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Research Article

ASSESSMENT OF THE LEVEL OF RISK PERCEPTIONS AND RELATED PARAMETERS FOR THE COVID-19 PANDEMIC

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Abstract: *Assessment of risk perception in communities in the context of the COVID-19 pandemic is essential for organizing effective interventions. The study aims to determine the level of COVID-19 risk perception and the factors associated with it. It is a cross-sectional study in which 452 participants, who were employees of Eskisehir Osmangazi University, were included between December-2020 and January-2021. The COVID-19 risk perception level was assessed with nine questions by modifying the COVID-19 Instant Monitoring Turkey protocol study questions. The prepared questionnaire included variables of sociodemographic characteristics, transmission risk status, preparedness, self-efficacy, compliance with protective behaviors, actionism(ineffective protection behavior), and confidence in information sources/tools. The 25th percentile and lower scores were evaluated as having low-risk perception. The study data were evaluated with univariate and multivariate analysis. The participants had a mean age of 38.51±9.66 years (46.9% females, 53.1% males). The median COVID-19 risk perception score was 42(Interquartile range: 35-50). In this study, the low COVID-19 risk perception frequency was 26.3%. Being 40 years old and older (OR;%95CI: 1.76;1.12-2.76), a low level of compliance with protective behaviors (1.75;1.09-2.76), and low level of confidence in information sources/tools (2.37;1.49-3.78) were predictive for having a low level of risk perception of COVID-19. Those with a low COVID-19 risk perception were more likely to agree that the restrictions being applied were exaggerated (p=0.001). The most trusted sources of information about COVID-19 were the statements of health professionals and official institutions (p<0.001). Low-level risk perception was detected in one out of every four people in the study group. COVID-19 risk perception of individuals should be monitored since it is related to many parameters in epidemic management.*

Keywords: *Risk perception, COVID-19, risk factors, preparedness*

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1. Introduction

As in past epidemics, being able to fight the COVID-19 epidemic effectively can be achieved by changing the behavior of individuals in accordance with the precautions. Perception of risk, which plays a role in recognizing the characteristics of communities, is an important component of behavior change theories [1]. Risk perception is a subjective judgment based on the characteristics, severity, and management of risk; it can be effective on the behavioral changes recommended to society in epidemics and relates to many parameters [2]. Features including sociodemographic characteristics, trust in information sources tools, being able to respond to the problems encountered during the pandemic management, level of preparedness and self-efficacy, political beliefs, and values are the factors that can affect the risk perception levels of communities [3, 4].

It has been reported that a positive relationship was found between risk perception levels and protective behaviors in many studies [5-8] conducted in the context of COVID-19 protective/preventive behaviors [9]. On the other hand, the low-risk perception may cause to adapt more slowly to the changes and the decisions taken and cause adaptation problems. Furthermore, this perception can lead to wrong decisions and risky behaviors when combined with rapid decision-making and high impulsivity. This may lead to an increase in ineffective precautionary behaviors (actionism) [3]. It has been confirmed that the negative consequences of disasters are associated with low-risk perception [10]. For these reasons, risk perception, along with some level of concern, can be a useful tool to encourage preparedness and better responsiveness in the health sector.

As the pandemic of the 21st century, COVID-19 has created fear, anxiety, and panic. Monitoring communities' risk perceptions and behaviors against COVID-19 has been one of the priority actions. A standard protocol has been developed to create a national series of cross-sectional studies with COVID-19 Snapshot MOnitoring (COVID-19 Instant Monitoring, COSMO), one of the most comprehensive studies in this field [11]. The purpose of the protocol is to enable rapid and adaptive monitoring of different populations over time by assessing the relationships between COVID-19 risk perception and information and misinformation, preparedness, and protective behavior. All over the world and in Turkey, the risk perceptions, knowledge, preparedness, and compliance levels of communities regarding COVID-19 have been evaluated by COSMO study reports [11, 12].

It can be said that after the first official COVID-19 case was reported in Turkey on March 11, 2020, the rapid increase in cases was controlled by strict social measures. However, in June 2020, a second wave of the epidemic was observed following the normalization period. The study was carried out to determine the risk perception levels of university employees and examine the related factors during the period when the effects of the second wave began to ease in Turkey.

2. Materials and Methods

2.1. Study design

The study is a cross-sectional study conducted on employees of Eskisehir Osmangazi University between December-2020 and January-2021. During this period, Turkey's daily number of new cases ranged between 5,277 and 33,198, while deaths were between 129 and 259 [13]. Ethical permission for the study was obtained from Eskisehir Osmangazi University Non-Interventional Clinical Research Ethics Committee.

