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THE EFFECT OF VACCINE-RELATED SCRATCH ACTIVITIES ON THE VACCINE AWARENESS OF SECONDARY SCHOOL STUDENTS

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Abstract

Due to the Covid 19 Pandemic, countries around the world are going through very difficult times and thousands of people are dying. This shows that the treatment of infectious fatal diseases is very important. Therefore, it is of great importance to develop vaccines and drugs that prevent infectious diseases as soon as possible. Vaccine development studies continue in many countries, covering the whole world. Vaccine trials have been completed in China, Germany, England and the USA. However, despite these positive developments, there are many people who are against vaccination. However, the medical world argues that vaccination prevents many diseases and is very important in stopping mass spread. In our country, there are people who have positive views towards vaccination, as well as people who have negative views. In order for these people to think positively, studies need to be carried out to raise awareness about how important the vaccine is. In this study, vaccination activities were developed by researchers using the Scratch program in order to increase vaccine awareness of secondary school students. These activities developed in this study with a quasi-experimental design with a control group were made available to students in a secondary school in the Marmara Region. In the experimental group, information about the vaccine was given using these activities. In the control group, information about the vaccine was given using traditional methods. A Vaccine Awareness Survey was administered to all groups as a pre-test before teaching. After the training, the same survey was applied as a posttest and the effect of the developed Scratch activities on vaccine awareness was determined. Although there was no significant difference between the pre-test scores of the groups, it was determined that the post-test scores of the experimental group, in which the activities developed using the Scratch Program were used after the instruction, were significantly higher than the control group. In light of these results, it is important to disseminate the activities developed with applications such as Scratch, etc., which attract the attention of students.

Keywords: Covid-19, scratch program, secondary school students, vaccine.

INTRODUCTION

The new type of corona virus, detected in Wuhan, China in 2020, has become an epidemic and has reached a global dimension by affecting the whole world (Şahin Akboğa, 2020). The disease spread all over the world in a very short time due to its high human-to-human contagiousness. More than fourteen million people have been infected. This epidemic, which causes an increase in the number of cases and deaths every day both in the world and in our country, has been declared a pandemic by the

World Health Organization (WHO). Compliance with personal precautions to protect against the Covid-19 virus is seen as the most effective way to prevent the epidemic. It is also obvious that vaccination is very effective in protecting against diseases.

The general and basic purpose of healthcare professionals is to protect the health of individuals and prevent the transmission of diseases and illnesses. Vaccination is also of great importance in preventing the transmission of infectious diseases. Vaccination is very important for individuals and societies. It plays a major role in protecting against the disease and preventing the spread of the disease. At the same time, when unvaccinated individuals are vaccinated, it also affects the society and positive results are achieved. Of course, there are people who do not want to be vaccinated and do not think that the vaccine is beneficial (Gür, 2019). Therefore, in order to raise people's awareness, this issue was considered to raise the awareness of secondary school students on this subject.

When the studies on vaccines in the literature are examined, it is seen that there are not many studies, but an increase in research on this subject has been observed due to the pandemic (Gür, 2019; Kılınçarslan, Sarıgül, Toraman & Şahin, 2020; Yüksel & Topuzoğlu, 2019; Yürüyen, Toprak & Kutlu, 2019).

In their research, Yürüyen et al. (2019) aimed to raise awareness about physician approaches and practices regarding adult vaccination. For this purpose, they created an awareness survey consisting of 22 multiple choice questions. They applied this survey to 200 physicians and evaluated the answers as a percentage based on frequency calculation. According to the results of the research, it was determined that the vaccination rate of physicians in adulthood was 87%, and the most frequently vaccinated vaccine was the Hepatitis B vaccine. It has been found that the rate of physicians recommending vaccination to their patients is quite high, at 90%. In addition, only 20% of physicians stated that they took part in a vaccine-related training activity after graduation, and only 30% stated that they gave due importance to adult vaccination in their daily practice. As a result, according to the theoretical knowledge and the accuracy rates of the answers, it was determined that the theoretical knowledge of the physicians was sufficient. However, they concluded that current information on vaccination practices and travel health in risk groups should be updated.

