Mother's Awareness About The Effect Of Climate Changes On Health Of Their Children Under 5 Years

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Abstract

Background: Climate change includes both global warming caused by humans and its impacts on Earth's weather patterns. **The study aimed to:** assess mother's awareness about the effect of climate changes on health of their children under 5years . **Research design:** descriptive exploratory design was utilized to achieve the aim of this study. **Setting:** The study was conducted at Elamiria Medical Center in Elzaton Zone. **Sample:** A Purposive sample of 264 enrolled at the above mentioned setting was involved in this study. **Tools:** One tool was used for data collection structural interviewing questionnaire**:** It was included three parts as following**: Part (I):** mothers Socio demographic data**. Part (II):** mothers Knowledge about climate changes effects on health of their children**. Part (III)**: mothers reported practices about climate changes effects on health of their children**. Results:** the present study showed that 61.4% of the studied As regard to total level of knowledge of the studied mothers had unsatisfactory level of knowledge about the effects of climate change on the health of their children. While, 38.6% of them had satisfactory level of knowledge. As regard to total level of practices of the studied mothers related to the effects of climate change on the health of their children, the current study result illustrated that 52.3% of the studied mothers demonstrated healthy practices related to the effects of climate change on the health of their children. While, 47.7 % of them demonstrated unhealthy practices. **Conclusion** there was a significant statistical relation between total level of knowledge and total level of practice among the studied mothers. **Recommendation:** Awareness programs should be conducted regularly for improving mothers' knowledge which could positively affect their perception and daily life practices and their children health regarding climate change. Apply further research about climate change in other setting for generalization. Mothers need to have adequate knowledge regarding nutrition for under fives and how much it is important for children's growth and development.

Keywords: Mothers Awareness, Climate changes, Children.

Introduction:

Climate changes are considered as the most expansive global environmental, economic, and political problem facing humanity right now. Consequently, it has become the cornerstone of policy making throughout the world and the coffee-table-discussion-topic among the masses now-a-days. Informed mass awareness on the causes, consequences and mitigation as well as adaptation strategies to Climate changes is important to confront this largely human-induced phenomenon **(Gills, et al., 2019).**

Climate change poses a significant threat to children's health because children have unique metabolism, behavior, physiology and development characteristics. Many of the main killers of children (e.g., malaria, diarrheal disease and malnutrition) are very sensitive to climatic conditions and they are expected to worsen as a result of climate change. Changes in the spectrum of vector-borne diseases, and increasing air pollution from the continued burning of fossil fuels also threaten children's health, quality of life, access to education and overall development **(Tong, et al., 2021).**

Mothers are primarily responsible for protecting and maintaining the health of their family members especially under five children. They can be a role model for their family member and affect positively their health behaviors

especially among rural residences. Mothers are also often the most concerned about climate change - which threatens their children's future – and this triggers action **(Meehan, Levy, and Collet-Gildard. 2018)**.

Children's bodies are still growing and developing and their detoxification mechanisms are not fully developed – harm to their organs in this delicate and critical stage can have lifelong implications. For example, lung damage in early childhood due to air pollution can be irreparable and affect lung capacity through to adulthood. Children's brains are also growing at their fastest rate – exposure to harmful toxins such as lead and mercury can affect their cognitive development, decrease IQ, and create a range of mental disabilities **(Cordero & Centeno & Todd, 2020)**.

