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RESEARCH ARTICLE

TRUST IN HEALTH SERVICES DURING AND AFTER COVID-19: BELIEVING TO TRUST, KNOWING TO BELIEVE

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ABSTRACT

BACKROUND:

This research aimed to measure the multidimensional trust in the health services and health perception of individuals with health literacy under the conditions of COVID-19.

METHODS:

This research was a relational, descriptive and cross-sectional study. A total of 1025 participants were reached in our study. Three different scales were used of the multidimensional trust scale in health services, health perception scale and a health literacy scale. SPSS 22.0 package program (regression, Cronbach alpha and t-test analyses), R 4.2.2 package program and Rstudio (correlation and distribution tests) were used for statistical analysis in the study.

RESULTS:

The effect of health perception on multidimensional trust in health services was significant (B=.261±0.031; β=0.262; p=0.000 <0.05). Additionally, the effect of health literacy on multidimensional trust in health services was also significant (B=0.072±0.026; β=0.083; p=0.007<0.05). Finally, health literacy was found to have a significant effect on health perception (B=0.192±0.020; β=0.272; p=0.000 <0.05).

CONCLUSION:

Especially during the pandemic period, health literacy affected health perception and trust in the health services. Health literacy was a partial mediator variable between health perception and multidimensional trust in health services.

KEYWORDS

COVID-19, health literacy, health perception, trust in healthcare

INTRODUCTION

The coronavirus (COVID-19) emerged in late 2019 as one of the deadliest and most severe viral outbreaks in history [1]. The World Health Organization (WHO) declared COVID-19 a pandemic in 2020 [2]. The fact that the situation turned into a pandemic prompted people to acquire and apply health information and change their behavior. Health communication educating about how to avoid catching and spreading the virus has become commonplace. Thus, COVID-19 revealed that low health literacy is a global public health problem [3].

According to a study, individuals with low health literacy are less likely to understand health problems and care management and have higher hospitalization/death rates. Healthcare costs associated with low health literacy are estimated at $50 to $73 billion annually. Therefore, improving the health literacy levels of patients has become one of the main goals of WHO [4]. Health literacy is a focus for healthcare providers and policy makers in many countries around the world. People's health perceptions have also changed. Health perception is an individual's self-evaluation and their general idea about health [5]. Due to the pandemic, people around the world better understood the value and importance of health; social distancing lifestyle and healthy living habits were adopted [6]. As the perception of health has changed, so has people's sense of trust in health services. Trust is one of the strongest emotions that keeps a society in unity and togetherness, especially in a crisis. Studies reported that the level of trust in healthcare positively affects both general health and mental health [7].

Trust in healthcare is the patient's consideration of benefit from a physician or health system [8]. The pandemic affected people's trust and service demands from hospitals, health services, and insurance companies [7]. As a result, trust is vital to effective functioning of health systems [9].

It is important to understand the interaction of health literacy, health perception and trust in health care. It is also useful to focus on health literacy, which is financed and accepted as a valuable issue by the European Union. This research aimed to measure the multidimensional trust in the health services and health perception of individuals with health literacy under the conditions of COVID-19.

In this study, trust in health services is conceptualised as a multidimensional construct encompassing trust in healthcare providers, healthcare institutions, and healthcare payers, reflecting individuals' confidence in the functioning, fairness, and reliability of the health system as a whole. Health perception refers to individuals' subjective evaluation of their health status, including perceived control, certainty, importance of health, and self-awareness. These dimensions are particularly salient during public health crises such as the COVID-19 pandemic, when heightened uncertainty, perceived risk, and information overload may reshape both trust in health systems and individuals' perceptions of their own health.

METHODS

AIM OF THE STUDY:

This research measured the impact of individual health literacy on multidimensional trust in the health services and health perception under the conditions of COVID-19.

RESEARCH DESIGN:

This research was a relational, descriptive and cross-sectional study.

RESEARCH HYPOTHESIS:

Based on the literature, the hypotheses of the research are listed as follows;

H_1: Health perception has a significant effect on multidimensional trust in health services.

H_2: Health literacy has a significant effect on multidimensional trust in health services.

H_3: Health literacy has a significant effect on health perception.

H_4: Health literacy plays a mediating role between health perception and multidimensional trust in health services.

