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Evaluation of the effectiveness of a health literacy education program during the pandemic

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ABSTRACT

Objectives: This study investigated the effectiveness of a health literacy education program on first and emergency aid students during the pandemic.

Materials and Methods: This study adopted a single group pre-test-post-test quasi-experimental design. The study population consisted of 135 students of the First and Emergency Aid Program of a private university in Konya, Turkey. No sampling was performed because we could reach the entire study population. Therefore, the sample consisted of 114 students. Participants attended a health literacy education program (intervention). Data were collected through face-to-face interviews using a personal information form and the Health Literacy Scale (HLS). Number, percentage, and Mann-Whitney U test were used to analyze the data. The study adhered to all ethical principles.

Results: Participants had a significantly higher mean post-test HLS score (117 ± 5.03) than the pre-test score (105 ± 11.50) ($p < 0.05$). Participants with a high income had a significantly higher mean post-test HLS score than those with a low income ($p < 0.05$). Participants covered by insurance had a significantly higher mean post-test HLS score than those who were not ($p < 0.05$). Participants who did regular exercise had a significantly higher mean post-test HLS score than those who did not ($p < 0.05$). Participants who knew about health literacy before the intervention had a significantly higher mean post-test HLS score than those who did not ($p < 0.05$).

Conclusion: The education program helped participants learn more about health literacy. Therefore, universities should integrate it into their curricula.

Keywords: Education, Health Literacy, Students

1. INTRODUCTION

The World Health Organization (WHO) defines health literacy as the "cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand, and use information in ways which promote and maintain good health" [1]. The concept of health should be addressed from different perspectives. Health is affected by eating habits, hygiene practices, living arrangements, and diseases [2]. People with health literacy can access current health information and adopt healthy lifestyle behaviors. Health literacy is the ability to make the right decisions for health [3,4]. It promotes both our individual and sociopolitical actions and helps us achieve national and global public health goals. The term "health literacy" was first used in 1974 to describe how health information impacts education. There has been a growing body of research on health literacy since the 1990s [5,6]. Many studies have reported insufficient health literacy levels [7-9].

Literacy status, education, income, age, social status, and chronic disease history affect health literacy [7-12]. Epidemics and pandemics also affect it because people are supposed to be careful about their health during outbreaks. Adolescence is a critical period when people adopt healthy lifestyle behaviors. Young adults are more likely to adapt to the "new" normal and create a change during outbreaks. The novel coronavirus disease (COVID-19) broke out in Wuhan, China, at the end of 2019 and has taken hold of the whole world since then. Turkey shifted to online learning amidst COVID-19 from June 2020

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to April 2021. During this period, only a small number of college students could receive face-to-face education. Between June 2020 and April 2021, when the pandemic was particularly severe, most universities in Turkey continued their education and training activities, including exams and summer schools, with a hybrid education model. We should ensure that young adults have high health literacy levels to improve current health indicators, make health policies effective, and manage the pandemic effectively throughout the country. Students studying in First and Emergency Aid Programs constitute the group that will work actively in the setting of pre-hospital care while applying appropriate information in the field of health. Therefore, these students will have positive indirect effects on the health of the country. Especially in situations such as the COVID-19 pandemic, it is important that they access and apply the right information and adopt more accurate approaches in the first response to patients in the pre-hospital setting. In doing so, they can reduce the transmission pathways during a pandemic. Students of First and Emergency Aid Programs will have a tremendous impact on healthcare capacity because they are the professionals of tomorrow who will work actively in the field of healthcare. Therefore, they should be able to access and use the right information regarding health issues. First and Emergency Aid students with high health literacy levels are more likely to protect and improve public health and prevent diseases [13]. Meherali et al., argue that health literacy education can improve health outcomes and reduce health inequities in low – and middle-income countries [14]. Lin et al., maintain that health literacy education makes healthcare professionals more capable of protecting their patients from many diseases [15]. We hypothesized that an educational intervention would be effective in increasing participants' knowledge and awareness of health literacy. Therefore, this study implemented a health literacy education program (intervention) to help First and Emergency Aid Program students develop health literacy knowledge and skills. The sample consisted of 114 students. All participants attended the intervention.

2. MATERIALS and METHODS

Design

This study adopted a single-group pre-test-post-test quasi-experimental design.

Sample

This study was planned to increase the health literacy levels of students in a First and Emergency Aid Program, who have critical roles in the pre-hospital setting and will carry out the first treatment interventions in the field, in the context of the COVID-19 pandemic.The study population consisted of 135 first and second year students from the First and Emergency Aid Program of a university in Konya, central part of Turkey, in the 2020-2021 academic year. A power analysis was performed (G Power) to determine the sample size. The results showed that a sample of 100 would be large enough to detect significant differences (0.05 margin of error, 0.66 effect size, and 95% power). The sample consisted of 114 students. The inclusion criteria were (1) being a First and Emergency Aid student, (2) having received a hybrid education since the COVID-19 pandemic, and (3) agreeing to participate in the study.

