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Staff Nurses' Perception of Climate Change and Environmental Sustainability Practice at Selected Hospitals

Eman F. Ali [1], Nermin M. Eid [2], Wafaa M. Abdel hamid [3]

[1] B.Sc. in nursing sciences, 2012, ,
[2]Professor of Nursing Administration
[3] Assistant Professor of Nursing Administration
[2,3] Faculty of Nursing-Menoufia University.

Abstract: Background: The climate change is a ubiquitous phenomenon having wide-ranging social, economic, political, geographical, and psychological implications. It is impacting human lives and health in a variety of ways. Sustainability is a goal that everyone must reach. **Purpose**: To assess the staff nurses' perceptions of climate change and environmental sustainability practice at Menoufia University Hospitals and El Sadat Central Hospital. **Design**: A descriptive correlational research design was used. **Setting**: The study was conducted at different units of Menoufia University Hospitals, and El Sadat Central Hospital. **Sample**: A convenience sampling was used to select the staff nurses in the present study (471). **Instruments**: Two instruments were used (Staff nurse's perception toward climate change questionnaire and staff nurse's perception toward environmental sustainability questionnaire). **Results**: The Majority (90.4%) of the studied nurses at Menoufia University Hospitals had a high perception level of climate change and more than three quarter of studied nurses at El Sadat Hospital (74.2%) had a high perception level of climate change, more than three quarters of the studied nurses at Menoufia University Hospitals (90.8%) had a high perception level about environmental sustainability practice domains and more than two third of them at El Sadat Hospital (51.5%) had a high perception level about it. **Conclusion**: There was a statistically significance positive correlation between perception about climate change and environmental sustainability practices items at Menoufia University Hospitals**.. Recommendation**: Staff nurses should be supported and encouraged to adapt with climate change and deal with environmental sustainability

Keywords: *Climate change, Environmental sustainability practice and Staff nurses perception.*

Introduction

Sustainability is of vital importance to everyone because it deals with the survival of the human race and almost every living being on the planet. Sustainable is one of the main goals that humans have made in order to create a better life as the ultimate model for all their activities. For this reason, moving towards greener sustainability is the main goal of current architecture in our time (Addo-Bankas, et al., 2021). At the rate of the development needs of this world are using up the scarce and limited resources on Earth, it is becoming clear that unless there are major changes in human thinking and behavior, the future of civilization as it is known today will be doubtful. This complex issue does not have a direct solution, especially since sustainability is a goal that everyone must reach and they are constantly striving to reach it. Sustainability produces environmental, social and economic benefits. Environmentally, Sustainability helps reduce pollution, limit climate change, conserve natural resources and prevent environmental deterioration (Addo-Bankas, et al., 2021). Climate change described as a major threat to human health)Watts, et al, 2020(.It is also defined as „the systematic change in the atmosphere over multiple decades or longer" (Knowlton, et al, 2021). It is caused by natural events such as changes in incoming solar radiation, volcanoes and changes in global biogeochemical cycles. There are other major causes of it such as combustion of fossil fuel for energy production and energy use, deforestations, atmospheric aerosols, change in land use and emission of other gases such as water vapour and other greenhouse gases are the major causes of climate change (Yeboah, et al., 2023). Introduction 2 The climate also affects most basic health factors, such as access to food and water, clean air, and a safe environment. It causes droughts, heat waves, and rainrelated floods, storms, and hurricanes, which have a direct or indirect impact on the health and well-being of the patients. It also has serious consequences for healthcare providers, healthcare systems, and the national economy (International Panel of Climate Change, 2020). It will cause an additional 250 000 deaths across the globe between 2030 and 2050, from heat exhaustion in elderly people, malnutrition among children, malaria and diarrhoea (World Health Organisation WHO; Climate change, 2022). Hence, comes the role of healthy sector to limit climate change because, the healthy sector is one of the most trusted and respected sections of society, and it is also one of the largest employers and consumers of energy. So, they have a duty and opportunity to achieve climate-neutrality, efficiency and cost reduction all at the same time" (WHO, 2021). The healthy sector can become environmentally sustainable by siting hospitals near public transportation routes, using local and regional building materials, planting trees on the site, and by incorporating design components like day lighting, natural ventilation, alternative energy, water harvesting and green roofs (Koytcheva, et al., 2021). Since nurses constitute the largest segment of health

