# Effect of Health Education on Improving Elderly Awareness Regarding **Coronavirus and its Variants**

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### Abstract

Background: Coronavirus is naturally mutating over time, producing new variants with genetic changes, it is an airborne virus, that causes illnesses varying in severity, mortality rate rises in the age groups above 60 years. Aim: To evaluate the effect of health education on improving elderly awareness regarding Coronavirus and its variants in selected geriatric homes. Design: A quasi-experimental design was used. Setting: This study was conducted at five geriatric homes in Elgeza governorate in Egypt; and involved 120 elderlies. Tools for Data Collection: Three tools were used: I: A structured self-administrated questionnaire sheet included the elderly: a) Sociodemographic characteristics, b) Medical history, c) Coronavirus and its variants Knowledge assessment questionnaire, d) Source of elderly information questionnaire, II: Elderly self-reported attitudes questionnaire, III: Elderly self-reported behavior practices questionnaire, consisted of four parts, a)Elderly self-reported behavior practices questionnaire, b) Self-reported hand washing practice. c)Self-reported face mask wearing and take off and d) Self-reported sneezing and coughing technique **Results:** The mean age was  $65.39\pm3$ , there was an improvement in the satisfactory knowledge total percentage post-health education compared with pre-health education with a statistically significant difference, more than one-third had an unsatisfactory self-reported performance of hand washing, wearing off and take off face mask, coughing and sneezing performance pre-health education which turned to satisfactory self-reported performance for the majority of the elderly under the study post- health education with a highly statistically significant difference. Conclusion: Elderly knowledge reported practices and attitudes toward Coronavirus and its variants improved after delivering health education compared to pre-health education. Recommendations: Provide further health education to improve the elderly awareness regarding Coronavirus and its variants for positive awareness, especially in crowded settings such as geriatric homes, elderly clubs, and places for warships (mosques and churches).

Keywords: Awareness, Coronavirus and its variants, and elderly.						
Introduction	Coronavirus and its variants cases and more					
	then 5.5 million related deaths mean and the					

Coronavirus is mutating producing new variants with genetic changes. Some of these variants are speedier contagious and harmful than previous waves, creating new challenges to the global healthcare systems. The new variants might have a very rapid spreading capacity, causing disease severity (Islam, et al., 2022). The world is suffering from waves of Coronavirus pandemic and variants of this virus in the form of Alpha, Beta, Gamma, Delta variants, and the most recent variant is Omicron. More than 349 million confirmed

than 5.5 million related deaths were reported, as of January 24, 2022 (WHO, 2022).

Elderly, over 65 years account for 9% of the world's population, one-third of all deaths in the elderly are due to infectious diseases (Centers for Disease Control and Prevention, 2022) because they have weaker immune systems due to physiologic changes associated with aging leading to a prolonged and more severe infectious course (Gustafson et al., 2020).

Coronavirus and its variants virus is an airborne infection, caused by SARS-CoV-2, particles found in air that have viral content, it can travel meters and can affect the entire population. Coronavirus and its variants can affect many systems in the human body. Still, older adults with this infection develop new conditions, (Cohen et al., 2022), besides the virus that causes Coronavirus and its variants.

Several new variants that are different from the original variants with genetic changes are expected to enhance the virulence and transmissibility of the virus, which has been identified as causing community transmission in many countries and pose a potential global public health risk (Centers for Disease Control and Prevention, 2023).

Elderly staying in nursery homes generally live in close and sometimes crowded areas and have close contact with workers such as home aides or caregivers, facilitating the spread of the viral infection (**Clarke**, 2021) and (**Bui et al.**, 2020).

Disease awareness is the understanding of a medical condition well in advance so that severe effects can be prevented. A lack of awareness of diseases or knowledge of options for screening and treatment is a serious barrier to health; it can often mean the difference between life and death (Lee, et al., 2020).

