

Research Article

Awareness and attitudes of academics in Türkiye toward the impacts of global climate change

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ABSTRACT

This study aims to reveal the awareness and attitudes of academics in Türkiye on the impacts of global climate change. It utilized quantitative research methodology. The data was collected through a survey sent to the e-mail addresses of academics between December 2023 and May 2024. The sample comprises 421 respondents (212 male and 209 female; the duration of their academic career ranges from 1 to 16 years) affiliated with nearly 100 universities. They were selected through the convenience sampling method. The data was collected from the survey and analyzed using the SPSS 27 software including frequency distributions, mean calculation, exploratory factor analysis, and reliability analysis. The reliability levels of the sub-dimensions were tested with the Alpha method. The findings indicate that the global climate change awareness scale consists of four sub-dimensions: awareness of global organizations and agreements, impacts on the natural and human environment, energy consumption relations, and causes of emergence. 62.430% of the total variance is explained by these four sub-dimensions. All sub-dimensions are reliable ($\alpha \geq .70$) (Kaiser-Meyer-Olkin Sampling Adequacy: 0.870; Bartlett's Test of Sphericity P Value: .000; Total Variance Explained: 62.430). Findings also show that the sample had medium to high awareness of global climate change and its effects. This study concludes that academics advocated the need to raise awareness of society as the most effective method to combat global climate change and the need to take international collaboration and legal measures.

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INTRODUCTION

Awareness and attitudes of individuals are crucial in combating the impacts of global climate change and policymaking for the transformations stemming from these impacts. Sociodemographic features change the awareness and attitudes regarding societal, environmental, and economic topics. Academics possessing a wealth of knowledge, skills, culture, and experience play a crucial role in addressing individual, environmental, social, political, and economic issues due to their significant responsibilities and tasks. They contemplate such matters in their service provision, knowledge and skills transfer, research, and scientific endeavors.

The growing body of research on climate change has cata-

lyzed social movements by heightening public concern for the future. The sense of solidarity between younger and older generations has placed a significant responsibility on policymakers, highlighting the need for both national and international cooperation [1]. Educational attainment plays a crucial role in shaping awareness of climate change. Consequently, providing basic climate change education and building public support are essential components of effective climate action [2]. Individuals with higher levels of education tend to have a better understanding of climate change issues. Furthermore, younger generations show a higher level of climate consciousness compared to older generations. Thus, implementing public policies that prioritize post-secondary education can significantly improve public awareness [3].

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Governments rely on scientific expertise to obtain accurate data and inform effective policymaking [4]. Consequently, raising public awareness is essential in the fight against climate change.

This study specifically delves into the attitudes and awareness of academics toward the impacts of climate change. It aims to uncover the actions that academics take in addressing global climate change through their service provision to society, scientific research, and the training they provide to future professionals, while also exploring their level of awareness regarding this issue. Therefore, this study first provides definitions of global warming and climate change, discusses the causes of climate change and its effects, and emphasizes global climate change awareness. Secondly, it presents the research methodology, which includes a survey of academics in Türkiye regarding their attitudes and awareness of the effects of global climate change. Finally, it concludes with a general evaluation, conclusions, and recommendations.

Causes and Effects of Global Climate Change

Global climate change and its impacts are evident in numerous fields. It is a priority for society to recognize and engage in efforts to grasp and alleviate these impacts. Raising future generations with this understanding and taking conscious steps make the ground for a more sustainable world. Climate change, widely discussed recently, and the adverse effects have global repercussions that concern all countries, societies, and individuals. Environmental challenges influence the thoughts and behaviors of individuals, as well as the structure and operation of society.

Weather directly affects the lives of all creators. Weather events are defined as occurrences with statistical changes representing values occurring between two extremes [5]. Climate change, on the other hand, refers to long-term alterations in the elements that determine the climate such as temperature, humidity, pressure, wind, and precipitation [6]. The World Meteorological Organization (WMO), responsible for studying and analyzing weather events, defines climate as the average weather conditions in a region over a minimum period of 30 years [5]. Established in 1988, the Intergovernmental Panel on Climate Change (IPCC) has emphasized climate change as a political and economic issue due to its impacts, which are determined by statistical calculations of changes occurring with averages over decades [7]. Moreover, scientific evidence points out that climate change and other environmental problems are mainly caused by human activities [8].

Taking into account the weather and climate determinants, the process of climate change should include not only temperature increases but also other developments in the climate system. Here, it can be asserted that climate change encompasses global warming. Considering the relationship between the two, global warming can be seen as a cause, while

climate change can be seen as a consequence through simple cause-and-effect relations [9]. However, global warming and climate change are often incorrectly used interchangeably. Impacting all living organisms and leading to environmental changes, global warming refers to forming the greenhouse effect in the lower layers due to the sun's rays reaching the ground cannot be reflected in the upper parts of the atmosphere in a balanced way due to the effect of greenhouse gases accumulating in the atmosphere; that is, it is an increase in the earth's temperature. In particular, it is the increase in the temperature of the earth and lower parts of the atmosphere caused by the strengthening of the natural greenhouse effect with the effect of urbanization because of the rapid increase in the accumulation of greenhouse gases released into the atmosphere, and various human activities such as the use of fossil fuels, deforestation, and industrial processes [10]. Here, the prime suspect of this phenomenon is certainly the "greenhouse effect" [11].

