 18).

The absence of these support systems exacerbates student anxiety, attrition, and burnout, negatively impacting exam success rates and prolonging time to degree completion (13, 19). Moreover, variability in students' educational and research backgrounds contributes to inconsistent levels of preparedness, complicating efforts to maintain standardized assessment expectations (1, 7). Studies also emphasize the importance of peer support networks and proactive faculty engagement in enhancing doctoral student resilience and academic progress (2, 20). The lack of such support can lead to feelings of isolation and diminished motivation, further hindering exam readiness (21).

### **3-4. Contextual and Systemic Factors**

- **3-4-1. Institutional Culture and Resource Allocation:** Institutional resistance to change, inconsistent faculty engagement, and insufficient allocation of resources for exam preparation and student support services significantly impede the comprehensive examination process. These systemic barriers limit doctoral candidates' access to essential study materials, academic counseling, and support mechanisms (22). Research shows that entrenched academic cultures often resist pedagogical innovation, thereby restricting the effectiveness of doctoral student support structures (7). Additionally, disparities in resource distribution across institutions contribute to inequities in doctoral completion rates and examination outcomes (18). Notably, institutions with dedicated doctoral support centers and robust mentoring programs report higher levels of student satisfaction and academic success (2, 15).
- **3-4-2. Assessment Methods and Feedback:** The conventional comprehensive examination format is increasingly criticized for failing to capture the multifaceted competencies required of doctoral candidates. There is growing consensus in the literature advocating for more holistic and diversified assessment approaches, such as portfolio evaluations, continuous assessment models, and research project presentations. These alternatives provide a more comprehensive appraisal of student capabilities while also reducing exam-related anxiety (11, 14, 23). Studies indicate that traditional comprehensive exams often fall short in evaluating critical thinking and research skills (24), while the integration of formative assessments and iterative

feedback mechanisms can enhance doctoral education (25). Employing varied assessment strategies has been shown to foster greater student engagement and reduce attrition rates (25). Both global and Iranian research suggest that adopting alternative assessment models—emphasizing mentorship, regular feedback, and authentic research tasks—can improve exam fairness and better prepare students for academic and professional success (3, 11, 13, 27).

### **3-5. Interconnectedness of Challenges**

Importantly, these domains are not isolated; they are intricately linked. Administrative inefficiencies can hinder the implementation of curricular reforms and restrict students' access to necessary preparatory resources (28). Conversely, curriculum gaps often prompt students to seek greater institutional support, which is frequently inadequate due to existing administrative limitations (29). This cyclical relationship underscores the need for holistic, system-wide solutions that address root causes rather than isolated symptoms (30).

### **3-6. Implications for the Quality of Doctoral Education**

The cumulative impact of these interconnected challenges poses a significant threat to the quality, fairness, and integrity of the comprehensive examination process, and by extension, to doctoral education in the medical sciences (31). Effectively addressing these complex issues is critical for maintaining rigorous academic standards, improving student outcomes, and ensuring that graduates are thoroughly prepared for both research and professional practice (32).

**Table-1:** Main Domains of Challenges, Impacts, and Recommended Solutions for the Comprehensive Exam in Iranian Medical Ph.D. Programs.

