Effect of Designed Nursing Instructional Guidelines about Climate Change on Awareness, Anxiety and Mitigation Behaviors of Elderly

Esteer Ibrahim Ghayth[1], Omima Mostafa Abd Elzaher[2], Heba Mohamed Fahamy[3], and Asmaa Mohamed Ahmed madkour[4]

[1]Assistant Professor of Geriatric Nursing, Faculty of Nursing, Sohag University
[2]Assistant Professor of Community Health Nursing, Faculty of Nursing, Sohag University
[3]Assistant Professor of Gerontological Nursing, Faculty of Nursing, Assuit University
[4]Lecturer of Community Health Nursing, Faculty of Nursing, Sohag University

Corresponding author: Esteer Ibrahim Ghayth
E-mail: Dr.esteeribrahim@yahoo.com

Abstract

Background: Climate change is a problem that affects all human beings, and the most vulnerable population groups largely, including the elderly. **Aim:** To evaluate the effectiveness of designed nursing instructional guidelines about climate change on awareness, anxiety and mitigation behaviors of elderly. **Subjects and Method:** Quazi experimental research design. **Setting:** The study conducted at the out-patients clinics at Sohag University hospitals. **Sample:** Total number of 100 older persons was included. **Study tools:** Contained four tools; **Tool (I):** Demographic data, **Tool (II):** climate change awareness assessment includes 3 parts: knowledge, risk perception and attitude scale. **Tool (III):** Climate change anxiety scale. **Tool (IV):** Climate change mitigation behavior. **Results:** There was statistically significant improvement of the older persons' climate change awareness, anxiety and mitigation behavior after implementation of the designed nursing instructional guidelines **P.0,000** ; **Conclusion and recommendations**: The results concluded that that the designed nursing instructional guidelines program improved the awareness, anxiety and mitigation behavior among older persons about climate change. Continuous educational programs about climate change of older persons are recommended.

Keywords: Anxiety, Attitude, Awareness, Climate change, Elderly, Mitigation behaviors and Risk Perception**.**

Introduction:

A complex process, aging affects people in many ways, including social, psychological, and physical changes. The number of people 65 and older worldwide is expected to reach 2.2 billion by the late 2070s. Additionally, according to **World Population Prospects (2023),** there would be 265 million persons 80 years of age and older by the middle of the 1930s. 9.3 million people in Egypt are 60 years of age or older, making about 8.8% of the country's total population (**Central Agency for Public Mobilization and Statistics (2024).**

Both natural ecosystems and human cultures are seen to be at risk from climate change (CC). However, there are significant differences in how the general population views it (**WHO, 2022).** Long-term changes in weather and temperature patterns are referred to as climate change. Human activity has been the main driver of these shifts since the 1800s, although they can also happen naturally as a result of large volcanic eruptions or variations in solar activity (**United Nations, 2023).**

The World Health Organization (WHO) estimates that between 2030 and 2050, climate change would cause an extra 250 000 deaths per year, posing a serious danger to human health **(Caminade et al., 2021).** The environment and people are both impacted by climate change. Extreme weather events, heat waves, and increased pollen exposure can all have a direct impact on people's health. Furthermore, it has an indirect impact on human health by creating air pollution, food instability, population shifts, conflicts, respiratory and cardiovascular diseases, and water contamination. It degrades biodiversity in addition to having direct and indirect effects on mental and physical health **(Mohammed et al., 2024).**

The elderly, children, pregnant women, people with disabilities, those with limited resources, and outdoor workers are among the groups that are more susceptible to the consequences of climate change than others **(Ngcamu, 2023).** The physiological aging process causes changes in the body, which influence how the senior demographic group responds to the effects of climatic change. Increased mortality results from their response to extreme cold and heat waves due to a malfunctioning thermoregulatory system. Additionally, because of their diminished lung capacity and less ability to expel pollutants from the body, they are more susceptible to heart and respiratory diseases brought on by air pollution, as well as cognitive decline **(Singer et al., 2022).**

A cumulative impact results from frequent exposure to these effects, which is crucial in addition to physiological features. The older population group may be more vulnerable to climate change due to socioeconomic variables such poverty, low educational attainment, lack of family or absence of family, and social networks (**Singer et al., 2022).** Vulnerability and resilience characteristics contribute to health inequalities among older persons as a result of climate change. Risks increase during climatic events since aging impairs immunity and decreases thermoregulation. Air pollution and heat waves exacerbate pre-existing health conditions **(Goldsmith *et al.*, 2022).**

The most vulnerable populations, such as older persons and people with underlying medical issues, are disproportionately affected by these climate-sensitive health hazards **(Singer et al., 2022).** Due to biophysical differences between older adults and others, which are crucial for people's ability to handle both heat and cold extremes, older adults may be more susceptible to negative physical effects like dehydration and the exacerbation of symptoms of pre-existing health conditions like respiratory and heart disease during a heat wave. This makes temperature regulation processes less effective. When older adults have additional health conditions that impact thermoregulation, such as diabetes, respiratory illnesses, or chronic cardiovascular disease, it can be very difficult for them to cope with heat waves (**Mohammed et al., 2022).** Additionally, older persons may be more vulnerable to: The impact of meteorological events on psychological health, adverse effects on one's bodily and mental health brought on by droughts, wildfires, and air pollution, services being interrupted as a result of mandatory evacuations. For some with chronic illnesses, these disruptions may exacerbate preexisting symptoms (**Bryant et al., 2022).**

The way people view risks that could jeopardize their core beliefs is known as risk perception. It illustrates the individual's risk perception and the factors influencing it. A higher risk perception motivates people to act decisively (**Van Valkengoed Steg, 2019**).

