Digital Threat: The Influence of Social Media Use on Climate Anxiety in Emerging Adulthood Moderated by Gender

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Abstract. Several studies have investigated the mental health impacts of climate change, with only a few examining the effect of social media use on climate anxiety. The spread of information through social media can exacerbate anxiety, including climate change anxiety. Therefore, this study aimed to examine the influence of social media use on climate anxiety among emerging adults. A cross-sectional design was used, with data collected from both males (n = 55) and females (n = 225). Participants completed a self-administered questionnaire that included demographic characteristics, the Social Media Use Integration Scale, and the Climate Anxiety Scale. Data were analyzed using a moderator analysis technique. The results showed social media use significantly predicted climate anxiety among emerging adults, confirming that higher social media use could directly increase climate anxiety. However, gender had no significant moderating effect on the relationship. These results had important theoretical and practical implications for understanding climate anxiety, especially in the digital era.

Keywords: climate anxiety, emerging adults, social media use, SMUIS, youth

Ancaman Digital: Pengaruh Penggunaan Media Sosial terhadap Kecemasan Iklim pada Masa Dewasa Muda Dimoderatori oleh Gender

Abstrak. Penelitian terbaru telah mengungkap dampak perubahan iklim terhadap kesehatan mental yang dikenal sebagai kecemasan iklim (*climate anxiety*). Selain itu, penyebaran informasi melalui media sosial dapat meningkatkan kecemasan, termasuk kecemasan terhadap perubahan iklim. Namun, penelitian mengenai pengaruh penggunaan media sosial terhadap kecemasan iklim masih terbatas. Penelitian ini bertujuan untuk menguji pengaruh penggunaan media sosial terhadap kecemasan iklim di kalangan individu beranjak dewasa (*emerging adults*). Penelitian ini menggunakan desain *cross-sectional* dan terbagi menjadi partisipan pria (n = 55) dan wanita (n = 225) yang baru memasuki masa dewasa. Partisipan mengisi kuesioner yang terdiri dari karakteristik demografis, skala Integrasi Penggunaan Media Sosial dan skala Kecemasan Iklim. Data dianalisis dengan menggunakan teknik analisis moderator. Hasil penelitian menunjukkan bahwa penggunaan media sosial secara signifikan memprediksi kecemasan iklim di kalangan orang yang memasuki usia dewasa. Dengan kata lain, penggunaan media sosial yang lebih tinggi secara langsung akan meningkatkan kecemasan iklim. Akan tetapi, gender tidak memiliki efek moderator yang signifikan terhadap relasi ini. Temuan ini memberikan implikasi teoritis dan praktis yang penting untuk memahami kecemasan iklim terutama di era digital.

Kata Kunci: anak muda, *emerging adults*, kecemasan iklim, penggunaan media sosial, SMUIS

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Climate change has a significant impact on both physical and mental health. Studies on the relationship between climate change and mental health (Berry et al., 2010; Bourque & Cunsolo Willox, 2014; Cianconi et al., 2020; Usher et al., 2019), have shown that climate change generates negative emotions, leading to a variety of psychological conditions. Mental health problems arising from climate change can occur either directly or indirectly, over short or long periods (Berry et al., 2010; Bourque & Cunsolo Willox, 2014). Moreover, natural disasters such as floods, landslides, and tornados directly contribute to anxiety and post-traumatic stress for victims. Over the longer term, the devastation can displace and leave people trapped in uncertainty and exacerbate psychological distress.

Common psychological problems associated with environmental and climatic deterioration include anxiety and depression (Clayton & Karazsia, 2020), post-traumatic stress disorder, and suicidal behavior (Cianconi et al., 2020), insomnia and self-rated mental health issues (Ogunbode et al., 2021), and decreased individuals well-being (Ogunbode et al., 2022). The conditions are particularly severe for vulnerable groups, such as individuals depending on nature for livelihoods, such as fishermen and farmers (Bourque & Cunsolo Willox, 2014; Coffey et al., 2021), those from lower socioeconomic backgrounds, women, and the youth (Cianconi et al., 2020; Clayton et al., 2023; Coffey et al., 2021). Studies conducted in various contexts have shown relatively consistent results.

