



Organizational Innovation in the Faculties of Shiraz University of Medical Sciences: Barriers and Facilitating Factors

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Abstract:

Introduction: In recent years, organizational innovation has been an essential component of third-generation universities. This study aimed to examine organizational innovation and identify its barriers and facilitating factors in the faculties of Shiraz University of Medical Sciences.

Methods: In this descriptive-analytical cross-sectional study, data from 94 employees and faculty members of three faculties at Shiraz University of Medical Sciences in 2022 were examined. The Innovation Climate Questionnaire-Persian version was used. Descriptive statistics and Spearman's correlation test were utilized.

Results: Out of 94 participants, 33 percent were male, and 67 percent were female. Among the seven Likert-scale dimensions, "Professional relations at the university" had the highest score (3.51 ± 0.97), while "Measuring innovation" had the lowest (3.13 ± 0.87). In terms of the four percentage areas, "Involvement" had the highest score (63.67 ± 24.84), while "Idea-Time" had the lowest score (34 ± 21.27). The mean for "Foreseeing" was reported as 3.50 ± 0.94 . A significant negative correlation between age and "Idea-Support" ($r_s = -0.531$, $p = 0.003$), as well as between working experience and "Idea-Support" ($r_s = -0.387$, $p = 0.034$).

Conclusion: This study identified key facilitators and barriers to organizational innovation at Shiraz University of Medical Sciences, with strengths in professional relations and involvement, and weaknesses in measuring innovation and in idea time. The findings suggest the need for structured innovation evaluation, protected time for idea development, and targeted managerial support to strengthen innovation and support the university's transition toward a third-generation university.

Keywords: Faculty, Innovation, Organizational Innovation

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Introduction

Innovation originates from the Latin word "nova," which means "new" (1). It refers to planning, production processes, structures, or new products (2). Innovation is a change facilitated by new management skills, resources, technologies, and systems (3). Finally,

Innovation is a part of the system that produces it (4). Researchers have proposed various classifications of innovation. One such classification distinguishes between single and complex innovation: single innovation is applied to a single dimension, whereas complex innovation is applied to multiple dimensions (5). Another classification proposes product, process, and organizational innovation as types of

innovation (6). Among these classifications, organizational innovation is particularly relevant to this study, as it focuses on organizational-level conditions influencing innovation within faculties rather than on products or service outputs.

Schumpeter originally defined organizational innovation as encompassing new services, processes, products, and brands. He believed innovation could drive effective economic growth and development (7). Organizational innovation is defined as a new idea, method, strategy, process, service, or product adopted by an organization (8). Essentially, organizational innovation leads to the creation or acceptance of a new idea or behavior (5), resulting in the emergence of something novel and an improvement in organizational performance by transforming new ideas into practical methods for use within the organization (9).

To foster organizational innovation, it is necessary to understand the sources of new ideas. These sources are typically presented top-down in research, ranging from leaders within the organization and government to employees and even external sources such as universities and service beneficiaries (10). Organizational innovation is particularly relevant in universities, which function as complex organizations where innovation occurs not only in products and services but also in processes, structures, and strategies that support teaching, research, and management. Thus, understanding organizational innovation in universities requires connecting general concepts of innovation to the unique organizational, cultural, and operational characteristics of academic institutions. Implementing organizational innovation can increase welfare, legitimacy, efficiency, performance, trust, and satisfaction with the organization (8). Additionally, there are many advantages to having organizational innovation, such as increased competitiveness, reduced costs, improved service quality, development of new

services, and innovative service delivery methods (11). Studies have shown that several factors can effectively enhance organizational innovation, including specialization, professionalism, resource allocation, management's positive attitude toward change, and internal and external communication (12).

Today, organizational innovation is considered a vital element for organizations' growth and effective performance. This has drawn the attention of many researchers in different dimensions (13). Upon reviewing the existing literature, it becomes clear that organizational innovation is diverse and that there is no consensus on the best way to achieve it. This lack of agreement can be attributed to the absence of valid samples and acceptable innovations (14). In a study by Dechamkhoy et al., the organizational innovation of the libraries of Shiraz University and Shiraz University of Medical Sciences was investigated. The results indicated that there was desired organizational innovation (15). Similarly, Iqbal et al. identified innovations in industrial organizations in Pakistan. However, only three dimensions of organizational innovation received acceptable scores (16). Additionally, Saki et al. examined the relationship between organizational learning and organizational innovation at the University of Tehran. The study showed a positive and significant association between all dimensions of these two components (17).

