Knowledge and Beliefs regarding Climate Change among Pregnant Women Attending Outpatient Clinics

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Abstract

Background: Climate change is considered a significant global health problem of the 21st century. It is significant associated with risk to women, pregnant mothers, unborn fetuses, and offspring who were exposed in utero to climate stressors, especially those in marginalized communities where effects are magnified. **The aim** of this study was to assess the knowledge and beliefs toward climate change among pregnant women**. Design:** A descriptive research design was utilized for the current study. **Sample**: A convenience samples of 100 pregnant women were recruited. **Setting**: The study was conducted at outpatient clinics at Menoufia University Hospital. **Tools of Data Collection:** Three tools were used; 1) Structured Interviewing Questionnaire, 2) Women Knowledge related Climate Change Tool, And 3) Likert Beliefs Scale regarding Climate Change. **Result:** Findings of the current study revealed that, the mean age of the study sample was 26.68 ± 4.25 years old. More than half of pregnant women had satisfactory level of knowledge and positive beliefs toward climate change. In addition, there is statistical significant differences between level of knowledge and beliefs categories toward climate change with p< 0.001. **Conclusion**: the study findings concluded that majority of the study sample had satisfactory level of knowledge toward climate change and positive beliefs toward it. **Recommendation**: Raising awareness of pregnant women toward climate change and its impact on their babies through health education is essential for all women.

Key words: Knowledge, Beliefs, Climate Change, Pregnant Women.

Introduction

Climate change is considered a significant global health problem of the 21stcentury (**Berry et al., 2018**), contributing adversely to multiple physical and mental health conditions **(World Health Organization [WHO], 2021; Centers for Disease Control [CDC], 2021).** Scientific evidence shows that climate change is an all-encompassing severe threat to wellbeing and ecological sustainability of humanity (Intergovernmental Panel [IPCC] on **Climate Change, 2021**). The public health harms associated with climate change are rapidly-growing, worldwide, with the harms projected to grow considerably worse if left unchecked **(Alo, 2020**).

The "National Aeronautics and Space Administration (NASA)" defined climate change as "a broad range of global phenomena created predominantly by burning fossil fuels, which add

heat trapping gases to Earth's atmosphere. These phenomena include the increased temperature trends described by global warming, but also encompass changes such as wildfires, air pollution, and ocean heating, ocean acidification, sea-level rise and ice mass loss in Greenland, Antarctica, the Arctic and mountain glaciers worldwide that lead to flooding, shifts in flower/plant blooming; more intense storms, droughts, and other extreme weather events" **(NASA, 2022).**

Climate change is considered one of the major threats to achieving the Millennium Development Goal (MDG) for maternal health, clearly emphasizing the need for better and geographically more specific knowledge of climate change and maternal health **(Akwala, 2020)**. Egypt is now dealing with a number of environmental issues, including climate change. Because the link between climate change and common human behaviors like driving a car is not clearly established, the Egyptian public lacks knowledge about the precise causes of climate change (**Salem et al., 2022**). It has been discovered that climate change has a negative impact on human health in Egypt, which can be made worse by the country's high population densities. Increased prevalence and severity of asthma, infectious disorders such vector-borne infections, respiratory illnesses, diarrhea, and dysentery are possible effects. Additionally, it raises the risk of death by causing heat stroke, eye cataracts, and skin cancer. Malnutrition cases and the infant mortality rate are anticipated to be increased **(Elshirbiny & Abrahamse, 2020).**

Climate changes has a great effect on pregnancy health which involve direct &indirect impacts (a) direct impacts via discrete environmental disasters, (b) indirect impacts through changes in the natural environment, and changes in the social environment (**CDC, 2021**). Climate change is expected to cause more frequent and intense climate-related environmental disasters such as heat waves; wildfires; and extreme weather events such as drought, hurricane, and flood (**IPCC, 2021**). The average annual number of heat waves, defined as a series of unusually hot days, in the USA increased from two in the 1960s to six in the 2010s. The length and average temperature of individual heat waves have also increased significantly in recent decades. Pregnant women are more prone to heat stress than non-pregnant women due to their compromised thermoregulation and homeostasis ability. A recent meta-analysis of 70 studies across 27 countries examines the impact of high temperature on preterm birth, low birth weight, stillbirth and higher risk of preterm birth during heat wave days compared to on non-heat wave days (**CDC, 2021**).