Main Domain	Key Challenges (Examples)	Impact	Recommended Solutions	References
1. Administrative Barriers	<ul style="list-style-type: none"> <li>- Fragmented and inconsistent policies</li> <li>- Bureaucratic delays and poor coordination</li> <li>- Lack of unified national guidelines</li> </ul>	<ul style="list-style-type: none"> <li>- Undermined exam validity and fairness</li> <li>- Increased student anxiety</li> <li>- Reduced trust in the process</li> </ul>	<ul style="list-style-type: none"> <li>- Develop standardized national guidelines</li> <li>- Improve coordination and resource management</li> <li>- Strengthen oversight</li> </ul>	(4, 10, 12, 16)
2. Curriculum Gaps	<ul style="list-style-type: none"> <li>- Insufficient training in research methodology and academic writing</li> <li>- Poor curriculum planning</li> <li>- Lack of practical and interdisciplinary training</li> </ul>	<ul style="list-style-type: none"> <li>- Students inadequately prepared for exam and future roles</li> <li>- Mismatch between training and exam demands</li> </ul>	<ul style="list-style-type: none"> <li>- Revise and modernize curriculum</li> <li>- Emphasize research and practical skills</li> <li>- Integrate interdisciplinary content</li> </ul>	(1, 3, 5, 6, 8, 17)
3. Student Preparedness & Support	<ul style="list-style-type: none"> <li>- Low academic performance</li> <li>- Delays in prerequisite courses</li> <li>- High stress and anxiety</li> <li>- Lack of structured support and mentorship</li> </ul>	<ul style="list-style-type: none"> <li>- Lower exam success rates</li> <li>- Increased attrition and burnout</li> <li>- Extended time to degree completion</li> </ul>	<ul style="list-style-type: none"> <li>- Establish mentorship and counseling programs</li> <li>- Provide preparatory workshops</li> <li>- Enhance peer and faculty support</li> </ul>	(1, 2, 7, 13, 14, 18, 19, 20, 21)
4. Contextual and Systemic Factors	<ul style="list-style-type: none"> <li>- Institutional resistance to change</li> <li>- Unequal resource allocation</li> <li>- Overreliance on traditional exams</li> <li>- Limited formative feedback</li> </ul>	<ul style="list-style-type: none"> <li>- Inequity in outcomes</li> <li>- Outdated assessment methods</li> <li>- Low student engagement and motivation</li> </ul>	<ul style="list-style-type: none"> <li>- Promote faculty development</li> <li>- Ensure equitable resource distribution</li> <li>- Adopt holistic and formative assessment methods</li> </ul>	(2, 7, 11, 14, 15, 18, 22, 24, 25, 27)

## 4- DISCUSSION

This review shows that, although the comprehensive exam in Iranian medical Ph.D. programs is intended as a rigorous benchmark of doctoral readiness, it is currently limited by a range of systemic, curricular, and individual challenges. These findings reflect global concerns in doctoral education, highlighting both universal and context-specific barriers to effective assessment.

### 4-1. Administrative Barriers

The most persistent obstacles are rooted in administrative complexity and policy ambiguity. National and international studies (12, 33, 34) identify unclear guidelines, inconsistent enforcement, and bureaucratic delays as key factors undermining the fairness and efficiency of the exam process. In Iran, the lack of unified national standards and variability in institutional practices not only create confusion for students and faculty but also threaten the comparability and credibility of exam outcomes. These findings align

with research from other countries, where decentralized or poorly articulated assessment policies disadvantage students and perpetuate inequity (35). Recent recommendations emphasize the need for macro-level policy reforms, including the development and implementation of explicit, standardized guidelines for both the written and oral components of the comprehensive exam (4). Establishing uniform protocols and transparent evaluation criteria will enhance the credibility of the assessment process and foster greater trust among students and faculty.

### 4-2. Curriculum Gaps

A significant gap persists between the competencies expected of doctoral graduates and those actually developed during training. Iranian Ph.D. curricula often lack robust components in research methodology, educational scholarship, and interdisciplinary integration (1, 6). This misalignment is not unique to Iran; studies from North America and Europe have similarly documented that doctoral

programs frequently lag behind contemporary research and professional demands (36, 37). As a result, many students are underprepared for both the comprehensive exam and subsequent academic or clinical roles. Emerging research underscores the value of competency-based education and active learning strategies in doctoral training, which better prepare students for comprehensive assessments and future careers (38). The comprehensive exam itself can serve as a diagnostic tool, revealing curricular weaknesses and guiding targeted reforms (27). Systematic curriculum reform—emphasizing research skills, educational theory, and practical experience—is essential to bridge this divide and ensure that doctoral graduates are equipped for both the comprehensive exam and their future academic roles (14).

