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The Relationship Between Knowledge, Attitude, And Preventive Practices Towards Respiratory Viral Infections and Quality of Life in Medical Sciences Students: A Descriptive-Correlational Study

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A B S T R A C T

Introduction: Respiratory infections affect millions worldwide, and preventive practices are essential for their control. The relationship between knowledge, attitude, and preventive practices (KAP) towards respiratory viral infections and quality of life (QoL) among medical sciences students was investigated in this study.

Materials & Methods: A descriptive-correlational study with 535 participants from Shahid Sadoughi University in 2021. Data were collected using a demographic questionnaire, the SF-12 quality-of-life scale, and a KAP (knowledge, attitude, and preventive practices) questionnaire. Data were analysed with SPSS 20.0 using independent t-tests, Kruskal-Wallis tests, and Spearman's correlation at a significance level of 0.05.

Results: The results showed significant positive correlations among knowledge, attitude, and preventive practice scores ($p < 0.001$). However, no significant association was found between these variables and quality of life ($p = 0.528$, $p = 0.354$, and $p = 0.977$, respectively). Students with higher economic status reported significantly better quality of life compared to others ($p = 0.003$).

Conclusion: While medical students demonstrated good KAP, targeted interventions are needed to enhance practices and improve QoL, particularly among economically disadvantaged groups.

Keywords: attitude, knowledge, practice, quality of life, respiratory infections

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Introduction

Respiratory infections comprise a range of disorders that affect millions worldwide, with young people and the elderly being particularly at risk. Moreover, respiratory viruses are responsible for infections that may involve either the upper or lower parts of the respiratory tract (1).

To prevent the spread of infection, early and rapid detection of suspected infections and adherence to isolation guidelines are important (2). In general, awareness of and preparedness for fighting respiratory viral infections continues worldwide, and the adherence of people and authorities to preventive practices is considered essential (3, 4). Preventive practices for respiratory viral infections include washing hands with soap and water or disinfectant solution, avoiding shaking hands or kissing, wearing a mask, keeping a social distance, and even sometimes quarantining (5, 6).

People's knowledge and attitudes can help predict a behavior (7). To control a disease, it is important to know the target society in terms of the knowledge and attitudes of the people of the society about that disease (5). Through KAP surveys, researchers can gather insights into the knowledge, perceptions, and behaviors of targeted groups (8). Medical students encounter many sick people who will affect them. Therefore, these students must be well aware of the nature and methods of disease transmission (9). Medical students are more susceptible to infectious diseases, and respiratory viral infections can be transmitted even from asymptomatic carriers (10). In addition, medical students are common sources of healthcare advice and guidance (11). In a study by Taghrir and others, in 2020, medical students were aware of respiratory viral infections, but there was a significant negative correlation between preventive practices and risk perception (10). In addition, being knowledgeable about respiratory viral infections will positively affect the understanding of students and their quality of life (12).

Due to the effects on mental health and quality of life, respiratory viral infections have caused a decrease in living standards (13). Achieving a standard quality of life in today's world in which infectious disease is widespread has been affected (14). The WHO defines quality of life as a multidimensional mental framework, referring to an individual’s subjective evaluation of their role and standing in life within their cultural context and prevailing value systems (15). In general, students’ quality of life is influenced by various factors, including academic challenges, living conditions, and the availability of study resources (16). Additionally, the health level and quality of life of students have significant effects on their learning and scientific knowledge (17).

The novelty of this study lies in examining the relationship between knowledge, attitudes, and preventive practices regarding respiratory viral infections and the quality of life among medical sciences students—a topic that has been rarely addressed in this population. Accordingly, the relationship between knowledge, attitudes, and preventive practices and quality of life among medical sciences students was investigated.

Materials and methods

Study Design

In this descriptive-correlational study conducted in 2021, a total of 535 medical sciences students at Shahid Sadoughi University of Medical Sciences, Yazd.

Setting and Participants

This study was carried out between January to March 2021 in Iran, Yazd. The random sampling method was used and students of Shahid Sadoughi University of Medical Sciences were contacted via WhatsApp. The inclusion criteria were students who were enrolled in one of the faculties of Shahid Sadoughi University of Medical Sciences in Yazd, had access to WhatsApp, and agreed to participate

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in the study. Students with cognitive problems, mood disorders, or those unwilling to continue the research were excluded from the study.