care employees, they have an important role in reducing climate change, (reducing or preventing greenhouse gas emissions) and adapting (reducing vulnerability to harmful effects) and they also have a great opportunity to protect their patients from the effects of climate change by working to create sustainable, climate smart hospitals and health systems (International Council for Nursing, 2019). Introduction 3 Therefore, environmental sustainability is defined as a dynamic state that requires association between ecological, economic, and social systems to achieve the capacity to avoid the depletion of natural resources and maintain an ecological balance (United Nation, 2020). It is also means not cause harm for the current and future generations "Their right to enjoy good health" (Sherman, et al., 2020(. Therefore, the healthy sector in general and nursing in particular can take several measures to achieve environmental sustainability and reduce the impact of climate change through: switching to compact fluorescent and light-emitting diode light bulbs, turning thermostats down by just a few degrees in the winter or up a little in the summer, purchasing energy-efficient products, reducing "stand- by" energy use, and retrofitting buildings to cut energy waste systematically turning off office equipment, using natural light during daylight hours in hospital corridors, and plugging leaks in the air conditioning, can have a major impact (Koytcheva, et al., 2021). The healthy sector can also reduce waste and emissions through composting, recycling, better purchasing (minimizing packaging, using reusable rather than disposable products, and buying recycled products), and minimizing waste transport (Koytcheva, et al., 2021). The infected plastic materials can also be buried after disinfection, rather than incinerated, since burning plastic produces greenhouse gases and toxic pollutants such as dioxins and furans (Ibn-Mohammed, et al., 2021). They can conserve water by harvesting rainwater and recycling water for non-drinking purposes (Koytcheva, et al., 2021) In addition, the healthy sector consumes countless liters of fossil fuel when patients and medical professionals travel to and from hospitals, pick up prescriptions, and obtain tests and results (Kaplan, et al., 2021). Transportation is one of the biggest Introduction 4 influences on health and is also considered a major source of carbon emissions, and thus an important focus of climate change mitigation (Naidu, et al., 2021). Hence the role of healthy sector in reducing the emissions of the means of transportation that you use through effective siting (near public transportation infrastructure) of hospitals, using alternative-fuel (CNG, Electric) vehicles, encouraging hospital staff and patients to use bicycles, public transportation and carpools, and by purchasing from local suppliers or/and suppliers who use fuelefficient transportation (Luschkova, et al., 2022). So, there is a dual relationship between climate change and sustainability. On the one hand, climate change influences key natural and human living conditions and thereby is the basis for social and economic development; while on the other hand,

society's priorities on sustainable development influence both the greenhouse emissions that are causing climate change and the vulnerable (Lellis, et al., 2019) Through achieving this relation hospital will become green hospital. Green and healthy hospital it is one that promotes overall health through continuous reduction. Their environmental impact and ultimately eliminate their contribution to the burden of disease. Green and healthy hospital recognized the relationship between patient health and the environment, demonstrates this understanding through its management and strategy and operations. It links local needs to environmental action primary prevention is practiced by actively participating in efforts to promote community environmental health, health equity and green Economy (Koytcheva, et, al, 2021). Last but not least, to be environmentally-friendly, health sector need to do some basic measures like: Improvement of hospital design, introduction of sustainable Introduction 5 waste-reduction and management strategies, sustainable use of natural resources such as water and energy and Purchase products and chemicals that have a minimal impact on the climate (Luschkova, et al., 2022)