RESEARCH QUESTIONS:

Based on these hypotheses, the research questions are listed as follows;

Q_1: Does the perception of health have a significant effect on the multidimensional trust in health services?

Q_2: Does health literacy have a significant effect on multidimensional trust in health services?

Q_3: Does health literacy have a significant impact on health perception?

Q_4: Does health literacy play a mediating role between health perception and multidimensional trust in health services?

POPULATION AND SAMPLE:

This study was conducted in Türkiye at a public university during the COVID-19 pandemic period, within a higher education setting that includes students, academic and administrative staff. There are 10,077 students, 1,039 academic staff and 381 administrative staff on campus. Participants were determined by the random sampling method. It is considered appropriate that the number of participants should be five or ten times the number of scale questions [10]. Considering the two factors mentioned above, the number of samples for this study was determined as 1000 because if more individuals are reached, the higher the reliability of the scales applied. Data were prepared for the R program and 45 participants were excluded before analysis. In total, 1025 data were studied.

DATA COLLECTION TOOLS:

In the study, first, a form containing information about the sociodemographic features of the participants, and then scales obtained from the relevant literature in accordance with the purpose of the research were used. These scales were the multidimensional trust scale in health services, health perception scale and a health literacy scale.

***Health Literacy Scale (HLS-EU)*:** The Health Literacy Survey – European Union (HLS-EU) Questionnaire was used in the study. The questionnaire developed by Sorensen et al. (2013) [11] with 47 items was later simplified by Toçi et al. (2013) [12] and its validity and reliability were tested. The simplified version of the Health Literacy Scale consists of four subscales and 25 items. The internal consistency coefficients for the scale were between 0.90 and 0.94 (Jerliu et al. 2013) [13]. Adaptation to Türkiye was performed by Aras and Bayık Temel (2017) [14].

Health Perception Scale (HPS): The Health Perception Scale was developed by Diamond et al. (2007) [15] The HPS consists of four subscales and 15 items. Cronbach alpha values were 0.82 for importance of health; 0.91 for self-awareness; 0.90 for center of control; and 0.91 for certainty. Adaptation to Turkish was performed by Kadıoğlu and Yıldız (2012) [16].

Multidimensional Trust in Health Care Systems Scale (MTHCSS): The Multidimensional Trust in Health Care Systems Scale was developed by Egede and Ellis (2008) [17]. The MTHCSS consists of three subscales and 17 items. Cronbach alpha values for the subscales were 0.64 for trust in healthcare institutions; 0.74 for trust in healthcare payers; and 0.94 for trust in healthcare providers. Adaptation to Turkish was performed by Dinç, Korkmaz, and Karabulut (2013) [18].

Moreover, Cronbach's *α* internal consistency coefficient was found to be 0.84 for all scales in this study based on reliability calculations for the scales. Reliability coefficients for all scales were 0.89 for "health literacy", 0.72 for "health perception" and 0.78 for "multidimensional trust in health services". Reliability coefficients were found suitable for the study.

DATA COLLECTION:

The face-to-face survey method was used. Before interviews, training was given to the interviewers. Interviewers training: Four-hour training was given to 10 interviewers selected for data collection. They were trained in the subject, scope and questions of the research. The purpose of receiving training is to ensure that they understand the study and conduct better quality surveys.

DATA ANALYSIS:

The SPSS 22.0 package program, R 4.2.2 package program and Rstudio were used for statistical analysis in the study. Before analyzing the data, the data in SPSS were transferred to the R program and the tidyverse package was loaded. Variable names were arranged and analyses were obtained with R commander. The data were normally distributed. When data is normally distributed, the kurtosis and skewness values are between -1.5 and +1.5 [19]. The kurtosis and skewness values obtained from the analysis (skewness – between 0.93 and 0.94; kurtosis - between 0.90 and 0.23) were in the appropriate range and it was decided to use parametric tests. Demographic findings, descriptive values for the subscales, Cronbach alpha values, ANOVA, and t-test were calculated with the SPSS package program. The R package program was applied for correlation analysis, multiple regression analysis and ANOVA analysis.

RESULTS

SOCIODEMOGRAPHIC FINDINGS

The sociodemographic characteristics of the academics, administrative staff and students participating in the research are given in Table 1.

