Assessment of Pregnant Women Knowledge about Climate Changes and its Effect on Their Pregnancy

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Abstract

Background: Climate changes are the most serious health concern of the twenty first century; pregnant women and their children are particularly susceptible to the effects of climate change, including preterm birth, low birth weight, congenital abnormalities, and neonatal mortality. **Aim**: The study aimed to assess pregnant women knowledge about climate changes and its effect on their pregnancy. **Research design:** A Descriptive, cross sectional design was used. **Setting**: The study was conducted at an antenatal outpatient clinic at Women's Health Hospital, Assiut University. **Sample:** A convenient sample of 300 pregnant women was involved in the study. **Tool of data collection:** Data were collected by a structured interview questionnaire consisting of three parts: **Part 1:** Included personal data, medical history, and obstetric history. **Part 2:** knowledge about climate changes, and **Part 3:** knowledge regarding the effect of climate changes on pregnancy. **Results:** The current study findings showed that only 8% of the pregnant women had good knowledge, while 13.3% had fair knowledge, and 78.7% had poor knowledge regarding climate change and its effects on their pregnancy. There was a highly significant relation between the total score of women's knowledge about climate change and its effects on their pregnancy and their residence, educational level, and occupation. **Conclusion:** More than three quarters of the pregnant women had poor knowledge about climate change and its effects on their pregnancy. **Recommendation:** Raising public awareness through antenatal visits and campaigns about climate change and related effects on pregnant women health especially in rural areas.

Keywords: Assessment, Climate changes, Knowledge & Pregnant women.

Introduction:

Climate change refers to any alterations in the climate over time, resulting from either natural variability or human activities, numerous effects of climate change are being felt on human health and well-being. It endangers the basic components of health: clean air, safe drinking water, a plentiful supply of nutrient-rich food, and safe shelter **(World Health Organization, 2022).**

Human activities cause climate change, which raises the temperature, precipitates more often, raises the sea level, and produces more extreme weather. A number of the health problems that climate change has already and will continue to affect include malnutrition, diarrhea, malaria, dengue fever, injuries, and mortality. Climate change has special risks for expectant mothers and their unborn children because of the physiological and social changes that take place throughout pregnancy and childbirth. Climate-related health hazards during pregnancy include eclampsia, anemia, low birth weight, preterm delivery, and miscarriage **(Mahmoud & Mahmoud, 2023).**

Internationally felt, the effects of climate and environmental change will only get worse if meaningful global adjustments are not made. Regardless of color, ethnicity, income, or education level, it is time to increase awareness of the effects of climate change on women's health and their transgenerational effects **(Girardi & Bremer, 2024).**

Higher rates of miscarriage, preterm birth, and stillbirth are among the negative effects of heat and air pollution on the health of expectant mothers and newborns. Additionally, warmer temperatures raise the risk of vector-borne illnesses such malaria, dengue, and zika. For instance, low birth weight, stillbirth, and early delivery are linked to malaria infection during pregnancy. In addition, malaria is a direct cause of maternal mortality. Anemia from malaria raises the risk of postpartum hemorrhage-related death **(Miller & Miller, 2022).**

One of the main duties of midwives is to safeguard women's and children's health from the negative consequences of climate change. They understand how climate change affects the health of mothers and children, therefore they practice breastfeeding, support fertility restrictions, and provide enough and balanced nutrition. Furthermore, midwives are aware of the profession's importance in addressing how climate change affects human health and minimizing its negative consequences on people's and society's health **(Dağlı, et al., 2024).**

Significant of the study:

According to a recent assessment by the United Nations Intergovernmental Panel on Climate Change (IPCC), climate change is occurring more quickly than anticipated, and this crisis should now be acknowledged as a "global emergency," as it puts women, expectant mothers, unborn children, and offspring who were exposed to climate stressors while they were in utero at serious risk. To educate professional healthcare professionals, patients, and the general public about evolving health effects and worldwide awareness, which must prioritize education, research, and advocacy **(Gupta, et al., 2024).**

It is expected that between 2030 and 2050, the effects of climate change will result in an additional 250000 deaths per year due to heat stress, diarrhea, malaria, and malnourishment **(World Health Organization, 2022).** The crisis of climate change is exacerbating the already high and unequal rates of mother and newborn mortality. Newborns and expecting mothers are especially susceptible to the consequences of climate change because of their biological vulnerabilities. Heat and air pollution can cause an increase in the incidence of miscarriage, stillbirth, and premature birth. While further research is required to fully understand the effects and provide answers, there are immediate steps that the global health community can take to protect expectant mothers, babies, families, and communities. **(Miller & Miller, 2022).** So, this study was carried out to assess pregnant women knowledge about climate change and its effect on their pregnancy.