Significance of the study

In Egypt's new vision for sustainability, dealing with the environment after the harmful effects of the coronavirus pandemic, and working to reconstruct the future, Egypt also sought to host the conference of states parties to the United Nations Convention on Climate Change's (COP27) 27th session in 2022 as a representation of the challenges, initiatives, and priorities facing the catastrophe of climate change. The issue of health took a large part in the climate conference held in Sharm El-Sheikh, the conference activities contributing to reduce the impact of negative climate changes on health of patients, their families, and the health of nursing care providers, such as carbon emission, wastes, and energy consumption. the climate conference encouraged population to modify their behavior by saving energy, carbon emission reduction, waste reduction, and water recycling (Enterprise Ventures, 2022 and WHO, 2022). Otherwise, United Nation Department Practice (UNDP EGYPT, 2020) found that the negative effects of climate change on environmental sustainability, such as drought or, water scarcity, have an adverse impact on human health, placing a heavy strain on hospitals to care for those who are suffering from these effects. Also, assessing climate change and sustainability awareness among staff nurses can help them to acquire advanced competencies relevant to environmental sustainability practice. Researcher's literature review such as Mekawy (2023), showed that little studies has been conducted on this subject among nurses in Egypt. Consequently, the present study was conducted to assess staff nurses' perceptions of climate change and environmental sustainability practice at selected hospitals

Purpose of study

The purpose of the current study is to assess staff nurses, perceptions of climate change and environmental sustainability practice at Menuofia University Hospitals and El Sadat Central Hospital.

Research questions;

1) What is staff nurses' perception level toward climate change at selected hospitals?
2) What is staff nurses' perception level toward environmental sustainability practice at selected hospitals?
3) What's the relation between climate change and environmental sustainability practice as perceived by staff nurses at selected hospitals?

Methods

Study design:

A descriptive correlational research design was utilized to conduct this study.

Study sample: A group of staff nurses were used in the current study.

Sampling technique: A convenient sample technique of staff nurses(471) from both hospital. The total staff nurses in Menoufia University Hospitals was 1300, sample size in it 306 they accepted to participate in the study. The total staff nurses in El Sadat Central Hospital was 281, sample size in it 165 they accepted to participate in the study, their total number was 471 staff nurses from two hospitals.

Study Sample:

Sample size and power of the study: In order to calculate the sample size required to assess staff nurses' perception toward climate change and environmental sustainability practice, the sample size was calculated according to the following equation;

Sample size in El Sadat Central Hospital:

n= N=total sample =281

n=sample size=165 e=0.05%

Sample size in Menoufia University Hospital:

n= N= total sample=1300

n=sample size=306 e=0.05%.

Setting:

The current study was conducted at different units (Critical and General departments) at Menoufia University Hospitals and El Sadat Central Hospital. They are affiliated to different sectors of health hospitals in Menoufia Governorate. Menoufia University hospitals, at Shebin El kom Menoufia Governorate, Egypt.

Instruments for data collection;

Two instruments were utilized for data collection by the investigator: Staff nurses' perception toward climate change questionnaire and Staff nurses' perception toward environmental sustainability practice questionnaire.

Instrument one: Staff nurses' perception toward climate change questionnaire.

It was developed by Mekawy, (2023) and adopted by the investigator to determine staff nurses perception toward climate change at the studied hospital

This questionnaire consisted of two main parts as follows:

- **Part 1**: Personal characteristics It included personal data of the staff

nurses such as "hospital name, working unit age, sex, marital status, educational qualifications and years of experience of staff nurses in the nursing profession.

- **Part 2**: Staff nurses' perception toward climate change questionnaire. It consisted of two major domains covered by 18 items. First domain, the impact of climate change on the indoor environment for healthcare (10 items).
  Second domain, the impact of climate change on the outdoor environment for healthcare (8 items).

Scoring system:

(know=3, Not sure= 2, I don't know = 1).

The score of each dimension is summed up and converted to a percentage score.

The staff nurses' perception score was determined as

- Low level of perception < 60
- Moderate level of perception 60 ≤ 75 and
- High level of perception >75 Buriro, et al., (2018); La Torre et al. (2020) & Anaker, et al.,(2022).

