

# Investigating the Tendency towards Research in the Curriculum of a Paramedical Faculty

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## ABSTRACT

**Background:** Today, conducting research is among the most important skills in medical sciences, and plays a significant role in terms of improving students' learning and their career prospects. This study aimed to evaluate the research factors in the curriculum of paramedical faculty at Shahid Sadoughi University of Medical Sciences in Yazd, Iran.

**Methods:** The statistical population included the students at the paramedical faculty at Shahid Sadoughi University of medical sciences in 2019. Simple random sampling was applied and 224 students were selected. The research instrument was a researcher-made questionnaire. Its validity was determined based on the opinions of professors and experts, and its reliability was measured at 0.87 using Cronbach's alpha.

**Results:** From the paramedical students' viewpoints, a number of research factors in the curriculum like individual factors (1.70), motivational factors (2.05), service delivery factors (2.11), and cultural administrative factors (1.78) are not in a favorable situation ( $P < 0.05$ ). Besides, in terms of prioritization, the service delivery factors of research in the curriculum have the greatest importance, and the individual factors have the least importance.

**Conclusion:** The authorities, curriculum planners, and medical practitioners must take the necessary measures to enhance the presence of research factors in the curriculum of paramedical students.

**Keywords:** Educational, Curriculum, Research, Paramedical Students

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Please cite this paper as:

Malekipour A, Mirjalili SMA.  
Investigating the Tendency  
towards Research in the  
Curriculum of a Paramedical  
Faculty. *Interdiscip J  
Virtual Learn Med Sci.*  
2020;11(2):121-129. doi:10.30476/  
ijvlms.2020.85422.1020.

Received: 24-03-2020

Revised: 31-05-2020

Accepted: 06-06-2020

## Introduction

Today, research plays an important role in the professional development of medical experts, and in improving and promoting healthcare in society. Due to the rapid transformations in science and technology, our former knowledge and findings may not be applicable as an effective means of supporting healthcare in society. Therefore, in addition to furthering professional development

and scientific advancement, a strong spirit of research in students paves the way for a country's comprehensive development. Today, developed countries attribute their development and prosperity largely to the strong desire in academic environments to conduct research, especially in medical disciplines. Therefore, research in medical education plays the most critical role in terms of fulfilling the objectives of a community

in modern times, since an education system provides the required knowledge and resources for other systems (1). In the third millennium, the social, industrial, economic and political developments in any country are largely influenced by scientific and cultural advancements that are realized through education. In advanced societies, continuous and extensive research is conducted under the supervision of the scientific communities with the aim of producing knowledge and applying it to real-life situations in private and public sectors. Research is conducted to contribute to knowledge and theory and illuminate social concerns (2). In scientific debates it is generally argued that researchers require higher motivation and commitment to make greater contributions in scientific research (3).

Accordingly, substantial funding and logistical support are allocated to research in some countries so that their research budgets constitute about 5% of GDP. A glance at the statistics of the world science production indicates that the world's top seven industrialized countries are also the first seven producing science (4). Therefore, research, as one of the most powerful means of fostering potential talents, is one of the major issues that must be taken into account by university planners (5). Bell and Schiller believe that, nowadays, knowledge and research have become the primary basis and foundation of modern economics (6). New knowledge is created through research activities so that the Organization for Economic Co-operation and Development (OECD) considers the enhancement of human, cultural, and social knowledge as the main purpose of research (7).

Hence, research activities encourage an individual to formulate questions in a related field, analyze the information, become familiar with the methodology, design an appropriate methodology for each research question, carefully reread relevant texts, write reports, and apply various instructions in practice (8). Narayana et al. acknowledge that scientific research is a systematic way of gathering data and harnessing curiosity (9).

Takman also defines research as a systematic effort to provide answers to several questions (10). According to Delavar, research is a set of regular activities aimed at discovering the truth or reach more science from little science, whether by mere experimentation or other methods (11). The above definitions illustrate research as a scientific and systematic attempt to uncover the truth and help with decision-making in solving problems. The objective of research in education systems is to identify educational phenomena, improve educational processes and institutions, and solve educational problems. Thus, research is of particular importance due to its prominence in identifying educational, scientific, social, and cultural issues, along with providing solutions to the relevant problems. Today, research in medical sciences is of utmost significance due to its salient role in identifying educational, research, and health problems, besides providing solutions to problems associated with community health (12). Therefore, without engaging the students of medical sciences in research activities in their daily lives and learning, it will be impossible to foster their creativity and encourage science production and participation in the development of the country (10). In connection with this study, several investigations have been conducted both inside and outside Iran, some of which are discussed in the following paragraphs.

