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RESEARCH ARTICLE / ARAŞTIRMA MAKALESİ

The Relationship between Health Literacy, Health Perception, and Health Anxiety

Sağlık Okuryazarlığı, Sağlık Algısı ve Sağlık Kaygısı Arasındaki İlişki

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Abstract:

This study aims to examine the effects of health literacy and health perception on health anxiety among university students. The research population comprised 16,911 undergraduate students, and the sample included 468 participants. Since the assumptions of parametric tests were not met, the Mann–Whitney U test was used to compare two groups, and the Kruskal–Wallis H test was used to compare three or more groups. Of the participants, 67.9% were female, and 32.1% were male; 61.1% were between 17 and 20 years old. Additionally, 86.5% reported no chronic disease, and 83.8% reported not regularly using medication. The mean general health status score was 7.132, and the mean number of physician visits in the past year was 3.991. A negative and significant relationship was found between health anxiety and health perception ($r = –0.274$, $p < 0.001$), as well as between health anxiety and health literacy ($r = –0.206$, $p < 0.001$). Furthermore, a significant positive relationship was identified between health perception and health literacy ($r = 0.427$, $p < 0.001$). Individuals with higher levels of health anxiety were observed to have lower levels of health perception and health literacy. In contrast, individuals with higher health perception demonstrated stronger abilities to access, understand, and evaluate health-related information. The findings indicate that the interaction among health literacy, health perception, and health anxiety has important implications not only at the individual level but also for public health and health policies. Therefore, adopting a holistic approach that encompasses both individual and societal health is recommended.

Keywords: Health literacy, Health anxiety, Attitude to health, Anxiety.

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Öz:

Bu çalışmanın amacı, üniversite öğrencileri arasında sağlık okuryazarlığı ve sağlık algısının sağlık kaygısı üzerindeki etkilerini incelemektir. Araştırmanın evrenini 16.911 lisans öğrencisi oluştururken, örneklem 468 katılımcıdan oluşmuştur. Parametrik test varsayımları karşılanmadığından, ikili grup karşılaştırmalarında Mann–Whitney U testi, üç ve üzeri grup karşılaştırmalarında ise Kruskal–Wallis H testi uygulanmıştır. Katılımcıların %67,9'u kadın, %32,1'i erkek olup, %61,1'i 17–20 yaş aralığındadır. Katılımcıların %86,5'i kronik hastalığının bulunmadığını, %83,8'i ise düzenli ilaç kullanmadığını belirtmiştir. Genel sağlık durumu puanı ortalaması 7,132; son bir yıldaki hekim başvuru sayısı ortalaması ise 3,991 olarak saptanmıştır. Sağlık kaygısı ile sağlık algısı arasında negatif ve anlamlı bir ilişki ($r = –0,274$, $p < 0,001$), sağlık kaygısı ile sağlık okuryazarlığı arasında da negatif ve anlamlı bir ilişki ($r = –0,206$, $p < 0,001$) belirlenmiştir. Ayrıca sağlık algısı ile sağlık okuryazarlığı arasında pozitif ve anlamlı bir ilişki ($r = 0,427$, $p < 0,001$) tespit edilmiştir. Yüksek sağlık kaygısına sahip bireylerin sağlık algısı ve sağlık okuryazarlığı düzeylerinin daha düşük olduğu görülmektedir. Buna karşılık, sağlık algısı yüksek bireylerin sağlıkla ilgili bilgilere erişme, anlama ve değerlendirme becerilerinin daha güçlü olduğu belirlenmiştir. Elde edilen bulgular, sağlık okuryazarlığı, sağlık algısı ve sağlık kaygısı arasındaki etkileşimin yalnızca bireysel düzeyde değil, halk sağlığı ve sağlık politikaları açısından da önemli yansımaları olduğunu göstermektedir. Bu nedenle, bireysel ve toplumsal sağlığı kapsayan bütüncül bir yaklaşımın benimsenmesi gerekmektedir.

Anahtar Kelimeler: Sağlık okuryazarlığı, Sağlık kaygısı, Sağlık tutumu, Kaygı.