Protecting the health of individuals and preventing diseases is the main purpose of health services. Vaccination is one of the most important practices in preventing infectious diseases (Yüksel & Topuzoğlu, 2019). Although there is an increase in vaccination rates in our country, concerns about vaccination are increasing, as in many other countries. Yüksel and Topuzoğlu (2019) stated in their study in which they examined the studies on vaccination, that there is a need to reconsider the factors affecting vaccine applications. According to the report prepared as a result of the work of the World Health Organization commission, which was established in 2012 to investigate vaccine refusals, the concepts of vaccine hesitancy and vaccine rejection were explained. According to the data obtained from the studies examined in this study, the behaviors and reasons why parents refuse, delay or hesitate to vaccinate their children were examined. The most important reason for vaccine refusal is the lack of knowledge of parents. Since physicians are the most reliable source of information about vaccination, they play an important role in parent education. Since the fact that diseases and their complications are less common as a result of vaccination does not eliminate the need for vaccination, parents should be informed about childhood vaccinations, especially the effectiveness of vaccines and vaccine components; Being adequately informed about the risks, such as possible side effects and the benefits of vaccination, can enable them to make an informed choice about vaccinating their children.

In their study, Aydoğmuş et al. (2010) investigated the awareness rates of influenza and pneumococcal vaccination. Although pneumococcal and influenza vaccinations are recommended for individuals aged 65 and over, it has been observed that vaccination rates in this age group do not reach the desired levels. For this reason, they aimed to raise awareness on this issue in their studies. In their research, they studied 103 patients aged 65 and over who applied to the outpatient clinic for any reason. Patients were asked whether they had received influenza vaccine in the last year, pneumococcal vaccine after the age of 65, or within the last five years, and patients who had not been vaccinated were asked about their reasons for not having received the vaccine. Elderly people who

had not been vaccinated were asked whether they would be vaccinated after being informed about vaccination. It has been stated that the most common reason for individuals over the age of 65 not to get vaccinated is that they do not know the indication (46.7% for influenza vaccine, 61% for pneumococcal vaccine). In the study, it was stated that after the necessary information was given, 60% of the patients decided to get influenza vaccine and 71.2% decided to get pneumococcal vaccine. As a result, it has been determined that the most important reason for not reaching the desired prevalence of immunization in the elderly is lack of information and low level of awareness about vaccination. As a recommendation, it is stated that by asking every individual over the age of 65 whether they have received these vaccines or not, the elderly can be informed and social awareness about vaccination can be increased and immunization targets can be approached at the desired rates.

In this study, vaccination activities were developed by researchers using the Scratch Program in order to increase vaccine awareness of secondary school students. The effect of these activities on students' vaccination awareness was investigated. For this purpose, answers were sought to the following questions.

• What is the awareness of secondary school students about vaccination before education?

• What is the awareness of secondary school students about vaccination after education?

• What is the impact of the developed Scratch Activities on students' vaccination awareness?

METHOD

Research Design

The research undertook a quasi-experimental research design with control group, pre-test, and post-test. As Karasar (2005) noted, the research designs with pre-test and post-test control groups are models which have experimental and control groups to be measured with regards to a dependent variable prior to and after the experimenting.

Sample and Sampling Method

A quasi-experimental design with a control group was used in the research. In sample selection, easy sampling method was used based on accessibility. The sample of the research consists of 100 secondary school 5th grade students studying in a secondary school in the Marmara Region.

Table1.Distribution of Students in Exp. and Control Groups by Groups and Gender.

