



## The Knowledge Levels, Preventive Behavior And Risk Perception On COVID-19 Of The Healthcare Students In Turkey

### Türkiye’de Sağlık Öğrencilerinin COVID-19 Üzerine Bilgi Düzeyleri, Koruyucu Davranışları ve Risk Algıları

Emine Cihan<sup>1</sup>, Cansu Şahbaz Pirinççi<sup>2</sup>, Hasan Gerçek<sup>3</sup>, Bayram Sönmez Ünüvar<sup>3</sup>, Ertuğrul Demirdel<sup>4</sup>

<sup>1</sup>Selcuk University, Vocational School Of Health Services, Department Of Therapy And Rehabilitation, Konya, Turkey.

<sup>2</sup>Ankara City Hospital, Ankara, Turkey.

<sup>3</sup>KTO Karatay University, Vocational School Of Health Services, Department Of Physiotherapy, Konya, Turkey.

<sup>4</sup>Ankara Yıldırım Beyazıt University, Faculty Of Health Sciences, Physiotherapy and Rehabilitation Dep., Ankara, Turkey.

#### Abstract

**Objective:** In this study, 19 health-related knowledge level of students Covidien in Turkey, was conducted to determine the preventive behavior and risk perception.

**Material-Method:** This cross-sectional study was conducted from 14th to 20th of May, 2020. The questionnaire was completed with voluntary participation of university students who have education in the field of health. Questionnaire consisted of 26 questions including 15 items about COVID-19 related knowledge, 9 items regarding preventive measures and 2 items about COVID-19 risk perception. Reliability of the questionnaire was shown to be satisfactory.

**Results:** Total 1438 students studying in departments about health participated in the study. 943 participants (65%) were associate degree students, 495 people (35%) were undergraduate students. The average COVID-19 knowledge level was 90.3%, its attitude towards protective behavior was 99%, and the risk perception rate was 4.82. In terms of applying protective behavior, 99% of the respondents gave the correct answer. 24% of the participants had low level risk perception, 40% medium level perception, 36% high level risk perception. Participants' high level of knowledge and risk perceptions ( $r=-0.560, p=0.015$ ) between protective behaviors and risk perceptions ( $r=-0.839, p=0.005$ ) and protective behaviors and knowledge level ( $r=-0.737, p=0.009$ ) There was a moderate correlation between.

**Conclusion:** The knowledge level is at a level that provides insulation with the recognition and protection of the disease in our study if cases and the mortality rate in Turkey is considered. Hierarchical knowledge-based education is a prerequisite for preventing and controlling the spread COVID-19 for healthcare professionals who will take active role in the epidemic.

**Keywords:** COVID-19, Knowledge Levels, Preventive Behaviours, Risk Perception, Students.

#### Özet

**Amaç:** Çalışma Türkiye'deki sağlık öğrencilerinin COVID-19 ile ilgili bilgi düzeylerini, önleyici davranışları ve risk algılamasını belirlemek amacıyla yapıldı.

**Materyal-Metot:** Araştırma, sağlık alanında eğitim alan üniversite öğrencilerinin gönüllü katılımı ile 14-20 Mayıs 2020 tarihleri arasında gerçekleştirildi. Anket, COVID-19 ile ilgili bilgilerle ilgili 15 madde, koruyucu davranışlarla ilgili 9 madde ve risk algısıyla ilgili 2 maddeden oluşan 26 sorudan oluşmaktadır. Anketin güvenilirliğinin yeterli düzeyde bulundu.

**Bulgular:** Araştırmaya sağlıkla ilgili bölümlerde okuyan toplam 1438 öğrenci katıldı. 943 katılımcı (%65) ön lisans öğrencisi, 495 kişi (%35) lisans öğrencisiydi. Ortalama COVID-19 bilgi düzeyi %90,3, koruyucu davranışa karşı tutumu %99 ve risk algılama oranı %4,82'dir. Koruyucu davranışların uygulanması açısından katılımcıların %99'u doğru cevabı verdi. Katılımcıların %24'ü düşük seviye risk algısına, %40 orta seviye risk algısına, %36'sı ise yüksek seviye risk algısına sahipti. Katılımcıların, koruyucu davranışlar ile risk algılamaları ( $r=-0,839, p=0,005$ ) ve koruyucu davranışlar ile bilgi düzeyi ( $r=-0,737, p=0,009$ ) arasında yüksek düzeyde, bilgi ve risk algıları ( $r=-0,560, p=0,015$ ) arasında orta düzeyde bir korelasyon vardı.

