

The effect of activity-supported hand-hygiene and mask-using education on behavior of secondary school students: Wash your hands, wear your mask, do not get COVID-19!

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ABSTRACT

Objective: COVID-19 still poses a global threat. Children may develop infections (COVID-19) as they dislike using masks, touch their faces more frequently while using masks, and often take off/on their masks. This quasi-experimental study aimed to examine the effect of education for secondary school students on hand hygiene and mask use. **Method:** A total of 273 secondary school students were included in the study and were provided with two weeks of education on hand hygiene and mask use, including presentations and practical activities. A Descriptive Information Form, the Hand Hygiene Behavior Form, and the Mask-Wearing Behavior Form were used. The data collection forms were applied before (T1) and one month after (T2) the education. **Results:** Of the students, 57.5% had previously received education on hand hygiene and 44.3% on correct mask use. The students' hand hygiene behavior (T1=31.46±5.25, T2=32.90±5.43; t=98.861) and mask-wearing behavior (T1=20.10±4.48, T2=21.38±5.71; t=74.113) total mean score significantly increased after the education. **Conclusion:** Correct hand hygiene and mask use education, which uses simple and easy-to-use educational materials to appeal to students and allows them to participate in interactive applications, effectively makes students acquire correct hand hygiene and mask use behaviors.

Keywords: Children, hand hygiene, masks, COVID-19, health education

Aktivite destekli el hijyeni ve maske kullanım eğitiminin ortaokul öğrencilerinin davranışlarına etkisi: Ellerini yıka, maskeni tak, COVID-19 olma!

ÖZET

Amaç: COVID-19 hala küresel bir tehdit oluşturuyor. Çocuklar maske kullanmaktan hoşlanmadıkları, maske kullanırken yüzlerine daha sık dokundukları ve maskelerini sık sık çıkardıkları/taktıkları için enfeksiyon (COVID-19) geliştirebilirler. Bu yarı deneysel çalışma, ortaokul öğrencilerine verilen bir eğitimin el hijyeni ve maske kullanımına etkisini incelemeyi amaçlamıştır. **Yöntem:** Çalışmaya toplam 273 ortaokul öğrencisi dahil edilerek el hijyeni ve maske kullanımı konusunda sunum ve uygulamalı etkinlikleri içeren iki haftalık eğitim verildi. Tanımlayıcı Bilgi Formu, El Hijyeni Davranış Formu ve Maske Takma Davranış Formu kullanıldı. Veri toplama formları eğitimden önce (T1) ve eğitimden bir ay sonra (T2) uygulanmıştır. **Bulgular:** Öğrencilerin %57.5'i daha önce hijyen, %44.3'ü ise doğru maske kullanımı konusunda eğitim almıştı. Öğrencilerin el hijyeni davranışı (T1=31.46±5.25, T2=32.90±5.43; t=98.861) ve maske takma davranışı (T1=20.10±4.48, T2=21.38±5.71; t=74.113) toplam puan ortalamasında eğitim sonrasında anlamlı artış görülmüştür. **Sonuç:** Öğrencilerin ilgisini çekecek basit ve kullanımı kolay eğitim materyallerinin kullanıldığı, interaktif uygulamalara katılma olanağı sağlayan doğru bir el hijyeni ve maske kullanımı eğitimi, öğrencilere doğru el hijyeni ve maske kullanım davranışlarını kazandırmada etkilidir.

