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Original Article

Factors Affecting Plagiarism from the Standpoint of Faculty Members and Graduate Students

Mohammad Reza Amiri[1], Samad Moslehi[2], Fatemeh Allahmoradii[1], Narges Ahmadvand[1], Maryam Zarghani[3*]

[1] Department of Medical Library and Information, Faculty of Paramedicine, Hamadan University of Medical Sciences, Hamadan, Iran.

[2] Department of Biostatistics, School of Public Health, Hamadan University of Medical Sciences, Hamadan, Iran.

[3] Document Center and Central Library, Medical Information Management, Hamadan University of Medical Sciences, Hamadan, Iran.

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*** Corresponding author:**
Maryam Zarghani
Email: mary.zarghani@gmail.com

Abstract

Introduction: Plagiarism is a form of scientific misconduct, and academics may be involved in it deliberately or unintentionally. This study aims to investigate the attitudes of faculty members and graduate students of Hamadan University of Medical Sciences towards the factors influencing the development of academic plagiarism.

Methods: This survey was conducted on faculty members and graduate students from Hamadan University of Medical Sciences in the academic year of 2023. The sample size was determined using a stratified random method (306 people). The data collection tool was a questionnaire scored on a five-point Likert scale. Data analysis was performed using descriptive statistics and the Mann-Whitney U test, as implemented in SPSS software.

Results: The study participants included 148 faculty members and 144 students. The main background factors affecting academic plagiarism are related to “low self-confidence and fear of the label of requesting help from others” (53.6%), “lack of understanding of intellectual property rights” (52.6%), “absence of ratified laws and executive mechanisms to penalize plagiarists” (49.8%), “inappropriate cultural and moral values in the society regarding scientific plagiarism” (46.6%). No significant differences were reported between the views of faculty members and students regarding personal, normative, organizational, and cultural factors; however, a significant difference was observed in technology factors.

Conclusion: Faculty members and students share similar viewpoints regarding the factors creating the context for plagiarism. According to the opinions of the community under study, appropriate educational programs, regulatory guidelines, and adjustments to cultural and organizational conditions should be considered to reduce plagiarism.

Introduction

The development of information technology tools has made access to research content much easier than before, allowing users to determine within a few hours whether a new project can be started (1). University professors and students publish various ideas and articles demonstrating their research performance. Scientific ethics obliges every researcher to observe its stipulations and to comply with relevant features in a scientific field. However, researchers encounter obstacles and

nuisances in the growth and development path of these scientific ideas knowingly or unknowingly, including plagiarism or research misconduct (2). Representing the work of others without mentioning the source at any stage of research planning, writing, or publishing an article is an unethical act and a type of violation in the field of research and writing (3). In the same way that the development and growth of scientific works lead to the advancement of various fields, scientific plagiarism weakens this process. It violates other people's rights, creating pseudo-science or knowledge that is not the result of the efforts of the persons generating it, but instead signifies stealing other people's works and damaging scientific knowledge (4). Academic plagiarism occurs for various reasons such as individual, environmental and organizational factors (5), which can be related to such things as professional ethics, self-esteem, promotion goals, fear of failure, scientific, work and managerial consequences in the organization, positive peer assessment of plagiarism, the culture governing individual and environmental practices, and satisfaction of parents (4-6). In addition, economic, social, and educational factors have been implicated in encouraging the development of this phenomenon (7). Other external factors, such as the increase in publications, research slogans like Publish or Perish, technological capabilities such as reproduction, fast transmission, information storage, and retrieval tools, have also aggravated or facilitated plagiarism among academics (3, 8).