Sample Size

The sample size was estimated to be 535 by considering a=0.05 (significance level of 95%), an estimation error of point 1 (d), and 15% dropout of students, based on the study by Nasirzade and others (18).

Measurements & Validity and Reliability

1. Demographic Questionnaire

Demographic information included age, gender, marital status, educational level, field of study, economic status, history of respiratory viral infection in the participant and first-degree relatives, and history of underlying diseases including diabetes, hypertension, respiratory diseases, and kidney diseases.

2. Knowledge, Attitude, and Preventive Practices (KAP) Questionnaire

Knowledge, attitudes, and preventive practices toward respiratory viral infections were assessed using a researcher-developed questionnaire designed based on an extensive literature review. The questionnaire consisted of three domains including knowledge, attitudes, and preventive practices. The knowledge section was scored using a three-point Likert scale ("Yes = 3", "No = 2", and "I do not know = 1"). Attitude-related items, including perceived sensitivity, severity, and threat, were scored using a five-point Likert scale ranging from strongly agree (5) to strongly disagree (1). Items 14–16 were reverse scored. Preventive practice items were scored from always (5) to never (1). Final scores were converted to a 0–100 scale, with higher scores indicating better knowledge, more positive attitudes, and more appropriate preventive practices.

The questionnaire's validity was evaluated by 20 faculty members with clinical expertise using the Content Validity Ratio (CVR) and Content Validity Index (CVI). Reliability was assessed through internal consistency using Cronbach's alpha coefficient, which demonstrated acceptable reliability ($\alpha = 0.85$).

3. Short Form Health Survey (SF-12)

Quality of life was measured using the SF-12 Health Survey developed by John E. Ware Jr. and colleagues in 1996. The questionnaire evaluates multiple domains including general health, physical functioning, social functioning, bodily pain, vitality, and mental health. Items 1, 8, 10, and 11 were reverse scored. Total scores ranged from 12 to 48 and were categorized as poor quality of life (12–24), moderate quality of life (25–36), and good quality of life (37–48).

The original instrument demonstrated acceptable reliability with Cronbach's alpha coefficients of 0.89 for the Physical Component Summary and 0.76 for the Mental Component Summary. Additionally, the Persian version validated by Montazeri et al. showed satisfactory reliability coefficients ranging from 0.72 to 0.73.

Statistical and Data Analysis

Data were analyzed using SPSS V.20. Descriptive statistics were used to summarize demographic characteristics and study variables. An independent t-test compared mean scores between two groups (e.g., gender, marital status). The Kruskal-Wallis test assessed differences across multi-level groups (e.g., age, education, major, economic status). Spearman's correlation examined relationships between scale scores.

Results

The study included 535 students aged 19 years and older, 66.4% female and 33.6% male. Most participants were undergraduates (65.2%), and 50.8% were studying nursing/midwifery or health. Only 2.4% reported underlying diseases (Table 1).

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The mean scores for knowledge, attitudes, and preventive practices were 57.49±2.09, 44.45±4.16, and 43.82±7.61, respectively. Better preventive practice scores were observed among female students, older participants, married individuals, and those with higher economic status (p = 0.001, 0.001, 0.003, and 0.004, respectively). However, no significant differences were found among majors (p = 0.650). Students with a history of respiratory infections in first-degree relatives had significantly higher knowledge and preventive practice scores (p = 0.020 and 0.026, respectively) (Table 2).

Table 1. Frequency distribution of demographic characteristics of the students.