Gender	Experimental	Control Group	Total
Girl	18	22	40
Boy	29	31	60
Total	47	53	100

Data Collection Tool

Vaccine Awareness Survey

In this research, a Vaccine Awareness Survey was applied to the students participating in the research as a pre-test and post-test as a data collection tool. A 5-point Likert-type survey prepared by Kılınçarslan et al. (2020) consists of a total of 15 items, 7 of which contain positive and 8 negative statements. When performing statistical analysis, negative statements were reversed in scoring. The highest score that can be obtained from the Vaccine Awareness Survey is 75 and the lowest score is 15. For the Vaccine Awareness Survey, the Cronbach's Alpha reliability coefficient obtained from the pre-test data was calculated as 0.93 and 0.94 for the post-test data.

Procedure

Vaccine Awareness Survey was applied to the entire sample as a pre-test. Vaccination activities developed using the Scratch program were carried out in the experimental group. In the control group,

information about the vaccine was given. After the training, the Vaccine Awareness Survey was applied to both groups as a posttest. The data obtained was analyzed using SPSS and Excel programs.

Vaccine Scratch Activities

Scratch activities related to vaccination were prepared by three researchers who were sixth, seventh and eighth grade secondary school students. The researchers have taken courses on the Scratch program in secondary school classes and have the necessary proficiency.

Figure1. Vaccine Scratch activity page

The dart game and informative animation prepared by coding through the Scratch application in order to inform secondary school students about vaccine awareness are explained below.

Dart Game: When the game starts, students are asked questions about vaccination. Students who answered these questions played a dart game by shooting darts with a syringe after each question, depending on whether the answers they clicked were correct or incorrect. While the students were playing darts, their awareness about the vaccine was increased.

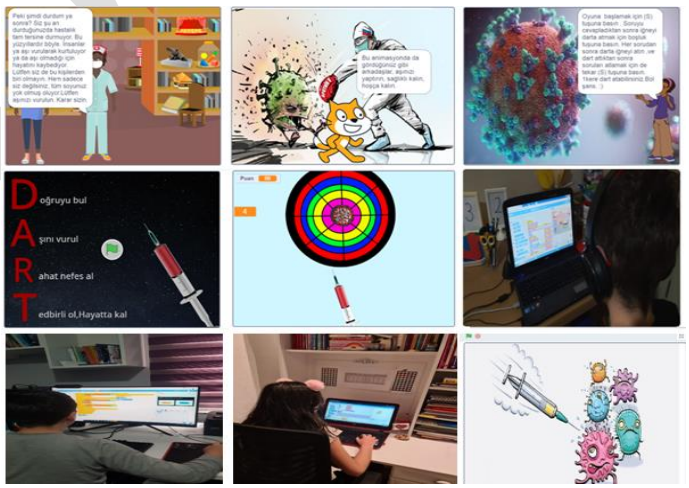

Figure 2. Researchers preparing a Vaccine-related Scratch activity.

Animation: After the nurse informs our main character, who is undecided whether to be vaccinated or not, the player is offered the options of "getting vaccinated" or "going home". If the player chooses the "get vaccinated" option, our character will not get sick after 14 days and will continue his life happily. However, if the player chooses the "go home" option, an information animation appears in which our character is sick and regrets not being vaccinated.

RESULTS

To determine whether the Vaccine Awareness Survey data showed a normal distribution, the values obtained by dividing the Skewness and Kurtosis values by the Skewness and Kurtosis error values, respectively, were examined. If these values are between -1.96 and +1.96, the data is considered to have a normal distribution (Can, 2014). As seen in Table 2, the data shows a normal distribution.

Table 2. Normal Distribution Values of Data

	Pre Test		Post Test	
	Exp.	Control.	Exp.	Control.
N	47	53	47	53
Mean	40.21	42.66	67.15	47.43
Median	37.00	43.00	68.00	48.00
Std. Deviation	12.441	14.631	5.030	11.515
Skewness	.182	.175	-.664	.171
Std. Skew Error	.347	.327	.347	.327
Kurtosis	-1.137	-1.222	.339	-.794

After it was determined that the data were normally distributed, it was decided to use parametric tests in the analysis of the data. In the analysis of the data, T test for related samples and T test for independent samples were used using the SPSS 23 package program.