The relationship between climate and child health has not been well investigated. This review discusses the role of climate change on child health and suggests 3 ways in which this relationship may manifest. First, environmental changes associated with anthropogenic greenhouse gases can lead to respiratory diseases, sunburn, melanoma, and immunosuppression. Second, climate change may directly cause heat stroke, drowning, gastrointestinal diseases, and psychosocial maldevelopment. Third, ecologic alterations triggered by climate change can increase rates of malnutrition, allergies and exposure to mycotoxins, vector-borne diseases (malaria, dengue, encephalitides, Lyme disease), and emerging infectious diseases. Further climate change is likely, given global industrial and political realities. **(Helldén, et al., 2021)**

Nurse practitioners play a critical role in translating scientific findings into their clinical practices to promote and protect children's health through interventions that include anticipatory guidance . The nursing profession has a duty to contribute to climate change adaptation (reducing vulnerability to the harmful effects) and mitigation (reducing or preventing greenhouse gas emissions as it is committed to protecting health and wellbeing and to promoting social justice **(Watts N, et al., 2018).**

Significance of the Study:

Children experience multiple climate shocks combined with poor essential services such as water, sanitation and healthcare. As climate change disrupts the environment, children are being forced to grow up in an increasingly dangerous world. This is a crisis that threatens their health, nutrition, education, development, survival and future **(Rees, N. 2021).**

Under a high climate change scenario, this projection increases to an additional 60,000 to 250,000 children's deaths per year by 2100. The World Health Organization (WHO) estimated that climate change contributed to more than 150,000 deaths and 5.5 million lost disability-adjusted life years worldwide, in 2000 alone, and more than 88% of this burden occurs in children under the age of five years **(Ramie, D. 2021).**

Almost 160 million children are exposed to high severe and prolonged droughts. The education of around 38 million children is disrupted each year by the climate crisis. The climate crisis is forcing families to migrate. By 2050, there could be 143 million more migrants due to the climate crisis. It is now well established that climate change can impair all population groups, however, children are considered as particularly threatened. As noted by the World Health Organization (WHO) in total 88% of global burden of disease arising from climate change relate to children younger than five years *(Munn et al., 2018).*

Aim of the study:

The study aims to assess mother's awareness about the effect of climate changes on health of their children under 5years through:

1- Assessing mother's knowledge about the effect of climate changes on health of their children under 5 years.

2- Assessing mother's reported practice about the effect of climate changes on health of their children under 5 years.

Research questions:

1- What is the mother knowledge about the effect of climate changes on health of their children under 5 years?

2- What is the mother reported practice level about the effect of climate changes on health of their children under 5 years?

3- Is there a relation between mother's knowledge and their reported practice about the

effect of climate changes on health of their children under 5 years?

Subjects and Methods:

Research design:

A descriptive exploratory design was utilized to achieve the aim of this study.

Setting:

The study was conducted at Elamiria Medical Center in Elzaton Zone affiliated to Ministry Of Health .

Subjects:

Sample type:

A Purposive sample used to conduct the study Under the following criteria:-

1- Mothers of children under 5 years.

2-Free from any genetic disease.

Sample Size:

Sample size of total population 15600 mothers at 2020-2021 will be 264 mothers' needs to be recruited to achieve confidence level 90%

$$n = \frac{N \times p(1-p)}{\left[\left[N-1 \times \left(d^2 \div z^2\right)\right] + p(1-p)\right]}$$

Data collection tools:

One tool was used for data collection to achieve the aim of the present study:

<u>Tool I.</u> interviewing questionnaire

It was designed by the investigator in the Arabic language after reviewing the related literature and consisted of 79 questions. **Mousa et al.,(2019)** It was utilized into three parts:

<u>Part (I):</u> It was designed to assess mothers Socio demographic characteristics (21questions).

Mothers Socio demographic data questions from (1-6) as {age, mother's education, Social marital, mother's job, number of children under 5years.

Children data questions from(7-11) as (gender,feeding type,receive vaccination, going nursery,having chronic disease)).

Home environment assessment Questions from (11-21) as housing, numbers of house rooms, crowding, windows, ventilation, source of water, sewage, electricity, disposing waste, factories around the house.

<u>Part (II):</u> It was used to assess mother's knowledge about the effect of climate changes on health of their children under 5 years. it included questions from (22-34) as (Definition, causes, physical effect, social effect, psychological and mental effect, ways to reduce effects, ways to rationalize energy, ways to rationalize water, affect on child diet, play routine, sleep pattern, immunity, source of information.