Variable		Frequency	Percentage
Gender	Male	180	33.6
	Female	355	66.4
Age Group (Years)	19-25	478	89.3
	25-30	32	6
	>30	25	4.7
Education	Associate Degree	2	0.4
	Bachelor's	349	65.2
	Master's	29	5.4
	Ph.D.	155	29
Marital Status	Married	60	11.2
	Single	475	88.8
Major	Medical	87	16.3
	Pharmacology	58	10.8
	Dental	39	7.3
	Health	128	23.9
	Paramedicine	79	14.8
	Nursing/Midwifery	144	26.9
Underlying Disease	Diabetes	2	0.4
	Blood Pressure	1	0.2
	Respiratory	8	1.5
	Kidney	2	0.4
	Does not have	522	97.6
History of infection of respiratory viral infection in the individual	Yes	192	35.9
	No	343	64.1
History of being infection respiratory viral infection in first-degree relatives	Yes	348	65
	No	187	35
Economic Status	Poor	20	3.7
	Not bad	397	74.2
	Good	118	22.1

The data are presented as the number (%)

Table 2. Descriptive and Comparative Results of Knowledge, Attitudes, and Preventive Practices (KAP).

Variable	Knowledge (Mean ± SD)	Attitudes (Mean ± SD)	Preventive Practices (Mean ± SD)	P-value (K)	P-value (A)	P-value (P)
Overall mean	57.49 ± 2.9	44.45 ± 4.16	43.82 ± 7.61	-	-	-

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Gender*				0.032	0.047	<0.001
Male	57.06 ± 3.61	43.91 ± 4.64	51.51 ± 8.29			
Female	57.71 ± 2.44	44.72 ± 3.88	54.99 ± 6.97			
Age group (years)**				0.412	0.008	0.001
19–25	57.42 ± 2.98	44.29 ± 4.16	53.43 ± 7.53			
25–30	58.00 ± 2.19	45.09 ± 3.54	56.00 ± 8.84			
>30	58.16 ± 1.92	46.68 ± 4.33	58.44 ± 5.43			
Education**				0.008	0.003	0.461
Associate	54.00 ± 1.41	43.50 ± 4.94	55.50 ± 10.60			
Bachelor	57.67 ± 2.95	44.89 ± 4.02	54.13 ± 7.75			
Master	57.06 ± 2.03	43.27 ± 4.18	52.72 ± 8.40			
PhD	57.22 ± 2.90	43.68 ± 4.36	53.32 ± 7.14			
Marital Status*				0.215	0.376	0.003
Married	57.93 ± 2.24	44.90 ± 4.42	56.08 ± 5.90			
Single	57.44 ± 2.97	44.39 ± 4.13	53.53 ± 7.76			
Major**				0.660	0.688	0.650
Medical	57.78 ± 2.43	44.66 ± 4.01	54.54 ± 7.16			
Pharmacology	57.36 ± 2.72	44.31 ± 3.76	53.36 ± 6.11			
Dental	57.17 ± 3.61	43.66 ± 4.45	53.35 ± 6.96			
Health	57.42 ± 2.52	44.66 ± 4.06	54.38 ± 7.69			
Paramedicine	57.67 ± 2.89	44.31 ± 4.09	53.91 ± 8.10			
Nursing/Midwifery	57.42 ± 3.33	44.47 ± 4.49	53.15 ± 8.27			
Economic Status**				0.258	0.031	0.004
Poor	57.70 ± 2.49	43.40 ± 4.73	50.85 ± 8.49			
Average	57.44 ± 2.66	44.28 ± 4.08	53.50 ± 7.43			
Good	57.63 ± 3.66	45.19 ± 4.26	55.39 ± 7.84			
Underlying Disease*				0.731	0.277	0.749
Yes	57.76 ± 2.24	45.69 ± 3.83	53.10 ± 7.42			
No	57.48 ± 2.92	44.41 ± 4.17	53.83 ± 7.62			
History of Infection (self)*				0.367	0.582	0.063
Yes	57.34 ± 3.28	44.58 ± 4.16	53.00 ± 7.83			
No	57.58 ± 2.66	44.37 ± 4.17	54.27 ± 7.46			
History of Infection (relatives)*				0.020	0.757	0.026
Yes	57.34 ± 3.28	44.49 ± 4.17	53.28 ± 7.54			
No	57.58 ± 2.66	44.37 ± 4.16	54.82 ± 7.67			

*Data are presented as mean ± SD and Independent T-test was used for comparison. **Data are presented as mean ± SD and Kruskal-Wallis Test was used for comparison

The average quality of life score was 36.05±5.68. Economic status was the only factor significantly associated with quality of life, with students from better economic backgrounds reporting higher scores ($p = 0.003$). Additionally, the mean quality of life score was not significantly associated with underlying diseases or the history of respiratory viral infections, either in the individuals themselves or their first-degree relatives ($p > 0.05$) (Table 3).