Emerging adults are particularly responsible for the future of society and are the most affected by the worsening climate crisis. These individuals experience anxiety and fear for the future (Ágoston et al., 2022; Hickman et al., 2021; Wu et al., 2020), believing it will be bleak unless climate change is addressed. Hickman et al. (2021) investigated 10,000 participants in 10 countries and found that young individuals experience negative emotions related to climate change, including worry, fear, anger, sadness, anxiety, helplessness, hopelessness, and guilt.

A potential source that can exacerbate anxiety is the widespread information accessed through social media. The significant increase in social media users has provided more efficient and effective communication channels (Khan et al., 2022). Social media also makes it easier to maintain interpersonal relationships with closest relatives and has become an integral part of daily life. Currently, there are various social media platforms with unique features. Instagram, being the most popular, has over 2 billion active users globally, with Indonesia ranking 4th among the heavy users (NapoleonCat, 2022; We Are Social, 2025).

Studies have shown that exposure to information on social media can exacerbate anxiety. Moreover, news, reports, and environmental actions are prevalent on social media and can influence how people perceive

the information encountered. Karim et al. (2020) found that social media use positively correlated with mental health issues, particularly anxiety and depression. Keles et al. (2020) reported similar results, adding psychological distress to the list of concerns. The impact of exposure to social media information on anxiety increases during crisis, such as the Covid-19 pandemic (Hossain et al., 2020), and similar effects are anticipated during the climate crisis. Anxiety related to the worsening climate change is known as climate anxiety (Clayton, 2020).

Investigations have been conducted on the influence of social media exposure on climate anxiety (Kricorian & Turner, 2022; Maran & Begotti, 2021). Climate change knowledge originates from various sources, including social media (Maran & Begotti, 2021). Based on report, exposure to climate change information from social media heightens perceived anxiety, especially among women (Kricorian & Turner, 2022). Different types of media have varying impacts on climate anxiety, with video-based information having the most significant effect (Loll et al., 2023). Shao and Yu (2023) reported similar results among youth in China, where exposure to climate change news increased climate anxiety. In the Indonesian context, Anggraini (2024) found that exposure to negative environmental information from social media also contributed to climate anxiety. Therefore, social media can be a valuable resource for bringing individuals

who have not been personally affected by climate change closer to an understanding of its impacts (Parry et al., 2022).

Investigations on social media and anxiety, as well as climate anxiety have shown a significant influence of gender. Kricorian and Turner (2022) found that women felt more anxiety due to information from social media than men. Studies on climate anxiety also identified that women experienced significant anxiety than men (Cianconi et al., 2020; Clayton et al., 2023; Coffey et al., 2021). Therefore, gender plays a role in the influence of social media use on anxiety, including climate anxiety, with women experiencing greater anxiety.

Based on the preceding explanations, social media exposure is related to climate anxiety. However, studies on the influence of social media use on climate anxiety are still limited, particularly among emerging adults in both global and Indonesia contexts. The majority have focused on each variable independently and rarely discussed the dynamics between the two, with none addressing gender as a moderating variable. Therefore, this study aimed to determine the effect of social media use on climate anxiety in emerging adults moderated by gender.

The following hypotheses were formulated:

H1: Social media use affects climate anxiety in emerging adults.

H2: The effect of social media use on climate anxiety is stronger for women compared to men.

Method

Study design

This cross-sectional study was conducted with protocal approved by the Health Research Ethical Committee of the Faculty of Nursing, Universitas Airlangga, Indonesia (Ethical Clearance Number 2806-KEPK). Data were collected online using a Google Forms questionnaire, with participants expected to read the description and instructions before consenting to participate.

Participants

The participants were selected using an accidental sampling method, where those who met the inclusion criteria could voluntarily choose to participate. The inclusion criteria for the study were (1) aged between 18-29 years, (2) owned and used Instagram, and (3) resided in Indonesia. Participants were recruited through accidental sampling by distributing the scale online via social media (Instagram and WhatsApp). Those who met the inclusion criteria were expected to fill out the given scale and provide an informed consent to become participants.