Since practical work is vital in any field, including research, if individuals gain prestige and status based on the work done by others, the incentives to improve their professional competencies will decrease. The problem of plagiarism is not new, but has existed for centuries (9). Review of previous studies clearly shows that research misconduct exists everywhere; however, its causes are different in various parts of the world. Background factors range from a lack of training in scholarly writing, inadequate regulatory practices, absence of resources, pressure to publish in China and India, to a lack of clear understanding of plagiarism in Pakistan and cultural acceptance of unethical behavior in many other countries (10). Pakistani freshman and senior students do not have a proper understanding of plagiarism, and no clear policies have been formulated in this regard by the Higher Education Commission of Pakistan (11). However, in examining the attitudes of men and women towards the phenomenon of academic plagiarism, it has been determined that women in particular have a much more negative attitude than men. Factors like social life, the motivation to study and work during education have also strongly influenced plagiarism (12). In addition, the false social value attributed to academic degrees in society is considered another influential factor in the development of scientific plagiarism, which sometimes leads to the violation of cultural principles and ignorance of material and spiritual aspects of authors' rights (13). The lack of basic education and proper culturalization from a basic level, the absence of sufficient awareness of the types of plagiarism and their consequences, and the imposition of assignments beyond one's ability for the sake of promotion, achieving a higher rank, or academic degree have been the main reasons for the prevalence of plagiarism in Iran (14). Correct and principled inculcation from a basic educational level, stipulation of strict laws and severe penalties for offenders, and education and training have been among the most critical solutions proposed to deal with plagiarism (15). In the study of Mohammed et al. the leading cause of plagiarism was a lack of awareness about the subject associated with factors such as time constraints, writing skills, and pressure on researchers to publish their works in authentic journals, which can be reduced through raising awareness (14). Moreover, the culture governing the society has a significant impact on the academic plagiarism rate of the members of that society. In the European Union member states, apart from the stipulation of laws, much emphasis has been placed on the implementation of educational policies to instill a suitable and efficient research culture (13).

To prevent and manage the problem of plagiarism, its causes must be recognized and considered from several aspects. Understanding the perspective of researchers on academic plagiarism can help academics observe appropriate norms to be effective

in formulating proper strategies for promoting academic integrity and preventing academic plagiarism (2). Trustworthy researchers try to comply with scientific ethics in their works to win a valid scientific position in the scientific community with the works and innovations they present (8). Therefore, paying attention to actions and informing stakeholders in different sectors can pave the way for preventing scientific misconduct, which is a necessary measure to maintain the credibility of science and research organizations. There have been efforts to create anti-plagiarism systems and programs for preventing this phenomenon, which could be a solution for plagiarism, given that "prevention is better than cure". Given the growing number of postgraduate students and faculty members in universities, comprising the main research community of higher education institutions, exploring the understanding and attitude of them as influential groups in the process of producing university research allows for understanding the factors affecting academic plagiarism from their standpoint in an attempt to present solutions for preventing plagiarism to administrators and researchers themselves based on opinions of students and faculty members. Therefore, this study aims to investigate and compare the attitude of faculty members and graduate students of Hamadan University of Medical Sciences towards personal, regulatory, organizational, cultural, and technological factors predisposing to academic plagiarism. In this way, by recognizing these factors, it is possible to clearly present solutions to reduce this problem and to help academic centers formulate appropriate educational programs and executive rules to implement research ethics and train decent researchers.

Methods

The study is applied research adopting a survey method and a quantitative approach. To collect data, a self-administered questionnaire with two sections was used, including personal characteristics and academic plagiarism factors. The questionnaire was designed based on studies conducted by Zamani et al. (4), Amiri & Razmjoo (16), and Rodrigues et al. (10). The validity of questionnaire components was approved based on CVR score > 0.62 and CVI score > 0.79, and its reliability was confirmed by Cronbach's alpha of 0.85. Data was collected in two ways: face-to-face visits and online. In the former method, with prior coordination, the researcher visited the work or study environment of the research community to collect data. In the latter, first the e-mail address of the research community was obtained by official correspondence from the Education Department of the faculties, after which the hyperlink and the questionnaire file were sent to them. The population included 507 faculty members and 818 graduate students from Hamadan University of Medical Sciences in the academic year of 2023. A random sampling method was utilized to specify the sample size. First, the sample size was estimated to be 278 people according to Krejcie and Morgan's sample size determination table. Considering a 10% dropout, the final sample size was calculated as 306 people. In addition, the stratified sampling method was used to distribute the sample size among the study subjects according to the difference in the number of subjects in each group. The sample size included 117 faculty members and 189 graduate students, according to each class, using the following formula:

$$n_j = \frac{n}{N} \times N_j$$

Convenience sampling was used to access the samples. The questionnaire was distributed between all faculty members via email or face to face, and if they were willing to participate in the study, they answered the questionnaires. This process continued until a sufficient number was reached. The same process was followed for students.