**Sonuç:** Çalışmamız da bilgi düzeyinin, Türkiye'deki vaka ve ölüm oranı dikkate alınacak olursa hastalığı tanıma ve korunma ile izolasyon sağlayacak düzeyde olduğunu görüyoruz. Salgın konusunda aktif rol üstlenecek sağlık profesyoneli adayları için COVID-19'un yayılımının önlenmesi ve kontrol altına alınması için hiyerarşik bilgi tabanlı öğretimin önkoşul olduğu kanaatindeyiz.

**Anahtar kelimeler:** COVID-19, Bilgi Düzeyleri, Koruyucu Davranışlar, Risk Algısı, Öğrenci.

## Introduction

The coronavirus (1) which emerged as a pneumonia epidemic with unknown etiology in City Wuhan, China in December 2019, and which caused severe acute respiratory syndrome was called as COVID-19 by World Organization Health (WHO) (2). It was reported that more than 2 million people in the worldwide were affected by the disease, COVID-19 that caused pandemics and even thousands of deaths due to this disease (3) and it was seen firstly in Turkey on 11th March, 2020 (4).

Though the disease is generally infected by sick individuals, it is reported that asymptomatic cases play critical role in disease spread (5). It was stated that average incubation period of the disease was for 4-5 days however it can last up to 14 day and the symptoms of disease was defined as fever, fatigue and dry cough. Other reported symptoms are shortness of breath, myalgia, sore throat and diarrhea but they are less common (6).

Individual protection brings social protection with it in this period. Especially, the attitudes of the media about the period can increase the risk of infection by leading the public to fear, and diseases are taken under control thanks to implementing and controlling the right policies (7). Carrying out of these applications depends on the guidance of the healthcare professionals who have adequately equipped in the field with the correct information.

Healthcare professionals' candidates who will take an active role in the epidemic are the first people who have close contact with the infected people. When it is considered that the transmission rate of the disease to healthcare professionals is 29% (8), this can increase the lack of information, stress and anxiety levels in the population and interrupt the compatibleness of medical decisions (9). Therefore, we think that the level of knowledge of the students who are being educated in the field of health sciences about COVID-19 and their knowledge level about the disease should be determined and investigated. Such studies in the literature are rare and the conditions that occurred upon the disease and that has not yet been clarified increase the importance of the research.

Our study was planned to evaluation the knowledge levels, preventive behaviours and risk perception on COVID-19 of the healthcare students in Turkey and in the light of the data obtained, it was planned to determine the adequacy about the pandemic.

## Material and Methods

This study is a cross-sectional study which was performed to search knowledge on COVID-19, preventive behaviors and risk perception of university students who have education in the field of health in Turkey in accordance with the Helsinki Declaration. The questionnaire was completed with the voluntary participation of university students who have education in the field of health. The survey which was available to access by target mass between May 14 and 20 was conducted through using an Google survey in Turkish.

1438 students who are having education in the field of

health participated in the study. A questionnaire composing 4 (four) sections (demographic data, COVID-19 knowledge level, preventive behaviors, risk perception) was used in the study. The questionnaire was prepared in relation to COVID-19, taking into consideration the questionnaires used in past epidemic periods and the reliability of the questionnaire was tested by the infectious diseases specialist and epidemiologists (10). We calculated The Cronbach Alpha reliability coefficient for the knowledge level, preventive behavior and risk perception. The Cronbach Alpha was found respectively to be 0.730, 0.660 and 0.728 in a pilot study with 300 participants.

The gender, education level, student's education level and COVID-19 training and training resources were questioned in demographic data of the questionnaire.

The COVID-19 knowledge level inquiry consists of 15 articles. There are three articles on the basis of COVID-19 and its etiology, two articles related to symptoms and incubation period, one article related to diagnosis, two articles related to contamination, four articles related to public prevention, one article related to specific prevention of medical professionals, treatment, one article related to treatment and one article about referring to suspicious cases. The answers of all questions except the 14th question are "True". If the participant answered the question correctly, s/he had 1 point; if s/he answered the question incorrectly s/he had 0 point. Total points were obtained upon summing the correct answers. The total score was converted to a percentile. If the score was greater than or equal to 75%, it was determined as high, if it was between 50% and 75% it was determined as medium level, and if it was less than or equal to 50%, it was determined as low level of knowledge.