2.2. Population and data collection

The population of the study consisted of 5600 people. It was calculated that at least 359 people should be reached (low prevalence of COVID-19 risk perception level 50%, confidence interval 95%, the margin of error 5%), and the questionnaire form links were sent to all employees via corporate e-mail, a total of 452 people formed the working group. In the links, information was given about the subject and purpose of the study. A total of 3 reminders were sent via e-mails and web page announcements.

2.3. Questionnaire form

The questionnaire form was prepared by modifying the COSMO protocol study questions and the literature [6, 12]. The prepared questionnaire included variables of sociodemographic characteristics, transmission risk status, preparedness, self-efficacy, compliance with protective behaviors, actionism(ineffective protection behavior), confidence in information sources/tools, and experiencing

problems in certain issues. The prepared questionnaire was uploaded to the Google Forms online platform. The consent of the participants was obtained in the questionnaire form.

In the study, COVID-19 risk perception levels of individuals were evaluated with nine questions in 7-point Likert-type by modifying the COVID-19 Instant Monitoring Turkey protocol questions. Perception of risk includes cognitive and emotional sub-headings within the framework of the concepts of perceived vulnerability and severity, which are suggested by two basic models (Conservation Motivation Theory and Health Belief Model). In evaluating risk perception, the self-reported possibility of being infected, susceptibility of being infected, disease severity in case of infection, and the anxiety that changing conditions may cause were taken into account. The scores obtained from the risk perception level questions ranged from 9 to 63. The internal consistency of the question group created to measure risk perception was 0.81, calculated with Cronbach's alpha coefficient.

The risk perception level of COVID-19 was accepted as "low" in those who scored 25th percentile (35) and below of the total score, "high" in those who scored 75th percentile (35) and above, and "moderate" in those who scored between 25th and 75th percentile. In order to evaluate the parameters that may be associated with the low COVID-19 risk perception level, moderate and high-risk perception groups were combined and ultimately grouped as "low-risk perception level" below the 25th percentile and "medium-high risk perception level" above the 25th percentile.

Those who had COVID-19 PCR positivity in their home or workplace nearby were taken as “the group at risk of transmission” and those who did not have positivity were taken as "the group, not at risk of transmission".

The level of preparedness-self-efficacy was evaluated with two questions in the 7-point Likert type. Those who scored in the 25th percentile and below (≤8 points) of the total score were considered to have a "low" level of preparedness-self-efficacy, while the others were considered "normal".

The level of adaptation to protective behaviors was related to the level of adaptation to situations that were removed, changed, and/or newly added in the context of social life during the epidemic; it was evaluated with eight questions in a 5-point Likert type. Those who scored in the 25th percentile and below (≤16 points) of the total score were accepted as "low", while the others were considered "normal". The Cronbach's alpha coefficient was calculated as 0.85.

The actionism level, which evaluates ineffective protection behaviors in the epidemic, was calculated with four questions with yes (1 point)/no (0 points) options questioned differently from other groups. Those who scored at or below the 25th percentile (≤1) of the total score were considered to have a “low” actionism level.

The level of trust in information sources/tools was evaluated with ten questions in a 7-point Likert type. Those who scored at the 25th percentile and below (≤30) of the calculated total score were considered "low", while the others were considered "normal". The Cronbach's alpha coefficient was calculated as 0.87.

2.4. Statistical analysis

The obtained data were evaluated using the SPSS Statistical Package Program (ver. 15.0, Chicago). The statistical significance value was $p \leq 0.05$. Quantitative data were presented with a mean (±standard deviation), median, 25th, and 75th percentile values. Non-parametric tests Mann-Whitney U and Kruskal Wallis were used because the data were not suitable for normal distribution. Frequency distribution was used to present descriptive features; the Chi-Square test was used to compare categorical variables. In further analysis, a multiple logistic regression model was applied. Low and medium-high risk perception groups were the dependent variables; gender, age group, COVID-19 transmission risk group, adaptation level to protective behaviors, and confidence level in information

sources/tools were independent variables. The model was established with variables that showed a significant level of p<0.10 in univariate analysis.

3. Results

The participants (46.9% females, 53.1% males) had a mean age of 38.51±9.66 years (Min-Max:19-64).