Introduction

The World Health Organization (WHO) defines health as "a state of complete physical, social, and mental well-being, not merely the absence of disease or infirmity" (WHO, 2018). To define health literacy, it is first necessary to consider the broader concept of literacy. Literacy is defined in various ways in the literature, and the Turkish Language Association (TDK) describes it as "a person who has learned to read and write, who can read and write" (TDK, 2024).

Although the concept of health literacy first emerged in 1974, it became widely used in the health services literature in the early 1990s. Nutbeam (1998) stated that "health literacy refers to achieving the level of knowledge, personal skills, and confidence necessary to take action to improve personal and societal health by changing personal lifestyles and living circumstances." Thus, health literacy encompasses more than reading brochures or making appointments. It includes improving individuals' access to health information and their capacity to use it effectively, and it is a critical component of empowerment. Health literacy is also grounded in general literacy skills. Poor literacy can negatively affect people's health by limiting their personal, social, and cultural development and hindering the development of health literacy.

Over the years, several conceptual analyses and definitional refinements have been made regarding health literacy. Most commonly, health literacy is defined as the ability to understand and use health-related information and to make decisions that improve one's health (Baker, 2006; Daşlı et al., 2022). Another definition describes health literacy as a dynamic construct that encompasses "the combination of personal competencies and situational resources required for people to access, understand, evaluate, and use information and services to make health-related decisions" (Rasmussen et al., 2023).

Health literacy includes individuals' ability to navigate medical treatment and disease processes, read medication leaflets, make hospital appointments, manage daily health activities, and utilize preventive care. It is recognized as an important determinant of health (Kim et al., 2001). Health literacy is also associated with individuals' knowledge of diseases and treatment processes and plays a significant role in reducing healthcare costs (Wilson et al., 2003). Individuals with poor health literacy have greater difficulty accessing preventive care (Scott et al., 2002; Wolf et al., 2007). Inadequate health literacy is linked to poor health outcomes, risky health behaviors, more extended hospital stays, and increased mortality, ultimately raising healthcare costs and straining healthcare resources (Svendsen et al., 2020). Because individuals with low health literacy struggle to use healthcare resources efficiently, their care becomes more costly. Overall, health literacy reflects both individuals' and societies' general understanding of health and facilitates the complex processes involved in healthcare delivery. For these reasons, health literacy is regarded as a key component of individual health and a central indicator of healthy societies (Nutbeam, 2000; Wolf et al., 2007).

Numerous factors influence health literacy, including gender, age, motivation, cognitive skills, physical and emotional health, specific health conditions, beliefs, socioeconomic status, complexity of health information, communication skills of healthcare providers, patient expectations, characteristics of healthcare environments, and time pressures on professionals (Baker, 2006; Kıraç et al., 2020). These factors also shape individuals' perceptions of health. Therefore, a strong link exists between health literacy and health perception. Improving these two constructs enables individuals to make informed health decisions and supports the efficient functioning of the healthcare system. Furthermore, strengthening health literacy and health perception contributes to the development of health policies and enhances the long-term benefits of health investments (Kertez & Şahin, 2023; Turgut et al., 2023; Erdoğan & Araman, 2017).

Health perception is a subjective concept that reflects how individuals evaluate their health status and guide their health-related behaviors. With advancements in technology, individuals increasingly assess their health independently. Technology and sociocultural factors have significantly influenced changes in people's perceptions of

health (Souto et al., 2018). Health perception is defined as "a combination of an individual's personal feelings, thoughts, prejudices, and expectations regarding their own health" (Diamond et al., 2007; Yılmaz Türe et al., 2018). Another definition describes it as the subjective assessment of one's personal health, which varies across individuals, societies, and countries (Saravia & Chau, 2018). Individuals' efforts to improve and maintain their health are closely tied to their perceptions of health, which, in turn, positively influence their responsibilities and behaviors and reduce health concerns (Grotz et al., 2011; Özsoy et al., 2021).

