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A study to assess the knowledge regarding health problems related to climate change among peoples in selected community areas at Mehsana City

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Abstract
Climate change is increasingly recognized as a major global public health concern, with wide-ranging effects on human health. It contributes to the rising burden of both communicable and non-communicable diseases through direct and indirect pathways. Understanding community knowledge regarding climate change-related health problems is essential for planning effective health education and preventive strategies. The present study aimed to assess the knowledge regarding health problems related to climate change among people in selected community areas of Mehsana city. A quantitative research approach with a descriptive cross-sectional survey design was adopted for the study. A total of 200 participants aged 18 years and above were selected using a non-probability purposive sampling technique. Data were collected using a structured demographic data sheet and a structured knowledge questionnaire consisting of 20 multiple-choice questions. The collected data were analyzed using descriptive and inferential statistics. The findings of the study revealed that 30% of participants had poor knowledge, 46% had average knowledge, and only 24% had good knowledge regarding health problems related to climate change. The overall mean knowledge score was 11.0 out of 20 (55%), indicating an average level of knowledge among participants. Area-wise analysis showed that knowledge was highest regarding vulnerable populations (63%) and lowest regarding health impacts of climate change (50%). Significant associations were found between knowledge level and educational qualification ($p < 0.05$) as well as participation in environmental awareness programs ($p < 0.05$). No significant association was observed with age, gender, occupation, residential area, or source of information. The study concludes that although the overall knowledge regarding health problems related to climate change was average, a considerable proportion of the population demonstrated poor knowledge. These findings highlight the need for structured health education programs, community awareness initiatives, and increased engagement in environmental education activities to enhance public understanding of climate change and its health consequences.

Keywords: Climate change, knowledge, health problems, community population, public health, awareness, environmental health

Introduction

Climate is defined as the long-term statistical expression of short-term weather patterns. It can be described as the "expected weather" in a particular region. When changes occur within the expected weather patterns, we refer to these as climate changes. These changes can be defined by variations between average climate conditions at two separate times. Climate may change in various ways, over different time scales and at different geographical scales.

In recent decades, scientists have shown increasing interest in global warming due to mankind's impact on the climate system, particularly through the enhancement of the natural greenhouse effect. The Earth's climate has changed throughout history, but the current warming trend is of particular significance because it is extremely likely (greater than 95% probability) to be the result of human activity since the mid-20th century and is proceeding at an unprecedented rate.

According to the World Health Organization (WHO), approximately 77,000 deaths annually in Asia and the Pacific region are due to the direct and indirect effects of climate change, representing about half of the world total attributed to climate change. Developing country populations, particularly those in small island states, high mountain zones, and densely populated coastal areas, are considered especially vulnerable to these impacts.

Each of the last decades has been successively warmer than any preceding decade since 1850. Sea levels are rising, glaciers are melting, and precipitation patterns are changing. Extreme weather events are becoming more intense and frequent, posing significant challenges to human health and well-being. Understanding public knowledge about these health impacts is crucial for developing effective public health interventions and climate adaptation strategies.

In recent years there has been a large scientific and public debate on climate change and its direct as well as indirect effects on human health. According to, some 2.5 million people die every year from non-infectious diseases directly attributable to environmental factors such as air pollution, extreme weather events, stressful conditions in the workplace, exposure to chemicals such as lead, and exposure to environmental tobacco smoke. In particular, lead exposure has been estimated to account for 2% of the ischaemic heart disease burden and 3% of the cerebrovascular disease burden. Exposure to outdoor air pollution accounted for approximately 2% of the global cardiopulmonary disease burden. In the U.S., about 12% of the ischaemic heart disease burden has been related to occupation, for the age group 20–69 years. This estimate has been based on the specific risk factors of job control, noise, shift work and environmental tobacco smoke at work. In Finland, it has been estimated that occupational risks

account for 17% of the deaths from ischaemic heart disease, and 11% of those from stroke. In Denmark, the occurrence of cardiovascular diseases is related to the type of occupation. Specifically, a reduction of 16% (22%) in the cardiovascular disease burden can be attributable to men (women) with non-sedentary occupations. Changes in climatic conditions and climate variability represent a further factor which can affect human health directly or indirectly via changes in biological and ecological processes that influence the transmission of several infectious diseases. Direct effects on human health include, for example, thermal stresses due to increased frequency and intensity heat waves (cardiovascular and respiratory diseases, heat exhaustion), and deaths and injuries due to extreme weather events. Indirect effects include malnutrition, food-, water- and vector-borne diseases, together with increased morbidity due to the combined effect of exposure to high temperature and air pollution. Empirical evidence suggests that malaria varies seasonally in highly endemic areas and is probably the vector-borne disease more sensitive to long-run climate changes. For example, the comparison of monthly climate and malaria data in highland Kakamega, Western Kenya, highlights a close association between malaria transmission and monthly maximum temperature anomalies over the years 1997–2000.