### 4-3. Student Preparedness

Student-related factors—including academic background, psychological readiness, and access to support—play a decisive role in exam success. Many Iranian Ph.D. candidates report high levels of stress and anxiety, compounded by insufficient preparatory resources and unclear expectations (14, 39). International evidence highlights the importance of academic coaching, mentorship, and structured preparatory workshops in improving student outcomes (13). Mental health support is increasingly recognized as vital; the systematic incorporation of psychological counseling and stress management programs has a significant impact on doctoral students' success rates (40). Strengthening faculty mentorship through targeted training programs also improves guidance quality and student outcomes (41). Variability in students' prior training further complicates efforts to standardize assessment and ensure equitable outcomes. Therefore, establishing robust support systems—including mentorship, counseling, and

tailored preparatory programs—is critical to fostering resilience and academic achievement (13, 40, 41).

### 4-4. Contextual and Systemic Factors

The findings of this review underscore that contextual and systemic factors—such as institutional culture, resource allocation, and assessment practices—are fundamental determinants of the quality and fairness of the comprehensive exam in Iranian medical Ph.D. programs. Unlike some Western higher education systems where centralized support and resource equity are more established, Iranian universities often experience fragmented resource distribution and resistance to pedagogical innovation (2, 18). These systemic limitations not only perpetuate inequities in student experiences but also reduce the effectiveness of reform efforts aimed at improving exam quality and student outcomes.

Furthermore, there is increasing support in the literature for shifting away from traditional, high-stakes assessment formats toward more holistic and formative approaches, such as portfolio-based evaluations and continuous assessment (24, 25). Implementing these alternative methods in Iran could help address both student anxiety and the limitations of current assessment practices, but their success depends on overcoming institutional inertia and fostering a culture of innovation and support. Because contextual and systemic challenges are closely intertwined with administrative, curricular, and student-related issues, addressing them requires coordinated, system-wide reforms that prioritize resource allocation, faculty development, and the adoption of modern assessment strategies. Such efforts are essential to ensure that comprehensive exams accurately reflect doctoral competencies and prepare graduates for future academic and professional roles (2, 7).

#### **4-5. Assessment Methods**

Traditional comprehensive exams, typically limited to written and oral components, may not adequately capture the full range of competencies required for contemporary doctoral work (27). There is increasing advocacy for alternative and complementary assessment strategies, such as portfolio evaluations, continuous assessment, and research project presentations, which provide a more holistic and authentic measure of student capabilities while reducing the high-pressure environment associated with conventional exams (36, 42, 43). Additionally, the integration of digital technologies and AI-driven assessment tools can enhance exam efficiency and offer personalized feedback, further reducing student anxiety and improving fairness (44, 45). These innovative approaches align with international trends toward authentic assessment and the promotion of lifelong learning in doctoral education (46).

#### **4-6. Implications for Policy and Practice**

Addressing the challenges identified in this review requires a coordinated, multi-level approach involving policy, curriculum, and institutional practice. Policymakers should prioritize the development of clear, standardized guidelines and strengthen institutional oversight to ensure consistency and fairness in comprehensive exam administration. Curricular reforms must align doctoral training with the competencies required for both the exam and the broader field of medical education, while robust student support systems—including mentorship, counseling, and preparatory workshops—are essential to foster resilience and academic achievement. Faculty development, especially in mentorship and feedback, is also critical. Embracing innovative assessment methods and educational technologies can further enhance the relevance, fairness, and effectiveness of

comprehensive exams. These priorities align with Iran's ongoing medical education transformation initiatives, which emphasize integrated policy frameworks, value-based education, and alignment with national health goals. While the Ministry of Health and Medical Education (MOHME) has implemented reforms to integrate healthcare delivery and medical education, ongoing challenges such as limited stakeholder awareness, gaps in policy implementation, and the need for continuous faculty development must be addressed to fully realize these reforms' potential (47–50).