TABLE 1 DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS

Demographic Characteristics		Number (n)	Percent (%)
Gender	Female	733	71.5
	Male	292	28.5
Age	1-18	79	7.7
	19-25	842	82.1
	26-35	75	7.3
	36-45	23	2.2
	46 and over	6	0.6
Marital status	Married	55	5.4
	Single	970	94.6
Grade Level	Middle School	5	0.5
	High school	610	59.5
	University	366	35,7
	Master- Doctorate	44	4.3
Profession	Student	905	88.3
	Academic/ Administrative staff	120	11.7
Working time	0-5 years	915	89.3
	6-10 years	75	7.3
	11-15 years	16	1.6
	16-20 years	13	1.3
	21 years and over	6	0.6
Monthly Income	0-5500 tl	892	87
	5501 tl and over	133	13

Of respondents, 71.5% (n=733) were female and 94.6% (n=970) were single. Respondents were mostly between the ages of 19-25, comprising 82.1% (n=842). For education, 59.5% (n=610) of them were high school graduates. Looking at the distribution of occupations, 88.3% (n=905) were students and 11.7% (n=120) were academics/administrative staff. The highest duration of employment 89.3% (n=915) was 0–5 years. In terms of economic status, most participants had income of minimum wage or less 87% (n=892).

TABLE 2 DESCRIPTIVE VALUES FOR THE SUB-DIMENSIONS OF THE VARIABLES

Subdimensions	N	Minimum	Maximum	Mean	Std.deviation
Health literacy					
Access	1025	1.00	5.00	3.76	0.82
Understanding	1025	1.00	5.00	3.75	0.73
Appraisal	1025	1.00	5.00	3.70	0.72
Application	1025	1.00	5.00	3.71	0.81
Health perception					
center of control	1025	1.00	5.00	2.46	0.95
Certainty	1025	1.00	5.00	2.95	0.86
Importance of health	1025	1.00	5.00	3.36	1.04
Self-awareness	1025	1.00	5.00	3.23	0.97
Multidimensional trust					
Trust in Health Care Providers	1025	1.00	5.00	3.32	0.59
Trust in Health Care Payers	1025	1.00	5.00	3.17	0.76
Trust in Health Care Institutions	1025	1.00	5.00	3.21	0.80

Additionally, the values for subscales related to the variables were also examined in the study, as shown in Table 2. According to the table, the access to information subscale had highest mean score (3.76), and lowest mean score was for the control center (2.46) subscale. Additionally, standard deviation values varied between 0.76 – 1.04.

The correlations between the subscales are shown in Table 3. Values between 0.00-0.30 indicate a low level relationship, values between 0.30-0.70 indicate a medium level relationship and values between 0.70-1.00 indicate a high level of relationship [20]. There were significant and moderate relationships between all subscales of health literacy and all subscales of health perception. Additionally, there were moderate and significant relationships between the subscales of health literacy and the subscales of multidimensional trust in health services. Finally, significant and positive relationships were found between the subscales of health perception and the subscales of trust in health services. According to these results, there were positive and significant relationships between almost all subscales at the 95% confidence level ($p<0.001$; $p<0.05$).

TABLE 3 CORRELATIONS BETWEEN THE SUBSCALES OF HEALTH LITERACY, HEATH PERCEPTION AND MULTIDIMENSIONAL TRUST IN HEALTH SERVICES

Subscales	1	2	3	4	5	6	7	8	9	10	11
Access (1)	1	0.60**	0.56**	0.46**	-0.54**	-0.63**	0.55**	0.54**	0.42**	-	
Understanding (2)	-	1	0.49**	-0.56**	-0.21**	0.34**	0.42**	0.33**	0.68**	-	
Appraisal (3)	0.52**	0.56*	1	0.55**	-	-0.44**	0.36**	0.33**	0.31**		
Application (4)	0.61**	0.59**		1	-0.55**	-0.78**	0.42**	0.33**	0.69**		

center of control (5)	0.67**	0.76**		1	0.46**	-	-	0.70**		
Certainty (6)	0.79**			1	0.66*	0.57*	0.49*	*0.62**		
Importance of health (7)	0.58**				1	0.50**	0.31**	0.58**		
Self-awareness (8)	0.45**					1	0.37**	0.32**		
Trust in Health Care Providers (9)	0.35**						1	0.41**		
Trust in Health Care Payers (10)	0.43**							1		
Trust in Health Care Institutions (11)	1									

****** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed). **p<,01; * p<,05

The correlation values for the relationships subject to the hypothesis were examined. There was a positive, significant and low correlation (r=0.55; p<0.001) between health literacy and health perception. There were positive, significant and moderate correlations between health literacy and multidimensional trust in health services (r=0.61; p<0.001), and between health perception and multidimensional trust in health services (r=0.38; p<0.001). When these relationships are examined, the correlation coefficients were considered sufficient for hypothesis testing.