Greenhouse gases are widely recognized as key factors that influence the intensity of climate change [12]. Gases having greenhouse effects in the atmosphere are as follows: water vapor, carbon dioxide (CO₂), ozone (O₃), methane (CH₄), nitrous oxide (N₂O), halocarbons, and other industrial gases [13].

One of the causes of climate change is the human-induced increase in CO₂ emissions. CH₄, the second most abundant human-induced greenhouse gas, has experienced a significant surge, contributing to elevated O₃ levels. In addition, N₂O causes global warming due to its high heat retention capacity [14]. Public awareness plays a pivotal role in mitigating human impact on the environment. As population growth fuels increased consumption, the implementation of policies that promote sustainable consumption and production practices is essential [15]. Human activities are the fundamental source of poor air quality and rising greenhouse gas emissions. Population growth, urbanization, and economic development further exacerbate this situation. Gases such as CO₂, CH₄, and O₃ are the best examples of this situation. Human-induced energy consumption including transportation, lighting, heating, and cooling, constantly elevates greenhouse gas production [16]. Figure 1 indicates per capita greenhouse gas emissions by sector.

Upon analysis of Figure 1, it is clear that the most significant contributor to greenhouse gas emissions is the electricity and heating sector, which accounts for 32% of total emissions. Following this, the transportation sector represents the second-largest source, contributing 15% to the overall emissions. The demand for electricity and transportation is responsible for nearly half of the total greenhouse gas emissions. Other factors contributing to anthropogenic greenhouse gas emissions underscore the substantial impact of human activity on climate change.

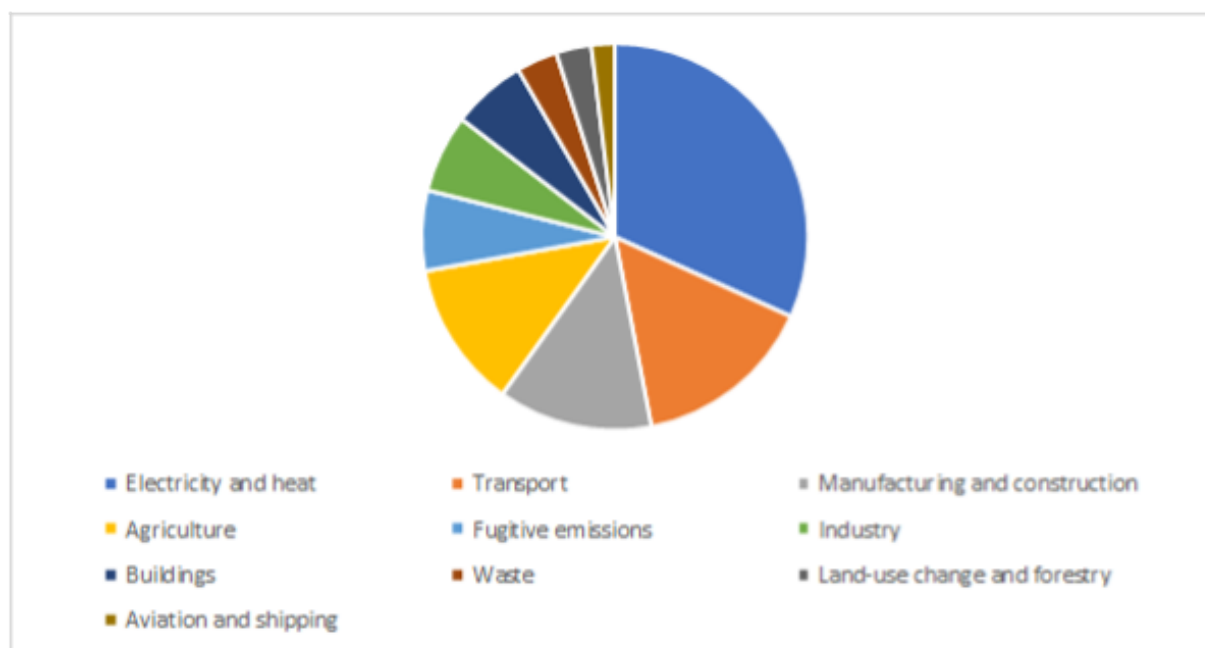


Figure 1. Greenhouse gas emissions by sector, World, 2020 (<https://ourworldindata.org/grapher/per-capita-ghg-sector>)

Once these greenhouse gases disperse in the atmosphere, most of them remain there for extended periods, and as additional gases are introduced into the atmosphere, more heat becomes trapped [17].

