

Knowledge and Attitude of Climate Change Impacts on Human Health among Community in Kuantan, Pahang, Malaysia

Aniawanis Makhtar^{1*}, Nur Sabila Mohd Sanusi² & Norfadzilah Ahmad³

¹Department of Special Care Nursing, Kulliyah of Nursing, International Islamic University Malaysia, Pahang, Malaysia

²Thomson Hospital Kota Damansara, Petaling Jaya, Selangor, Malaysia

³Department of Professional Nursing Studies, Kulliyah of Nursing, International Islamic University Malaysia, Pahang, Malaysia

ABSTRACT

Background: Climate change poses significant threats to human health through increased frequency of extreme weather events, alterations in disease patterns, and impacts on food and water security. This study aimed to determine the levels of knowledge and attitudes regarding climate change and its health impacts among the community in Kuantan, Pahang.

Methods: A cross-sectional study was conducted among 292 residents conveniently selected in Kuantan, Pahang's areas. Data gathered between March to June 2024 using questionnaires through Google Form. Descriptive statistics, chi-square tests, and Fisher's exact test were used to describe the findings.

Results: The findings indicate that 80.5% of respondents possess adequate knowledge about the health impacts of climate change, and 88.4% demonstrate positive attitudes toward mitigation and adaptation. A significant association exists between higher levels of knowledge and more favorable attitudes toward addressing climate change ($p = 0.045$). Additionally, younger age and higher education levels are significantly associated with better knowledge of climate change on health impacts among the community in Kuantan.

Conclusion: The study underscores the importance of enhancing community education to improve both knowledge and attitudes regarding the health impacts of climate change. These insights are vital for developing targeted public health strategies and fostering proactive community engagement in climate change mitigation and adaptation efforts.

Keywords: Climate change; Human health; Knowledge; Attitude; Kuantan

*Corresponding author

Aniawanis Makhtar
Department of Special Care Nursing,
Kulliyah of Nursing,
International Islamic University Malaysia,
Pahang, Malaysia
E-mail: aniawanis@iiu.edu.my

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INTRODUCTION

Global warming, driven by increased greenhouse gases such as carbon dioxide, has been evident since the Industrial Revolution in the 1800s and is linked to climate change (1,2). Climate change involves long-term shifts in atmospheric conditions, leading to phenomena such as heavier rainstorms, melting glaciers, and frequent droughts (3). Urbanization, industrialization, and transportation contribute significantly to the emission of greenhouse gasses including carbon dioxide, methane, nitrous oxide, and water vapor (4).

Malaysia has also faced the impacts of climate change through rising temperatures and increased heat waves. The country also faces annual monsoons leading to floods, landslides, and tropical storms. In 2018 alone, Malaysia experienced 110 natural disasters, predominantly floods (60.5%), storms (22.9%), and fires (8.2%), with floods affecting over 800,000 people and causing approximately 150 deaths over two decades (5). Furthermore, six low to medium-scale earthquakes were recorded in regions including Ranau and Kundasang in Sabah, and Miri in Sarawak. In Southeast Asia, Malaysia is located in a tropical zone; therefore, it experiences warm and humid temperatures annually (6). The 2009 Lancet Commission on Global Health identified climate change as the 21st century's greatest global health threat, highlighting its extensive impact beyond the environment and its long-term risks to physical and mental health from human-driven development that, while improving life quality, has also led to declining health outcomes (7).

The World Health Organization (WHO) stated that between 2030 and 2050, climate change is expected to cause approximately 250,000 additional deaths per year, from undernutrition, malaria, diarrhea, and heat stress alone (8). The effects of climate change also influence mental health, with people suffering from floods and earthquakes tending to have mental health problems due to the loss of family and necessities. The climate crisis has an impact on social and environmental health determinants, such as clean air, safe drinking water, enough food, and safe shelter (9). Furthermore, storms, floods, and droughts cause the increase and introduction of climate-sensitive diseases by contaminating water and the environment, as well as creating hatching grounds for disease-carrying vector mosquitoes (6).