#### **4-7. Study Limitations and Recommendations**

While this review provides a comprehensive synthesis of the current evidence, several limitations should be acknowledged. The analysis is inherently constrained by the availability, quality, and scope of published studies, and—as with all narrative reviews—there is a potential for selection bias due to the absence of a formal risk of bias assessment. Nonetheless, efforts were made to ensure a broad and balanced representation of the literature to capture the multifaceted challenges associated with the comprehensive exam in Iranian medical doctoral education.

Future research should utilize longitudinal and comparative study designs to evaluate the impact of implemented reforms and to identify best practices from other educational systems. It is also essential that future studies systematically incorporate the perspectives of diverse stakeholders—including students, faculty, and policymakers—to guide ongoing improvements and ensure that reforms are responsive to real-world needs.

### **5- CONCLUSION**

The comprehensive exam is a crucial part of doctoral education in Iranian

medical universities, evaluating students' expertise in specialized knowledge and research skills. However, its effectiveness and fairness face significant challenges. Administrative issues, including bureaucratic complexities and inconsistent policies, undermine the exam's credibility and comparability across institutions. Moreover, gaps in the Ph.D. curriculum—especially inadequate training in advanced research methods and educational scholarship—leave students insufficiently prepared. Poor academic performance and delays in prerequisite courses further reduce student readiness and success.

Addressing these challenges requires a coordinated strategy. Policy reforms should introduce clear, standardized guidelines and strengthen institutional oversight. Curriculum updates must align with the competencies needed for the exam and professional roles. Establishing support systems—such as preparatory workshops, academic counseling, and mentorship—can boost student confidence and performance. Additionally, adopting innovative assessment methods like portfolio evaluations, continuous assessment, and educational technologies can offer a fairer, more comprehensive evaluation of doctoral candidates, while alleviating the pressures of traditional exams.

In summary, reforming the comprehensive exam process is essential to enhance the quality and credibility of doctoral education in Iranian medical universities. Targeted improvements in policy, curriculum, and student support will better prepare graduates for research, teaching, and professional careers, strengthening Iran's medical higher education nationally and internationally.

## 6- AUTHORS' CONTRIBUTIONS

Study conception or design: MG, MS; Data analyzing and draft manuscript preparation: AZ, and KM; Critical revision of the paper:

MG; Supervision of the research: MS and MG; Final approval of the version to be published: MG, AZ, KM, and MS.

**7- CONFLICT OF INTEREST:** None.

## 8- REFERENCES

1. Lovitts, B. E. Making the implicit explicit: Creating performance expectations for the dissertation. Sterling, VA: Stylus Publishing; 2006. ISBN 9781579221812.
2. Gardner SK. The Development of Doctoral Students--Phases of Challenge and Support. ASHE Higher Education Report, Volume 34, Number 6. ASHE higher education report. 2009 Mar;34(6):1-27.
3. McBrayer, J. S., Melton, T. D., Calhoun, D. W., Dunbar, M., & Tolman, S. The correlation between self-efficacy and time to degree completion of educational leadership doctoral students. *International Journal of Doctoral Studies*, 2018;13: 413-439
4. Samouei R, Ashrafi-rizi H, Soleymani M R, Yamani N, Kazempour Z. Identifying the Challenges and Appropriate Solutions for Holding Comprehensive Exam for PhD Students in the Medical Sciences Universities: a Qualitative Research. *Res Med Edu* 2024; 15(4):42-54.
5. Khansari F, Asghari F, Mortaz Hejri S, Bathaie F, Larijani B. Challenges of the Medical Ethics PhD curriculum in Iran: A qualitative study. *Caspian J Intern Med*. 2022 Summer;13(3):498-510. doi: 10.22088/cjim.13.3.498. PMID: 35974940; PMCID: PMC9348214.
6. Moradi E. Educational scholarship and Ph.D. curriculum of medical education in Iran: A serious critique and a proposal. *JMED* 2023; 16 (51):82-3.
7. Golde, C. M. The Role of the Department and Discipline in Doctoral Student Attrition: Lessons from Four Departments. *The Journal of Higher Education*, 2005;76:669-700. <http://dx.doi.org/10.1353/jhe.2005.0039>.
8. Moonaghi HK, Valizadehzare N, Khorashadizadeh F. PhD programs in nursing in Iran and Canada: A qualitative study. *J Pak Med Assoc*. 2017 Jun;67(6):863-868. PMID: 28585583.