Nurses are the initial point of contact for patients and their families, they play an important role in raising health awareness. They are well-placed to educate and raise awareness about healthcare issues (Fooladi, 2015). Therefore intervention to increase elderly knowledge is important to take more assertive and health-promoting measures as elderly behaviors such as correct and continuous hand washing, wearing masks inside and outside in crowded places (Ferreira et al., 2022), covering mouth and nose using elbow or tissue when coughing and sneezing, where respiratory droplets emitted while sneezing, speaking/singing, coughing (Stadnytskyi et al., 2021) Avoiding touching face, social distance, isolation and reducing contacts with other people and unnecessary hospital visiting are other examples of protective measures and

preventing spread of illness (Dadras et al., 2021).

# Significance of the study

Coronavirus and its variants has spread in more than 200 countries all over the world with a mortality rate of about 5.7% (WHO, 2022), In Egypt life expectancy rose from 73.9 years in 2019 to 74.3 years in 2021, so, Egypt is undergoing a demographic transition toward an aging society; meanwhile, people aged 66 and above represented 48.9 percent of the total number of Coronavirus and its variants deaths (Kasemy, et al., 2020). The Egyptian Ministry of Health and Population explained the reasons for the surge in the number of daily infections with Coronavirus to more than 45 percent of infections (Abdel Naby, 2022).

# Aim of the study

The study aims to evaluate the effect of health education on improving elderly awareness regarding Coronavirus and its variants in selected geriatric homes.

## **Research hypothesis**

The health education will positively improve the elderly awareness regarding Coronavirus and its variants in selected geriatric homes.

## **Operational definitions:**

Awareness involves knowledge, practice, and attitude (KAP) regarding the infection prevention of Coronavirus and its variants.

### Subjects and Methods Research Design:

A quasi-experimental design (One group pre-, and post-health education) was used to achieve the aim of the study.

## Setting:

The study was conducted in five geriatric homes in Elgiza Governorates. (Malak El kheer, Malak El Rahma, Al Jasmen, Ahalena and Amal El mostakbal). All the homes under study are privet geriatric homes and consist of private rooms, shared rooms, and more than one reception for the elderly if they want to share watching TV or share in group talking.

# Subjects and Sample Size:

A purposive sample was used in this study with a total of 120 elderly, from a total number of 137 residents, in the studied homes, including 12 elderlies from the pilot study, through three months. The sample size included all the elderly residents in the selected homes, who agreed to participate in the study from the mentioned settings, with the inclusion criteria.

**Inclusion criteria:** Aged 60 years and above, and able to communicate.

**Exclusion criteria:** Elderly with mental illness, inability to talk, and/or refusal to participate in the study.

**Tools of Data Collection:** Three tools were used; they were translated into Arabic language.

Tool I: Self-administrated questionnaire, included four parts:

A) Elderly personal characteristics: It was developed by the researchers; including, age, gender, education, previous occupation, and income.

**B)** Elderly medical history: It included the elderly present medical history as elderly history of chronic diseases and history of Coronavirus immunization.

**C**) Elderly knowledge regarding Coronavirus and its variants questionnaire was determined upon a review of the relevant literature (Zhou et al., 2020) and modified by the researchers, to assess the elderly general knowledge of Coronavirus and its variants. It included 29 questions, divided into five domains; common symptoms (6 questions), risky groups (5 questions), complications of infection (4 questions), preventive and mode of transmission (6 questions), and control measures (8 questions) and answers were either right or wrong.

## Scoring system

A correct response was scored (1) and an incorrect or unanswered question was scored (0). The maximum score was 29, and the minimum was zero. The percentage of the items were summed up and total divided by the number of the items, giving a mean percentage for the domains, and were categorized into; satisfactory knowledge ( $\geq$ 70) and unsatisfactory knowledge (<70) (**Zhou et al., 2020**).

D) Source of elderly information questionnaire: Adapted from Filho et al. (2021) and modified by researchers to assess the source of elderly information, it was divided into three sources; "Tri-media sources" that include TV/radio and the newspaper. The next source was "New media sources" which represent the internet, social media, and short message service (SMS); the last source was friends and family.