Data Collection Tools

The data were collected using a personal information form and the Health Literacy Scale (HLS).

Personal Information Form

The personal information form was based on a literature review conducted by the researcher. The form consisted of ten items on demographic characteristics (age, gender, income, education, health coverage, chronic disease, regular exercise, tobacco use, regular medication use, and knowing the concept of health literacy) [7,10,11,16,17]. After the necessary form was prepared, it was finalized by obtaining expert opinions from a practitioner of emergency medicine, a lecturer from an emergency aid program, and a public health nurse, all of whom were experts in the field of first and emergency aid. Three experts checked the form intelligibility and relevance. It was revised based on expert feedback.

Health Literacy Scale

Health Literacy Scale was developed by Toçi et al. in 2013 and adapted into Turkish by Aras and Bayık Temel in 2017. The scale consists of 25 items and four subscales. The total score ranges from 25 to 125. The items are rated on a five-point Likert-type scale ("5: I have no difficulty at all, 4: I have little difficulty, 3: I have some difficulty, 2: I have very difficulty, 1: I am unable to do it / I have no talent / impossible"). Higher scores indicate higher health literacy levels [16,17].

Health Literacy Education Program

The First and Emergency Aid Program considered here is an associate degree program that provides a 2-year education. Students graduating from this program can work as emergency medicine technicians in health institutions and organizations in the public and private sectors. This group of health professionals, actively working in ambulances and emergency services, has an important impact on survival rates as they carry out the first treatment interventions in the pre-hospital setting [7,11]. The Health Literacy Education Program was based on a literature review conducted by the researchers [18-21]. The education program for health literacy created by the researchers based on the relevant literature includes four main sessions addressing areas for which health literacy and pandemic processes should be emphasized. After the education program was prepared and expert opinions were obtained from experts in the field of first and emergency aid, including a medic, a lecturer, and a public health nurse, the education program was finalized. This health literacy education program was then implemented for the students face-to-face by the researchers.

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1. Contents of the First Session:

a. Communication in health; the concept of health literacy

b. Factors affecting health literacy

c. Duties of first and emergency aid technicians in pandemics and measures to protect the public in pandemics

2. **Contents of the Second Session:**

a. Health literacy in Turkey and the world

b. The pandemic and the importance of health literacy

c. Health literacy for individuals and society

3. **Contents of the Third Session:**

a. Differences between health literacy and basic literacy

b. Role of society and state in the development of health literacy

4. **Contents of the Fourth Session:**

a. Basic principles and barriers to improving health literacy

b. Access to accurate information resources in the field of health and its importance in the pandemic process

Data Collection

Pre-test

Students were informed about the research purpose and procedure before the intervention. Written and verbal consent was obtained from those who agreed to participate in the study. Participants filled out the personal information form and HLS (pre-test). In the classroom environment, students were given a personal information form and the HLS to complete, and they were asked to fill those out individually under the supervision of the researchers. It took each participant 10-15 minutes to fill out the data collection forms.

Post-test

After the fourth session was completed, post-test data were collected from students who had attended all sessions, again under the supervision of the researchers in the classroom environment. Participants filled out the HLS (post-test) after the intervention. It took each participant ten minutes to fill out the scale.

Intervention

After the pre-test data were collected from the students included in this study, a meeting time outside of class hours was determined for the first session and the group was dispersed. The first training session started 2 days after the pre-test data were collected. The Health Literacy Education Program was implemented for the students in a face-to-face classroom environment, with two sessions two days a week, outside of class hours. Face-to-face training was thus completed in four sessions and two weeks in total. PowerPoint presentations, question-and-answer sessions, and discussion methods were used as educational techniques in these training sessions. Each session lasted about 40 minutes. Participants were taken to the lecture hall based on the number of people per square meter specified by the occupational health and safety teams. All participants and the researcher wore masks throughout the intervention. The classroom was ventilated and disinfected between the sessions.

The study was approved by the University Drug and Non-Medical Device Research Ethics Committee of Konya Karatay University (approval number: 2020/08). Permission was obtained from the institution. All students were briefed about the research purpose and procedure. They were also informed that they could withdraw from the study at any time. Written consent was obtained from those who agreed to participate in the study. The study was conducted according to the ethical principles outlined by the Declaration of Helsinki.