The inclusion criteria were serving as a faculty member or graduate student at Hamadan University of Medical Sciences, Hamadan, Iran, and publishing a minimum of three articles. Exclusion criteria were having fewer than three published articles and not having research activity during the study period. Three hundred six questionnaires were distributed to the research community through two methods: In-person and online. After collecting and reviewing the responses, 14 questionnaires were eliminated

due to incomplete information, resulting in a final analysis of 292 questionnaires. Data analysis was done using descriptive and analytical statistics using SPSS software (version 16). The identity of the participants in the study remained confidential, and their opinions were used only for the analysis of the study objectives. If they did not wish to cooperate, the participants were free to withdraw from the study without any restrictions.

Descriptive statistics were reported in the form of indicators, tables, and graphs. The normality of the data was tested using the Kolmogorov-Smirnov test, and the results showed that the distribution was not normal. As a result, the Mann-Whitney U test was used to compare the means of factors affecting plagiarism in the two groups of students and faculty members.

Results

Analysis of demographic information showed that there were 135 men and 157 women (292 participants), namely 148 faculty members and 144 students. Table 1 shows the demographic information of the participants.

Table 1. Demographic variables of the participants

Demographic variables		Frequency (%)
Gender	Male	135 (46.2)
	Female	157 (53.8)
	Total	292 (100)
Type of participants	Faculty members	148 (50.7)
	Student	144 (49.3)
	Total	292 (100)
Age	25-35	115 (42.8)
	36-45	104 (38.7)
	>45	50 (18.5)
	Total	269 (100) *

*The difference in the number from the total participants (292) is due to missing numbers

Descriptive information regarding the factors affecting academic plagiarism based on personal, regulatory, organizational, cultural, and technological factors is reported in Tables 2 and 3 based on a five-point Likert scale (Due to the length of the table, the factors were divided into two categories and presented in 2 separate tables).

According to the data in Table 2 regarding the factors affecting academic plagiarism, from the standpoint of participants of this study, all eight components recognized as personal factors affect academic plagiarism behavior. The highest rate of agreement was related to the element "Low self-confidence and fear of the label of requesting help from others," with 53.6% choosing the "I agree" option. In relation to regulatory factors, all the four investigated components showed the highest level of agreement as the underlying factors of academic plagiarism, such that the two components of "lack of understanding of intellectual property rights" with 52.6% and "lack of approved laws and enforcement mechanisms for punishment of scientific plagiarists" with 49.8% have received the "I agree" option. With respect to cultural factors, it was determined that all four investigated components have had the highest agreement rate, as indicated by the "I agree" option. The highest points are related to the two components of "the inappropriateness of

cultural and moral values governing the society regarding academic plagiarism" with 46.2% and "lack of personal-scientific values in educational and research activities" with 46.2%.

Table 3 shows that, with respect to the organizational factors, the highest agreement rate was variable, such that in some factors, such as "tendency toward degree orientation and hope for grades" with 46.6% and "excessive attention to the quantity of published articles and scientific works" with 52.9% received the "I strongly agree" option. In other components, the highest agreement rate was based on the "I agree" option, and the option "lack of a clear policy on academic plagiarism in universities" received the highest attention of participants, with 46.4%. In general, the regulatory factors have a significant impact on the process of academic plagiarism, as indicated by the selection of "I agree" and "I strongly agree" options. In connection with technology components, a different view of their impact on academic plagiarism was observed. In the four investigated components, "easy access to scientific articles and ideas through databases and the Internet" with 36.6% and "widespread dissemination of scientific content and materials through the web" with 35.6% had no significant impact on academic plagiarism, as indicated by the choice of the low option. However, "lack of appropriate technologies for identifying plagiarism" with 38.4% and "lack of proper use of plagiarism software" with 43.5% have been considered by participants as the factors influencing the development of plagiarism, as is evident by choosing the option "I agree".