In the historical process, the global surface temperature has displayed a continuous increase with recent years showing a higher acceleration in this trend. Since 1880, the annual global surface temperature has risen by an average of $+0.08^{\circ}\text{C}$, and from 1981, the average increase has been $+0.18^{\circ}\text{C}$. Among the years from 1880 to 2021, 2021 ranks as the sixth warmest year record. For 2021, the average temperature at global surfaces was 0.84°C higher than the 20th century average [18]. These data reveal the striking impact of climate change. The changing climate with warming affects the entire ecosystem. These effects appear by creating adverse effects in various fields.

Climate change is causing significant impacts on terrestrial, freshwater, and ocean ecosystems, leading to shifts in geographical ranges, seasonal activities, and migration patterns [8]. These changes lead economic losses through the heightened intensity and frequency of natural disasters such as drought, flood, and storm. In the United States of America, for instance, 298 climate-related disasters occurred from 1980 to 2020, with a total cost above one billion dollars and a total cost of more than 1.975 trillion dollars in 2021 alone [19]. As a result of global warming and climate change, numerous elements are affected and altered. We can generally list some of them as follows.

In 2021, 38 million individuals experienced internal displacement with 23.7 million of whom being displaced as a

result of disasters [20]. Of the displacement due to catastrophe, 1.4 million were affected by geophysical reasons (earthquakes, volcanic eruptions, landslides) while 22.3 million were displaced by weather-related causes. Considering the displacement due to weather-related causes, 11.5 million people were displaced by storms, 10.1 million by floods, 451 thousand by forest fires, 240 thousand by drought, 37 thousand by landslides, and 20 thousand by extreme heat [21].

Global climate change is recognized as one of the major threats to human health as well as affecting people's welfare. It is predicted that approximately 250,000 deaths may occur annually in 2030-2050 owing to global climate change [22]. The defining issue of our time, climate change poses a significant global health threat for the next century, impacting the life opportunities of future generations. It is thought to affect human health through food and fresh water availability, rising sea levels, abnormal weather events, migration, and diseases [23, 24].

The warming of the earth resulting from the shifts in the energy balance causes a variety of changes in the climate system, such as temperature increase, differentiation in precipitation regime, rise in sea level, and melting of glaciers. These changes, in turn, impact the environmental conditions in which the socioeconomic system operates. While almost all economic activities in the industry, agriculture, and transportation sectors lead to the release of greenhouse gases into the atmosphere, all social and economic life is also affected by changing climatic conditions [25].

Although climate change is a current issue, specifically with its structure driven by human activities, it is often per-

ceived as a future problem due to its widespread impact and far-reaching consequences [18]. Rather than being local, regional, or national, the challenges posed by climate change are global and affect all life on earth, including future generations. Climate change topics, predominantly based on quantitative data regarding their definitions, underline the challenges encompassing the rate of harmful gas emissions, average temperature changes over the years, and measurable disruptions in various aspects of the ecosystem, including melting glaciers and total or remaining numbers of animal generations [26].

These issues are becoming more serious due to the increasing carbon footprints of countries and individuals resulting from population growth, gradual industrial development, and other factors contributing to harmful gas emissions. In this context, an essential distinction of climate change from other public issues is the potential for irreversible consequences [27] and in this respect; the issue involves the common concern of humanity. The problem of global climate change, which the world is currently confronting, is one that scientists have been drawing attention to and trying to seek solutions for over the years. Hence, it is seen various global efforts to address global warming and climate change.

Global initiatives indicate that the issue of climate change stemming from anthropogenic activities is widely considered. Present data can be informative on the extent of climate change and human-induced impacts. In the first two decades of the 21st century, global surface temperature was 0.99 °C higher than in the period from 1850 to 1900. The global surface temperature in this period was also 1.09 °C higher than the 1850-1900 period. Additionally, it is stated that the total human-induced global surface temperature increase was 0.8 °C-1.3 °C between the periods 1850-1900 and 2010-2019 [28]. Today, it is widely acknowledged by almost all climate scientists that there is a discernible deterioration in the global climate system.

IPCC one of the global initiatives reveals the deterioration in the natural balance with concrete evidence through scientific research [26]. Established by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) in 1988 in Geneva, Switzerland, the IPCC aims to regularly assess the scientific basis of climate change, its impacts, future risks, and adaptation and mitigation options [27, 28]. The IPCC operates independently following processes set by its 195 member countries, including Türkiye, as well as releases its "Assessment Reports" on the state of the world climate system to the public every 5-7 years. The last report (AR6) was prepared and published in 2021. As a matter of fact, with the IPCC's "Special Report on 1.5 °C Global Warming" [29] putting forward the net zero emission targets to achieve the goals of the Paris Agreement; the process has turned into climate urgency. This urgency implies that solving the issue of climate change is a prerequisite for achieving any sustainable development goal or overcoming any crisis [30].