The required sample size was calculated using G*Power before data collection. Based on the G*Power calculation formula, a minimum of 133 participants was needed to obtain a power of .8 and a moderate effect size. Considering that the target population was emerging adults in Indonesia, a total of 300 participants were expected to be recruited. However, after data collection, 280 participants had completed the scale. This number did not meet the target, but the analysis proceeded as it met the minimum required according to the G*Power calculation. Further demographic details are provided as follows.

Table 1

Participants Demographic

Demographics	n	%
Sex		
Male	55	19.6
Female	225	80.4
Education		
High school	190	67.9
Undergraduate	76	27.1
Postgraduate	13	4.6
Doctoral Degree	1	.4

Note: N = 280, Age 18 – 29 years old, M = 21.1

Based on Table 1, a total of 280 participants completed the study, with the majority being female (n = 225) and the remaining male (n = 55). The overall mean age was 21.1, with average age for female and male participants being 20.8 and 22.3, respectively.

In terms of educational level, most participants had a high school education (67.9%), followed by undergraduates (27.1%),

postgraduates (4.6%), and those with a doctoral degree (.4%). The participants were from various regions across Indonesia, with the majority from the Java region.

Based on this demographic distribution, the participants were fairly representative of the population. Considering the relatively high number of participants and the age range of 18 to 29 years, the sample represented emerging adults.

Measurements

Three instruments were used in this study. First, a socio-demographic scale containing questions about participants' personal data information, such as name (initials allowed), age (with options ranging from 18 to 29 years), gender, regional origin (city/district), and education level (junior high school, high school, undergraduate, graduate, doctoral).

Second, Social Media Use Integration Scale (SMUIS), developed by Jenkins-Guarnieri et al. (2013), was used to measure individuals' social media use behavior. This scale comprised 10 items divided into two dimensions, namely (1) Social Integration And Emotional Connection (SIEC), with an example item "I am happy when people use Instagram to communicate"; and (2) Integration in Social Routines (ISR), with an example item "Using Instagram is part of my routine". This scale used a Likert rating design, with a score range from 1 "Strongly disagree" to 5 "Strongly agree". The scale included one reverse item, and participants with high scores on this scale confirmed high intensity and integration of social media use in social routines. The adaptation of this scale into Bahasa Indonesia was carried out through forward-backward translation and readability testing on 30 students who had similar characteristics to the participant criteria. Generally, the adapted SMUIS Bahasa version showed good internal consistency reliability (Cronbach's α = .846; McDonalds's ω = .847). Both the SIEC and ISR dimensions specfically showed satisfactory reliability (SIEC = Cronbach's α .794 and McDonald's ω of .795; ISR = Cronbach's α .716 and McDonalds's ω .728). The adaptation and validation of this scale could be explored further by Ardelia (2024).

Third, Climate Anxiety Scale (CAS), developed by Clayton and Karazsia (2020), was used to measure climate anxiety. CAS consisted of two dimensions, namely cognitive-emotional impairment and functional impairment, totaling 13 items. Examples of the items were "Thinking about climate change makes it difficult for me to concentrate", and "My concern about climate change makes it difficult to have fun with my family and friends". This instrument used a Likert scale with five answer choices, namely 1 (never), 2 (seldom), 3 (sometimes), 4 (often), and 5 (always). CAS had been adapted in Bahasa Indonesia (Jaro'ah & Saffana, 2023) showing good internal consistency reliability (Cronbach's α = .91; McDonald's ω = .91). Based on exploratory and confirmatory factor analyses, the Indonesian version of CAS showed dimensional consistency with the original instrument.

Data analysis

Data were analyzed using Moderator Analysis technique, assisted by Medmod module of Jamovi program for macOS version 2.3 (Navarro & Foxcroft, 2025).