Scoring System: each question was evaluated as 1 score for correct answer and 0 score for incorrect .The total score will be summed up and classified into:

- Satisfactory: 50% or more.
- Unsatisfactory: less than 50% .

Part (III): mother's reported practices regarding climate changes effects on health of their children. it included questions from (35-73) as general hygiene, proper clothing, use medication, prevention, vaccination and environmental prtection ……etc.

Scoring system: each statement will be evaluated as 1 score for done and 0 score for not done. The total reported practices will be summed up and classified into:

- Healthy practice: 60 % or more.

- Unhealthy practice: less than 60%.

A practice was 35 points, which represent 100%.

The total reported practices will be summed up and classified into:

- Healthy practice: 60 % or more.

- Unhealthy practice: less than 60%.

Validity:

It was tested by 5 experts from community health nursing, faculty of nursing Ain Shams University to review the tools for clarity, relevance, comprehensiveness, understanding and applicability.

Reliability:

Reliability is the consistency of measurement tool. The degree to which the instrument measures the same way each time, it is used under the same condition with the same subjects and it was done by using an alpha Cronbach test. The Cronbach's alpha model which is a model of internal consistency was used in the analysis of mother's knowledge and reported practices and each part : knowledge = 0.89, reported practices =0.85

Ethical considerations:

The research approval was issued from the Scientific Research Ethical Committee in the Faculty of Nursing at Ain Shams University before starting the study. The investigator clarified the importance and aim of the study to all mothers included in the study. Oral consents were obtained from all mothers. a clear and simple explanation was given according to their level of understanding, physical and mental readiness. All mothers were informed that they are allowed to choose to participate or not in the study and that they have the right to withdraw from the study at any time without giving any reason and confidentiality of the information was assured. All mothers were informed that the collected data would be used only for the present study, as well as for their benefits.

Pilot study:

Apilot study was carried out on 5% from the total sample (14 mothers) for one week to evaluate the feasibility, applicability and time needed to fill the tool to find the possible obstacles that might be faced during data collection. The sample was chosen randomly from the previously mentioned setting. There were no modifications found after the pilot study. The sample of pilot study was included in the research.

Field work:

The actual process of data collection was carried out in six months from beginning of April 2022, till the end of September 2022 . two days/week nearly about 4 hours/day (Sunday and Wednesday) from 9.00 a.m. to 1 p.m to collect the total sample.

the investigator introduced herself and explained the purpose of the study to the mothers before starting the interview. The investigator self administered questionnaire to mothers who can read and write and read questions to illiterate mothers in order to collect the required data to assess knowledge of mothers about climate changes effects on health of their children. The investigator was available for any more clarifications.

The investigator assessed reported practices of mothers about climate changes effects on health of their children. The questionnaire took about 20-30 minutes to be completed.

Administrative design:

An official permission was issued from the Dean of the Faculty of Nursing at Ain Shams University affiliated to the Director of Elamiria Medical Center.

Statistical analysis:

Data collected from the studied sample was revised, coded and entered using Personal Computer (PC) using Statistical Package for Social Sciences (SPSS) version. Computerized data entry and statistical analysis were fulfilled using the SPSS version 22. Data were presented using descriptive statistics in the form of frequencies, percentages and Mean Standard Deviation (SD). The Chi Square statistic is used for testing relationships between categorical variables.

Significance of the results:

- Highly significant at p-value < 0.01.
- Statistical significant was considered at p-value <0.05.
- Non-significant at p-value ≥ 0.05.

Results:

Table (1) shows that, 57.9% of the studied mothers were in age group ≤20-<30 years old with mean age 28.94 ± 9.65 and 79.9% of them were married. Also, 55.4% of the studied mothers had secondary educational level, 64.8% of them were housewives and 63.3% of them reported insufficient monthly income. Additionally, 56.4% of them had one children aged less than 5years old.