To evaluate innovation, various methods and tools have been introduced and utilized. Among these tools, we can mention the Oslo Manuals, Community Innovation Surveys, Federal Employee Viewpoint Surveys, and the Australian Public Service Commission's (10). These questionnaires are designed for private organizations and are not suitable for use in Iranian society. Therefore, the Iranian Innovation Climate Questionnaire (ICQ) was utilized to evaluate innovation. The ICQ assesses different dimensions (18). Using this questionnaire will

enable comparison of study results with those from other countries where it has been implemented.

In today's dynamic and constantly changing organizations, innovation is critical for survival and success (8). However, not all innovations are useful, despite their aim to improve things (8). Organizations that prioritize innovation tend to perform better and achieve greater success (19). Indeed, an organization's first policy should be innovation for it to be successful (20). Despite its importance, limited information on organizational innovation is available (8). Universities must focus on organizational innovation to become third-generation institutions. While organizational innovation has been studied in various international contexts, there is limited evidence on the specific barriers and facilitators that affect it in Iranian academic institutions. However, no prior study has systematically examined these barriers and facilitators within the faculties of Shiraz University of Medical Sciences, thereby creating a clear research gap that this study addresses. Shiraz University of Medical Sciences was selected for this study because it is a leading medical university in the region and because there is a lack of prior research evaluating organizational innovation within its faculties. By focusing on this university, the present study aims to provide actionable insights for managers and faculty members to promote innovation and enhance organizational performance in similar academic settings. The study was designed in a focused manner, with a clear scope and methodology, specifically targeting the assessment of organizational innovation, the identification of its barriers and facilitators, and the facilitation of the study within the faculties of Shiraz University of Medical Sciences.

Methods

Study design

The current study is a descriptive-analytic cross-sectional study to assess organizational innovation at the faculties of Shiraz University of Medical Sciences in Shiraz, Iran, in the year 2022. The study community comprises staff and faculty of Shiraz University of Medical Sciences.

Participants and setting

The study sample comprised staff and faculty members from the Fatemeh (P.B.U.H) School of Nursing and Midwifery, School of Health, and School of Nutrition and Food Sciences at Shiraz University of Medical Sciences. 94 participants were selected through non-probability convenience sampling and met the inclusion and informed consent criteria. Inclusion criteria included having informed consent to participate in the study and having more than 1 year of work experience at any of the aforementioned schools. Exclusion criteria included reluctance to continue participating in the study or leaving their job for any reason during the study.

Data collection procedure

After obtaining permission, the researcher obtained a list of all personnel and faculty members from the Fatemeh (PBUH) School of Nursing and Midwifery, School of Health, and School of Nutrition and Food Sciences at Shiraz University of Medical Sciences. To start the sampling process, the researcher referred to the three faculties under study and coordinated with the education and resource management affairs. The participants were provided with a written informed consent form and questionnaires, which they completed after receiving an explanation of the study's objectives and voluntary participation. Due to the COVID-19 pandemic and limitations on face-to-face data collection, the questionnaires were administered electronically via Avalform, an online survey platform that enables secure data collection and management (21).

Innovation Climate Questionnaire-Persian version (ICQ).

This study collected data using the Persian version of the ICQ, translated and psychometrically evaluated. Ekvall originally designed this questionnaire in Sweden in 1983, and it is called the ICQ. It was later edited by Isaksen and reintroduced as the ICQ. The questionnaire consists of three parts: the first part includes eight questions on demographic information, the second part includes 43 questions on twelve areas, and the third part includes two open questions for obtaining more detailed information about the experience of employees and faculty members regarding facilitators and barriers to innovation in the organization (18)(22).

