Assiut Scientific Nursing Journal
http://asnj.journals.ekb.eg http://www.arabimpactfactor.com
DOI:10.21608/asnj.2025.364310.2025 http://olddrji.lbp.world/indexedJournals.aspx
https://vlibrary.emro.who.int/journals/assiut-scientific-nursing-journal

Effect of Supportive Guidelines on Knowledge and Self-care Practices among Working and Non-Working Pregnant Women about Climate Change

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Abstract
Climate change was universally recognized as an important challenge for pregnant women. It poses the greatest threat to public health in the twenty-first century which expose the pregnant women and their developing fetuses at serious risk. **Aim:** To evaluate the effect of supportive guidelines on knowledge and self-care practices among working and non-working pregnant women about climate change. **Methods:** A pre-post quasi-experimental design was conducted. Sample constituted of 384 working and non-working pregnant women recruited through a purposive sample from the antenatal clinic of the Woman's Health Hospital, Assiut University, Egypt. Data were collected using three tools; an interview questionnaire, knowledge, and reported practices of the pregnant women about climate change. **Results:** The study revealed that the mean knowledge and practices scores increased significantly after giving supportive educational guidelines (6.24 ± 2.18 & 10.64 ± 2.15) respectively. Additionally, working pregnant women had higher scores of knowledge than non-working. **Conclusion:** The supportive educational guidelines had a positive effect on climate change knowledge and self-care practices of working and non-working pregnant women. **Recommendation:** Encourage the use of mass media to improve health awareness about climate change and how it affects the health of pregnant women and their fetuses.

Keywords: Climate Change, Knowledge, Self-Care Practices, Supportive Guidelines, Pregnant Women & Working, Non-Working.

Introduction:
Climate change poses an escalating hazard to the health of populations in Africa, marked by a transition in seasonal temperatures towards increasingly intense heat exposure **(Kadio et al., 2024).** It is induced by global warming, primarily attributable to elevated concentrations of greenhouse gases emissions from human activities, such as carbon dioxide from fossil fuel combustion, methane from manure from livestock farming, ozone, nitrogen oxides, sulfur dioxide from industrial emissions, vehicular and factory exhaust, and chlorofluorocarbon aerosols that entrap additional heat in the Earth's atmosphere**..** Resulting weather extremes lead to wildfires, air pollution, ecological changes, and flooding which endangers the basic components of health **(Kotb et al., 2024; Okada & Gray, 2023).**
Exposure to higher temperatures and more heat-related incidents may lead to increased prevalence of heat stroke, heat stress, exhaustion, and exposure to ultraviolet rays **(Afifi et al., 2024; Helldén et al., 2023; Ibrahim et al., 2018)**.
During pregnancy all body systems adapt to support the developing fetus, resulting in significant anatomical and physiological changes. These changes peak in advanced pregnancy & labor and overwhelm a pregnant woman's thermoregulatory system. In addition, the endogenous heat produced by fetal metabolism, the strain of increased pregnancy weight, fat deposits that save heat, and the considerable exertion of labor and delivery, result in massive heat generation. All this makes the expecting mothers and newborns more susceptible to the negative health effects of climate change **(Toptaş Acar & Gerçek Öter, 2024; Chersich et al., 2023 & Ha, 2022).**
Excessive heat and air pollution may impair placental function, induce dehydration & endocrine dysfunction, increase the risk of miscarriage or stillbirth, low birth, intrauterine growth retardation, preterm birth, congenital anomalies, respiratory problems, gestational diabetes, gestational hypertension, and preeclampsia could be brought on by climate change. Additionally, several vector-borne diseases like, dengue fever, zika and malaria are more likely to occur in warmer climates **(Chersich et al., 2023; Fan & Zlatnik, 2023).**
The crisis of climate change is aggravating woman and newborn mortality. 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 **(Ha, 2022).** The Egyptian government was forced to compel significant and powerful initiatives, strategies,

and regulations to prepare for the coming climate change and ameliorate its detrimental repercussions in numerous regions **(Mohamed et al., 2024).**

Nurses play a crucial role in guiding pregnant women regarding the climate change indicators and symptoms of heat stress. Furthermore, they emphasize the significance of maintaining proper hydration levels before, during, and after their work shifts, as well as the importance of consuming a well-balanced and nutritious diet along with an adequate intake of fluids. Nurses also stress the importance of taking breaks at appropriate intervals, monitoring hydration levels, and using personal protective equipment (PPE) in conjunction with protective clothing, such as cotton garments, when working outdoors. Lastly, they emphasize the necessity of seeking medical advice when needed **(Abokhashabah et al., 2020)**.