Table3. Vaccine Awareness Survey Average and Percentage Values

Item No.	Item	Pre Test Mean	Std. Dev.	Post Test Mean	Std. Dev.
1	I know enough about the vaccine.	**2.20**	1.128	3.56	1.297
2	I know that vaccination has been practiced all over the world for nearly 230 years and has prevented millions of deaths.	2.25	1.274	3.53	1.432
3	Vaccination is an important assurance for our health.	2.87	1.509	3.96	1.118
4	The most powerful method against epidemic diseases is vaccination.	2.31	1.161	3.43	1.233
5	I think the vaccine is very useful.	2.60	1.189	3.58	1.288
6	I follow and support the studies on vaccines during the pandemic.	2.84	1.022	3.55	1.167
7	If everyone is vaccinated, diseases will decrease.	2.64	1.243	3.67	1.181
8	The vaccine can cause many diseases.	2.49	1.345	3.75	1.140
9	The side effects of the vaccine worry me.	**2.07**	1.148	3.26	1.292
10	I'm afraid the vaccine will cause autism or learning disabilities.	2.48	1.359	3.67	1.223
11	Since infectious diseases are rare, vaccination is unnecessary.	3.21	1.358	**4.18**	1.009
12	I would rather have the disease than get vaccinated to gain immunity.	2.97	1.344	3.96	1.286
13	I don't get vaccinated because I'm afraid of needles.	3.22	1.440	4.05	1.167
14	Vaccines contain toxic substances.	**3.44**	.988	**4.13**	.872
15	I do not get vaccinated because of my religious beliefs.	**3.92**	1.070	**4.42**	.794

Table 3 shows the Vaccine Awareness Survey items and the mean and standard deviation values of these items in the pre-test and post-test. According to the pre-test data, the items with the lowest mean are items 1 and 9, which are about the side effects of the vaccine and whether there is sufficient knowledge about the vaccine. The highest score average is in the 14th and 15th items. According to the post-test data, the average scores of the items increased. The items with the highest mean are the 15th and 11th items. According to these findings, religious beliefs do not affect students' willingness

to be vaccinated. They also believe that vaccination is necessary. Generally speaking, the averages of the Vaccine Awareness Survey items increased after the training.

In the research questions, first of all, it was wondered what level of vaccination awareness the sample had before the training. For this purpose, pre-test results were calculated in both groups. Additionally, it was investigated whether there was a significant difference between the pre-test scores of the experimental group regarding vaccine awareness and the pre-test scores of the control group. For this purpose, independent samples t test was applied by comparing the pre-test scores of the experimental and control groups.

Table 4. Independent T Test Findings of Exp.-Cont. Group Pretest Vaccine Awareness Survey Scores

	N	Mean	Mean(%)	S.D.	t	sd	p
Exp.	47	40.21	53.61	12.441	-.895	98	**.138**
Cont.	53	42.66	56.88	14.631			

p>.05

When the descriptive statistics and independent t test findings of the pre-test vaccine awareness % scores of the experimental and control groups are examined in Table 4, there is no significant difference between the pre-test scores of the experimental and control groups regarding the vaccine [t(98)=-.895, p>.05]

In order to determine the significance between the pre-test and post-test scores of the experimental group regarding vaccine awareness, t-test for related samples was applied to the pre-test and post-test data of the experimental group.

Table 5. Related Samples T Test Statistics of Exp. Group Pretest-Posttest Scores

	N	Mean	Mean(%)	S.D.	sd	t	p
PreTest	47	40.21	53.61	12.441	46	-13.678	**.000**
PostTest	47	67.15	89.53	5.030			

p<.05

When Table 5 is examined, the pre-test score average of the experimental group was 53.6% before the instruction, and it increased to 89.53% after the instruction. To determine whether this difference was significant or not, analysis was performed with the t test for related samples. According to the findings, it was determined that there was a significant difference between the vaccine awareness pre-test scores and post-test scores of the experimental group in favor of the post-test [t(46)=-13.678, p<.05].