The titles of the twelve dimensions are:

- . Vision and Strategic Objectives
- . Risk Taking
- . Idea-Support
- . Interdisciplinary or Inter-professional Teams
- . Involvement
- . Idea-Time
- . Foreseeing
- . Cross-Border
- . Professional Relations at the University
- . Measuring Innovation
- . Trust and Openness
- . Appropriate Behavior with Faculty Members and Staff

Organizational innovation was assessed across twelve distinct dimensions; however, different scoring approaches were intentionally applied based on the conceptual characteristics of each dimension. Seven dimensions (1, 2, 4, 9, 10, 11, and 12) were measured using a five-point Likert scale ranging from 1 (completely disagree) to 5 (completely agree). For these dimensions, mean scores were calculated and standardized by multiplying by 100 (total score divided by the number of items in each dimension), yielding a score range of 0–500. This standardization facilitates comparison across dimensions with different numbers of items.

Four dimensions (3, 5, 6, and 8) were designed as percentage-based indicators and were therefore scored on a 0–100 scale, reflecting the proportion of respondents endorsing each item. The seventh dimension, consisting of six categorical response options, was interpreted based on the response frequency distribution rather than numerical aggregation.

Two open-ended questions, one aimed at identifying three facilitating factors and the other at identifying three barriers to organizational innovation, were analyzed using descriptive coding. To avoid conceptual and statistical misinterpretation, no overall composite score was calculated for the questionnaire; instead, each dimension was analyzed independently according to its specific scoring framework. This approach reflects the multidimensional nature of organizational innovation and does not indicate inconsistency in measurement (23)(24).

Responses to open-ended questions were analyzed using descriptive coding. The coding process was conducted independently by two researchers. The initial codes were reviewed and compared, and any discrepancies were resolved through discussion and consensus to enhance the trustworthiness of the findings.

Isaksen et al. reported Cronbach's alpha coefficients ranging from 0.62 to 0.90 for different dimensions of the Situational Outlook Questionnaire (25). To confirm construct validity, exploratory factor analysis results showed that all questionnaire dimensions had eigenvalues greater than one and combined accounted for 62.30 percent of the variance (22). The Persian version of the ICQ has demonstrated acceptable validity and reliability for use in Iranian organizations, with confirmed content validity, Cronbach's alpha coefficients above 0.70 for most dimensions, and satisfactory test–retest reliability ($ICC > 0.70$) (26).

Data analysis

After completing the questionnaires, the data were checked and coded, then analyzed using IBM SPSS Statistics version 25. Descriptive statistics, including frequencies and percentages, were used for qualitative variables, while mean and standard deviation were used for quantitative variables. Data normality was assessed using the Kolmogorov–Smirnov test. Since the data did not follow a normal distribution, Spearman's rank correlation test was used to examine the relationships between variables. All statistical analyses were performed at a 95% confidence level, with the level of significance set at $\alpha = 0.05$.

Ethical consideration

At the beginning of the electronic questionnaire, the objectives of the study were fully explained, along with the confidentiality of the information and the option to participate. Subsequently, informed consent was obtained from the participants. This manuscript is extracted from a research proposal that received approval from the Vice Chancellor for Research and Technology at Shiraz University of Medical Sciences under number 21983. The study was also approved by the Research Ethics Committee of Shiraz University of Medical Sciences under approval ID IR.SUMS.REC.1399.1136 and approval date 2021.19.01.

Results

In this study, we examined 94 employees and faculty members from the Fatemeh (P.B.U.H)

School of Nursing and Midwifery (51 people), the School of Health (22 people), and the School of Nutrition and Food Sciences (21 people) at Shiraz. The results of the research showed that, among the sample, 33 percent were male and 67 percent were female, with ages ranging from 26 to 62 years and a mean age of 40.77 ± 6.72 years. In terms of education level, 10.60 percent had associate's degrees, 30.90 percent had bachelor's degrees, 37.20 percent had master's degrees, and 21.30 percent had Ph.D. degrees. Of the participants, 39.40 percent were employed, 21.20 percent were instructors, and 39.40 percent were assistant professors, associate professors, and full professors. The fields of study included operating room (3.20 percent), reproductive health (3.20 percent), medical education (3.20 percent), midwifery (7.40 percent), cultural (5.30 percent), nursing (35.10 percent), environmental health engineering (7.40 percent), public health (13.80 percent), epidemiology (3.20 percent), chemistry (1.10 percent), and nutrition (17.10 percent). Participants reported working experience in the faculty ranging from 1-34 years, with an average of 13.10 ± 6.78 years. Employment type was reported as probationary (48.90 percent), permanent (15.90 percent), contractual (15.90 percent), faculty member with K-coefficient appointment (8.60 percent), non-faculty instructor (6.40 percent), and manpower planning staff (4.30 percent) (Table 1).

