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Psychological aspects of climate change risk perception: A content analysis in Iranian context

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Abstract:

BACKGROUND: Risk perception is an important predictor to mitigate climate change effects which can produce mental health consequences such as anxiety and depression. For developing policies of climate risk adaptation, awareness of public attitudes, beliefs, and perception is essential. At this study, researchers tried to focus on the often "unseen" psychological aspects of climate change.

MATERIALS AND METHODS: A qualitative approach was done with a consistent content analysis method. The study consisted of 33 participants including ordinary people and experts in disasters and climate change. Purposeful sampling was adopted until data saturation. The data collection was performed through in-depth and semi-structured interviews. All interviews were transcribed after listening again and again and reading several times to catch an overall understanding of the interviews.

RESULTS: The main theme of the study was "Complexity nature of climate change risk perception" and related categories including "the Mental health dimension," "the Cognitive dimension" and "Interaction of imposed components." The structure of the research community strongly reflected effects of cultural and religious factors in all aspects of community life. Participants' life experiences of extreme events were associated to their perception of climate change.

CONCLUSIONS: Risk perception is multifactorial and complicate and should clearly be understood to improve community participation to manage climate change-related risks. We propose that authorities and related managers should pay attention to it as a priority. This may assist in developing research on public mental health practices.

Keywords:

climate change, psychological aspects, risk perception

Introduction

Climate change is not like other environmental threats and is not directly experienced.[1,2] Several important international frameworks such as Sendai and UN Framework Conventions on climate change have emphasized response policies which need comprehensive understanding of the risk.[3,4] The first priority of Sendai's Framework is the essential of disaster risk understanding.[4] Risk perception is a subjective assessment[5] and requires assessing people's perception of climate change.[6]

Climate Change risk perception (CCRP) is complex and multidimensional.[1] CCRP varies not only over time but also between countries and among the people of the same country.[7] Perception of climate change is influenced by individual factors such as personal experiences, memories of climate events, and various biases.[8] Cultural processes and structures can be major social barriers to the adaptation of climate change[9] and can be shaped by these factors: cultural dimensions,[10] the experience and characteristic of people who live in that cultural context, and combinations of

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individual's attitude and behavior.[11] Shyang-Chyuan Fang Behavioral Model of CCRP for Students proposes hidden key variables to create a Structural Equation Model.[12] Sanders's study showed that psychosocial determinants of CCRP in a comprehensive model can explain nearly 70% of risk perception variables.[1] Azizi and Zamani have studied the risk perception of farmers on climate change in economic, social, and environmental dimensions.[13] Salehi studied global climate change knowledge and showed that students' perception of the global climate change phenomenon is moderate and their knowledge on it is also influenced by social factors, environmental attitudes, trust, and individual efficiency.[14] The World Health Organization estimates that we will meet an increase in annual deaths up to 250,000 people between 2030 and 2050 because of the known health effects of climate change.[15] We will also see the dangerous threshold of catastrophic climate change (2°C or more) by 2100.[16] Risk perception is an important predictor of the society willingness to mitigate climate change effects.[1] Although public perception of climate change is relatively understood, there is inadequate knowledge on factors that shape perception to prompt a public response.[17] With increasing in risk perception, community folks will influence political processes and will develop climate change policies.[18] For developing adaptation policies on climate risks, improving awareness of public attitudes, beliefs, and perception is essential.[19] Although significant progress has been made in psychological principles to understand risk perception, there is still little knowledge on how they are to be applied in the climate change.[20] Studies in Iran have focused on specific subjects such as agriculture and drought and have not addressed psychological dimensions of risk perception of climate change. To better shape policies to manage climate change-related risks, develop science exchange on climate, and enhance partnerships, studies on people's understanding and perception of climate change are essential. In this study, we tried to focus on the often "less-seen or perceived" climate change effects which include psychological effects and aspects. Therefore, it is necessary to determine the psychological factors affecting understanding of climate change risks in the Iranian community.

Materials and Methods

This qualitative study was conducted with a consistent content analysis approach in the Iranian context in 2018–2019. The study population consisted of wide-ranging ordinary citizens affected by climate change, related specialists in disaster fields, and PhD students in the health in emergency and disaster fields. Participants were selected using purposive sampling among people who directly or indirectly affected by climate change or were involved in risk management of climate change or global warming.