In order to determine the significance between the pre-test and post-test scores of the control group regarding vaccine awareness, t-test for related samples was applied to the pre-test and post-test data of the control group.

Table 6. Related Samples T Test Statistics of Control Group Pretest-Posttest Scores

	N	Mean	Mean(%)	S.D.	sd	t	p
PreTest	53	42.66	56.88	14.631	52	-2.859	**0.006**
PostTest	53	47.43	63.24	11.515			

p<.05

When Table 6 is examined, the pre-test score average of the control group was 56.88% before the instruction, and it increased to 63.24% after the instruction. To determine whether this difference was significant or not, analysis was performed with the t test for related samples. According to the findings, it was determined that there was a significant difference between the vaccine awareness pre-test scores and post-test scores of the control group in favor of the post-test [t(52)=-2.859, p<0.05]. After the training, there was also an increase in the vaccination awareness scores of the control group, but this increase was lower than the increase in the experimental group.

Finally, the study investigated whether there was a significant difference between the vaccine awareness survey post-test scores of the experimental and control groups. Therefore, independent samples t test was applied.

Table 7. Independent T Test Findings of Exp.Control Group Post-Test Vaccination Awareness Scores

	N	Mean	Mean(%)	S.D.	t	sd	p
Exp.	47	67.15	89.53	12.441	10.851	98	**.000**
Cont.	53	47.43	63.24	14.631			

p<.05

Table 7 shows the descriptive statistics of the post-test % scores and independent t-test findings. According to Table 7, it is seen that the post-test scores are significantly different in favor of the experimental group [$t_{(98)}$=10.851, p<0.05].

In general, while there was no significant difference between the pre-test vaccine awareness average scores of the experimental and control groups, it was observed that there was a significant difference in favor of the experimental group after the instruction, and the vaccine awareness activities prepared with the Scratch Program increased the students' vaccine awareness.

DISCUSSION and CONCLUSIONS

In this study, in which it was investigated how vaccine awareness activities prepared with the Scratch program would affect the vaccine awareness of fifth grade students in this period when global epidemics are common and technology is used extensively, a Vaccine Awareness Survey was applied before and after the teaching and a comparison was made. According to the results of the research, it was determined that the students' awareness of the vaccine in both the experimental and control groups was close in the pre-test. The Vaccine Awareness Survey pre-test average scores were calculated as 53.61% in the experimental group and 56.88% in the control group. No study has been found in the literature regarding vaccine awareness of 5th grade students.

In the study, the pre-test mean score of the control group regarding vaccination awareness was 56.88% before the instruction, and it increased to 63.24% after the instruction. Although this increase is not very high, it has increased significantly. Compared to the post-instruction score increases of the control group, the increase in the pre-test and post-test scores of the experimental group is much higher. In the study, the experimental group's pre-test score average regarding vaccine awareness before the instruction was 53.6%, but it increased to 89.53% after the instruction. The post-test average scores of the Vaccine Awareness Survey were found to be very high in the experimental group (89.53%) compared to the control group (63.24%) and this difference was found to be significant. According to this result, vaccine awareness activities prepared with the Scratch program are very effective in increasing students' vaccine awareness. There are studies on different subjects showing that technology-supported studies increase student success, attitude, motivation and awareness (Aycan et al., 2002; Boyraz, 2014; Çankaya et al., 2008; Çirkinoğlu Şekercioğlu & Yünkül,2021; Göğebakan Yıldız et al., 2016; Palta Benek & Çirkinoğlu Şekercioğlu, 2023; Wilson, 2013;).

According to these results, since we are now in the age of technology and students are very interested in technology, it is seen that it is important to organize teaching activities that include not only vaccine awareness but also activities in which many technological programs such as the scratch program are used in both lessons and different subjects. Such courses that include these methods need to be disseminated. For this purpose, it is recommended to provide seminars and in-service training courses on scratch and similar modern teaching methods to teachers and academics teaching in a wide range of areas from primary school to university, and to carry out studies to increase their awareness in the light of studies on this model.

Ethics and Conflict of Interest

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