Table (2) shows that, **77.0%** of the studied mothers had incorrect answers

regarding the effect of climatic changes on the psychological and mental health of the child. Also, 64.4% and 64.1% of them had incorrect answers regarding the ways to rationalize the use of energy and the effect of climate change on the child's social health respectively also **64.4%** of the studied mothers had incorrect answers regarding the ways to rationalize the use of water. Also, 59.9% and 58.8% of them had incorrect answers regarding effect of climate change on child's immunity and effect of climate change on child's play routine respectively.

Table (3) shows that, 64.8% and 53.8% of the studied mothers demonstrated healthy practices related to medications / vaccinations and appropriate clothing respectively. On the other hand, 67.5%, 57.2% and 55.7% of the studied mothers demonstrated unhealthy practices related to personal hygiene, good nutrition and environmental protection respectively.

Table (4) shows that, there was a significant statistical correlation between total level of knowledge and total level of practice among the studied mothers at P-value 0.015.

Figure (1) illustrate that, 47.0% of the studied mothers had their information about the effects of climate change on the health of their children from mass media and internet. While 32.5% of them had their information from their relatives and friends while only 20.5% of them had their information from health team.

Figure (2) illustrate that, 61.4% of the studied mothers had unsatisfactory level of knowledge about the effects of climate change on the health of their children. While, 38.6% of them had satisfactory level of knowledge.

Figure (3) illustrate that, 52.3% of the studied mothers demonstrated healthy practices related to the effects of climate change on the health of their children. While, 47.7 % of them demonstrated unhealthy practices.

Table (1): Distribution of the studied mothers according to their demographic characteristics (n=264).

Demographic characteristics	**N**	**%**
Age (in years)		
≤20-<30	**153**	**57.9**
≥30-≤40	**83**	**31.5**
≥40	**28**	**10.6**
Mean ± SD	**28.94 ± 9.65**	
Marital status		
Married	**211**	**79.9**
Divorced	**14**	**5.4**
Widow	**39**	**14.7**
Educational level		
Don't read /write	**8**	**3.0**
Elementary	**34**	**12.8**
Secondary	**146**	**55.4**
University	**76**	**28.8**
Occupation		
Occupied	**93**	**35.2**
Housewife	**171**	**64.8**
Monthly income		
Sufficient	**97**	**36.7**
Insufficient	**167**	**63.3**
Number of children <5 years in family		
One	**149**	**56.4**
Two	**96**	**36.4**
Three	**19**	**7.2**

Table (2): Distribution of the studied mothers according to their knowledge about the effect of climate change on the health of their children (n=264).

Items	Correct		Incorrect	
	N	%	N	%
Meaning of climate change	101	38.3	163	61.7
Causes of climate change	97	36.7	167	63.3
The effect of climate change on the child's physical health	103	39.0	161	61.0
The effect of climate change on the child's social health	95	35.9	169	64.1
The effect of climatic changes on the psychological and mental health of the child	59	22.4	205	77.6
The ways to reduce the effects of climate change	98	37.1	166	62.9
The ways to rationalize the use of energy to reduce the effects of climate change	94	35.6	170	64.4
The ways to rationalize the use of water to reduce the effects of climate change	94	35.6	170	64.4
climate change affect the child's diet	116	43.9	148	56.1
climate change affect the child's play routine	109	41.2	155	58.8
climate changes affect the child's sleep pattern	154	58.3	110	41.7
climate change affect the child's immunity	106	40.1	158	59.9