Understanding climate change is essential to achieving sustainability in developing nations. One major obstacle to poor nations' ability to adapt to climate change is a lack of understanding. Since the effects of climate change are making disasters more frequent and severe in this disaster-prone nation, it is imperative that local communities become more

aware of the issue. Globally, vulnerability to the effects of climate change is highly ranked (Abbas, 2023) The first line of defense to raise awareness and begin influencing people's behavior and attitudes toward the environment is health education (**Ayeni., 2022**).

Gerontological health nurses should aware vulnerable groups, particularly older persons about **t**he possible health effects of extreme weather events, such as heat and cold waves, poor air quality, food and water-borne illnesses, and vector-borne infections **(Winquist et al., 2023).**

Significance of the Study:

Around 157 million people, especially elderly people, experienced heat waves that negatively impacted their health. Around 2030 and 2050, it is estimated that global climate change would cause an additional 250,000 deaths annually as a result of heat stress, respiratory ailments, malaria, diarrhea, and starvation **(WHO, 2021).** Egypt ranks 31st in the world with an annual carbon dioxide emission of 221.1 million tons. It accounts for 0.6% of total emissions. According to the World Bank, Egypt is among the top nations **(The World Bank, 2023)** By the 2050s, the proportion of deaths in Egypt attributed to climate change could rise to almost 15.2%. Heat-related mortality is expected to be significantly impacted by Egypt's rising temperatures and severe heat waves, particularly for vulnerable groups **(World Bank, 2021)**.

By implementing health education and instructional guiding programs, nurses can effect change. People must be made aware of the consequences of climate change, and they must be inspired to take part in environmental sustainability and achieve the Sustainable Development Goals **(Kreslake et al., 2023).** Thus, the purpose of this study is to enhance older people's climate change awareness, anxiety, and mitigation practices.

Aim of the Study

The aim of study is to evaluate the effectiveness of designed nursing instructional guidelines about climate change on awareness, anxiety and mitigation behaviors of elderly.

Research hypothesis

1. The elderly exhibit low mitigation behavior, excessive worry, and limited awareness of climate change.
2. The nursing instructional guidelines program will raise older adults' climate change awareness, anxiety, and mitigation behavior.
3. Following the implementation of nursing guidelines, there will be a statistically significant association between older adults' awareness, anxiety, and mitigation practices regarding climate change.

Subjects and Method

Research design:

This study employed a quasi-experimental one group (pretest & posttest) research design.

Study Setting: -

The outpatient clinics of the attached Sohag University Hospital served as the study's sites. Three clinics with a high elderly flow rate—that is, clinics for diabetes, medicine, and ophthalmology—were chosen at random.

Sample

A convenient sampling was employed to accomplish the study's goal. One hundred senior citizens of both sexes who attended the aforementioned outpatient clinics made up this group.

Sample size:

Based on information found in **Alagamy et al.'s 2019** study, Taking into account the two-sided test type, power of 80%, and significance level of 5%

The sample size calculation formula is [2(Zα/2 + Zβ) 2 × p (1-p)]/ (difference) 2 = n, where n is the necessary sample size. p = proportional pooled Zα/2: Depending on the significance level, this is 1.96 for 5%. Zβ: Depending on power, this is 0.84 for 80%. Therefore, The formula for n is [2(1.96 + 84)2 × 0.5625 (1–0.5625)]/ (0.20)2=96.5 Thus, 97 senior people are the necessary sample size.

Inclusion criteria:

-Elderly people 60 years of age and older, regardless of gender

-Who are able to converse well and consent to take part in the study.

Study tools:

There are four tools were utilized to collect data for this study:

Tool I: Demographic Data Questionnaire: This included age, sex, residence, and marital status, and occupation, level of education, living condition, and source of income.

Tool II: Climate Change Awareness Assessment: It was created by the researcher following a review of relevant literature and had three sections:

Part one: **Older Adults' Knowledge regarding to climate change**. In order to evaluate older individuals' knowledge, it was modified from earlier research **(Salem et al., 2022 and Chairunnisa et al., 2022)** and consisted of fifteen closed-ended questions. Incorporate events, information regarding climate change, occurrences, experiences, emergencies, impacts, and hazards. There were only three possible answers to the questions: yes, no, and don't know.

The scoring system: used for each question was "0" for "no and don't know" and "1" for "yes" responses.

After compilation, the score was converted to a percentage **(Amin and others, 2023**). The following categories comprised the knowledge total score:

The knowledge total score was divided into the following:

- Unsatisfactory: ≤ 60%
- Satisfactory: > 60%

Reliability: Cronbach's Alpha was used to evaluate the study instrument's internal consistency; the reliability coefficient for the knowledge evaluation was 0.750 **(Abdullah et al., 2022) (Ibrahim et al., 2024).**

Part Two: Older adults' risk Perception Questionnaire: This instrument was modified from **Van Eck et al., 2020 & Lee et al., 2015** to evaluate older adults' overall risk perceptions about climate change and its effects on the environment and human health. There were 27 items in all.

Scoring system: A five-point Likert scale, spanning from strongly disagree to strongly agree, is used to score each item. Each response received a score ranging from 1 for strongly disagree to 5 for strongly agree. Higher perceived risks from climate change are indicated by a higher score **(Amin et al., 2023).** A percentage score was created by adding up these scores. The following categories comprise the risk perception total score:

-Low level of risk perception: ≤ 60%

-High level of risk perception :> 60%

Part three: The Climate Change Attitude Scale:

It was created and updated by the researchers to gauge the attitudes of the elderly about climate change (**Netravathia & Chauhan 2014).** A Likert scale was employed, and there were eleven assertions **(Ghazy and Fathy, 2023).**

Scoring system: each statement's replies were graded as either agree or disagree (1, 0). To be taken into consideration, the total attitude ratings were added together and transformed into a percentage.