Significance of Study:

During pregnancy, high ambient temperatures may be too much for the mother's thermoregulation systems to handle **(Toptaş Acar & Gerçek Öter, 2024).** Between 2030 and 2050, climate change is expected to lead to an additional 250,000 deaths per year from malnutrition, diarrhea, malaria, and heat stress **(World Health Organization, 2022).**

The climate change effects are often felt early by pregnant women, particularly those who work outside the home. Longer durations and higher intensities are characteristics of this exposure, which may eventually lead to the emergence of adverse pregnancy outcomes. Working mothers may be exposed to UV radiation more frequently, intensely, and for longer periods, which could compromise immune function and increase the risk of negative impacts on maternal and fetal health **(Gjellestad et al., 2023)**.

Aim of the study:

Evaluate the effect of supportive guidelines on knowledge and self-care practices among working and non-working pregnant women about climate change.

Research hypothesis:

H0: Working pregnant women are expected to have the same knowledge and self-care practices as non-working women when given supportive guidelines about climate change.

H1: Working pregnant women are expected to have higher knowledge and self-care practices rather than non-working women when given supportive guidelines about climate change.

Methods

Research Design and Settings:

A pre-post quasi-experimental design was implemented from the end of September until the end of December 2024 at the antenatal clinic of the Woman's Health Hospital, Assiut University, Egypt. Woman Health Hospital is a tertiary healthcare institution.

Study participants and recruitment:

A purposive sample of 384 working and non-working low-risk pregnant women with single-living fetuses in her 1st, 2nd, or 3rd trimester included in the study. The exclusion criteria were the women declined to engage in the study or were unable to offer informed consent due to mental disorders.

Sample size estimation:

Based on Steven K. Thompson's sample size equation, a minimum of 384 pregnant women is necessary, accounting for a 10% non-response rate adjustment. The sample size equation:

$$n = N*P (1-P)/ [N-1) (d2/z2)] +P(1-P)$$

N (population) = 6383 in last year

p (Hypothesized) = 0.50

d (tolerated margin of error) = 0.05 at CI 95%

Z (level of confidence) = 1.96 at CI 95%

n = 6383*0.50*(1-0.50)/ [6383-1) *(0.052/ 1.962)] + 0.50(1-0.50)

n= 384 pregnant women (98 working and 286 non-working).

Study tools

Data collected by using three different tools.

Tool (I): An interview questionnaire; it divided into two parts:

Part (1): El-Gilany scale it was used to evaluate the socioeconomic status of the Egyptian family. This scale was developed by **Fahmy and El Sherbini (1983)** and updated by **El-Gilany et al. (2012).**

It includes 7 domains: education & culture (score 30), score 10 for occupation, score 10 to family, score 12 for family possessions, score 5 to economics, score 12 to home sanitation, and score 5 to health care domain.

Scoring system:

The scale has a maximum score of 84 and is classified as follows: 42 and below = very low, 42-63 = low, 63-71.4 = middle, and 71.4-84 = high socioeconomic status.

Part (2): The obstetrical history, which included gravidity, parity, abortion, the last delivery/ years, number of living children, gestational age/ weeks, type of last delivery, complications of the previous pregnancy, complications during the current pregnancy, and complications during the previous labor.

Tool (II): Knowledge of the pregnant women about climate change. It was designed after reviewing related literature **(Afifi et al., 2024)**. It included (9 items) such as (the concept of climate change, its causes, gases that cause climate change, climate change images, the effect of climate change on the psychological health of pregnant women, physical impact of climate change on the pregnant women's' health, adverse effect of climate change on

the health of the fetus, People most affected by climate change and individual measures to limit climate change).