Data collection

The data collection method was a semi-structured interview in this study. After communicating the selected participants, the study purpose was explained to them. If they accepted to participate in the study, the researcher asked them about the interview place and time. Preceding to each interview, participants were assured that contents of interviews were only available to the researchers and they were used as the research goals, and if participants did not want to continue collaborating with the researchers, they could withdraw at any step. The researchers used the semi-structured interview guide at this study. All interviews were conducted at participants' proposed sites. The average time of each interview was 55 min. Interviews were recorded after participants' permission. Interviews began with the general question, "What does global warming or climate change mean to you?" or "Do you have any experience of global warming?" Very ordinary participants were asked the simpler questions like "Do you have any experiences or memories of climate change or global warming in your lifetime?" Then probing, further questioning, taking notes during the interviews, as well as more observation, if available, were conducted. The sampling process continued up to saturation which was achieved after 33 interviews, when no new information or code or category was obtained.

Data analysis

Each interview was transcribed after listening again and again and subsequently reading several times to catch an overall understanding of that interview. Then, checking the content was done with the interviewees. Finally, through deep reading and focusing, codes, categories, and main categories were identified and final themes were formed. To verify the credibility of the data, two methods including prolong engagement with the data and the member checking were done. Furthermore, Peer check method was used to confirm the relevance of the results and data validation was done by bracketing. In our study, when we translated codes and categories from Persian into English, we encountered challenges because some words and phrases in Persian had no direct translation. For example, "Afiyattalabi" in the Persian language is "a behavior implies avoiding risks or injuries,"[21] and when it was literally translated, its nearest meaning was hedonism. Translating the complexities of the climate change science "into the language of popular culture" is a very challenging task. Hence, there is a risk of its conceptualization with their own experiences.[22] Notably, this article was extracted from the doctoral thesis.

Results

After analyzing the data, three main categories (mental health dimension, cognitive dimension, and interaction of imposed components) were obtained. The main theme,

categories, subcategories, and coding samples are shown in Table 1.

Mental Health dimension

The main category of *mental health dimension* consists of two subcategories: "mood-affective impacts " and "personal experiences of risks."

Mood-affective impacts

A participant has stated about impacts of climate change on emotional and individual relationships: *"Even personal-emotional marriage relationships are gonna be involved. Familial relationships which are the most personal things in everybody's life could be disturbed. If you continue the chain, you'll face up to the fact of climate change."*

Table 1: Main theme, categories, subcategories, and coding samples

Theme	Main category	Sub-category	Code
Complexity nature of climate change risk perception	Mental health dimension	Emotional and mood effects	Impacts on personal and emotional relationships
			Mood swings
			Downturn in behavioral performances
			Interpersonal tensions
		Personal experiences of risks	Occurrence envisage of risks
			Related and similar events
			Experiencing extreme weather events
			impacts of severe precipitation
			Impacts of experiences on risk perception
	Cognitive dimension	Available information	Actual knowledge
			Common knowledge
			Uncertain knowledge
			Subjective knowledge
			lack of providing ongoing information
			Lack of knowledge
		Phenomenon nature	Complexity in perception of problems
			Being unknown
			time consuming
			Being intangible
			Chain effects on life
	Interaction of imposed components	Fiscal consequences	Not providing livelihood
			Immigration due to lack of livelihood
			Lack of job security in the future
			Career changes after immigration
		Social contexts	The Vague Future
			Sense of not belonging to the country
			Lack of scientific principles governing the community
			Indifference to the conditions of the society
			hedonism management
			Normalized social anomalies
			Reverse and low impacts of mass media
			Pioneer of social networks
		Religious cultural components	Different value orientation in the society
			Unresponsive to liability influenced by dominant culture
			Traditional belief-based views to crisis
		Political factors	Politicians' instrumental use
			Distrust to statesmen
			Political orientation
			Political ideology
			Preferences of group gain to public
		Environmental components	Not prioritizing the environment
			Eco-system turbulence
			Earth is under influenced by the weather
			Poor environmental compatibility

Individual experiences of risks

A research participant expressed about the extreme weather events: *"I don't know what happened to weather. Floods are terrible. They suddenly start and take everything with themselves."* And another one said: *Walnut trees were killed and they don't live for so long any more. Newly planted trees didn't grow as thick trunk trees. Things like that have badly affected people's livelihood."*

Participants interpreted the concept of climate change in different ways based on their experiences of its effects and consequences. Climate change was affecting the weather of regions so that further warming has caused changes in cover crop and agriculture. The native trees and plants of regions are not tolerant of the new imposed conditions and as a result their crops are not of good quality. Therefore, inhabitants' livelihood has been affected.

Cognitive dimension

Available information

Participant's knowledge can be in the area of quantity, quality, objectivity and subjectivity of climate change information, its effects, or even how to respond to it. This knowledge on risk perception of climate change can lead to different reactions and responses from people, such as anxiety, apathy, productive, warning, and restrictive action.