Awareness of Global Climate Change and Its Impacts

Climate awareness pertains to individuals' insights of climate change and their ability to adjust to the resulting conditions [31]. Given this definition, it is crucial to address the question, "What factors affect individuals' climate awareness?" to effectively combat climate change. Several studies have explored the drivers of climate change awareness with a particular focus on socio-demographic factors at the micro-level [32]. Apart from socio-demographic factors, individuals' behaviors and attitudes are directly linked to their approach to the issue. Therefore, it can be assumed that individuals' perception of societal issues plays a crucial role in their awareness of climate change and environmental problems, as in many other issues [33]. All kinds of approaches that individuals take toward climate change and global warming in their daily lives, professional endeavors, and personal choices can be indicative of their attitudes towards the issue. Therefore, the present study investigates the level of climate change awareness among academics affiliated with various disciplines at universities in Türkiye and their attitudes toward this issue. This is important because the attitudes of academics at the highest level of education toward a critical issue like climate change have significant relevance. In addition to their scientific contributions to the issue, personal attitudes of academics in their daily lives also play a significant role. Thus, the perspectives of academics on climate change are significant in terms of revealing the level of awareness of individuals with a high level of education. Furthermore, since the perception levels of academics in Türkiye on global climate change will affect the perspectives and behaviors of future generations, the study holds significant importance.

Multiple definitions take place in the literature on the concept of academics and their activities. These definitions indicate academics are active in the discovery, integration, application, and teaching of knowledge [34]. Another definition identifies the main actions of academics as learning, research, community service, and management emphasizes that these actions support each other despite appearing different [35]. In Türkiye, academics both advance their careers by conducting academic studies and contribute to the education of students by giving courses in associate, undergraduate, and graduate education. They play an active role in helping students acquire professional competence, also engage in continuous scientific studies to improve their capabilities. In this context, academics in Türkiye have important roles in education, training, and contributing to scientific developments.

MATERIALS AND METHODOLOGY

The study utilized quantitative research methodology to define and explain the subject matter. Data was collected through the survey technique and descriptive generalizations were derived from statistical analysis. It is an important issue in descriptive studies to accurately depict the existing situation without intervening in the current environment [36].

The universe of the study consists of 150 thousand academics (including professors, associate professors, assistant professor, lecturers, and research assistants) employed in both state and foundation universities in Türkiye [37]. The sample comprises 421 academics reached by convenience sampling from the universe, considering time and cost constraints. Since a non-random sampling method was chosen, the sample size was based on the number of Likert statements. The awareness scale on effects of global climate change contains 21 statements in the awareness scale on the. The sample size was $50 + (8 \times \text{Number of Variables})$ [38]. Therefore, the sample size was $50 + (8 \times 21) = 218$. Finally, the data collected from 421 participants (212 male, 209 female; 124 assistant professor, 105 lecturer, 70 associate professor, 68 professor, and 54 research assistant).

The study collected data through a survey consisting of two types of questionnaires. The first set of 15 questions pertained to the participants' sex, academic titles, and working years, as well as their views and practices on climate change. These questions were formulated by benefiting from the relevant literature [22, 39, 40, 41, 42, 43]. The second set of questions in the survey was adapted from the study titled "Awareness Scale of University Students about Global Climate Change" conducted by Deniz, İnel, and Sezer in 2021 [44]. The same scale used in the present study with the necessary permissions. The set of questions that constitute the second part of the survey utilized a scale to gauge the awareness of academics about the impacts of climate change. The scale includes a total of 21 questions organized into four dimensions.

The data was collected by sending the survey via e-mail addresses to the specified email addresses reached on the websites of the universities. Nearly 100 universities responded the questionnaire. Reminder e-mails were not sent to universities, resulting in a two-month delay in responses. Prior to collecting the research data, ethics committee permission was obtained. Through university correspondence, the survey was sent online to all universities in Türkiye. This approach aimed to secure participation from all academics. However, since the study was conducted in an electronic environment, no verbal or written consent was obtained from the participants, and answering the questions was left optional. Therefore, it was accepted that the participants who answered the questions consented to participate in the study. Data was collected over a period of approximately 6 months between December 2023 and May 2024. A total of 421 academics responded to all the questions in the survey form.

The data collected from the survey was analyzed using the SPSS 27 software. The statistical techniques employed included frequency distributions, mean calculation, exploratory factor analysis and reliability analysis. Exploratory factor analysis was utilized to determine how many sub-dimensions the statements in the Global Climate Change Awareness Scale consist of. The reliability levels of the sub-dimensions were tested with the Alpha method. The results of the analysis are thoroughly presented in the subsequent section.

This study bears some methodological limitations. First, the findings only represent the perceptions of the participants on global climate change, so they cannot be generalized to the universe. Second, the accuracy of the responses is contingent on the honesty and knowledge of the participants. Finally, there is a possibility of non-delivery of correspondence as the participants did not provide their e-mail addresses.

RESULTS AND DISCUSSIONS

As seen in the table below, the global climate change awareness scale consists of four sub-dimensions. 62.430% of the total variance is explained by these four sub-dimensions. All sub-dimensions are reliable ($\alpha \geq .70$) (see Table 1).

