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Knowledge, Attitude, and Performance of Paramedical Faculty Students Regarding COVID-19 Prevention Principles

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ABSTRACT

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Key words:
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Aims Compliance with COVID-19 prevention principles among students is influenced by their knowledge, attitude, and performance (KAP) regarding the disease. According to previous studies, KAP is vital in dealing with infectious diseases because low levels lead to distress, panic, and the further spread of the disease. This study aimed to investigate the KAP of paramedical students regarding COVID-19 prevention principles.

Materials & Methods In this cross-sectional study, 103 undergraduate students at Gonabad University of Medical Sciences, Gonabad, Iran, participated in 2022. After explaining the study's objectives and obtaining informed consent from the students, the researcher-made questionnaires on KAP were given to the students. Data were analyzed using SPSS software (version 20). Mann-Whitney and Kruskal-Wallis tests were used to compare the data.

Findings The results showed that the majority had an average knowledge (n=72, 69.9%), attitude (n=59, 57.3%), and performance (n=59, 57.3%) regarding the observance of COVID-19 prevention principles. No significant difference was observed between KAP levels and gender, marriage, field, and academic semester ($P < 0.05$). The average scores of KAP of students separately from gender, marriage, field, and academic semester were not significant ($P < 0.05$).

Conclusion The KAP of paramedical students regarding COVID-19 prevention principles, regardless of gender, age, marital status, field, and academic semester, is at an average level. Considering the importance of students' KAP regarding COVID-19 prevention principles, it is recommended that those involved make every effort to provide accurate information on social networks and media.

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Introduction

COVID-19 is caused by a new type of coronavirus that was first reported in December 2019 in Wuhan, China, and later became a pandemic with extensive economic, social, and health consequences [1]. The most important mode of transmission currently agreed upon is human-to-human transmission through respiratory droplets or direct contact [2]. Knowing that this disease can be transmitted even by people without symptoms, the risk of infection multiplies [3, 4]. Similar to other viruses of the coronavirus family, the primary clinical manifestation of the disease is fever, which occurs in 99% of infected individuals. Other symptoms include a dry cough and shortness of breath [2, 5]. The COVID-19 pandemic is a challenge that affects people's quality of life due to the virus's negative impact on human health and other problems, such as increasing poverty rates and global financial and job crises. This virus can infect the upper and lower respiratory systems and cause lung infections and chronic lung obstruction; therefore, it poses a serious health risk to people with underlying diseases. Environmental stability, longevity, and pathogenicity are among the virus's characteristics that increase the likelihood of a worldwide epidemic in the coming years [6].

Iran, like many other countries, has been affected by the COVID-19 pandemic. According to official statistics, Iran is one of the 10 countries with the highest number of deaths due to the coronavirus [7]. Although the newness of this virus limits the amount of information available about this disease, its control, and treatment methods, the most crucial way to deal with it is to prevent its spread [5]. In response to lessons learned from previous pandemics, such as H1N1 in 2009 and severe acute respiratory syndrome (SARS) in 2003, management measures should include prevention of infection in animals, animal-to-human transmission, and human-to-human transmission [8]. During the recent pandemic, most countries implemented appropriate responses, including slowing the spread of infection through measures, such as quarantine, health infrastructure, banning large gatherings, social distancing, handwashing, isolation, oxygen therapy with a ventilator, vaccination, and increasing knowledge about COVID-19. These measures can prevent the population from contracting the disease and reduce its spread [6, 9]. Vaccination is the best way to fight SARS-CoV-2 infections. To date, more than eight vaccines for priority groups have been approved under Emergency Use Authorization [10].

Compliance with these preventive principles set by the government is necessary to control the spread of the disease, and the success of these measures depends on society's behavior, which is influenced by people's knowledge, attitude, and performance (KAP) toward COVID-19. Various studies have shown that people's KAP is vital for dealing with infectious diseases [11, 12]. KAP studies can gather information about what a particular population knows, believes, or does[13]. Such a review is necessary because unclear information and negative attitudes toward infectious diseases in the community may lead to distress and panic[14, 15].