Table 2. Frequency distribution of personal, regulatory, and cultural factors affecting academic plagiarism according to the research community

	Components	Frequency (%)					
		Strongly disagree	Disagree	No comment	Agree	Strongly agree	Total*
Personal factors	Low self-confidence and fear of the label of requesting help from others	9 (3.1)	33 (11.4)	28 (9.7)	155 (53.7)	64 (22.1)	289 (100)
	Lack of familiarity with the types of plagiarism	4 (4.8)	35 (12)	48 (16.5)	141 (48.5)	53 (18.2)	281 (100)
	Weakness in conducting research processes	14 (4.8)	35 (12)	44 (15.2)	143 (49.1)	55 (18.9)	291 (100)
	Lack of citing skills	9 (3.1)	40 (13.7)	24 (8.2)	148 (50.7)	71 (24.3)	292 (100)
	Lack of familiarity with the correct way of writing direct quotations	18 (6.2)	50 (17.2)	50 (17.2)	116 (39.8)	57 (19.6)	291 (100)
	Lack of scientific writing skills (articles, books, research project, etc.)	12 (4.1)	51 (17.6)	60 (20.5)	103 (35.6)	64 (22.2)	290 (100)
	Not worrying about the consequences of plagiarism punishment	33 (11.4)	74 (25.7)	64 (22.2)	88 (30.4)	29 (10.3)	288 (100)
	Time consuming and difficult nature of conducting research activities	18 (6.2)	50 (17.1)	30 (10.3)	148 (50.7)	46 (15.7)	292 (100)
	Absence of appropriate mechanisms for detecting and punishing scientific plagiarists	8 (2.8)	40 (13.8)	56 (19.3)	134 (46.2)	52 (17.9)	290 (100)
	Absence of ratified laws and executive mechanisms to penalize plagiarists	8 (2.8)	42 (14.4)	52 (17.9)	145 (49.8)	44 (15.1)	291 (100)

Table 2. Frequency distribution of personal, regulatory, and cultural factors ... (continued)

	Components	Frequency (%)					
		Strongly disagree	Disagree	No comment	Agree	Strongly agree	Total*
Regulatory factors	Lack of understanding of intellectual property rights and related laws	3 (1.1)	37 (12.7)	40 (13.7)	153 (52.6)	58 (19.9)	291 (100)
	Inadequacy of enforcement requirements of plagiarism laws at the community level	9 (3.1)	23 (7.9)	49 (16.8)	134 (46.1)	76 (26.1)	291 (100)
Cultural factors	Educational and moral culture in the family	12 (4.1)	54 (18.6)	65 (22.3)	120 (41.3)	40 (13.7)	291 (100)
	Encouragement to progress by any means possible	9 (3.1)	25 (8.6)	46 (15.8)	131 (45)	80 (27.5)	291 (100)
	The inappropriateness of the cultural and moral values governing the society regarding academic plagiarism	5 (1.7)	24 (8.2)	50 (17.2)	135 (46.4)	77 (26.5)	291 (100)
	Lack of personal-scientific values in educational and research activities	9 (3.1)	27 (9.2)	66 (22.6)	135 (46.3)	55 (18.8)	292 (100)

*The difference in the number from the total participants (292) is due to missing data

Table 3. Frequency distribution of organizational and technological factors affecting academic plagiarism according to the research community

	Components	Frequency (%)					
		Strongly disagree	Disagree	No comment	Agree	Strongly agree	Total*
Organizational factors	Tendency toward degree orientation and giving importance to grades	4 (1.4)	23 (7.9)	16 (5.5)	113 (38.8)	135 (46.4)	291 (100)
	Weakness in teaching research skills and rules	4 (1.4)	20 (6.8)	29 (10)	131 (45)	107 (36.8)	291 (100)
	Paying too much attention to the quantity of published articles and scientific works	2 (.8)	17 (5.9)	29 (10)	88 (30.4)	153 (52.9)	289 (100)
	Absence of a clear policy on academic plagiarism in universities	4 (1.4)	28 (9.3)	57 (19.6)	135 (46.4)	68 (23.3)	292 (100)
	Lack of proper information about regulations and laws related to academic plagiarism in universities	3 (1)	44 (15.1)	41 (14.2)	134 (46)	69 (23.7)	291 (100)
	Lack of cooperation of senior and expert researchers as guides of young researchers	8 (2.8)	66 (22.7)	71 (24.5)	81 (27.9)	64 (22.1)	290 (100)
	Lack of familiarity of young researchers with the working process of journals	8 (2.8)	34 (11.8)	53 (18.3)	139 (48.2)	54 (18.9)	288 (100)

Table 3. Frequency distribution of organizational and technological factors ... (continued)