According to the Table 1 and structure obtained, the first dimension consisted of nine themes, the second one consisted of six themes, the third one consisted of three themes, and the fourth dimension consisted of three themes. Confirmatory factor analysis was carried out to assess the appropriateness of the structure revealed by principal component analysis, and as a result of the analysis, it was seen that the hypothesized model was aligned well with the research data (for validity and reliability tests and scale details, see [37]).

Descriptive statistics were analyzed to determine the awareness levels of academics regarding each sub-dimension. The results are shown in the table below (see Table 2).

Scale scores by the authors who developed the Global Climate Change awareness scale interpreted as,

1 to 2.33: Low level awareness

2.34 to 3.66: Moderate awareness

3.67 to 5.00: High level of awareness.

Table 1. Exploratory factor and reliability analysis results for the global climate change awareness scale

Factor	Statement	Factor Loading	Explained Variance	Reliability Coefficient
Awareness of Global Organizations and Agreements	In 1988, the Intergovernmental Panel on Climate Change was established to assess the risk of climate change caused by human activities.	0.868	20.686	0.901
	Internationally, controls and quotas on the use of CFCs (Chloro-fluorocarbons) were introduced by the Montreal Protocol.	0.868		
	Since 1968, the Club of Rome has published reports highlighting dangers related to economics, politics, the environment, and global climate change.	0.860		
	The Montreal Protocol is a framework for protecting the ozone layer.	0.843		
	With the 2016 Paris Agreement on global climate change, it was agreed that the world's average temperature could increase by 1.5 to 2 Co.	0.701		
	The Kyoto Protocol is the only framework agreement that supports the fight against global warming and climate change in the international arena.	0.632		
Awareness of Global Organizations and Agreements	With global warming, some winter tourism centers will experience changes.	0.785	20.686	0.901
	The types of touristic activities of places may change due to global warming.	0.757		
	Classical agricultural methods are challenged by global climate change.	0.658		
	With global climate change, the habitats of creatures such as polar bears are shrinking.	0.657		
	The spread of tropical plants and fish that like warm air and water towards the poles is one of the indicators of global climate change.	0.657		
	Global climate change will accelerate the extinction of plant and animal species.	0.644		
	In parallel with global climate change and global warming, some of the areas such as natural monuments, natural areas and national parks may disappear.	0.636		
	Some of the mass migrations are important consequences of global climate change.	0.573		
	Migration routes and accommodation places of birds are changing with global warming.	0.565		
Energy Consumption Relations	The more non-renewable energy we consume, the more carbon dioxide we emit.	0.783	10.981	0.771
	Using solar energy instead of fossil fuels is one of the measures that can be taken against global climate change.	0.775		
	Increased use of energy-saving appliances reduces risks from global climate change.	0.758		
Causes of Emergence	Increasing cattle breeding also increases global warming.	0.916	10.600	0.846
	Eating more meat increases global warming.	0.905		
	Increasing rice cultivation areas is one of the agricultural activities that cause global warming.	0.590		
Kaiser-Meyer-Olkin Sampling Adequacy: 0.870				
Bartlett's Test of Sphericity P Value: .000				
Total Variance Explained: 62.430				

Table 2. Descriptive statistics of academics' awareness on global climate change

SCBA content (%)	Arithmetic Average	Standard Deviation
Awareness of Global Organizations and Agreements	2.8603	1.01669
Impacts on the Natural and Human Environment	4.1884	0.56835
Energy Consumption Relations	4.2835	0.68421
Causes of Emergence	2.9485	1.12839

According to the Table 2 and based on the scores, the level of awareness on Global Organizations and Agreements is medium, the level of awareness on Impacts on Natural and Human Environment is high, the level of awareness on Energy Consumption Relationship is high and the level of awareness on Causes of emergence is medium. Findings from the analysis revealed that 421 academics had medium to high awareness levels regarding global climate change and its effects.

The survey also included questions about academics' working experience, as well as their academic attitudes and preferences on global climate change. The results are presented in the tables below (see Table 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, and 15 in order).

Table 3 shows that majority (58,28%) have at least 11 years of academic experience.

Table 4 points out that majority (79,09%) did not conduct studies on climate change.

Table 5 indicates that the majority (72%) did not include global climate change topics in their lessons.

Table 6 demonstrates that majority (78%) is not members of any civil society organizations that carry out studies on the environment and global climate change.

Table 3. Duration of your academic career

Options	N	%
16 years and above	130	30,87
11-15 years	115	27,31
6-10 years	85	20,19
1-5 years	91	21,61

Table 4. Do you have any studies on global climate change?

Options	N	%
No	333	79,09
Yes	88	20,9

Table 5. Do you have any topics related to global climate change in your lessons?

Options	N	%
No	304	72,2
Yes	117	27,79

Table 6. Are you a member of an environmental non-governmental organization (Greenpeace, World Wide Fund for Nature-WWF, TEMA, Sustainable Living Association, etc.)?

Options	N	%
No	327	77,67
Yes	94	22,32

Table 7. Do you feel professionally responsible for preventing global climate change?

Options	N	%
No	348	82,66
Yes	73	17,33

Table 7 illustrates that majority (80%) feel professionally responsible for preventing global climate change.