Table 1. Demographic Characteristics of the Study Participants (n = 94)

Demographic characteristics	Categories	n (%)	M $\pm$ SD
Age	26-44	72 (76.60)	6.72 $\pm$ 40.77
	45-62	22 (23.40)	
Sex	Male	31 (33)	
	Female	63 (67)	
Faculty	Nursing and Midwifery	51 (54.30)	
	Health	22 (23.40)	
	Nutrition and Food Sciences	21 (22.30)	
Educational level	Associate's degrees	10 (10.60)	
	Bachelor's degrees	29 (30.90)	
	Master's degrees	35 (37.20)	

Position	Ph.D. degrees	20 (21.30)	
	Employed	37 (39.40)	
	Instructors	20 (21.20)	
	Assistant professors, Associate professors, and Full professors	37 (39.40)	
Field of Study	Operating room	3 (3.20)	
	Reproductive health	3 (3.20)	
	Medical education	3 (3.20)	
	Midwifery	7 (7.40)	
	Cultural	5 (5.30)	
	Nursing	33 (35.10)	
	Environmental health engineering	7 (7.40)	
	Public health	13 (13.80)	
	Epidemiology	3 (3.20)	
	Chemistry	1 (1.10)	
Working experience (y)	Nutrition	16 (17.10)	
Employment type	1-17	75 (79.80)	6.78±13.10
	18-34	19 (20.20)	
Employment type	Probationary (tenure-track)	46 (48.90)	
	Permanent	15 (15.90)	
	Contractual	15 (15.90)	
	Faculty member with K-coefficient appointment *	8 (8.60)	
	Non-faculty instructor	6 (6.40)	
	Manpower planning staff	4 (4.30)	

* The K-coefficient system refers to a national salary and employment classification used for faculty members in Iranian medical universities.

The evaluation of innovation in the faculties of Shiraz University of Medical Sciences revealed that, based on the Likert scale, organizational innovation scores were ranked from highest to lowest as follows: 9, 12, 1, 2, 4, 11, and 10. "Professional relations at the

university" had the highest score (350.75), with a mean of 3.51 ± 0.97 , while "Measuring innovation" had the lowest score for organizational innovation (312.80), with a mean of 3.13 ± 0.87 . The scores of each question within each area are presented in Table 2.

Table 2. Descriptive Statistics Related to the First, Second, Fourth, Ninth, Tenth, Eleventh, and Twelfth Dimensions of Organizational Innovation

Dimensions	Questions	Mean $\pm$ SD	Mean $\pm$ SD	Score (0-500)
1. Vision and Strategic Objectives	1	3.27 $\pm$ 0.79	3.45 $\pm$ 0.85	344.60
	2	1.07 $\pm$ 3.13		
	3	0.92 $\pm$ 3.30		
	4	0.74 $\pm$ 3.93		
	5	0.72 $\pm$ 3.60		
2. Risk Taking	1	1.24 $\pm$ 2.80	0.97 $\pm$ 3.39	339.20
	2	1.17 $\pm$ 2.53		
	3	0.97 $\pm$ 3.60		
	4	0.67 $\pm$ 4.10		
	5	0.79 $\pm$ 3.93		
4. Interdisciplinary or Inter-professional Teams	1	1.06 $\pm$ 2.20	0.83 $\pm$ 3.39	339.20
	2	0.76 $\pm$ 2.90		
	3	0.87 $\pm$ 3.93		
	4	0.79 $\pm$ 3.83		
	5	0.67 $\pm$ 4.10		
9. Professional Relations at the University	1	1.05 $\pm$ 2.93	0.97 $\pm$ 3.51	350.75
	2	0.86 $\pm$ 3.87		
	3	0.93 $\pm$ 3.03		
	4	0.86 $\pm$ 3.87		
	5	1.07 $\pm$ 3.13		
	6	0.83 $\pm$ 3.73		