9. Stensaker, B., & Harvey, L. *Accountability in higher education: Global perspectives on trust and power*. Routledge; 2011. ISBN 9780415871969.
10. Memarian B, Gollish S, Moozeh K, Gerrard D, Tihanyi D, Costa SA, editors. *Comprehensive exam variations and experiences of doctoral candidates in engineering*. ASEE Annual Conference & Exposition; 2019 Jun 15; 2019.
11. O'Neill, G. Initiating curriculum revision: exploring the practices of educational developers. *International Journal for Academic Development*, 2010;15(1): 61–71. <https://doi.org/10.1080/13601440903529927>
12. Amir Samavati Pirouz, Nassrin Mehra. *Regulating Iranian Medical Institutes: Towards Criminal Policy For A Clear Regulatory Model*. *International Journal of Medical and Clinical Research*, 2011;2 (2): 53-62. <http://dx.doi.org/10.9735/0976-5530.2.2.53-62>.
13. Pyhältö, K., Toom, A., Stubb, J., & Lonka, K. *Challenges of Becoming a Scholar: A Study of Doctoral Students' Problems and Well-Being*. *ISRN Education*, 2012 (Article ID 934941); 1-12. <https://doi.org/10.5402/2012/934941>.
14. Niromand E, Salehi A R, Khazaei M, Khazaei M R, *The Influential Factors in the Academic Achievement and Failure of Medical Students in Iran: A Review Study*. *Educ Res Med Sci*.2020;9(2):e105860. <https://doi.org/10.5812/erms.105860>.
15. Austin, A.E., McDaniels, M. *Preparing the Professoriate of the Future: Graduate Student Socialization For Faculty Roles*. In: Smart, J.C. (eds) *Higher Education: Higher Education: Handbook of Theory and Research*, 2006; vol 21. Springer, Dordrecht. [https://doi.org/10.1007/1-4020-4512-3\\_8](https://doi.org/10.1007/1-4020-4512-3_8).
16. Salanova M, Schaufeli W, Martinez I, Breso E. *How obstacles and facilitators predict academic performance: the mediating role of study burnout and engagement*. *Anxiety Stress Coping*. 2010 Jan;23(1):53-70. doi: 10.1080/10615800802609965. PMID: 19326271.
17. Derakhshanfard S, Jokar F, Ehsanpour S, Hadadgar A. *Evaluation of the doctoral program in medical education of Isfahan University of Medical Sciences based on the CIPP model*. *J Educ Health Promot*. 2022 Jul 29;11:217. doi: 10.4103/jehp.jehp\_536\_21. PMID: 36177422; PMCID: PMC9514264.
18. Lovitts, B. E. *Leaving the Ivory Tower: The Causes and Consequences of Departure from Doctoral Study*. Lanham: Rowman & Littlefield; 2001.
19. Stubb, J., Pyhältö, K., & Lonka, K. *Balancing between inspiration and exhaustion: PhD students' experienced socio-psychological well-being*. *Studies in Continuing Education*, 2011;33(1): 33-50. <https://doi.org/10.1080/0158037X.2010.515572>.
20. Lovitts, B. E., & Nelson, C. *The hidden crisis in graduate education: Attrition from Ph.D. programs*. *Academe*, 2000;86(6): 44-50.
21. Peluso, D. L., Carleton, R. N., & Asmundson, G. J. G. *Depression symptoms in Canadian psychology graduate students: Do research productivity, funding, and the academic advisory relationship play a role?* *Canadian Journal of Behavioural Science / Revue canadienne des sciences du comportement*, 2011;43(2): 119–27. <https://doi.org/10.1037/a0022624>.
22. Ashrafi-Rizi H, Samouei R, Soleymani MR, Yamani N. *Identifying the challenges of holding comprehensive exams in the Ph.D. programs of Iranian medical universities: A protocol for qualitative research*. *J Educ Health Promot*. 2023 Aug 31;12:293. doi: 10.4103/jehp.jehp\_111\_23. PMID: 37849869; PMCID: PMC10578549.
23. Thyer, B. A. *A Student Portfolio Approach to Conducting Doctoral Social Work Comprehensive Examinations*. *Journal of Teaching in Social Work*, 2004;23(3–4):117–26. [https://doi.org/10.1300/J067v23n03\\_10](https://doi.org/10.1300/J067v23n03_10).
24. Nerad M, Cerny J. *Postdoctoral patterns, career advancement, and problems*. *Science*. 1999 Sep 3; 285(5433):1533-5. doi: 10.1126/science.285.5433.1533. PMID: 10477510.
25. Lovitts, B. E., & Wert, E. L. *Developing quality dissertations in the social sciences: A graduate student's guide to achieving*