<u>Instrument two</u>: Staff nurses' perception toward environmental sustainability practice questionnaire

It was developed by Mekawy, (2023) and adopted by the investigator to assess staff nurses' perception of environmental sustainability practice at two hospitals. Some modification was done on the questionnaire such as nurses can save energy domain changed for product energy efficiency domain.

This questionnaire contained six dimensions covered by 29 items as follows: • Energy saving (6 items) • Reducing carbon emission (5 items) • Reducing waste (5 items) • Water reuse (3 items) • Economic sustainable practices (5 items) • And product energy efficiency (5 items)

Scoring system:

Respondents answered items against a three- point Likert scale ranging as follow (Agree= 3, neutral = 2, disagree =1).

The total perception score was summed up and converted into a percent to be considered:

- Low level of perception < 60
- Moderate level of perception 60 ≤ 75 and
- High level of perception >75. (Butter field, et al., (2014); Kangasniemi, et al., (2014); Martin et al., (2019).

Validity:

The instruments of data collection were translated into Arabic and reviewed for their Content and Face validity of the instruments. The panel of expertise included two professors in Nursing Administration from Menoufia University, two Assistant Professors in Nursing Administration department at Benha University and one Professor in Community Health Nursing department at Benha University. The panel examined the following; Few modifications were made in some translated words of the sentences .

Reliability of the instrument:

- **Staff nurses' perception toward climate change questionnaire**

Reliability was estimated among 10 participants by using test retest method with two weeks apart between them. Then Cronbach alpha was calculated between the two scores using SPSS computer package. It was 0.71 which indicated that the instrument was reliable to detect the objectives of the study.

- **Staff nurses' perception toward environmental sustainability practice questionnaire.**

Reliability was estimated among 10 participants by using test retest method with two weeks apart between them. Then Cronbach alpha was calculated between the two scores. It was 0.74 which indicated that the instrument was reliable to detect the objectives of the study.

Ethical consideration:

An approval was obtained from Ethical and Research Committee of the Faculty of Nursing (No 955,date?????). A written formal letter was obtained from each participant in the sample. Studied nurses were informed that participation in the study was voluntary. The respondents were assured that their data would be treated as strictly confidential and their anonymity was maintained. Additionally, each participant was notified about her right to accept or refuse to participate in the study.

Pilot study:

After reviewing of the instruments by the experts, the investigator conducted a pilot study before using the final questionnaire. The purpose of the pilot study was to ascertain clarity, relevance, feasibility and applicability of the study instruments and to determine obstacles that may be encountered during data collection. It was also helpful to estimate the time needed to fill each study instrument. The time needed to fill the study instrumenst was 20 minutes. The pilot study was carried on (10%) 47 nurses. No modifications were done. So, the sample of the pilot study was included in the study.

Procedure

An official letter was sent from the Dean of the Faculty of Nursing containing title and explaining the purpose and method of data collection to the directors of studied settings. Then a short briefing was conducted to orient the respondents to the objectives, possible risks and benefits of the study to gain their cooperation to participate in the study. After explaining the purpose and nature of the study, staff nurses who fulfilled the inclusion criteria were invited to participate in the study. Thereafter, data were collected through a self-administered questionnaire to ascertain that all questions were answered and to clarify any inquiry. It took about 20-25 minutes to fulfill the two questionnaires. Data were collected in a period of three months from the the middle of August 2023 till the middle of November 2023 in the morning, afternoon and night shifts. The researcher collected data three days a week. The average number of participants was 10-12 per day.