The following categories comprise the overall attitude score:

-Positive attitude >60%

-Negative attitude ≤ 60 **(Ghazy and fathy, 2023).**

Reliability: The climate change attitude scale's acquired Cronbach's alpha of 0.87 indicated that the instrument was both valid and reliable **(Folajogun et al., 2016).**

Tool III: The Climate Change Anxiety Scale: It was developed by (**Clayton and Karaszia, 2020)**: It has twenty-two items. Cognitive and emotional impairment, functional impairment, personal experience of climate change, and behavioral

involvement were among its four sub-scales as follows:

-Cognitive-emotional impairment subscale includes eight items (e.g., thoughts about climate change and its effects on concentration, sleep, nightmares, crying, and coping)

-Functional impairment subscales includes five items (e.g., climate change concerns affect relations with friends and family, ability to complete school or work).

-Personal experience of climate change subscales includes Three items (e.g., directly affected, know someone directly affected, notices change in place.).

-Behavioral engagement subscales includes six items for (e.g., behaved more sustainably, recycle, turn off lights, reduce behaviors, feels guilty for waste energy and address the problem).

Scoring System: The 22 items on the climate change anxiety scale are scored on a five-point Likert scale, with 1 denoting "never answer" and 5 denoting "almost always answer." **Clayton & Karazsia, 2020).** A percentage score was created by adding up these scores. The overall score, which varied between 22 to 110, may be divided into the following three groups:

Mild anxiety level: ≤ 25%.

Moderate anxiety level: 50-70%.

Severe anxiety level :> 70% .

Reliability: Cronbach's alpha was used to assess the reliability of the climate change anxiety scale, and it was 0.87 when it was first developed and 0.91 throughout that research **(Jang et al., 2023).**

Tool IV: Older adults' mitigation behavior regarding climate change: It was utilized to evaluate the mitigation behavior and was modified from earlier research (**Kaiser & Wilson, 2004; Arnold et al., 2018**). Ten items that represented both ecologically beneficial and detrimental activities were taken from the general ecological behavior scale. A 5-point Likert scale, ranging from "never" to "always," was used to answer the questions.

Scoring system: Scoring responses for each item was graded 1 degree for never answer to 5 degree for always answer. A higher score indicates that people engage more frequently in mitigation behaviors (**Van Valkengoed et al., 2021).**

A percentage score was created by adding up these scores. The overall score, which varied between 10 to 50, may be divided into the following two groups:

-High mitigation behavior: > 60%

-Low mitigation behavior**:** ≤ 60%

Reliability: All of the reliabilities of the mitigation behavior subscale of the climate change perception were

above.80, indicating outstanding reliability.

Validity and reliability of tools:

A panel of five experts—three in the area of community health nursing and two in geriatric nursing—tested the tool's content validity, and adjustments were made in response to their comments. With the assistance of additional specialists, content and construct validity were established. The final version of the instrument was prepared taking into account all of the experts' revisions and helpful critiques.

Reliability was used to examine the instruments' internal consistency; the instruments' reliability was assessed in order to determine the measurement consistency. The correlation coefficient for every scale was computed to arrive at this result. Using a range of 0.69 to 0.78, the Cronbach's alpha coefficient was applied to the risk perception and attitude scale respectively.

A Pilot study

Ten percent of older adults participated in a pilot trial; they were not included in the research's participant pool. The purpose of the pilot research is to determine how clear the tool is and how long it will take to complete. Data gathering techniques were modified as needed based on the pilot study's findings. This was done to assess the tools' applicability, test the questions' phrasing, and gauge how long the interview would take. Identifying any obstacles or problems that can arise during data collecting

Method

Administrative stage:

- The director of Sohag University Hospitals received a formal letter of approval from the dean of the faculty of nursing. This letter explains the goal and scope of the study and grants authorization to visit outpatient clinics to conduct it.
- After describing the goal and methodology of the study and gaining their consent to participate in anonymity, each older adult was interviewed one-on-one.

II- Ethical Consideration:

On April 24, 2024, the Faculty of Nursing at Sohag University received clearance from the scientific study ethics council using ethical code number (167). The older people were told about the purpose and nature of the study prior to data collection. They were also given the assurance that the data would be kept private and utilized exclusively for research. The participants were made aware that their participation in the study is entirely voluntary and that they are free to leave at any moment without giving a reason.

The Designed Nursing Instructional Guidelines:

After studying the jury committee's recommendations and existing national and international literature, the researchers created the nursing instructional guideline. Enhancing senior people's awareness, anxiety, and mitigation practices around the issue of climate change is the goal of the guidelines (**Pillemer et al., 2021).** This guideline was implemented in four stages:

A) Assessment phase: After explaining the study's nature and goal to the elderly participants, the researchers requested their consent to participate. During the initial consultation with the patients, the researchers gave an introduction to the participants and explained the nature and goal of the study. Permission from the participants was acquired. The researchers conducted individual interviews with each older person in order to collect demographic data Tool I, climate change awareness questionnaire, Tool II, anxiety scale for climate change, Tool III and mitigation behavior Tool IV.

B) Planning phase: This stage involved setting up the guidelines' conduct, including the teaching location, time, techniques, and supplies.

Teaching place: the curriculum was taught in outpatient clinic lecture hall.

Teaching Time: From 9 a.m. to 2 p.m., the researchers and the elderly participants planned the guidelines' time.

Sessions: There were three sessions in the guidelines.