Anahtar Kelimeler: Çocuklar, el hijyeni, maskeler, COVID-19, sağlık eğitimi

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INTRODUCTION

In Turkey, 6.4% of all COVID-19 cases are children under the age of 15. Children under the age of 15 constitute 22.3% of the entire population in Turkey.¹ Children have milder clinical findings due to the COVID-19 disease compared to adults.² Most children recover within a few weeks after the onset of their complaints and have no serious health issues during the disease process.^{3,4} However, multisystem inflammatory syndrome can be observed in some children after COVID-19 infection.^{5,6} Fever, high biochemistry indicators related to infection, and involvement of at least two organs or systems can be seen in a patient with COVID-19 contact. It is now life-threatening also for children due to multisystem inflammatory syndrome.^{5,7} Wearing masks and washing hands are among the most common measures against the rapid spread of COVID-19 and its life-threatening consequences.⁸

The World Health Organization (WHO) emphasizes that everyone should wash their hands frequently with soap and water and use hand disinfectant gels or solutions to protect themselves and others.⁹ The WHO and The United Nations Children's Fund (UNICEF) have reported several recommendations on how long and when to wash hands. Studies show that children still exhibit misbehaviors regarding handwashing.¹⁰⁻¹²

Masks are another important tool in the prevention of COVID-19 transmission.¹³ The WHO and UNICEF recommend that children aged 6-11 years only wear masks under certain circumstances as follows: "They should wear a mask if they can put on and take off the mask on their own, live in an environment with a high contamination rate, have access to a clean mask, and if the mask does not impair their cognitive development and mood". In addition, if appropriate distance protection is not possible for children older than 12 years of age, it is recommended that the methods applied to adults should be applied to children, especially in environments with high contamination rates.⁹

A study of secondary school students in Turkey has stated that 50.3% of the children have not received any education on wearing masks.¹⁴ Children may develop infections as they dislike using masks, touch their faces more frequently while using masks, and often take off/on their masks.¹⁵ To eliminate the problems related to the use of masks and hand hygiene in children, it is essential to prepare them for the correct hand hygiene and use of masks, to clearly explain the reasons for wearing masks, and to make them gain mask-wearing behavior. This study aimed to examine the effect of education for students on hand hygiene and mask usage. In line with this

general purpose, the hypotheses of the study are as follows:

H₀ = An education for school children aged 11-14 years on hand hygiene and mask usage does not affect their hand hygiene and mask use behaviors.

H₁ = An education for school children aged 11-14 years on hand hygiene and mask use will ensure that children use correct hand hygiene and masks.

METHOD

Design and participants

This is a quasi-experimental study with a registration number (NCT05572840). The study was conducted in a secondary school in the western Black Sea region of Turkey. During the 2022-2023 academic term, 316 students are enrolled in the school where the study is conducted (N=316). In the research, it has been tried to reach the entire universe by not going to sample selection. For the implementation of the research, 273 students who met the criteria for becoming a member of the study were included in the study. The participation rate in the research is 86.4% (273/316).¹⁶ Criteria for participation in the study: (1) Having family consent (2) Willingness to participate in the study (3) Complete all education and follow-ups completely. Exclusion for participation in the study: (1) To leave complete in all education and follow-ups.

Data collection tools

A Descriptive Information Form, the Hand Hygiene Behavior Form, and the Mask-Wearing Behavior Form were the data collection tools.

Descriptive Information Form: The form includes questions about the children's age, gender, grade, and previous education on hand hygiene and mask use.

Hand Hygiene Behavior Form: This form was developed by Ayran et al.¹⁴ to determine the hand hygiene behaviors of children. This form includes 21 items, scoring as "Never = 0", "Sometimes = 1" and "Always = 2". The total scale score varies between 0 and 42. The response rates of each item can also be used in the evaluation of the form. The Cronbach's alpha value of the scale was determined as 0.79.¹⁴ In this study, the Cronbach's alpha value of the scale was found to be 0.79.

Mask-Wearing Behavior Form: This form was developed by Ayran et al.¹⁴ to determine the mask-wearing behaviors of children. This form includes 21 items, scoring as "Never = 0", "Sometimes = 1" and "Always = 2". The total scale score varies between 0

and 42. The response rates of each item can also be used in the evaluation of the form. The Cronbach's alpha value of the scale was determined as 0.72.¹⁴ In this study, the Cronbach's alpha value of the scale was found to be 0.77.