Components		Frequency (%)					
		Strongly disagree	Disagree	No comment	Agree	Strongly agree	Total*
	Failure to present procedures and clear statements about academic plagiarism in the policy of journals	3 (1)	63 (21.9)	64 (21.7)	123 (42.8)	36 (12.6)	289 (100)
	Lack of ethical work environment in educational and research institutions	4 (1.4)	51 (17.5)	71 (24.4)	103 (35.4)	62 (21.3)	291 (100)
	Lack of proper policies to increase the number of researches	3 (1)	27 (9.3)	48 (16.6)	126 (43.4)	86 (29.7)	290 (100)
	Lack of proper policies to evaluate researches	1 (.3)	29 (10)	49 (16.8)	124 (42.6)	88 (30.3)	291 (100)
	Non-recognition of academic plagiarism by professors and not reacting to it	11 (3.8)	45 (15.5)	63 (21.6)	116 (39.9)	56 (19.2)	291 (100)
Technological	Easy access to articles and scientific ideas through databases and the Internet	42 (14.4)	107 (36.6)	40 (13.7)	77 (26.4)	26 (8.9)	292 (100)
	Widespread distribution of scientific content and materials through the Internet	39 (13.3)	104 (35.6)	46 (15.8)	79 (27.1)	24 (8.2)	292 (100)
	Lack of appropriate technologies for identifying plagiarism	19 (6.5)	82 (28.2)	48 (16.4)	112 (38.5)	30 (10.4)	291 (100)
	Lack of proper use of plagiarism software	15 (5.1)	45 (15.4)	65 (22.3)	127 (43.5)	40 (13.7)	292 (100)

*The difference in the number from the total participants (292) is due to missing data

To clarify, the raw scores for each factor influencing scientific plagiarism were converted to a 0-100 scale. This was done by dividing the total score of each factor's questions by the highest possible score for that component. This process ensures all scores are directly comparable. Table 4 presents the mean normalized scores for factors affecting plagiarism, as reported by both groups. The organizational factor received the highest mean score (76, SD=12), indicating it was perceived as the most influential factor. Conversely, the technological factor received the lowest mean score (61.3, SD=16.98), identifying it as the least influential.

Table 4. Mean (SD) normalized score of factors affecting plagiarism from the perspective of students and faculty members

Factors affecting scientific plagiarism	Students' Mean (SD)*	Academic staff Mean (SD)	Total Mean (SD)
Personal	69.8 (17.44)	72.5 (13.26)	71.2 (15.49)
Regulatory	74.2 (15.37)	74.2 (16.76)	74.2 (16.06)
Organizational	76.4 (12.48)	75.7 (11.55)	76.0 (12.00)
Cultural	72.3 (15.37)	75.6 (15.25)	74.0 (15.38)
Technological	63.2 (16.94)	59.5 (16.86)	61.3 (16.98)

*SD: Standard Deviation

The Kolmogorov-Smirnov test was used to assess the normality of the Personal, Regulatory, Organizational, Cultural, and Technological components for both groups. The results indicated that the data for these components were not normally distributed. Therefore, the Mann-Whitney U test was used to compare the means of factors affecting academic plagiarism in the two groups of students and faculty members as reported in Table 5.

Table 5 revealed a statistically significant difference in the ratings for Technological factors (P=0.013), with students reporting a significantly higher perceived influence than faculty members. No statistically significant differences were found between the groups for Regulatory (P=0.923), Organizational (P=0.314), Cultural (P=0.062), or Personal (P=0.060) factors.

Table 5. Significant difference in the normalized score of factors affecting academic plagiarism between students and faculty members

Factors affecting scientific plagiarism	Mann-Whitney U	Z-score	P-value
Personal	9303.5	-1.879	0.060
Regulatory	10513.5	-0.096	0.923
Organizational	9860.5	-1.007	0.314
Cultural	9315	-1.87	0.062
Technological	8877.5	-2.478	0.013*