The median COVID-19 risk perception score was 42 (Min-Max:9-63, Interquartile Range:35-50). In this study, 119 (26.3%) of the participants had a "low" and 333 (74.7%) had a "medium-high" perception of COVID-19 risk.

The percentages of having a low level of risk perception were 13.4% under the age of 30, 29.4% between 30-39 ages, and 57.2% aged 40 and over. It was found that the low COVID-19 risk perception was higher in those aged 40 and over compared to other age groups (p=0.032).

It was found that the group who experienced a risk of transmission (59.7%) had a lower perception of COVID-19 risk than those who did not (40.3%) (p=0.029).

No relationship was found between low COVID-19 risk perception level and gender, educational status, presence of chronic disease, presence of children (<18 years old) or elderly (>65 years old) living in the same household, and the number of people living at home (Table 1).

Table 1. Distribution of risk perception levels for COVID-19 according to sociodemographic parameters and risk of transmission.

Parameters		Low (≤35) risk perception	Medium-high (>35) risk perception	Total	p
		n=119 (%)[b]	n=333 (%)[b]	n=452 (%)[b]	
Age groups	19 -29	16 (13.4)	71 (21.3)	87 (19.2)	0.032*
	30 -39	35 (29.4)	116 (34.8)	180 (33.5)	
	+40 [a]	68 (57.2)	146 (43.9)	185 (47.3)	
Gender	Female	47 (39.5)	165 (49.5)	212 (46.9)	0.059
	Male	72 (60.5)	168 (50.5)	240 (53.1)	
Education	High school and below	41 (34.5)	104 (31.2)	145 (32.1)	0.518
	University and above	78 (65.5)	229 (68.8)	307 (67.9)	
Number of people living in the household	Alone	8 (6.7)	42 (12.6)	50 (11.1)	0.174
	2	18 (15.1)	55 (16.5)	73 (16.2)	
	3 and above	93 (78.2)	236 (70.9)	329 (72.7)	
Presence of persons under 18 years of age living in the same household	Yes	67 (56.3)	164 (49.2)	231 (51.1)	0.186
	No	52 (43.7)	169 (50.8)	221 (48.9)	
Presence of persons over 65 years of age living in the same household	Yes	16 (13.4)	46 (13.8)	62 (13.7)	0.920
	No	103 (86.6)	287 (86.2)	390 (86.3)	
Presence of chronic disease	Yes	17 (14.3)	68 (20.4)	85 (18.8)	0.142
	No	102 (85.7)	265 (79.6)	367 (81.2)	
The state of having experienced a risk of transmission[c]	Those who experience the risk of transmission	71 (59.7)	235 (70.6)	306 (67.7)	0.029*
	Those who do not experience the risk of transmission	48 (40.3)	98 (29.4)	146 (32.3)	

[a]The group that makes the difference; [b]The column percentage; [c]Positivity in oneself, at home or workplace nearby; *p<0.05

Those with low COVID-19 risk perception were found to have lower levels of adherence to protective behaviors (39.5%, p=0.001) and levels of trust in information sources/tools (41.2%, p<0.001). No relationship was found between levels of preparedness-self-efficacy or actionism and having a low level of risk perception. The distribution of the levels of preparedness-self-efficacy, adaptability, actionism, and trust in information sources regarding the COVID-19 disease according to the risk perception levels is given in Table 2.

Table 2. Distribution of COVID-19 risk perception levels according to levels of preparedness-self-efficacy, compliance with protective behaviors, actionism, and confidence in information sources/tools.

Parameters		Low (≤35) risk perception	Medium-high (>35) risk perception	Total	p
		n=119 (%)[a]	n=333 (%)[a]	n=452 (%)[a]	
Levels of preparedness-self-efficacy	Low	38 (31.9)	97 (29.1)	135 (29.9)	0.566
	Normal	81 (68.1)	236 (70.9	317 (70.1)	
Levels of compliance with protective behaviors	Low	47 (39.5)	78 (23.4)	125 (27.7)	0.001**
	Normal	72 (60.5)	255 (76.6)	327 (72.3)	
Actionism (ineffective behavior) levels	Low	59 (49.6)	166 (49.8)	225 (49.8)	0.960
	Normal	60 (50.4)	167 (50.2)	227 (50.2)	
Levels of trust in information sources/tools	Low	49 (41.2)	80 (24.0)	129 (28.5)	0.001**
	Normal	70 (58.8)	253 (76.0)	323 (71.5)	

[a]The column percentage;**p<0.01

When the study group was asked to rate their level of trust in information sources/tools related to COVID-19 from 1 to 7, it was seen that the most trusted information sources were healthcare professionals (6 points) and press releases or statements of public institutions (5 points), respectively (p< 0.001) (Figure 1).