Education program

The program contains two modules consisting of two theoretical and two practical activities for two weeks and was prepared by the researchers in line with the literature.^{9,17,18} The first module consists of a

PowerPoint presentation, lecture, and interactive activity about proper hand hygiene. The second module consists of a PowerPoint presentation, lecture, and interactive activity for the correct use of masks. Expert opinions were received from a total of 10 pediatric nursing experts to develop the program. After relevant changes were made in line with their opinions, a pilot study was conducted with five students. The modules were finalized after receiving feedback from the students regarding the clarity and applicability of the program. Table 1 presents relevant information on the modules.

Table 1. Education program

Modules	Descriptions
Module 1: Correct Hand Washing/Hygiene Module	
Lecturing (1st week-1st hour)	Lecture, PowerPoint presentation, Brochure
Content	COVID-19 pandemic, health problems caused by the virus, spread of the virus, the importance of hand hygiene, hygienic hand washing
Activity (1st week – 2nd hour)	How Accurately Do We Wash Our Hands?
Materials	Food coloring, water, latex gloves
Application	The researcher (executive student) and students wear latex gloves. Children are asked to wash their latex gloves with water dyed with food coloring. It is emphasized that the remaining unpainted parts of the gloves are not actually cleaned. The researcher shows correct hand washing using the correct hand washing technique with food dyed water. Children are asked to repeat at the same time. It is stated that with the right-hand washing technique, there will be no unpainted (unwashed) area in the glove. The importance of correct hand washing technique is emphasized.
Module 2: Correct Mask Usage Module	
Lecturing (2nd week-1st hour)	Lecture, Power Point presentation, Brochure
Content	The role of mask use in preventing the spread of virus, mask types and protection, things to consider when wearing masks, hand hygiene
Activity (2nd week – 2nd hour)	Make Your Own Mask
Materials	White surgical mask suitable for children, felt-tip pen
Application	Several figures and drawings are made on masks with children. They are asked to hang their masks on the classroom board. Then, surgical masks are distributed to the children in a clean package.

Data collection

The data were collected between September and December 2022. The researchers informed the principal and the teachers of the school where the study would be conducted, about the purpose and information confidentiality of the study. Written consent was obtained from the parents of the students through the school principal and vice principal. Before the education (T1), the students were asked to fill in the tools completely. A two-week education program with two modules was given to the students. To increase its permanence, several brochures on hand hygiene and the correct use of masks were given to the students after each module. One month after the education (T2), the students were asked to fill in the tools completely.

Data evaluation

Data were evaluated using the SPSS for Windows 22.0 program. The students' demographic data were presented in percentage, number, mean and standard deviation. The Kolmogorov-Smirnov test was used to check the normality of the data. The student t-test compares two groups with normally distributed data. The chi-square test to examine the relationship

between pre-and post-test correct hand hygiene and mask use behaviors of the students.

RESULTS

The mean age of the students was 11.45±1.28 years. Of them 50.5% were girls, 37.7% were 5th-grade students, and 57.5% had previously received education on hand hygiene and 44.3% on correct mask use (Table 2).

Table 2. Characteristics of students (n=273)

	Mean±SD	Min-Max
Age	11.45±1.28	9-14
	n	%
Gender		
Girl	138	50.5
Boy	135	49.5
Grade in secondary school		
5 th	103	37.7
6 th	49	17.9
7 th	31	11.4
8 th	90	33.0
Past hand hygiene education		
Yes	157	57.5
No	116	42.5
Past mask use education		
Yes	121	44.3
No	152	55.7