Another respondent pointed out "Well, I read and heard something about the warming up of the weather in Telegram and the television." Another participant about changing in seasons emphasized: "*The seasons are weirdly changed. It's not the same as before. Summers have got warmer and winters aren't like before. It's so long, there aren't the same snowy winters as before.*"

The participant has clearly emphasized on change of seasons, and he has actually indicated the seasonal patterns have moved. This is derived from the participant experiences and he/she implicitly referred to effects of shifting climate patterns; indeed, the concept of "climate change" is at the core of participatory talk.

Phenomenon Nature

Climate change as a phenomenon takes a long time to have its effects. Hence, it seems hard to understand. Many respondents considered the extreme weather events as climate change.

One of the participants said about "more difficulty in understanding climate change than understanding other hazards:" "A difference of climate change with other dangers is people have trouble to understand it. For example, you cannot give people to understand what tragedy will happen if the earth's temperature rises 3 degrees." Another participant said: *"The essence of this hazard is, primarily, like education. You will see its results for the next 20 years."*

Interaction of imposed components

Climate change encompasses the interplay of various underlying factors including the relationship between socioeconomic–religious–political–security issues and it is much more complex than it seems. Climate change is central to all the changes that will happen later in the community.

Fiscal consequences

The entire people's life cycles will be disrupted with regarding livelihood. Remoteness and proximity of downtowns and provinces impact the governmental support for the affected population. However, marginal cities and villages are the most affected. Economic conflicts will increase depending on the severity of impacts and will eventually lead to the marginalization of people, as well.

One participant said about climate change impacts on the forced migration of the entire village dwellers: "*Many left the villages and went. You see uninhabited villages because people could not provide their ordinary needs there.*"

Social contexts

People's risk assessment and reactions are influenced by the behavior and activities of other people. Interpersonal interactions play an important role in the flow of information in that community. These interactions are influenced by the norms of the society. Furthermore, the predominant normative factors are likely to influence the community risk perception.

One of the participants mentioned scientific principle dominance in managing climate change risks: *"The only theory which is gonna do in our country is "let see what will happen!" The biggest fault of our officials is their desire to hedonism. I think hedonism is the biggest defect of law enforcement we are suffering."*

According to one of the participants, "In most cases, social messengers are a few steps ahead of national media, and before the news is officially released, pictures and videos of events are released."

Religious cultural components

The structure of the research community strongly reflects effects of cultural and religious factors so that it is clearly visible in all aspects of community life. Ordinary people emphasize on and believe in this process in their community, while educated people acknowledge this though they may have less adherence to it.

A participant said about the impacts of religious factors: "All these happenings are usual and natural and what God wants. They are done by the will of God. No need to worry."

Political factors

Participants acknowledge political factors are one of the issues that affect all aspects of their lives. Climate change-related precautionary measures are more likely to be involved in political backstabbing because they are not tangible.

One participant stated climate change issues were not prioritized: "Because measures related to climate change aren't early returns, politicians ignore them. They like to have in their work records something that people could see." Another participant pointed to the use of climate change as a political tool: "You see, someone like Mr. Donald Trump does not understand the situation and exit from the Paris agreement. So you expect a person who is an ordinary citizen to understand."

Environmental components

According to our participants, unnecessary and excessive use of personal vehicles has caused global warming while public transport infrastructure development was not implemented by the government. Hence, people prefer to use their own cars.

"In fact, the main reason why people like to use their personal cars is the lack of public transportation. Buses are very worn out and not comfortable at all. They even may get stuck in traffic."

Discussion

Climate change has resulted in a wide range of risks and its management may include a broad collection of adaptations and mitigation.[23] The purpose of this study was to understand the psychological aspects of CCRP. In this regard, factors for CCRP were studied. Research findings indicated that participants' perception of climate change is more related to people's experience of extreme events throughout their lives. Most people interpret experiences of severe weather events as climate change. Ordinary people have received most of their information on climate change from the media, especially social networks, which have a high penetration coefficient in the community.

The conceptual dimensions of risk perception of climate change include cognitive, empirical, sociocultural, and sociodemographic factors. Two-third of the combination of these factors seem as a predictor of overall CCRP risks, and the sociocultural and experiential processed factors are also very weighty and influential.[1]

The results showed most participants had heard at least the term "climate change" or "global warming." About a half of the participants did not understand the minimum meaning of this concept, and they had very little awareness. It seems that this awareness comes from social messengers used by the most people. A few key people and expert participants in disaster and climate change were very seriously concerned and hopeless about the country's climate. A study showed that a half of the Nepalese population know nothing about climate change and 12% have never heard of it.[6]