Additionally, stillbirth risk was 46% higher during heat wave compared to non-heat wave days, with risk increment of 5% for each additional degree Fahrenheit. Early pregnancy appears to be the most susceptible window of exposure for stillbirth (**Chersich, et al, 2020**). Meanwhile, high temperatures have also been linked to other serious pregnancy outcomes such as premature rupture of membranes **(Ha et al., 2018),** gestational cardiovascular events, gestational hypertension and preeclampsia (**Xiong et al., 2020**), birth defects, and neonatal mortality. Floods are the most common natural disasters globally. They can affect pregnancy health by disrupting infrastructure, limiting access to safe food and water, facilitating the spread of waterborne pathogen and certain vectors, and creating the opportunity for unintentional distribution hazardous chemicals such as heavy metals and toxic pesticide compounds. Also, indirect impact on pregnancy through natural environment, such as, air, food and water quality and availability **(Stingone et al., 2019).**

Studies around the world, regardless of design, consistently suggest that preconception and prenatal exposures to ubiquitous gaseous pollutants and fine particles increase the risk of adverse pregnancy outcomes including gestational hypertension, gestational diabetes, pregnancy loss, preterm birth, and restricted fetal growth **(Kanner et al., 2020).**

Maternity nurses can play a crucial role in improving the well-being of women who might suffer from the consequences of climate change. As purveyors of an essential service, they have a

duty to advocate for and uphold the wellbeing of women. Moreover, they need to evaluate how climate change could affect women's health in their local area and create detailed care plans that address the harmful effects of climate change on women's health **(Martin & Vold, 2019; WHO, 2022).** Moreover, it is important for them to consistently start conversations about how climate change impacts women's health and to highlight practices in the workplace that contribute to the issue, such as excessive use of air conditioning, electricity, elevators, paper, and plastic products, as well as improper waste separation and disposal of toxic fumes and chemicals. This will assist in unifying the language and working together with government officials, allied health professionals, and other emergency responders **(Martin & Vold, 2019; WHO, 2022).**

Significance of the study

The continuous climate crisis presents major dangers to women, expectant mothers, developing fetuses, and children who were exposed to climate stressors while in the womb, particularly in marginalized communities where impacts are intensified. A recent analysis of 70 studies from 27 different countries looks at how high temperatures affect the chances of preterm birth, low birth weight, and stillbirth. At the same time, elevated temperatures have been associated with various severe complications during pregnancy such as early rupture of membranes, cardiovascular issues during pregnancy, high blood pressure, preeclampsia, birth abnormalities, and infant mortality **(Chersich et al., 2020).**

As a result, negative consequences will impact people throughout their entire lives, as those who are born disadvantaged due to climate insults while in the womb may face a higher risk of various health issues such as obesity, metabolic disorders, birth defects, allergies, neurodevelopmental and psychological impairments, and struggle to cope with additional climate challenges later in life. Egypt is at high risk from climate change due to its location and reliance on neighboring countries vulnerable to extreme weather events like heat waves, dust storms, and storms along the Mediterranean coast, as indicated by reports from the Intergovernmental Panel on Climate Change (**World Bank; 2021**). So, the aim of this study was to assess the knowledge and beliefs toward climate changes among pregnant women.

Aim of the study

The aim of this study was to assess the knowledge and beliefs toward climate change among pregnant women.

Subject and Methods

Research questions

To fulfil the aim of this study, the following research questions were formulated:

Q1- What is the level of knowledge toward climate change among pregnant women?

Q2- What are the beliefs toward climate change among pregnant women?

Research design

A descriptive research design was utilized for this study; this descriptive research design delineates or explains the variables being studied and provides flexibility in examining a problem from many different angles (Polit & Beck, 2020).

Setting

The study was conducted at the out-patient clinics at Menoufia University Hospital which serves 50 to 100 pregnant women from different regions each working day and approximately annually (Statistical department, 2023). Out-patient clinics provides free healthcare to pregnant women as well as women with gynecological problems or complaints.

Sample

A convenience sample of 100 pregnant women were recruited based on the following inclusion and exclusion criteria. Inclusion criteria as; all pregnant women who had willingness, were asked to participate in the study. Women who not welling to participate were excluded from the current study.

