

Mothers' anxiety levels regarding the impacts of global climate change on their children and associated factors

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ABSTRACT

This study was designed to determine mothers' anxiety levels regarding the impacts of global climate change on their children and to identify the factors associated with these anxiety levels. The study adopted a descriptive and correlational design and was conducted with 204 mothers attending Family Health Centers. Data were collected using a "Data Collection Form" and the "Climate Change Worry Scale." The data were analyzed using descriptive statistics (mean, standard deviation, and frequency), Student's t-test, Pearson correlation, and regression analyses. The findings revealed that the majority of mothers experienced high levels of anxiety concerning the negative effects of global climate change on child health. Anxiety levels were found to be significantly associated with mothers' educational level, exposure to environmental news, the presence of a chronic illness in the child, and mothers' participation in environmentally friendly behaviors. In conclusion, mothers' climate-related anxiety largely stems from concerns about their children's future health and safety, and higher levels of environmental awareness are associated with increased anxiety. The study highlights the importance of community-based educational programs aimed at improving climate literacy among families.

Keywords: Global climate change, Nursing, Child

INTRODUCTION

Global climate change (GCC) is defined as the disruption of the climate system resulting from the increase in greenhouse gases in the atmosphere due to human activities (NASA, 2023). Climate disruptions have led to conditions such as floods, wildfires, reduced biodiversity, and increased infectious diseases, all of which threaten the survival of living organisms (IPCC, 2023). The World Health Organization (WHO, 2023) has declared global climate change as the greatest health threat to the world's

population. In the People's Climate Vote survey conducted by the United Nations with participants from 50 different countries, more than 65% of respondents perceived global climate change as a global threat (WHO, 2023).

Global climate change represents a crisis that adversely affects ecosystems, societies, and human health in the long term. Global warming resulting from GCC influences the amount, type, frequency, and intensity of precipitation, leading to extreme weather events such as thunderstorms, floods, heatwaves,

droughts, and hurricanes (Proulx et al., 2024; Philipsborn & Chan, 2018; Campbell-Lendrum & Prüss-Ustün, 2019). If GCC cannot be prevented, it is expected that global temperatures will continue to rise and that the melting of glaciers will accelerate sea-level rise. It is anticipated that the severity and frequency of natural disasters will increase due to GCC, and that the environmental consequences of the escalating global climate crisis will adversely affect human health, particularly the pediatric population at a time when the child population is declining (Proulx et al., 2024; Philipsborn & Chan, 2018; Campbell-Lendrum & Prüss-Ustün, 2019; Watts et al., 2021; Emral, 2022).

Environmental exposures during the prenatal period and early postnatal life can permanently alter physiology and metabolism, leading to serious health problems later in life (Edis, 2024; Basagaña et al., 2021). Studies have demonstrated that factors such as increased air pollution, temperature variability, food insecurity, and persistent organic pollutants associated with climate change negatively affect maternal and child health (Edis, 2024; Proulx et al., 2024; Basagaña et al., 2021; Bryson et al., 2021). Exposure to high temperatures during pregnancy adversely affects fetal development and is associated with congenital cardiac and neural tube defects, fetal distress, low birth weight, preterm birth, increased risk of stillbirth, neonatal stress, reduced placental weight and volume, placental abruption, premature rupture of membranes, and hypertensive disorders of pregnancy (Dalugoda et al., 2022). Numerous studies in the literature have demonstrated the negative effects of climate change on maternal–fetal, infant, and child health (Edis, 2024; Dalugoda et al., 2022; Basagaña et al., 2021; Bryson et al., 2021).

Therefore, raising awareness of the adverse effects of climate change and promoting protective behaviors are of critical importance. However, a limited number of studies have addressed the effects of climate change on child health and sustainability. For this reason, determining mothers' levels of anxiety regarding the impacts of global climate change on their children and the factors influencing these anxiety levels is expected to contribute to the existing literature. This study was planned to determine mothers' anxiety levels related to global climate change and the factors affecting these levels.

Research Questions

- What are the levels of climate change–related anxiety among mothers regarding their children?

- Are maternal climate change anxiety levels associated with mothers' and children's sociodemographic characteristics?
- Which maternal and contextual factors predict climate change–related anxiety among mothers?
- Is maternal climate change anxiety associated with mothers' sustainability attitudes?

MATERIALS and METHODS

Study Design

This study was designed as a descriptive and correlational study.

Population and Sample

The research was conducted between June 16, 2025, and October 31, 2025, at Family Health Centers located in XXXX. These centers provide services on weekdays. The sample size was calculated using the G*Power 3.0.1 software, with a confidence level of 0.95, statistical power of 0.80, and a Type I error rate of 0.20 (Yamane, 2001). The minimum required sample size was determined to be 170 participants. However, considering a potential data loss rate of 20%, the final sample size was increased to 204 mothers.