Malaysia has entered a golden age that prioritizes Malaysians' quality of life as it meets the third goals of Sustainable Development Goals, which is to have good health and well-being related to target 3.3, infectious disease, and target 3.9, environmental health. Communities often have varying levels of understanding and attitude of these impacts (10,11), which can influence their response to health risks associated with climate change. For instance, previous research highlights the crucial role of education and healthcare professionals in enhancing community awareness (12,13).

Based on previous studies, most people of all ages have inadequate knowledge regarding climate change and its effects on health (9,14,15). Furthermore, sociodemographic factors such as age, education, and socioeconomic status can affect climate change knowledge and attitudes (16,17). Given the documented climate change also effects on Malaysia, such as natural disasters and rising temperatures (5,18). Thus, this study aims to fill the gap in local data by evaluating the knowledge and attitudes of Kuantan's residents towards climate change and its health implications.

METHODS

Study Design

This study utilized a descriptive cross-sectional study which determined the level of knowledge and attitude of climate change on human health among communities in Kuantan, Pahang. Pahang is a state located in the North-East Region of Peninsular Malaysia. These areas were facing the monsoon season and annual floods.

Sample Size

The sample size was computed using a single population proportion formula (19). The sample size was calculated to be 265 using $Z = 1.96$, $P = 0.54\%$ (20), and $d = 0.05$. Considering the issues of missing data, potential dropouts, and unusable questionnaires, this study aimed for a sample size of 10%, which was more than 138. The final total sample size was 292.

Instruments

The questionnaire was a self-administered tool developed in both Malay and English to align with the study objectives. Questions were adapted from previous studies (9,20), with permission obtained from the original developers

to use and modify these items as needed. A pilot study was conducted prior to the main study, yielding a Cronbach's Alpha of 0.80 for the knowledge section and 0.71 for the attitude section, indicating acceptable reliability for both parts. Content validity was assessed by a panel of experts, including two community health nursing lecturers and two medical-surgical nursing lecturers, who confirmed the questionnaire's appropriateness without requiring further modifications. Research questionnaires contained three distinct parts:

Part I was socio-demographic information of Kuantan' people; including gender that include male and female, age consist of; young adult (18-39), middle-age adult (40-59) and elderly (above 60), level of education include primary until tertiary education, marital status, address, ethnic that consist of; Malay, India, Chinese, Orang Asli, and religion consists of; Muslim, Christian, Buddhist, and Hindu. Occupations are also included in this questionnaire which involves public sector, private sector, unemployed and students.

Next, Part II measured their knowledge about climate change impact on health. The knowledge section included 15 semi-structured questions with multiple choice which includes meaning climate change, cause of climate change, effects climate change on health It also consist of multiple responses and dichotomous (Yes/No) questions. The total score was converted into percentage and was interpreted as follows: above 68% adequate knowledge, 32% to 67% moderate knowledge and below 31% inadequate knowledge (9).

Lastly, Part III measured the attitude of climate change and its impact on health (9,20). In the attitude section there are 7 semi-structured dichotomous questions. Each question related to attitude carried one mark but in case of multiple responses each correct response consists of one mark. The total score was converted into percentage and was interpreted as follows: above 72% good attitude, 30% to 71% fair attitude and below 29% poor attitude (20).

Data Collection

This study was conducted between March to June 2024. Data collection facilitated through Google Forms, an online survey platform and distributed to social media such as WhatsApp, Facebook, and Instagram. The survey was also conducted face-to-face in the public areas around Kuantan. Prior to the study, an explanation of the study was

provided. Participants who agreed to join this study provided their consent before completing the questionnaire. Approximately, 10-15 minutes were taken to complete the survey for each person. The data collection was updated every two weeks during the data collection period. All completed questionnaires were analyzed, while incomplete ones were excluded from the study.

Data Analysis

Data obtained from the questionnaire were entered into an Excel spreadsheet and analyzed using IBM SPSS Statistics for Windows, Version 27 (IBM Corp., Armonk, New York, United States). Descriptive statistics were presented as frequencies and percentages in tables. The chi-square test was used to determine associations between respondents' attitudes and sociodemographic factors (independent variables) and their level of knowledge about climate change (dependent variable), with statistical significance assumed at $p \leq 0.05$. When chi-square test assumptions were not met, Fisher's Exact Test was applied.