Sample size calculation

A total of (100) pregnant woman was selected. The sample size was calculated using the following formula:

$$\text{formula: } n=\frac{z^2*p*(1-p)/e^2}{1+\frac{z^2*p*(1-p)}{e^2*N}}$$

= 100, N = Population size, z = Critical value of the normal distribution at the required confidence level, z = 1.96, p = Sample proportion, p= 0.5 and e = Margin of error, e =0.05. The actual sample size was 100 pregnant women (Chaokromthong & Sintao, 2021).

Tools for data collections

Three tools were used; 1) Structured Interviewing Questionnaire, 2) Women knowledge related to Climate Change Tool, and 3) Likert beliefs Scale related to Climate Change.

Tool I: Structured Interviewing Questionnaire

This tool designed by researcher after extensive review **(Eltelt et al., 2023),** it consists of three parts; part I; included data related to demographic characteristics as; age, level of education, occupational level, residence. And Part II: included data related to obstetrical history as; parity, gravidity, parity, and gestational age, and complications of last pregnancy and labor. And Part III: included data related to environmental characteristics as; family size, home location and time of sun exposure.

Tool II: Women knowledge related to Climate Change Tool

This tool was designed by researcher after extensive literature review **(Amin, Eldeeb, & Elbialy, 2023; Eltelt et al., 2023)**, included data related to climate changes knowledge, which consists of 6 questions. the following question were asked as; What is climate change, its causes, effect of climate change on environment, most exposed categories exposed to climate change, effect of climate change on maternal health & mother's source of information about climate change. The question's answer was yes or no; the yes response equaled three score, and the no response equaled one score. The total knowledge scores were from 0 to 18, and they were classified into two levels: score 0-<10.8(less than 60%) was considered an unsatisfactory level of knowledge, while score 10.8–18 (equal and more than 60%) was considered a satisfactory level of knowledge.

Tool III: Likert Beliefs Scale related to Climate Change

It was developed by researcher after extensive literature review (Amin et al., 2023). This tool included data related to climate change belief was measured by using 3 point Likert scale from 1-3 in which score 1 denote disagree, score 2 denote neutral, and score 3 denote agree. With total score for the climate change beliefs was 21. Total scoring about beliefs was categorized into two levels less than 50% was considered as negative belief, and equal or more than 50% was considered as a positive belief.

Tool validity and reliability

Tools were submitted to a panel of three experts in the fields of maternity and community health nursing. This revision was performed to test the content validity, relevance, and clarity of the tools. Modifications were performed accordingly. The reliability of tools was tested using Cronbach's alpha test, and the result was highly respectively reliable (0.78 & 0.86) for tools (2 & 3).

Ethical Considerations

Ethical Considerations Official permission was granted from the director of maternity hospital at Menoufia University (No: 835). The researchers introduced themselves to the women who met the inclusion criteria and informed them about the purpose of this study to obtain their acceptance to share in this study. The researchers ensured that the study posed no risk or hazards on their health and their participation in the study is voluntary. Women in childbearing period who were willing to participate in the study and met the inclusion criteria were approached by the researchers and asked for

written consent to confirm their acceptance, and all events that occurred during data collection were considered confidential.

Pilot Study

A pilot study was carried out on 10 women from antenatal outpatient's clinic to assess time required to answer the questions; to judge the feasibility, objectivity, test the ability of the tool to elicit the desired information and to test appropriateness of content, and wording. Pilot study revealed that the average time required to complete the questionnaire was approximately 30 - 45 minutes for each woman. Based on its outcome, modifications have been carried out. The pregnant women involved in the pilot study were excluded from the sample.

Procedure

First, primary official permission was obtained from the research ethics committee of the Faculty of Nursing at Menoufia University to approve the tools and the study. Then, an official letter was sent to the administrative authorities of obstetrics and gynecology outpatient clinics at Menoufia University Hospital to grant approval for conducting the present study, and official permission was obtained from the administrative authority of the selected setting (outpatient manager). Data was collected two days per week; around four to five women per day were recruited around a three months period, from October to December 2022. Data collection was carried out in two steps: Interviewing, recruitment, and assessment phase.