A significant positive correlation was found between knowledge, attitudes, and preventive practices ($p < 0.05$). However, no significant relationship was observed between quality of life and these variables ($p > 0.05$) (Table 4).

Table 3. Comparison of Quality-of-Life Scores by Demographic Variables, Underlying Disease, and Infection History.

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Variable	Mean ± SD	P-value
Overall mean	36.05 ± 5.68	-
Gender*		
Male	36.32 ± 5.61	0.434
Female	35.91 ± 5.71	
Age group (years)**		
19–25	36.00 ± 5.73	0.734
25–30	36.03 ± 4.99	
>30	36.92 ± 5.52	
Education**		
Associate	31.50 ± 9.19	0.353
Bachelor	36.21 ± 5.63	
Master	37.34 ± 4.90	
PhD	35.50 ± 5.85	
Marital status*		
Married	36.70 ± 5.34	0.349
Single	35.97 ± 5.72	
Major**		
Medical	35.79 ± 5.98	0.112
Pharmacology	34.29 ± 6.61	
Dental	37.00 ± 5.00	
Health	36.95 ± 5.70	
Paramedicine	36.18 ± 5.65	
Nursing/Midwifery	35.78 ± 5.10	
Economic status**		
Poor	35.35 ± 6.23	**0.003**
Average	35.59 ± 5.63	
Good	37.69 ± 5.49	
Underlying disease*		
Yes	39.00 ± 5.87	0.058
No	35.97 ± 5.66	
History of infection (self)*		
Yes	35.81 ± 5.55	0.240
No	36.49 ± 5.89	
History of infection (relatives)*		
Yes	35.81 ± 5.55	0.190
No	36.49 ± 5.89	

*Data are presented as mean ± SD and Independent T-test was used for comparison. **Data are presented as mean ± SD and Kruskal-Wallis Test was used for comparison

Table 4. Relationship Between Knowledge, Attitude, Preventive Practices, and Quality of Life

Variable		Knowledge	Attitudes	Preventive Practices	Quality Of Life
Knowledge	The correlation coefficient	1	0.310	0.297	0.027
	P-value	--	less than 0.001	less than 0.001	0.528
Attitudes	The correlation coefficient	0.310	1	0.381	- 0.040
	P-value	less than 0.001	---	less than 0.001	0.354

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Preventive Practices	The correlation coefficient	0.297	0.381	1	0.001
	P-value	less than 0.001	less than 0.001	---	0.977
Quality Of Life	The correlation coefficient	0.027	- 0.040	0.001	1
	P-value	0.528	0.354	0.977	---

Spearman's correlation test was used to analyze the relationships between variables

Discussion

The aim of this study was to examine the relationship between knowledge, attitudes, and preventive practices regarding respiratory viral infections and the quality of life among medical sciences students. The findings highlighted the crucial role of preventive practices in controlling respiratory viral infections and revealed a significant positive correlation between knowledge, attitudes, and preventive practices. However, no significant association was observed between these variables and quality of life. As one of the few studies in this area, these results provide valuable insights into the relationship between educational factors and health outcomes among medical sciences students.

In this study, students' attitudes toward respiratory viral infections were influenced by age, sex, education, and economic status, with higher scores observed among women, older students, and those with better economic status. Additionally, medical and health students exhibited the highest average attitude scores among the medical sciences students in Yazd. Unlike our findings, Ranjbar Roghani et al. reported the highest attitudes among dental students and found no significant relationship between attitudes and demographic characteristics (21), which could be attributed to their smaller contrast to our findings.

Rahmanian and colleagues showed that medical students also had a high level of COVID-19-related knowledge. Therefore, the more relevant courses they have taken, the more aware they are of the disease (22).

Larebo and Abame (2021) conducted a cross-sectional study and the results showed that compared to other research, the knowledge about the usage of face masks in this study was low, but the attitudes and practices were high. Authorities in regions at risk for a COVID-19 pandemic should prioritize public knowledge and educational initiatives (23).