Statistical Analysis

The data were analyzed using the Statistical Package for Social Sciences (SPSS, IBM v. 22.0) at a significance level of 0.05. Number, percentage, mean, and standard deviation were used for descriptive data. The Kolmogorov-Smirnov test and skewness-kurtosis were used for normality analysis. The results showed that the data were nonnormally distributed. The Mann-Whitney U test (Z) was used to compare two groups.

3. RESULTS

Table I shows all participants' sociodemographic characteristics. More than half the participants were women (60.5%). Half the participants were second-year students (50.9%). Less than a quarter of the participants had no health coverage (14.9%). Nine participants had chronic diseases (7.9%). More than half the participants did not know about health literacy (64.9%) (Table II).

Participants with a high income had a significantly higher mean post-test HLS score than those with a low income. Participants covered by insurance had a significantly higher mean posttest HLS score than those who were not. Participants who did regular exercise had a significantly higher mean posttest HLS score than those who did not. Participants who knew about health literacy before the intervention had a significantly higher mean post-test HLS score than those who did not ($p < 0.05$) (Table III).

Participants had a significantly higher mean post-test HLS score (117 ± 5.03) than the pre-test score (105 ± 11.50) ($p < 0.05$).

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Table I. *Students' sociodemographic characteristics (n:114)*

Items	n	%
Age		
X ± SS 20.0 + 1.6 (min: 15 – max: 25)	88	77.2
18 – 21 age	26	22.8
22 – 25 age		
Gender		
Famale	69	60.5
Male	45	39.5
Class		
1.st grade	56	49.1
2.nd grade	58	50.9
Income Status		
Upper income	12	10.5
Middle income	95	83.3
Low income	7	6.1
Health Insurance		
Yes	97	85.1
No	17	14.9
Chronic Disease		
Yes	9	7.9
No	105	92.1
Exercise Regularity		
Yes	30	26.3
No	84	73.7
Smoking		
Yes	34	29.8
No	80	70.2
Continuous Medication Use		
Yes	11	9.6
No	103	90.4
Know the Concept of Health Literacy		
Yes	40	35.1
No	74	64.9

X: Average/Mean, SS: Standard Deviation

Table II. *Comparison of pre-test and post-test health literacy score averages by socio-demographic characteristics*

	Pre-test		Post-test	
Items	**X±SS**	**Test value – p**	**X±SS**	**Test value – p**
Age				
18 – 21 age	105.0±11.7	Z: – 0.226	116.7±5.1	Z: – 0.382
22 – 25 age	103.0±11.2	p: 0.821	116.3±4.8	p: 0.702
Gender				
Famale	105.0±10.5	Z:-0.009	116.6±4.9	Z: – 0.458
Male	104.0±13.0	p:0.993	116.6±5.2	p: 0.647
Class				
1. class	104.5±11.7	Z:-1.058	116.6±4.9	Z: – 0.672
2. class	105.0±11.4	p: 0.290	117.2±5.0	p: 0.502
Income Status				
Upper income	108.5±4.9	Z: – 2.158	119.5±3.5	Z: – 2.207
Middle/Low income	104.0±11.8	**p: 0.031**	116.3±5.0	**p: 0.27**
Health Insurance				
Yes	106.0±10.0	Z: – 3.551	117.3±4.7	Z: – 1.536
No	88.0±14.1	**p: 0.000**	112.5±4.5	p: 0.127
Chronic Disease				
Yes	103.0±10.2	Z: – 0.168	116.2±4.6	Z: – 0.059
No	105.0±11.7	p: 0.866	116.6±5.0	p: 0.953
Exercise Regularity	109.0±10.4	Z: – 2.122	118.3±5.0	Z: – 2.135
Yes	104.0±11.7	**p: 0.034**	116.0±4.9	**p: 0.033**
No				
Smoking				
Yes	105.0±13.6	Z: – 0.533	116.3±5.4	Z: – 0.379
No	105.0±10.5	p: 0.594	116.7±4.8	p: 0.705
Continuous Medication Use	108.0±11.0	Z: – 0.379	117.1±5.3	Z: – 0.365
Yes	105.0±11.6	p: 0.704	116.5±5.0	p: 0.715
No				
Know the Concept of Health Literacy				
Yes	107.50±10.6	Z: – 2.149	117.8±4.9	Z: – 2.020
No	103.50±11.8	**p: 0.032**	115.9±4.9	**p: 0.043**

X: Average/Mean, SS: Standard Deviation, Z: Mann Whitney U test

Table III. *Comparison of students' health literacy scale scores of pre-test and post-test*

Score of Health Literacy Scale	X±SS	Q(Q1–Q3)*
Pre-Education	105.0±11.50	105.0 (94.00 – 110.25)
Post-Education	117.0±5.03	117 (112.00 – 121.00)
Test value (Z):	-9.290	
P	**0.000**	