Tool II: The elderly self-reported attitudes questionnaire, Adapted from (Akalu and Birhan, 2020, and Burcu et al., 2022) it was modified by the researchers upon a review of the relevant literature to assess elderly attitudes toward Coronavirus and its variants and toward vaccination, it consists of six items.

## Scoring system:

For attitude, one point for a positive attitude response and zero point for a negative attitude response. The maximum score was six, and the minimum was zero. It was categorized into, a score  $\geq$  70 is considered a positive attitude, and a score <70 is considered a negative attitude (Akalu and Birhan, 2020, Burcu et al., 2022).

Tool III: Elderly self-reported behavior practices questionnaire, consisted of four parts:

Part 1: Precautionary behavior practices questionnaire, related to protective measures against Coronavirus and its variants, adapted from Aschwanden et al. 2020, and modified by the researchers to assess elderly precautionary behavior practices toward Coronavirus and its variants, it included 11 questions that covered the following two categories: (1) Preventive measures and (2) social Keeping distancing, questionnaire answers were categorized (yes) or (No).

# Scoring system:

For reported precautionary behavior practices, questions were given one point for positive responses and zero points for unanswered questions or negative responses. The maximum score was 11, and the minimum was 0. A score  $\geq$  70 is considered positive behavior practices and a score <70 is considered negative behavior practices (Aschwanden et al. 2020)

**Part 2: Self-reported Hand Washing practices questionnaire,** to assess elderly persons' ability to correctly wash their hands. Adapted from **Al zoubi, (2020)** and modified by researchers after reviewing the related literature it involved routine hand washing practice, , it consists of 6 items.

Part 3: Self-reported Face Mask Wearing and Taking Off questionnaire, to assess the elderly ability to correctly wear and remove the face mask correctly and discard it, Adapted from Al zoubi, (2020) and modified by the researchers, it consists of six questions, hand hygiene before putting on the face mask, ensuring that the mask covers the nose, mouth, and chin while tightening it against the sides of the face, cleaning hand before taking off the face mask, during removal avoid touch the mask but touch only the elastic bands, ensure proper disposal of the used face mask in a paper bag or a lidded dust bin and perform hand hygiene after disposing of the face mask.

Part 4: Self-reported Sneezing and Coughing Technique questionnaire, To assess elderly person's ability to sneez and cough correctly, Adapted from Al zoubi, (2020) and modified by the researchers, it consists of six steps, turn the head away from others, use a tissue to cover the nose and mouth, drop tissue into a waste bin, or use a sleeve, if there are no tissues available, and clean hands after discarding tissue and clean hands, by using soap and water or alcohol gel for at least 15 seconds (Al zoubi, 2020).

## Scoring system

One point was given for doing a satisfactory response while a zero was given for an unsatisfactory one. The total percentage was calculated, satisfactory reported practice or (complete) ( $\geq$ 50%) and unsatisfactory practice or (incomplete) (<50%) (Al zoubi, 2020).

## **Tool Validity:**

The tools were made on a scientific basis and reviewed by three experts in the field of Geriatric Health Nursing, concerning relevance, comprehensiveness, understanding, and applicability. Corrections were performed according to the modifications needed and were printed on paper.

# **Reliability:**

Reliability was tested statistically for the tools after translation using Cronbach's Alpha to be expressed at 0.813 to ensure reliability before data collection.

## **Pilot study:**

A pilot was carried out to test the feasibility, objectivity, comprehensiveness, and applicability of the study tools on 12 of the elderly under study (10%), According to the result of the pilot study, the questionnaires were assessed as minor modifications were performed, and the pilot sample was included in the main study sample.

## Fieldwork:

This study was conducted in five selected geriatrics homes, located in Elgiza Governorate, between the periods of the  $10^{\text{th}}$  of January to the 10<sup>th</sup> of April 2022, after acceptance of the geriatrics homes administrations. The researcher interviewed the elderly under study three days/week in the activities area of the homes under study and delivered the questionnaire to the elderly, who agreed to participate in the study after explaining the aim of the study to them, every questionnaire took about 30 minutes to be completed.