Aim of the study:

Assess pregnant women knowledge about climate changes and its effect on their pregnancy**.**

Research question:

What is the level of pregnant women knowledge about climate changes and its effect on their pregnancy?

Subjects and Methods:

Research design:

A descriptive, cross-sectional design was used to achieve the aim of this study.

Study Setting:

This study was conducted at the antenatal outpatient clinic at Women's Health Hospital, Assiut University. This clinic is located on the ground floor of the Women's Health Hospital which consists of two rooms, the first room contains four beds used to examine pregnant women, and the second room contains two offices, one for obstetricians and the second office for nurses affiliated with the clinic.

Subjects:

Sample type:

A convenience sample was used for all women who visited the antenatal outpatient clinic at the Women's Health Hospital, Assiut University.

Sample size:

The current study was carried out on 300 pregnant women; the sample was calculated according to Herbert Arkin's equation: N (population) according to hospital-based records was 1777 women were registered in the antenatal outpatient clinic at Women's Health Hospital in 2022.

$$n = \frac{p(1-p)}{(SE \div t) + [p(1-p) \div N]}$$

N (population) = 1777
T = 1.96
SE = 0.05
P = 0.50
N = 300 pregnant women

Inclusion criteria:

All pregnant women (primigravida and multigravida).

Exclusion criteria:

Women who are not willing to participate in the study.

Tool of the study:

Data collection was obtained by using the following:

Tool (1): A structured interview questionnaire was used in this study

This tool was designed and utilized by the researcher based on the literature review and consulting expertise in this area **(Adebayo et al.,2020)**, it was structured to include the following parts:

Part 1: Included.

Personal data: As age, educational level, residence, family type, and occupation status**.**

Medical history: As hypertension, anemia, diabetes mellitus, kidney, and liver diseases**.**

Obstetric history: As gravidity, parity, gestational age, number of abortions, mode of last delivery, number of living children, and antenatal follow-up visit.

Part 2: Assessment of pregnant women's knowledge about climate change:

Which consisted of **(13)** questions divided into **(4)** multiple choice questions, including the woman knowledge about climate change, source of knowledge, components of climate change, and how people can stop climate change, and, **(9)** close-ended questions, as included a definition of climate change, inevitability of climate, causes of climate change as cutting trees, garbage waste, burning fossil fuels, and human activities, and how people can help to stop climate change by planting more trees …etc.

Scoring system for assessing knowledge about climate change:

It included 13 items regarding pregnant women's general knowledge about climate change. for the first four items, each correct and complete answer was given 2 points, correct and incomplete was given 1 point, and don't know was given zero point. The other items were scored as each correct answer was given one point, and incorrect and don't know answer was given zero points. The total score ranged from 0-17, a score of each item summed up and then converted into a percent score which is categorized as follows:

Poor knowledge <50% (8 points) of total score of knowledge.

Fair knowledge 50-65 % (8-11 points) of total score of knowledge.

Good knowledge > 65% (>11 points) of total score of knowledge

Part 3: Assessment of knowledge regarding the effect of climate changes on pregnancy.

It consisted of **(9)** close-ended questions on the effect of heat waves, air pollution, and dehydration on the health of pregnant women and their fetus as heat waves can cause premature rupture of membranes and gestational hypertension and birth defect, air pollution can reduce placental blood flow to your fetus and dehydration early in pregnancy cause preterm birth. Also, how to protect themselves from heat waves and air pollution...etc.

Scoring system for assessing knowledge about the effect of climate changes:

It included 9 items regarding pregnant women's knowledge about climate change's effect on their pregnancy. Each correct answer was given one point, and incorrect and don't know answer was given zero point. The total score ranged from 0-9, a score of each item summed up and then converted into percent score which is categorized as follows:

Poor knowledge <50% (5 point) of total knowledge score.

Fair knowledge 50-65 % (5-6 point) of total knowledge score.

Good knowledge > 65% (>6 point) of total knowledge score.

