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Nursing Students' Thoughts and Knowledge Levels about Global Warming

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ABSTRACT

Objective: The aim of this study is to determine nursing students' thoughts and knowledge levels about global warming.

Methods: This descriptive study was conducted with 236 nursing students studying at the faculty of health sciences of a state university between May and July 2022. Data were collected using a Sociodemographic Form, the Global Warming Questionnaire. Independent Samples t-test, One-Way ANOVA were used to evaluate the data.

Results: Ninety-seven percent of the students stated that global warming was a public health issue. Students' mean score on the global warming knowledge scale was 90.02±8.76. There was a significant difference between the mean scale score participating in activities on the subject, having received information/education on environment, climate change aside from undergraduate education, wanting to become a member of an environmental non-governmental organization, and school year ($p < .05$).

Conclusion: Participants' knowledge level about global warming was above the average value of the scale. However, they still needed information, greater sensitivity to participate in environmental non-governmental organizations, global warming activities. For all these reasons, it is recommended that nursing students increase their knowledge and sensitivity during their undergraduate education, learn ways to combat the adverse effects of climate change, put them into practice.

Keywords: Global warming, knowledge, nurses, thinking,

1. INTRODUCTION

The most obvious effect of global warming is climate change. In addition to causing negative consequences such as the melting of glaciers and the inundation of many coastlines because of sea level rise, it is thought that global climate change has and will also cause negative effects in social, economic, and health areas (1,2). Its health effects are heat waves, air pollution, floods and fires, vectorial and infectious diseases, water – and food-borne diseases, respiratory diseases, and allergic diseases (1). Changes in climate and weather conditions also cause the emergence of new infectious diseases by affecting pathogens, vectors, hosts, and their habitats (3). It is argued that the pandemic occurring between 2019 and 2022 has links to climate change (4). In addition, has recently reported that climate change may cause chronic and serious mental health disorders, as well as anxiety-related reactions, depression, aggressive behavior, and violence in people (5).

Most nurses work in settings that meet the needs of individuals, families, or the community. They should be aware of factors related to social determinants of health, such as economic,

political, cultural, and environmental influences, as well as national policies. Nowadays, the roles of nurses are increasing both regionally and internationally in extraordinary situations, such as disasters, pandemics, and climate change (6).

The concept of environment, which is not a new concept and is among the basic concepts in the nursing curriculum, has maintained its place since Florence Nightingale. Many nursing theorists have included the environment as a component in their conceptual models. The importance of the topic is frequently emphasized in undergraduate and graduate education. However, nurses need to improve their knowledge and practices on a global basis to protect and support health. Nurses have an important role in addressing and evaluating environmental health issues at the individual, family, and community levels (7).

According to the Association of Nurses for Healthy Environments (ANHE), nurses should make a great contribution to greenhouse gas emissions and global warming with their individual measures in the fight against climate

change, by using consumables and energy appropriately while working in hospitals and by using public transportation more in daily life. Therefore, they are in a critical position to influence the decisions made in healthcare institutions and advocate for regulations that will help reduce global warming (8). Newly graduated nurses will be more likely to experience the negative effects of global warming on individuals, families, groups, and public health. Nursing students, who will be health professionals of the future, need to know and be aware of the subject very well. Nurses, as health educators, are advocates on behalf of society regarding risks or dangers, which will be fundamental to the prevention of environmentally related diseases and the success of other interventions. At the same time, nurses play a key role in making individuals, families, and society aware of the effects of climate change and taking measures to protect and improve health. For all these reasons, we think that determining nursing students' knowledge levels about global warming will guide future studies. The aim of this study is to determine nursing students' thoughts and knowledge levels about global warming.

2. METHODS

Ethics committee approval was obtained (Number: 61351342/April 2022-55). Written permission of the author of the scale to be used in the study was obtained via e-mail. Participants' informed consent was obtained. Institutional permission was obtained.

2.1. Study Design and Participants

A descriptive study design was used. The research was conducted with students studying in the nursing department of the faculty of health sciences at a state university between May 2022 and July 2022. The population consisted of students studying in the nursing department (N=1033). The sample size of the research was calculated as at least 215 subjects using the sampling the known population formula, based on a population size of 1.033 individuals, a margin of error of 5%, a confidence interval of 90%, and an incidence value of 50%. The study was completed with 236 individuals. Inclusion criteria: Being a student in the nursing department of the faculty of health sciences and volunteering to participate in research. Exclusion criteria: Filling out the forms incompletely.