Teaching strategies and resources: The researchers employed lectures and discussions as teaching strategies. At the conclusion of the seminar, the researchers gave out pamphlets, photographs, and a power slide presentation about climate change to all of the older adults.

C) Implementation phase: For older adults, the nursing instructional guidelines were implemented. Small groups of 10 to 15 elderly people were formed according to their availability and preparedness for presentation. For three weeks, the elderly attended one session lasting thirty-five minutes each week, with varying numbers ranging from five to ten each day, depending on the date of the initial interview. Each session was followed by a 10-minute break.

An introduction to the nursing guidelines and their objectives was given. Considering the use of basic language appropriate for the patients' level, each session began with a recap of the previous sessions' contents and the goals of the current one. Three sessions were used to apply the nursing educational guidelines that were created.

During the first session, the older adults were given an overview of climate change, including its definition, causes, forms, experiences, and effects on human health, the environment, and society. The researcher also administered a pretest utilizing all the study instruments.

The second session started by reviewing the previously provided information. Then, through lectures and discussions, the elderly were given information about the relationship between food and climate change, food-friendly environments, and mitigation behavior related to protective measures against climate change events. The focus was on preventive strategies to adopt during extreme temperatures, severe cold spells, elevated air pollution levels, and winter rainfall.

-Designed nursing instructional guidelines during high temperatures

-Designed nursing instructional guidelines during extreme cold waves.

-Designed nursing instructional guidelines during periods of high air pollution.

-Designed nursing instructional guidelines in order to prevent infectious diseases,

-Designed nursing instructional guidelines during the winter rains,

The third Session: started with a review of the previously presented material, and then, using video resources for clarity, taught the patient vital practical skills through repeated demonstrations of how to wash their hands properly, how to wash their fruits and vegetables, and how to breathe to lessen the effects of air pollution.

Informed by the pretest evaluation of the requirements of the elderly, the implementation phase got underway right away. It used a variety of illustrative media, such as PowerPoint presentations, posters, and booklets, to convey climate change protection strategies.

Additionally, when the proposed nursing instruction guidelines were implemented, researchers produced an illustrated booklet for older adults to use as a reference. They then gave a ten-minute summary of the program's contents. The researchers scheduled a follow-up appointment and monitored the older person's compliance with climate change education. Informed by the pretest evaluation of the requirements of the elderly, the implementation phase got underway right away. It used a variety of illustrative media, such as PowerPoint presentations, posters, and booklets, to convey climate change protection strategies. Additionally, when the proposed nursing instruction guidelines were implemented, researchers produced an illustrated booklet for older adults to use as a

reference. They then gave a ten-minute summary of the nursing guideline contents.

D) Evaluation phase: After four weeks of the guidelines' implementation, an evaluation was conducted. When the participants visited outpatient clinics for follow-up visits, the researchers scheduled a phone follow-up with them to conduct the post-test. This was done using the pretest questionnaire (Tool (II), Tool (III), and Tool (IV)) to assess the impact of the nursing instructional guidelines on enhancing the older persons' climate change awareness, anxiety, and mitigation behaviors.

Field of work:

The researchers started gathering data in the aforementioned outpatient clinics on May 1st, 2024, and continued for six months, ending at the end of October 2024 (two months for the assessment phase and four months for the implementation and evaluation phase). They met with an average of two to four elderly people every day for two to four hours each, with each interview lasting roughly thirty to forty-five minutes. Following their introduction, discussion of the purpose, length, and activities of the study, and oral agreement obtained during the first contact, the researchers filled out the structured form and finished the pretest. The educational program's contents were explained in three sessions as part of the pretest. All participants received a handout booklet in Arabic at the conclusion of the posttest, which was conducted one month later. Following their introduction, discussion of the purpose, length, and activities of the study, and oral agreement obtained during the first contact, the researchers filled out the structured form and finished the pretest.

Statistical analysis

The Anderson-Darling test was used to check the data for homogeneity variances and normality before any statistical analysis. The mean and standard deviation were used to describe continuous variables, whereas the number and percentage were used to represent categorical variables. Two methods for comparing categorical variables are the chi-square test and the Fisher exact test. All analyses used IBM SPSS 20.0 software, and a two-tailed $p < 0.05$ was deemed statistically significant.

Results:

Table (1): shows 78% of the elderly were in the 60–70 age range. Fifty-five percent of them were married, and over half (58%) were women. In terms of education, almost one-quarter (27.0%) of the elderly had only completed primary school. However, 56% of the elderly came from rural regions.

Figure (1): shows a strong statistically significant difference (P-value<0.001) between the elderly's knowledge before and after the implementation of climate change nursing guidelines.

Figure (2): demonstrates that, following program implementation, older adults' views of the risks associated with climate change increased (P-value<0.001).

Table (2): demonstrates that 48% and 45.0% of older people get their information and perspectives from television and research from colleges and universities.

Figure (3): shows that when the nursing guideline was implemented, the elderly's attitude toward climate change improved (P-value <0.001).

Figure (4): demonstrates that older individuals' anxiety levels regarding climate change are considerably reduced when the nursing instructional instructions are used (P-value <0.001).