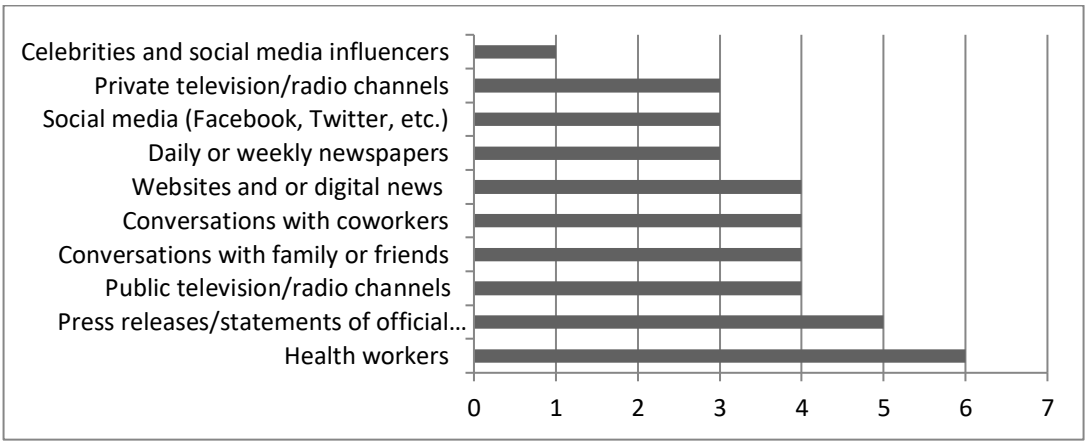

Figure 1. Median values of confidence scores in information sources/tools related to COVID-19.

It was found that those with a low COVID-19 risk perception level felt less lonely/helpless (54.6%), lost interest in things they enjoyed before (59.7%), and their sleep patterns were disrupted (58.8%). It was also found that they had fewer problems (34.5%) in their close relationships (Table 3).

Table 3. Distribution of cases of experiencing problems that may be encountered in the context of COVID-19 at least once, according to risk perception levels associated with COVID-19.

Problems that may be encountered in the context of COVID-19[c]	Low (≤35) risk perception	Medium-high (>35) risk perception	Total	p
	n (%)[d]	n (%)[d]	n (%)[d]	
I felt alone/helpless	65 (54.6)	251 (74.4)	316 (69.9)	0.001**
I've lost interest in things I've always enjoyed	71 (59.7)	271 (81.4)	342 (75.7)	0.001**
My sleep pattern is disturbed	70 (58.8)	249 (74.8)	319 (70.6)	0.001**
I took alcohol or sedatives	17 (14.3)	62 (18.6)	79 (17.5)	0.285
I was more nervous and angry than usual	58 (48.7)	221 (66.4)	279 (61.7)	0.001**
I have had problems with my spouse, family, or close relationships	41 (34.5)	168 (50.5)	209 (46.2)	0.008**
I have been subjected to physical violence	7 (5.9)	19 (5.7)	26 (5.8)	0.943
I witnessed physical violence	9 (7.6)	38 (11.4)	47 (10.4)	0.238

[c]Having problems at least once; [d]The column percentage;**p<0.01

In the further analysis, being 40 years old and older (OR;%95CI: 1.76;1.12-2.76), a low level of compliance with protective behaviors (1.75;1.09-2.76), and a low level of confidence in information sources/tools (2.37;1.49-3.78) were predictive for having a low level of risk perception of COVID-19. Multiple logistic regression results in determining the importance of variables on the perception of low and medium-high risk associated with COVID-19 are given in Table 4.

Table 4. Multiple logistic regression model results of variables associated with COVID-19 risk perception level.

Variables	OR	%95 CI	p
Gender			
(reference: Female)			
Male	1.553	0.996 -2.421	0.052
Age groups			
(reference: age <40)			
≥40 ages	1.762	1.123-2.764	0.014*
The state of having experienced a risk of transmission			
(reference: no)			
Yes	1.554	0.985-2.452	0.058
Level of compliance with protective behaviors			
(reference: normal)			
Low	1.745	1.089-2.794	0.021*
Level of trust in information sources			
(reference: normal)			
Low	2.373	1.492-3.775	0.001**
Constant	0.493	- -	0.026*

OR: Odd's ratio, CI: Confidence interval; *p<0.05; **p<0.01

Those with a low COVID-19 risk perception were more likely to agree that the restrictions being applied were exaggerated (p=0.001) (Figure 2).