In his study, entitled "Investigating Factors Affecting the Development of Student Research", Rouhollahi found that strategic and cultural factors, along with human resources, are among the most essential and fundamental factors affecting the development of research activities of university students (13).

In a study entitled the barriers to research from the perspective of students of Hormozgan University of Medical Sciences, Safari Moradabadi et al. concluded that the insufficient knowledge of research methodology and skills in research in the domain of personal barriers, and lack of access to information resources in the domain of organizational barriers are the

most significant obstacles to research among students. (14)

In a study entitled “Identifying barriers to successful research during medical school”, Chakraborti et al. revealed that students’ inadequate knowledge of research, professors’ lack of expertise, and the lack of physical space for coordinating research activities are among the obstacles to research (15).

The studies by Hama (16), Khalaf et al. (17), Ichsan et al. (18), Kuuppelomaki & Thioumie (19), Parahoo (20), Tuppal et al. (21), and Adamsen et al. (22) refer to personal factors, besides organizational and environmental barriers, as the major obstacles to improving research productivity.

In view of the abovementioned studies, paramedical students need research to apply educational findings, and also, acquiring research skills plays a key role in their professional development. The question arises as to what extent the curriculum programs developed to enhance the spirit of research among paramedical students have been successful in this area. Hence, this study aims to evaluate the research factors in the curriculum of the paramedical faculty of Shahid Sadoughi University of Medical Sciences.

## Methods

This is quantitative research in terms of nature, and it is an applied one in terms of study type, which has been conducted using the descriptive-survey method. It was conducted from October to November 2019. The statistical population was 540 students at the paramedical faculty of Shahid Sadoughi University of Medical Sciences. The sample size was calculated to be 224 using Cochran’s equation. Stratified sampling was applied concerning the five fields of laboratory science, radiology technology, operating room, anesthesia, and medical emergency. The questionnaires were distributed among 137 females and 87 males using simple random sampling. The research instrument was a researcher-made questionnaire. Initially, 35 questions were

designed by reviewing the available literature and theoretical foundations, as well as the research background. Then, the qualitative method was used to determine the face and content validity. To determine the face validity, the questionnaire was issued to 8 students of paramedical faculty (two laboratory science students, two radiology technology students, two operating room students, and two anesthesia students) and 6 specialists (two curriculum specialists, one educational management specialist, three statistical and research experts) to express their views on the level of difficulty, disproportion, and ambiguity. In order to examine the content validity, the questionnaire was given to 6 specialists (two curriculum specialists, one educational management specialist, three statistical and research experts) to examine it concerning grammar compliance criteria, use of appropriate words, necessity, importance, and right placement of each phrase. Finally, the desired changes of students, specialists, and researchers were applied in the questionnaire, and a questionnaire consisting of 30 closed-ended questions with a five-point Likert scale (always - often - sometimes - seldom - never) was designed with the codes 1 to 5. The reliability of the questionnaire (Cronbach’s alpha) was calculated to be 0.87. Ethical considerations (purpose of the research, the confidentiality of personal information, and ensuring that the data collected will be used only for research) were taken into account in this study. The questionnaire consisted of two parts. The first section dealt with the demographic characteristics of the students. This section contained 5 items for the individual factors, 6 items for the motivational factors, 7 items for the service delivery factors, 5 items for the administrative and structural factors, and 6 items for the cultural factors in the curriculum. The inclusion criteria in this study included bursary students, undergraduate students and interest in research participation. Exclusion criteria included virtual students, post-graduate students and incomplete questionnaires. For the sake of ethical considerations, this

study was conducted with the consent of the participants. Researchers introduced themselves and explained the aims of the study. Participants were also assured that all the collected information would remain confidential. To analyze the data, in addition to descriptive statistics, inferential statistics of Kolmogorov-Smirnov were applied for the normality of data, and also one-sample t-test and Friedman rank test (to prioritize the importance of each research factor in the curriculum) were used. (Figure 1)