*Sufficient at the 0.05 level

Discussion

This study investigated and compared the attitude of faculty members and graduate students of Hamadan University of Medical Sciences towards personal, regulatory, organizational, cultural, and technological factors predisposing to academic plagiarism. The findings showed that the main factors affecting academic plagiarism were "low self-confidence and fear of being labeled by others", "lack of understanding of intellectual property rights", "absence of ratified laws and enforcement mechanisms to punish scientific plagiarists", "tendency toward degrees and giving importance to grades" and "excessive attention to the quantity of published articles and scientific works", "absence of a clear policy on academic plagiarism in universities", "inappropriateness of cultural and moral values governing the society regarding academic plagiarism", "non-observance of personal-scientific values in educational and research activities, which have been considered by a majority of participants based on five-point Likert scale through choosing two options: "I agree" and "I strongly agree". According to the results of studies related to this field, research misconduct exists almost everywhere, but its causes are different in various parts of the world (8). Furthermore, the factors of social life, the motivation to study and work during education, have strongly influenced the development of scientific plagiarism (12). Other factors influencing this phenomenon are related to a lack of training in the field of scientific writing, insufficient regulatory measures, a lack of resources, publication pressure, a poor understanding of plagiarism, cultural acceptance of unethical behaviors in the field of writing and research (8), and the absence of clear and decisive policies (11). Mohammed et al. also considered the leading cause of plagiarism to be time constraints, writing skills, and pressure on researchers to publish their works (14). In addition, Nemati and Hosseini Moghadam considered academic plagiarism to be related to obtaining higher academic degrees and the false social value given to it in society, leading to ignorance of the material and spiritual aspects of scientific works and creates a background for academic plagiarism (13). Yi et al. suggested that a

lack of awareness increases the risk of plagiarism, and they considered necessary training along with objective examples to improve the ability to recognize and avoid plagiarism (17).

On the other hand, in examining cultural factors, it has been identified that "the inappropriateness of the cultural and moral values governing the society regarding academic plagiarism" and "lack of personal-scientific values in educational and research activities" have received the most attention from the participants. Mohammad Hosseinpur et al. have reported lack of basic education and proper culturalization from an elementary level, the prevalence of indolence culture, the compulsion to submit essays and assignments beyond the scope of ability as common factors of academic plagiarism (15). Moreover, studies have reported the cultural factors affecting the incidence of academic plagiarism to be related to the prevailing thought that governs the family and society in the direction of not paying attention to moral values in the path of education and research. Well-defined definitions and deterrents from this behavior, such as correct culturalization from the first educational environments, including family, school, and university, establishing and implementing strict laws and severely punishing offenders (15), applying educational policies and informing to instill an ethical and efficient research culture, can be effective in this respect (13).

In investigating the technology components, it was specified that if appropriate technology for identifying plagiarism content, as well as plagiarism software or systems like auxiliary tools, are not used in scientific environments, this may predispose to plagiarism. Since the development of information technologies in the field of publishing and assessing scientific works has detected and decreased plagiarism behavior and facilitated scientific evaluations relative to the past by providing various types of software or plagiarism and matching systems such as Turnitin and Grammarly, application of these software in the process of assessing scientific works by scientific researchers in journals, editors, and supervisors in different departments is a proper approach to identify and reduce plagiarism. In this regard, Perkins et al. have reported that the use of fingerprint effect and marking process is a suggested solution to minimize the academic plagiarism behavior. Nonetheless, to compare information using this method, appropriate interventions for the collection and comparison of information should be considered because this approach focuses on writing styles, and it cannot provide a functional assessment in cases related to artworks or computer coding (18). In designing an online plagiarism detection system, Setu et al. have presented an effective method for maintaining scientific integrity and increasing the originality of the work, which has increased the average accuracy of online plagiarism detection to 65% (19).

Regarding the factors affecting plagiarism, Zamani et al. examined 11 components in general among students, and evidence-based orientation and high attention to grades were recognized as the most significant factors influencing plagiarism (4). Amiri and Razmjoo also addressed the issue of plagiarism among undergraduate English students and mentioned various factors such as professors' ignorance of plagiarism, limited writing and research skills, pressure from peers, obligation to submit high-quality assignments, and ease of plagiarism as effective factors (16). Rodrigues et al. reviewed articles in the field of plagiarism and identified factors such as lack of training in scientific writing and research ethics, publication pressure, lax attitudes, and inadequate monitoring measures as the main reasons for research misconduct in scientific publications (10). A distinguishing point of the factors examined in the present study, compared to the studies mentioned above, was the classification of 32 components into five groups: Personal, regulatory, organizational, cultural, and technological, examined from the standpoint of faculty members and postgraduate medical students. Since these two groups constitute the majority of academic researchers, they can provide more relevant results for other Iranian universities.