Objectives

- To assess the knowledge regarding health problems related to climate change among people in selected community areas of Mehsana.
- To find out the association between the demographic variables and knowledge score regarding health problems related to climate change among people in selected community areas of Mehsana.

Materials and Methods

The present study adopted a quantitative research approach with a descriptive cross-sectional survey research design to assess the knowledge regarding health problems related to climate change among people in selected community areas of Mehsana city. This approach was considered appropriate as it allows the researcher to collect systematic information from a large group of participants and analyze their level of knowledge related to a specific topic. The study population consisted of people in selected community areas, and a total of 200 participants were selected for the study. The samples were chosen using a non-probability purposive sampling technique, which enabled the researcher to select participants who were readily available and willing to participate in the study during the period of data collection. Data were collected using a self-structured questionnaire designed to assess the level of knowledge regarding climate change. The questionnaire consisted of two sections. The first section included demographic variables such as age, gender, class, educational qualification, occupation, type of family, residential area, source of information on climate change, Any History of Climate-related Illness in the Family, Participation in Environmental Awareness Programs. The second section consisted of knowledge-related questions regarding climate change. Prior to data collection, necessary permission was obtained from the respective community leaders and local authorities and informed consent was taken from the participants. The collected data were organized, tabulated, and analyzed using descriptive and inferential statistical methods. Descriptive statistics such as frequency and percentage were used to describe the demographic variables and knowledge level. Inferential statistics, particularly the Chi-square test, were used to determine the association between the level of knowledge with selected demographic variables. The demographic analysis of the participants revealed that the highest proportion of community people 34% belonged to the age group of 18–30 years, In terms of gender distribution, 54% of the respondents were female. Regarding educational qualification, 26% of the participants were studying till secondary. In terms of occupation 22% were laborer, With respect to place of residence, 42% of the respondent's belonged to rural areas, regarding source of information on climate change 36% from TV/Radio. The findings related to the level of knowledge regarding climate change showed that 24% of the people had good knowledge, 46% had adequate or moderate knowledge, and 30% had poor knowledge about climate change. These results indicate that while a majority of the people of community possessed moderate knowledge, there is still a need for further educational interventions to improve their understanding of climate change. This suggests that although many people have a positive outlook on climate change. Furthermore, the Chi-square test was used to examine the association between the levels of knowledge with selected demographic variables. The analysis helped identify significant relationships between certain demographic characteristics and the knowledge of people of community regarding climate change.

Result

1. Distribution of respondents in relation to age revealed that the highest percentage 34% of participants were in the age group of 18-30 years, 28% were in the 31-45 years age group, 24% were in the 46-60 years age group, and 14% were above 60 years.
   Distribution of respondents in relation to gender revealed that the majority of the sample were females (54%) and 46% were males.
   Distribution of respondents in relation to educational qualification the majority of participants (26%) had secondary level education, followed by 22% with higher secondary education, 18% with primary education, 16% were graduates, 12% were illiterate, and 6% had postgraduate education.
   Distribution of respondents in relation with occupation 22% of participants were laborers, 18% were self-employed, 16% were farmers, 14% were unemployed, 14% were private employees, 10% were government
   Distribution of respondents in relation to place of residence 42% of participants resided in rural areas, 38% in urban areas, and 20% in semi-urban areas.
   Distribution of respondents in relation to source of information on climate change the majority of participants (36%) received information about climate change through television/radio, followed by 28% through internet/social media, 16% through newspapers, 10% from health workers, 8% from friends/family, and 2% from other.

2. This section deals with the analysis of data related to knowledge regarding climate change. The findings showed that 24% of participants had good knowledge,

46% had average knowledge, and 30% had poor knowledge regarding health problems related to climate change. The overall mean knowledge score was 55%, indicating average knowledge among participants regarding climate change.

Association between knowledge and selected demographic variables

This section deals with the association between knowledge and selected demographic variables. The study revealed that knowledge was significantly associated with educational qualification and participation in environmental awareness programs. There was no significant association between knowledge and age, gender, occupation, residential area and source of information.