SD: Standard Deviation, Min: Minimum, Max: Maximum

The students' hand hygiene behavior total mean score was significantly increased after the program (pre-test = 31.46±5.25, post-test = 32.90±5.43; t=98.861, p<0.001). After the education, the students more frequently washed their hands before wearing a mask (T1=31.9%, T2=51.8%), after wearing a mask (T1=37.4%, T2=57.9%), after visiting bathroom (T1=83.2%, T2=95.2%), after waking up in the morning (T1=74.0%, T2=78.0%), after combing the hair (T1=26.0%, T2=38.5%), after touching things (T1=38.5%, T2=50.9%), after returning home (T1=86.8%, T2=97.1%), after contacting with animals (T1=91.6%, T2=93.4%),

after contacting with body fluids (T1=97.1%, T2=98.1%), after coughing or sneezing (T1=76.4%, T2=80.6%), and after having dirty hands (T1=88.3%, T2=90.1%). After the education, the students more frequently washed their hands with soap (T1=89.0%, T2=92.7%), used warm water (T1=40.7%, T2=52.0), took off their jewelry before washing their hands (T1=62.6%, T2=68.5%), washed their hands for at least 20 seconds (T1=60.1%, T2=64.1%), rinsed their hands thoroughly (T1=79.9%, T2=83.9%) and dried their hands with a towel (T1=60.8%, T2=76.9%) (p<0.001) (Table 3).

Table 3. Differences in hand washing hygiene behaviors of the participants before and after the education

Hand hygiene behaviors		Before education (T1) (n=273)		After education (T2) (n=273)		Difference
		Mean±SD		Mean±SD		t, p
Total score		31.46± 5.25		32.90±5.43		t=98.861, p<0.001
Items		n	%	n	%	χ ² , p
Washing hands before and after meals	Always	214	78.4	227	83.2	2.638, p=0.267
	Sometimes/ No	59	21.6	46	16.8	
Washing hands before using the toilet	Always	141	51.6	164	60.1	4.173, p=0.124
	Sometimes/ No	172	48.4	109	39.9	
Washing hands after using the toilet	Always	260	95.2	268	98.2	8.264, p=0.016
	Sometimes/ No	13	4.8	5	1.8	
Washing hands after waking up in the morning	Always	202	74.0	213	78.0	12.530, p<0.001
	Sometimes/ No	71	26.0	60	22.0	
Washing hands after combing my hair	Always	71	26.0	105	38.5	9.752, p<0.001
	Sometimes/ No	202	74.0	168	61.5	
Washing hands after touching things	Always	105	38.5	139	50.9	8.892, p=0.011
	Sometimes/ No	168	61.5	134	49.1	
Washing hands before wearing a mask	Always	87	31.9	114	41.8	13.419, p<0.001
	Sometimes/ No	186	68.1	159	58.2	
Washing hands after wearing a mask	Always	102	37.4	158	57.9	23.037, p<0.001
	Sometimes/ No	171	62.6	115	42.1	
Washing hands after I get home	Always	237	86.8	265	97.1	28.628, p<0.001
	Sometimes/ No	36	13.2	16	2.9	
Washing hands after contact with animals	Always	250	91.6	255	93.4	15.497, p<0.001
	Sometimes/ No	23	8.4	18	6.6	
Washing hands after contact with tears, mucus, sputum and saliva	Always	237	86.8	246	97.1	28.628, p<0.001
	Sometimes/ No	36	13.2	27	2.9	
Washing hands after coughing or sneezing	Always	209	76.4	220	80.6	110.410, p<0.001
	Sometimes/ No	64	23.6	53	19.4	
Washing hands when my hands are visibly dirty	Always	241	88.3	246	90.1	126.404, p<0.001
	Sometimes/ No	32	11.7	27	9.9	
Using soap to wash hands	Always	243	89.0	253	92.7	28.132, p<0.001
	Sometimes/ No	30	11.0	20	7.3	
Using warm water to wash hands	Always	111	40.7	142	52.0	94.067, p<0.001
	Sometimes/ No	156	59.3	131	48.0	
Taking off jewelry like rings and watches before washing hands	Always	171	62.6	186	68.1	141.017, p<0.001
	Sometimes/ No	102	37.4	87	31.9	
Wetting hands under running water	Always	177	64.8	187	68.5	124.310, p<0.001
	Sometimes/ No	96	35.2	86	31.5	
Rubbing hands vigorously for at least 20 seconds	Always	164	60.1	175	64.1	129.922, p<0.001
	Sometimes/ No	109	39.9	98	35.9	
Rinsing hands thoroughly under water	Always	218	79.9	229	83.9	55.494, p<0.001
	Sometimes/ No	55	21.1	44	16.1	
Drying hands with a paper towel starting from wrists	Always	166	60.8	210	76.9	57.701, p<0.001
	Sometimes/ No	107	39.2	63	31.1	
Turning off the faucet with the same paper towel	Always	166	60.8	210	76.9	57.701, p<0.001
	Sometimes/ No	107	39.2	63	31.1	