Scoring system for knowledge:

Each item took a score of 2 for a correct response and an incorrect answer or don't know was given a score of 1. Then, summing up the all items scores to indicate the overall score. Total score of knowledge was categorized as Good: 60 - 100% (Score 11-18), Average: 50≤ 60 % (Score 9 - 11) or Poor: < 50 % (Score < 9).

Tool (III): Pregnant women's reported practices: It assessed the pregnant women's self-care practices of climate change. It was adopted by **Eltelt et al. (2023)**. It included 7 factors (heat stress work and breaks, shade, hydration, hat, gloves, sunglasses, and sunscreen).

Scoring system for practice:

The total number of questions in all factors was 16 questions. The questions answered by done score (1), not done score or not applicable (0). The total score of each question summed up and then transformed into percentage: satisfactory practice ≥ 60% and unsatisfactory practice < 60%.

Supportive materials:

The researchers developed educational materials by examining pertinent and contemporary literature **(Rylander et al., 2013; WHO, 2025).** It was designed into a simple and clear Arabic language booklet. Additionally, smartphone photos and videos were utilized to enhance the dissemination of knowledge and support the practices of climate change among both non-working and working pregnant women. The booklet contained an introduction, definition, causes, most vulnerable groups, the climate change impact on pregnant woman and the fetus health, guidelines that the pregnant women must follow to safeguard themselves from climate change and finally the references.

Tools Validity:

The content validity examined by three experts in the community health and maternity nursing specialty to test the clarity and comprehensiveness of the tool.

Tools Reliability:

The Cronbach Alpha coefficient was determined for the instrument, revealing values of 0.771 and 0.802 for knowledge and practices related to climate change, respectively.

Pilot study:

It was conducted on 10% (38) of pregnant women to assess the simplicity and feasibility of the tool. No changes were implemented to the tool; therefore, the pilot study was included in the overall sample.

Data collection procedure:

Data was obtained from September to the end of December 2024. The data acquisition process consisted of three phases: Pre-intervention (Pre-test), Intervention, and Post-intervention (Post-test).

The Pre-intervention phase:

Ethical consideration:

Involved obtaining formal permission from the manager of the Woman's Health Hospital and approval from the ethical committee of the Faculty of Nursing, Assiut University (Approval No:1120240871). Upon acquiring informed consent from the pregnant participants, the researcher identified herself and described the study's objective. The women were notified to withdraw from the study at any phase. The anonymity and confidentiality of participants were consistently maintained; the researcher conducted individual interviews in separate rooms to uphold confidentiality, gathering data on the women's socioeconomic characteristics, past and current obstetric data and evaluating their knowledge and reported self-care practices regarding climate change.

The Interventional phase:

Encompassed the implementation of supportive guidelines pertaining to the knowledge and practices of climate change for both working and non-working women. The same researcher delivered guidance to each small group of women, comprising 3 to 5 women, across 3 sessions, the first session was the introductory session which last 10 minutes and it was aimed to cultivate rapport between the researcher and the women. The subsequent sessions toke about 20 to 30 minutes. During the second session, a pretest was administered to assess their knowledge and practices on climate change utilizing knowledge and reported practices tools. During the third session, both working and non-working women received the established supportive guidelines. A support booklet was distributed to the participating women. The program was delivered to the women via lectures, talks, pictures, and videos. The sessions were conducted during the waiting period for women receiving clinical evaluations at the prenatal clinic.

The Post-intervention phase:

Was the post-test evaluating knowledge and reported practices related to climate change. This session was conducted four weeks after the implementation of the program, utilizing the identical methods employed in the pretest assessment.

Statistical analysis:

Data were analyzed using IBM SPSS software package version 26.0. Chi-square test used to compare between groups for categorical variables. The t-test was used to compare two categories for normally distributed quantitative variables. The significance of the results obtained was judged at the 5% level.