One of these sections is the medical staff, who are always at risk of infectious diseases. The students of the University of Medical Sciences are a unique group who may experience harmful effects of distance learning and reliance on social media and the Internet. If students do not receive real information about COVID, its symptoms and signs, where they are most likely to get infected, and updates on public health and COVID-19 through social media, they will face a crisis that will negatively affect their performance to protect their health [16].

Even though healthcare workers play a central role in the response to COVID-19, to our knowledge, there is minimal information on healthcare workers' KAP towards SARS-CoV-2. Also, paramedical science students are among those who may have close contact with infected patients. Therefore, it seems necessary to examine the KAP of this segment of society regarding the observance of principles to prevent the spread of COVID-19.

Materials and Methods

Inclusion and Exclusion Criteria

The current research was a cross-sectional analytical study. The research population consisted of all students of Gonabad Paramedical Faculty in 2022 who were in the second semester or higher and completing the internship. After obtaining the ethics approval code explaining the objectives of the study, and obtaining informed consent from the students, the questionnaires were administered. They were also assured that their answers would remain confidential. The inclusion criteria included willingness to participate in research, completion of questionnaires, and being a second-semester student or above. The exclusion criteria included unwillingness to participate in the research and incomplete responses to the questionnaires.

Study Sampling

According to the data of a similar study [17] about the knowledge variable ($P = 0.93$) and using the prevalence formula and considering $\alpha = 0.05$ and the test power of 80%, the sample size was approximately 100 people, which increased to approximately 110 people considering the probability of 10% dropout. Questionnaires of seven people were excluded from the statistical analysis due to incompleteness. Sampling was stratified. Each academic field at the university was

considered as a class, and a number of students were randomly selected from each class based on the sample size. Eventually, 103 paramedical students from four different fields, including operating room technology, laboratory science, radiology, and anesthesiology, were included in the study.

Dependent and Independent Variables

The dependent variables included KAP regarding adherence to COVID-19 prevention principles, measured using a researcher-made questionnaire. The independent variables included demographic characteristics, such as gender, field of study, and semester.

Questionnaires

The tool used in this research was a researcher-made questionnaire consisting of four parts (demographic information, knowledge assessment, attitude questions, and performance questions). The knowledge section consisted of 13 items, and the performance section consisted of 10 items, which were in the form of three options (yes, no, and I don't know), and a positive score was considered for each correct answer. The knowledge score ranged from 13 to 39, and it was divided into three levels. A score less than 21 indicates unfavorable, a score between 22 and 30 is average, and a score above 31 is favorable. A performance score of less than 17 indicates unfavorable, a score between 18 and 24 indicates average, and a score above 25 indicates favorable performance. The attitude section also consisted of 14 questions, each rated on a five-point Likert scale (I completely agree, I agree, I have no opinion, I disagree, and I completely disagree). A score of 5-1 was considered for each question. The total score of the attitude tool ranged from 14 to 70, with scores below 33 indicating an unfavorable attitude, scores between 34 and 52 indicating an average attitude, and scores above 53 indicating a favorable attitude. The researcher prepared this questionnaire using scientific texts, and its content and face validity were subsequently determined. For this purpose, the questionnaire was given to 20 professors from the paramedical faculty, and the necessary corrections were made. Cronbach's alpha ($\alpha = 0.79$) was used to measure reliability.

Statistical Analysis

Data were analyzed using SPSS software (version 20). Kolmogorov-Smirnov was used to evaluate the normality of the distribution of continuous variables. Then, frequency distribution tables and the mean were used to describe the data. To compare KAP scores between two groups, the Mann-Whitney U test was used, and for more than two groups, the Kruskal-Wallis test was used. The significance level was set at $P < 0.05$.