The questioning of preventive behavior consisted of 9 articles. There were five articles about reducing the use of public spaces in daily life, one article about preventive behavior during coughing, two articles about intensive hand washing and surface disinfection, and finally one article about talking to people about prevention nearby. The answers were determined as 'Yes' and 'No'. Those who answered 'Yes' got '1' point and those who answered 'No' got '0' points. The total score was obtained by summing up those who answered 'Yes'. Seventy five percent or higher scores were evaluated as high performance and <75% was evaluated as low performance in preventive behaviors.

Risk perception consisted 2 articles. Answers were given through using a 4-point Likert scale (1=Not At All, 4=Absolutely Yes). The 4-point scale has a mixed order for the participants to reduce any prejudice. The total score ranged from 2 to 8. Scores between 2-3 points were determined as low, 4-5 points were determined as medium and 6-8 points were determined as high risk perception.

The sample size was calculated with the Raosoft sample size calculator (11). The required sample size was 643, with a 99% confidence level and a 5% margin of error based on the estimated universe and 50% response distribution. The conformity of the data to normal distribution was tested

with the Kolmogorov-Smirnov test. Since the data did not show normal distribution, Mann Whitney U test was used. Results are given as mean ± standard deviation (X±SD) and percentage values (%). The relationship between knowledge level, displaying preventive behaviors and risk perception was analyzed with Spearman's correlation test. Correlation coefficients were categorized as very weak (r=0.00-0.25), weak (r=0.26-0.49), medium (r=0.50-0.69), high (r=0.70-0.89) and very high medium (r=0.90-1.0) (12). SPSS for Windows version 20.0 package program (SPSS Inc., Chicago, IL., USA) was used for statistical analysis and p <0.05 was considered statistically significant.

**Results**

Total 1438 people studying in departments about health participated in the study. 1152 participants (80%) were female and 286 (20%) were male. There was no difference between groups in terms of COVID-19 knowledge level (p=0.411) and risk perception (p=0.210), but there was a difference in preventive behavior (p=0.000). 943 participants (65%) were associate degree students, 495 people (35%) were undergraduate students. There was no difference between groups in terms of COVID-19 knowledge level (p=0.088), preventive behaviors (p=0.270), perception of risk (p=0.188). 274 participants (18%) had training on COVID-19, but 1164 (72%) participants did not have education on it. There was no difference between participants had COVID-19 training and participants who did not have training on COVID-19 in terms of knowledge level (p=0.896) and risk perception (p=0.624), but there was a difference regarding to preventive behavior (p=0.032) (Table 1).

According to the COVID-19 knowledge level questions, answering the correct rate of the questions was 85.9%. 80% of participants had a high level of knowledge, 6.67% had a medium level, and 13.33% had a low level of knowledge. The questions, 'Everyone in society should wear a mask' (N) and 'Disease can be treated with antiviral drugs. (N) ' were the lowest scoring questions (Table 2).

**Table 2.** Knowledge levels related to COVID-19

Questions (True/False)	Rate of Correct Answer (%)
COVID-19 is a respiratory infection caused by a new species of coronavirus family. (T)	97.6%
The first case of COVID-19 was diagnosed in Wuhan. China. (T)	99.4%
The origin of COVID-19 is not clear but it seems that it has been transmitted to human by sea foods. snake or bat. (T)	96.7%
Its common symptoms are fever. cough and shortness of breath but nausea and diarrhea were reported rarely. (T)	99.8%
Its incubation period is up to 14 days with mean of 5 days. (T)	95.2%
It can be diagnosed by PCR test on sample collected from nasopharyngeal and oropharyngeal discharge or from sputum and bronchial washing. (T)	89.5%
It is transmitted through respiratory droplets such as cough and sneeze. (T)	97.6%
It is transmitted through close contacts with an infected case (especially in family. crowded places and health centers). (T)	99.7%
The disease can be prevented through handwashing and personal hygiene. (T)	98.6%
A medical mask is useful to prevent spread of respiratory droplets during cough. (T)	98.0%
The disease can be prevented through no close contacts such as handshake and kissing. not attending meetings and hand disinfection frequently. (T)	96.0%
All people in society should wear masks. (T)	16.6%
Only during intubation. suction. bronchoscopy and cardiopulmonary resuscitation. you have to wear N95 mask. (T)	64.7%
The disease can be treated by usual antiviral drugs. (F)	44.0%
If symptoms appear within 14 days from direct contact with the suspected case. the person should inquire at a nearby public health center. (T)	94.6%
Total	85.9%