Results

Table (1): Socio-demographic characteristics of studied pregnant women, (n=384)

Socio-demographic characteristics	No. (384)	%
Age: (years)		
< 30	141	36.7
30 - < 40	125	32.6
≥ 40	118	30.7
Mean ± SD (Range)	33.81 ± 8.65 (19.0-49.0)	
Educational level:		
Illiterate/ Read & write	99	25.8
Basic education	65	16.9
Secondary education	79	20.6
Technical institute	48	12.5
University or more	93	24.2
Occupation:		
Working	98	25.5
Not working	286	74.5
Residence:		
Rural	162	42.2
Urban	222	57.8
Socioeconomic status:		
Very low	87	22.7
Low	95	24.7
Middle	106	27.6
High	96	25.0

Table (2): Distribution of sample according to women's obstetric data (n=384)

Obstetric data	No. (384)	%
Gravidity:		
Primigravida	86	22.4
Multigravida	298	77.6
Parity:		
Primiparous	103	26.8
Multiparous	281	73.2
Abortions:		
Yes	119	31.0
No	265	69.0
Season of last abortion:		
Summer	68	57.1
Winter	29	24.4
Spring	25	21.0
Fall	11	9.2
Duration from last delivery: (years)		
< 2	63	21.1
2 - < 4	118	39.6
≥ 4	117	39.3
Number of living children:		
< 3	119	39.9
3 – 4	114	38.3
5 or more	65	21.8
Gestational age: (weeks)		
< 13	77	20.1
13 - < 26	150	39.1
26 - < 40	98	25.5
≥ 40	59	15.4
Type of last delivery:		

Obstetric data	No. (384)	%
Normal	51	17.9
C.S.	234	82.1
Complications during previous pregnancy:		
Yes	52	17.4
No	246	82.6
Complications during the current pregnancy:		
Yes	86	22.4
No	298	77.6
Complications during previous labor		
Yes	43	15.1
No	242	84.9

Table (3): Distribution of sample according to environmental characteristics for studied women (n=384)

Environmental characteristics	No. (384)	%
Time of sun exposure throughout the day:		
Before 10 AM	67	17.4
10 AM - 3 PM	276	71.9
After 3 PM	94	24.5
History of sunburn in the last 12 month:		
Yes	21	5.5
No	363	94.5
History of heat exhaustion in the last 12 month:		
Yes	70	18.2
No	314	81.8

Table (4): Total knowledge scores of climate change.

	Knowledge score		P-value
	Pre-test (n= 384)	Post-test (n= 384)	
Mean ± SD	3.01 ± 1.59	6.24 ± 2.18	0.000*
Range	1.0-6.0	3.0-9.0	