Total scoring system for assessment of pregnant women's knowledge about climate change and its effect:

It included 22 items regarding pregnant women's knowledge about climate change and its effect on their pregnancy. For the first four items, each correct and complete answer was given 2 point, correct and incomplete were given 1 point and don't know was given zero point. The other items was scored as each correct answer was given one point, incorrect and don't know answer was given zero point. The total

score ranged from 0-17, a score of every item totaled and then transformed into a present score that may be divided into the following categories:

Poor knowledge <50% (8 point) of total knowledge score.

Fair knowledge 50-65 % (8-11 point) of total knowledge score.

Good knowledge > 65% (>11 point) of total knowledge score.

Validity of the tool:

The tool was reviewed to ascertain its content validity by three experts from the nursing staff of the Obstetrics and Gynecological Department at the Faculty of Nursing, Assiut University who reviewed the tool for clarity, relevance, comprehensiveness, applicability, and easiness, and according to the opinion of the experts, the modifications were done according to panel judgment.

Reliability of the tool:

The reliability of the tool was applied by the researcher for testing the internal consistency of the tool was calculated by using Cronbach's Alpha test it was measured by using the reliability item deprived from the scale and analysis found in the SPSS program and it was reported as **0.780.**

Pilot study:

After preparing of the questionnaire, it was pre-tested on 10% of the sample (30 pregnant women) before implementation of the study to test the validity and reliability of the study tools. The data obtained from the pilot study were analyzed and minor modifications were done, so the sample of the pilot study was included in the main study.

Procedures:

1. An official permission was obtained from the chairman of Woman's Health Hospital, Assiut University to proceed the study.

2. Data collection of the study was conducted over 6 months starting from the period of beginning of September 2023 to the end of February 2024.

3. The researcher was available in the study setting three days per week starting from 9.00 am to 1.00 pm until the sample size reached the predetermined number.

4. The researcher interviewed each pregnant woman through face-to-face communication, greeted them, introduced herself, and got informed consent from women who participated in the study after explaining the purpose, nature of the study, and anonymity of the questionnaire.

5. Each woman was interviewed separately to obtain the necessary data, The researcher directed to the women each question regarding knowledge about climate change and its effect on their pregnancy.

6. After filling out the questionnaire, the researcher gave pregnant women oral instructions regarding

the harmful effect of climate change on their pregnancy health and how to protect themselves from heat waves and air pollution which took 25-30 minutes for every woman.

7. Confidentiality of the data was assured.

Ethical considerations:
▪ The research proposal was approved by the ethical Committee (approved ethical number 1120240660) in the faculty of Nursing on (September 2023).
▪ Informed consent was obtained from women who participated in the study, after explaining the nature and purpose of the study.
▪ There was no risk for the study subject during the application of the research.
▪ The study followed common ethical principles in clinical research.

▪ Confidentiality and anonymity were assured.
▪ Participant women had the right to refuse to participate or withdraw from the study without any rationale at any time from the study.
▪ Participant women's privacy was considered during the collection of data.

Statistical analysis:
Data entry and data analysis were done using a statistical package for the social science (SPSS) version 26. Data were presented as numbers, percentage means, and standard deviation. The chi-square test was used to show the relation between variables. The P-value is considered statistically significant when $p < 0.05$.

Results:

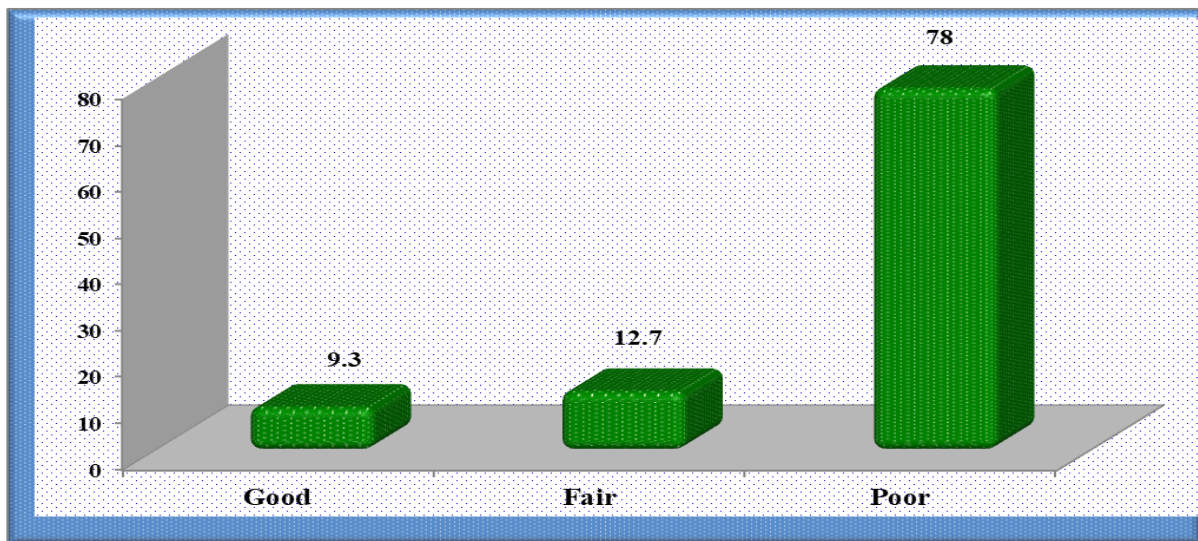**Table (1): Distribution of the studied women according to their personal data (N=300)**