Statistical analysis

Data was coded and transformed into specially designed form to be suitable for computer entry process. Data was entered and analyzed by using SPSS (Statistical Package for Social Science) statistical package version 22. Graphics were done using Excel program. Quantitative data were presented by mean ($\bar{}$) and standard deviation (SD). Qualitative data were presented in the form of frequency distribution tables, number and percentage. It was analyzed by chi-square (X^2) test. However, if an expected value of any cell in the table was less than 5, Fisher Exact test was used (if the table was 4 cells), or Likelihood Ratio (LR) test (if the table was more than 4 cells). Level of significance was set as P value

Results:

Table 1 : shows that more than one third of studied nurses at Menoufia University Hospitals and more than quarter of staff at El Sadat Hospital aged from 30<35 years with Mean ±SD 32.24±4.22 and 31.11±4.31 respectively, More than half of the studied nurses were female respectively. In relation to marital status, most of them were married and concerning to educational qualification, more than one third of studied nurses at Menoufia University Hospitals had associated degree in nursing while, nearly half of studied nurses at El Sadat Hospital had nursing diploma. Regarding years of experience, less than half of studied nurses at Menoufia University Hospitals had from 5<10 years of experience while, more than one third of studied nurses at El Sadat Hospital had from 10<15 years of experience. Less than two third of studied nurses at Menoufia University Hospitals attend conferences or workshops on climate change, and all of studied nurses at El Sadat Hospital didn't attend conferences or workshops on climate change. Majority of studied nurses at study settings were knowing about the climate change conference in Egypt. In addition; the majority of studied nurses at study settings didn't have experience during the past five years, damages caused by climate change.

Table (2): illustrates that there was a highly statistical significance differences between studied nurses' response to climate change domains at Menoufia University Hospitals and El Sadat Hospital.

Table (3) illustrates that there was a highly statistically significance differences between studied nurses' agreement regarding perception toward environmental sustainability practice domains at Menoufia University Hospitals and El Sadat Central Hospital.

Table (4) illustrates that there was a highly statistical significance correlation between climate change and environmental sustainability practices scores among studied nurses at Menoufia University Hospitals, While, there was a statistical non significance correlation between climate change and environmental sustainability practices scores among studied nurses at El Sadat hospital.

Figure (1): Clears that most of the studied nurses at Menoufia University Hospitals had a high perception level of climate change and more than three quarter of studied nurses at El Sadat

Hospital had high perception of climate change.

Figure (2): clears that more than three quarter of the studied nurses at Menoufia University Hospitals had a high perception level about environmental sustainability practice domains and more than two third of them at El Sadat Hospital had a high perception level about it.

Table (1): Distribution of studied nurses according to the personal characteristics at selected hospitals (n=471).

Personal characteristics Items	Menoufia University Hospitals (n=306)		El Sadat Hospital (n=165)	
Age	N.	%	N.	%
20 <30	73	23.9	46	27.9
30<35	104	34.0	48	29.1
35<40	91	29.7	38	23.0
More than 40	38	12.4	33	20.0
Mean ±SD	32.24±4.22		31.11±4.31	
Sex				
Male	123	40.2	68	41.2
Female	183	59.8	97	58.8
Marital status				
Married	297	97.1	165	100.0
Un married	9	2.9	0	0.0
Educational qualification				
Nursing diploma	30	9.8	69	41.8
Associated degree in nursing	113	36.9	52	31.5
Bachelor degree in nursing	78	25.5	39	23.6
Post graduated studies	85	27.8	5	3.0
Years of experience				
Less than 5 years	25	8.2	9	5.5
5 <10 years	127	41.5	56	33.9
10 <15 years	116	37.9	59	35.8
15 <20 years	38	12.4	24	14.5
20 years and more	0	0.0	17	10.3
Attended conferences or workshops on climate change				
Yes	201	65.7	0	0.0
No	105	34.3	165	100.0
Know about the climate change conference in Egypt				
Yes	274	89.5	124	75.2
No	32	10.5	41	24.8
Have experienced, during the past five years, damages caused by climate change				
Yes	76	24.8	68	41.2
No	230	75.2	97	58.8

Table (2): Mean score and SD of studied nurses' response to climate change domains in the studied settings (n= 471)