Results

The majority of the respondents were female (70.9%), unmarried (80.6%), from the fields of laboratory science and anesthesiology (27.2%), and in the seventh semester (28.2%). The majority of students had an average knowledge (69.9%), attitude (57.3%), and performance (57.3%) regarding the observance of COVID-19 prevention principles (Table 1).

Table 1. Frequency Distribution of Research Units According to Knowledge, Attitude, and Performance (KAP)

Status of KAP		No. (%)
Knowledge	Favorable	29 (28.2)
	Average	72 (69.9)
	Unfavorable	2 (1.9)
Attitude	Favorable	44 (42.7)
	Average	59 (57.3)
	Unfavorable	0
Performance	Favorable	25 (24.3)
	Average	59 (57.3)
	Unfavorable	19 (18.4)

According to Spearman's test, no significant relationship was observed between age and knowledge ($P = 0.194$), attitude ($P = 0.672$), and performance ($P = 0.581$) regarding compliance with COVID-19 prevention principles. Also, the Mann-Whitney test showed no statistically significant difference in KAP by gender and marital status (Table 2). The Kruskal-Wallis test showed that the KAP levels did not differ significantly according to field of study or academic semester (Table 2).

Table 2. Comparison of the Average Rank of Knowledge, Attitude, and Performance (KAP) of Students According to Gender, Marriage, Field, and Academic Semester

Scale		Knowledge	Attitude	Performance
Gender	Man	55.25 ± 10.21	49.77 ± 9.48	50.85 ± 9.58
	Woman	50.66 ± 10.15	52.92 ± 10.13	52.47 ± 10.52
Mann-Whitney test results		$P = 0.470$	$P = 0.626$	$P = 0.800$
Marriage status	Single	50.14 ± 11.45	50.84 ± 10.08	53.69 ± 11.41
	Marriage	59.73 ± 12.81	56.83 ± 11.63	44.98 ± 12.79
Mann-Whitney test results		$P = 0.189$	$P = 0.420$	$P = 0.237$
Academic field	Operating room technology	50.02 ± 10.33	51.23 ± 10.83	51.25 ± 10.97
	Laboratory science	53.68 ± 12.65	49.09 ± 9.82	56.30 ± 12.18
	Anesthesiology	51.02 ± 11.79	56.16 ± 10.48	55.70 ± 11.03
	Radiology	51.20 ± 11.2	51.28 ± 10.38	43.70 ± 13.05
Kruskal-Wallis test results		$P = 0.986$	$P = 0.840$	$P = 0.390$
Academic semester	Semester 1	57.92 ± 13.02	50.50 ± 10.49	54.35 ± 12.36
	Semester 3	46.02 ± 12.37	62.13 ± 13.28	48.69 ± 11.61
	Semester 5	60.52 ± 13.26	48.72 ± 10.42	57.61 ± 13.05
	Semester 7	45.91 ± 11.05	46.41 ± 9.32	48.69 ± 11.33
Kruskal-Wallis test results		$P = 0.150$	$P = 0.215$	$P = 0.642$

Discussion

The results of the present study showed that the KAP of Gonabad medical students regarding the COVID-19 prevention principles was average. Also, KAP was not significantly associated with gender, age, marital status, major, or academic semester.

Several internal and external studies have evaluated students' KAP regarding COVID-19 at different levels[17-23]. In accordance with the present results, Kazemipour et al. evaluated the levels of knowledge, attitude, and understanding of dental students in Yazd, Iran, regarding COVID-19 prevention, finding an average level [18]. Also, Kermani et al. reported that medical students in Mashhad had an average level of knowledge regarding COVID-19 prevention and transmission [19]. In another study, Ranjbar Roghani et al. found that medical students' knowledge and attitudes towards COVID-19 are acceptable [17]. In contrast, Rahmanian et al. found that the average KAP scores of medical students in Jahrom, Iran, regarding COVID-19 are higher than the average [20]. Taorut et al. indicated a high level of knowledge of COVID-19 preventive behaviors among medical students [21]. The results of studies on South Korean, English, and Hong Kong students also showed high KAP towards COVID-19 [22-24].