2.2. Data collection tools

In the study, data were collected using a Sociodemographic Form and the Global Warming Questionnaire.

2.2.1. Sociodemographic Form

This form consists of 19 questions about age, gender, school year, parents' education level, place of residence, global warming, and climate change (1). A pilot study was conducted.

2.2.2. The Global Warming Questionnaire

This scale was developed by Eroğlu and Aydoğdu (9) and its validity and reliability studies were conducted. It is used to

evaluate global warming knowledge levels using questions about the occurrence of global warming, its causes, consequences, and how it can be prevented. It is a 26-item scale with a five-point Likert scale (absolutely true, 5 points – absolutely false, 1 point). Scores on the scale range between 26 and 130. A high score on the total scale indicates a high level of knowledge about global warming. Cronbach's alpha value of the scale was found to be 0.85.9 The alpha value was found to be 0.87 in this study.

2.3. Data analysis

Data were analyzed on the SPSS software package by using mean and percentage values, independent samples t-test, and One-Way ANOVA. The significance level was accepted as $p < .05$.

2.4. Limitations of the research

The results of the study are specific to the school where the data were collected and cannot be generalized to all nursing students.

3. RESULTS

Nursing students' mean score on the Global Warming Questionnaire was 90.02 ± 8.76 . When students' descriptive characteristics were examined, it was determined that 78.8% were female, 47.5% were first-year students, and that the mothers of 59.3% and the fathers of 56.4% had primary school education. Fifty percent of the students said they studied global warming as part of their school curriculum, but it was determined that some of them did not know global warming (1.2%), the greenhouse effect (3.8%), and the concept of carbon footprint (6.4%) (Table 1). The mean global warming knowledge score was the highest in seniors and the lowest in freshmen ($p < .05$). It was determined that the mean global warming knowledge score was significantly higher in students who found global warming preventable, had knowledge about climate change agreements, participated in activities on climate change, had received education on environment and climate change other than undergraduate education, and wanted to become a member of an environmental non-governmental organization ($p < .001$) (Table 1). Students stated that the most important signs of climate change were drought (80.1%) and a decrease in biodiversity (74.6%). They thought that global warming may cause an increase in epidemics (83.1%), cancer (75.8%), psychological diseases (64.4%), respiratory system diseases (63.1%), cardiovascular diseases (65.3%) and premature deaths (47.5%) now and in the future and that global warming is a public health problem (97%). Most of them stated that they followed information about climate change on social media (90.7%). They also added that global warming might cause the emergence of new unknown diseases (90.2%) and an increase in the immune system (86.8%) and infectious diseases (86.4%) (Table 2).

Table 1. Nursing students' mean score on the Global Warming Questionnaire according to their descriptive characteristics

		n	%	Mean	SD	Statistics	p*
Gender	Female	186	78.8	89.92	8.74	-.329	.742
	Male	50	21.2	90.38	8.93		
School year	1	112	47.5	88.98	7.99	3.141	.026
	2	24	10.2	92.17	8.77		
	3	62	26.3	89.03	9.82		
	4	38	16.1	93.32	8.38		
Mother's education	Non-literate	27	11.4	90.37	8.34	.767	.513
	Elementary-middle school	140	59.3	89.94	8.35		
	High school	38	16.1	91.47	8.73		
	Associate-undergraduate	31	13.1	88.29	10.87		
Father's education	Elementary-middle school	133	56.4	90.29	8.63	.581	.560
	High school	69	29.2	89.10	8.44		
	Associate-undergraduate	34	14.4	90.82	9.96		
Finding global warming preventable	Yes	180	76.3	91.16	8.47	3.691	.001
	No	56	23.7	86.34	8.74		
If yes, how	Personal measures	18	9.4	86.33	10.40	2.159	.075
	By the activities of local governments	10	5.2	93.30	8.37		
	Social measures	62	32.3	90.02	9.18		
	Legal measures implemented at a national level	34	17.7	92.59	8.44		
	Global measures	68	35.4	91.68	7.18		
If no, why	Difficulty changing habits	22	23.9	90.68	9.17	.973	.382
	Lack of social awareness	45	48.9	87.42	8.88		
	Irreversible damage	25	27.2	89.04	9.56		
Having information about agreements on climate change	Yes	34	14.4	95.76	7.41	15.194	.001
	No	135	57.2	87.67	8.37		
	Somewhat	67	28.4	91.82	8.49		
Participating in activities on climate change	Yes	50	21.2	95.70	7.63	18.536	.001
	No	116	49.2	87.31	8.51		
	Somewhat	70	29.7	90.44	7.97		
Having received information/education on environment and climate apart from undergraduate education	Yes	85	36.0	94.42	8.68	6.247	.001
	No	151	64.0	87.54	7.81		
Desire for membership in an environmental non-governmental organization	Yes	146	61.9	91.68	7.80	3.814	.001
	No	90	38.1	87.32	9.58		