Climate change domains	Max score	Menoufia University Hospitals (n=306)	El Sadat Hospital (n=165)	ttest	P-value
		Mean ±SD	Mean ±SD		
Indoor impact	30	28.04 ±1.39	26.98 ±1.74	6.731	.000**
Outdoor impact	24	23.00 ±1.32	21.37 ±2.57	7.572	.000**
Total	54	51.04 ±1.82	48.35 ±3.52	9.142	.000**

**Highly statistical significance differences(P<0.001)

Table (3): Mean Score and SD of Studied Nurses According to Their Responses to Environmental Sustainability Practice

Environmental sustainability practice domains	Max score	Menoufia University Hospitals (n=306)	El Sadat Hospital (n=165)	ttest	P-value
		Mean±SD	Mean±SD		
Energy saving	18	17.72±.54	16.86±1.12	9.335	.000**
Reducing carbon emissions	15	12.95±1.33	12.27±1.60	4.641	.000**
Reducing Waste	15	13.14±1.36	11.92±2.08	6.755	.000**
Water reuse	9	8.50±.66	7.90±.94	7.330	.000**
Sustainable Economic Activities	15	13.44±1.23	11.92±1.84	9.513	.000**
Product energy efficiency	15	14.40±.96	11.90±1.87	16.022	.000**

**Highly statistical significance differences (P<0.001)

Figure (1): Distribution of studied nursesaccording to Their Levels of Perception towards climate change in the studied settings (n=471).

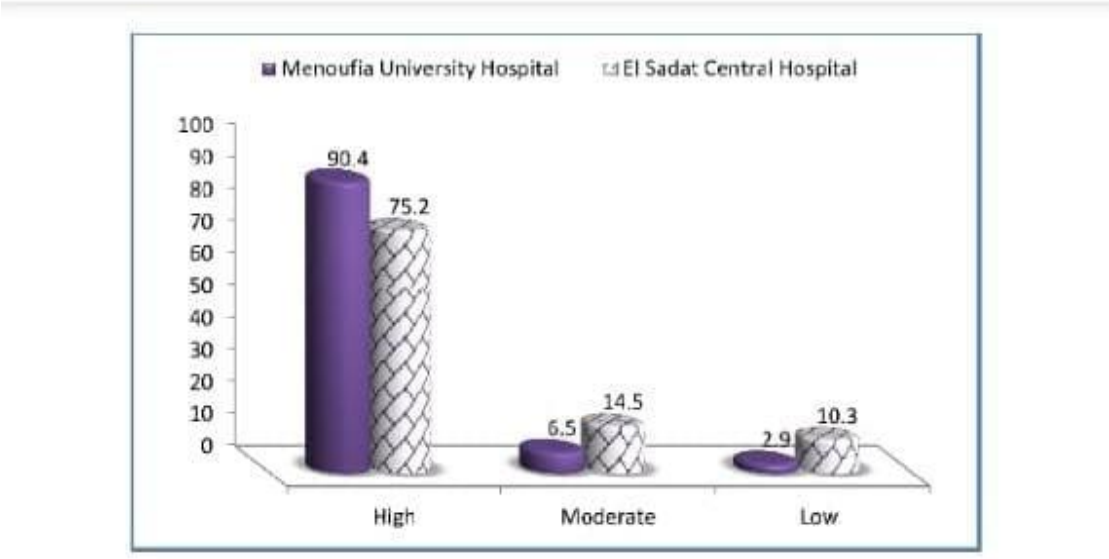

Figure (2): Distribution of studied nursesAccording to Their Levels of perception of Environmental Sustainability in the studied settings (n=471).