Health anxiety is defined as "fears and anxieties centered on a perceived threat to one's health" (Bailer et al., 2015). It includes persistent worry about one's mental and physical health, fear of contracting an illness despite medical reassurance, and negative effects on overall well-being (Asmundson et al., 2012; Yorulmaz & Dirik, 2018; Kıraç & Öztürk, 2020). Health anxiety often emerges when bodily sensations or changes are misinterpreted as signs of a severe disease. Anxiety levels differ among individuals and may vary over time (Abramowitz et al., 2005; Norton et al., 2005; Akar & Karan, 2024). Health anxiety results from the misinterpretation of bodily symptoms and may range from mild to severe (Melli et al., 2016).

Although the mediating role of health anxiety in the relationship between health literacy and health perception has not been directly examined, the literature reports age-, gender-, education-, and income-level variations (Shah et al., 2010). Health literacy increases with higher levels of education (Soysal & Obuz, 2020). A positive relationship exists between health literacy and health perception, particularly among pregnant women and healthy individuals (Furuya et al., 2015; Kıbrıs & Kızılkaya, 2023). Health perception also supports appropriate medication use (Özişli, 2023).

As a result, health literacy not only helps individuals acquire health knowledge but also supports their integration of this information into daily life, thereby improving well-being. In addition to shaping perceptions of health, health literacy significantly influences health-related beliefs and behaviors, contributing to overall societal health. An increase in health literacy, combined with improved perceptions of health, leads to better health outcomes. Therefore, strengthening the link between health literacy and health perception, while reducing health anxiety and societal health concerns, is essential.

The primary aim of this study is to examine the effects of university students' health literacy and health perception on health anxiety. By identifying the factors associated with health anxiety among young adults, this study provides valuable insights at both individual and societal levels. The findings provide an evidence-based foundation for developing health education programs, psychosocial support strategies, and public health policies, particularly those targeting university students. In this context, the study underscores the critical role of improving health literacy and perceptions of health in reducing health anxiety and makes a significant contribution to the existing literature.

Method

This descriptive, cross-sectional study was conducted between September 27 and October 28, 2024, among students at Sivas Cumhuriyet University. The study population consisted of 16,911 undergraduate students. The sample size was calculated as 376 using the formula $n = N.t^2.p.q / d^2(N–1) + t^2.p.q$; however, data were collected from 468 participants. Simple random sampling was used. Since the dataset contained missing or incomplete information for 52 participants, these individuals were excluded from the analysis, and evaluations were conducted only on the complete-case sample.

The data collection tool was a questionnaire consisting of four sections. The first section included a Personal Information Form with demographic questions. The second section contained the 25-item Health Literacy Scale developed by Sørensen et al. (2013) and adapted into Turkish by Aras and Bayık (2017). The Cronbach's alpha coefficients for this scale ranged from 0.90 to 0.94. The third section included the 15-item Health Perception Scale developed by Diamond et al. (2007) and adapted into Turkish by Kadıoğlu and Yıldız (2012). The Cronbach's alpha values for its subscales ranged between 0.82 and 0.91. The fourth section consisted of the 18-item Health Anxiety Inventory (Salkovskis et al., 2002), adapted into Turkish by Aydemir et al. (2011).

Ethical approval for the study was obtained from the Ethics Committee for Scientific Research Proposals of Sivas Cumhuriyet University (Document No: 6, Date: 22.05.2024; Number: E-99711239-050.01.04). Written permission was also obtained from the relevant institution.

The data were analyzed using SPSS (Statistical Package for the Social Sciences) 23.0. The students' individual characteristics were presented as numerical values and percentages. Compliance with the normal distribution assumption was evaluated using the Kolmogorov–Smirnov test, and the total scores of the scales did not meet this assumption ($p < 0.05$). Therefore, the Mann–Whitney U test was used to compare two groups, and the Kruskal–Wallis H test was used to compare three or more groups, due to violations of the assumptions of parametric tests. The statistical significance level was accepted as $p < 0.05$.

The Cronbach's alpha coefficient for the Health Literacy Scale was calculated as 0.920, for the Health Anxiety Inventory as 0.826, and for the Health Perception Scale as 0.708. Cronbach's alpha coefficients above 0.70 for each dimension and for the overall scales indicate "moderate to high reliability" (George & Mallery, 2003).