RESULTS

Sociodemographic Characteristics of Respondents

In this study **Table 1**, a total of 292 completed questionnaires were retained for analysis, with a response rate of 100%. Descriptive statistics revealed that the majority of respondents were female (70.5%), predominantly Malay (95.2%), and identified as Muslim (95.9%). A high level of education was observed, with 89.4% having attained tertiary education. Employment was primarily among students (42.8%), and most respondents were single (62.7%).

Knowledge of Climate Change Among the Community in Kuantan

Table 2 shows that the majority of respondents (38.4%) correctly identify climate change as a long-term change in weather patterns. Most respondents demonstrate a solid understanding of its causes, with 89.4% acknowledging greenhouse gas emissions, 82.2% recognizing industrialization, and 81.5% citing deforestation.

In **Table 3**, 97.3% of respondents recognize that climate change affects rain patterns, while 94.5% acknowledge its impact on wind patterns. The most commonly identified consequence of climate change is increased temperature (94.2%). Among

the observed impacts, health effects are noted by 89.0% of respondents. Additionally, 96.9%

identify heat waves as an extreme weather-related issue due to climate change.

Table 1: Sociodemographic information of respondent (N=292)

Variable	Number (<i>n</i>)	Percentage (%)
Age		
18-39 (young adult)	223	76.4
40-59 (middle-aged adult)	54	18.5
60 and Above (old adult)	15	5.1
Gender		
Male	86	29.5
Female	206	70.5
Ethnicity		
Malays	278	95.2
Chinese	6	2.1
Indians	4	1.4
Others (Melanau, Bugis, Kadazan Dusun, Iban)	4	1.4
Religion		
Muslim	280	95.9
Christian	2	0.7
Hindu	4	1.4
Buddhist	6	2.1
Others	0	0
Education level		
Informal Education	1	0.3
Primary level	1	0.3
Secondary level	29	9.9
Tertiary Level	261	89.4
Occupation		
Public Sector	60	20.5
Private Sector	70	24.0
Unemployee	21	7.2
Students	125	42.8
Others (Housewife, Self-employee, NGO, Retired)	16	5.5
Marital Status		
Single	183	62.7
Married	106	36.3
Others (widow and divorce)	3	1.0

Table 2: Knowledge of climate change (N=292)

Response	Number (<i>n</i>)	Percentage (%)
Meaning of climate change		
Change in weather over decades	112	38.4
Change in weather over years	68	23.3
Change in weather over months	84	28.8
Change in weather over days	28	9.6
Cause of climate change		
Industrialization	240	82.2
Excess use of chemical fertilizer	160	54.8
Release of greenhouse gasses (CO ₂ , methane, etc.)	261	89.4
Earthquake	48	16.4
Deforestation	238	81.5

Table 3: Knowledge of effects and consequences of climate change (N=292)

Response	Number (n)	Percentage (%)
Climate change affecting rain pattern		
Yes	284	97.3
No	8	2.7
Climate change affecting wind pattern		
Yes	276	94.5
No	16	5.5
Wind pattern		
Increasing	155	53.1
Decreasing	137	46.9
Consequences of climate change		
Increased temperature	275	94.2
Flood	216	74.0
Melting snow	206	70.5
Excessive rain	134	45.9
Landslide	177	60.6
Drought	245	83.9
Observed impact of climate change		
Health effects	260	89.0
Seasonal change	222	76.0
Flood	192	65.8
Irregularities in rainfall	213	72.9
Landslide	163	55.8
Strom	144	49.3
Drought	225	77.1
Extreme weather-related issues due to climate change		
Heat waves	283	96.9
Cold waves	91	31.2
Flood	157	53.8
Drought	223	76.4

Knowledge of Climate Change Affects Human Health

Table 4 shows that respondents most associate climate change with respiratory conditions, with 85.3% linking it to bronchitis and 76.0% to respiratory allergies. The majority also connect climate change to waterborne diseases, specifically diarrhea (72.6%). Nutritional deficiencies are recognized, with decreased nutrient value in food noted by 74.3% of respondents. Additionally, dengue (59.6%) is the most commonly identified vector-borne disease related to climate change. The data indicates that over half of the respondents (52.4%) believe that climate change can lead to mental health problems, while 44.5% associate climate change with an increased risk of cancer.