** Quarter values are given for data that are not normally distributed. X: Average/Mean, SS: Standard Deviation, Z: Mann Whitney U test*

4. DISCUSSION

Health literacy is essential for reducing health inequities and expenditures [13]. This study was carried out to determine the effect of health literacy education on the health literacy scores of students enrolled in a First and Emergency Aid Program during the COVID-19 pandemic with the aim of increasing the health literacy levels of these students and contributing to the literature. It is important for students to understand the concept of health literacy in order to access appropriate information and apply it correctly to improve the health of the public during pandemic processes. This study investigated the effect of the Health Literacy Education Program (intervention) on First and Emergency Aid Program students' health literacy levels. Participants had a significantly higher mean post-test HLS score (117 ± 5.03) than the pre-test score (105 ± 11.50) ($p < 0.05$).

Our results indicate that universities should provide students with health literacy training programs to help them learn about health literacy and its significance on health outcomes. After the training program, the health literacy scores of the First and Emergency Aid Program students increased, and a significant difference was found between pre-test and post-test scores. In this context, in this study examining the effect of a training program on health literacy scores, the hypothesis that a health literacy education program will increase the health literacy of First and Emergency Aid Program students was confirmed.

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When the literature is examined, it is seen that Erunal et al., conducted a study with 808 nursing students and found that the overall average score was sufficient. Şahinöz et al., conducted a study with students enrolled in health departments and found that these students had sufficient health literacy, similar to our results [22,23]. In our study, similar to the literature, it was determined that levels of health literacy approached the upper value as a result of the implementation of an education program and health literacy levels were sufficient. In a study of high school and university students in Canada and Greece, it was determined that the health literacy levels of men were low [24,25]. In our study, the health literacy scores of male students were found to be lower than those of female students, but this difference was not statistically significant. We also found that as the income status of the students increased, the average health literacy score also increased, although, this was again not statistically significant. In the literature, there are studies showing no significant difference between income levels and health literacy levels, similar to our findings [26,27], although, it has been concluded that there is a positive relationship between income status and health literacy [25]. Individuals who perceive their own health positively also have higher health literacy scores [24,26,27]. Based on the limited data in the literature, it can be said that there is a significant positive relationship between positive health perceptions and health literacy. In our study, the health literacy levels of the students who exercised regularly were significantly higher. In line with these results, it is suggested that regular exercise may help students develop a positive perception of their health [28]. Cianfracca et al., investigated whether a multidisciplinary theoretical-practical training course affected Italian caregivers' health literacy levels. They found that the training course helped the caregivers develop health literacy skills and suffer less from the burden of care [29]. Doi Kanno et al., offered a health literacy training program to older Japanese-Brazilian adults and found that the participants had higher self-efficacy and life satisfaction after the training [30]. Kaper et al., determined that a health literacy consultation skills training program helped undergraduate medical students develop health literacy and self-management skills [31]. Lin et al., provided older Taiwanese adults with a community-based participatory health literacy program and found that the participants were better at controlling their body weights, doing regular exercises, and navigating health information after the training [32]. Zibellini et al., conducted a systematic review to assess the effectiveness of health literacy interventions on pregnancy outcomes and reported that the interventions helped pregnant women learn about health literacy and have better secondary outcomes, such as fetal outcomes and healthcare service utilization [33]. The researchers have drawn two conclusions. First, maternal and child health is critical for development. Second, pregnant women should be provided with health literacy training interventions to help improve health indicators [34-36].

First and Emergency Aid Program students are the professionals of tomorrow who will play a vital role in delivering healthcare services. Our results will pave the way for further research and encourage universities to integrate health literacy training programs into their curricula to help First and Emergency Aid students develop health literacy skills.

Limitations

This study had three limitations. First, it adopted a quasi-experimental design. Second, the sample was recruited from only one university. Third, the data were based on self-report

Conclusion

After attending the Health Literacy Education Program, our participants had significantly higher health literacy levels. This result suggests that Health Literacy Education Programs are affordable, user-friendly, and effective ways to teach students about health literacy. Universities should integrate Health Literacy Education Programs into their curricula and assess teaching outcomes. Researchers should recruit larger samples and adopt randomized controlled experimental research designs to better understand the effectiveness of Health Literacy Education Programs on students' knowledge and awareness of health literacy.

Compliance with Ethical Standards

Ethical Approval: This study was approved by Konya Karatay University Drug and Non-Medical Device Research Ethics Committee (approval number 2020/08). Permission was obtained from the institution. Written consent was obtained from those who agreed to participate in the study. The study was conducted according to the ethical principles outlined by the Declaration of Helsinki.

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