According to the Kolmogorov–Smirnov and Shapiro–Wilk test results, at the 95% confidence level, data were considered normally distributed when the p-value was above 0.05 and non-normally distributed when the p-value was below 0.05. Since the p-values for all dimensions were below 0.05, the data were deemed not to follow a normal distribution. Consequently, non-parametric tests were used in the analyses.

Results

Table 1. *Demographic characteristics of the participants*

Gender	**N**	**Percentage (%)**
Male	150	32,1
Female	318	67,9
Family Structure	**N**	**Percentage (%)**
Nuclear Family	357	76,3
Extended Family	111	23,7
Age	**N**	**Percentage (%)**
17-20	286	61,1
21-25	150	32,1
26 and Above	32	6,8
Do You Have a Chronic Illness?	**N**	**Percentage (%)**
Yes	63	13,5
No	405	86,5
Regular Medication Use	**N**	**Percentage (%)**
Yes	76	16,2
No	392	83,8
Accommodation	**N**	**Percentage (%)**
Family	408	87,2
Relatives	6	1,3
Friends	39	8,3
Alone	15	3,2
Does Your Family Have a Member with a Chronic Illness?	**N**	**Percentage (%)**
Yes	177	37,8
No	291	62,2
Monthly Family Income (TRY)	**N**	**Percentage (%)**
20,000 and Below	136	29,1
21,000 – 40,000	151	32,3
41,000 – 60,000	121	25,9
61,000 and Above	60	12,8
Faculty	**N**	**Percentage (%)**
Faculty of Medicine	49	10,5
Faculty of Veterinary Medicine	52	11,1
Faculty of Communication	39	8,3
Faculty of Health Sciences	40	8,5
Faculty of Technology	19	4,1
Faculty of Architecture	25	5,3
Faculty of Literature	51	10,9
Faculty of Law	52	11,1
Faculty of Science	60	12,8
Faculty of Education	81	17,3

	N	**Mean**	**Median**
General Health Status	468	7,132	7,000
Number of Doctor Visits in the Last Year	468	3,991	3,000

In Table 1, women (67.9%), men (32.1%) were seen in the study group; 17-20 age group (61.1%); The proportion of those living in nuclear family was 76.3%, 23.7% of those living in extended families; 32.3% had a family monthly income between 21,000-40,000; Participants without chronic diseases (86.5%) and those who do not use medication continuously (83.8%) are in the majority. The Faculty of Education (17.3%) has the highest rate, while the Faculty of Technology (4.1%) has the lowest. Overall Health: Average 7,132 and median 7,000; Number of Physician Visits in the Last Year: The average is 3,991, and the median is 3,000.

According to the test results, women have higher health literacy and information use levels than men, while individuals who use medication continuously have higher levels of understanding information and anxiety. The importance of health is greater in nuclear families, and individuals without chronic illness have higher scores in certainty and the perception of negative consequences of disease. Factors such as gender, age, and income did not produce significant differences in health literacy, perceptions, or anxiety.

Table 2. *Kruskal-Wallis test results for Health Perception and its subgroups by age*

	Age Group	N	Mean Rank	Chi Square	p-value	sd
Locus of Control	17-20 Years[1]	286	234,66	8,685	,013	1-3
	21-25 Years[2]	150	220,64			2-3
	26 andAbove[3]	32	298,08			
	Total	468				
Certainty	17-20 Years[1]	286	232,62	2,977	,226	
	21-25 Years[2]	150	229,70			
	26 andAbove[3]	32	273,83			
	Total	468				
Importance of Health	17-20 Years[1]	286	240,06	5,982	,050	2-3
	21-25 Years[2]	150	215,89			
	26 andAbove[3]	32	272,00			
	Total	468				
Self-Awareness	17-20 Years[1]	286	234,28	3,801	,150	
	21-25 Years[2]	150	225,92			
	26 andAbove[3]	32	276,70			
	Total	468				
Total Health Perception	17-20 Years[1]	286	233,95	8,523	,014	1-3
	21-25 Years[2]	150	221,86			2-3
	26 andAbove[3]	32	298,63			
	Total	468				

The results of the Kruskal–Wallis test revealed significant differences between age groups in some sub-dimensions of health perception. On the locus of control sub-dimension, individuals aged 26 and above had higher scores than those in the 17–20 and 21–25 age groups, and this difference was statistically significant. This suggests that as age increases, individuals' perceived control over their health becomes stronger. A similar significant difference was observed in the importance of the health sub-dimension: individuals aged 26 and above placed greater importance on health than those aged 21–25.

