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The Effectiveness of Health Education Program Implemented by School Nurses on Primary School Students' Health Perception, Health Behaviors and Health Control

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Abstract

Objective: This study aimed to investigate the effectiveness of health education program implemented by school nurses on primary school students' health perception, health behaviors and health control.

Methods: Single-group pre-test post-test quasi-experimental study was conducted in Türkiye between September 2016 and June 2019 at a primary school with 1433 students. Data were collected using Student Description Form, Scale of Health Perception and Health Behaviors in Children, Scale of Health Control Focus in Children. Health education program was composed of health responsibility, adequate and balanced nutrition, sleep, rest and exercise, protection from accidents and a safe classroom environment, and personal hygiene. Data were collected pretest, posttest after the end of the education program.

Results: There was a significant increase in the students' mean scores on the control focus scale and the health perceptions and health behaviors scale ($p < .05$).

Conclusion: Health education program given by the nurse was effective in instilling positive health behaviors. In health education to be given in schools, the effective participation of students in activities relating to gaining positive health behaviors must be ensured, and more permanent learning and easier transfer of what has been learned into behavior must be ensured by interactive, participatory education of students.

Keywords: Health Education, Health Behavior, Health Focus Of Control, Primary School Student, School Nursing

Öz

Okul Hemşirelerinin Uyguladığı Sağlık Eğitimi Programının İlköğretim Öğrencilerinin Sağlık Algısı, Sağlık Davranışları ve Sağlık Kontrolü Üzerine Etkinliği

Amaç: Bu çalışmanın amacı, okul hemşireleri tarafından uygulanan sağlık eğitim programının ilkokul öğrencilerinin sağlık algısı, sağlık davranışları ve sağlık kontrolü üzerindeki etkililiğinin araştırılmasıdır.

Yöntem: Tek gruplu ön test son test yarı deneysel çalışma, Eylül 2016 ile Haziran 2019 tarihleri arasında Türkiye'de 1433 öğrencinin bulunduğu bir ilkokulda gerçekleştirilmiştir. Veriler Öğrenci Tanımlama Formu, Çocuklarda Sağlık Algısı ve Sağlık Davranışları Ölçeği, Çocuklarda Sağlık Kontrol Odağı Ölçeği kullanılarak toplanmıştır. Sağlık eğitimi programı; sağlık sorumluluğu, yeterli ve dengeli beslenme, uyku, dinlenme ve egzersiz, kazalardan korunma ve güvenli sınıf ortamı, kişisel hijyen konularından oluşmuştur. Veriler ön test eğitim programından önce, son test eğitim programının bitiminden sonra toplanmıştır.

Bulgular: Öğrencilerin kontrol odağı ölçeği ve sağlık algısı ve sağlık davranışları ölçeği puan ortalamalarında anlamlı bir artış saptanmıştır ($p < .05$).

Sonuç: Hemşire tarafından verilen sağlık eğitim programı olumlu sağlık davranışlarının kazandırılmasında etkili olmuştur. Okullarda verilecek sağlık eğitiminde öğrencilerin olumlu sağlık davranışlarını kazandırmaya yönelik etkinliklere katılımı sağlanmalı. Öğrencilerin etkileşimli, katılımcı bir eğitimle daha kalıcı öğrenmeleri ve öğrendiklerinin davranışa daha kolay aktarılması sağlanmalıdır.

Anahtar Kelimeler: Sağlık Eğitimi, Sağlık Davranışı, Sağlıkta Kontrol Odağı, İlkokul Öğrencisi, Okul Hemşireliği

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INTRODUCTION

The school-age population in Turkey is steadily increasing in the school year 2022-2023, there was a total of 5 535 531 students in 25 182 schools (NES, 2023). The size of the child population and their being together in schools emphasizes the importance of the school environment.