SD: Standart Deviation, t: Student t test, χ²: Chi-square test

The students' mask-wearing behavior total mean score was significantly increased after the program (pre-test=20.10±4.48, post-test=21.38±5.71; $t=74.113$, $p<0.001$). After the education, the students wore masks more frequently when going out ($T1=44.7\%$, $T2=64.8\%$), washed their hands with soap and water after touching the mask ($T1=51.3\%$, $T2=56.0\%$), took the mask off by holding the laces ($T1=69.2\%$, $T2=72.2\%$), could distinguish the front and back of the mask ($T1=67.0\%$, $T2=79.5\%$), and wore the mask completely covering their mouth, nose, and chin ($T1=57.5\%$, $T2=69.5\%$) ($p<0.001$).

After the education, the students less frequently wore more than one mask at the same time ($T1=84.2\%$, $T2=74.0\%$), pulled the mask down to expose the mouth ($T1=84.2\%$, $T2=74.0\%$) and nose ($T1=83.5\%$, $T2=76.2\%$), touched the mask ($T1=85.0\%$, $T2=78.4\%$), lowered the mask under the chin ($T1=79.5\%$, $T2=71.0\%$), took off and wore the mask repeatedly ($T1=88.2\%$, $T2=66.6\%$), unmasked others ($T1=91.9\%$, $T2=81.4\%$), and removed the mask by holding its front part ($T1=17.2\%$, $T2=15.0\%$) ($p<0.001$) (Table 4).

Table 4. Differences in mask use behaviors of the participants before and after the education