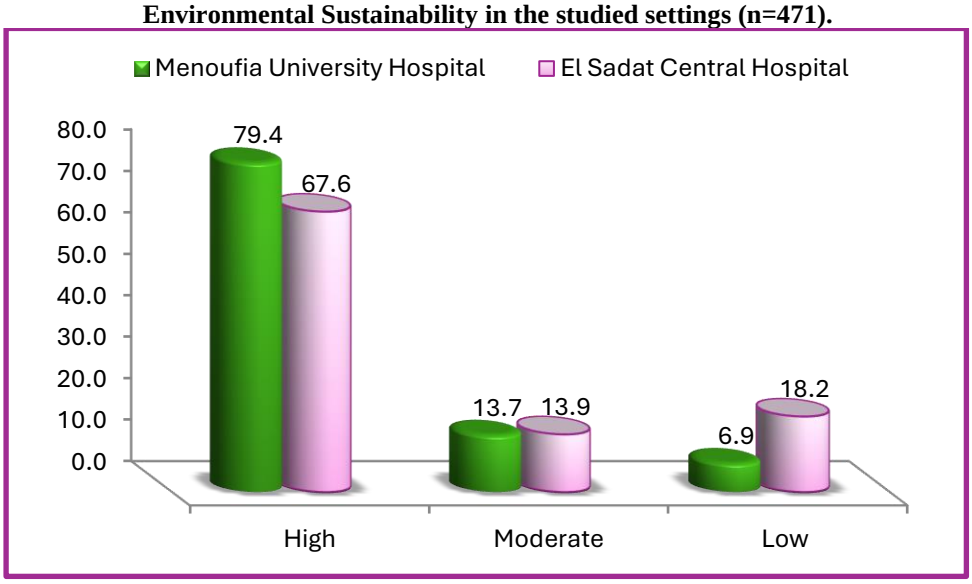

Table (4) Correlation between perception of staff nurses toward climate change and environmental sustainability practices scores at the studied settings .

Environment sustainability practices score	Total climate change score			
	Menoufia university hospitals (n=306)		El Sadat hospital (n=165)	
	R	P-vale	R	P-vale
Total	.350	.000**	.079	.166

*Statistical significance differences (P≤0.05)

**Highly statistical significance differences (P<0.001).

Discussion

Climate change causes droughts, heat waves, and rain-related floods, storms, and hurricanes, which have a direct or indirect impact on the health and well-being of the population. It also has serious consequences for healthcare providers, healthcare systems, and the national economy. Nurses have a tremendous opportunity to protect their patients from the impacts of climate change by working to create sustainable, climate smart hospitals and health systems (Hartinger, et al., 2024). Sustainability in nursing has been defined as the core of knowledge in which ecology, globally and holistically comprise the foundation of sustainability. Its concept includes environmental considerations at all levels and the implementation of sustainability will contribute to a development that preserves the environment to not harm the current and future generations' opportunities for good health (Mohamed, et al., 2024).

Concerning studied nurses perception of climate change, findings of the current study revealed that the majority of the studied nurses at Menoufia University Hospitals and more than three quarters of studied nurses at El Sadat Hospital had high perception levels of climate change. From the

investigator‟s point of view, this result may be due to studied nurses attendance of conferences and workshops about climate change at Menuofia University Hospitals ,but no one of them in El Sadat Hospital had previously attended conferences or workshop about it. This result was in agreement with a study by Mulugeta et al., (2023), the study title was Knowledge towards the Health Impacts of Climate Change and its Associated Factors among Community of Amhara Sayint District, Northeastern Ethiopia. They showed that respondents' levels of perception of the health effects of climate change were adequate.

Also, it was in agreement with La Torre et al., (2020).The study title was Knowledge and perception about climate change among healthcare professionals andstudents. They found that nurses perceived the nursing profession as having a clear role and responsibilities in engaging in the issue of climate change. In the same line, these results were similar to Diallo, et al., (2023), in a study was entitled Nurses‟ Perceptions of Climate Change: Protocol for a Scoping Review. It was revealed that nurse's perceptions were strong about changing the climatic patterns that had harmful consequences on health and that diseases are sensitive to weather change, a huge number believed an increase in vector-borne, food-borne, water-borne and air-borne diseases may be due to global warming.