A study of 240 Iranian medical students found that only 5.8% of participants exhibited low performance in preventive practice. This was attributed to their status as stagers and their placement in non-emergency departments, which may have resulted in reduced adherence to preventive practices. Similarly, our findings revealed a significant relationship between preventive practices and marital status, with married participants showing higher adherence. These results underscore the importance of education and personal circumstances in fostering preventive practices during health crises (10).

A study by Saadat and coworkers on the relationship between preventive practices and COVID-19 exposure levels, risk perception, and anxiety about COVID-19 in students and personnel at Military Medical Sciences University showed that marital status, age, education, and history of COVID-19 infection were not significantly associated with preventive practices. In the present study, preventive practices were significantly associated with age, history of respiratory viral infection in first-degree relatives, and economic status, but no significant relationships were observed with education level (24). Generally, adhering to preventive practices,

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such as COVID-19, has a significant effect on decreasing infectious disease mortality, and people should believe that adhering to preventive practices will cost less than treating the disease.

Heidari et al. found no significant relationship between knowledge and gender, nor any association between attitudes and demographic factors, which is consistent with our findings regarding underlying diseases. These discrepancies may be attributed to differences in sample composition and educational levels. Additionally, our results indicate that the mean quality of life score reflects a moderate level of quality of life among students, which aligns with Heidari et al.'s finding of an acceptable quality of life (12). Considering the difference in the quality-of-life scores between the two studies, we observed a difference in the average quality-of-life score. In the present study, the average quality-of-life score had a statistically significant relationship only with economic status, while in the study by Heidari and others, quality-of-life was significantly associated with only the history of COVID-19 infection. Shakiba et al. (2021) examined the average quality of life of medical and dental students and agreed with this research. In this study, the students' average quality of life was 36.05. This concordance is due to the similarity in the participant group (medical sciences students) (25).

The present study calculated the average scores for knowledge, attitudes, preventive practices, and quality of life. According to Spearman's correlation coefficient, there were significant and direct relationships among the scores for knowledge, attitudes, and preventive practices (p-value> 0.05); however, there were no significant relationships found between the quality-of-life score and the variables of knowledge, attitudes, or preventive practices.

Limitations and Strengths

This study's limitations include voluntary sampling, a small population, and restricted generalizability. Its cross-sectional design limits the findings to correlations, highlighting the need for longitudinal studies. Future research should use larger, more diverse samples for broader applicability.

Conclusion

This study demonstrated that medical sciences students had good knowledge, attitudes, and preventive practices (KAP) toward respiratory viral infections, yet their preventive behaviors require further improvement. While no significant association was observed between KAP and quality of life (QoL), socioeconomic status was a significant determinant of QoL, emphasizing the need to consider economic disparities alongside educational interventions. Policymakers should develop integrated programs combining health education on infection prevention with strategies to reduce socioeconomic inequities among students. Future research should examine longitudinal effects of targeted educational interventions on preventive behaviors, the role of socioeconomic and environmental factors on QoL, and explore mental health, lifestyle, and institutional support as potential moderators of health outcomes in medical sciences students.

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CRediT authorship contribution statement

Conceptualization, Methodology, Validation, Formal Analysis, Investigation, Resources, Software, Data Curation: FF, AF, Writing–Original Draft Preparation, Writing–Review & Editing, Visualization, Supervision, Project Administration: FF. MA, FS.

Declaration of Generative AI and AI-assisted technologies in the writing process

No generative artificial intelligence (AI) tools, including ChatGPT or other large language models, were used in the preparation or writing of this manuscript. The text was revised and improved

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using Grammarly for language enhancement and clarity.

Conflict of interest

The authors have declared that no competing interests exist.

Ethical considerations

This study was approved by the Ethics Committee of Reproductive Sciences Institute - Shahid Sadoughi University of Medical Sciences (Yazd University of Medical Sciences (Iran) (IR.SSU.RSI.REC.1400.011). The authors avoided data fabrication, falsification, plagiarism, and misconduct.

Data availability statement

The data that support the findings of this study are available on request.

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