The Level of Knowledge Toward the Health Impacts of Climate Change

Table 5 shows that the largest group of respondents, comprising 112 participants (38.4%), demonstrates a moderate level of knowledge on the health impacts of climate change, with most scoring above 68%. This indicates that the majority of the community in Kuantan has a fair understanding of climate change's effects on health.

Attitude of Climate Change Among the Community in Kuantan

Table 6 shows that a significant majority are willing to take personal actions to mitigate the effects of climate change. This includes using public transport (69.5%), planting trees (92.5%), paying more for cleaner energy (87.3%), and reducing energy usage (89.7%). Furthermore, 72.9% express a willingness to join climate change advocacy groups. Most respondents (93.8%) support making climate change education mandatory across all age groups.

Table 4: Knowledge of the effects of climate change on health (N=292)

Response	Number (n)	Percentage (%)
Water borne disease due to climate change		
Diarrhea	212	72.6
Skin disease	211	72.3
Typhoid	124	42.5
Do not know	16	5.5
Nutritional deficiencies due to climate change		
Decreased nutrient value in food	217	74.3
Marasmus	187	64.0
Kwashiorkor	157	53.8
Do not know	38	13.0
Vector borne disease related to climate change		
Malaria	167	57.2
Dengue	174	59.6
Kala Azar	136	46.6
Japanese encephalitis	70	24.0
Do not know	55	18.8
Air pollution related problem due to climate change		
Asthma	213	72.9
Respiratory allergies	222	76.0
Bronchitis	249	85.3
Do not know	10	3.4
Climate change can cause cancer		
Yes	130	44.5
No	58	19.9
Do not know	104	35.6
Climate change cause mental problem		
Yes	153	52.4
No	72	24.7
Do not know	67	22.9

Table 5: Level of knowledge of climate change impacts on health (N=292)

Level of knowledge	Participants Total	
	Number (n)	Percentage (%)
Inadequate knowledge (Below 31%)	85	29.1
Moderate knowledge (32%-67%)	112	38.4
Adequate knowledge (Above 68%)	95	32.5

The Level of Attitude Toward the Health Impacts of Climate Change

Table 7 indicates that the majority of respondents, 206 participants (70.5%), exhibit a good attitude toward the health impacts of climate change, reflecting strong awareness and concern within the community in Kuantan.

Association Between Sociodemographic Factors and The Level of Knowledge About Climate Change Impacts on Health Among Communities in Kuantan

In this study, the results Table 8 of the chi-square test reveal significant associations between certain

sociodemographic factors and the level of knowledge regarding climate change impacts on health. There is a statistically significant association between age and knowledge level ($p=0.023$), with younger respondents (aged 18-39) showing a higher proportion of adequate knowledge (83.4%) compared to older respondents (aged 40 and above), who show a lower proportion (71.0%). Additionally, a significant association is observed between education level and knowledge ($p=0.004$). Respondents with tertiary education demonstrate a higher proportion of adequate knowledge (82.8%) compared to those with lower education levels (61.3%).

Table 6: Attitude on climate change and its effects (N=292)

Response	Number (n)	Percentage (%)
Willing to use public transport to reduce the impact of climate change.		
Yes	203	69.5
No	71	24.3
Do not know	18	6.2
Willing to plant trees to reduce the impact of climate change.		
Yes	270	92.5
No	18	6.2
Do not know	4	1.4
Willing to pay more for cleaner (environmentally friendly) sources of energy to reduce the impact of climate change.		
Yes	255	87.3
No	19	6.5
Do not know	18	6.2
Willing to reduce energy usage to reduce the impact of climate change.		
Yes	262	89.7
No	22	7.5
Do not know	8	2.7
Willing to join any climate change advocacy group.		
Yes	213	72.9
No	37	12.7
Do not know	42	14.4
The study of climate change should be mandatory for all age group		
Yes	274	93.8
No	6	2.1
Do not know	12	4.1