Personal data	N	%
Age group:		
▪ Less than 20 years	29	9.7
▪ 20-35 year	231	**77.0**
▪ More than 35 year	40	13.3
Age (mean±SD)	**27.63±6.41**	
Residence:		
▪ Rural	238	**79.3**
▪ Urban	62	20.7
Level of education:		
▪ Illiterate	136	**45.4**
▪ Read and write	65	21.7
▪ Primary education	19	6.3
▪ Secondary education	55	18.3
▪ University education	4	1.3
▪ Post graduate	21	7.0
Occupation:		
▪ Housewife	274	**91.3**
▪ Employed	26	8.7

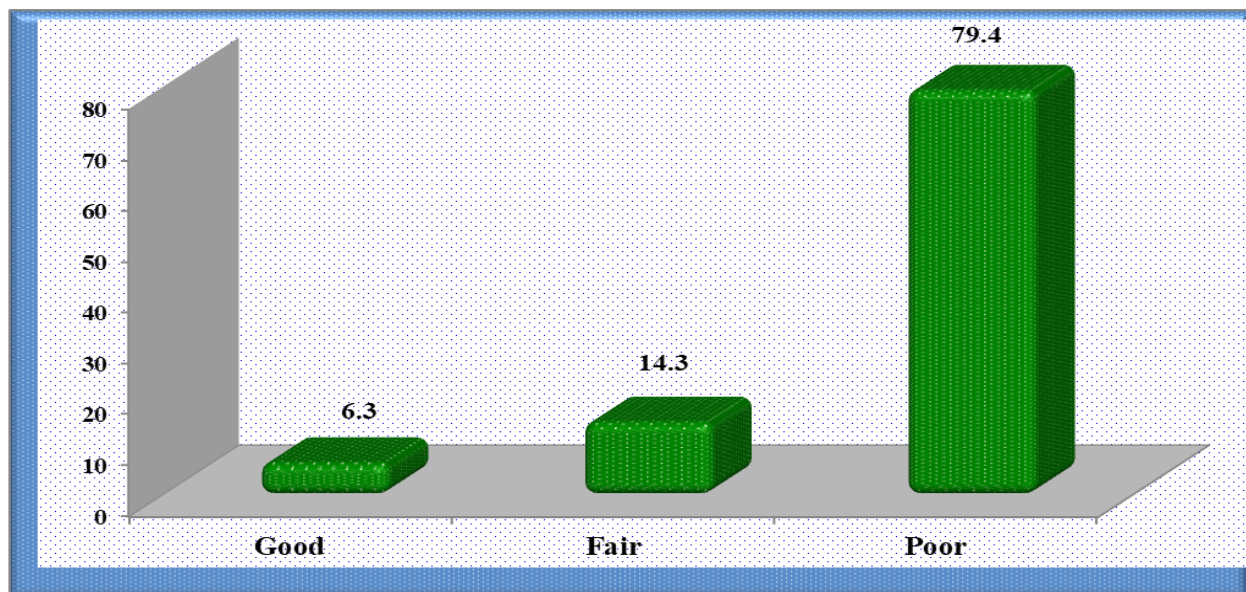**Table (2): Distribution of the studied women according to their obstetrical history (N=300)**