- excellence. Stylus Publishing; 2009. ISBN 9781579222598.
26. Gardner, S. K. Contrasting the Socialization Experiences of Doctoral Students in High- and Low-Completing Departments: A Qualitative Analysis of Disciplinary Contexts at One Institution. *The Journal of Higher Education*, 2010;81(1): 61–81. <https://doi.org/10.1080/00221546.2010.11778970>.
  27. Bayat A, Jamshidipour A, Hashemi M. The Beneficial Impacts of Applying Formative Assessment on Iranian University Students' Anxiety Reduction and Listening Efficacy. *International Journal of Languages' Education and Teaching*, 2017; 5(2): 1-11.
  28. Altbach, P. G., & de Wit, H. Internationalisation and Global Tension: Lessons from History. *Journal of Studies in International Education*, 2015;19: 4-10. <https://doi.org/10.1177/1028315314564734>.
  29. Trowler, P. *Doing Insider Research in Universities*. Bloomsbury Academic; 2014; 1-76. ISBN: 1500672726, 9781500672720.
  30. Boud D, Lee A, editors. *Changing practices of doctoral education*. London: Routledge; 2009 May 7.
  31. Shin, J. C., Kim, S. J., Kim, E., & Lim, H. Doctoral Education in South Korea: On the Way Toward Becoming an Independent Research Hub: Convergence or Divergence in National Approaches? In book: *Doctoral Education for the Knowledge Society*, 2018; pp.183-202. DOI:10.1007/978-3-319-89713-4\_11.
  32. Walker, G. E., Golde, C. M., Jones, L., Bueschel, A. C., & Hutchings, P. *The Formation of Scholars: Rethinking Doctoral Education for the Twenty-First Century*. Jossey-Bass; 2007. ISBN: 978-0-470-19743-1.
  33. Morley, L., Leonard, D., & David, M. Variations in Vivas: Quality and equality in British PhD assessments. *Studies in Higher Education*, 2002; 27(3): 263–73. <https://doi.org/10.1080/03075070220000653>.
  34. Lovitts, B.E. Being a Good Course Taker Is Not Enough: A Theoretical Perspective on the Transition to Independent Research. *Studies in Higher Education*, 2005;30: 137-54. <http://dx.doi.org/10.1080/03075070500043093>
  35. Barnes, B. J., & Randall, J. Doctoral student satisfaction: An examination of disciplinary, enrollment, and institutional differences. *Research in Higher Education*, 2012;53(1): 47–75. <https://doi.org/10.1007/s11162-011-9225-4>
  36. Barnett, R. University knowledge in an age of supercomplexity. *Higher Education* 2000;40: 409–22. <https://doi.org/10.1023/A:1004159513741>.
  37. Rezaieitavirani M, Sadeghi Y, Kavarizadeh F. Curriculum Audit of the Iranian Anatomy PhD Program according to ORPHEOUS Standards: A European Standard . *J. Ilam Uni. Med. Sci.* 2018; 26 (4) :136-141
  38. Schumacher DJ, Englander R, Carraccio C. Developing the master learner: applying learning theory to the learner, the teacher, and the learning environment. *Acad Med.* 2013 Nov;88(11):1635-45. doi: 10.1097/ACM.0b013e3182a6e8f8. PMID: 24072107.
  39. Mogaddamzadeh, A., Abbasi, F., Kazemitabar, M. Examining the Effective Factors in the National Ranks of the Entrance Exam Candidates of State Universities and Higher Education Institutions in Iran: A Multilevel Analysis. *Iranian Journal of Learning and Memory*, 2018; 1(3): 47-60. doi: 10.22034/iepa.2018.86024.
  40. Evans TM, Bira L, Gastelum JB, Weiss LT, Vanderford NL. Evidence for a mental health crisis in graduate education. *Nat Biotechnol.* 2018 Mar 6;36(3):282-284. doi: 10.1038/nbt.4089. PMID: 29509732.
  41. Sambunjak D, Straus SE, Marusić A. Mentoring in academic medicine: a systematic review. *JAMA.* 2006 Sep 6;296(9):1103-15. doi: 10.1001/jama.296.9.1103. PMID: 16954490.
  42. Nicol, D., & Macfarlane-Dick, D. Formative Assessment and Self-Regulated Learning: A Model and Seven Principles of Good Feedback Practice. *Studies in Higher Education*, 2006;31: 199-218. <http://dx.doi.org/10.1080/03075070600572090>