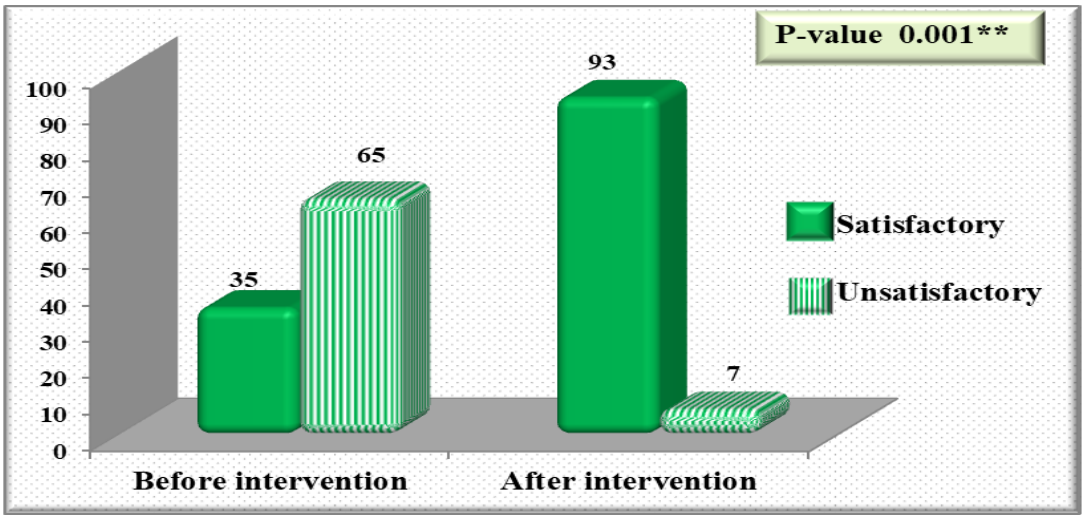
Table (3): Illustrate that There was high statistical significant difference between elderly's mitigation behaviors before and after implementation of climate change nursing guidelines with P-value <0.001

Table (4): shows a highly significant positive association (P-value =0.016, 0.001) between the age, education, and total knowledge scores of seniors after the nursing guideline was implemented. Elders' gender, place of residence, and perceptions following the nursing guideline's adoption were shown to be statistically significantly positively correlated (P-value =0.002, 0.007). Additionally, once the nursing guideline was implemented, a statistically significant positive association was discovered between the seniors' educational background and attitude (P-value =0.023).

Table (5): indicates that there is a very significant positive association between the elderly's mitigation behavior, anxiety, and risk perception, as well as a highly statistically significant positive correlation between their knowledge and mitigation behavior. Furthermore, there is a positive association that is highly statistically significant between the elderly's anxiety, perception, attitude, and mitigation action.

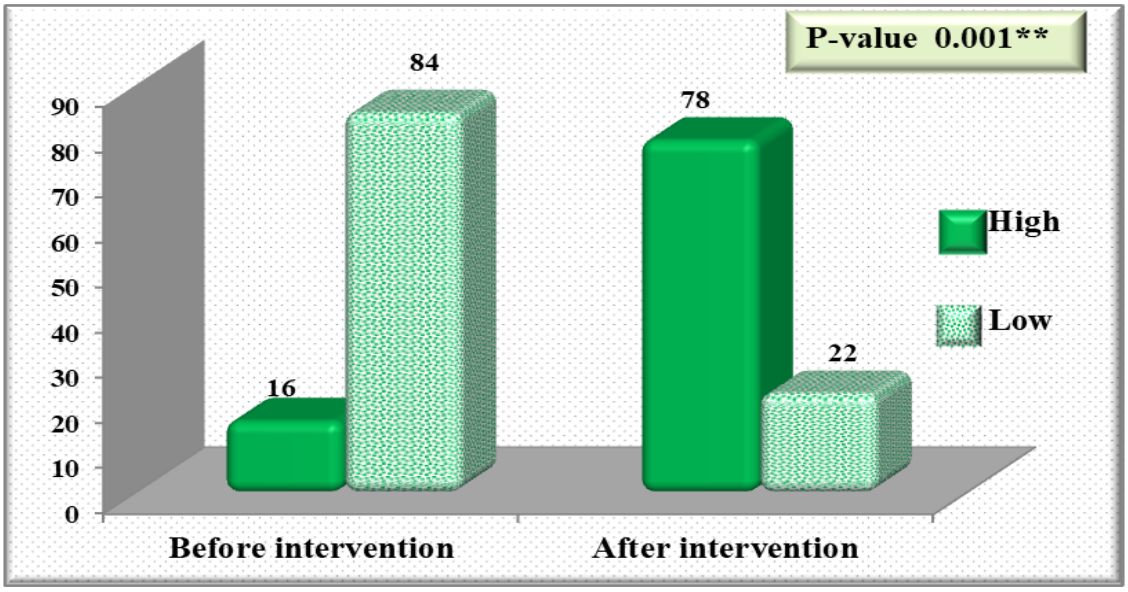
Table (1): Distribution of elderly people according to their demographic characteristics (n=100)

Demographic characteristics	N=100	%
Age/ years		
60-70	78	78.0
71-80	17	17.0
More than 80	5	5.0
Gender		
Female	58	58.0
Male	42	42.0
Residence		
Rural	56	56.0
Urban	44	44.0
Marital status		
Married	55	55.0
Single	10	10.0
Widower	24	24.0
Divorced	11	11.0
Educational level:		
Illiterate	23	23.0
Read and write	22	22.0
Primary	27	27.0
Preparatory	10	10.0
Secondary or technical	8	8.0
University	10	10.0
Occupation		
Housewife	30	30.0
Craft work	7	7.0
Retirement	15	15.0
Free or private work	16	16.0
Not working	32	32.0
Living condition		
Alone	26	26.0
With husband or wife	41	41.0
One of the children	25	25.0
One of the grandchildren	8	8.0
Income		
Enough	21	21.0
Not enough	79	79.0



McNemar test (**) highly statistical significant difference

Figure (1): Knowledge of elderly people about climate changes before and after implementation of nursing guideline.