n: number; %: percent; SD: Standart deviation; p* < .05

Table 2. Nursing students' thoughts about climate change

		n	%
What do you think are the important symptoms of climate change?	Spread of infectious diseases	130	55.1
	Changing biodiversity	176	74.6
	Effects of greenhouse gases on health	164	69.5
	Drought	189	80.1
	Heat waves	156	66.1
What do you think its future health effects will be?	Cancer	179	75.8
	Epidemic diseases	196	83.1
	Psychological diseases	152	64.4
	Respiratory system diseases	149	63.1
	Increase in premature deaths	112	47.5
	Premature births	108	45.8
	Cardiovascular diseases	154	65.3
Where do you most often get information about climate change?	Eye problems	106	44.9
	Radio	17	7.2
	Television	142	60.2
	Newspaper	33	14.0
	Social media	214	90.7
	Scientific studies	112	47.5
Does global warming cause infectious diseases?	Courses taken at school	122	51.7
	Yes	204	86.4
Will global warming cause the emergence of new unknown diseases?	No	34	13.6
	Yes	213	90.2
Does global warming cause suppression of the immune system?	No	23	9.8
	Yes	205	86.8
Do you think global warming is a public health problem?	No	31	13.2
	Yes	229	97
	No	7	3

*More than one response was given.

4. DISCUSSION

In this study, nursing students' knowledge levels about global warming were examined. Participants' knowledge level about global warming was found to be above average. While some studies on the concept of global warming have shown that university students have enough knowledge, (9-11) others have indicated the opposite (12,13). In the present study, participants were nursing students, and the concept of environment was frequently included in their curriculum, which may have increased their knowledge level scores on this subject above the average. However, students' high knowledge of global warming and climate change alone is not enough. They need to be supported in putting their knowledge into practice to prevent global warming because many studies still show that nurses and student nurses lack knowledge of climate change (14-16). To achieve the 2030 Sustainable Development Goals, it is necessary to educate healthcare professional groups and equip them with the necessary knowledge, skills, and responsibility to ensure the health of future generations in the context of human rights (17).

When participants' knowledge levels about global warming were examined according to students' school years, it was found that the knowledge level of the 4th-year participants was higher. In the study conducted by Ay and Yalçın Erik (18) on university students, it was seen that the global warming knowledge level did not change according to the school year, while other studies conducted with university students showed that the knowledge level of 4th-year students was higher. In our study, it is thought that the increasing level of knowledge in parallel with the school year might have stemmed from the fact that the concept of environment was discussed together with climate change as one of the roles of public health nursing, the concept of environment, which is one of the four main concepts of nursing, had been addressed during the participants' education starting from the first year, and that the climate crisis was discussed during studying the environment topic in the public health course curriculum. However, while environmental theory and theorists are frequently emphasized in the lessons before the 4th year, the effect of global warming on health should also be emphasized and integrated into every course in the curriculum.

In this study, the global warming knowledge score of the participants who participated in climate change activities was high. Similarly, in the study conducted by Ergin et al. (19) with nursing students, the knowledge score of the students who participated in environment and climate change activities was high. However, in our study, most students unfortunately stated that they had not participated in any climate change activities. Participating in climate change and environment activities improves the leadership and advocacy roles of nursing. For this reason, the subject of these activities should be introduced during undergraduate education and students should be encouraged in this regard. As Article 56 of the Constitution of the Republic of Türkiye puts it, "Everyone has

the right to live in a healthy and balanced environment. It is the duty of the State and citizens to improve the environment, protect environmental health, and prevent environmental pollution." However, students are hesitant about participating in such actions. To reverse this situation, the importance of the role of the whole society in protecting environmental and climate health and participating in various activities should be given by families and schools from an early age.

