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Detection of COVID-19 vaccine rejection situation and reasons in people over 18 years of age applying to family health centers in Karabük and its relationship with health literacy level

Detection of COVID-19 vaccine rejection situation

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Abstract: **Objective:** The aim of this study is to examine the rejection of the COVID-19 vaccine, its reasons and its relationship with health literacy levels.

Material and Method: This study is a cross-sectional analytical study. The sample of the research consisted of 648 people who applied to family health centers in Karabük province between May 1, 2022 and June 30, 2022 and agreed to participate in the research. "Sociodemographic Characteristics", "Questions determining the characteristics of COVID-19 vaccine rejection" and "Health Literacy Scale TSOY-32 scale" were used to collect data. Descriptive characteristics of people are expressed with frequency and percentage in categorical data. Pearson Chi-Square and Fisher's Exact Test were used. A value of $p<0,05$ was considered significant.

Results: It is seen that 31.6% of the participants have an inadequate health literacy level, 36.9% have a problematic-limited health literacy level, 21.9% have an adequate health literacy level and 9.6% have an excellent health literacy level. A significant difference was found between rejection of the COVID-19 vaccine and health literacy ($p = 0.014$).

Conclusion: As a result, by increasing the level of health literacy, positive attitudes towards the COVID-19 vaccine will also increase. It is thought that positive attitudes towards the COVID-19 vaccine will increase by increasing health literacy levels. Therefore, it seems that there is a need for research to increase health literacy

Keywords: COVID-19 vaccines, health literacy, vaccination refusal

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INTRODUCTION

The COVID-19 pandemic first emerged in the news due to pneumonia cases in Wuhan, China. These cases spread from cities to provinces and quickly expanded worldwide (1). While the disease primarily spreads through respiratory droplets, it has also been identified that it can spread when individuals touch droplets released by infected people, thereby contaminating their hands and then touching their mouth, nose, or eyes (2).

After the pandemic was declared, vaccine development efforts were rapidly initiated, and many vaccines were developed in less than a year (3). COVID-19 vaccines, developed using different technological platforms, received emergency use authorization and began to be used starting from the end of 2020 (4). Before the COVID-19 pandemic, the process of developing a vaccine typically took 10-15 years. However, with the emergence of COVID-19, vaccine development was accelerated, and some stages were carried out simultaneously, reducing the timeline to 12-18 months (5).

Vaccine refusal refers to the idea of rejecting vaccines, whereas vaccine hesitancy involves delaying acceptance of the vaccine or rejecting it despite having access to it (6). Among the anti-vaccine statements are claims that the chemicals in vaccines are harmful to human health, that pharmaceutical companies have financial motives, or that it is possible to protect oneself from diseases naturally through diet (7). For this reason, some individuals doubt the safety or effectiveness of vaccines, which can lead to potential risks in vaccine-preventable epidemics (8).

Health literacy refers to the ability to access, understand, and evaluate health-related information in order to make informed decisions in everyday life about disease prevention, healthcare services, and the promotion and improvement of health. It also increases individuals' knowledge, motivation, and competencies in applying this information (9). This concept was first used by Professor Dr. Scott K. Simonds in his 1974 article "Health Education as Social Policy." In this article, health education was considered a policy impacting both the health and education systems, and it was emphasized that health literacy should be one of the fundamental standards at all educational levels (10). The concept of health literacy has continued to evolve to this day through cumulative studies on literacy, adult education, and health promotion (11). Health literacy helps individuals make the most of the healthcare system, while also enabling them to develop critical thinking and decision-making skills. These skills not only affect individual well-being but also have a significant impact on public health (12).

High levels of health literacy encourage individuals to protect themselves and the community from diseases, participate in public health interventions such as vaccination, and increase their awareness (13).

The aim of this study was to determine the attitudes of individuals aged 18 years and over towards COVID-19 vaccination, to evaluate their level of knowledge, and to examine the relationship between these attitudes and health literacy levels

MATERIALS AND METHODS

Type and Purpose of the Study: This is a cross-sectional analytical study. The aim of the research is to determine the state of COVID-19 vaccine refusal, its reasons, and its relationship with health literacy levels among individuals applying to Family Health Centers in Karabük province.