Interviewing and recruitment phase

During the interview and recruitment phase, the aim of the study was explained to the selected women to gain their acceptance to participate in the study. Women who fitted the inclusion criteria and accepted to be included in this study were recruited and then data related to demographic status and obstetric history was collected from each woman.

Assessment phase

Data was collected individually through face to face interview for each pregnant woman two days per week (total sample of 100 pregnant women). The researchers met the study sample, asked them questions in Arabic and record answers in the tools. Data related to general knowledge about climate change among pregnant women were collected using knowledge questionnaire and data related to women's belief about climate change was collected using likert belief scale regarding climate change. The interview was carried out in the waiting room at outpatient clinic, and the time consumed to fulfill the questionnaire ranged from 25-30 minutes.

Statistical Analysis

Collected data were coded and tabulated using a personal computer. Statistical package for social science (SPSS) version 23 was used. The researcher checked all data to avoid any discrepancies. Data were examined for coding and entry errors. Percentage, mean, standard deviation and frequency were used for analyzing the data. These tests were used to identify the significant of the relations. Level of significance was considered at p-value <0.05.

Results

Findings of the current study are presented into four sections. 1) Demographic characteristics, environmental factor and obstetrical history; 2) pregnant women knowledge about climate change; 3) pregnant women beliefs about climate change, and 4) the relations between total knowledge categories among women and their beliefs regarding climate change.

Table (1) reveals that, forty six percent of the pregnant women their age ranged between 25-30 years old with mean age was 26.68 ± 4.25 years old. Furthermore, 99% of them were housewife. Also, 64% complete their secondary education, 90% of the study sample lived in urban areas.

Table (2) shows that, 75.0 % of study sample live with her husband only and 93% their home location did not near to river. Also, 51% of them were exposed to the sun from 10-3pm with working hours were 6 hours.

Table (3) reveals that, forty four percent of the study sample had second gravida. With the mean gestational age was 33.22 ± 5.99 weeks.

Table (4) shows that sixty seven percent of pregnant women had knowledge about the climate change and 54% had knowledge about it is causes. Furthermore, 68% having knowledge that the

climate change affects the environment and 59% identify the floods is the most common cause. Also, the most affected category to the climate change is old age and children with 87% &80% respectively.

Table (5) shows that 88% and 85% of pregnant women had knowledge about the climate change can effect on pregnancy and menstruation respectively.

Figure (1) Illustrates that 53% of pregnant women had satisfactory level of knowledge about the climate change, while 47% of them had unsatisfactory level of knowledge.

Table (6) reveals that, 95% of the pregnant women agree that the climate change affects the health, while 3.0 of them don't agree. Furthermore, 93%, 89 % and 89% of the pregnant women believed that the climate change can affect the society, pregnancy, and fetal health respectively.

Figure (2) Illustrates that 89% of pregnant women have positive beliefs about the effect of climate change, while 11% of them have negative beliefs.

Table (7) shows that there was a highly statistically significant relation between beliefs categories and total knowledge categories among the study sample regarding climate change.

Table (1) Distribution of the Study Sample Regarding Demographic Characteristics (N=100)

Items	Freq.	%
Age (Years)		
less 20	9	9.0
20-	30	30.0
25-	46	46.0
More than 30	15	15.0
Mean ± SD **yrs**	**26.68 ± 4.25**	
Occupation		
Housewife	99	99.0
Working	1	1.0
Educational level		
Read and write	4	4.0
Primary Education	4	4.0
preparatory school	21	21.0
Secondary Education	64	64.0
University education	7	7.0
Residence		
Urban	90	90.0
Rural	10	10.0

Table (2) Distribution of the Study Sample Regarding To Environmental Characteristics (N=100)

Items	Freq.	%
Family size		
with husband only	75	75.0
Live with less than 5 persons	9	9.0
Live with 5-10 persons	10	10.0
Live with more than 10 persons	6	6.0
Home location		
Near to river	5	5.0
No near to river	93	93.0
Low places	2	2.0
Time to sun exposure		
before 10 am	49	49.0
from 10-3 pm	51	51.0

Table (3) Distribution of the Study Sample Regarding Obstetrical History (N=100)