# The health education was constructed through five phases:

1- **Pre-assessment phase:** The study protocol was approved, and official permissions were obtained from the directors of the selected homes under the study after identification of the purpose of the study.

**2- Assessment phase:**An initial assessment was performed for the participants under study in the previously mentioned settings, before applying the health education, using pre-program assessment tools, the questionnaires were given to the elderly they took about 25-45 minutes for the participants to answer them, and an observational checklist was performed in about 5:10 minutes for every

elderly, to collect the necessary data using the tools I, II, III, and IV the elderly were informed about maintained privacy.

**3- Planning phase:** This phase included the development of health education for Coronavirus and its variants depending on the analysis of the data collected to determine the elderly's educational needs, after reviewing the relevant literature. The researcher developed it in Arabic with large-sized fonts, and attractive colored images were added to cope with the visual changes related to aging to attract the elderly's attention and encourage their learning abilities.

**4- Implementation phase:** Included the delivery of health education; every nursery home under study was visited twice a week, according to the participants' number of it. They were divided into 2 groups at each home, each group composed of about 8-11 participants, and the program was conducted in 6 sessions over 3 weeks, 2 sessions per week, and each session duration took about 30-40 minutes.

## **Content of the health education:**

**The general objective:** To improve elderly awareness in the selected geriatric homes about Coronavirus and its variants infection prevention.

**Specific objectives:** The aim of this study was fulfilled through the following objectives:

- Assess the effect of health education on improving the elderly awareness regarding Coronavirus and its variants on elderly knowledge in the selected geriatric homes.

- Assess the effect of the health education regarding Coronavirus and its variants on elderly self-reported practices in selected geriatric homes.

- Designed and implemented a health education for the elderly, according to their needs, to enhance their knowledge and practices in the selected geriatric homes.

- Evaluate the effect of the health education regarding Coronavirus and its variants on elderly knowledge and self-reported practices and attitudes in the selected geriatric homes. **Program Sessions:** The contents of the program were divided into 6 sessions over 3 weeks two scheduled sessions per week, each session duration took about 30-40 min. The health education was developed based on the general objective to improve the elderly knowledge and performance regards Coronavirus and its variants infection control and prevention, and the content was revised and modified according to the related literature.

## A) Theoretical sessions:

The theoretical part of the health education was divided into two sessions; it included two topics, one topic for each session: the nature of Coronavirus and its variants (definition, modes of transmission, signs, and symptoms when infected with Coronavirus and its variants, people at increased risk, mild and severe complications, daily activities and going out. They included recommendations for the elderly to protect themselves against Coronavirus and its variants and preventive measures such as using only personal tools, good hygiene, avoiding crowded and poor ventilated places, keeping proper physical and social distance between other people, avoiding unnecessary hospital visiting. а recommendation if the visiting hospital is necessary, and healthy nutrition to promote older adult's immunity. They also included coronavirus vaccination of the elderly and vaccination of elderly with health problems or chronic diseases, where and how the elderly can get coronavirus vaccine and vaccine providers near them, and access to reliable technology such as the hotline of coronavirus help in Elgiza Governorate. What to do if he/she is diagnosed with Coronavirus and its variants infection and how to avoid infecting another resident in the nursery home was also explained to the participants.

B) **Practical sessions:** They were divided into two sessions, which included eight topics, four topics for each session, delivered after completing the theoretical sessions: As the proper way to wear and take off the face mask, coughing and sneezing technique (ways to cover mouth and nose during coughing and sneezing), the proper way to open doors, call the elevator, opening doors in public places and switching on and off light with minimal touching using elbow instead of fingers, breathing and coughing exercises, hand washing, using sanitizers and how to deal with shopping bags and, removing them without touching.

**Teaching methods and aids:** The researchers used teaching aids and media such as, educational videos and pamphlets, available in Arabic language. Roleplay, demonstration, re-demonstration, and group discussion were performed where interaction between the participants can stimulate richer responses and allow new and valuable issues to emerge.

**Teaching Time:** It was flexible and decided according to the homes under study timetable of daily routine and elderly time. Sessions were delivered individually for participants if they asked for that or in case, they could not move to the place of teaching in the home due to any reason.