Mask-wearing behaviors		Before education (T1) (n=273)		After education (T2) (n=273)		Difference
		Mean±SD		Mean±SD		t p
Total score		20.10±4.48		21.38±5.71		$t=74.113$ $p<0.001$
Items		n	%	n	%	χ^2 , p
Wearing a mask when go out	Always	122	44.7	177	64.8	117.567 $p<0.001$
	Sometimes/ No	151	55.3	96	35.2	
Wearing multiple masks at the same time	Always	43	15.8	71	26.0	44.829 $p<0.001$
	Sometimes/ No	230	84.2	202	74.0	
Pulling mask down to expose mouth	Always	43	15.8	71	26.0	44.829 $p<0.001$
	Sometimes/ No	230	84.2	202	74.0	
Pulling mask down to expose nose	Always	45	16.5	65	23.8	83.928 $p<0.001$
	Sometimes/ No	228	83.5	208	76.2	
Opening mouth and/or nose to breathe while using mask	Always	72	26.4	66	24.2	96.174 $p<0.001$
	Sometimes/ No	201	73.6	207	75.8	
Touching mask with hand while mask is on face	Always	41	15.0	59	21.6	101.099 $p<0.001$
	Sometimes/ No	232	85.0	214	78.4	
Lowering mask under chin while using it	Always	56	20.5	79	28.9	47.640 $p<0.001$
	Sometimes/ No	217	79.5	194	71.1	
Taking off and put on mask over and over	Always	32	11.7	64	23.4	61.882 $p<0.001$
	Sometimes/ No	241	88.3	179	66.6	
Taking off other people's masks	Always	22	8.1	51	18.7	109.065 $p<0.001$
	Sometimes/ No	251	91.9	222	81.3	
Washing hands with soap and water after touching mask	Always	140	51.3	153	56.0	66.484 $p<0.001$
	Sometimes/ No	133	48.7	120	44.0	
Taking off used mask by holding laces	Always	189	69.2	197	72.2	40.810 $p<0.001$
	Sometimes/ No	84	30.8	76	27.8	
Removing used mask by holding it from the front	Always	226	82.8	232	85.0	65.578 $p<0.001$
	Sometimes/ No	47	17.2	41	15.0	
Before putting on mask, washing hands with soap and water	Always	107	39.2	154	56.4	81.502 $p<0.001$
	Sometimes/ No	166	60.8	119	43.6	
Distinguishing front and back of mask	Always	183	67.0	217	79.5	145.615 $p<0.001$
	Sometimes/ No	90	33.0	56	20.5	
Wearing mask with the metal strip on the top of the nose bridge, with the folded part on the outside	Always	228	83.5	234	85.7	106.127 $p<0.001$
	Sometimes/ No	45	16.5	39	14.3	
If the mask is elastic, wearing the elastics on the sides of mask by passing it through auricle	Always	208	76.2	212	77.7	83.860 $p<0.001$
	Sometimes/ No	65	23.8	61	22.3	
Placing the metal strip on the top of mask by pressing it lightly over bridge of nose	Always	194	71.1	210	76.9	150.913 $p<0.001$
	Sometimes/ No	79	28.9	63	23.1	
Wearing mask in such a way that it completely covers nose, mouth and chin and does not allow air passage from the sides	Always	157	57.5	190	69.6	96.397 $p<0.001$
	Sometimes/ No	116	42.5	83	30.4	

SD: Standard Deviation, t: Student t test, χ^2 : Chi-square test

DISCUSSION

This study aimed to examine the effect of education given to children aged 11-14 years on hand hygiene/washing and mask use. After the education,

the children gained the correct hand hygiene and mask-use behaviors. The most effective weapons in the fight against COVID-19 are masks, distance, and hygiene. Violation of hygiene rules by children is a common situation.¹⁹ Children may have wrong hand hygiene and mask-wearing behaviors. It is often not

possible for parents to follow their children whenever they leave and enter the house. Therefore, education is necessary for children especially during the COVID-19 pandemic to improve their behaviors and raise awareness in this regard.¹⁰⁻¹²

In this study, the students acquired more correct behaviors after the education on hand hygiene, including several important subjects such as time to wash hands, duration of handwashing, and use of handwashing products. Similarly, in the study that Yumru and Koç²⁰ examined the effectiveness of role-play-supported hand hygiene education, it was stated that 49% of children washed their hands before eating, 35.6% after eating, 27.8% before going to the toilet, 43.8% after going to the toilet, 35.1% after coming home from outside before education. In the same study, it is stated that 84.0% of children washed their hands before eating, 80.4% after eating, 65.5% before going to the toilet, 85.1% after going to the toilet, 77.3% after coming home from the outside after role-play-supported hand hygiene education. With role-play-supported hand hygiene education, children have paid more attention to hand hygiene from there. In the same study, 82% of the students considered 10 seconds sufficient for handwashing before the education, while this figure decreased to 12.9% after the education. The rate of students who considered that they should wash their hands with warm water was 27.8% before the education, while it increased to 93.3% after the education. In addition, while 42.8% of the students considered that jewelry should be removed before washing their hands before the education, this rate was 89.2% after the education. While 47.4% of the students considered that hands should be dried after washing, - this figure increased to 96.9% after the education.²⁰