Location and Time of the Study: The study was conducted in all Family Health Centers in Karabük city center between May 1, 2022 and June 30, 2022.

Population and Sample of the Study: The population of the study consists of individuals who applied to Family Health Centers in Karabük province in 2022. The sample size was calculated based on data from a similar study. To achieve a 95% confidence interval and 80% power, the minimum sample size required was determined to be 628 individuals. A total of 648 participants took part in our study.

Data Collection Tools: The questionnaire consists of three sections. The first section gathers sociodemographic characteristics, the second section includes questions identifying the characteristics of COVID-19 vaccine refusal, and the third section comprises the Health Literacy Scale (TSOY-32). We considered refusing the COVID-19 vaccine as not getting the COVID-19 vaccine.

Turkey Health Literacy Scale (TSOY-32): Developed by Okyay and colleagues, this 32-question scale is based on the conceptual framework of the Health Literacy (HLS-EU) study, which has been proven to be effective and reliable. Participants are asked to select the appropriate option based on a 5-point Likert scale (very easy = 1, easy = 2, difficult = 3, very difficult = 4, no opinion = 5). Scoring is reversed: very easy = 4, easy = 3, difficult = 2, very difficult = 1. The lowest health literacy score is 0, and the highest score is 50.

(0-25) points: inadequate health literacy

(>25-33) points: problematic - limited health literacy

(>33-42) points: adequate health literacy

(>42-50) points: excellent health literacy

Data Analysis: Data analysis was conducted using the SPSS 21 software package. Descriptive statistics for categorical variables were expressed as frequencies and percentages. The normality of numerical data was tested using the Kolmogorov-Smirnov test. For normally distributed data, the Independent t-test was used for two or fewer subgroups, and the One-Way ANOVA test was used for more than two groups. For non-normally distributed data, the Mann-Whitney U test was used for two or fewer subgroups, and the Kruskal-Wallis test was used for more than two groups. Chi-square analysis was applied to examine relationships between nominal variables across groups. Fisher's exact test was used when expected values in the cells of 2x2 tables were insufficient, and Pearson's chi-square analysis was performed with Monte Carlo simulation for RxC tables. A significance level of 0.05 was used in interpreting the results.

Ethical Approval: Ethical approval for the study was obtained from the …….. University Non-Interventional Clinical Research Ethics Committee. Other necessary institutional permissions for the study were also obtained. Participation in the study was based on voluntary consent, and a voluntary participation form was used for all participants.

RESULTS

According to Table 1, 92.1% (n=597) of the 648 participants in the study had received the COVID-19 vaccine, while 7.9% (n=51) had not received any COVID-19 vaccine (Table 1).

According to Table 1, 60.0% (n=389) of the participants were female, and 40.0% (n=259) were male. Regarding age distribution, 54.3% (n=352) were aged 18-45, 34.6% (n=224) were aged 46-65, 9.4% (n=61) were aged 66-79, and 1.7% (n=11) were aged 80 and above. Among the participants, 65.4% (n=424) were married, while 34.6% (n=224) were single.

When examining education levels, 24.2% (n=157) of the participants had completed primary school, 43.8% (n=284) had completed secondary school, 29.6% (n=192) had completed associate's/bachelor's degrees, and 2.3% (n=15) had completed graduate studies.

Regarding employment status, 32.4% (n=210) of the participants were actively employed, while 67.6% (n=438) were not working. Among the employed participants, 2.9% (n=19) worked in the primary economic sector, 19.6% (n=127) in the secondary sector, and 12.7% (n=82) in the tertiary sector. Among those not working, 41.0% (n=266) were unemployed, 9.0% (n=58) were students, and 14.8% (n=96) were retirees.

Concerning the place of residence, 95.5% (n=619) of the participants lived in the city, 2.5% (n=16) in the district, and 2.0% (n=13) in the village. Regarding family type, 96% (n=622) lived in nuclear families, while 4.0% (n=26) lived in extended families.

In terms of social security, 89.7% (n=581) had Social Security (SGK), 5.6% (n=36) had a Green

Card, 2.8% (n=18) had private insurance, and 2.0% (n=13) had no insurance.