43. Norcini J, Burch V. Workplace-based assessment as an educational tool: AMEE Guide No. 31. *Med Teach*. 2007 Nov;29(9):855-71. doi: 10.1080/01421590701775453. PMID: 18158655.
44. Crompton, H., Burke, D. Artificial intelligence in higher education: the state of the field. *Int J Educ Technol High Educ* 2023;20(22). <https://doi.org/10.1186/s41239-023-00392-8>.
45. Boud D, Falchikov N. Aligning assessment with long-term learning. *Assessment & evaluation in higher education*. 2006 Aug 1;31(4):399-413.
46. Vlachopoulos, D., & Makri, A. A systematic literature review on authentic assessment in higher education: Best practices for the development of 21st century skills, and policy considerations. *Studies in Educational Evaluation*, 2024;83: Article 101425. <https://doi.org/10.1016/j.stueduc.2024.101425>.
47. Ashrafizadeh H, Rokhafroz R, Beiranvand S. Policy analysis of education transformation plan in Iran's health system using Walt Gilson model. *JMED* 2022; 15(46) :8-21.
48. Ansari, H., Talebi, B., Khadivi, A. The Challenges of Assessing Medical Educational Policies in Iran: A Systematic Review. *Strides in Development of Medical Education*, 2020; 17(1): 1-8. doi: 10.22062/sdme.2020.91482.
49. Salehi A, Harris N, Lotfi F, Hashemi N, Kojouri J, Amini M. Reform in medical and health sciences educational system: a Delphi study of faculty members' views at Shiraz University of Medical Sciences. *East Mediterr Health J*. 2014 Apr 3;20(3):151-61. PMID: 24950072.
50. Tabatabai S, Simforoosh N. A conceptual framework to incorporate fundamental values in the health and medical education system in Islamic Republic of Iran. *East Mediterr Health J*. 2023 Aug 31; 29(8):608-19. doi: 10.26719/emhj.23.089. PMID: 37698216.