In contrast, no significant differences were found between age groups in the certainty and self-awareness sub-dimensions, indicating that perceptions of health certainty and self-awareness do not vary substantially with age. Regarding total health perception scores, individuals aged 26 and above had significantly higher scores than those in the 17–20 and 21–25 age groups. Overall, these findings suggest that as individuals age, their perceptions of health strengthen and they tend to adopt a more mature, conscious approach, particularly in dimensions such as health control and the importance of health. No significant difference ($p > 0.05$) was found among the other sub-dimensions ($N = 468$).

Table 3. *Kruskal-Wallis test results for Health Anxiety and its sub-groups based on the age variable*

	Age Group	N	Mean Rank	Chi-Square	p-value	sd
Hypersensitivity to Physical Symptoms and Anxiety	17-20 Years[1]	286	230,51	6,726	,035	2-3
	21-25 Years[2]	150	252,17			
	26 and Above[3]	32	187,31			
	Total	468				
Negative Consequences of Illness	17-20 Years[1]	286	228,70	3,026	,220	
	21-25 Years[2]	150	249,52			
	26 and Above[3]	32	215,94			
	Total	468				
Total Health Anxiety	17-20 Years[1]	286	229,52	6,006	,050	2-3
	21-25 Years[2]	150	252,68			
	26 and Above[3]	32	193,81			
	Total	468				

The results of the Kruskal–Wallis test indicated that there were significant differences between age groups in some sub-dimensions of health anxiety. In the sub-dimension of heightened sensitivity to physical symptoms and anxiety, a statistically significant difference was found between the age groups (χ^2 = 6.726, p = .035), with the difference explicitly observed between the 21–25 age group and those aged 26 and above. The higher mean rank score of the 21–25 age group suggests that individuals in this age range perceive physical symptoms as more threatening and are more sensitive to anxiety related to these symptoms. In the sub-dimension on the negative consequences of illness, no significant difference was observed (p = .220), indicating that negative expectations and worries about disease were similar across age groups. However, an important difference was observed in total health anxiety scores (χ^2 = 6.006, p = .050), again indicating a clear distinction between the 21–25 age group and those aged 26 and above. This result indicates that individuals aged 21–25 experience higher overall health anxiety, whereas those aged 26 and above tend to have lower levels of health-related worry. Overall, the findings suggest that health anxiety is more pronounced during young adulthood.

Table 4. *Kruskal-Wallis test results for Health Literacy and its subgroups by housing variable*

	Housing	N	Mean Rank	Chi-Square	p-value	sd
Total Health Literacy	Family[1]	408	240,90	8,749	,033	1-4
	Relatives[2]	6	224,67			
	Friends[3]	39	199,79			
	Alone [4]	15	154,63			
	Total	468				
Access to Information	Family[1]	408	234,80	2,043	,564	
	Relatives[2]	6	234,58			
	Friends[3]	39	248,42			
	Alone [4]	15	190,23			
	Total	468				
Understanding Information	Family[1]	408	238,26	3,307	,347	
	Relatives[2]	6	210,42			
	Friends[3]	39	219,14			
	Alone [4]	15	181,77			
	Total	468				
Evaluating Information	Family[1]	408	242,75	13,167	,004	1-4
	Relatives[2]	6	229,17			
	Friends[3]	39	179,21			
	Alone [4]	15	155,90			
	Total	468				
Using Information	Family[1]	408	242,70	13,541	,004	1-4
	Relatives[2]	6	200,83			
	Friends[3]	39	190,54			
	Alone [4]	15	139,30			
	Total	468				

The results of the Kruskal–Wallis test indicated significant differences in certain sub-dimensions of health literacy across living arrangements. A significant difference in total health literacy scores was found between individuals living with their families and those living alone (p = .033), with those living with their families having higher scores. Although no significant differences were observed in the sub-dimensions of accessing and understanding information, individuals living with their families scored higher on appraising information (p = .004) and applying information (p = .004). These findings suggest that individuals living alone may have more limited abilities, particularly in evaluating and using health information.