10. Measuring Innovation	7	1.22± 3.97	0.87 ± 3.13	312.80
	8	0.90± 3.53		
	1	0.97 ± 2.97		
	2	1 ± 3.20		
	3	0.85± 3.03		
	4	0.78 ± 2.87		
11. Trust and Openness	5	0.73± 3.57	0.80± 3.15	315.25
	1	1.07 ± 2.47		
	2	0.65 ± 4.17		
	3	0.70 ± 2.37		
12. Appropriate Behavior with Faculty Members and Staff	4	0.77 ± 3.60	0.82 ± 3.49	349.33
	1	0.99 ± 2.70		
	2	0.45 ± 3.93		
	3	0.96± 2.90		
	4	0.68± 4.13		
	5	0.77± 4.23		
	6	1.08 ± 3.07		

Based on the percentage scale, an examination of organizational innovation in four areas indicated that the scores were assigned in the following order: five, three, eight, and six, from highest to lowest. "Involvement" had the highest score (63.67), with a mean of $63.67 \pm$

24.84, while "Idea-Time" had the lowest score for organizational innovation (34), with a mean of 34 ± 21.27 . Additionally, the "Idea" area also had a score of 63.67. Table 3 presents the percentages and the minimum and maximum values for each dimension.

Table 3. Descriptive Statistics Related to the Third, Fifth, Sixth, and Eighth Dimensions of Organizational Innovation

Dimensions	Actual range	Potential range	Mean ± SD	Score (0-100)
3. Idea-Support	10-100	0-100	24.17 ± 44.33	44.33
5. Involvement	20-100	0-100	24.84 ± 63.67	63.67
6. Idea-Time	0-80	0-100	21.27 ± 34	34
8. Cross-Border	10-70	0-100	16.75 ± 35.67	35.67

The seventh dimension of organizational innovation revealed that only 3.30 percent of participants knew managers' views of the future until the next day, 6.70 percent until the next week, 40 percent until the next month, 36.70

percent until the following year, and 13.30 percent until 4-5 years later. None of the samples aligned with the 20-year managers' view, and the mean for "Foreseeing" was 3.50 ± 0.94 (Table 4).

Table 4: Descriptive Statistics Related to the Seventh Dimension of Organizational Innovation

Dimension	The next day (%)	The next week (%)	The next month (%)	The following year (%)	The next 4-5 years (%)	The next 20 years (%)	Mean ± SD
7. Foreseeing	3.30	6.70	40	36.70	13.30	0	3.50 ± 0.94

Descriptive coding was used to interpret two open-ended questions about facilitators and

barriers to organizational innovation. Results showed that participants listed 48 facilitators and 51 barriers to innovation. These factors are

ranked in order from most to least repeated in Table 5.

Table 5: Facilitators and Barriers to Organizational Innovation (13th and 14th Dimensions of Organizational Innovation)

Facilitators of organizational innovation	n	Barriers to organizational innovation	n
Encouraging innovative people by officials	6	The workload and a large number of educational credits	8
Sufficient and available cost and resources	6	Having inadequate time	5
Employing talented, young, and motivated personnel	4	Sufficient and available cost and resources	5
Enough time	3	Not valuing and not giving importance to new ideas and innovative people	3
Reducing the workload and the number of balanced educational credits	3	Lack of training, lack of expertise, and lack of familiarity with innovation	3
Increasing independence, freedom of action, and freedom of expression	3	Special focus on essay writing and compulsory essay writing	3
The attention and emphasis of the faculty on the importance of innovation	2	Legal requirements and licensing	2
Job security for expressing opinions	2	Pretending, unhealthy relationships, and unhealthy competition between people	2
Managers support	2	Lack of interest in the innovation job position	2
Efficient managers	2	Lack of feeling of belonging to the university	1
Flexible managers	2	Autocratic managers	1
The risk power of an innovator	2	Ignorant managers	1
The risk power of the direct manager of the innovator	1	Incompetent managers	1
The new perspective of managers	1	Managers' opposition	1
Collaborative managers	1	Lack of sufficient support for young human resources	1
Notices about the presentation of innovative ideas	1	Traditional thinking in the system	1
Familiarity with the concept of innovation	1	Interference and multiplicity of duties of faculty members	1
Encouraging personnel to present new ideas	1	Failure to guarantee the career future of personnel and faculty members, especially contractual and faculty members with a K-coefficient appointment	1
Attention to the ability of the innovative person	1	Attendance and absence of faculty members	1
Failure to do routine and repetitive tasks	1	Implementation of programs based on non-expert frameworks	1
Reducing the employment of retired personnel	1	Establishing momentary rules	1
The personal influence and trust in relationships instead of the criteria	1	Pay attention to short-term results	1
Creating a suitable discussion setting to talk directly and without worries with higher managers	1	Attention to the quantity in faculties	1
		Lack of clear rules to support personnel	1
		Lack of space for discussion based on respect and peace	1
		Lack of importance to the person's piety, originality, and background	1