Results

Descriptive analysis

Table 2

Descriptive Analysis

		N	M	Median	SD	Min	Max
Sex							
Male		55	22.3	21	3.43	18	29
Female		225	20.8	20	3.16	18	29
Age			21.1	20	3.26	18	29
SMUIS							
Social Integration and	Male	55	15.4	16	5.03	6	27
Emotional Connection (SIEC)	Female	225	16.3	16	4.45	6	30
Integration to Social	Male	55	14.3	15	2.59	7	20
Routines (ISR)	Female	225	14.2	15	2.90	5	20
Climate Anxiety							
Cognitive-Emotional	Male	55	16.8	17	5.43	8	29
Impairment (CEI)	Female	225	16.5	16	5.92	8	40
Functional Impairment	Male	55	10.1	10	3.80	5	21
(FI)	Female	225	10.2	10	4.15	5	25

Note: N = total samples; SD = standard deviation; SMUIS = Social Media Use Integration Scale

Based on the results of the descriptive analysis in Table 2, there were no significant mean differences in social media use and climate anxiety between men and women. For the social media use variable, women had a higher average on SIEC dimension (16.3), while men had a slightly higher average on ISR (14.3). Regarding the Climate Anxiety variable, men had a higher average on CEI (16.8), while women had a slightly higher average on FI (10.2).

Data analysis

The data were analyzed using moderation analysis with Medmod model to explore the contributions of social media use (as measured by SMUIS) on climate anxiety (as measured by CAS) among emerging adults, as well as the relationship between social media use and climate anxiety moderated by gender. Table 3 showed that social media use significantly predicted climate anxiety (b = .27, CI 95% [.11, .43], β = .08, *p* < .001). These results also showed a positive correlation, where higher intensity in social media use significantly predicted a higher tendency for climate anxiety among emerging adults. Furthermore, gender did not have a significant moderating effect on the relationship between social media use and climate anxiety.

Table 3

Moderation Estimates

	Estimate	SE	95% CI		Z	p
			LL	UL		
SMUIS	.270	.079	.115	.426	3.405	<.001
Gender	.576	1.336	-2.042	3.195	.431	.666
SMUIS*Gender	.160	.197	-.225	.546	.816	.415

Note: SE = standard estimates, SMUIS = Social Media Use-Integration Scale

Table 4 shows the regression model with a good fit (F(281) = 5.78, df = 277, R^2 = .040, p = .003). The variance scores of social media use were able to predict the variance scores of climate anxiety among emerging adults for approximately 4%.

Table 4

Model Fit Measures			Adjusted	Overall Model Test			
Model	R	R^2	R^2	F	df1	df2	p
SMU - CA	.200	.040	.033	5.78	2	277	.003

Note: Abbreviation = SMU: Social Media Use, CA: Climate Anxiety

Discussion

This study examined the influence of social media use on climate anxiety in emerging adults aged 18-29 years, moderated by gender. The results of simple linear regression analysis showed a significant positive effect, where high intensity of social media use was related to high climate anxiety. The intensity of social media use contributed to a predictive value of approximately 4%. These results were consistent with Kricorian and Turner (2022), and Maran and Begotti (2021), where exposure to information through social media could predict climate anxiety, especially for individuals who frequently accessed information through the platforms. According to Anggraini (2024), negative environmental information obtained from social media triggered negative affective symptoms and rumination, where individuals dwell on troubling scenarios repeatedly without constructive solutions. Meanwhile, Kricorian and Turner (2022) found that individuals who accessed information less frequently from social media had lower levels of climate anxiety.

This study found that gender had no significant effect in moderating the dynamics between social media use and climate anxiety, as both males and females showed similar impacts. The results did not support the second hypothesis due to other factors, such as education, personality, and values, having more significant influence on individual concerns about environmental issues than gender (Gifford & Nilsson, 2014). In addition, social media use was becoming more equalized, with men and women accessing similar information on the same platforms, potentially leading to

similar levels of anxiety over major issues (Tufekci & Wilson, 2012), including climate change. Another possibility was the imbalance in the number of male and female participants, capable of weakening the influence on the relationship, leading to biased results, and reducing the generalizability of the results.

The media can shape and influence society's perceptions through published information. During crisis, such as the Covid-19 pandemic, the media played a major role in shaping perceptions (Garfin et al., 2020) and increasing anxiety among individuals who found it difficult to disconnect from social media (Ung et al., 2022). Climate change can be considered a crisis, and social media serves as a source of information that can contribute to anxiety. Emerging adults engage with social media more than other age groups and are more vulnerable to experiencing climate anxiety due to their screen time.