**Results**

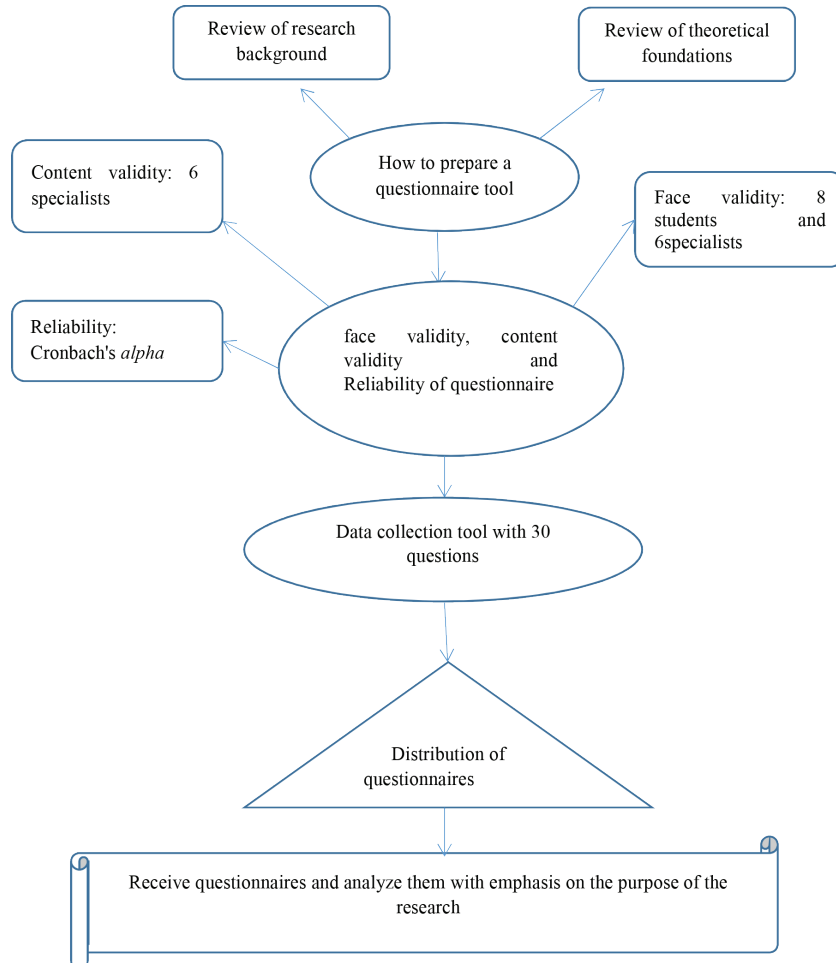
Table 1 indicates that the significance level of all data is higher than 0.05. Thus, it could be concluded that the data are normal in all research factors in the curriculum of in-service courses; therefore, parametric tests are used.

According to the demographic information provided in Table 2, the participants are

from the fields of laboratory science (0.28), radiology technology (0.21), operating room (0.20), anesthesia (0.24), and medical emergency (0.07). The table also features the number of male (0.39) and female (0.61) students.

According to Table 3, with an emphasis on the t value obtained (-26.240), which is significant at the error level 0.05, it can be stated that there is a significant difference between the actual mean (1.70) and the theoretical mean of the Likert scale (3). Since the actual mean obtained is less than the theoretical mean of the Likert scale, it can be concluded that, from the viewpoint of paramedical students, the presence of individual factors of research in the curriculum is not in a favorable condition.

According to Table 4, with an emphasis on the t value obtained (-13.417), which is significant at the error level 0.05, it can be stated that there is a significant difference



**Figure 1:** Research process

**Table 1:** Kolmogorov-Smirnov test for research factors

Research variables	Kolmogorov-Smirnov	Significance level
Individual factors	0.478	0.191
Motivating factors	0.781	0.966
Service Delivery factors	0.849	0.529
Administrative factors	0.795	0.823
Cultural factors	0.243	0.661

**Table 2:** demographic variables

Discipline	Laboratory science	61	0.28
	Radiology Technology	49	0.21
	Operating Room	45	0.20
	Anesthesia	53	0.24
	Medical emergency	16	0.07
	Total	215	0.100
Gender	Female	137	0.61
	Male	87	0.39
	Total	224	0.100