According to the results of the Kruskal-Wallis test, no statistically significant differences were found in health perception and health anxiety, or in their sub-dimensions, across housing status and income group.

Table 5. *Correlation coefficients between Health Literacy, Health Perception, and Health Anxiety*

		Health Anxiety Total	Health Perception Total	Health Literacy Total
Health Anxiety Total	r	1	**-,274****	**-,206****
	p		,000	,000
	N		468	468
Health Perception Total	r		1	**,427****
	p			,000
	N			468
Health Literacy Total	r			1
	p			
	N			

The results of the correlation analysis indicate significant relationships among the variables. A negative and significant relationship was found between health anxiety and health perception ($r = –.274$, $p < .001$), suggesting that as health perception increases, health anxiety decreases. Similarly, there was a negative and significant relationship between health anxiety and health literacy ($r = –.206$, $p < .001$), indicating that higher levels of health literacy are associated with lower levels of health-related anxiety. On the other hand, a strong, positive relationship was observed between health perception and health literacy ($r = .427$, $p < .001$). Overall, these findings demonstrate that individuals with higher levels of health perception and health literacy tend to experience lower levels of health anxiety.

Discussion

The main expectation of this study is that increased health literacy and improved health perceptions among university students will lead to reduced health anxiety. The findings support this expectation, demonstrating that as health perception and health literacy increase, health anxiety significantly decreases. This result clearly indicates that enhancing access to information, strengthening information-evaluation skills, and improving accurate perceptions of health play a critical role in managing health anxiety among young adults.

Significant differences were identified between health literacy and gender. A statistically significant difference in favor of women was observed, particularly in the total health literacy score and in the sub-dimensions of information evaluation and information use. These findings suggest that women tend to access, interpret, and integrate health-related information into their daily lives more actively than men. Therefore, gender can be considered an important sociodemographic variable influencing health literacy. Similar findings have been reported in previous studies (Çimen & Bayık, 2017; Akyol Güner et al., 2020; Kıraç & Öztürk, 2020). However, Özcan and Özkaraman (2021) found no significant difference between male and female patients regarding overall health literacy and disease-prevention awareness. Their study revealed that male patients had higher health literacy regarding healthcare services and health improvement than female patients.

No statistically significant differences were found between health literacy and family structure, chronic illness status, or having a family member with a chronic illness. This finding is consistent with prior studies reporting similar results (Kıraç & Öztürk, 2020). Additionally, no significant association was identified between health literacy and age. Considering that the sample consisted of young individuals familiar with technology, this outcome may be attributable to their active use of digital health information resources. Contrary to this finding, Özcan and Özkaraman (2021) reported a negative correlation between age and both general health literacy and its sub-dimensions, suggesting a decline in health literacy with increasing age. Similarly, Akar and Karan (2024) found that individuals aged 36–45 had higher health literacy than those aged 25 and younger.

Although no significant relationship was found between health literacy and income level in this study, similar results have been reported previously (Soysal & Obuz, 2020; Karabulut, 2021). Nonetheless, other studies have suggested that health literacy varies according to income status (Akyol Güner et al., 2020; Kıraç & Öztürk, 2020). Individuals with higher incomes generally have easier access to healthcare services and health-related resources, whereas those with lower incomes may face barriers that limit their health literacy.

When housing conditions were examined, statistically significant differences were observed in the sub-dimensions of information use, information evaluation, and overall health literacy. Students living with their families demonstrated higher health literacy than those living alone. This may be explained by factors such as family support, shared health information, and easier access to healthcare resources. In contrast, individuals living alone may encounter greater challenges in accessing, evaluating, and using health-related information.

Regarding health perception, individuals living in nuclear families scored higher in the “importance of health” sub-dimension, suggesting that family structure influences health awareness. Increased responsibility, supportive interactions, and greater access to health information within nuclear families may contribute to this outcome. No significant differences were detected in the other dimensions.