People differently react depending on their experiences to events. Climate change has very different effects on people's psyche in the long time in compare with the immediate and instant events. Depression, low mood, lack of motivation, and other psychiatric symptoms are among mentioned effects. There are arising concerns about the effects of climate change on people's mental health. Severe weather events have devastating effects on mental health in the form of depression, anxiety, and posttraumatic stress disorders.[24] Emotional reactions to risks often depend on the clarity of perceived or experienced negative consequences.[25]

Some consequences of climate change have resulted in migration from dry areas due to scarcity of resources. It seems that the government should focus on planning in places where people have had the most impacts especially in livelihood and with running preventive measures, it avoids migration of residents, prevents future marginalization, and subsequently, impedes other social problems. Understanding of risk perception will be complicated because of the country's recent inflation and the complexity of people's economic conditions, during the research project. People with high economic status feel a sense of control and thus may have perceived lower risks, and people with lower economic status may not see it as their top priority.

The World Health Organization estimates 250,000 annual deaths between 2030 and 2050 because of healthy effects of climate change.[15] It will also have serious health effects on marginalized populations.[26] Developing climate change response and measures depends on understanding how people make sense of local climate change and how they interpret related risks and opportunities.[6] People realize the wide alterations around themselves[27] like heat waves and this may affect their perception of global warming.[1,28] A few studies showed that higher education and better socioeconomic status give people a higher sense of control and therefore lower risk perception.[1] However, studies have reported a weak association.[29]

Sources of participants' climate change information were media. It is unclear whether formal media or social

messengers (domestic and informal) have been more prominent, but what is clear is that communication exchange has taken place through media and social messengers. People receive much of their knowledge on climate change science via the mass media, and it is confirmed that media impact the public psyche in all parts;[17] therefore, global warming is influenced by the public media.[1] High relationships between climate change and the media may be due to increased flooding events during this research project, which happened during data gathering in 2018–2019. Subsequently, this information presented from media (TV and radio) and social messengers like telegram has high penetration coefficient among Iranian people. The Telegram Messenger application, as the most popular social messaging network in Iran, has 40 million users, almost half of the Iran population, through its channels and groups.[30]

Given the heavyweight of cultural and religious components in the Iranian context, It seems best to place the cultural-religious component in one group. It may be better to add social components and examine them as religious–cultural–social. Locally and regionally planning seems better, given the different cultures along with different religious groups, and this requires focused interventions in accordance with needs of target groups.

Iranian lifestyles show that culture has a strong influence on religion. The lifestyle has a two-way interaction with cultural capital and is shaped by individual beliefs and values.[31] Risk perception of climate change and processing of relevant information are done through cultural dimensions.[10] Cultural processes and constructions can act as social barriers for climate change adaptation through distinct norms and associations.[32] Lack of understanding of the culture can even lead to maladaptation.[32] A great deal of research has not deeply studied how people understand climate change and how they respond to it.[33]

Most participants attribute climate change issues to the authorities, policymakers, and top disaster managers, which can result in a loss of public trust. This missed trust could be associated with antithesis actions done and information provided by parallel agencies.

Risk perception theories have criticized "depoliticizing risks" for shaping people's perception of risks.[1] Reciprocal messages, scientific contradictions, and political standing which play a key role in mitigation strategies have caused people confusion.[17] It is much to ponder on why the authorities still did not have to think about preserving the environment and climate of the country and to do essential work. They may not be aware of climate change, extreme weather events, and notable reduction in subterranean freshwater sources of the country. The budget may be low so these are not priorities. Unfortunately, there is a lack of accountability in authorities in charge during incidents, after the events, and even when a crisis is poorly responded. Further studies are needed to investigate the behavioral pathology of the authorities and managers as well as their nonresponsiveness to the responsibilities assigned to events and disasters.

Conclusion

It was found that all participants were affected by climate change. Participants believe that the main responsible for current climate change issues is the government. Climate change has direct and indirect impacts on psychological health through various ways. Understanding of less considerable impacts of psychological aspects is as difficult as understanding of risk perception of climate change. Both psychological consequences and climate change phenomenon are not clearly perceivable and may not be sensed, and they have covertly infiltrated into the society and community. At the right time, these less focused consequences will have their effects. Hence, paying attention to them should be a priority for the authorities and related managers and it is recommended that the "process" and "how" of risk perception in climate change would be assessed in another research.

Ethical consideration

Informed consent was obtained as oral acceptance from all participants and if they tended to give it in a written form, the interviewee's consent form was in their access to complete and sign. They were informed that all collected data were anonymous and confidential and they had the right to withdraw from the research at any time. The study was approved by the Ethics Committee at the University of Social Welfare and Rehabilitation Sciences, with the ethical code of IR. USWR. REC.1397.116.

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Conflicts of interest

There are no conflicts of interest.

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