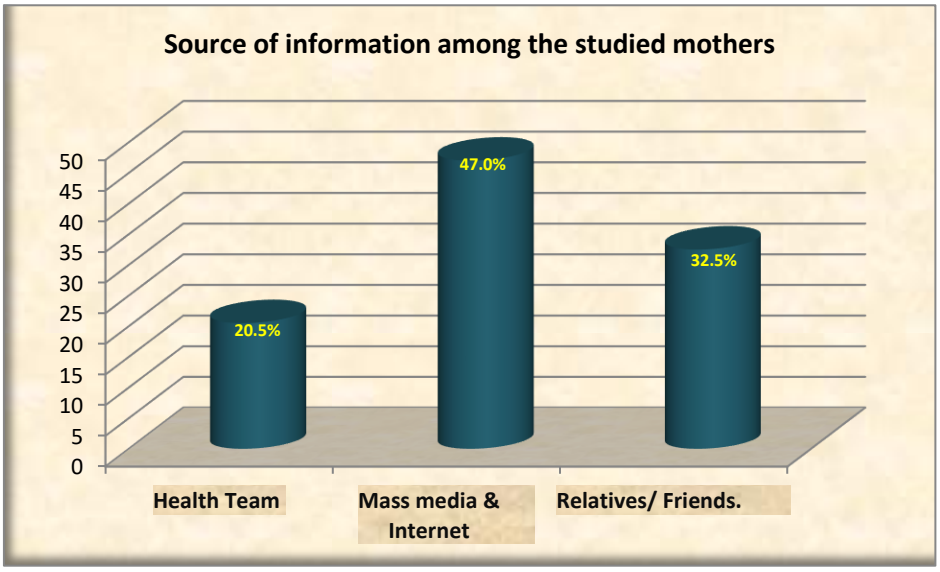

Figure (1): Distribution of the studied mothers according to their source of information about the effects of climate change on the health of their children (n=264).

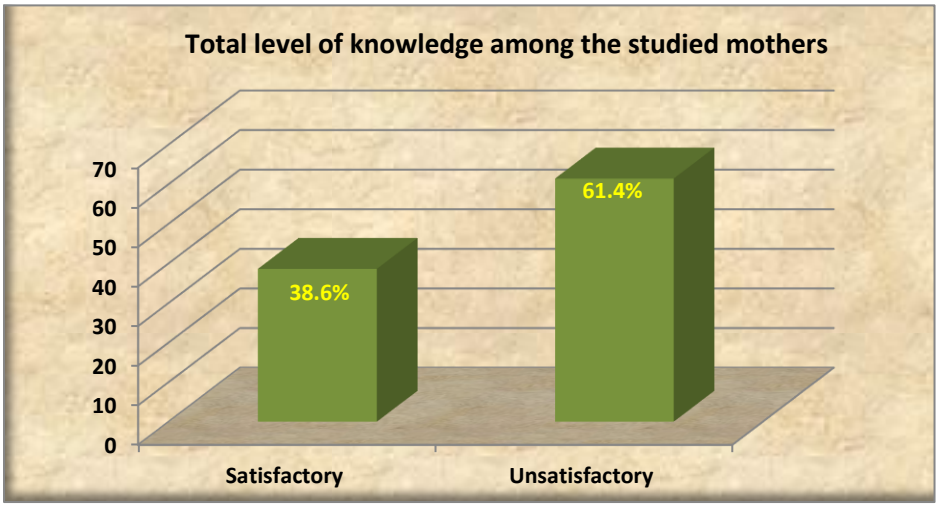

Figure (2): Distribution of the studied mothers according to their total level of knowledge (n=264).

Table (3): Distribution of the studied mothers according to their total level practice domains (n=264).

Domains of practice	Healthy		Unhealthy	
	N	%	N	%
Personal hygiene	86	32.5	178	67.5
Appropriate clothing	142	53.8	122	46.2
Good Nutrition	113	42.8	151	57.2
Medications / vaccinations	171	64.8	93	35.2
Environmental protection and awareness	117	44.3	147	55.7