Obstetrical history	N	%
Gravidity:		
▪ Primigravida	58	19.3
▪ Multigravida	242	**80.7**
Gravidity (mean±SD)	**3.45±1.98**	
Parity:		
▪ None	69	23.0
▪ Primipara	32	10.7
▪ Multipara	199	**66.3**
Parity (mean±SD)	**1.99±1.64**	
History of abortion:		
▪ Yes	83	27.7
▪ No	217	**72.3**
Abortion (mean±SD)	**1.72±0.448**	
Mode of last delivery:		
▪ None	69	23.0
▪ Normal delivery	82	27.3
▪ C. S	149	**49.7**

Table (3): Distribution of the studied women according to knowledge about climate change (N=300)

Knowledge about climate change		N	%
Climate change components	Correct and complete	12	4.0
	Correct and incomplete	54	18.0
	Incorrect or don't know	234	**78.0**
Causes of climate change	Correct and complete	10	3.3
	Correct and incomplete	69	23.0
	Incorrect or don't know	221	**73.7**
Effect of climate change	Correct and complete	14	4.7
	Correct and incomplete	49	16.3
	Incorrect or don't know	237	**79.0**
How can people stop climate change?	Correct and complete	13	4.3
	Correct and incomplete	71	23.7
	Incorrect or don't know	216	**72.0**

Figure (1): Distribution of studied women according to scores level of knowledge about climate change (N=300).

Figure (2): Distribution of studied women according to scores level of knowledge about the effect of climate change on pregnancy (N)=300.
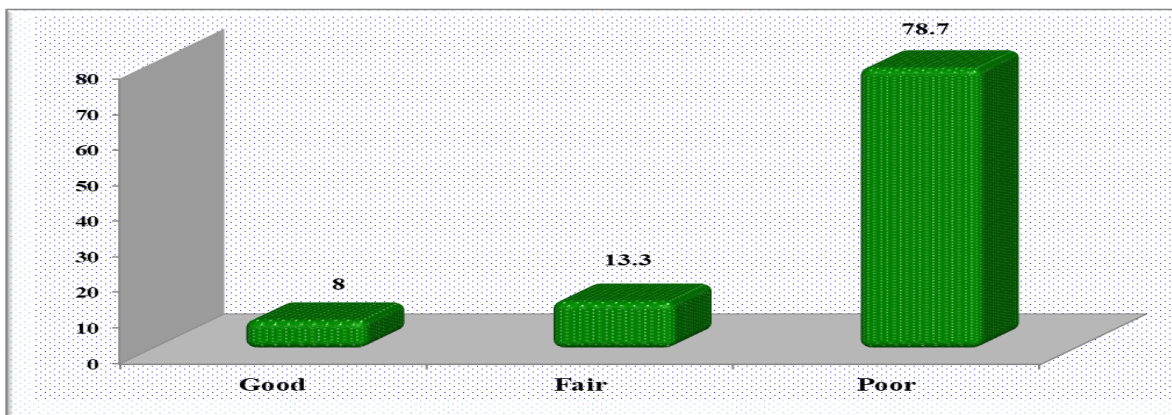
Figure (3): Total knowledge score about climate change and its effect on their pregnancy (N=300)
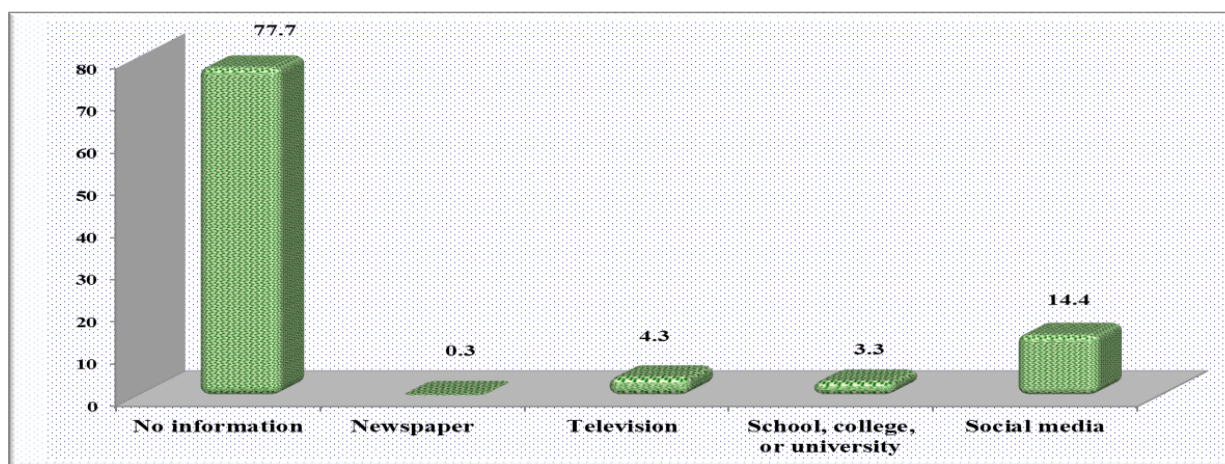