T: True; F: False

**Table 1.** Differences in variables according to demographic data

		N (1438)	Knowledge level		Preventive Behaviors (0-100)			Risk Perception (2-8)			
			X±SD	U	p	X±SD	U	p	X±SD	U	p
<b>Gender</b>	Female	1152	85.82±6.75	159.923	0.411	99.23±3.84	174.519	0.000	4.79±1.73	156.971	0.210
	Male	286	86.03±6.75			98.25±5.65			4.93±1.67		
<b>Education Status</b>	Association Degree	943	85.70±6.17	221.529	0.088	99.12±4.09	229.968	0.270	4.77±1.72	223.693	0.188
	Undergraduate degree	495	86.18±6.97			98.87±4.60			4.91±1.72		
<b>Was training taken?</b>	Yes	274	85.83±6.19	160.219	0.896	99.39±4.40	164.983	0.032	4.78±1.72	156.48	0.624
	No	1164	85.87±6.52			98.95±4.40			4.83±1.72		

N: Number. Mean: Mean. SD: Standard Deviation. U: Mann Whitney U. p: Significance level

99% of the participants gave the correct answer in terms of applying preventive behaviors. 100% of the participants showed high performance in terms of applying preventive behaviors. The lowest score was obtained from the question 'I started to clean the surfaces that I touch with my hands more frequently.' (Table 3).

24% of the participants had low level risk perception, 40% had medium level risk perception and 36% had high level risk perception (Table 4).

High level correlation between the level of knowledge and preventive behavior of the participants ( $r=-0.737$ ,  $p=0.009$ ) and medium level of correlation between risk perception ( $r=-0.560$ ,  $p=0.015$ ) was found. A high level correlation ( $r=-0.839$ ,  $p=0.005$ ) was found between risk perception and preventive behavior (Table 5).

**Table 3.** Application of protective behaviors

Questions (Yes/No)	Percentage of YES (%)
I cancelled or postponed meetings with friends. eating-out and sport events.	99.4%
I reduced the use of public transportation.	99.7%
I went shopping less frequently.	99.7%
I reduced the use of closed spaces. such as library. theatre and cinema.	100.0%
I avoided coughing around people as much as possible.	99.5%
I avoided places where a large number of people gathered.	99.4%
I increased the frequency of cleaning and disinfecting items that can be easily touched with hands (i.e. door handles and surfaces).	97.8%
I washed the hands more often than usual.	97.6%
I discussed. with my family and friends about COVID-19 preventions.	98.2%
Total	99.0%

**Table 4.** COVID-19 risk perception

Questions	X±SD (1-4)
I may be infected with COVID-19 more easily than others	2.23±0.93
I am afraid to be infected with COVID-19	2.59±1.01
Total	4.82±1.72

Avg: Mean. SD: Standard Deviation

**Table 5.** Knowledge levels. protective behavior. relationship between risk perception

		Knowledge Level	Protective Behavior	Risk Perception
<b>Knowledge Level</b>	p	1000	0.009	0.015
	r	-	-0.737	-0.560
<b>Protective Behavior</b>	p	0.009	1000	0.005
	r	-0.737	-	-0.839
<b>Risk Perception</b>	p	0.015	0.005	1000
	r	-0.560	-0.839	-

r: Spearman's correlation coefficient. p: significance level

## Discussion

The acute respiratory syndrome, called COVID-19 by WHO, was declared as a pandemic due to its extremely widespread in March 2020 (13). Suspicious or incorrect information about the transmission routes, incubation time, geographical impact, number of infections and actual mortality rates spreading after the pandemic announcement, and different levels of health policies applied worldwide have caused fear in the general population (7).

The level of knowledge of the people about the effective and infectious diseases that can cause pandemic can lead to the spread of the disease, or it can ensure controlling of disease (14). If it is considered that the public takes into account the discourses of healthcare professionals then the main job is on the health personnel.