The possible reason for these differences may be the different educational content that the students used. According to previous studies, the primary source of information for students is the Internet and virtual spaces [19, 20, 25]. However, this virtual space and social networks can facilitate the development and spread of false information and fake news. Therefore, it is suggested that the Ministry of Health make every effort to deliver appropriate information and educational programs through social networks and other media.

The present study showed that students' KAP has no significant relationship with gender. In line with our study, Kazemipour et al. did not observe any significant difference between the scores of knowledge, attitude, and understanding of students of two genders and emphasized that gender is not an influential factor in this field [18]. Rahmanian et al. also did not find a significant relationship between gender and performance [20]. Maheshvari et al. did not report a significant relationship between knowledge and attitude and demographic variables among medical students regarding COVID-19 [26]. At the same time, some studies believe that students' performance is influenced by gender. For example, Kermani et al. reported that female students were more aware than male students. A possible reason is that women are more worried about the disease than men [19]. Also, women are more interested in life, public relations, and curiosity, and are more motivated to learn [27, 28]. It has been said that women spend more time at home and have more time to receive information, while in our study, both sexes were students and had the same amount of time to search online or read about COVID-19 [20]. Also, the present study showed that students' KAP has no significant relationship with their marriage, major, or academic semester. In accordance with this part of the findings, Ranjbar Roghani et al. found no significant relationship between students' attitudes and demographic characteristics [17]. While the same study, contrary to our results, reported a significant relationship between students' knowledge and age, gender, field, and academic semester. So that younger, male students with higher education and semesters had more knowledge [17]. Contrary to our results, Rahmanian et al. found a significant relationship between the field of study, marital status, and academic year with students' performance; therefore, the highest level of performance was reported in anesthesiology, unmarried, and third-year students [20]. Also, Kazemipour et al. showed that as the academic term increased, students' knowledge and attitudes toward COVID-19 increased, likely due to the presence of most seniors in the hospital, realizing the importance of this disease, and a need to learn more [18]. Among the weaknesses of this study, it can be pointed out that students in different semesters and fields of study probably had close interactions with each other and exchanged information. Also, they were members of the same groups and social networks that lacked accurate information. For this reason, regardless of gender, marital status, field, or academic term, they all have the same level of KAP regarding COVID-19 prevention principles. The researchers suggest that designing courses and educational content on the COVID-19 prevention principles increases students' KAP and takes an effective step to control the COVID-19 pandemic.

Conclusion

The KAP of paramedical students in Gonabad, Iran, regarding COVID-19 prevention principles, regardless of gender, age, marital status, field, or academic semester, is at an average level. Considering the importance of students' KAP regarding COVID-19 prevention principles, it is recommended that those involved make every effort to provide accurate information on social networks and media.

Research Limitations

One limitation of the present study was the small sample size. In addition, the students were members of the same group and virtual networks, which provided the possibility of accessing similar information. Therefore, this study should be conducted across multiple centers with a larger sample size.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Ethics Committee of Gonabad University of Medical Sciences, Gonabad, Iran (ethics code: IR.GMU.REC.1401.020;

https://ethics.research.ac.ir/IR.GMU.REC.1401.020).

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Authors' contributions

Conceptualization and design of the study: M. B. M., E.R.; Data collection and administration: R.B., A.S., and E.R.; Formal analysis: M. B. M., R. B.; Investigation: M. B. M., A. H.; Methodology: M. B. M. Project administration: M. B. M.; Writing of the original draft: R. B., E. R., A. S., A. H.; Writing, reviewing, and editing: M. B. M., R. B., and A. H.

Conflicts of interest

The authors declared no conflicts of interest.

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