But on the other hand this current finding was in disagreement with the study results of Almulhim (2021), the study title was Public knowledge and perception of climate change and global warming in the context of environmental challenges and policies in Saudi Arabia. It was declared that one-third of the study sample had poor knowledge and perception about the causes and effects of climate change; besides just over one quarter of the study participants had a good level of knowledge, perception, understanding and awareness of climate change.

The findings of the current study were incongruent with a study by Yeboah, et al., (2023). The study was entitled Nurses‟ perceptions, attitudes, and perspectives in relation to climate change and sustainable healthcare practices. They concluded thatthe majority of nurses had insufficient knowledge and weak perception of adverse health effects of climate change, and the main sources of information were social media.

The findings of the current study were in disagreement with Mekawy (2023). in a study entitled Climate Change and its Relation to Environmental Sustainability Practice as Perceived by Staff Nurses. It was indicated that slightly more than half of staff nurses had low perception of climate change in Egypt. Hence, slightly less than half of the staff nurses had low level of perception towards environmental sustainability. The findings of the study were in disagreement with Mohamed Ahmed, et al., (2024)in a study entitled 'Effect of instructional guidelines regarding climate change on nurses' knowledge and its relation to environmental sustainability practice. They revealed that most nurses don't have any background knowledge about climate change. Otherwise this current finding disagreed with Otto et al.,

(2020)and Shaw et al., (2021who found that most of nurses had insufficient knowledge and weak perception about climate change and its impacts on health.

For studied nurses perception toward environmental sustainability practice, findings of the current study revealed that more than three quarters of the studied nurses at Menoufia University Hospitals had a high perception level about environmental sustainability practice and more than two thirds of them at El Sadat Hospital had a high perception level about it. From the investigator‟s point of view, this might be due to the media that now focused on the vision of Egypt 2030 and sustainability. The findings of the study was consistent with El Shall et al., (2022), the study was entitled the effectiveness of educational interventions about sustainability development among Nursing Students. They concluded that nursing students achieved high means scores of perception, attitude, and behavior toward sustainability development .

However, this study was in disagreement with a study conducted by Mekawy (2023), who clarified that slightly less than half of staff nurses had low level of perception towards environmental sustainability. Additionally, more than half of staff nurses had low level of perception towards waste reduction and energy saving .While slightly more than half of them had high level of perception of environmental sustainability.

For the correlation between between climate change and environmental sustainability, the findings of the current study demonstrated that there was a highly statistical significan positive correlation between climate change and environmental sustainability in Menoufia University hospital.

From investigator‟s point of view, this result could be due to most staff nurses attend conferences and workshops held at Menoufia University Hospital on climate change and environmental sustainability and were familiar with environmental sustainability and the extent of its impact on climate change

The result of the current study was consistent with Saleh & Elsabahy, (2022in a study entitled integrating sustainability development education program in nursing to challenge practice among nursing interns in health care. and Mekawy, (2023) who revealed that there was a statistically positive significant correlation between staff nurses' perception of climate change and their environmental sustainability practice in nursing.

On the otherhand, this study contradicted with Anåker et al., (2021)who concluded that there was an incongruence between environmental and climate change challenges and nurses' day-to-day responsibilities.

Conclusion:

In the light of the current study results, it was concluded that the majority of the studied nurses at Menoufia University Hospitals and more than three quarters of nurses in Sadat hospital had high level of perception of climate change More than three quarters of the studied nurses at Menoufia University Hospitals and more than two third of them at El Sadat Hospital had a high perception level about environmental

sustainability Also, there was a highly statistical positive significance correlation between climate change and environmental sustainability among studied nurses at Menoufia University Hospitals.

Recommendations:

Based on the findings of this study, the following recommendations are proposed: Hospital administrators should:

- Nurse should receive guidelines about how to apply environmental sustainability practice in work place and preserve the climate. Ethical, practical policies pertaining environmental sustainability practice and how to preserve the climate should be established.

This study can be applied in other settings to ensure the generalizability of results.

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