In such cases, knowledge level of the people who work and having education in the field of health plays a critical role in the control of the disease because they have the highest incidence with the disease.

Therefore, applications on the education of other health groups, as well as physicians who take an active role in the pandemic process are important regarding to both individual and social protection (15).

This study that investigates the knowledge level, risk perception and preventive behavior of students regarding COVID-19 and involves associate and undergraduate students studying in the field of health is the first wide cross-sectional descriptive study in the literature.

Mentioned pandemic is new and this case causes a problem on insufficient study about it. Therefore, we compared the data we obtained about COVID-19 with studies on MERS-COV that caused acute respiratory syndrome, which may be other lethal, although COVID-19 is more lethal (16).

While the knowledge level of the health department students who participated in our study questioning the basic issues such as diagnosis, diagnosis, transmission and treatment, the "high score" on COVID-19 was 80%, the similar level was obtained with the percentage of 79.6% in the questionnaire study in which medical students in Iran previously participated (10). Although the level between the two studies is similar, while the rate of false answers on diagnosis method is higher than among medical faculty students in Iran; both studies differentiated about the mask N95 and the wrong answer rate has been higher in this subject. Considering that surgical masks are designed to protect the user from the environment and the N95 mask is designed to protect the user from the environment (17), the wrong ratio reason in the answers may arisen that the participants think that using masks with high protection rate will provide an advantage in the work area. Also, it is seen that the wrong answers are more in this judgment, "Everyone should wear a mask in the society." in both studies. We think that this rate may be due to statements of WHO; WHO's previous statement was 'It is suitable that only infected person should wear a mask' but WHO's next statement was 'It is suitable to use a mask as one of social protection methods' (18). The fact that the correct response

rate given by the medical students in the proposal, "The disease can be treated with antiviral drugs", which measures the general knowledge of the drugs used for COVID-19, was higher than the students studying in the field of health; this case may be arisen from medical students' being included in the active processes in clinical treatment and intensive pharmacological training. However, the correct response rate regarding the incubation period of the disease and the appearance of symptoms is higher in students studying in the field of health than medical students. We attribute this to the progress of the process and to the increase of awareness.

When we consider other groups in healthcare in a study conducted in China about MERS, it was reported that the medical students were well educated, while this knowledge level was found low in other healthcare students (15). In another MERS study conducted in the field of nursing, the correct response rate about the disease was 84% (9).

Information transfer transparency and process management in the health policies implemented on COVID-19 will take the society away from fear and ensure that the preventive behaviors are adequate level and appropriateness through explaining the risk factors and the domestic and global returns of the disease (19-21).

Preventive behavior remained at the rate of 44.5% in Korean healthcare students unlike the correct answers about MERS (9). Preventive behaviors related to COVID-19 in Iran are largely compatible with WHO's recommended principles (94.47%). When we compare those data with our questionnaire study, the article 'I started to clean the surfaces that I touched with my hands more frequently' had lower correct response relatively than other in both studies. Also, preventive behavior is significantly higher in women in both studies ( $p < 0.01$ ) (10). However, this rate for preventive behavior suitability with 99% of the students participating in our study is higher than the other rates in the literature. The data in our study prove that the percentage of preventive behavior increases depending on the level of knowledge (Table.1).

The high risk perception rate is 36%, and this perception is 30.8% among medical students in our study (10). This case can be arisen from the fact that medical faculty students are on the field and they spend more time with patients and they are more experienced in stress management. In addition, on the contrary Taghrir et al., it has been determined that coherent to the general population, high preventive behavior brings high risk perception in our study (9, 22, 23).

## Conclusion

Consequently, we think that education about pandemic in universities, which can be described as the backbone of the society will have positive individual and social effects. We believe that hierarchical knowledge-based education is a prerequisite for preventing and controlling the spread of COVID-19 for healthcare professionals who will take an active role in the epidemic. We see that knowledge level is at a level that provides insulation with the recognition and protection of the disease in our study if cases and the mortality

rate in Turkey (24) is considered.

Only students studying at the vocational school of health and the faculties of health sciences were involved in this study. Therefore, no comparison has been made with the students educated in the Social Sciences Departments. Also, no inquiries were made in terms of the departments of students in associate and undergraduate degree groups. We think that more detailed researches can be done in other fields through setting an example of our study.

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