TABLE 4 MULTIPLE REGRESSION ANALYSIS RESULTS

Variables	B	Standart error	β	t	p	VIF
Multidimensional trust in health care	2.17	0.13	15.80	0.000		
Health perception	0.26	0.03	0.26	8.50	0.000	1.00
Health literacy	0.07	0.02	0.08	2.70	0.007	1.00
R=0.27 R^2=0.07 Adjusted R^2:0.07 F=39.75 Durbin Watson=1.68 DF (2. 97) p-value: < $2.2e^{-16}$						

Multiple linear regression analysis was applied to understand the relationship between health literacy, health perception and multidimensional trust in health services, and results are presented in Table 4. The effect of health perception on multidimensional trust in health services was significant (B=0.261±0.031; β=0.262; p=0.000 <0.05). H1 was accepted. Additionally, the effect of health literacy on multidimensional trust in health services was also significant (B=0.072±0.026; β=0.083; p=0.007<0.05). H2 was accepted. Finally, health literacy had a significant impact on health perception (B=0.192±0.020; β=0.272; p=0.000 <0.05). H3 was also accepted.

According to the table, the contributions of health perception and health literacy to multidimensional trust in health services were significant (Adjusted R^2: 0.073; F=39.75; p<0.05). The power of health perception and health literacy to explain multidimensional trust in health services was 7%. Although this value is low, it is significant as p<0.05. This indicates that health literacy is a partial mediator variable between health perception and multidimensional trust in health services. H_4 was accepted.

ANOVA and t-test were applied to understand whether there was a significant difference in multidimensional trust in health services, health perception and health literacy according to demographic characteristics. When the difference levels due to the participants' ages were examined, age did not make a significant difference to health literacy (F=1.74; p>0.05). There were notable differences in health perception (F=5.73; p<0.05) and multidimensional trust in health services (F=3.27; p<0.05). The Tukey test was used for health literacy and multidimensional trust in health services, and the Games-Howell test was used for health perception to understand the cause of the difference.

In cases where 'N' varies between groups with heterogeneous variances, the Games-Howell method is one of the most robust methods [21]. Participants in the 1-18 age range (X=3.68) had higher confidence in health services than individuals between the ages of 19-25 (X=3.22) and individuals between the ages of 26-35 (X=3.22). Additionally, the health perceptions of respondents aged 19-25 (X=2.98) were higher than individuals aged 26-35 (X=3.14).

In addition to this, health literacy was notably different according to gender (t=2.94; p<0.05). The health literacy of female participants (X=3.77) was higher than male participants (X=3.65). Health perception did not differ significantly based on gender (t=0.10; p>0.05). Additionally, multidimensional trust in health services did not differ significantly by gender (t=.-0.39; p>0.05). Difference in terms of marital status were examined for the variables.

DISCUSSION

There is still a lack of information about the long-term effects of COVID-19, which may have consequences not only for individuals, but may also affect the functioning of the entire population [22].

When the pandemic emerged, some issues took priority in health. Health literacy globally became important for the prevention of communicable and noncommunicable diseases. Secondly, individual preparation gained importance as much as the preparation of the system [3]. During the pandemic, myths and misinformation greatly worried the public. People with higher health literacy are thought to have better perception of health information [23]. In a study by Yiğitalp, Değer, and Çifçi (2021) [24], 80.7% of the participants had a relatively low level of health literacy. As a result of the study, older people and those with low educational levels had higher health literacy scores. Additionally, there is a positive relationship between health literacy levels and health perception. Moreover, Fransen et al. (2015) [25] investigated the relationship between health perceptions of diabetes patients and health literacy. There was a notable relationship between health perceptions and low literacy.