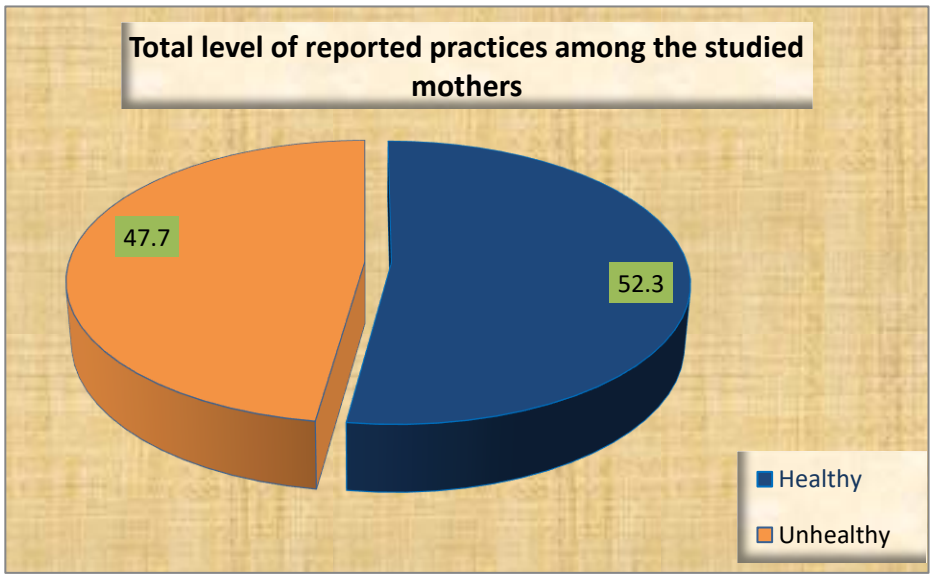

Figure (3): Distribution of the studied mothers according to their total level of practices related to the effects of climate change on the health of their children (n=264).

Table (4): Relation between total level of knowledge and total level of practice among the studied mothers (n=264).

Variables		Total level of Knowledge				X^2	P-value
		Satisfactory		Unsatisfactory			
		N	%	N	%		
Total level of Practice	**Healthy**	71	26.8	55	20.8	1.437	**0.015* (S)**
	Unhealthy	31	11.8	107	40.6		

-X^2= Chi square test * P-value ≤ 0.05 **Significant (S)**

Discussion:

Climate Change (CC) can cause several serious alterations and eventually impacting human health related to mothers and their children. Those human health consequences include re-emergence of malaria, respiratory disorders, malnutrition, different heat disorders as heat stress and stroke, infectious diseases like vector-borne and waterborne diseases including gastrointestinal problems and mental health disorders as stress disorders and depression, which associated with natural disasters. The World Health Organization (WHO) reports that global CC is liable for a minimum of 150,000 deaths annually, a number that is expected to double by 2030 (United Nations, 2021).So the present study was conducted to assess mother's awareness about the effect of climate changes on health of their children under five years.

Part (I): Demographic characteristics of the studied subjects

As regard to age of the studied mothers, the current study result showed that, more than half of the studied mothers were in age group ≤20-<30 years old .(Table 1). This result in the same line with Kamai et al. (2023) who applied a study in California among 36 s women entitled "Perceptions and experiences of environmental health and risks among Latina mothers in urban Los Angeles, California, USA" and found that 50% half of the studied mothers were in age 25-35 with e median age of participants was 32.5years.

As regard to marital status of the studied mothers, the current study result revealed that most of them were married (Table 1). This result was supported with Mousa et al. (2019) who conducted study in Egypt among 360 participant entitled"climate change, responsible leadership and organizational commitment: An experience from Egypt" and found that 75% highly percentage of the studied subjects were married

Concerning educational level, more than half of the studied mothers had secondary educational level, less than two thirds of them were housewives and reported insufficient monthly income respectively. Additionally, more than half of them had one children aged less than 5years old **(Table 1)**

These result was contrasted with **Mousa et al.,(2019)** who 90% vast the majority of the studied subjects had Bachelor + Diploma, and monthly income was EGP 1,300–2,500, all of them working full time. Also disagreed with **Yamazaki & Nakai, (2023)** who applied a cross-sectional study in Japan among 1298 I participants entitled "Understanding Mothers' Worries about the Effects of Disaster Evacuation on Their Children": and showed that 66% two thirds of the studied mothers had children under 3 years old

From the investigator point of view, in Egypt the family income level is not enough for daily living needs this might due to high standards of living. .