The sentiment of information accessed through social media contributed to the increase in climate anxiety. Information related to climate change tended to be negative, and posts containing negative information spread faster (Fan et al., 2014; Hornik et al., 2015; Li et al., 2020) than positive. This was especially true when influential individuals with large number of followers shared the information (Hou et al., 2015; Li et al., 2020). News about natural disasters caused by climate change is prevalent on social media, often posted by influential users, and could be a source of climate anxiety.

Climate change has been shown to significantly affect individuals' well-being and health. Currently, social media has become a primary source of information, especially on environmental crises, and is widely used to share informations after disasters (Ghafarian & Yazdi, 2020). Some studies have also found that social media use affected how people perceive the dangers of climate change. Different individuals interpreted the phenomenon of climate change in various ways, with some becoming more aware to adopt pro-environmental behaviors, and others having negative perceptions and experiencing anxiety (Mavrodieva et al., 2019). According to Jones et al. (2017), these negative perceptions can be attributed to the narrowing of psychological distance between individuals and environmental issues due to information exposure through social media.

Based on the perspective of emerging adult developmental tasks, some unique characteristics of this developmental stage were feeling in-between, instability, and personality exploration in social situations and the role in the social environment (Arnett, 2014). This may explain why social media has become an indispensable part of emerging adults' lives, fostering continuous interaction with the surroundings. However, emerging adults are also experiencing a sense of possibility, namely the optimism about doing better than the parents. This includes the possibility of maintaining existence in the universe, as negative

information like climate change may influence perception of the future world. Furthermore, news about the increasingly obvious negative impacts of climate change on the environment can increase anxiety about human survival in the future (Hickman et al., 2021).

Climate anxiety is prevalent among the youth (Dodds, 2021; Hickman et al., 2021). According to Hickman et al. (2021), emerging adults reported negative emotions regarding climate change, such as sadness, anxiety, anger, powerlessness, helplessness, and guilt. The manifestations of climate anxiety include panic attacks, loss of appetite, or sleeplessness, which are symptoms similar to other psychological disorders (Swim et al., 2009). Therefore, studies on climate anxiety needed more attention, especially in the context of emerging adults, to fully understand the symptoms of climate anxiety and develop prevention strategies.

This study provided new insights into the influence of social media use on climate anxiety, a topic that had not been widely investigated. Therefore, it is expected to inspire future investigations aiming to expand on the results. The results can also offer adequate guidance on social media use to prevent the emergence of climate anxiety, especially among the emerging adults who spend considerable time on social media.

Several limitations were cited despite the significant contribution made to the currently limited knowledge of dynamics between social media use and climate anxiety, specifically focused on gender differences. First, data were collected through online self-report questionnaires, fostering possible bias from participants. Second, other potential extraneous variables contributing to climate anxiety or social media use, such as socioeconomic background or personality traits, were not considered. Third, the demographic distribution was uneven, potentially weakening the impact on the relationship, causing bias, and reducing generalizability of results.

Conclusions

This study aimed to determine the effect of social media use on climate anxiety in emerging adults moderated by gender. In conclusion, this study showed social media use positively and significantly predicted climate anxiety among emerging adults, although gender did not play a significant role in the relationship. Therefore, the study served as an initial exploration into the dynamics of social media use and climate anxiety according to gender differences. Investigating these concepts could further contribute to a better understanding of mental processes in perceiving climate change through social media. This could also help in designing messages or strategies to prevent climate anxiety while still raising awareness about climate change.

Suggestion

Future studies should consider the following improvements to address the mentioned limitations. First, utilizing multiple

data collection methods, such as interviews or behavioral tracking, could help reduce potential biases associated with self-report questionnaires. Second, incorporating additional variables, such as socioeconomic background, personality traits, personal values, and screen time, would provide a more comprehensive understanding of the factors influencing climate anxiety and social media use. Third, ensuring a more balanced demographic distribution and equal participant representation would improve the validity and generalizability of the results.

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