Table 7: The level of attitude toward the health impacts of climate change (N=292)

Level of attitude	Participants Total	
	Number (n)	Percentage (%)
Poor Attitude (Below 29%)	9	3.1
Fair Attitude (30%-71%)	77	26.4
Good Attitude (Above 72%)	206	70.5

Table 8: Association between sociodemographic factors and the level of knowledge among communities in Kuantan (N=292)

	Variables	Adequate knowledge	Inadequate knowledge	p-value
		(Above 75%)	(Below 55%)	
Age ¹	18 - 39	186 (83.4%)	37 (16.6%)	0.0237*
	40 - Above	49 (71.0%)	20 (29.0%)	
Gender ¹	Male	67 (77.9%)	19 (22.1%)	0.474
	Female	168 (81.6%)	38 (18.4%)	
Ethnicity ²	Malay	226 (81.3%)	52 (18.7%)	0.159
	Non-Malays	9 (64.3%)	5 (35.7%)	
Religion ²	Muslim	227 (81.1%)	53 (18.9%)	0.259
	Non-Muslim	8 (66.7%)	4 (33.3%)	
Level of Education ¹	Tertiary Level	216 (82.8%)	45 (17.2%)	0.004*
	Informal / Primary/ Secondary)	19 (61.3%)	12 (38.7%)	
Occupation ¹	Employed	106 (77.4%)	31 (22.6%)	0.208
	Unemployed	129 (83.2%)	26 (16.8%)	
Marital Status ¹	Single	149 (81.4%)	34 (18.6%)	0.599
	Married/Widow/Divorced	86 (78.9%)	23 (21.1%)	

Notes: Some of variable was grouped with others in light of the small number of participants, ¹Chi-Square Test, ²Fisher Exact Test, *Significant value at $p < 0.05$

Association Between Attitude and The Level of Knowledge Among Communities in Kuantan

In this study, the results **Table 9** of the chi-square test reveal significant associations between the level of knowledge and the attitude towards

climate change among the respondents ($p=0.045$). This suggests that respondents with adequate knowledge of climate change impacts on human health are more likely to exhibit a good attitude towards climate change mitigation and adaptation.

Table 9: Association between attitude and the level of knowledge among communities in Kuantan (N=292)

Variables	Adequate knowledge (Above 50%)	Inadequate knowledge (Below 50%)	Total	<i>p</i> -value
Poor Attitude (Below 50%)	23 (67.6%)	11 (32.4%)	258 (100%)	0.045*
Good Attitude (Above 50%)	212 (82.2%)	46 (17.8%)	34 (100%)	
Total	235 (80.5%)	57 (19.5%)	292 (100%)	

Notes. Chi-Square Test, *Significant value at $p<0.05$

DISCUSSION

Level of Knowledge Among the Community in Kuantan

The study aims to determine the levels of knowledge and attitudes regarding climate change and its health impacts among the community in Kuantan, Pahang. The study found that knowledge about the health impacts of climate change in the community of Kuantan varies and has significant knowledge gaps. Almost a third of participants (29.1%) had inadequate knowledge, indicating an awareness gap that is consistent with findings from countries such as Nepal and Ghana, where limited educational opportunities limit climate literacy (9,16). The moderate knowledge level of 38.4% of respondents indicates a partial understanding, highlighting the need for comprehensive educational efforts to close these gaps, as emphasized by previous research (21). Encouragingly, 32.5% of respondents demonstrated adequate knowledge, suggesting that some members of the community have access to reliable information, similar to Algeria (22).

This variation highlights a critical need for targeted climate education initiatives in Kuantan, focusing on bridging the knowledge gap to foster informed and proactive community engagement in climate adaptation and mitigation. By strengthening educational outreach, particularly for those with inadequate or moderate knowledge, public health responses can be enhanced, leading to a community better prepared to address and adapt to climate-related health challenges.

The community showed a strong understanding of certain climate change drivers, with 89.4% identifying greenhouse gas emissions as a primary cause. This awareness aligns with broader trends in climate knowledge, indicating that public messaging around greenhouse gases has been

effective (4). However, misconceptions persisted, as 16.4% incorrectly attributed climate change to earthquakes, emphasizing the need for more precise educational efforts to dispel such myths.