Regarding chronic illness, 24.1% (n=156) of the participants had a chronic disease, while 75.9% (n=492) did not (Table 1).

Table 1: Sociodemographic Characteristics of Participants in the Study

		n	%
Gender	Female	389	60,0
	Male	259	40,0
Age	18-45 Years	352	54,3
	46-65 Years	224	34,6
	66-79 Years	61	9,4
	80 Years and Above	11	1,7
Marital Status	Married	424	65,4
	Single	224	34,6
Education Level	Primary School	157	24,2
	Secondary School	284	43,8
	Associate's/Bachelor's Degree	192	29,6
	Graduate Studies	15	2,3
Place of Residence	City	619	95,5
	District	16	2,5
	Village	13	2,0
Family Type	Nuclear Family	622	96
	Extended Family	26	4,0
Social Security	SGK	581	89,7
	Green Card	36	5,6
	Private Insurance	13	2,0
	No Insurance	18	2,8
Chronic Illness	Yes	156	24,1
	No	492	75,9
Employment Status	Yes	210	32,4
	No	438	67,6
Occupation	Primary Economic Sector Occupation	19	2,9
	Secondary Economic Sector Occupation	127	19,6
	Tertiary Economic Sector Occupation	82	12,7
	Not Working	266	41,0
	Student	58	9,0
	Retired	96	14,8
COVID-19 Vaccination Status	Vaccinated for COVID-19	597	92,1
	Not Vaccinated for COVID-19	51	7,9

Table 2: Relationship Between COVID-19 Vaccine Refusal and Marital Status					
COVID-19 Vaccine Refusal Status Married			**Marital Status**		
		Single	**Total**	**p**	
Vaccinated for COVID-19	**n**	384	213	597	0,042*
	%	59,3	32,8	92,1	
Not Vaccinated for COVID-19	**n**	40	11	51	
	%	6,2	1,7	7,9	
Total	**n**	424	224	648	
	%	65,4	34,6	100	

*Pearson Chi-Square Test

According to Table 2, the number of married individuals who received the COVID-19 vaccine is 384 (59.3%), while the number of single individuals who received the vaccine is 213 (32.8%). Among those who did not receive the COVID-19 vaccine, 40 (6.2%) are married, and 11 (1.7%) are single. Therefore, a statistically significant difference was found between COVID-19 vaccine refusal and marital status (p=0.042) (Table 2).

The number of women who have received the COVID-19 vaccine is 360 (55.6%), while the number of men is 237 (36.6%). There are 29 women (4.5%) who have not received the vaccine, and 22 men (3.4%) who have not received it. It has been found that there is no statistically significant difference between gender and vaccine refusal (p> 0.05).

Table 3: Relationship Between COVID-19 Vaccine Refusal and Health Literacy Scale					
TSOY Group		**Vaccinated for COVID-19**	**Not Vaccinated for COVID-19**	**Total**	**p**
Inadequate	**n**	181	24	205	0,014*
	%	27,9	3,7	31,6	
Problematic	**n**	227	12	239	
	%	35,0	1,9	36,9	
Adequate	**n**	135	7	142	
	%	20,8	1,1	21,9	
Excellent	**n**	54	8	62	
	%	8,3	1,2	9,6	
Total	**n**	597	51	648	
	%	92,1	7,9	100	

*Pearson Chi-Square Test

No statistically significant difference was found between COVID-19 vaccine refusal and employment status, place of residence, chronic illness, or family type (p>0.05).

According to Table 3, among the individuals who received the COVID-19 vaccine, 181 (27.9%) had inadequate, 227 (35%) had problematic, 135 (20.8%) had adequate, and 54 (8.3%) had excellent health literacy levels. Among those who did not receive the COVID-19 vaccine, 24 (3.7%) had inadequate, 12 (1.9%) had problematic, 7 (1.1%) had adequate, and 8 (1.2%) had excellent health literacy levels. Therefore, a significant difference was found between the COVID-19 vaccine refusal status and the TSOY-32 groups (p=0.014) (Table 3).