Table 8 demonstrates that almost all participants (90%) stated that they follow news and developments related to environmental problems.

More than one answer option was presented to the question in Table 9 where seen participants stated that they obtained information on global climate change mostly from the Internet and social media. In the second place, TV, radio, and newspapers were emphasized in obtaining information, and the third option was scientific articles and magazines.

Table 8. Do you follow news/developments related to environmental problems?

Options	N	%
No	381	90,49
Yes	40	9,5

Table 9. How do you get information about global climate change? (You can choose more than one option)

Options	N	%
Internet, social media	372	28,77
TV, radio, newspaper	321	24,82
Scientific articles, journals	260	20,1
Meeting-conference-seminar	157	12,14
Environmental organizations	154	11,91

Table 10. How often do you discuss global climate change in daily life?

Options	N	%
Often	168	39,9
Sometimes	159	37,76
Rarely	70	16,62
Always	18	4,27
Never	6	1,42

Table 11. How do you think education on global climate change should be provided? (You can choose more than one option)

Options	N	%
Should be added to the curriculum	266	33,12
Should be offered as an elective course	221	27,52
Field studies should be carried out with implementation groups	165	20,54
Should be offered as a course	111	13,82
Events should be organized (panel, debate, film screening, etc.)	40	4,98

Table 10 shows that the participants discuss frequently or sometimes global climate change in their daily lives.

As seen in Table 11, the participants selected multiple options. They mostly (33%) stated that it should be included to the curriculum as a course. The second most popular option, chosen by the participants, was organizing activities related to the subject. In third place, participants suggested carrying out field studies with practice groups.

As seen in Table 12, a significant proportion of the participants (92,15%) stated their willingness to comply with the imposed restriction by answering partially in the affirmative or fully endorsing the limitations on living standards as a measure to mitigate the impacts of global climate change.

As shown in Table 13, majority (79,32%) stated that they were concerned or extremely concern about global climate change.

Table 14 shows that the participants firstly stated that global climate change can be prevented through education and rising public awareness. International cooperation and partnerships were selected as the second most effective method to prevent global climate change, and the third option was legal measures.

As shown in Table 15, the majority of participants prioritized using electricity and water resources carefully. Following that, they opted for using environmentally friendly products and vehicles, and lastly, they selected raising public awareness.

Table 12. Would you accept a reduction in your living standards to slow down global climate change?

Options	N	%
Partially yes	247	58,66
Certainly yes	141	33,49
No	26	6,17
Neutral	7	1,66

Table 13. How Concerned Are You About Global Climate Change?

Options	N	%
Worried	207	49,16
Overly worried	127	30,16
Little worried	69	16,38
No worries	18	4,27

Table 14. What do you think is the most effective method to mitigate global climate change? (You can choose more than one option)

Options	N	%
Education/raising public awareness	282	27,29
Legal Precautions	247	23,91
International collaborations and partnerships	207	20,03
Social Precautions	166	16,06
Individual Precautions	131	12,68

Table 15. What is the practice/behavior you pay attention to regarding global climate change? (You can select more than one option)

Options	N	%
Careful use of electricity and water resources	358	34,62
Use environmentally friendly products and tools	226	21,85
Raising public awareness	182	17,6
Plantation	169	16,34
No use of deodorant	86	8,31
I don't do anything	13	1,25

CONCLUSIONS

This study explored the attitudes and awareness of academics toward the impacts of global climate change by an online survey involving 421 academics from various universities in Türkiye. The majority of the participants were assistant professors. The sex distribution was relatively balanced. Two distinct question groups were utilized in the study. While the first group evaluated the academics' attitudes and behaviors toward the effects of climate change, the second one measured their awareness regarding global climate change. The findings are presented in detail through tables in the study.

The findings for the first question group revealed that the majority of the participants were worried or overly worried about global climate change. Many participants either frequently or sometimes discuss global climate change in their daily lives. The majority closely followed the news and developments related to environmental problems. It was revealed that the primary sources for obtaining information on global climate change is the internet and social media followed by TV, radio, newspapers, scientific articles and magazines. Notably, it was understood that the majority of the participants were not members of any non-governmental organizations related to the environment.

The study also uncovered that the majority were in favor of lifestyle adjustments to mitigate global climate change. At this point, prudent use of electricity and water resources and the adaption of environmentally friendly products and vehicles came to the forefront as practices that the majority of participants pay attention to regarding global climate change.

The study further investigated the participants' professional activities associated with global climate change. Although the majority of the participants acknowledged feeling professionally responsible for addressing global climate change, a significant number did not partake in related research or integrate global climate change topics into their teaching. Academics stressed that climate change should be included as a course in the curricula of higher education programs to increase awareness of global climate change and foster individual responsibility in addressing the issue. Also the majority advocated the need to raise awareness of the society as the most effective method to combat global climate change and the need to take international collaboration and legal measures.

In the second question group of the questionnaire, global climate change awareness of academics was measured. The awareness scale includes 21 questions across four different dimensions. It was concluded that the participants' awareness of global climate change is at medium and high levels across different dimensions.