In terms of climate impacts, most respondents recognized changes in rainfall (97.3%) and wind patterns (94.5%), as well as common consequences like increased temperatures and droughts, indicating a general awareness of direct climate effects. However, fewer respondents were aware of less visible impacts, such as melting snow (70.5%) and landslides (60.6%), likely due to Malaysia’s tropical climate, which does not typically experience these phenomena (18). This trend mirrors findings by Greibe et al. (10), who observed that awareness of complex climate impacts may be limited by local environmental factors.

Health impacts of climate change were widely acknowledged, with high awareness of conditions linked to extreme weather events and air pollution, including asthma, respiratory allergies, and waterborne diseases like diarrhoea. These findings are consistent with WHO reports and studies by Alhoot et al. and van Wijk et al. which highlight the association between climate change and increased health risks, particularly respiratory and infectious diseases (6,8,23). Notably, 52.4% of respondents recognized the potential mental health impacts of climate change, a significant area of concern highlighted in recent literature on psychological stress linked to climate-related events (12,24).

While knowledge of immediate health impacts was strong, fewer respondents understood indirect or long-term effects, such as cancer (44.5%) and nutritional deficiencies (74.3%). This aligns with Heydari et al.’s findings, where healthcare students demonstrated awareness of

immediate health risks but often overlooked insidious long-term consequences (11). These insights suggest a need for educational initiatives that cover both visible and less obvious health implications of climate change, promoting comprehensive climate literacy.

Level of Attitude Among the Community in Kuantan

The Kuantan community demonstrates a promising level of positive attitude towards the health impacts of climate change, with a significant majority (70.5%) exhibiting a good attitude. This reflects a high degree of awareness, consistent with findings by Heydari et al. and Mohammed et al. who observed proactive attitudes towards climate-related health issues among educated groups exposed to relevant information (11,25). However, the presence of a smaller segment with fair (26.4%) or poor attitudes (3.1%) indicates that knowledge gaps still exist, particularly among those with limited exposure to climate education, as also noted by La Torre et al. (7). This highlights the ongoing need for targeted educational initiatives to elevate awareness uniformly across the community.

In terms of climate action, the study reveals strong community support for measures that mitigate climate change. For instance, 92.5% of respondents expressed willingness to engage in tree-planting efforts, a nature-based solution known for its benefits in carbon sequestration and reducing urban heat effects (13,26). This widespread support points to the potential for successful community-driven reforestation initiatives that could significantly contribute to climate mitigation efforts (12).

The willingness to pay more for cleaner energy (87.3%) further demonstrates community readiness to support renewable energy sources, a crucial factor in climate action. However, economic constraints among a small fraction (6.5%) suggest that policy measures are needed to make renewable energy more affordable and accessible, as indicated in similar studies (6). Additionally, 89.7% of respondents showed a commitment to reducing energy usage, reflecting a strong sense of personal responsibility towards energy conservation, which can have substantial impacts on emissions reduction (21,25).

A notable proportion of the community (72.9%) expressed interest in joining climate advocacy groups, indicating an awareness of the importance of social engagement in driving climate policies (10). However, the reluctance among about 27% of

respondents underscores a need for clearer communication on the role and benefits of advocacy in effecting change.

Support for climate education was overwhelmingly high, with 93.8% endorsing mandatory climate education across all age groups. This aligns with global calls for integrating climate education into curricula to foster a society prepared to address climate challenges (1,27). Additionally, the desire of 91.1% to learn more about climate change reflects a strong public interest in understanding its health impacts, a factor crucial for building a well-informed and engaged community capable of supporting sustainable climate action (14,28).

Association Between the Level of Knowledge and Sociodemographic Factors Among the Community in Kuantan About Climate Change on Human Health

A statistically significant association was found between age and the level of knowledge on climate change, with younger individuals (18-39 years) demonstrating higher knowledge levels. This trend aligns with prior research indicating that younger populations often possess greater climate knowledge, likely due to better access to digital information and education that emphasizes environmental awareness (16,17,26). The inclusion of climate-related topics in media and curricula targeted at younger audiences further enhances this awareness, highlighting the importance of digital and educational channels in reaching younger demographics.