The inclusion criteria were mothers who voluntarily agreed to participate and provided informed consent, had children aged between 0 and 18 years, and were able to read, write, and speak Turkish. The exclusion criteria were mothers with any communication difficulties and those who did not provide written or verbal consent to participate in the study.

Data Collection Tools

Data were collected using the Data Collection Form and the Climate Change Worry Scale. Data were collected through face-to-face interviews.

Data Collection Form

This form was developed by the researcher based on a review of the relevant literature (Incesu & Yas, 2024; Mat & Yilmaz, 2024; İlaslan & Şahin Orak, 2024; Uzun, 2021; Semenderoğlu et al., 2024; Edis, 2024) and consisted of 18 questions assessing the sociodemographic characteristics of the mothers.

Climate Change Worry Scale

The scale was developed by Stewart (2021). The Turkish validity and reliability study of the scale was conducted by Gezer and İlhan (2021) to assess individuals' levels of worry about climate change, as both the observed impacts of climate change and its

potential future consequences may lead to psychological responses such as fear, stress, trauma, depression, and anxiety. It consists of two subdimensions—*anxiety* and *feelings of helplessness*—and 10 items rated on a five-point Likert scale ranging from “never” (1) to “always” (5). No reverse-coded items are included. Total scores range from 10 to 50, with higher scores indicating greater climate change anxiety. Cronbach’s alpha was reported as 0.91 for the total scale, 0.87 for the anxiety subscale, and 0.83 for the helplessness subscale (Gezer & İlhan, 2021). In the present study, the total Cronbach’s alpha coefficient of the scale was found to be 0.891.

Data Collection Procedure

At the beginning of the study, mothers of children who met the inclusion criteria were informed about the purpose and content of the study. Written informed consent was obtained from those who agreed to participate. Data were collected by administering the Data Collection Form and the Climate Change Worry Scale to the mothers. The forms were completed by the participants in the presence of the researcher, with guidance provided when necessary. The completion of the forms took approximately 15 minutes.

Data Analysis

Statistical analyses were performed using IBM SPSS Statistics version 22 (IBM Corp., Armonk, NY, USA; released 2013). The normality of the data distribution was assessed using the Kolmogorov–Smirnov test. The data were found to be normally distributed. Descriptive statistics, including numbers, percentages, means, standard deviations, and frequencies, were used to summarize the data. Student’s t-test was applied to compare normally distributed variables between two groups. Relationships between scale scores were examined using correlation analysis. Multiple linear regression analysis was conducted to identify independent variables affecting the total and subscale scores of the Climate Change Worry Scale. The backward elimination method was used for variable selection in the regression models. Statistical significance was set at $p < .05$.

Ethical Considerations

Ethical approval was obtained from the Burdur Mehmet Akif Ersoy University Non-Interventional Clinical

Research Ethics Committee (decision numbered: GO 2025/1575; dated: 07.05.2025) and institutional permission was granted. Permission to use the Climate Change Worry Scale was obtained from Gezer. Participants who met the inclusion criteria were informed about the purpose and procedures of the study, and informed consent was obtained. The study was conducted in accordance with the principles of the Declaration of Helsinki.

RESULTS

A total of 204 mothers participated in the study. The mean age of the participants was 32.8 ± 6.1 years. Most mothers were high school graduates or above (62.7%), while 37.3% had primary or secondary education. The majority of participants (71.1%) reported having a moderate socioeconomic status, and 68.6% were not employed. Nearly half of the mothers (48.5%) stated that they regularly follow environmental or climate-related news through television, social media, or online platforms. Regarding children’s characteristics, the mean age of children was 7.4 ± 4.1 years, and 12.7% had at least one chronic condition such as asthma or allergies (Table 1).

The mean total score of the Climate Change Worry Scale (CCWS) among mothers was 36.84 ± 7.92 , indicating a relatively high level of climate change anxiety. The mean score of the Anxiety subdimension was 19.62 ± 4.38 , while the mean score of the Helplessness subdimension was 17.22 ± 4.06 . Based on score distribution, 61.3% of the mothers were classified in the high anxiety group, whereas only 8.8% were classified in the low anxiety group (Table 2).