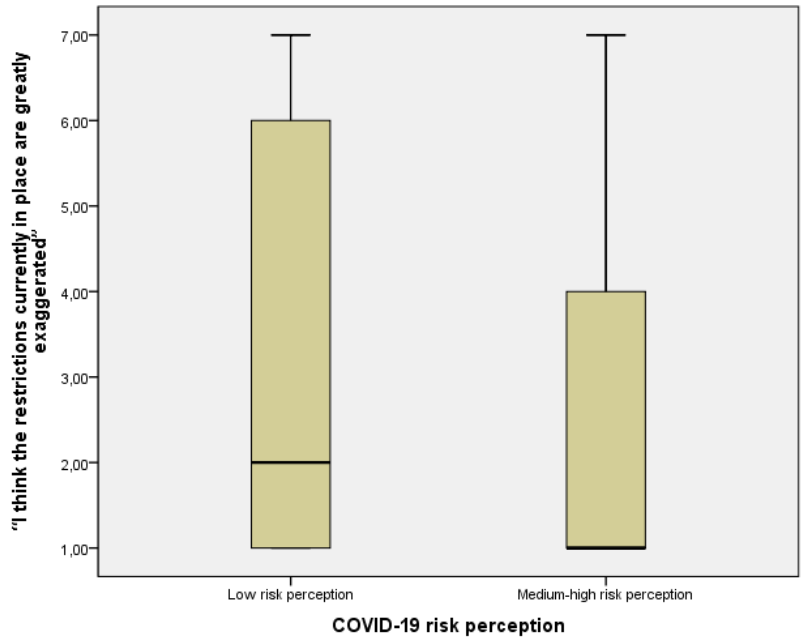

Figure 2. Scores from the analog scale for the proposition "I think the restrictions currently in place are greatly exaggerated" according to the COVID-19 risk perception levels.

4. Discussion

COVID-19 is an epidemic whose severity has been questioned globally since its early stages. This situation has led to the experiences such as not perceiving the risk it poses in an ideal way and not taking action on time. Assessing risk perception levels in communities is essential to implementing and organizing adequate and effective responses to combat the COVID-19 outbreak. In our study, it was aimed to determine the factors associated with low-risk perception levels.

Risk perception is a dynamic concept, and this was a unicenter study, so these factors could be considered the study's main limitations. In addition, religion and cultural characteristics could not be interpreted because they were not questioned. In a study conducted in Iran, it was reported that the factors most associated with the COVID-19 risk perception were religious/cultural characteristics besides emotional characteristics [10]. A different aspect of our study, which is evaluated positively, is the consideration of compliance to COVID-19 protective behaviors, actionism, and approach to policies together with the risk perception. In this way, the findings can be significant in providing feedback public health policymakers may need.

In the study, 26.3% of the participants were found to have low-risk perception, and this group remained in the minority. In the COSMO Turkey study, which was used in the study, a direct comparison cannot be made because the components evaluating the risk perception are handled separately. In the reports created with the data collected in July and August 2020 in the COSMO Turkey study, it was noted that the perception of low susceptibility to being infected with COVID-19, which is one of the most critical parameters, was seen in 30-40% of the study group [15]. In another study by Peres et al. (2020), the perception of risk was evaluated with separate parameters, where the perception of low susceptibility to infection is 19.1% in the general population, excluding healthcare workers, and 5.7% among healthcare professionals [16]. The comparisons between studies may have been affected by the data collection period. Since the data were collected when the second wave of the pandemic started fading, and a more favorable climate was created due to developments in vaccine research, it may have affected the comparisons with other studies. In addition, the fact that the study group consists of

employees with higher education in the public sector and that the risk perception is evaluated by scoring some parameters may also be effective in the differentiation of the scores between the studies.

Studies conducted in many different countries have revealed different results according to environmental and temporal effects. It is seen that risk perception levels are lower, especially in the first months of the pandemic. In a study conducted in Italy with 3.282 participants and two different temporal data sets (February and March 2020), higher risk perception was found in the second wave than in the first wave [17]. In the first week of the pandemic in the USA, Wise et al. (2020) reported that risk perception parameters are relatively high [8]. In the study by Kuang et al. (May 2020) in India, it was reported that those who perceived the risk of having COVID-19 disease as none (60.0%) or low (23.0%) constituted the majority [18].