Items	Freq.	%
No. of pregnancy		
One	22	22.0
Two	44	44.0
Three or more	34	34.0
Gestational age weeks Mean ± SD	33.22 ± 5.99	

Table (4) Distribution of The Study Sample Regarding Knowledge about Climate change (N=100)

Items	Yes		No	
	Freq.	%	Freq.	%
Concept of climate change	67	67.0	33	33.0
Causes of climate change	54	54.0	46	46.0
Effect of climate change on the nature and environment	68	68.0	32	32.0
Effect of climate change on sea level rise	14	14.0	86	86.0
Effect of climate change on ice melting	53	53.0	47	47.0
Effect of climate change on drought	3	3.0	97	97.0
Effect of climate change on floods	59	59.0	41	41.0
The most affected category to climate change				
Children	80	80.0	20	20.0
Old age	87	87.0	13	13.0
Chronic disease	14	14.0	86	86.0
Pregnancy	70	70.0	30	30.0
Post-Partum	0	0.00	100	100.0
Lactation	0	0.00	100	100.0
Total mean knowledge score **Min - Max**	30.63 ± 5.51 24.00 - 45.00			

Table (5) Distribution of the Study Sample Regarding the Adverse Health Effect of Climate Change (N=100)

Adverse health effect	Yes		No	
	Freq.	%	Freq.	%
1. On menstruation	85	85.0	15	15.0
2. On pregnancy	88	88.0	12	6.0
3. On fetal health	77	77.0	23	15.0
4. Abortion	62	62.0	38	38.0
5. Child death	82	82.0	18	18.0
6. Bleeding	74	74.0	26	26.0
7. Preterm labor	74	74.0	26	26.0

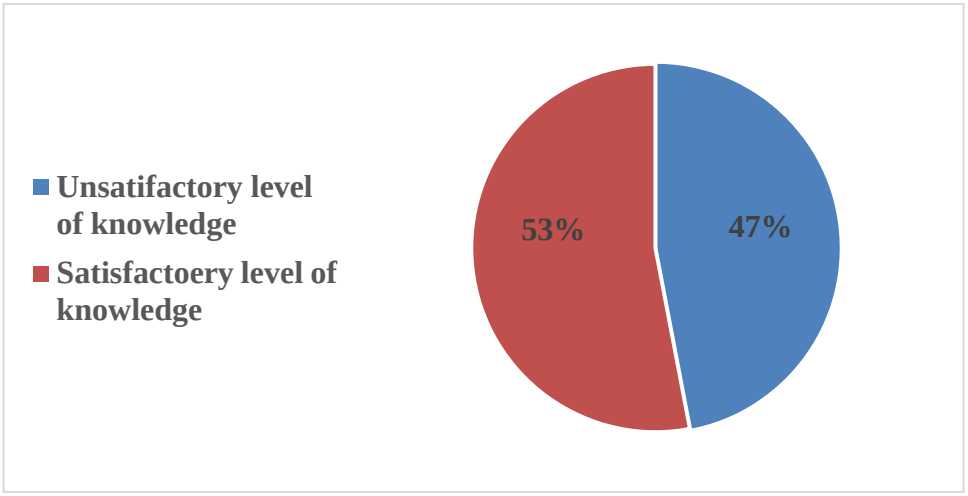

Figure (1) Distribution of the study sample regarding categorize of the level of Knowledge

Table (6) Distribution of the Study Sample Beliefs toward Climate Change (N=100)

Beliefs toward Climate Change	Agree		Neutral		disagree	
	Freq.	%	Freq.	%	Freq.	%
1. Overuse of transportation affect health.	86	86.0	6	6.0	8	8.0
2. Affect society.	93	93.0	4	4.0	3	3.0
3. Affect their health.	95	95.0	2	2.0	3	3.0
4. Affect menstruation.	83	83.0	2	2.0	15	15.0
5. Affect their pregnancy.	89	89.0	0	0.00	11	11.0
6. High risk for abortion.	59	59.0	0	0.00	41	41.0
7. Affect your fetal health.	89	89.0	0	0.00	11	11.0
8. High incidence of preterm labor.	74	74.0	2	2.0	24	24.0
9. High risk for bleeding.	73	73.0	0	0.00	27	27.0
Total mean score of Beliefs **Min - Max**	23.98 ± 4.57 9.00 - 27.00					