No missing data were identified in the variables included in the correlation analysis. The results of Spearman's correlation coefficient analysis between "age and organizational innovation" at Shiraz University of Medical Sciences indicated a negative and significant correlation between age and "Idea-Support" ($r_s = -0.531$, $p = 0.003$). However, there was no

significant correlation between age and the areas of "Involvement," "Idea-Time," and "Cross-Border." Similarly, the correlation between "working experience and organizational innovation" was examined, and the study found a negative, significant correlation between "working experience" and "Idea-Support" ($r_s = -0.387$, $p = 0.034$). However, no significant

correlation was observed between working experience and the areas of "Involvement," "Idea-Time," and "Cross-Border."

Finally, correlations were measured between the areas of "Idea-Support," "Involvement,"

"Idea-Time", and "Cross-Border". Except for the positive and significant correlation between "Idea-Support" and "Idea-Time" ($p=0.000$, $r_s=0.640$), no significant correlation was observed between the other areas (Table 6).

Table 6. Spearman's Correlation Coefficient between Demographic Characteristics and the Third, Fifth, Sixth, and Eighth Areas of Organizational Innovation

		Age	Working experience	3. Idea-Support	5. Involvement	6. Idea-Time	8. Cross-Border
Age	Correlation	1					
	Significant						
Working experience	Correlation	0.870****	1				
	Significant	0.000					
3. Idea-Support	Correlation	-0.531***	-0.387**	1			
	Significant	0.003	0.034				
5. Involvement	Correlation	-0.031*	-0.094*	-0.145*	1		
	Significant	0.871	0.622	0.445			
6. Idea-Time	Correlation	-0.324*	-0.158*	0.640****	0.034*	1	
	Significant	0.080	0.405	0.000	0.860		
8. Cross-Border	Correlation	-0.309*	-0.201*	0.141*	0.329*	0.349*	1
	Significant	0.097	0.286	0.456	0.076	0.059	

**** $p < 0.0001$, *** $p < 0.01$, ** $p < 0.05$, * $p > 0.05$

Discussion

The findings of the current study indicate that the "Professional Relations at the University" category earned the highest score (350.75) and a mean of 3.51 ± 0.97 in organizational innovation. These results are consistent with previous studies (27)(28). However, the slightly higher scores in our study compared to some prior research may reflect contextual differences such as faculty composition, organizational culture, and specific management practices at Shiraz University of Medical Sciences. This highlights the importance of considering local organizational factors when interpreting innovation scores.

In this regard, the study conducted by Hoveida et al. demonstrated that organizational innovation necessitates the collective effort of all individuals and units within the organization. Transparent and effective communication among employees facilitates collective action, ultimately driving innovation within the organization. This is due to high levels of knowledge, awareness, relationships, and participation, which motivate individuals and

groups in such organizations to implement new ideas successfully (29). Compared to Hoveida et al., our study also found that, while communication and participation were strong, the systematic evaluation of innovation ("Measuring Innovation") was weaker, suggesting that even when collaborative processes are in place, formal mechanisms for monitoring innovation are essential for sustained progress.

In the current study, the "Measuring Innovation" category received the lowest score in organizational innovation (312.80), with a mean of 3.13 ± 0.87 . Previous research shows that focusing on personnel innovativeness is an important factor in enhancing organizational innovation (30)(31). The relatively low score in the "Measuring Innovation" category may reflect the absence of systematic procedures for

evaluating innovation outcomes within the faculties. Potential contributing factors include the lack of standardized metrics, limited resources dedicated to monitoring innovative activities, and insufficient managerial focus on tracking innovation performance. To address these challenges, faculties can implement formal mechanisms to measure innovation, provide staff training in effective evaluation methods, and integrate measurement processes into routine management practices. By improving the assessment of innovation, the university can identify gaps, recognize successful initiatives, and support continuous improvement in organizational innovation.