Figure (4): Distribution of the studied women according to sources of knowledge about climate change (N=300).

Table (4): Relation between total knowledge about climate change and its effect on their pregnancy and the studied women's personal data (N=300)

Personal data	Total knowledge about climate change and its effect their pregnancy						P- value
	Good (24)		Fair (40)		Poor (236)		
	N	%	N	%	N	%	
Age group:							
▪ < 20 years	0	0.0	1	2.5	28	11.9	**0.026***
▪ 20-35 year	17	70.8	34	85.0	180	76.2	
▪ > 35 year	7	29.2	5	12.5	28	11.9	
Residence:							
▪ Rural	9	37.5	17	42.5	212	89.8	**0.001****
▪ Urban	15	62.5	23	57.5	24	10.2	
Level of education:							
▪ Illiterate	0	0.0	3	7.5	133	56.4	
▪ Read and write	1	4.2	2	5.0	62	26.2	
▪ Primary education	3	12.5	4	10.0	12	5.1	**0.001****
▪ Secondary education	11	45.8	19	47.5	25	10.6	
▪ University education	1	4.2	2	5.0	1	0.4	
▪ Postgraduate	8	33.3	10	25.0	3	1.3	
Occupation							
▪ Housewife	15	62.5	26	65.0	233	98.7	**0.001****
▪ Employed	9	37.5	14	35.0	3	1.3	
Family type:							
▪ Nuclear family	13	54.2	27	67.5	103	43.6	**0.016***
▪ Extended family	11	45.8	13	32.5	133	56.4	

(*) *statistical significant difference*   (**) *highly statistical significant difference*
No statistically significant difference (p-value >0.05)

Interpretation of result:
Table (1): Reported that 77.0% of the studied women were in the age group of 20-35 years with a mean age and SD was 27.63±6.41years of 300 women included in this study. About 79.3% and 45.4% were from rural areas and illiterate. Regarding occupation 91.3 %of studied women were housewife.

Table (2): Illustrates the distribution of the studied women according to their obstetrical history, The gravidity mean±SD was 3.45±1.98, and 80.7% of them were multigravida, The parity mean±SD was 1.99±1.64, and 66.3% of them are multipara, The mean±SD of abortion is 1.72±0.448, and 72.3% has no history of abortion, About 49.7% of them their mode of last delivery was cesarean section.

Table (3): Illustrates the distribution of studied women according to knowledge about climate change, About 78.0%, 73.7%, 79.0%, and 72.0% of them answered incorrectly or don't know about components, causes, effects and how can people stop climate change respectively.

Figure (1): Demonstrated that 78% of women involved in the study had poor knowledge about climate change while 12.7% of them had fair knowledge, and 9.3% had good knowledge about climate change.

Figure (2): Clarifies that 79.4% of studied women had poor knowledge about the effect of climate change on their pregnancy while 14.3% of them had a fair knowledge, and only 6.3% had good knowledge about climate change's effect on their pregnancy.

Figure (3): Presents that 78.7% of the women included in this study had poor knowledge about climate change and its effect on their pregnancy also, 13.3% had fair knowledge and only 8% of them had good knowledge about climate change and its effect on their pregnancy.

Figure (4): Clarifies that 77.7% of the studied women had no information according to the source of information about climate change, and only 14.4% of the them source of knowledge from social media, also 4.3%, 3.3% source of knowledge from television, school, and college.