A statistically significant relationship was found between educational status and CCWS scores ($p < 0.01$). Mothers with university-level education showed significantly higher anxiety scores (38.21 ± 6.93) compared to those with primary or secondary education (34.47 ± 8.14). Mothers who frequently followed environmental news exhibited significantly higher mean anxiety scores (39.10 ± 6.52) compared to those who rarely followed such news (34.92 ± 7.83) ($p < 0.001$). Exposure to environmental information appeared to heighten awareness, which in turn increased concern regarding the effects of climate change on children. The presence of chronic disease in the child was strongly associated with higher anxiety levels. Mothers of children with chronic illnesses had a mean CCWS score of 41.27 ± 5.89 , significantly higher than mothers of healthy children, whose mean score was 35.92 ± 7.94 ($p < 0.001$). These mothers frequently expressed concerns that extreme heat, air pollution, and increasing environmental allergens could adversely affect

Table 1. Distribution of Sociodemographic Characteristics of the Mothers (N = 204)

Variable	Mean ± SD	
Mother's age (years)	32.8 ± 6.1	
Child's age (years)	7.4 ± 4.1	
	n	%
Mother education level		
Primary/Secondary school	76	37.3
High school and above	128	62.7
Socioeconomic status		
Low	29	14.2
Moderate	145	71.1
High	30	14.7
Employment status		
Employed	64	31.4
Unemployed	140	68.6
Following environmental/climate-related news		
Regularly	99	48.5
Rarely/Never	105	51.5
Presence of chronic illness in the child		
Yes	26	12.7
No	178	87.3

their children's health. A significant relationship was also identified between environmental behavior patterns and anxiety levels. Mothers who regularly engaged in environmentally friendly behaviors—such as recycling, reducing plastic use, conserving water, and participating in environmental awareness activities—had higher anxiety scores (38.94 ± 7.05) than those who did not consistently engage in such behaviors (34.35 ± 7.72) ($p < 0.01$). This finding suggests that individuals with higher environmental awareness experience greater anxiety regarding climate-related threats to their children's health (Table 3).

No significant difference was found between mothers' age and anxiety scores ($p > 0.05$). Similarly, socioeconomic status and number of children did not significantly affect CCWS scores. Although mothers with children aged 0–6 years exhibited higher anxiety levels than those with children aged 7–18 years, this difference did not reach statistical significance ($p = 0.06$).

Regression analysis identified four variables that significantly predicted mothers' climate change anxiety:

educational level ($\beta = 0.223$; $p = 0.002$), frequency of exposure to environmental news ($\beta = 0.245$; $p < 0.001$), presence of a chronic illness in the child ($\beta = 0.314$; $p < 0.001$), and participation in environmentally friendly practices ($\beta = 0.182$; $p = 0.01$). The model explained 42% of the variance in CCWS scores ($R^2 = 0.42$) (Table 4).

Overall, the findings indicate that mothers experience high levels of climate change-related anxiety, which is strongly associated with educational level, access to environmental information, child health status, and environmental behaviors. The general trend suggests that as awareness and knowledge about climate change increase, anxiety levels—particularly among mothers of vulnerable children—also increase.

Table 2. Mean Scores of the Climate Change Worry Scale and Its Subdimensions Among Mothers

Scale and subdimensions	Min-Max	Mean ± SD
Climate Change Worry Scale Total Score	10-50	36.84 ± 7.92
Anxiety subdimension	-	19.62 ± 4.38
Feelings of helplessness subdimension	-	17.22 ± 4.06

Table 3. Comparison of Mothers' Climate Change Worry Scale Total Scores According to Selected Characteristics

Variable	Grup	Mean ± SD	t/p
Education level	Primary/Secondary school	34.47 ± 8.14	.001
	High school and above	38.21 ± 6.93	
Environmental news exposure	Rarely	34.92 ± 7.83	.001
	Frequently	39.10 ± 6.52	
Presence of chronic illness in the child	No	35.92 ± 7.94	.001
	Yes	41.27 ± 5.89	
Environmentally friendly behaviors	No	34.35 ± 7.72	.001
	Yes	38.94 ± 7.05	

Student t Test

**p<0.05*

DISCUSSION

This study examined mothers' levels of anxiety regarding the impacts of global climate change on their children and identified several key factors influencing this anxiety. The findings make an important contribution to the literature indicating that climate change-related anxiety among mothers is an increasingly significant public health concern, particularly in communities with high environmental exposure or where children are more vulnerable.

The high mean anxiety scores observed in this study are consistent with international research reporting elevated climate-related anxiety among parents due to perceived threats to their children's health and future well-being (Clayton, 2020; Stewart, 2021; Efetürk et al., 2024; Proulx et al., 2024). As mothers often assume the role of primary caregivers, they may experience more intense emotional and psychological responses when environmental risks are perceived as threats to their children's safety (Amin et al., 2024; Efetürk et al., 2024; Proulx et al., 2024). In line with the findings of Stewart (2021) and Gezer and İlhan (2021), the high scores observed in both the anxiety and helplessness subdimensions suggest that mothers' concerns about climate change encompass not only emotional distress but also a perceived loss of control in the face of environmental threats.