In addition to presentation-supported education, the present study included hygienic and unhygienic hand-washing activities in which children used gloves with food coloring to provide hand hygiene. Thus, the children's awareness of the importance of hand hygiene was raised. There are several studies with videos/presentations that supported handwashing education and these studies are effective in providing correct hand-washing knowledge and skills to children.^{21,22} Öncü¹⁰ took several photographs of the students' hands after hand washing with fluorescent gel application and showed the fluorescent residues on their hands, and then provided them with a hand hygiene education to show they could adequately wash their hands and purify them from germs. However, their study suggested that concretization with fluorescent gel alone is not effective enough for hand hygiene and different motivational methods should be used in students.¹⁰ Evidence-based guidelines and examples should be presented to school health nurses about

correct handwashing education with interactive applications in which children take part in education, using simple and easy-to-use educational materials that will increase their interest and will for handwashing.²³ The active participation of the students in the educational activities and the fact that the students realized that there was no unpainted (unwashed) area on the gloves during the practical activity may have increased the effectiveness of the education in this study.

The students gained the correct mask-wearing behaviors, such as time to remove the mask, duration of mask use, mask types, and hand hygiene while using masks, after the education in this study. N95, surgical masks, and homemade masks protect from viruses, albeit at various rates.²⁴ Therefore, children should also use masks for protection from viruses. In the literature, there is only one study about the effectiveness of mask use education for children during the pandemic, where the use of masks in children with special needs was facilitated by an education in which they were gradually exposed to masks.²⁵ In the present study, children were educated and demonstrated in practice to use masks correctly through presentation-supported and practical educational activities. In addition, the typically developing children were asked to participate in a mask coloring activity to perceive masks more positively and to create their masks. By being involved in the activity and designing their masks to use, their perception of masks was turned positive.

Limitations and strengths

Although the impact of the COVID-19 pandemic has waned, it can still be difficult for institutions to accept studies with face-to-face interviews due to the pandemic. Therefore, the study was conducted in one single center. It is recommended that the study be conducted in more schools with students from diverse socio-economic groups. The fact that children heard and saw the concepts of mask use and hand hygiene during the pandemic may have caused the first measurement findings of the study to be high. The results obtained from the study are limited to the forms used in the data collection phase and are based on students' self-reports. This study has also some strengths. The study reached all students for both pre-and post-tests. The most important strength and aspect of the study, there were games and fun-based activities that could enable students to interactively participate in the education program, ensuring they learn while having fun.

CONCLUSION and RECOMMENDATIONS

The COVID-19 pandemic is a vital problem due to its contagious nature that continues globally and can have serious consequences. In the COVID-19

pandemic, knowledge of hand hygiene and mask-wearing is essential, especially in decreasing the prevalence of infectious diseases and the burden of care in childhood. Our results demonstrated the effectiveness of the educational program, including low-cost, fun, and interactive interventions, in increasing secondary school students' compliance with hand hygiene and mask use. Health education delivered by school health nurses is essential in promoting health and preventing the spread of infectious diseases among children in schools. Health promotion programs and health education classes should be implemented for children during the pandemic period. School health nurses and teachers also have an important role in teaching children good hygiene practices and supervising their cleanliness. School health nurses and teachers, who have an important role in gaining healthy behaviors, can increase the awareness of children on this issue by planning educational programs with children of different ages and with larger samples.

Ethical considerations

For conducting the study, approval was obtained from the social and human sciences ethics committee of a university (Protocol No: 2022-SBB-0209, Date: 27.05.2022, No: 9) and permission from the provincial directorate of national education. The students' parents were informed about the purpose of the study, the confidentiality of the students' responses, where and how the data would be stored; and a written consent was obtained from the parents for their children to participate in the study.

Author contributions

Working idea/design: AK, HK

Data collection: AK, HK

Data analysis and interpretation: AK, HK

Literature review: AK, HK

Writing the article: AK, HK

Critical review: AK, HK

Final approval and responsibility: AK, HK

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