No statistically significant differences were observed between gender and the sub-dimensions of health perception, in line with previous research (Çaka et al.,

2017). However, Karaoğlu et al. (2020) reported higher health perception scores among female students. In the present study, individuals without a family history of chronic illness scored higher in the "certainty" sub-dimension, indicating that having a family member with a chronic disease may reduce individuals' confidence in their own health status.

The literature presents mixed findings regarding health perception. Some studies reported that age does not significantly affect health perception (Karakoyunlu Şen & Kılıç Öztürk, 2020), whereas others indicated that higher health perception is associated with better outcomes, such as rational drug use (Özişli, 2023). In this study, health perception differed significantly by age, with participants aged 26 and above scoring higher. This may reflect greater life experience, heightened awareness of health risks, and increased health responsibility among older individuals.

Regarding health anxiety, no statistically significant differences were found based on gender, chronic illness status, or age, consistent with findings from previous studies (Akar & Karan, 2024; Abdelghani et al., 2021). However, the 21–25 age group demonstrated higher scores in the hypersensitivity to bodily symptoms sub-dimension and higher overall health anxiety than participants aged 26 and above. This result aligns with studies showing that younger individuals tend to exhibit higher levels of health anxiety (Kıraç & Öztürk, 2020; Kurçer et al., 2021).

This study identified a significant positive relationship between health literacy and health perception, supporting previous research (Akça et al., 2020; Kuloğlu & Uslu, 2022; Kıbrıs & Kızılkaya, 2023). Higher health literacy appears to strengthen health awareness and promote healthier lifestyle behaviors. Studies conducted in different contexts—including research from Belgrade, Ghana, and the United States—also demonstrate that higher health literacy contributes to better health perception, improved health behaviors, and more effective utilization of healthcare services.

A negative and significant relationship was found between health anxiety and both health perception and health literacy. Individuals with higher health anxiety tend to have lower health literacy levels and more negative health perceptions. These findings are consistent with previous studies (Karaoğlu et al., 2020; Keklik & Mert, 2023; Akar & Karan, 2024), indicating that efforts to enhance health literacy may help reduce health anxiety and strengthen perceptions of health.

Results and Recommendations

In conclusion, health anxiety negatively affects both health literacy and health perception. Individuals with higher levels of health anxiety tend to evaluate their health more negatively and experience greater difficulty in accessing, interpreting, and using health-related information. Conversely, individuals with higher health perception exhibit stronger analytical abilities and greater ease in obtaining and utilizing health information. Therefore, implementing health education programs to enhance health literacy and strengthen perceptions of health may help reduce health anxiety and improve overall well-being. The interaction among health literacy, health perception, and health anxiety should inform public health planning, and adopting a holistic approach is recommended to support both individual and community health.

Despite these findings, the study has certain limitations. The research was conducted at a single university, with participants in a narrow age range (17–25), which limits the generalizability of the results. The use of self-report measures may have introduced response bias, and the cross-sectional design does not allow for causal inferences. Furthermore, the absence of qualitative data restricts the depth of understanding regarding the psychosocial mechanisms underlying the relationships among health literacy, health perception, and health anxiety.

Future research should include samples from multiple institutions and more diverse demographic groups to enhance the generalizability of the findings. Longitudinal research designs are recommended to better examine causal pathways. Studies that incorporate mixed-methods and qualitative components may provide a more comprehensive understanding of these constructs. Additionally, research focusing on e-health literacy, digital health information use, and the role of social support would offer valuable contributions to the field.

Declarations

Ethical Approval and Informed Consent
Ethical approval for the study was obtained from the Ethics Committee for Scientific Research Proposals of Sivas Cumhuriyet University (Document No: 6, Date: 22.05.2024; Number: E-99711239-050.01.04), and written permission was received from the relevant institution.

Permission for Publication
Not applicable.

Availability of Data and Materials
Not applicable.

Conflict of Interest
The authors declare no conflicts of interest.

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Author Contributions
EM and MG contributed to writing the introduction, while MG and YD developed the methodology and discussion sections. EM made significant contributions to the preparation of the abstract and summary. MG conducted the data analysis and interpreted the findings. YD and EM played an active role in the data collection process. All authors reviewed the final version of the manuscript, agreed on its content, and approved it for publication.

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