One of the most important responsibilities of organizational managers is to prioritize innovation in their mission and vision statements, create a structure and tasks centered around fostering innovative thinking among personnel, allocate resources and channels for measuring success, produce and utilize ideas, and cultivate a culture of change within the organization (31). Universities should lead the way in driving change through institutionalizing changes, creating and disseminating information, and promoting the free exchange of ideas. In this regard, relevant managers should be able to see beyond the organization's short-term barriers and temporary issues and respect their employees' opinions. As managers are expected to be creative and innovative, employees should also possess creativity, self-control, self-organization, and co-creative skills. Hence, it is necessary to continuously measure employee creativity and innovation abilities with appropriate knowledge and skills (32).

Furthermore, the survey results on four dimensions of organizational innovation, using a percentage scale, showed that "Involvement" had the highest score (63.67), with a mean of 63.67 ± 24.84 . At the same time, "Idea-Time" received the lowest score in organizational innovation

(=34), with a mean of 34 ± 21.27 . The low score observed for the "Idea-Time" dimension may be closely related to organizational structural characteristics and workload patterns within academic institutions. In many universities, including medical sciences universities, faculty members and staff are often faced with heavy teaching loads, administrative responsibilities, clinical duties, and performance-based evaluation systems that prioritize immediate outputs over innovation-related activities. Such structures leave limited discretionary time for reflection, experimentation, and idea development. Additionally, hierarchical decision-making processes and rigid organizational procedures may further constrain the time available for creative and innovative work. Without formal organizational mechanisms that allocate protected time for innovation, Idea-Time is likely to remain limited despite positive attitudes toward innovation.

In addition to organizational and structural factors, individual characteristics such as age and work experience also appear to influence perceptions of organizational innovation. In the present study, the relationships between age, work experience, and the four dimensions of organizational innovation (3, 5, 6, and 8) did not follow a linear pattern, with correlation coefficients ranging from -0.031 to 0.870 . This pattern suggests that perceptions of innovation-related dimensions may vary across different career stages rather than change uniformly. Such non-linear relationships could be influenced by differences in job roles, managerial responsibilities, and levels of exposure to organizational change over time. Therefore, it is plausible that younger, less experienced staff perceive organizational support for ideas differently from more experienced employees, highlighting the potential need for differentiated managerial approaches to foster innovation.

Consistent with the results of the present study, previous research has demonstrated a positive and significant correlation between organizational innovation and collaborative culture within organizations (33)(34). Group participation is crucial in solving organizational problems, especially in light of the increasingly competitive environment, the need for continued development of competitive advantages, and fostering creativity and innovation within the organization (33). However, while prior studies highlighted collaboration as universally beneficial, our findings suggest that collaboration alone is insufficient without formal support mechanisms and structured time for implementing ideas, underscoring the roles of institutional policies and resource allocation.

In the present study, Idea-Time received the lowest score for organizational innovation. This finding is consistent with a study conducted in England, where participants reported insufficient support and resources for generating and discussing new ideas, and uncertainty about how to obtain assistance in realizing their creative ideas (35). Additionally, a separate study revealed that despite implementing numerous actions to foster organizational innovation, senior managers observed that Idea-Time continues to receive a low score due to high workloads and increased project demands (36). These comparisons underscore that, although contextual factors may vary, common challenges such as workload, limited resources, and unclear procedural support persist across settings, highlighting areas for targeted intervention at our university.

In the present study, we examined both the facilitators and inhibitors of organizational innovation. Our findings are consistent with those of Garnett et al., who identified several key barriers to innovation in higher education organizations. These barriers include insufficient resources, lack of unity and team participation,

inadequate organizational support for new ideas, internal policy constraints, and high pressure and workload (37). It is worth noting that one of an organization's most valuable assets is its intelligent and knowledgeable employees. To foster innovation within an organization, we recommend that managers endeavor to encourage creative input from staff by providing support and recognition. This may involve creating a committee or group to receive, review, and implement employee feedback, as well as providing the time and resources to generate new and innovative ideas. Managers should also consider implementing incentive programs, such as rewards, to motivate employees toward achieving their goals (38). By comparing these barriers with those reported in prior studies, it is evident that, while challenges are often similar across contexts, the specific institutional and cultural environment at Shiraz University of Medical Sciences shapes how these barriers manifest and are addressed effectively.