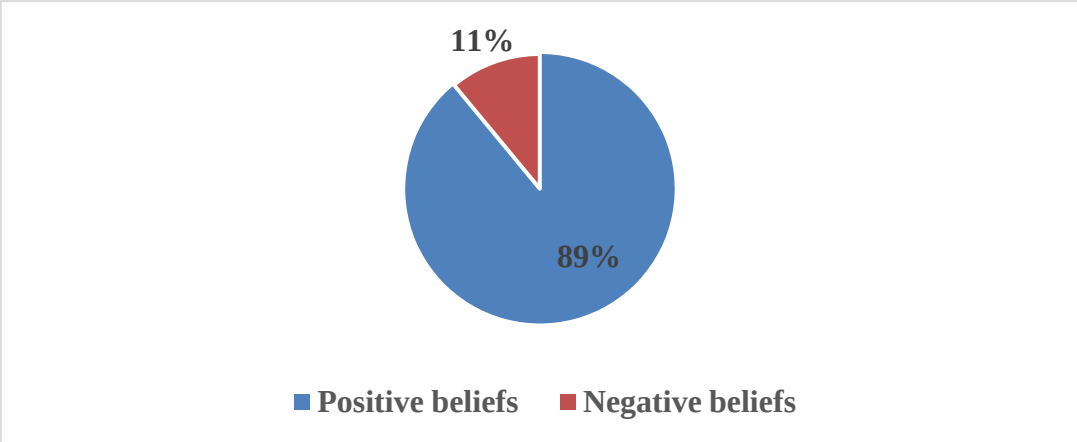

Figure (2) Distribution of the Study Sample Regarding Beliefs toward Climate Changes (N=100)

Table (7): Relation Between Total Knowledge Categories and Beliefs Study Sample Regarding Climate Change (N=100).

Belief categories	Total knowledge categories				p-value
	Satisfactory Level		Unsatisfactory Level		
	Freq.	%	Freq.	%	
-Negative	10	18.9	1	2.1	
-Positive	43	81.1	46	97.9	χ^2=7.13, p=0.008

Discussion

Climate change is seen as a major environmental problem in the 21st century, endangering both food security and public health. However, there is a lack of research on how the population in developing nations perceives the risk of climate change. Because of their high dependence on natural resources and their lack of ability to adapt, these countries are the most at risk from the impacts of climate change **(Amin et al., 2023).**

Finding gaps and creating awareness campaigns that address the effect of climate change on pregnancy outcome and take action to implement mitigation measures can be aided by identifying public perceptions of risk and awareness of climate change dangers. But there weren't many researches done in Egypt **(Venghaus et al., 2022).** Studying knowledge and beliefs of pregnant women regarding climate change is an essential step to develop strategies to adapt climate change. Knowledge, perceived risk, experiential, physical, psychological and sociocultural variables are determinants of climate change **(Elshirbiny, 2020).** So, the aim of this study was to assess the knowledge and beliefs toward climate changes among pregnant women.

The results of this study will be discussed within the following frame of reference: description of the study sample and answered the research questions.

Findings of the current study showed that, forty-six percent of the pregnant women their age ranged between 25-30 years old with mean age of 26.68 ± 4.25 years, the majority of them were housewife and more than half of them had secondary education. This in the same line with **(shih et al., 2022).** Also, findings indicated that the majority of study sample were lived in urban areas and faraway of the rivers. The findings agree with **Graham et al. (2021).** They conducted a study in sub-Saharan Africa about "Diversity and climate change: the dynamic burden of poor maternal health." The study found that 75% of the study sample live in urban areas and 80% of them lived in rural area.

Regarding to time of heat exposure half of the study sample were exposed to the sun between 3-10 pm, this in the same line with **(Eltelt , 2023)** who study the adverse effect of climate change on pregnant women worked outdoor in El fayoum, Egypt. The researcher revealed that near to half of them were exposed to heat between 3-10 pm. And contradicted with **Rother et al., (2019).** This study was conducted in South Africa about "Perceptions of occupational heat, sun exposure, and health risk prevention: a qualitative study of forestry workers in South Africa". They found that, 70% of them were exposed to heat between 6 am-12pm. From the researcher point of view, there is a difference in temperatures between South Africa and Egypt, which leads to different results.