Participants who had received information/education on environment and climate change aside from their undergraduate education had higher global warming knowledge scores than those who had not. Similarly, it was determined that the knowledge levels of students who had received information/education on environment and climate apart from undergraduate education were higher (18, 20). For this reason, it is thought that the issue of global warming should be integrated into education at all levels.

In this study, three-quarters of the participants stated that they found global warming preventable. This finding is promising in that they can combat the causes that increase global warming during clinical practices in the hospital, at home, in society, and in their daily lives. Additionally, 32.3% of the participants stated that social measures were as important as global measures. They also thought that legal measures implemented at the national level were important. However, it is noteworthy that only 18 participants stated that global warming could be prevented by taking personal precautions. Contrary to these findings, Ergin et al. (19) found that only 8.2% of the medical students in their study thought global warming was completely preventable. Of those who thought it could be prevented, 49.4% thought it could be prevented through education/public awareness, and 26% thought it could be prevented through international collaborations and partnerships. Nursing students who participated in this study thought that global, legal, and social measures were important in preventing global warming. This is a positive finding. However, in addition to all these, there are also climate change problems such as the greenhouse gas effect, which can be prevented with easier and more feasible individual efforts. Therefore, students should be told what these preventive activities are in their daily and professional lives. For example, strategies, such as paying more attention to the consumption of consumables used during patient care in the hospital, using public transportation and renewable energy, and supporting recycling are just some of the individual measures taken. Nurses must be aware of factors related to social determinants of health, such as economic, political, cultural, and environmental influences, as well as national policies that affect health beyond their area of practice. Today, nurses should know that some occurrences, such as disasters, pandemics, and climate change, may have regional as well as international or global effects.

More than half of the students stated that they heard information about climate change from sources such as social media and television. Similarly, in other studies, a majority of students stated that they had heard about

global warming from television and social media (12,20). According to these results in the literature, it can be said that social media and television provide important information about global warming and have positive effects. Therefore, effective use of social media is of great importance in raising public awareness. Health professionals can emphasize the significance of this issue to society through social media.

Almost all of the participants stated that they had no knowledge about agreements on climate change and more than half of them stated that they had not participated in any event to prevent global warming and were not members of an environmental organization. Similarly, Belleli et al (12) found that more than half of the students in their study had not heard of any international environmental agreements. Considering other studies, the rate of participating in an event to prevent global warming and becoming a member of an environmental organization was very low (12, 20). Students' recognition of the regulations and agreements that fight against climate change nationally, internationally, or globally and membership in activities and organizations on this topic is valuable in terms of showing the public's resistance and struggle against global warming and nursing students' taking on an advocacy role on this issue. It is thought that this subject should be included more in nursing curricula and students' awareness should be increased.

In this study, it was determined that nursing students had not taken a separate course on environment and climate change aside from their undergraduate education. In the study conducted by Ay and Yalçın Erik (18) with university students, it was observed that 53.7% of the students had not taken courses on environment and climate change. In line with these results, it can be said that courses on climate change are not enough in undergraduate nursing education in Türkiye. However, environmental theory, one of the four important theories of nursing, is taught to students from the first year. The relationship between environment and health is addressed with this theory. However, today, climate change has surpassed environmental theory. For this reason, the health effects of climate change should be integrated into all levels of nursing education as soon as possible. It is quite noteworthy that the rate of education about global warming, which is a global issue, is so low at universities. In higher education, students should be informed about global warming, which is the most important environmental problem that concerns the future of our world, both in the education curriculum and through events such as conferences and seminars.

5. CONCLUSION

Student nurses' knowledge level about global warming was above the average. Those who thought that global warming was preventable had a high level of knowledge.

Most participants were aware that global warming was a public health problem.

The effects of global warming and climate change on the environment and health should be updated in today's conditions in undergraduate nursing education, the awareness of students should be increased by giving it more space in the curriculum, and students should be encouraged to participate in events such as congresses and seminars on this subject. The study can be repeated using a larger sample size.

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Author Contributions:

Research idea: KG, NK, CN, RD

Design of the study: KG, NK, KBÇ, CN, RD

Acquisition of data for the study: KG, NK, CN, RD

Analysis of data for the study: RD

Interpretation of data for the study: KG, NK, KBÇ, CN, RD

Drafting the manuscript: KG, NK, KBÇ, CN, RD

Revising it critically for important intellectual content: KG, NK, KBÇ, CN, RD

Final approval of the version to be published: KG, NK, KBÇ, CN, RD

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