Limitations and Recommendations

Although the current study provided insights into organizational innovation across various areas within three faculties of Shiraz University of Medical Sciences, some limitations should be considered when generalizing the findings. This study was descriptive-analytical, and it is recommended that future studies utilize stronger research designs. To better understand the impact of various interventions on organizational innovation, it is necessary to thoroughly examine the concept itself. Therefore, intervention studies should be conducted following this study to improve organizational innovation.

The COVID-19 pandemic posed a significant challenge during the study, limiting access to personnel and faculty members from other faculties at Shiraz University of Medical Sciences, resulting in data collection from only three faculties. To draw more robust conclusions,

it is suggested that future studies sample participants from different faculties of Shiraz University of Medical Sciences and compare their results. Moreover, considering the existing limitations, non-probability convenience sampling with a relatively small sample size was utilized in this study, which may have introduced selection bias and limited the generalizability of the findings. Due to the exploratory nature of the study and the constraints imposed by the COVID-19 pandemic, no a priori power analysis or formal sample size calculation was conducted. Given that the "Measuring Innovation" and "Idea-Time" dimensions received the lowest mean scores, and a negative association was observed between age, work experience, and "Idea-Support," future studies are recommended to focus on intervention-based designs aimed at strengthening innovation evaluation mechanisms, allocating protected time for idea development, and enhancing support for innovative initiatives among experienced staff. Additionally, future research should employ probability sampling methods, larger sample sizes, and formal power analyses to allow for more precise estimation of these relationships and to improve the statistical robustness and applicability of the findings.

Although data were collected using a self-report questionnaire, which may inherently involve some degree of self-report bias, this approach is widely used in organizational research to capture participants' perceptions of innovation-related practices. Moreover, the use of a validated and psychometrically tested instrument and the anonymous nature of data collection likely reduced the potential impact of social desirability bias. Nevertheless, future studies may benefit from complementing self-report data with objective indicators or qualitative methods to further strengthen the assessment of organizational innovation.

Conclusion

The current study provides relatively comprehensive information on organizational innovation at Shiraz University of Medical Sciences, specifically in the Fatemeh (P.B.U.H) School of Nursing and Midwifery, the School of Health, and the School of Nutrition and Food Sciences. By examining various categories of organizational innovation and reporting their mean scores, this study sheds light on facilitators and barriers to innovation. Managers, employees, and faculty members can leverage this information to foster innovation and address potential obstacles within their respective organizations.

Furthermore, the results indicate a negative, significant correlation between age and "Idea-Support," and between working experience and "Idea-Support." Hence, managers should prioritize promoting organizational innovation in different faculties of Shiraz University of Medical Sciences and take steps to develop its various areas. The practical implications of these findings for Shiraz University of Medical Sciences include providing guidance to managers and faculty members on developing targeted strategies to foster organizational innovation. Specifically, the university can focus on allocating adequate resources, encouraging collaborative and interdisciplinary work, supporting new ideas, and systematically measuring innovation outcomes. Addressing these areas can enhance the university's innovation culture, improve organizational performance, and support its transformation toward a third-generation university.

From a policy perspective, the findings suggest that Shiraz University of Medical Sciences should institutionalize organizational innovation through formal policies and strategic plans. These may include integrating innovation-related indicators into faculty performance evaluation systems, establishing clear policies for

allocating time and financial resources to innovative activities, and developing incentive-based policies to encourage idea generation and implementation. Additionally, adopting university-level policies for systematic measurement and monitoring of innovation outcomes can support evidence-based decision-making and long-term innovation sustainability. Such policy actions can strengthen organizational innovation and align the university's development with national higher education and third-generation university policies. Organizational innovation plays a central role in the transition toward third-generation universities, which emphasize entrepreneurship, knowledge commercialization, interdisciplinary collaboration, and societal impact. The findings of the present study highlight that strengthening dimensions such as idea support, systematic measurement of innovation, and dedicated time for idea development can provide the organizational infrastructure required for this transition. By addressing identified barriers and reinforcing the facilitators of organizational innovation, Shiraz University of Medical Sciences can enhance its capacity to generate, implement, and sustain innovative practices, thereby supporting its strategic move toward a third-generation university model.

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Conflict of Interest

The authors declare that they have no competing interests.

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