**Table 3:** individual factors of research in the curriculum

Variable name	Theoretical mean	Actual mean	Standard deviation	df	T	Significance level
Individual factors	3	1.70	0.320	223	-26.240	0.000

**Table 4:** motivational factors of research in the curriculum

Variable name	Theoretical mean	Actual mean	Standard deviation	df	T	Significance level
Motivational factors	3	2.05	0.349	223	-13.417	0.000

between the actual mean (2.05) and the theoretical mean of the Likert scale (3). Since the actual mean obtained is less than the theoretical mean of the Likert scale, it can be concluded that, from the viewpoint of paramedical students, the presence of motivational factors of research in the curriculum is not in a favorable condition.

According to Table 5, with an emphasis on the t value obtained (-9.049), which is significant at the error level 0.05, it can be stated that there is a significant difference between the actual mean (2.11) and the theoretical mean of the Likert scale (3). Since the actual mean obtained is less than the theoretical mean of the Likert scale, it can be concluded that, from the viewpoint of paramedical students, the presence of service delivery factors of research in the curriculum

is not in a favorable condition.

According to Table 6, with an emphasis on the t value obtained (-18.498), which is significant at the error level 0.05, it can be stated that there is a significant difference between the actual mean (1.78) and the theoretical mean of the Likert scale (3). Since the actual mean obtained is less than the theoretical mean of the Likert scale, it can be inferred that, from the viewpoint of paramedical students, the presence of administrative factors of research in the curriculum is not in a favorable condition.

According to Table 7, with an emphasis on the t value obtained (-20.375), which is significant at the error level 0.05, it can be argued that there is a significant difference between the actual mean (1.83) and the theoretical mean of the Likert scale (3).

**Table 5:** service delivery factors of research in the curriculum

Variable name	Theoretical mean	Actual mean	Standard deviation	df	T	Significance level
Service delivery factors	3	2.11	0.446	223	-9.049	0.000

**Table 6:** administrative factors of research in the curriculum

Variable name	Theoretical mean	Actual mean	Standard deviation	df	T	Significance level
Administrative factors	3	1.78	0.408	223	-18.498	0.000

**Table 7:** evaluate the cultural factors of research in the curriculum

Variable name	Theoretical mean	Actual mean	Standard deviation	df	T	Significance level
Cultural factors	3	1.83	0.345	223	-20.375	0.000

**Table 8:** Friedman test for prioritization of research factors in the curriculum with  $P < 0.05$

Research factors	Mean	Prioritization	Significance level	Chi-Square
Individual factors	2.32	5	0.000	376/70
Motivational factors	2.83	1	0.000	
Service Delivery factors	3.67	2	0.000	
Administrative factors	2.55	4	0.000	
Cultural factors	2.64	3	0.000	

Because the actual mean obtained is less than the theoretical mean of the Likert scale, it can be inferred that, from the viewpoint of paramedical students, the presence of cultural factors of research in the curriculum is not in a favorable condition.

According to the Friedman test rating in Table 8, the significance level of Kai Square (376/70) is less than 0.05. Thus, there is a significant difference among the five factors of research. From the paramedical students' viewpoint, service delivery factors with a mean of (3.67), motivational factors with a mean of (2.83), cultural with a mean of (2.64), administrative factors with a mean of (2.55), and individual factors with a mean of (2.32) are in order of highest to lowest value. Thus, it can be concluded that, in the curriculum, the service delivery factors are of utmost importance, and the individual factors have the lowest importance.

## Discussion

This study aims to evaluate the presence of research factors in the curriculum of the

paramedical faculty at Shahid Sadoughi University of Medical Sciences. Overall, the findings indicate that, from the viewpoints of paramedical students, the individual, motivational, service delivery, administrative, and cultural factors of research in the curriculum are not in a favorable condition.

The students believed that individual factors of research do not have a strong presence in the curriculum. The results of the studies by Safari Moradabadi et al. (14), Chakraborti et al. (15), Hama (16), Khalaf et al. (17), Ichsan et al. (18), Kuuppelomaki & Thioumie (19), Parahoo (20), and Tuppal et al. (21) are in line with the findings of this study. Therefore, it could be generally argued that the authorities in medical sciences and educational managers should strive for a greater presence of research factors in the curriculum of paramedical students.