A level of risk perception, together with the establishment of an environment of trust, can impact the adoption of measures to reduce COVID-19 cases. Trust in local government and the media helps reduce disease transmission. The effects of different types of trust are manifested, in whole or in part, through risk perception. In a study conducted in Switzerland, it was reported that people with high "social" trust perceived more risk compared to people with low social trust [19]. In our study, low trust in information sources/tools ranks first among the risk factors for low COVID-19 risk perception, increasing the low-risk perception by 2.37 times. Building trust in management and the media plays a vital role in risk management of the disease and ensuring that the disease is perceived correctly [20]. For this reason, it seems that those with low COVID-19 risk perception are more likely to agree that the restrictions being implemented are exaggerated and that they have negative attitudes towards basic policies in efforts to flatten the epidemic curve.

In the study, it was observed that the low level of COVID-19 risk perception was higher in those over the age of 40 (50.4%), and in further analysis, being 40 years old and over was found to be 1.76 times riskier for low-risk perception. In the report of the COSMO Turkey 2020 July 17th-31th study, it was revealed that the perceived probability of being infected with COVID-19 decreases as age increases [21]. Although some studies [15, 22] show that as the age of the participants increases, their perceived vulnerability to COVID-19 decreases, but the perceived severity increases; it has been shown that older adults generally have lower risk perception levels, and the risk perception of susceptibility to infection tends to decrease as age increases [14, 23, 25]. One of the reasons for this may be the decline in cognitive function of the elderly, further limiting their knowledge of the incidence of people affected by the virus due to the further reduction of their social networks during the COVID-19 shutdowns.

In the context of epidemics, risk perception is a parameter related to “higher self-reported compliance behavior” for preventive measures. Wise et al. (2020) found that risk perception level was associated with self-reported compliance in two basic protective behaviors of hand washing and social distancing [8]. In our study, per the studies in the literature [5-8], it was evaluated that those with a low level of risk perception related to COVID-19 had lower compliance with protective behaviors. In a further analysis, a low level of compliance with protective behaviors was determined as one of the critical risk factors for low-risk perception (OR; 95%CI: 1.75; 1.09-2.76).

In this study, no difference was found between men and women regarding COVID-19 risk perception levels. In some studies, it has been reported that being a woman is one of the factors indicating high-risk sensitivity [14, 25, 26]. In the first report of COSMO Turkey (2020 July 17th-31th), being female was not found to be associated with the possibility or suspicion of getting sick, in line with our study, but differently, it was found to be associated with disease severity which is a component of risk perception [21].

As the age increases, the level of risk perception may vary due to the recognition of COVID-19 infection in the immediate environment, whether a more severe disease is seen or not, and accordingly "availability error". [27]. Rosi et al. (2021) showed that the experience of experiencing COVID-19

infection among relatives, friends, or acquaintances is determinant in explaining the level of vulnerability to risk in all age groups, except those over the age of 70 [14]. Our study observed that the risk perceptions of those who were at risk of transmission were lower than those of those who did not have a risk of transmission, but in further analysis, no difference was found between these groups.

Among the information sources/tools related to COVID-19, the most trusted information sources were healthcare professionals (6 points) and press releases or statements of official institutions (5 points), respectively. Celebrities and social media influencers were the groups with the lowest confidence levels. In the first report of COSMO Turkey, press releases of official institutions (approximately 5 points) and television/radio (approximately 4 points) took place in the first place [21]. In the second report, websites/online news sites and family friends are the most trusted sources of information [15]. One of the important reasons for these differences may be the high education level of the study group.

Limitations and strengths of the study: This study had several limitations. The main limiting factor is the study's cross-sectional nature preventing the establishment of a cause and effect relationship. The other limitation is that risk perception is a dynamic concept and closely related to personal and environmental characteristics. Additionally, since this study employed an online questionnaire for data collection due to COVID-19 measures, the presented data can only represent those who can use a digital device and access the internet. These users are typically younger and from a higher socioeconomic background. The minimize the overrepresentation of this population in the study, the managers were instructed to help those in need by filling out the survey. One of the strengths of the study is that it is the first evaluation of a community unit in our country evaluated by making use of the COSMO study questions in accordance with its purpose. Moreover, since the risk perception levels of individuals are the focus of the study, this parameter has been addressed more comprehensively than the COSMO study questions.