** t-test* ** P<0.05*

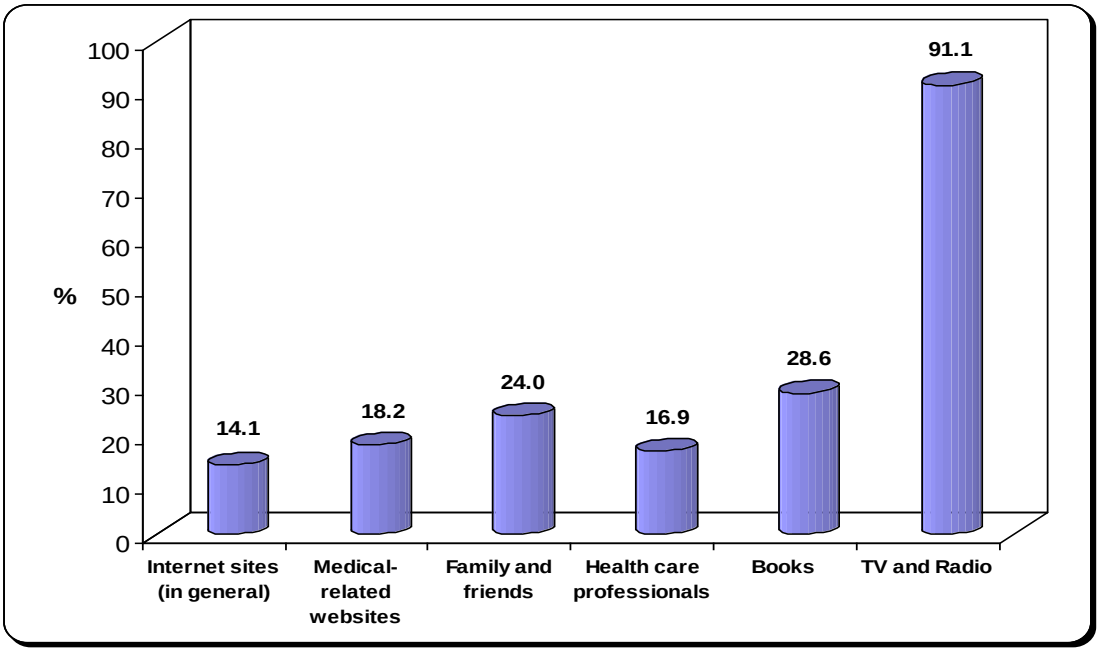

Figure (1): Source of information about climate change among studied women.

Table (5): Total practices score of climate change

	Practices score		P-value
	Pre-test (n= 384)	Post-test (n= 384)	
Mean ± SD	5.43 ± 1.58	10.64 ± 2.15	0.000*
Range	1.0-9.0	4.0-13.0	

* *t-test*
* *P<0.05*

Table (6): Relation between total knowledge score of climate change and women's personal characteristics (n=384)

Personal data	Knowledge score	
	Pre-test	Post-test
	Mean ± SD	Mean ± SD
Age: (years)		
< 30	2.99 ± 1.55	6.36 ± 2.20
30 - < 40	3.07 ± 1.63	6.13 ± 2.16
≥ 40	2.97 ± 1.62	6.23 ± 2.19
P-value	0.857	0.682
Level of education:		
Illiterate/ Read & write	2.67 ± 1.61	4.85 ± 1.49
Basic education	2.55 ± 1.53	4.85 ± 1.48
Secondary education	2.76 ± 1.60	5.03 ± 1.54
Technical institute	2.60 ± 1.01	8.06 ± 1.02
University or more	4.11 ± 1.36	8.81 ± 0.52
P-value	0.000*	0.000*
Residence:		
Rural	2.77 ± 1.62	5.25 ± 1.82
Urban	3.18 ± 1.55	6.97 ± 2.14
P-value	0.011*	0.000*
Socioeconomic status:		
Very low	2.67 ± 1.59	4.83 ± 1.53
Low	2.61 ± 1.59	5.16 ± 1.64
Middle	2.90 ± 1.45	6.61 ± 2.22

High	3.83 ± 1.47	8.20 ± 1.38
P-value	0.000*	0.000*

** t-test*
** ANOVA test*
** P<0.05*

Table (7): Relation between working and non-working pregnant women regards total score of knowledge

Knowledge score	Occupation		P-value[1]
	Working	Not working	
	Mean ± SD	Mean ± SD	
Pre-test	3.50 ± 1.68	2.84 ± 1.53	0.000*
Post-test	7.35 ± 1.91	5.87 ± 2.14	0.000*
P-value[2]	0.000*	0.000*	

** t-test (Independent & Paired samples).*
**P-value1: Comparison between working and non-working.*
**P-value2: Comparison between pre-posttest.*

Table (8): Relation between total practices score of studied women about climate change and their personal characteristics (n=384)

Personal data	Practices score	
	Pre-test	Post-test
	Mean ± SD	Mean ± SD
Age: (years)		
< 30	5.21 ± 1.51	10.69 ± 2.10
30 - < 40	5.47 ± 1.51	10.58 ± 2.27
≥ 40	5.65 ± 1.70	10.65 ± 2.11
P-value	0.071	0.912
Level of education:		
Illiterate/ Read & write	5.07 ± 1.39	10.33 ± 2.03
Basic education	5.26 ± 1.22	10.66 ± 2.05
Secondary education	4.91 ± 1.10	10.86 ± 2.03
Technical institute	5.81 ± 1.89	8.27 ± 1.45
University or more	6.17 ± 1.84	11.99 ± 1.59
P-value	0.000*	0.000*
Residence:		
Rural	5.15 ± 1.42	10.56 ± 2.06
Urban	5.63 ± 1.66	10.70 ± 2.22
P-value	0.003*	0.509
Socioeconomic status:		
Very low	5.03 ± 1.46	10.32 ± 2.00
Low	5.39 ± 1.00	10.40 ± 2.14
Middle	5.42 ± 1.58	10.62 ± 2.36
High	5.84 ± 2.01	11.19 ± 1.99
P-value	0.007*	0.025*