After the home, the environment which has the most effect on children is school, and this is seen as an ideal place to improve their health (AAP, 2008; Klein et al., 2012). A very significant part of a student's day is spent at school. For this reason, health services provided at school have an important place in protecting the health of school-age children and in forming the basis of behaviors which affect a healthy lifestyle. The family and the school enable a healthy lifestyle and are important in forming a healthy society. Protecting a person's bodily, spiritual and social health from the outset forms the basis for a happy and healthy society. Therefore, school health services aimed at improving health and preventing disease need to be started at as early an age as possible. School health services enables all school-age children to achieve and maintain the best possible bodily, spiritual and social health, and includes studies conducted with the aim of raising the levels of health of the community by protecting and improving schoolchildren's health (CDC, 2019; Zareipour et al., 2017).

Developing awareness of health and reflecting this awareness in attitudes and behaviors is of critical importance in preventing health problems for present and future generations (Sharma et al., 2018; Zareipour et al., 2017). The ability to develop positive health behaviors is made possible by determining the health risks of students and planning suitable health education (CDC, 2012). Health education; it is one of the most important factors that improves health, and the school nurse is in an ideal position to encourage students to adopt positive behaviors by conducting health education activities (Kleinet et al., 2012). The aim of health education is to provide students with correct health knowledge and positive behaviors (CDC, 2019).

Researchers in Turkey have shown that there are health problems such as arrested growth and development, being underweight or overweight, iron deficiency anemia, iodine deficiency diseases, deficiencies of other vitamins and minerals (COSI-TUR, 2019; Çelmeli *et al*., 2020; Hocaoğlu & Sarıbal, 2019), tooth decay (Kesim et al., 2016), problems of vision and hearing (Azizoğlu et al., 2017; Kaplama & Ak, 2020), ear, nose and throat diseases (Köksoy et al., 2020), mental problems (Senol et al., 2018), and chronic diseases relating to being overweight (Gül et al., 2017), and that coping problems are experienced as these conditions advance. The first step in preventing these problems can be taken by providing students with positive health behaviors (IUHPE, 2013). The health behaviors which must be gained by school students can be grouped as responsibility for health, nutrition, exercise, self-realization, social support, stress and coping, safety, and hygienic practices (Gürbüz, 2006; IUHPE, 2013).

In the literature, it is seen that nurses have given health education to school students on the topics of nutrition, exercise, self-realization (Tucker & Lanningham, 2015; Sert & Temel, 2017; Pittman, 2020), safety (Akçay &Yıldırımlar, 2018) and hygienic practices (Ahmad et al., 2019), and that this has been effective. This study aimed to investigate the effectiveness of health education program implemented by school nurses on primary school students' health perception, health behaviors and health control.

METHODS

Design: The study is a single-group pre-test post-test quasi-experimental study.

Hypothesis: The health education program implemented by the nurse is effective in developing primary school students' health perception, health behaviors and health control. There are differences about students' health perception, health behaviors and health control according to age and gender.

Variables: The independent variable was health education program implemented by school nurses and age, gender. The dependent variable was scale of health perception and health behaviors and health control focus.

Settings: The participation of parents is important in the success of school-dependent interventions to improve health. For this reason, the fact that parents could not be included in this study is a limitation of the research. Another limitation is that the positive health behaviors of students were determined through self-reporting. Also, because the study was conducted in a single school, the research findings cannot be generalized to all primary school students.

Population: This single-group pre-test post-test quasi-experimental study was performed between September 2016 and June 2019 at a primary school in Izmir, in the west of Turkey. The school was in a neighborhood with a low socioeconomic level, which was affected by internal and external migration. The reason for the choice of the school was that it was a school recommended for health education by the district National Education Directorate because it had a large number of students, it was in an area affected by internal and external migration, and because the families in the area were at a low socioeconomic level. The population of the research consisted of the 1794 students at the primary school. The measurement instruments used in the study were suitable for students of at least second year level, so that apart from first-year students, who were excluded because they could not read and write all other students, were included in the research. The 1433 students who participated in the pre-test evaluation, all of the health

education and the whole of the post-test evaluation were included in the research sample.