As regard to knowledge of the studied mothers about the effects of climate change on the health of their children, the current study result showed that, more than three quarters of the studied mothers had incorrect answers regarding the effect of climatic changes on the psychological and mental health of the child.

Also, around two thirds of them had incorrect answers regarding the ways to rationalize the use of energy and the effect of climate change on the child's social health respectively **(Table 2).**

This result was in accordance with **Abdallah & Wagdy, (2022)** who applied study in Egypt among 300 participants to assess Impact of Awareness Program Regarding Health Consequences of Climate Change on Knowledge, Perception and Daily Life practices and revealed that . pre intervention, highly percentage of the studied subjects had incorrect knowledge related to Climate Change as three quarters of them had poor knowledge regarding facts around climate change (definition and occurrence),97.3% vast the majority of them had poor knowledge regarding factors contributing to climate change:78.7% more than three quarters of them had poor knowledge about effects of climate change on human health, 82.3% most of them had poor knowledge about effects of climate change on environment, more than three quarters of them had poor knowledge about ways for eliminating climate change: while There was an improvement in the total good knowledge level after program.

These findings were slightly similar to the results of **Almulhim a., (2021)** who conducted a study in Dammam in Saudi Arabia among 30 participants to identify the level of knowledge and awareness of people living in Dammam in Saudi Arabia about CC, causes and impacts and cleared that 30% one third of the study sample had poor knowledge about the causes and impacts of CC. Also slightly more than one quarter of the study participants had good knowledge level, understanding and awareness of CC.

From the investigator point of view this result may be due to level of education of the studied mothers, and social media don't attention to increase mothers' awareness toward climate change

The present study result revealed that, less than two third of the studied mothers had incorrect answers regarding the ways to rationalize the use of water. Also, more than half of them had incorrect answers regarding effect of climate change on child's immunity and effect of climate change on child's play routine respectively **(Table 2).**

This result in disagreement with Sanson et al., (2022) who applied study entitled "Children and Climate Change." And found that 15% low percentage of the studied subject unaware about effect of climate change on child's immunity and effect of climate change on child's health. And climate change Element reviews and discusses its implications for the development of children (ages 0-12) today and in the future, and for the parents, teachers, researchers, and professionals who have responsibility for children. This Element adopts a bioecological model to examine both the direct impacts on children's physical and psychological well-being as well as indirect impacts through all the systems external to the child, emphasizing the greater vulnerability of children in the Global South. Given evidence of well-founded climate anxiety, this Element examines children's coping strategies and discusses the key roles of caregivers and schools in protecting and preparing children to face current and future challenges – with knowledge, hope, and agency as central themes. This Element highlights many under-researched areas and calls for action by all those caring for and about children's future.

From the investigator point of view this result may be due to highly percentage of the studied mothers had secondary level of education, and were housewife.

Concerning to source of information about the effects of climate change on the health of their children, the current study result illustrated that, less than half of the studied mothers had their information about the effects of climate change on the health of their children from mass media and internet. While about one third of them had their information from their relatives and friends while only one fifth of them had their information from health team **(Figure 1)**.

These results were in the same line with **Qian et al. (2018)** who applied A cross-sectional survey Among 1604 participants in China to assess Knowledge and perceptions of air pollution in Ningbo, China and found that highly percentage of the studied subjects their information from Television and internet, 22.88% less than one quarter of them obtained their information from books and newspapers, while 19.70%less than one fifth of them had their information from expert lecture and friends.

While Al-Khamees, (2018) who conducted study among 1288 participants in Kuwait to assess Knowledge of, Attitudes toward, and Practices regarding air Pollution at Kuwait and found that the main source of information on indoor pollution was Newspapers and magazines, followed by radio and television, classes, books, family, friends.