Table 4: Relationship Between Marital Status and Health Literacy Scale					
TSOY Group		**Marital Status**			
		Married	**Single**	**Total**	**p**
Inadequate	**n**	151	54	205	<0,001*
	%	23,3	8,3	31,6	
Problematic	**n**	160	79	239	
	%	24,7	12,2	36,9	
Adequate	**n**	92	50	142	
	%	14,2	7,7	21,9	
Excellent	**n**	21	41	62	
	%	3,2	6,3	9,6	
Total	**n**	424	224	648	
	%	65,4	34,6	100	

*Pearson Chi-Square Test

According to Table 4, among married individuals, 151 (23.3%) have inadequate, 160 (24.7%) have problematic, 92 (14.2%) have adequate, and 21 (3.2%) have excellent health literacy levels. Among single individuals, 54 (8.3%) have inadequate, 79 (12.2%) have problematic, 50 (7.7%) have adequate, and 41 (6.3%) have excellent health literacy levels. When the relationship between marital status and TSOY-32 groups was statistically analyzed, a significant difference was found (p<0.001) (Table 4).

Table 5: Relationship Between Employment Status and Health Literacy Scale					
TSOY Group		**Employment Status**			
		Yes	**No**	**Total**	**p**
Inadequate	**n**	42	163	205	<0,001*
	%	6,5	25,2	31,6	
Problematic	**n**	92	147	239	
	%	14,2	22,7	36,9	
Adequate	**n**	55	87	142	
	%	8,5	13,4	21,9	
Excellent	**n**	21	41	62	
	%	3,2	6,3	9,6	
Total	**n**	210	43,8	648	
	%	32,4	67,6	100	

*Pearson Chi-Square Test

According to Table 5, when the relationship between employment status and TSOY-32 groups was statistically analyzed, a significant difference was found (p<0.001) (Table 5).

Table 6: Relationship Between Chronic Illness Status and Health Literacy Scale					
TSOY Group		**Is There a Chronic Illness?**			
		Yes	**No**	**Total**	**p**
Inadequate	**n**	88	117	205	<0,001*
	%	13,6	18,1	31,6	
Problematic	**n**	43	196	239	
	%	6,6	30,2	36,9	
Adequate	**n**	20	122	142	
	%	3,1	18,8	21,9	
Excellent	**n**	5	57	62	
	%	0,8	8,8	9,6	
Total	**n**	156	492	648	
	%	24,1	75,9	100	

*Pearson Chi-Square Test

According to Table 6, when the relationship between chronic illness status and TSOY-32 groups was statistically analyzed, a significant difference was found (p<0.001) (Table 6).

117 women (18.1%) have inadequate, 148 women (22.8%) have problematic, 83 women (12.8%) have adequate, and 41 women (6.3%) have excellent health literacy levels. Among men, 88 (13.6%) have inadequate, 91 (14%) have problematic, 59 (9.1%) have adequate, and 21 (3.2%) have excellent health literacy levels. Accordingly, when examining the relationship between gender and the Turkish Health Literacy Scale (TSOY-32), no statistically significant difference was found (p> 0.05).

Similar to gender, no statistically significant differences were observed between the TSOY-32 scale and family type or place of residence.

DISCUSSION

In this study, it was observed that a majority of married individuals had received the COVID-19 vaccine, and there was a statistically significant difference. In a study by Durduran and colleagues, it was found that married individuals had a positive attitude towards the COVID-19 vaccine (14). Similarly, in a study by Walker and colleagues, married individuals were found to have a higher vaccination rate for COVID-19 (15). Likewise, in the study by AlMohaithef and Padhi, it was observed that married individuals were more likely to get vaccinated against COVID-19 (16). The findings of this study align with the mentioned studies. The positive attitude of married individuals towards the COVID-19 vaccine may be due to the sense of responsibility they feel toward each other, and their desire to protect and keep their families healthy from the disease. In the study conducted by Özdinç and colleagues in 2022 on young people, it was found that the vaccination rate was higher among singles (17). The reason for this being different from our study could be that their research was primarily focused on young people.