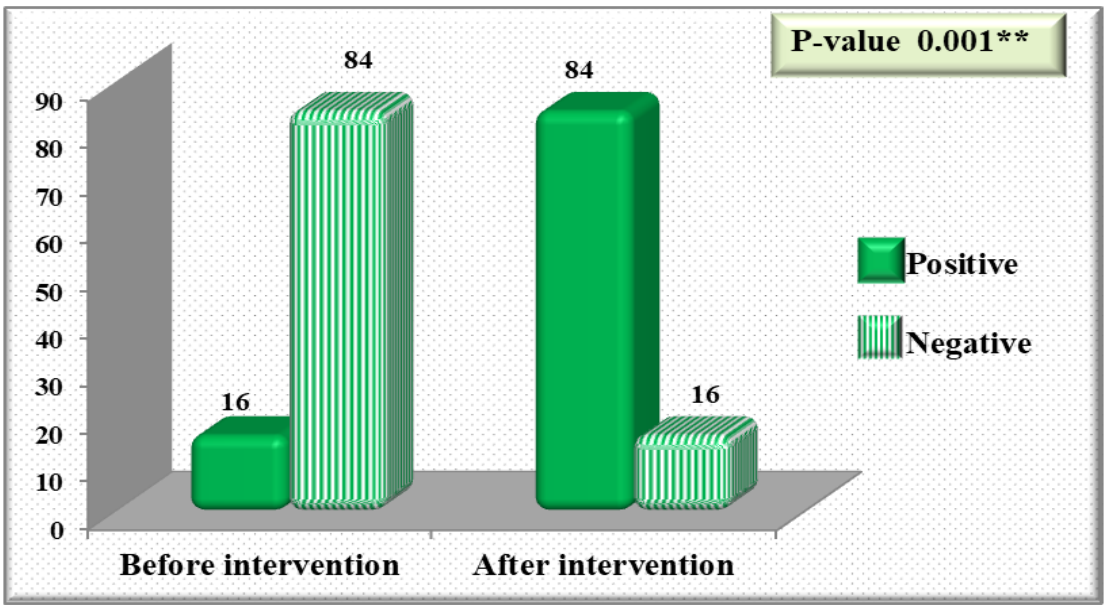


(**) highly statistical significant difference

Figure (2): Risk perception of elderly people about climate changes before and after implementation of nursing guideline.

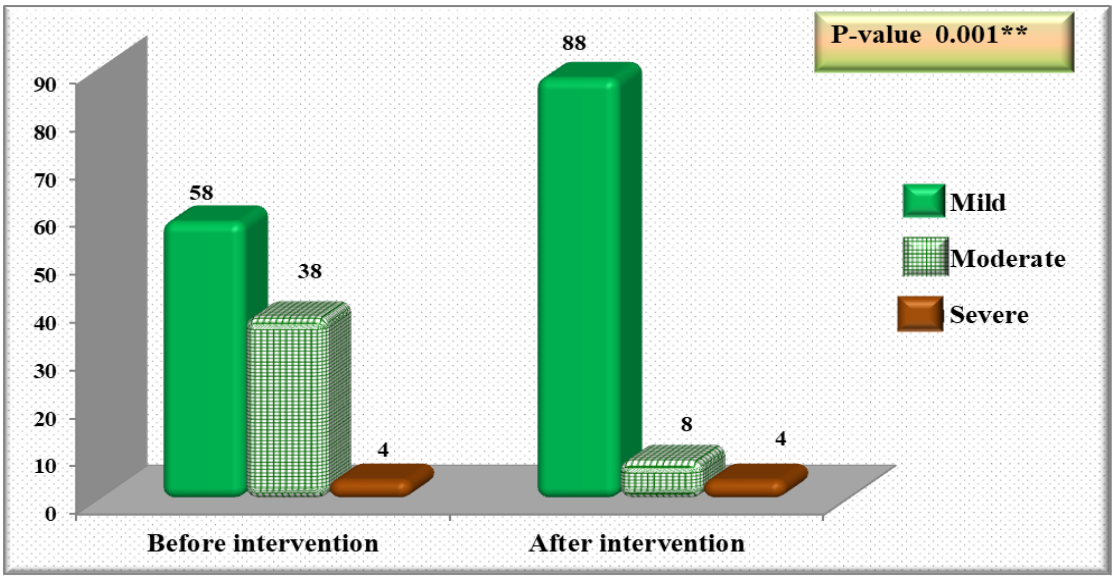
Table (2): Source of knowledge and risk perception of elderly people about climate changes (n=100).

Item	Source of knowledge and risk perception about climate changes			
	Yes		No	
	N	%	N	%
Internet and social media	27	27.0	73	73.0
Governmental and official websites	8	8.0	92	92.0
TV programs	48	48.0	52	52.0
Books and newspapers	4	4.0	96	96.0
Family and friends	14	14.0	86	86.0
Seminars and educational programs	10	10.0	90	90.0
Studying at school or university	45	45.0%	55	55.0



McNemar test **(**) highly statistical significant difference**

Figure (3): Attitude of elderly people regarding climate changes before and after implementation of nursing guideline.



McNemar test **(**) highly statistical significant difference**

Figure (4): Anxiety of elderly people regarding climate changes before and after implementation of nursing guideline.

Table (3): Mitigation behavior of elderly people regarding climate changes before and after implementation of nursing guideline (n=100)

climate change mitigation behaviors	Before intervention		After intervention		P-value
	N	%	N	%	
High mitigation behavior	12	12.0	71	71.0	
Low mitigation behavior	88	88.0	29	29.0	**0.001****
Total climate change mitigation behaviors (mean±SD)	**20.140±3.513**		**26.040±5.793**		**0.001****

McNemar test

(**) highly statistical significant difference

Table (4): Correlation between demographic' characteristics of elderly with their knowledge, perception, attitude, anxiety, mitigation behavior after implementation of nursing guideline (n=100).