One of the central findings of this study is the difference between educational level and climate change anxiety. Mothers with higher educational attainment reported significantly higher anxiety scores. This finding aligns with previous studies indicating that individuals with greater access to scientific knowledge and environmental information perceive climate risks more acutely (Yu et al.,

2023; Zhu et al., 2024; Amin et al., 2024; Kaya et al., 2025). Higher educational levels may enhance access to media, scientific reports, and risk communication, thereby increasing awareness of the severity and long-term consequences of climate change. However, when this heightened awareness is coupled with a perceived limitation in personal agency, it may also contribute to increased anxiety.

Exposure to environmental news emerged as another significant predictor of climate change anxiety (Zhu et al., 2024; Amin et al., 2024; Rothschild et al., 2023). Mothers who more frequently followed climate-related news reported significantly higher anxiety levels. This finding is consistent with previous research highlighting the influential role of media in shaping environmental risk perceptions (Zhu et al., 2024; Efetürk et al., 2024). The increasing visibility of extreme weather events, heatwaves, wildfires, and climate-related crises in the media may intensify fear and uncertainty among parents, particularly those who are highly concerned about their children's health (Basagaña et al., 2021; Zhu et al., 2024; Rothschild et al., 2023).

The presence of a chronic illness in the child was identified as the strongest predictor of mothers' climate change anxiety. Mothers of children with chronic conditions perceived climate change as a more immediate and direct threat. It is well documented that extreme temperatures, air pollution, and rising allergen levels exacerbate

Table 4. Results of Regression Analysis Mothers' Climate Change Worry Scale Total Scores

Variable	β	t	p
Educational level	0.223	3.112	.001
Exposure to environmental news	0.245	3.876	.001
Presence of chronic illness in the	0.314	4.743	.001
Engagement in environmentally	0.182	2.542	.001

β : Standardized beta coefficient; $R^2=0.421$

symptoms in children with respiratory, cardiac, and immunological conditions (Basagaña et al., 2021; Proulx et al., 2024; Meherali et al., 2024). This finding supports previous studies emphasizing the disproportionate impact of environmental stressors on pediatric populations (Amin et al., 2024; Basagaña et al., 2021; Bryson et al., 2021; Dalugoda et al., 2022). The heightened anxiety observed among these mothers may stem from both lived experiences and the medical vulnerability of their children.

Another notable finding is the association between environmentally friendly behaviors and increased anxiety levels. Although environmentally conscious mothers reported engaging more frequently in sustainable practices, these behaviors did not appear to alleviate anxiety; instead, they were associated with higher anxiety levels. Previous research similarly suggests that environmentally active individuals often possess heightened climate awareness, which may increase emotional burden (Amin et al., 2024; Rothschild et al., 2023; Efetürk et al., 2024; Proulx et al., 2024). While such behaviors may function as coping strategies to manage feelings of helplessness, they may also reinforce perceptions that individual efforts are insufficient in addressing the magnitude of global climate threats.

The predictive model, which explained 42% of the variance in climate change anxiety scores, indicates that climate-related anxiety is a multidimensional construct influenced by both environmental awareness and child vulnerability. These findings underscore the need for targeted interventions aimed at reducing parental anxiety while simultaneously strengthening adaptive coping strategies and psychological resilience. Community-based climate literacy programs, psychosocial counseling services for parents of children with chronic illnesses, and initiatives providing clear guidance on protective behaviors may contribute to mitigating climate-related anxiety among mothers.

LIMITATIONS

This study has some limitations. The fact that the study was conducted with mothers who applied to Family Health Centers and in a specific geographic region limits the generalization of the findings to all mothers. The fact that the data were collected with self-report-based measurement tools involves the risk of bias depending on the perceptions and evaluations of the participants. Considering these limitations, it is recommended that longitudinal and multivariate designs

covering different regions be used in future research.

CONCLUSION

This study shows that mothers experience high levels of anxiety regarding the effects of global climate change on their children. Educational level, exposure to environmental news, the presence of a chronic illness in the child, and engagement in environmentally friendly behaviors were significant factors associated with increased anxiety. Mothers of children with chronic conditions appear to be particularly vulnerable, perceiving climate change as a more immediate threat to their children's health. While greater climate awareness is essential, it may also intensify emotional distress when not accompanied by adequate coping resources. These findings highlight the importance of integrating climate literacy with psychosocial support in family and child health services to reduce maternal anxiety and strengthen resilience in the context of the growing climate crisis.

In light of these results, nurses and other healthcare professionals play a crucial role in raising awareness of the impacts of climate change on child and community health, providing reliable information to families, supporting preventive and sustainable health behaviors, and managing climate-related anxiety.

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