This study found that single individuals had a significantly higher level of health literacy compared to married individuals. Singles make up 34.6%, while married individuals account for 65.4%. In the study by Değer and Zoroğlu, which examined the relationship between health literacy and cancer knowledge burden in first-level healthcare visitors, singles represented 31.8%, and married individuals made up 65.5% (18). In the study conducted by Türkoğlu, similar to our study, single individuals were found to have a significantly higher level of health literacy compared to married individuals (19). This similarity may stem from the similarity in sample sizes, the balance of single and married

individuals, and the fact that the studies were conducted in urban centers.

This study concluded that health literacy was statistically significantly related to chronic diseases. In the study by İkışık and colleagues, it was found that individuals without chronic diseases had higher levels of sufficient-to-excellent health literacy (20). Based on this difference, it can be concluded that the presence of chronic diseases may have a varying impact on health literacy levels.

In this study, when the relationship between health literacy and employment status was examined, it was found that employed individuals had significantly higher health literacy compared to unemployed individuals. In a study conducted by Temel on individuals over 65 with chronic diseases, a significant difference was also found between employment status and health literacy levels (21). However, in Duman's study on parents in Istanbul Fatih, no change was observed in the health literacy levels according to employment status (22). Looking at these studies, it is evident that there are differences in how employment status affects health literacy levels. These differences may arise from variations in the age range of participants, health status, and the locations where the studies were conducted.

In this study, it was found that 55.6% of those vaccinated for COVID-19 were women, and no statistically significant difference was observed. In a study by Yılmaz and colleagues, it was found that men were more likely to get the COVID-19 vaccine (23). Similarly, in studies by Çağatay and colleagues, and Gencer and colleagues, no statistically significant relationship was found between gender and receiving the COVID-19 vaccine (7, 24). The differences in the number of male and female participants, variations in the sample size, and the fact that some studies were conducted with specific age groups may explain why personal values and responsibilities could differently influence the decision to get vaccinated against COVID-19.

In this study, women were found to have higher levels of health literacy across all levels, but this difference was not statistically significant. In a study conducted by the Ministry of Health, it was found that health literacy was 35% in women and 26.4% in men (25). In Abacıgil and colleagues' study on health literacy, as in our study, it was concluded that there was no significant difference between gender and health literacy (26). In the research conducted by Yılmaz and colleagues, it was noted that women had higher health literacy (27). On the other hand, in the studies by Yakar and colleagues, it was observed that men had higher levels of health literacy (28). As seen in the literature, different results can be obtained regarding the relationship between gender and health literacy. These differences may be due to the different cultures in which the participants were raised, variations in age groups, and differences in educational levels.

Limitations of the Study: The study is limited to the city center of Karabük. The data is limited to the 648 participants who took part in the study. The study is also limited to the responses provided by the participants in the survey and the period during which the research was conducted. The sociodemographic characteristics of the participants, such as education, age, gender, and occupation, show a limitation in that the distribution of people who have received the COVID-19 vaccine and those who have not is not balanced.

CONCLUSION

The study determined that problematic-inadequate health literacy levels were more common. It was observed that individuals who had not received the COVID-19 vaccine had higher levels of inadequate health literacy. Among individuals who received the COVID-19 vaccine, the levels of adequate-excellent health literacy were found to be higher than those who did not receive the vaccine. When examining the relationship between participants' marital status, employment status, chronic illness, and health literacy, it was found that most participants had problematic-inadequate health literacy, with only a few having excellent health literacy. This study demonstrates that there is a relationship

between the refusal of the COVID-19 vaccine and health literacy, and that improving health literacy is essential. To improve health literacy, it is necessary to assess the health literacy levels in the community and place more focus on individuals with lower levels of health literacy. Collaboration with the education system, healthcare system, and media can help promote health literacy. Short, reliable information that is understandable for everyone should be disseminated through mass media. Health education can start from childhood, and efforts can be made to raise awareness about health by including it in school curricula from an early age. Activities to enhance health literacy can be organized, and incorrect and incomplete information should be corrected. To better understand the issues regarding vaccine refusal and health literacy in our country, there is a need to increase the number of studies with larger sample sizes and broader scopes.

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