Health Education Program Given by School Nurses

Eight health education topics (Health Responsibility, Adequate and Balanced Nutrition, Sleep, Rest and Exercise, Protection from Accidents and a Safe Classroom Environment, and Personal Hygiene) were prepared by examining the literature. This health education program consisted of power point presentation, demonstration, banners, posters, animation shows, question-and-answer sessions and role-playing. The powerpoint presentations were checked by three of the teaching staff with regard to the topic, and simple, comprehensible language was used (Table 1).

Table 1. Research process and education program

Pre-test Student Description Form, Scale of Health Control Focus in Children, Scale of Health Behaviors in Children (SHBC)			
		EDUCATION PROCESS	
Session	**Duration**	**Content**	**Process, Method and Techniques**
1st lesson	40 min.	Health responsibility	*Power-point presentation *Q&A *Discussion *Banner, poster *Animation, cartoon film
SHBC – **Health responsibility** sub-dimension **(Post-test** 5 weeks later)			
2nd lesson	40 min.	Adequate and Balanced Nutrition	*Power-point presentation *Q&A *Discussion *Banner, poster *Animation, cartoon film
SHBC – **Nutrition** sub-dimension (**Post-test** 5 weeks later)			
3rd lesson	40 min.	Sleep, rest and exercise	*Power-point presentation *Q&A *Discussion *Banner, poster *Animation, cartoon film
SHBC – **Exercise** sub-dimensions **(Post-test** 5 weeks later)			
4th lesson	40 min.	Self-efficacy	*Power-point presentation *Q&A *Discussion *Banner, poster *Animation, cartoon film
SHBC – **Self-realization** sub-dimension (**Post-test** 5 weeks later)			
5th lesson	40 min.	Social support	*Power-point presentation *Q&A *Discussion *Banner, poster *Animation, cartoon film
SHBC – **Social support** sub-dimensions **(Post-test** 5 weeks later)			
6th lesson	40 min.	Stress and coping	*Power-point presentation *Q&A *Discussion *Banner, poster *Animation, cartoon film
SHBC – **Stress and coping** sub-dimensions **(Post-test** 5 weeks later)			
7th lesson	40 min.	Protection from accidents and a safe school environment	*Power-point presentation *Q&A *Discussion *Role play technique * Demonstration *Banner, poster *Animation show, cartoon film
SHBC – **Safety** sub-dimension **(Post-test** 5 weeks later)			
8th lesson	40 min.	Personal hygiene	*Power-point presentation *Q&A *Discussion *Role play technique * Demonstration *Banner, poster *Animation show, cartoon film
Post-test after 5 weeks SHBC – **Cleanliness habits** sub-dimension **Health Self-Control Focus Scale**			

After the presentation, a short film or an animation show was given to reinforce the lesson. Visual material was used in the presentation both to make the education process easier and to increase the amount which the students would retain (CDC, 2012). The spot films, talking books and cinevision films were chosen from the website of the Ministry of Health (RTMH/GDPH, 2017a; RTMH/GDPH, 2017b; RTMH/GDPH, 2017c). In addition, relevant training materials on the network of the Turkish National Education Ministry site were used (RTMNE, 2017). At the end of the lesson, four or five simple questions were asked (e.g. When should you wash your hands? How should you brush your teeth? What can you say about people who have a balanced and regular diet?) using a question and answer method in order to determine how effective the lesson had been. In some lessons, models (models of the mouth and teeth) were used. First, the students were shown a technique on the model (correct tooth-brushing technique), and later they were asked to show what they had learned on the model. In some lessons, role-play and demonstration methods were used after the presentation (hand washing). The researchers showed the technique of hand washing to the students and the students were asked to repeat it.

The health education program was given to the students in the first and second semesters of the academic years 2016-2019 in single 40-minute lessons at five-week intervals. The health classes were given in the school conference hall to three classes at a time (approximately 90 students) in class hours that were convenient to all sections.