5. Conclusion

A low level of risk perception was detected in one out of every four people in the study group. Age over 40, low level of trust in information sources/tools, and low level of compliance with COVID-19 measures pose a risk for low COVID-19 risk perception. People with a low perception of risk for the next wave of the disease may have a critical role, as they are less compliant with preventive measures. Since individuals' COVID-19 risk perception levels are related to many parameters in epidemic management, they should be monitored continuously using informative studies.

Conflict of Interest: The authors declare that they have no conflict of interest.

Ethical Approval: Ethical approval for this study was obtained from the Ethics Committee of the Eskisehir Osmangazi University (Number: E-25403353-050.99-121856, Date:12/14/2020)

Author's Contributions:

S.D., GK.: Conceptualization, Methodology, Resources, Analysis and/or Interpretation, Writing - Original draft preparation (30%)

S.M.: Conceptualization, Methodology, Resources, Analysis and/or Interpretation, Supervision, Writing - Original draft preparation (25%)

A.K.: Methodology, Resources, Analysis and/or Interpretation, Writing - Original draft preparation (15%)

S.S.: Methodology, Resources, Analysis, and/or Interpretation, - Writing Original draft preparation (15%)

A.U.: Analysis and/or Interpretation, Supervision, Critical Review - Original draft preparation (5%)

D.A.: Analysis and/or Interpretation, Supervision, Critical Review - Original draft preparation (5%)

M.F.O.: Supervision - Original draft preparation (5%)
All authors read and approved the final manuscript
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References

[1] Ferrer, R.A., Klein, W.M., "Risk perceptions and health behavior", *Current Opinion in Psychology,* 5, 85-89, 2015.

[2] Cori, L., Bianchi, F., Cadum, E., Anthonj, C., "Risk perception and COVID-19", *International Journal of Environmental Research and Public Health,* 17(9), 3114, 2020.

[3] Barrios, J.M., Hochberg, Y., "Risk perception through the lens of politics in the time of the covid-19 pandemic", *NBER Report No.: 0898-2937,* University of Chicago, Becker Friedman Institute for Economics Working Paper, Chicago, USA, 2020.

[4] Zhong, Y., Liu, W., Lee, T.Y., Zhao, H., Ji, J., "Risk perception, knowledge, information sources and emotional states among COVID-19 patients in Wuhan, China", *Nursing Outlook,* 69(1), 13-21, 2021.

[5] Velikonja, N.K., Erjavec, K., Verdenik, I., Hussein, M., Velikonja, V.G., "Association between preventive behaviour and anxiety at the start of the COVID-19 pandemic in Slovenia", *Slovenian Journal of Public Health,* 60(1), 17-24, 2020.

[6] Ahorsu, D.I., Lin, C.Y., Timpka, T., Broström, A., Updegraff, JA., Arestedt, K., &Pakpour, A.H., "Associations between fear of COVID-19, mental health, and preventive behaviours across pregnant women and husbands: an actor-partner interdependence modeling", *International Journal of Mental Health and Addiction,* 20(1), 1-15, 2020.

[7] Yang, H., Bin, P., He, A., "Opinions from the epicenter: An online survey of university students in Wuhan amidst the COVID-19 outbreak1", *Journal of Chinese Governance,* 5(2), 234-248, 2020.

[8] Wise, T., Zbozinek, T.D., Michelini, G., Hagan, C.C., Mobbs, D., "Changes in risk perception and self-reported protective behaviour during the first week of the COVID-19 pandemic in the United States", *Royal Society Open Science,* 7(9), 200742, 2020.

[9] Goodwin, R.W.J., Tuicomepee, A., Suttiwan, P., Watakakosol, R., "Anxiety and public responses to covid-19: Early data from Thailand", *Journal of Psychiatric Research,* 129, 118-121, 2020.

[10] Samadipour, E., Ghardashi, F., Aghaei, N., "Evaluation of risk perception of Covid-19 disease: A community-based participatory study", *Disaster Medicine and Public Health Preparedness,* Cambridge University Press, 1-8, 2020. doi:10.1017/dmp.2020.311.

[11] Psycharchieves. (2020). *COVID-19 snapshot monitoring (COSMO)* [Online]. Available from: https://www.psycharchives.org/en/item/62216bdb-69fa-44e7-92b4-8438b3817341.