As regards the second part of the research, the findings suggest that, from the paramedical students' perspective, the presence of motivational factors of research are not adequately considered in the

curriculum. Today, the motivational factors, as an integral part of the research, have a substantial role in promoting and improving the quality of learning among paramedical students. Hence, as long as the issue of research motivation and the factors that lower this motivation among paramedical students are not taken into account in the curriculum, medical students' interest in research will decline.

The findings also indicated that, according to the paramedical students, the level of presence of research-related service delivery is not favorable in the curriculum. Rouhollahi (13), Chakraborti et al. (15) have reported findings in their research that are partly consistent with the results of this study. However, the results of this study are not in line with those of research conducted by Safari Moradabadi et al. (14), Hama (16), Khalaf et al. (17), Ichsan et al. (18), Kuuppelomaki & Thioumie (19), Parahoo (20), and Tuppal et al. (21). Apparently, enhancing research motivation among paramedical students requires attention and provision of a series of services so that they achieve success in research. Therefore, authorities, curriculum planners, and educational managers must take the necessary measures in conjunction with providing services in the curriculum for paramedical students.

Based on the findings, the level of presence of administrative, structural, and cultural factors of research in the curriculum from the viewpoint of paramedical students is not favorable. The findings of studies performed by Rouhollahi (13), Chakraborti et al. (15), Safari Moradabadi et al. (14), Hama (16), Khalaf et al. (17), Ichsan et al. (18), Kuuppelomaki & Thioumie (19), Parahoo (20), Tuppal et al. (21), and Adamsen et al. (22) are consistent with those of this study. At present, administrative issues are among the most important elements in the curriculum, with a vital role in increasing paramedical students' willingness to conduct research. Hence, if administrative factors contribute to expediting the research activities of these students, they may also play an essential role

in increasing their tendency to do research.

The findings related to the study reveal that, from the viewpoint of paramedical students, the research-related cultural factors are not adequately reflected in the curriculum. The findings of a study by Rouhollahi (13) are consistent with the results of this study. However, the findings of Safari Moradabadi et al. (14), Chakraborti et al. (15), Hama (16), Khalaf et al. (17), Ichsan et al. (18), Kuuppelomaki & Thioumie (19), Parahoo (20), Tuppal et al. (21), and Adamsen et al. (22) differ from the results in this study. Today, the culture of research can lead to the tendency towards research among paramedical students. Thus, educational authorities and other decision makers should make the necessary efforts to strengthen the culture of research in curriculums and educational environments.

The findings in this study illustrated that, from the viewpoint of paramedical students, service delivery, motivational, cultural, administrative, and individual factors in the curriculum are in the order of highest to lowest priority. It can, therefore, be concluded that, with regard to prioritization, educational policymakers and practitioners should pay a great deal of attention to the service delivery and motivational factors of research in the curriculum of paramedical students.

Overall, in view of the changes in today's world, paramedical students should have the necessary skills and desire to do research and, accordingly, to enhance their learning. In addition to improving the quality of learning, boosting the spirit of research among paramedical students plays a significant role in a country's progress and development. Hence, the medical authorities should take the necessary measures in the educational environment and curriculum of paramedical students, including the provision of infrastructures for conducting research courses, inviting experts to hold research training courses, training the students according to their needs, applying research-related training courses, and creating a dynamic space for research.

## Limitations

The limitations of this study included the limited access to statistical samples, prejudice and bias of respondents, and the lack of accuracy and clarity of the responses that might affect the validity and reliability of the research results.

## Acknowledgements

We would like to thank the students of paramedical faculty at Shahid Sadoughi University of Medical Sciences who agreed to participate in this research.

## Ethical Declarations

In this study, the following ethical issues were considered: the study was approved by Yazd Farhangian University; explanations were provided to the students in advance of the study and they were reassured about the confidentiality of their information.

## Funding

No outside funding or support was provided for this work.

## Authors' contributions

A.M. devised the study concept, designed the study and analysis of the study data, participated in the coordination of the study, and critically revised the manuscript. S.M. collected data and revised the manuscript.

## Conflict of interests

The author declares that they have no conflict of interests.

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