**Teaching place:** The available reception room or activities room.

## 5- Evaluation phase:

Post-health education evaluation was achieved by reassessment of the elderly where the post-health education questionnaire was given to them, using the same tools as in the pre- health education. It started one week after their last session, to compare changes in the elderly's knowledge, reported attitude and selfreported precautionary behavior practices.

## **Ethical Consideration:**

The study was approved by the scientific ethical research committee at the faculty of nursing, Port Said University, code number, NUR (9/7/2023) (27). Explain the aim of the study to each participant included in the study to get his permission to participate, and to be importance familiar with the of his participation. The agreement to participate in the study was taken orally. Participants were assured that their information would be treated confidentially and used for research purposes only. Participants 'anonymity, confidentiality, privacy, safety and protection were secured. The intervention did not have any harmful effect on the participants. The participants were

informed about their rights to refuse or withdraw at any time without giving any reasons and with no consequences.

### Statistical analysis:

Data entry and data analyses were performed using the Statistical Package for Social Science (SPSS version 22). Data are presented as numbers, percentages, mean, and standard deviation. Pearson correlation was performed to measure the correlation between quantitative variables. P. value is considered statistically significant when P < 0.05, and highly significant when P < 0.001.

### **Results:**

Table (1) shows that; the mean age was  $65.39\pm3.226$ , 45% of the elderly under study had diplomas, while 30.8% of them were graduates; university concerning chronic diseases; Table (2) clarifies that, 80% of them had chronic diseases, as 62.5% suffer from arthritis. while 50.8% them had of cardiovascular diseases and 47.5% of them had diabetes mellitus. As well. 45% had hypertension. Whereas 70.8% of them had three diseases or more, 42.7% of the elderly under study had two diseases. Concerning smoking, 11.6% of the elderly under study were smokers. Regarding Coronavirus immunization, 70.8% of the elderly under study received Coronavirus vaccination.

Table (3) reveals that; there were widespread misconceptions about symptoms of infection with Coronavirus and its variants. As only 55.8%, 55.8% and 66.7% of the elderly under study had satisfactory knowledge that the body temperature, elevation in nausea. vomiting, diarrhea, and sore throat (respectively) are from symptoms of Coronavirus and its variants pre-program. This satisfactory knowledge improved to 88.3% and 96.7% (respectively) post-program, with highly statistically significant differences ( $_1x^2 = 20.03$ , and 8.27 at P- value= 0.00).

Concerning elderly knowledge regarding risky groups to Coronavirus and its variants, the same **Table (3)** shows that; only 20% and 24.2% of the elderly in the study had satisfactory knowledge that children and healthcare workers are risky groups for Coronavirus and its variants pre-program, improved to 93.3% and 85.8% satisfactory knowledge post-program, with highly statistically significant difference ( $_1X^2 = 2.143$  and 0.498, respectively at P- value= 0.143 and 0.459 respectively at P. value < 0.001).

In addition. concerning elderly regards complications knowledge as of Coronavirus and its variants the same Table (3) portrays that; 65%, 70%. and 70.8% of the elderly in this study reported satisfactory knowledge that clots in the lungs and parts of the body, cardiovascular complications, and death are from complications of Coronavirus, respectively, pre-program, which improved to satisfactory knowledge (94.2%, 86%, and 86% respectively) post-program with highly statistically significant difference  $({}_{1}X^{2})$ = 13.8,17.8 and, 6.42, (respectively) at P. value < 0.001).

Concerning the elderly knowledge regarding the mode of transmission of Coronavirus and its variants, **Table (3)** clarifies that only 35.8% of the elderly in this study had satisfactory knowledge that Coronavirus and its variants is transmitted by touching the mouth, nose, or eyes after touching contaminated surfaces or objects without hand washing, which improved to satisfactory knowledge (94.2%) post-program with highly statistically significant difference between pre-program and post-program,  $(_1X^2 = 4.151, \text{ at P value } < 0.001)$ .