Because this is a case study focusing on the academic community in Iran, the generalization of results to similar populations in other countries may be limited due to different cultural conditions. For this reason, it is better to conduct research

focusing on multicultural environments or perform joint studies in several educational organizations from various countries and present related reports regarding the factors influencing academic plagiarism in educational-research environments, and consider approaches to reduce them through existing regulations at an international level.

Conclusion

Personal and cultural factors have the highest impact on plagiarism, as the elements affecting academic plagiarism, according to the average rating reported from the standpoint of faculty members. Organizational and regulatory factors have a reciprocal effect. The organization's attitude concerning promotions, implementation of laws, and the existence of appropriate regulatory and admonishment programs can prevent this behavior to a large extent. On the other hand, the behavior of academic plagiarism is complicated in case these programs are not clearly formulated, information is not provided or insufficiently presented, and appropriate laws are not established and enforced. Given that students believe organizational and regulatory factors are more effective than other elements in mitigating this behavior, it is advisable to clearly outline and present these organizational and regulatory measures to students at the time of their admission to higher education. This can be achieved through the implementation of research educational programs or by offering pre-prepared content. Additionally, organizations can effectively promote research ethics by conducting training courses and issuing research qualification certificates. On the other hand, from the standpoint of faculty members, personal and cultural factors are in the first rank of creating the context of academic plagiarism. Seemingly, if both groups have proper awareness of the rules, feedback, and reprimanding effects of this behavior, it will reduce the practice of plagiarism. Factors related to technology can also be used to moderate this issue. According to faculty members, during the publication process of scientific works, technology does not have a significant impact on plagiarism. Nevertheless, the absence or non-use of plagiarism detection tools for quick and easy detection of this behavior by evaluators can encourage people to practice plagiarism.

Finally, the upward trend of plagiarism is related to the interaction of various individual, organizational, cultural, and technological factors. To prevent and combat plagiarism, a multifaceted approach is needed to maintain the quality and credibility of scientific productions, which research stakeholders in different sectors should consider and put scientific integrity as an essential commitment at the forefront of their research and educational activities. Given the global nature of scientific works, there should be extensive cooperation in this regard between various organizations around the world with researchers, which should be carried out in the form of practical training, integrated scientific policies, and definitions of uniform standards among all scientific communities in different countries, demanding the creation and strengthening of a strong scientific culture based on ethical behavior among scientific communities. Research managers and planners should focus on creating clear guidelines based on educational processes and workshops to inform researchers and students about the types of plagiarism and its adverse effects on the scientific and work path. Moreover, in academic environments, courses related to ethics in education and research should be developed and implemented. Legal authorities should consider the development of clear and enforceable guidelines regarding the consequences of committing plagiarism on their agenda. In addition, faculty members should use appropriate tools for reviewing research, consider the capabilities of students in the research path, and provide the necessary training before starting research.

Declaration

Acknowledgment

The authors would like to thank all participants in the study.

Conflict of Interest

The authors declare that they have no competing interests.

Ethical Statement

The study procedure was approved by the Medical Ethics Committee of Hamadan University of Medical Sciences [date: 18 Feb 2024, ID: IR.UMSHA.REC.1402.483]. All participants' information was anonymous and private; no personal information was collected that could link the answers to any of the participants in the present study. All methods in the study were in accordance with relevant regulations and guidelines (General Ethical Guidance for Medical Research with Human Participants in the Islamic Republic of Iran). Furthermore, at the time of delivering the questionnaire, the study objectives were fully explained to the participants, and it was stated in the introduction of the questionnaire that they should complete the questionnaire if they wished to participate in the study.

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Authors' Contribution

All authors contributed to the study conception and design.

Mohammad Reza Amiri: Conceptualization, Methodology, data analysis, writing review, and editing of the final manuscript.

Samad Moslehi: data analysis.

Maryam Zarghani: Conceptualization, Methodology, data analysis, first draft manuscript was written and writing review, and editing the final manuscript.

Fatemeh Allahmoradii: data collected. All authors commented on previous versions of the manuscript.

Narges Ahmadvand: data collected. All authors commented on previous versions of the manuscript.

All authors read and approved the final manuscript.

Use of Artificial Intelligence

Not applicable.

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