Discussion

The present study was conducted to assess the knowledge regarding health problems related to climate change among people in selected community areas of Mehsana. Climate change has emerged as a major global environmental issue with significant consequences for human health. Understanding the level of awareness among community members is essential for planning effective health education and environmental awareness programs. The demographic findings of the study revealed that the majority of participants (34%) belonged to the age group of 18–30 years, followed by 28% in the 31–45 years age group. Females constituted a slightly higher proportion (54%) compared to males (46%). In terms of educational qualification, the largest group of participants (26%) had completed secondary education, while a smaller proportion were graduates or postgraduates. Regarding occupation, a significant number of participants were laborers (22%), followed by self-employed individuals and farmers. Most participants resided in rural areas (42%), indicating that the study population largely represented rural and semi-urban communities. The findings related to knowledge regarding climate change showed that 46% of the participants had average knowledge, 24% had good knowledge, and 30% had poor knowledge about health problems related to climate change. The overall mean knowledge score was 55%, indicating that the majority of community members possessed only a moderate level of understanding regarding climate change and its health impacts. These findings suggest that although people may have heard about climate change, their understanding of its health consequences is still limited. Similar studies conducted in different regions have also reported moderate awareness levels among the general population, highlighting the need for improved public education and awareness initiatives. The study also examined the sources of information regarding climate change. The results indicated that television and radio (36%) were the most common sources of information, followed by internet and social media (28%) and newspapers (16%). Only a small percentage of participants reported receiving information from health workers (10%) or family and friends (8%). This finding highlights the important role of mass media in disseminating information about environmental issues and climate change. However, it also indicates that health professionals and community health workers may need to play a more active role in educating the public about climate-related health risks. The study further explored the association between knowledge and selected demographic variables. The findings revealed that knowledge regarding climate change was significantly associated with educational qualification and participation in environmental awareness programs. Participants with higher educational levels and those who had previously participated in awareness programs demonstrated better knowledge about climate change and its health impacts. This result suggests that education and structured awareness activities can significantly improve understanding of environmental health issues. However, the study found no significant association between knowledge and variables such as age, gender, occupation, residential area, and source of information. This indicates that knowledge regarding climate change is relatively similar across different demographic groups, regardless of age or gender. These findings suggest that climate change awareness programs should target the entire community rather than focusing on specific demographic groups. Overall, the findings of this study highlight that while community members possess a basic level of awareness about climate change, there is still a considerable need for comprehensive education and awareness programs. Providing information through pamphlets, community campaigns, environmental education programs, and the involvement of healthcare professionals can significantly enhance public knowledge and encourage preventive measures to reduce climate-related health risks.

Conclusion

Climate change has emerged as one of the most significant global environmental challenges affecting human health and well-being. Rising temperatures, changing rainfall patterns, sea level rise, and the increasing frequency of extreme weather events are directly and indirectly influencing the health of populations across the world. These climatic changes can lead to various health problems such as heat-related illnesses, respiratory and cardiovascular diseases, malnutrition, and the spread of vector-borne and water-borne diseases. Developing countries and vulnerable communities are particularly at greater risk due to limited resources, high population density, and reduced adaptive capacity. Understanding the level of knowledge and awareness among community members regarding the health impacts of climate change is essential for effective prevention and adaptation strategies. Public awareness plays a crucial role in encouraging protective behaviors, promoting environmental responsibility, and supporting public health initiatives. Therefore, assessing community knowledge regarding health problems related to climate change can help identify gaps in awareness and guide the development of educational and awareness programs. In this context, the present study aims to evaluate the knowledge regarding health problems related to climate change among people in selected community areas of Mehsana and to explore the association between knowledge and selected demographic variables.

Declaration

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We declare that no external funding was received for conducting this study. The research was carried out using the available institutional resources.

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Data Availability
The data used in this study are available from the corresponding author upon reasonable request.

Authors' Contribution
All authors contributed significantly to the conception, design, data collection, analysis, interpretation, and preparation of the manuscript. All authors read and approved the final version of the manuscript.

Use of AI and AI-Assisted Technologies
AI-assisted tools were used only for language editing and improving the clarity of the manuscript. We take full responsibility for the accuracy, originality, and integrity of the content.

Conflict of Interest
We declare that there is no conflict of interest regarding the publication of this research.

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