In a study by Bayrak Kahraman et al. (2022) [26], the health perceptions of older participants were found to be moderate, while health literacy was low. This research showed that there is a relationship between health perception and health literacy in the elderly. Additionally, Say Şahin et al. (2018) [27] determined that the relationship between health perception subscales and health literacy subscales was significant. These results show that health literacy is a significant factor for health perception. Bayık Temel and Çimen (2017) [28] examined the relationship between health literacy and health perception in older individuals with chronic diseases and the factors affecting health literacy.

According to the results of the research, as the perceived health level increased, the literacy level of individuals also increased. Moreover, the implementation of health literacy at national and local levels can increase trust in doctors and the health system. A study by Tsai et al. (2018) [29] showed that health literacy is related to trust in health services. Dawson-

Rose et al. (2016) [30] revealed there was a relationship between health literacy and trust in health services in a study about the care of patients with HIV.

Differences in findings across studies may be partly explained by variations in sample characteristics, age distributions, socioeconomic contexts, and measurement approaches. Studies focusing on older or more socioeconomically diverse populations may report different patterns of health perception, health literacy, and trust compared to research conducted among younger and educated groups. Therefore, seemingly contradictory results in the literature may reflect contextual and demographic differences rather than true inconsistencies.

The findings of this study should also be interpreted within the context of the Turkish healthcare system. Türkiye has a predominantly publicly funded and centrally organised health system, which played a critical role during the COVID-19 pandemic through nationwide coordination, standardised health messaging, and extensive public health interventions [31]. Such structural characteristics may influence individuals' trust in health services, particularly among younger and educated populations who were highly exposed to pandemic-related information and digital health communication. Therefore, the observed relationships between health literacy, health perception, and trust in health services may partly reflect the institutional and cultural context in which healthcare is delivered in Türkiye.

This study has several limitations. The sample primarily consisted of young and student populations, which limits the generalisability of the findings to older age groups or individuals with different socioeconomic backgrounds. However, younger and educated populations represent a critical group in post-pandemic digital health environments, as they are highly exposed to health information, digital health services, and online communication channels. Understanding the dynamics of health literacy, health perception, and trust within this group provides valuable insight for designing targeted health communication strategies and interventions in future public health crises. Future studies could benefit from more diverse samples to further explore these relationships across different ages, education, and income groups.

PRACTICAL IMPLICATIONS

The findings of this study offer several practical implications for health service management and policy making in the post-pandemic period. First, health literacy should be considered a strategic component of public health preparedness. Strengthening individuals' ability to access, understand, evaluate, and apply health information may contribute not only to improved health perceptions but also to enhanced trust in health services during times of crisis.

Second, trust-building strategies in healthcare systems should extend beyond service delivery to include transparent communication, consistent messaging, and accessible digital health information, particularly for younger and educated populations who are highly engaged with online health content.
Finally, the results suggest that universities and similar institutions can play a key role in promoting health literacy and trust by serving as platforms for targeted health communication and education initiatives. Integrating health literacy-focused interventions into institutional health policies may enhance societal resilience and trust in health systems in the face of future public health emergencies.

CONCLUSION

The COVID-19 pandemic has changed many aspects of healthcare, including trust in health services, health perception, and health literacy. This study demonstrated significant relationships between health literacy, multidimensional trust in health services, and health perception among a predominantly young and educated population. The findings highlight that health literacy not only directly influences trust in health services but also partially mediates the relationship between health perception and trust.

From a health management perspective, these results underline the importance of incorporating health literacy into public health strategies, particularly during periods of uncertainty such as pandemics. Strengthening transparent

communication and improving access to reliable health information may contribute to building and sustaining trust in health systems. Fostering health literacy through institutional and policy-level initiatives may enhance societal preparedness and resilience in the face of future public health emergencies.

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DATA AVAILABILITY

The Research Ethics Board has approved the sharing of data based on predefined criteria. To submit a request to acquire this data, contact the author at arzu.kursun@giresun.edu.tr describing the reason(s) why you would like access to the data and how you intend to use them. If a request is approved by the author, the data will be made available to the requestors.

ETHICS APPROVAL

Before the research, ethics committee permission was obtained from Giresun University Social, Science and Engineering Sciences Research Ethics Committee with the decision numbered 17287 and dated 07/04/2021 and numbered 9/17. Verbal consent was obtained from the participants.

CONFLICT OF INTEREST STATEMENT

The author has no conflicts of interest to disclose.

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