[12] Karadag, F., Aslan, S., Budakoglu, I., Kucukkarapinar, M., Yay, A., Ucar, O., "Turkey COVID-19 Snapshot MOnitoring (COSMO Turkey): Monitoring knowledge, risk perceptions, preventive behaviours, and public trust in the current coronavirus outbreak in Turkey", *PsychArchieves*, Preprint, 2020. https://doi.org/10.23668/psycharchives.3124

[13] World Health Organization (2021). COVID-19 Explorer. Country: Turkey, Doubling/Halving Time [Online]. Available: Available from: https://worldhealthorg.shinyapps.io/covid/

[14] Rosi, A., van Vugt, F.T., Lecce, S., Ceccato, I., Vallarino, M., Rapisarda, F., …&Cavallini, E., "Risk Perception in a Real-World Situation (COVID-19): How It Changes From 18 to 87 Years Old", *Frontiers in Psychology,* 12:646558,1-8, 2020. doi:10.3389/fpsyg.2021.64655

[15] Kucukkarapinar, M., Karadag, F., Aslan, S., Budakoglu, I., Ucar, O., Yay, A., Utku, T. "Turkish COVID-19 Snapshot Monitoring (COSMO) Wave-1,2,3 (17.07-31.07.2020; 01.08-15.08.2020; 16.08-31.08.2020)", *PsychArchives,* Preprint, 2020. https://doi.org/10.23668/psycharchives.4197

[16] Peres, D., Monteiro, J., Almeida, M., Ladeira, R., "Risk perception of COVID-19 among Portuguese healthcare professionals and the general population", *Journal of Hospital Infection,* 105(3), 434-437, 2020.

[17] Rubaltelli, E., Tedaldi, E., Orabona, N., Scrimin, S., "Environmental and psychological variables influencing reactions to the COVID-19 outbreak", *British Journal of Health Psychology,* 25(4), 1020-1038, 2020.

[18] Kuang, J., Ashraf, S., Das, U., Bicchieri, C., "Awareness, risk perception, and stress during the COVID-19 pandemic in communities of Tamil Nadu, India", *International Journal of Environmental Research and Public Health,* 17(19), 7177, 2020.

[19] Siegrist, M., Luchsinger, L., Bearth, A., "The Impact of trust and risk perception on the acceptance of measures to reduce COVID-19 cases", *Risk Analysis,* 41(5), 787-800, 2021.

[20] Ye, M., Lyu, Z., "Trust, risk perception, and COVID-19 infections: Evidence from multilevel analyses of combined original dataset in China", *Social Science and Medicine,* 265:113517, 2020.

[21] Kucukkarapinar, M., Karadag, F., Aslan, S., Budakoglu, I., Yay, A., Ucar, O., "Turkish COVID-19 Snapshot Monitoring (COSMO) Wave-1 (17.07-31.07.2020)", *PsychArchives,* Preprint, 2020. https://doi.org/10.23668/PSYCHARCHIVES.3457

[22] Kamran, A., Isazadehfar, K., Heydari, H., Azgomi, R.N.D., Naeim, M., "Risk perception and adherence to preventive behaviours related to the COVID-19 pandemic: a community-based study applying the health belief model", *BJPsych Open,* 7(4), 2021.

[23] Guastafierro, E., Toppo, C., Magnani, F.G., Romano, R., Facchini, C., Campioni, R., &Leonardi, M., "Older Adults' Risk Perception during the COVID-19 Pandemic in Lombardy Region of Italy: A Cross-sectional Survey", *Journal of Gerontological Social Work,* 64(6), 585-598, 2021. doi: 10.1007/s12062-021-09352-4.

[24] Pasion, R., Paiva, T.O., Fernandes, C., Barbosa, F., "The AGE effect on protective behaviors during the COVID-19 outbreak: sociodemographic, perceptions and psychological accounts", *Frontiers in Psychology,* 11:561785, 1-14, 2020. doi:10.3389/fpsyg.2020.561785.

[25] Dryhurst, S., Schneider, C.R., Kerr, J., Freeman, A.L., Recchia, G., Van Der Bles, A.M., …&van der Linden, S., "Risk perceptions of COVID-19 around the world", *Journal of Risk Research,* 23(7-8), 994-1006, 2020.

[26] Yıldırım, M., Güler, A., "Factor analysis of the COVID-19 Perceived Risk Scale: A preliminary study", *Death Studies,* 46(5),1065-1072, 2020.

[27] Tversky, A., Kahneman, D. Availability: a heuristic for judging frequency and probability, in Judgment under Uncertainty: Heuristics and Biases (Eds. D. Kahneman, P. Slovic, and A. Tversky), Cambridge University Press, Cambridge, pp. 163-189. 1982,