Demographic' characteristics		after implementation of nursing guideline				
		Knowledge	Perception	Attitude	Anxiety	Mitigation
Age	Pearson Correlation	-.241-*	0.126	0.113	0.028	-0.136-
	Sig. (2-tailed)	٠.016	0.211	0.263	0.781	0.179
Gender	Pearson Correlation	٠.138	0.305**	-0.053-	0.025	0.109
	Sig. (2-tailed)	٠.171	0.002	0.601	0.807	0.279
Residence	Pearson Correlation	٠.160	0.269**	0.069	0.092	0.255*
	Sig. (2-tailed)	٠.113	0.007	0.495	0.364	0.010
Marital status	Pearson Correlation	٠.085	0.051	-0.007-	-0.273-**	-0.127-
	Sig. (2-tailed)	٠.402	0.614	0.947	0.006	0.209
Education	Pearson Correlation	0.314**	0.016	0.227*	0.109	0.438**
	Sig. (2-tailed)	٠.001	0.875	0.023	0.282	0.000
Occupation	Pearson Correlation	-.147-	-0.101-	0.034	0.021	-0.068-
	Sig. (2-tailed)	٠.144	0.317	0.737	0.835	0.504
Living condition	Pearson Correlation	-0.053-	-0.135-	0.156	0.143	-0.130-
	Sig. (2-tailed)	0.599	0.180	0.122	0.157	0.196
Income	Pearson Correlation	-0.057-	-0.187-	-0.030-	-0.160-	-0.293-**
	Sig. (2-tailed)	0.572	0.062	0.764	0.113	0.003

Pearson test (**) Highly Statistical significant difference (*) Statistical significant difference

Table (5): Correlation between knowledge, perception, attitude, anxiety, and mitigation behavior of elderly after implementation of nursing guideline (n=100).

Items		after implementation of nursing guideline				
		Knowledge	Perception	Attitude	Anxiety	Mitigation
Knowledge	Pearson Correlation		0.098	0.085	-0.002-	0.605**
	Sig. (2-tailed)		0.333	0.398	0.983	0.000
Perception	Pearson Correlation	0.098		0.029	0.562**	0.489**
	Sig. (2-tailed)	0.333		0.775	0.000	0.000
Attitude	Pearson Correlation	0.085	0.029		0.418**	0.095
	Sig. (2-tailed)	0.398	0.775		0.000	0.348
Anxiety	Pearson Correlation	-0.002-	.0562**	0.418**		0.487**
	Sig. (2-tailed)	0.983	.000	0.000		0.000
Mitigation behaviors	Pearson Correlation	0.605**	0.489**	0.095	0.487**	
	Sig. (2-tailed)	0.000	0.000	0.348	0.000	

Pearson test

(**) Highly Statistical significant difference

(*) Statistical significant difference

Discussion

Climate change poses a hazard to the health of the elderly and is regarded as one of the most important environmental challenges of the twenty-first century. Raising local knowledge of climate change is essential as its effects are making disasters more frequent and severe in this disaster-prone nation. It is also vital to determine the awareness and perceptions of risk among the elderly with reference to climate change **(Amin et al., 2024).** The current study therefore sought to assess the impact of nursing instructional guidelines about climate change on older adults' knowledge, anxiety, and mitigation practices.

In terms of older adult demographics, the present study revealed that the bulk of the senior participants were between the ages of 60 and 70, that over half of them were married, from rural regions, and that over 25% had only completed basic school. Over one-third were unemployed, two-fifths were living with their spouses, and three-quarters reported having insufficient income.

This is in contrast to the findings of **Abdullah et al. (2022),** who investigated Health Risks Related to climate changes among older adults and discovered that men make up over half of the population.

Our study of older persons' knowledge and perceptions of risk related to climate change found that, before the recommendations were put into effect, over one-third of them had a sufficient level of understanding about climate change, but the great majority (93%) did so after they were put into effect. When it came to risk perceptions around climate change, it was discovered that, before the guideline was put into effect, fewer than one-fifth of the elderly had high risk perceptions, but three-quarters of them did so after it was put into effect. In my opinion this may be related to positive impact of nursing guideline on elderly knowledge and risk perception.

This is consistent with the findings of **Ahmed et al. (2024),** who investigated effect of instructional guidelines regarding climate change on nurses' knowledge and its relation to environmental sustainability practice. They discovered that nurses' knowledge of all aspects of climate change improved significantly before and after the implementation of the instructional guidelines. Similarly, after completing a training program that incorporated scenario-based learning and augmented reality relevant to

sustainability, climate change, and health, the great majority of the investigated sample had good or highly satisfactory knowledge, according to **Álvarez-Nieto et al. (2022).**

In their study of the effect of awareness program regarding climate change on knowledge, attitudes and practices of university students, **Ghazy & Fathy (2023)** discovered a highly statistically significant difference between the preprogram and postprogram.

Accordingly, **Ibrahim et al.'s (2022)** study, "The effectiveness of educational interventions about sustainability development among nursing students" in Egypt, supports the study's findings. It found that most students lacked adequate knowledge of climate change prior to the educational intervention. However, after the intervention, understanding of climate change and sustainability advancements significantly improved. Additionally, about two-thirds of the participants had adequate knowledge, according to **Amin et al. (2024).** In addition, a majority of participants saw climate change as a greater risk.