Data collection: Before presenting the health education programs to all the students, pretest data were collected with the Scale of Health Control Focus in Children and the Scale of Health Perception and Health Behaviors in Children in the classroom. Immediately before giving each education topic (pre-test) and four or five weeks afterwards (post-test), a sub-dimension including the education topic of the Scale of Health Perception and Health Behaviors in Children was given. After finishing all the education program, posttest data were collected with the Scale of Health Control Focus in Children (Table 1). Pretest and posttest applications were done in the classroom, during the course hour. Paper and pencil technique was used for data collection and the data collection time in each class was approximately 20 minutes.

Data Collection Tools

A student description form, The Scale of Health Control Focus in Children, and the Scale of Health Perception and Health Behaviors in Children were used to collect research data.

Student Description Form: This form collected information on students' name, age, gender and class section.

Scale of Health Perception and Health Behaviors in Children: This scale was developed with the aim of evaluating children's health perceptions and health, and study on the validity and reliability of the Turkish version was conducted by Gürbüz (2006). The Cronbach Alpha internal consistency coefficient of the scale was 0.84. The scale has 51 items relating to eight behavioral areas, namely health responsibility, nutrition, exercise, self-realization, social support, stress and coping, safety and cleanliness habits. The items are scored as "Never" (3 points), "Sometimes" (2 points), and "Always" (1 point). The lowest possible score on the scale is 51, and the highest is 163. A high score on the scale indicates that the individual has positive health behaviors. It was found that the Cronbach Alpha internal consistency coefficient of the scale was 0.91 in the study.

Table 2. The effect of health education program on students' health control focus

Scale and sub-dimensions	Pre-test	Post-test	Test[a] p
	$\bar{x} \pm SD$	$\bar{x} \pm SD$	
Internal control focus	10.27 ± 1.57	10.58 ± 1.51	6.072 .000*
External control focus	19.17 ± 2.98	20.30 ± 2.88	12.255 .000*
Control focus scale	29.44 ± 3.32	30.88 ± 3.52	13.933 .000*

*[a]Student t Test *p<.05*

Scale of Health Control Focus in Children: Study on the validity and reliability of the Turkish version of the scale was conducted by Gürbüz (2006). The internal consistency coefficient was found to be 0.91. Its purpose is to assess the control over health management of children in the 7-12year age group. The scale has 20 items, each scored "Yes" (1 point) or "No" (2 points). Items number 2, 9, 11, 26, 19 and 20 concern internal control focus, while the others are concerned with external control focus. The items concerned with internal control focus are scored in reverse. A high score on the scale indicates that the internal control focus in health management of an individual is developed. Cronbach Alpha internal consistency coefficient of the scale was found to be 0.67 in the study.

Ethical Considerations: This study was approved by the ethics committee of University Nursing Faculty (Date: 13.04.2016 and No: 2016-140), written permission was obtained from the district National Education Directorate. Students and their parents were informed about the research and written permissions were obtained. This research was supported by Ege University Scientific Research Projects Coordination Unit (Project ID:818).

Data Analysis: The data were analyzed using the SPSS for Windows, version 21.0 (SPSS Inc, Chicago, Illinois). Descriptive statistics (numbers, percentage distribution, mean, standard deviation), and in order to determine

the effect of the health education program, The paired sample t test and One-way ANOVA were used; p < .05 was evaluated istatistically significant.

RESULTS

The average age of the students participating in the study was 8.39 ± 0.95 (min = 6, max = 12) years and 50.5% were female.

In evaluating the pre-test, students' mean sub-dimension scores were 12.38 ± 2.26 for health responsibility, 27.64 ± 3.09 for nutrition, 6.48 ± 1.51 for exercise, 17.19 ± 2.99 for self-realization, 12.16 ± 2.28 for social support, 17.08 ± 2.94 for stress and coping, 10.60 ± 1.78 for safety, and 18.70 ± 2.75 for personal hygiene habits, and their mean score for the Health Perceptions and Health Behaviors Scale was 122.63 ± 14.97.

In the post-test, given after the health education, students showed a statistically significant increase in their mean scores as follows: health perceptions and health behaviors scale (p <.001), health responsibility (p <.001), nutrition (p <.05), exercise (p <.001), self-realization (p <.001), social support (p <.001), stress and coping (p <.001), safety (p <.05) and personal hygiene habits (p <.05) (Table 4).