Education level also emerged as a significant determinant of climate knowledge, with respondents holding tertiary education showing higher knowledge levels. This supports findings from other studies underscoring education as a crucial factor for climate literacy (15,17). Higher educational attainment is associated with improved access to comprehensive climate information, enhancing individuals' ability to understand and engage with climate issues. This finding suggests that increasing educational initiatives on climate change across all education levels could improve overall community knowledge.

Association Between Level of Knowledge and Level of Attitude Among the Community in Kuantan About Climate Change on Human Health

The study demonstrates a significant association between knowledge and attitude levels regarding climate change and its health impacts among the Kuantan community. Respondents with higher knowledge levels displayed more positive attitudes toward climate change issues, suggesting that knowledge is a key driver in fostering proactive attitudes. This finding aligns with Odonkor and Sallar's study in Ghana, which similarly showed that individuals with greater awareness of climate change were more likely to hold positive attitudes towards mitigation and adaptation efforts (16).

Notably, the majority of respondents with adequate knowledge exhibited a good attitude, indicating that improved understanding of climate change may enhance support for climate-related actions. Heydari et al. also found that medical students with greater knowledge about climate change held more favorable attitudes toward mitigation strategies, emphasizing the role of education in shaping attitudes (11). Conversely, limited knowledge was associated with less favorable attitudes, a trend observed by Lounis et al. among Algerian students, where lower climate knowledge correlated with more negative perceptions (22).

This relationship underscores the importance of educational initiatives to increase climate knowledge, as enhanced awareness can promote more supportive attitudes toward climate change mitigation and adaptation.

CONCLUSION

This study assessed the knowledge and attitudes of the Kuantan community regarding the health impacts of climate change, revealing that 80.5% of respondents had sufficient understanding of these effects, and 88.4% exhibited favorable attitudes towards mitigation and adaptation strategies. Age and education have emerged as significant factors influencing knowledge levels, offering valuable insights for nurses and healthcare professionals aiming to address community knowledge gaps in climate change.

A significant association was found between knowledge levels and attitudes, suggesting that individuals who are more informed about climate change tend to adopt a more proactive stance in addressing its impacts. This emphasizes the vital role of education and awareness in enhancing community resilience and engagement with climate change initiatives.

LIMITATIONS AND RECOMMENDATIONS

This study has a few limitations. First, its cross-sectional design limits the ability to draw causal inferences between knowledge and attitudes regarding climate change. Additionally, data collection through online questionnaires may introduce social desirability bias, as respondents might provide answers they perceive as more socially acceptable or expected.

Future research recommendations should consider qualitative methods to gain deeper insights into the reasons for people's attitudes and knowledge about climate change and health. In addition, extending similar studies to different regions of Malaysia could provide valuable comparative data and contribute to a more comprehensive understanding of national attitudes and knowledge. Finally, increasing the sample size in future studies would improve the robustness and reliability of the results and increase the generalisability of the findings.

ETHICAL CONSIDERATION

This study had been approved by the ethics research boards at the Kulliyah of Nursing Postgraduate & Research Committee (KNPGRC) and International Islamic University Malaysia Research Ethics Committee (IREC) (reference number: IIUM/504/14/11/2/IREC-2024-070) on 29 February 2024. All participants were provided with information which outlines the study details. Informed consent was obtained in the Google Form for all participants to show respect for the participants' autonomy and confidentiality. Furthermore, they had informed that their participation and any information they gave will not be used against them. This study is an anonymous survey that collects minimal identifying information and involves minimal risk to participants.

CONFLICT OF INTEREST

The authors declare there is no conflict of interest.

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AUTHOR CONTRIBUTIONS

NSMS: drafted the manuscript and contributes to the concept development and design of the article through data collection, analysis and data interpretation for the article.

AM: revised the manuscript critically with intellectual contents and approved the final version of the manuscript.

NA: involved in literature support and finalizing the manuscript.

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