** t-test*
** ANOVA*
** p<0.05*

Table (9): Working and non-working pregnant women regards total practices score

Practices score	Occupation		P-value[1]
	Working	Not working	

	Mean ± SD	Mean ± SD	
Pre-test	5.33 ± 1.88	5.47 ± 1.46	0.454
Post-test	10.61 ± 2.10	10.65 ± 2.18	0.880
P-value[2]	0.000*	0.000*	

** t-test.*
**P-value1: Comparison between working and non-working.*
**P-value2: Comparison between pre-posttest.*

Table (1): Reveals that 36.7% of the women less than 30 years old. Also, about 32.6% of them between the age of 30 ≤ 40 years. A significant proportion of the studied sample has lower educational level, about 25.8% are either illiterate or can only read and write. Moreover, 74.5% of the participants are not currently working, while 25.5% are working. According to their residence 57.8% residing in urban areas compared to 42.2% in rural areas.
Finally 27.6% of them fall into the middle socioeconomic status, followed by low 24.7%.
Table (2): Indicates 77.6% of the studied pregnant women are multigravida, while 22.4% are primigravida. A significant proportion of them (31.0%) have experienced an abortion, approximate 57.1%, occurred during the summer followed by winter 24.4%. With regards to the gestational age, about 39.1% of the studied sample is in the 13–26 weeks gestational age range, followed by 25.5% in the 26–39 weeks range, and only about 20.1% are in the early stages of pregnancy (<13 weeks).
Table (3): Shows that about 71.9% are exposed to the sun between 10 AM and 3 PM, only 5.5% of the women reported a history of sunburn in the last year while 18.2% of them experienced heat exhaustion in the last 12 months.
Table (4): Presents the mean knowledge score of the women in the pre-posttest, it clears that 3.01 ± 1.59 with scores ranging from 1.0 to 6.0. While after the educational program, the mean knowledge score increased significantly to 6.24 ± 2.18 with a statistically significant difference P-value 0.000.
Figure (1): Illustrates TV and Radio represents the most common source of information with a significant majority (91.1%).
Table (5): Presents the mean practices score of the pregnant women in the pre-posttest, it indicates that 5.43 ± 1.58 with scores ranging from 1.0-9.0. While after the educational program, the mean practices score increased significantly to 10.64 ± 2.15 with a statistically significant difference P-value 0.000.
Table (6): Represents statistical significance difference between total knowledge score of the pregnant women and the educational level, residence and socioeconomic status at both pre-posttest p<0.05.
Table (7): Clears that working women had higher scores of knowledge than non-working pregnant women either at pre-posttest with statistical significance difference p-value 0.000.
Table (8): It noticed that statistical significance difference between total practices score among pregnant women and the educational level, and socioeconomic status at both pre-posttest p<0.05.
Table (9): Shows working and non-working pregnant women had relatively similar mean score of practices at a pre-test with 5.33 ± 1.88 and 5.47 ± 1.46 respectively. Also, there was little difference in post-test mean practices scores, with both working (10.61 ± 2.10) and non-working participants (10.65 ± 2.18). Finally, there significant improvement in posttest scores compared to pretest scores of practices between working and non-working pregnant women p-value 0.000.