Almulhim's (2021) research on "public knowledge and perception of climate change and global warming in the context of environmental challenges and policies in Saudi Arabia" supports this finding. The study found that one-third of the participants lacked adequate knowledge of the causes and effects of climate change. Additionally, in the posttest, over 25% of the sample under study demonstrated a high level of knowledge and awareness regarding climate change. According to the researcher, it demonstrated the benefits of putting educational standards into place for senior citizens to increase their understanding of climate change.

Regarding the sources of information and perceptions of danger regarding climate change, we discovered that prior to the introduction of the guidelines, the elderly derived their knowledge and perceptions of risk from their education at school or university, television, and social media. In a similar vein, the majority of respondents to the study by **Fathy et al. (2024),** which examined the **e**ffect of educational program regarding climate change on nursing students' awareness, attitude and practices in Suez Canal University, stated that they learned about Global Warming and Climate Change (GWCC) and its effects from the internet, television, school, family, and friends.

Based on the attitudes of the elderly toward climate change before and after the nursing instructional guideline was implemented, we discovered a highly statistically significant improvement in the elderly's attitudes following the nursing guideline's adoption. According to this study**, Ghazy & Fathy (2023)** discovered that the majority of nursing students' positive attitudes toward climate change improved after the program, reaching less than half of their pre-program levels. This improvement was statistically significant. These findings were corroborated by another research conducted by **Tiong et al. (2020),** who found that most of their study participants had very favorable sentiments.

Regarding elderly people's anxiety about climate change before and after the guidelines were implemented, the current study showed that almost two-fifths of the elderly had a moderate level of anxiety about climate change before the program was implemented, compared to 8% after. The anxiety levels of the elderly before and after the adoption of climate change recommendations differed in a highly statistically significant way. This may be due to that anxiety levels among older adults may be positively impacted by improvements in knowledge, attitude, and mitigating behavior.

According to the current study, older individuals' climate change mitigation practices improved before the guideline was put into effect as opposed to after implementation. Furthermore, the difference between them is statistically significant. **Ibrahim et al.'s (2024)** study on self-care guidelines for older adults' climate change protective measures supports ours. They found that 50% of the elderly participants had a firm grasp of the topic prior to the self-care guidelines' implementation. The mean score for appropriate protective practices was 68.35 (SD = 23.81), which also demonstrated statistical significance (p=0.01), and this percentage rose to 61.5% (p=0.01) after these rules were introduced. Additionally, the study Climate Change and Health: Effect of Awareness Program on Knowledge, Attitudes, and Practices of Community Dwelling Elderly **Elsayed et al., (2023)** found that, three months after the awareness program was implemented, the elderly's overall mean score of knowledge, practices, attitudes, and awareness had significantly improved (P=0.000**).

According to the researcher opinion, these findings may be the consequence of the majority of older

individuals' ignorance of climate change adaptation strategies and their lack of skills, which improved following the adoption of nursing instructional standards.

As regard the relationship between the demographics of the elderly and their overall knowledge, perception, attitude, anxiety, and mitigation practices in respect to climate change. A strong statistically significant relationship between older individuals' sociod-emographic traits and their overall understanding of climate change was discovered by **Abdullah et al. in 2022**, with a p-value of 0.000**. Higher educated older folks were better informed than their counterparts.

This conclusion is corroborated by **Yang et al. (2020),** who conducted research in Singapore on "how is climate change knowledge distributed among the population in Singapore? Higher educated older persons know more about climate change than those without higher education, according to research showing a favorable correlation between education and knowledge. However, age was not a significant predictor of risk perception in a research by **Elshirbiny & Abrahamse (2020)** on the public's perception of climate change risk in Egypt.

Furthermore, in order to direct climate services activities in the east African area, **Steynor et al. (2021)** examined the relationship between behavior and perceptions of climate change risk. They found that age, gender, and education had no discernible effects on perceptions of the risk posed by climate change. These findings are contradictory. This might be explained by their study's emphasis on social standards and psychological intimacy.

The findings contradict those of a research by **Salem et al. (2022)** on the knowledge and attitudes of a sample of the Egyptian general public on climate change. They discovered that individuals who were married, lived in an urban area, and had a job had statistically greater levels of awareness on climate change.

This study found a highly statistically significant positive correlation between the elderly's total knowledge and mitigation of climate change after the nursing guidelines were implemented (P =.000). The correlation was based on the elderly's post-total knowledge, mitigation behavior, and attitude toward climate change. This is consistent with **Ghazy & Fathy (2023),** who discovered a strong positive connection (r=.980 & r=.839) between the post-program

total knowledge score level and mitigation behavior at $p < 0.001$.

In their study of the effects of an awareness program on nursing students' knowledge, perceptions, and daily life practices regarding the health consequences of climate change, **Abdallah & Farag (2022)** who studied impact of awareness program regarding health consequences of climate change on knowledge, perception and daily life practices among nursing students, discovered a strong positive correlation between the post-test results for total knowledge level and perceptions and daily life practices. These findings supported the study's premise that the awareness program's deployment has already enhanced people's understanding, attitudes, and day-to-day behaviors related to climate change. Additionally, following the implementation of the study, **El-sayed et al. (2023)** discovered a statistically significant strong positive correlation between the elderly participants' total knowledge score and their total practices, attitudes, and awareness scores.

Conclusion

The current findings showed that once the nursing instructional guidelines on climate change were implemented, older adults' knowledge, anxiety, and mitigation behavior improved.

Recommendations

Based upon the current findings, the following recommendations are suggested:

-Conducting educational programs and workshops to raise the elderly awareness concerning climate change

-Using social media platforms to enhance the elderly knowledge and foster their risk perception concerning climate change.

-Developing climate change hotlines to answer any queries of the citizens

-Conducting community mobilization campaigns to raise the community awareness concerning climate change especially among the rural residents

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