As regard to total level of knowledge of the studied mothers, the current study result illustrated that less than two thirds of the studied mothers had unsatisfactory level of knowledge about the effects of climate change on the health of their children. While, more than one third of them had satisfactory level of knowledge **(Figure 2)**.

This result was contrasted with study of **Kurup et al. (2021)** who applied study among 65 participants in United Kingdom entitled " Informed-Decision Regarding Global Warming and Climate Change in the United Kingdom and revealed that of students developed a strong knowledge regarding awareness related to causes and effects of CC and global warming. Also disagreement with **Freije et al. (2018)** who conducted study in Bahrain among 143 participants to assess Global warming awareness among the Bahrain population and revealed that the studied subjects were more knowledgeable regarding causes, effects and different solutions for CC.

From the investigator point of view this result may be due to TV and social media don't get greet attention to climate change to enhance community awareness.

As regard to total level of practices of the studied mothers related to the effects of climate change on the health of their children, the current study result illustrated that more than half of the studied mothers demonstrated healthy practices related to the effects of climate change on the health of their children. While, less than half of them demonstrated unhealthy practices **(Figure**

3).From the investigator point of view healthy practices related to the effects of climate change on the health of their children will enable them to eliminate the hazards of climate changes and minimizing its health consequences

This result in the same line with **Abdallah, & Wagdy, (2022)** who revealed that with a guidance and effective sessions with good participation from both researchers and students, and reached to adequate total level of healthy daily life practices by more than two thirds of the total sample.. While **Tiong et al. (2020)** who applied study among 465participants in Malaysia to assess Knowledge, perceptions of risks, attitudes and practices of environmental health and detected a moderate overall practices regarding save electricity and daily using of water and papers, but less activities in recycling and/or other environmental activities and least participation in gardening or planting trees.

Also **Al-Khamees, (2018)** who conducted study among 1288 participants in Kuwait to assess Knowledge of, Attitudes toward, and Practices regarding air Pollution at Kuwait and found that studied subjects had low level of practices related to air pollution. **And Amer et al. (2022)** who found that more than three quarter of study subjects have satisfactory practices scores, but more than one fifth of subjects have unsatisfactory practices scores. This result may be due to Egyptian community health centers periodically organizing training program for improving the community health awareness.

Part IV: relation between the studied variables among the studied nurses.

As regard to correlation between total level of knowledge and total level of practice among the studied mothers, the current study result showed that, there was a significant statistical correlation between total level of knowledge and total level of practice among the studied mothers **(Table 4)**

This result in the same line with **Abdallah, & Wagdy, (2022)** who revealed that there was a highly positive correlation between total nursing students' knowledge level and daily life practices & perception through the post-test **Ibrahim et al., (2018)** who applied study among 1300 participants in Egypt entitled "Knowledge and Attitude regarding Global Warming Phenomenon" and showed that there was a positive correlation between total knowledge and attitude score regarding global warming/ CC.

Conclusion:

The study was concluded that less than two thirds of the studied mothers had

unsatisfactory level of knowledge about the effects of climate change on the health of their children. While, more than one third of them had satisfactory level of knowledge. Also more than half of the studied mothers demonstrated healthy practices related to the effects of climate change on the health of their children. While, less than half of them demonstrated unhealthy practices. Additionally, there was a significant statistical correlation between total level of knowledge and total level of practice among the studied mothers.

Recommendation

- Awareness programs should be conducted regularly to improving mothers' knowledge which could positively affect their perception and daily life practices and their children health regarding climate change.
- Developing in the university curriculum by integrating more environmental issues as climate change is necessary that help to enhance community awareness.
- Disseminating health education booklets to increase mothers' awareness about child health problems.
- Apply further research about effect of climate change in children in other setting for generalization.
- More studies are needed to examine the interaction effects of indoor and outdoor environments and climate

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