Students' mean scores in the pre-test were 29.44 ± 3.32 on the control focus scale, 10.27 ± 1.57 on the internal focus sub-dimension, and 19.17 ± 2.98 on the external focus sub-dimension. In the post-test, administered after the health lessons were given, a statistically significant increase was seen in the mean scores of students on the control focus scale (p <.001), external control focus (p <.001), and internal control focus (p <.001; Table 3).

Table 3. The effect of health education program on students' health perception and health behaviors

Health Perceptions and Health Behaviors Scale	Pre-test	Post-test	Test[a] p
	$\bar{x}$ ± SD	$\bar{x}$ ± SD	
Sub-dimensions			
Health responsibility	12.38 ± 2.26	13.79 ± 1.71	20.827 .000**
Nutrition	27.64 ± 3.09	28.04 ± 4.12	2.968 .003*
Exercise	6.48 ± 1.51	6.68 ± 1.48	3.754 .000**
Self-realization	17.19 ± 2.99	19.22 ± 2.51	22.216 .000**
Social support	12.16 ± 2.28	12.63 ± 2.15	6.076 .000**
Stress and coping	17.08 ± 2.94	17.89 ± 2.79	8.572 .000**
Safety	10.60 ± 1.78	10.77 ± 1.68	3.014 .003*
Cleanliness habits	18.70 ± 2.75	18.96 ± 2.43	2.774 .006*
Scale total	122.63 ± 14.97	127.58 ± 9.62	12.211 .000**

*[a]Student t Test *p<.01 **p<.001*

Table 4. Students' Health Perception, Health Behaviors and Health Control according to Age and Gender

Variable	Health Perception and Behaviors Scale	Test
Gender	x̄ ± SD	
Female	128.67 ± 9.18	t= 4.336
Male	126.48 ± 9.93	p= .000*
Age		
6-7[x]	125.70 ± 9.32	F= 13.937
8-9[y]	127.35 ± 9.69	p= .000*
≥ 10[z]	130.61 ± 8.30	x< y < z
Variable	**Health Control Scale**	**Test**
Gender	x̄ ± SD	
Female	31.06 ± 9.93	t= 1.904[a]
Male	30.70 ± 3.43	p= .057
Age		
6-7[x]	29.86 ± 3.38	F= 22.941[b]
8-9[y]	30.81 ± 3.49	p= .000*
≥ 10[z]	32.22 ± 3.44	x< y < z

*t: Student t Test F: One-way ANOVA *p<.001*

A statistically significant difference was found in health perception and behaviors according to the gender ($p < .001$) and age of the students ($p < .001$). The mean health perception and behaviors scores were found to be higher in female students than in males, and students aged 10 and over compared with other age groups (Table 4). A statistically significant difference was found in the mean health control score according to the students' age groups ($p < .001$). It was determined that as students' ages increased, their health control also increased (Table 4). No statistically significant difference was found in the mean health control score according to the students' gender ($p > .05$).

The Correlation between Students' Health Perception and Behaviors and Their Health Control A statistically significant positive correlation was found between students' health perception, health behaviors and their health control ($r = 0.139$, $p < .001$).