Table (4): This table reveals that there is a highly statistically significant difference between the total score of knowledge of the studied women about climate change and its effect on their pregnancy with their educational level, residence, and occupation with a P-value were 0.001

Discussion:
The World Health Organization identified climate change as the phrase used to describe the gradual rise in global temperatures that is mostly accelerated by human activities. climate change has become a top priority on the global health agenda **(WHO, 2022).**

Because pregnancy and childbirth bring about physical and sociocultural changes, pregnant women and newborns are particularly vulnerable to the effects of climate change. Health issues such as eclampsia, anemia, low birth weight, preterm delivery, and even miscarriage can be brought by climate-related risks. **(Shalaby, et al., 2023).** So, this study aimed to assess pregnant women's knowledge about climate change and its effect on their pregnancy at Women's Health Hospital, Assiut University.

According to the score of women's knowledge about climate change, the findings of present study showed that most of the studied women had poor knowledge about climate change, this finding agreed with **Acar & Oter, (2024)** who assessed the awareness of climate change in pregnant women. In Turkey, they found that the majority of the women in the study had insufficient knowledge regarding climate change.

At the same line **Abd-Elhamed et al., (2023)** who studied" Impact of Narrative versus Didactic Information on Pregnant Women's Knowledge, Attitude and Perception Regarding Climate Change, in El-Minia University Hospital, Egypt, who illustrated that before the intervention, the vast majority of women in two groups had unsatisfactory knowledge level about climate changes.

This finding was inconsistent with **Adebayo, (2022)** who examined the understanding of young Nigerian women about climate change and maternal and child health in Nigeria, The study's conclusions demonstrate that most of the women in all study groups are aware of how the seasons and climate are changing and how it can affect their health during pregnancy and with their unborn children., A change in the study setting could be the reason for the variation between the results of this study and other research.

Concerning pregnant women's general knowledge about climate change definition, components, causes, impact and how can people help to stop climate change, the current study presents that about three-quarters of the studied women had incorrect or don't know answers, this result is supported by **Afifi et al., (2024)** who assess knowledge and health-related behaviors toward climate changes and heat stress among pregnant women working outdoors: tailored educational program, in Qaliobya governorate, Egypt. who illustrate that nearly three-quarters of the studied women in both study and control group had incorrect answers about climate change definition, components, causes, effects and measures that people can take to limit climate change.

This finding is dissimilar to **Baines et al., (2023)** who assessed pregnant women's information consumption and on health risks and effects related to climate change at Kansas University, United States. They

found that half of the studied women had a general knowledge of the climate change phenomenon, its cause, and the climate change global and local impact. The educational background of women may be the cause of these differences.

Regarding pregnant women's knowledge about the effects of climate change on their pregnancy as heat weaves, air pollution, and how they protect themselves from climate change, the current study demonstrated that more than two-thirds of the studied women had poor knowledge regarding climate change effects, this result is similar to **Elsayed et al., (2024)** who evaluated the effect of nursing instructional module on pregnant women's knowledge and practice regarding climate change at Beni Suef University, Egypt, they discovered that the vast majority of studied women had poor knowledge of climate change effect and how they protect themselves from climate change before the implementation of the nursing instructional module.

This finding is dissimilar to **Spencer et al., (2022)** who researched the challenges of working in the heat whilst pregnant insight from Gambia women farmer in the face of climate change in Gambia, London, who reported that most of the studied women demonstrated high awareness of climate change and had a good insight about how to protect themselves from harm effect of heat waves during pregnancy. The dissimilarity in the research environment between the current study and previous studies could be the reason for the difference.

According to the total score of women's knowledge about climate change and its effect on their pregnancy, the results of the current study showed that three-quarters of studied women had poor knowledge about climate change and its effect on their pregnancy also, our research findings demonstrated that more than one-eighth of them had fair knowledge and about one-ten of them had good knowledge about climate change, this finding agreed with **Afifi et al., (2024)**, who illustrated that a majority of the studied women had poor knowledge regarding climate change and its effect also nearly one-eighth of studied women had fair knowledge and one- ten of them had good knowledge about climate change and its effect on pregnancy.

Additionally, this result is consistent with **Abd-Elhamed et al., (2023)** who mentioned that at pre-intervention, most of the studied women in two groups had unsatisfactory knowledge levels about climate change, and fewer of them had a good knowledge level about climate change, and its effect on pregnancy health.

These findings disagree with **Mahmoud et al., (2023)** who studied knowledge and practices of maternity nurses related to the potential impacts of climate

change on women's health, who illustrated that general knowledge about climate change was fair in about two-thirds of the studied sample when assessing their knowledge about the potential impacts of climate change on women's health, it was found that more than one-third of them have good knowledge, The variation in their employment status could be the reason for the discrepancy between the results of the current study and the previous research.