Some recommendations have been developed within the framework of the research findings. The most important suggestions among these are to incorporate a global climate change course into the curricula of universities and vocational colleges, across all faculties and departments, and to integrate global climate change issues in the main curricula. Global climate change encompasses many fields in terms of its effects and consequences. Therefore, the second suggestion is for academics in different university disciplines to raise awareness about the issue in their respective fields and to include global climate change and its effects in their courses and research. In addition, awareness-raising activities such as field studies, seminars, panels, debates, film screenings, etc. should be organized for both academics and students at universities. As indicated by the research, since the internet and social media are preferred sources of information on global climate change, efforts to raise awareness and information activities in these areas should also be increased.

The third suggestion is that academics should undergo professional and individual training on the subject, stay updated on national and international studies, and apply the information they have acquired in their individual and professional lives. Also, environmental organizations have the capacity to influence decision-makers through promotions, activities and campaigns on environmental issues. Thus, the fourth suggestion is for academics to increase their involvement in environmental organizations and participate in their initiatives. This can lead to a change in the awareness, attitudes and behaviors of academics toward the environmental issue.

Finally, academics are expected to have a high level of awareness of global climate change and its far-reaching impacts on ecosystems, food production, migration, and the overall health of all living things. With this awareness, they are also expected to demonstrate attitudes and behaviors aimed at mitigating these effects. By doing so, they can impart awareness and consciousness about global climate change to the generations they educate. It is crucial for academics to recognize their influence on their students and to approach this issue as a responsibility.

DATA AVAILABILITY STATEMENT

The authors confirm that the data that supports the findings of this study are available within the article. Raw data that support the finding of this study are available from the corresponding author, upon reasonable request.

CONFLICT OF INTEREST

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

USE OF AI FOR WRITING ASSISTANCE

Not declared.

ETHICS

I hereby declare that the survey has been conducted and approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki." I confirm that I have obtained ethical approval by the Ethics Committee granted by Hakkari University with the reference number 2023/136 session number 1, and the document date and number 26.12.2023-7167.

REFERENCES

1. C. Calculli, A. M. D'Uggento, A. Labarile and N. Ribbecco, "Evaluating people's awareness about climate changes and environmental issues: A case study". *Journal of Cleaner Production*, Vol. 324, pp. 1-9, 2021.