Discussion

Pregnant women and their developing fetuses from the most vulnerable groups to the health risks posed by climate change. These risks can have both immediate and long-term effects on the mother and offspring, including miscarriages, low birth weight, reduced fetal growth, preterm birth, neonatal mortality, and gestational complications **(Baines, 2023).** The aim of the current study is to evaluate the effect of supportive guidelines on knowledge and self-care practices among working and non-working pregnant women about climate change. The present findings indicated that mean age ± SD 33.81 ± 8.65 of pregnant women. Almost three quarters of women were non-working, while only one quarter was working, the reason of this variation due to the percentage of non-working women in Egypt is high.
This contradicts **Mohamed et al. (2024)** who revealed that mean± SD 24.18 ± 1.63 of pregnant women. Also disagree with **Eltelt et al. (2023)** who stated that the studied pregnant women were less than 20 years old, with a mean age (19.8 ± 7.3years).
Regarding to residence, the study results cleared that more than half of women from urban areas. This finding was different from **Graham et al. (2016)** who studied "Diversity and climate change: the dynamic burden of poor maternal health" in sub-Saharan Africa and discovered that the majority of participants lived in rural areas.
The current study displayed that more than three quarters of women were multigravida, less than one

third of them experienced an abortion; this was disagree with **Afifi et al., (2024)** who study "Knowledge and Health-Related Behaviors toward Climate Changes and Heat Stress among Pregnant Women Working Outdoors: Tailored Educational Program" and cleared that less than two thirds of women were multigravida. Also, this finding contrasted with **Abd-Elhamed 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 results of the study indicated that less than three-quarters of pregnant women were exposed to sunlight between 10 a.m. and 3 p.m. In contrast, **Rother et al., (2019)** who noted that less than three-quarters of the study group engaged in sun exposure between 6 a.m. and 12 p.m. This may be due to decreased awareness of women about the serious effects of climate change during the peak time. Also, it may come from the different work time and circumstances between the countries.

The present study clustered that the majority of pregnant women were heard about climate change from TV and radio. It explained that mass media are playing a significant role in disseminating information about the risks of climate change on pregnant women. Furthermore, this result is inconsistent with **Afifi et al. (2024)** who mentioned that only one third of the studied sample had heard about climate change form TV. The current findings differ from Afifi et al. because the Egyptian television channels focus heavily on climate change and how to mitigate its hazards on human health.

Concerning the total knowledge score of climate change among the pregnant women, it was improved after implementation of the supportive guidelines. Also the finding revealed that statistically significance difference between knowledge of pregnant women and their education, residence and socioeconomic status in pre-posttest. This study is consistent with **(Mohamed et al., 2024; Acar & Öter, 2024; Abd-Elhamed et al., 2023 & Adebayo et al., 2020)**, who stated that statistically significant differences present between pre-posttest regarding women's knowledge about climate change.

According to the relation between working and non-working women's knowledge score, it was cleared that working pregnant women had higher scores than non-working women. This can be explained that the working pregnant women being able to acquire knowledge from the work environment. In the other side, this result contradicted with **(ElSayed et al., 2024)** who showed that no statistical significance difference in knowledge score between housewife and working women. It may probably because housewives have more time to watch TV and searching social media.

The present study revealed enhancement in climate change practices between the pre-posttest. This is because the educational programs may have a positive impact on pregnant women's practices. The supportive guidelines empower pregnant women to take proactive measures for protecting themselves and their fetuses. Also, encourage them to adopt new lifestyle habits, such as wearing gloves, hats, and sunglasses. These result congruent with **(ElSayed et al., 2024; Abd-Elhamed et al., 2023; Eltelt et al., 2023; Ghazy & Fathy, 2023)** who noticed that the majority of study participants had good practices after the implementation of the program.

In addition, the study showed that working and non-working pregnant women had relatively different mean score of practices at a pre-posttest. This may be resulting from that working and non-working women are exposed to the sun due to the work conditions or to carry out their daily life activities.

Conclusion:

The present study concluded that the working pregnant women had a good knowledge regarding climate change than non-working women and the supportive educational guidelines had a positive effect on knowledge and self- care practices. These findings rejected the null hypothesis.

Recommendations:

1. Continuing implementation of educational programs for pregnant women to improve their knowledge and practices regarding climate change.
2. Further studies with large representative sample are required to address how pregnant women and their fetuses may be affected by climate change in the short and long term.
3. Encourage the use of mass media to improve health awareness about climate change and how it affects the health of pregnant women and their fetuses.

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