Regarding sources of knowledge about climate change, above half of the women included in our research had no information according to the source of information about climate change, About one-eighth of the studied women source of knowledge from social media, and less than one-fifth of them source of knowledge about climate change from television, school, and college this finding near to **Mahmoud et al., (2023)** who reported that nearly half of the participants social media is the most common source of information and one-third of participants television is the source of knowledge about climate change.

This finding doesn't match with **Acar& Oter, (2024)** w Assistant Professor ho viewed that about two-fifths of the studied women's source of knowledge regarding climate change from school and books. The degree of education among women could be the cause of the discrepancy.

Regarding personal data, the finding of the current study showed that about three-quarters of women in the study aged between 20 and 35 years with a Mean±SD of **27.63±6.41.** This finding matches with **Adebayo et al., (2020)** who assessed the effectiveness of narrative versus didactic information formats on pregnant women's knowledge, risk perception, self-efficacy, and information-seeking related to climate change health risks, at George Mason University suggested that almost three-quarters of the groups under study were in the 25–35 age range with a mean age of **28.23 (SD = 5.89)** On the other hand, this result was dissimilar to **Eltelt et al., (2023)** who studied "Adverse Health Effects of Climate Change on Pregnant Women Working, in Fayoum Governorate, Egypt, reported that about two-thirds of the women aged between 20 - 40 years with a Mean±SD **19.83±7.34**. The reason for the difference may be due to differences in the study setting.

Concerning women's residence, the results found that almost all women included were from rural areas. Our study result was confirmed by **Elsayed et al., (2024)** who reported that nearly half of the study group was from rural areas in other words this result does not match with **Abd-Elhamed et al., (2023)** who found above fifty percent of the studied women were from urban areas. The study's various settings could be the cause of the inconsistency.

According to the educational level of women, the findings of this study demonstrated that under fifty percent of the women involved in the study were illiterate our view is supported by **Eltelt et al., (2023)** who stated that around one-third of the women in the study were illiterate on the other hand this finding inconsistent with **Baines et al., (2023)** who reported that more than half of the studied women had a university education. The varied settings could be the cause of the mismatch.

Regarding employment status, our study results showed that most of the women in the study were housewives this finding matches with **Afifi et al., (2024)** who found that approximately two-thirds of the studied women were housewives, also this finding is inconsistent with **Baines et al., (2023)** who reported that over two-thirds of the studied women were employed. The reason for the difference may be due to the rural residents.

Regarding women's obstetrical history, the study result shows that nearly all women in the study are multigravida, according to the present findings., two-thirds of them are multi-para, and most of them have no history of abortion. About half of their mode of last delivery is C.S, this finding is confirmed by **Elsayed et al., (2024)** who revealed that about two-fifths of the pregnant women multi gravida, nearly two-fifths were multipara, most of them had no abortion, and half of them had C.S deliveries.

The present study's findings showed a highly statistically significant difference between the total score of women's knowledge and their age, residence, education level, occupational status, and family type with P-values, 0.001, 0.001, 0.001, and 0.016 respectively. These findings agreed with **Elsayed et al., (2024)** who discovered that, with a P-value of 0.001, there is a very statistically significant difference between the women's knowledge overall score and their age and educational attainment.

This finding does not match with **Afifi et al., (2024)** who discovered that, with p-values of 0.484, 0.127, 0.924, and 0.516, respectively, there is no statistically significant difference between the overall score of women's knowledge and their age, place of residence, degree of education, and employment status.

The reason of the difference may be due to, the low education of women, unemployment status, and rural residents may be the cause for their insufficient knowledge about climate change because these factors limit the ability of women to develop their knowledge base and prevent them from exchanging information with others.

Conclusion:
Based on the results of the present study it can be concluded more than three quarters of the pregnant women had poor knowledge regarding climate changes and its effect on their pregnancy. There was a highly significant relation between the total score of women's knowledge and their residence, educational level, and occupation.

Recommendations:
Considering the current study findings, it was recommended that:
- Raising public awareness through antenatal visits and campaigns about climate change and its effect on pregnant women's health especially in rural areas.
- Using social media platforms to enhance pregnant women's knowledge and foster their healthy behaviors concerning climate change.
- Further research to assess practice and conduct programs to improve women's knowledge about climate change.

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