2. T. M. Lee, E. M. Markowitz, P. D. Howe, C. Ko and A. A. Leiserowitz, "Predictors of public climate change awareness and risk perception around the world", *nature climate change*, Vol. 5, pp. 1014-1023, 2015.
3. Tiller and C. Schott, "The critical relationship between climate change awareness and action: an origin-based perspective", *Asia Pacific Journal of Tourism Research*, Vol. 18(1-2), pp. 21-34, 2013.
4. R. W. Fortner, J. Lee, J. R. Corney, S. Romanello, J. Bonnell, B. Luthy, C. Figuerido and N. Ntsiko, "Public understanding of climate change: certainty and willingness to act", *Environmental Education Research*, Vol. 6(2), pp. 127-141, 2000.
5. T. Dietz, R.L. Shwom, and C.T. Whitley, "Climate change and society," *The Annual Review of Sociology*, Vol. 46, pp. 5.1-5.24, 2020.
6. <https://www.mgm.gov.tr/iklim/iklim.aspx?key=B>, Turkish State Meteorological Service website. [Online]. Available: (2022)
7. IPCC. "Climate change. The Physical Science Basis: Summary for Policy-Makers." *Geneva, Switzerland*. 2007.
8. R.K. Pachauri, and L.A. Meyer, Ed., IPCC. Climate change 2014: *Synthesis Report*. Geneva, Switzerland. 2014.
9. F.P. Incropera. Climate Change: A Wicked Problem Complexity and Uncertainty at the Intersection of Science, Economics, Politics, and Human Behaviors. Cambridge University Press, Cambridge, the UK. 2016.
10. <https://webdosya.csb.gov.tr/db/iklim/banner/banner595.pdf>, Ministry of Environment and Urbanization of Turkish Republic website. [Online]. Available: (2005)
11. G. Walker and S.D. King. The Hot Topic: What We Can Do About Global Warming. Harper Perennial, London, the UK. 2008.
12. <https://climate.nasa.gov/effects/>, NASA website. [Online]. Available: 2022.
13. J.T. Houghton. Global Warming: the Complete Briefing. 4th ed. Cambridge University Press, Cambridge, the UK. 2009.
14. J. Hansen, M. Sato, P. Kharecha, G. Russell, D. W. Lea and M. Siddall, "Climate Change and Trace Gases" Royal Society, Vol. 365(1856), pp. 1925-1954, 2007.
15. R. E. Dunlap and R. J. Brulle (eds), "The Human (Anthropogenic) Driving Forces of Global Climate Change" E. A. Rosa, T. K. Rudel, R. York, A. K. Jorgenson and T. Dietz, 2015.
16. J. F. May and J. A. Goldstone (eds). "Demographic dynamics, poverty and inequality" *J. A. Paz*, 2022.
17. S. Kahraman, and P. Şenol, "İklim değişikliği: küresel, bölgesel ve kentsel etkileri," *Academia Journal of Social Sciences*, Vol.1, pp. 353-370, 2018.
18. <https://www.ncei.noaa.gov/news/global-climate-202112>, NOAA website. [Online]. Available: (2022)
19. P.H. Raven, and D.L., "Wagner Agricultural intensification and climate change are rapidly decreasing insect biodiversity," *Proceedings of the National Academy of Sciences*, Vol. 118 (2), 2021.
20. https://www.internaldisplacement.org/sites/default/files/publications/documents/IDMC_GRID_2022_LR.pdf, IDMC website. [Online]. Available: (2022)
21. <https://www.who.int/news-room/fact-sheets/detail/climatechange-and-health>, WHO website. [Online]. Available: (2024)
22. S. Barna, B. Goodman, and F. Mortimer, "The health effects of climate change: what does a nurse need to know?" *Nurse Education Today*, Vol. 32, pp. 765-771, 2012.
23. A. Costello et al., "Managing the health effects of climate change," *Lancet*, Vol. 373, pp. 1693-1733, 2009.
24. W. Nordhaus. The Climate Casino: Risk Uncertainty and Economics for a Warming World. Yale University Press, London, the UK. 2013.
25. J. Shogren and T. Michael. Climate Change Policy Discussion Paper. NY: Resources for the Future, New York, USA. 2000.
26. A. Giddens. The Politics of Climate Change. Polity Press, Cambridge, the UK. 2009.
27. https://www.ipcc.ch/site/assets/uploads/2021/07/AR6_FS_What_is_IPCC.pdf, IPCC website. [Online]. Available: (2022)
28. https://report.ipcc.ch/ar6wg2/pdf/IPCC_AR6_WGII_FinalDraft_TechnicalSummary.pdf, IPCC website. [Online]. Available: (2022)
29. https://report.ipcc.ch/ar6wg3/pdf/IPCC_AR6_WGIII_FinalDraft_TechnicalSummary.pdf, IPCC website. [Online]. Available: (2024)
30. D. Porta, and M. Portos, "Rich kids of Europe? Social basis and strategic choices in the climate activism of fridays for future," *Rivista Italiana Di Scienza Politica*. Vol 53 (1), pp. 24-49, 2023.
31. <https://climate-adapt.eea.europa.eu/en/>, The European Climate Adaptation Platform website. [Online]. Available: (2022)
32. DC. North. Institutions, Institutional Change and Economic Performance. Cambridge University Press, Cambridge, the UK. 2012.
33. E.T. Tümer et al., "Climate change awareness and institution perception: an empirical analysis of European countries," *Fiscaoeconomia*, Vol. 7 (2), pp. 1511-1535, 2023.
34. E.L. Boyer. Scholarship Reconsidered: Priorities of the Professoriate. Princeton University Press, Princeton, USA. 1990.
35. J. Hattie, and HW. Marsh, "The relation between research productivity and teaching effectiveness: complementary, antagonistic or independent constructs?" *The Journal of Higher Education*, Vol. 73 (5), pp. 603-641, 2012.
36. Ş. Büyüköztürk et al. Eğitimde Bilimsel Araştırma Yöntemleri. Pegem Akademi, Ankara, Türkiye. 2015.

37. <https://www.yok.gov.tr/Sayfalar/Haberler/2023/yuksekokretimde-yeni-istatistikler.aspx>, YÖK website. [Online]. Available: (2014)
38. B. Tabachnick and L. Fidell. Using Multivariate Statistics, 6th ed. Pearson, Boston, USA. 2013.
39. A. Anaker et al., "Nurses' perceptions of climate and environmental issues: a qualitative study," *Journal of Advanced Nursing*, Vol. 71 (8), pp. 1883-1891, 2015.
40. J. Xiao et al., "Nurses' knowledge and attitudes regarding potential impacts of climate change on public health in central of China," *International Journal of Nursing Sciences*, Vol. 3 (2), pp. 158-161, 2016.
41. T. Dündar et al., "Akademiye hemşirelerin iklim değişikliği ile ilgili görüşleri," *Hemşirelik Bilimi Dergisi*, Vol. 3 (2), pp. 10-15, 2020.
42. I.R. Halady and P.H. Rao, "Does awareness to climate change lead to behavioral change?" *International Journal of Climate Change Strategies and Management*, Vol. 2 (1), pp. 6-22, 2010.
43. G. Tok, Ü. Cebesoy, and K. Bilican, "Investigating pre-service primary teachers' climate change awareness," *Western Anatolia Journal of Educational Sciences*, Vol. 8 (2), pp. 23-36, 2017.
44. M. Deniz, Y. İnel, and A. Sezer, "Awareness scale of university students about global climate change," *International Journal of Geography and Geography Education (IGGE)*, Vol. 43, pp. 252-264, 2021.