DISCUSSION

After the health education program, it was found that students' mean scores on the Health Control Focus Scale showed a statistically significant increase. This result shows that the health education given by the school nurse had developed students' internal control focus in health management. Starting from the first years in school, individuals' self-awareness increases with increasing age, and years in school. The study conducted by Moussi et al. (2024) revealed that there was a significant improvement in students' nutritional knowledge after the educational intervention. Similarly, the result of Ilgaz (2021)'s research determined that the knowledge, behavior and condition of primary school students improved after the school nurse's evidence-based interventions to protect and improve children's health. Examining the health behavior of young people in this period, teaching the correct health behaviors to protect and maintain their health, and supporting them in the lacking areas is of great importance (Çelebi et al., 2017). It is known that students learn more effectively not only by reading but by seeing, doing and experiencing. The visual materials used in the education (power point presentations, banners and posters, cartoon and animation films, and songs and role-play) are important in achieving lasting learning effects. When something taught is perceived through more of the senses, what is learned will be that much more permanent, and will not be forgotten soon (Akkaya & Sezici, 2020; CDC, 2012). In developing the focus of health control; colorful / interesting presentations, health education with student participation and students having access to school health nursing services made students realize the relationship between health status and behaviors. In addition, all these practices encouraged students to change their negative health behaviors and increased their self control. In an experimental study by Mert and Aksayan (2016), it was found that a positive health behaviors discovery programand actions by school health nurses (giving an opportunity for students themselves or along with the nurse to make health assessments, interviews by the nurse on negative health behaviors) was effective on the development of children's health control focus in the process of the students gaining health responsibility, healthy nutrition behavior, self-realization, social support, coping with stress, safe behavior and hygienic behaviors.

Students' scores on the Health Perceptions and Health Behaviors Scale post – health education increased significantly, confirming previous findings (Mert & Aksayan, 2016) .

It was found that as a result of the education program, the mean health perception and behaviors score of female students was higher than that of male students. As a result of the training program, it was determined that female students perform better. Female students were more successful in understanding information and acting accordingly. According to the result obtained; gender is thought to have an important effect on primary school students' motivation to learn at school. The results of the studies conducted by Awan and Azeem (2017), Parajuli and Thapa (2017) are parallel to the results of our study. In these studies, it was determined that girls performed better than boys in teaching programs and extracurricular activities. Also, the mean health perception and behavior scores of students in the ten and over age group were higher than those of students in younger age groups (between 6 and 9 ages). It is thought that the reason for this is that both female students and those aged ten or more understood the education topics better and were therefore more successful in turning their knowledge and what they had learned into behavior. According to the findings of a study conducted in Chinese schools by Wang et al. (2018), a comparison of the scores of behavior to prevent infectious disease between students of different genders was found to be statistically significant. Female students had higher scores than male students. It was determined in the conclusion of the study that gender was a significant factor affecting students' infectious disease prevention behavior. The effect of the development of lifestyle activities in school on levels of physical activity was assessed with a program called PLAY (Promoting Lifestyle Activity for Youth), which was made by Pangrazi et al. (2003). It was concluded from the study that physical activity had increased more in female students than in males. It was thought that one of the probable reasons was that female students are more sensitive than males and pay more attention to personal health. For this reason, female students showed a higher level of health awareness and more correct infectious disease prevention behaviors (Wanget et al., 2018). In the conclusion of health education given by Emlek Sert and Bayık Temel (2014), it was found that education by nurses on planned nutrition and physical activity had an effect on weight management, but that the factors of gender and age had no effect.

CONCLUSIONS AND RECOMMENDATIONS

Considering that health perception and healthy lifestyle behaviors are formed in childhood, it is extremely important to develop these two concepts at the earliest period, especially in school-age children.

It was concluded in the study that health education program implemented by the nurse was effective in primary school students' health perception, health behaviors and health control. The contributions on this topic by full-time school health nurses are undeniable. For this reason, school health nurses must certainly be included in the planning and implementation of school health services.

In health education to be given in schools, the effective participation of students in activities relating to gaining positive health behaviors must be ensured, and more permanent learning and easier transfer of what has been learned into behavior must be ensured by interactive, participatory education of students. School health is a service which is broad-ranging, requires continuity and most importantly necessitates cooperation between sectors. For this reason, school health services are a health service which must be conducted in a health unit to be set up within the school in cooperation with first, second and third stage health institutions, in this, the school nurse has a large role to play.

Families, friends, teachers and environmental factors have a strong influence on children's healthy lifestyles. Everyone involved in the child's education must cooperate in improving health perception, health behaviors and health control. Lack of attention to health education has and will continue to have a profound impact on public health indicators, especially in low-income countries. Health education programs have a positive impact on attitudes and behaviors and are vital for public health professionals fighting to end health inequities.

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Acquisition of data for the study: AK, ZES, HŞ
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