Concerning to their obstetric history, findings of the current study reveals that, more than two third of the study sample were multigravida, majority (of them have no abortion, more than half of them have normal previous pregnancy at third trimester). This finding agree with **(Ahmed et al., 2023)** who studied" Impact of Narrative versus Didactic Information on Pregnant Women's Knowledge, Attitude and Perception Regarding Climate Change, Egypt) who illustrated that more than one third of the women were multigravida.

The present study shows that sixty-four percent of the pregnant women had satisfactory level of knowledge about the climate change and half of them had unsatisfactory level of knowledge about the causes of it. The remaining had an unsatisfactory level of knowledge. Similar findings of adequate knowledge regarding climate change have been reported in studies carried out in Ethiopia **(Nigatu et al., 2014)** and China **(Liao et al., 2019).** The study results are disagreeing with **(Eltelt et al., 2023)** who studied "Adverse Health Effects of Climate Change on Pregnant Women Working" who mentioned that more than half of the pregnant women had poor level of knowledge. Also, disagreed with **(Morris et al., 2021)** who conducted a study about "Health vs. wealth: Employer, employee and policy-maker perspectives on occupational heat stress across multiple European industries and stated that 65% of participants had poor level of knowledge. May be related to there is a difference due to increase level of education in the study sample, the majority of the study sample in the current study had secondary and university education.

In relation to vulnerable populations affected by climate change, the finding of this study revealed that the most affected category to the climate change is old age and children with 87% &80% respectively, followed by more than half of them were pregnant women. This might be because children have an immature physiology, cognitive and development problems. The elderly has slow physiological adaptation to environmental change and multiple comorbidities. Adverse pregnancy outcomes such as; preeclampsia, preterm labor, and low birth weight, stillbirth, and intrapartum problems can result when increased ambient temperature. These results were in the same line with **Sambath et al., (2022)** who carried out a study about knowledge, attitudes, and practices related to climate change and its health aspects among the healthcare workforce in India. They revealed that, more than three-quarters of nurse participants indicated children and the elderly, and more than three-fifths of them selected women as categories to affect from climate changes. Despite that, these results were inconsistent with **Salem et al., (2022)** who performed a study about young students' knowledge, attitude, and practice toward climate change and demonstrated that more than one-third of students selected infants and children as more vulnerable people to the climate change effects. This may be due to educational level and sample size differences.

Findings of the current study revealed that, 95% of the pregnant women agree that the climate change affects the women's health and can cause multiple conditions. 93% and 89% of the pregnant women believed that the climate change can affect the society, pregnancy, and fetal health respectively. This finding supported by **Dehdashti, et al., (2020)** who studied "Impacts of Climate Changes on Pregnancy and Birth Outcomes: A Review" mentioned that climate change may effect on birth weight,

preterm labor, overheating, eclampsia and preeclampsia, and abortion. Also, these findings agree with **(Spencer et al., 2022)** who studied "The challenges of working in the heat whilst pregnant: insights from gambian women farmers in the face of climate change". They mentioned that all participants in the study discussed their experience of a range of significant physical changes during pregnancy. Common symptoms included nausea, anxiety, fatigue, excessive sweating, pale and dizziness. Our findings and many studies, mentioned that awareness of climate change and its impact on pregnant women is increasing in developed and developing countries. The media plays a significant role in disseminating information about the potential risks of climate change on public health, including its effects on pregnant women. Moreover, increasing awareness of these potential impacts can help pregnant women take preventive measures to protect themselves and their fetus from these risks.

Conclusion

The current study concluded that more than half of pregnant women had satisfactory level of knowledge and positive beliefs toward climate change. Also, there was a relationship between pregnant women knowledge categories and beliefs categories in relation to the effect of climate change with statistically significant difference (P≤0.001).

Recommendations:

Based on research findings it was recommended that:

1. Educational programs are needed for pregnant women to increase and maintain their knowledge and beliefs regarding climate change.

2. Provide health education program and booklets for pregnant women in outpatient and antenatal follow up clinics that focus on adapting to climate change.

3. Conduct researches that explore short and the long-term health effects of climate change on pregnant women and their fetuses.

4. Replication of the study on large representative probability sample is recommended in to generalization of the results.

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