Additionally, concerning elderly knowledge about preventive and control measures of Coronavirus and its variants, Table (3) also shows that; 60.8%, 64.2, and 66.7%, (respectively) of the elderly in this study had satisfactory knowledge that avoiding kissing, home quarantine for infected persons, avoiding crowded places, are preventive measures for controlling and preventing the spread of Coronavirus and its variants infection in preassessment improved program that to satisfactory knowledge for (91.7%, 91.7%, and 95.8%) post-program, respectively, with highly statistically significant differences between pre and post-program  $(_1X^2 = 16.94, 19.53, and$ 10.43, at P- value < 0.001).

**Figure (1)** illustrates that there is an improvement in the total percentage of satisfactory knowledge pre-health education compared with post-health education with a statistically significant difference between prepost-health education of the total percentages of knowledge.

**Figure (2)** portrays that; 86% and 70% of the elderly under study their main total percentage of knowledge about Coronavirus and its variants is the television and/or radio followed by family and/or friends and 45% of them get their knowledge about Coronavirus and its variants from social media and internet.

**Table (4)** presents that; 60.8%, and 61.7% of the elderly under study, reported a positive attitude toward Coronavirus and its vaccination they were convinced that the Coronavirus vaccine is important and effective, and this reported positive attitude increased post-health education (93.3%, and 92.5%, respectively), with highly statistically significant difference between pre and posthealth education  $(_1X^2=13.31, \text{ and } 15.65, \text{ respectively, at P-value <0.001}).$ 

regards elderly self-reported As precautionary behavior practices toward Coronavirus and its variants, Table (5) clarifies that; 60.8%, 62.5%, and 64.2%, of the elderly under study, respectively reported positive behavior practices such as using hand sanitizers, covering their mouth while sneezing, and hands washing when returning from the outside, these improved to positively reported behavior posthealth education (91.7%, 91.7%, and 91.7%) respectively post-health education with statistically significant differences, between the pre-and post-health education  ${}_{1}X^{2}=$  16.94, 12.82, and 13.80, respectively, at P. value < 0.001).

Concerning elderly total percentage of observed performance of hand washing practice pre-post health education **Figure (3)** portrays that; 41% of the elderly in this study had an unsatisfactory self-reported performance prehealth education that turned to satisfactory one, for 93.3% post-health education with a highly statistically significant difference in the total percentage pre compered to post-health education ( $_1X^2=8.2$  at P. value <0.001).

**Also, Figure (3)** illustrates that; 36.0 % of the elderly in this study had unsatisfactory self-reported performance of face mask wearing and taking off pre-health education that improved to satisfactory one, for 96.7% post-health education with highly statistically significant difference ( $_1X^2$ =17.600, at P. value <0.001).

Additionally, Figure (3) shows that; 60.8%, of the elderly had a satisfactory and self-reported performance of coughing and sneezing pre-health education, which improved to 96.7% Post-health education with a highly statistically significant difference (1X2=9.317, at P. value < 0.00).

Table (1): Distribution of the studied Elderly	According to Socio-demographic characteristics
and Medical History (n = 120).	

Socio-demographic characteristics	No	%		
Age:				
60-	66	55		
70-	39	32.5		
>71	15	12.5		
Mean age	65.39±3.226			
Gender:				
Male	73	60.8		
Female	47	39.2		
Education:				
Illiterate	12	10.0		
Read and write	17	14.2		
Diploma	54	45.0		
University education	37	30.8		
Previous occupation:				
Retirement	93	85.8		
Housewife	17	14.2		
Income:				
Less than expenses	80	66.7		
Equal to expenses	30	25.0		
More than expenses	10	8.3		

Table (2): Distribution of the studied Elderly According to Their Medical History (n = 120).				
Elderly Medical History	No	%		
History of chronic diseases:				
Yes	96	80.0		
No	24	20.0		
Type of chronic disease				
Diabetes mellitus.	57	47.5		
Hypertension.	54	45.0		
Cardiovascular disease.	61	50.8		
Arthritis	75	62.5		
Liver diseases.	43	35.8		
Renal diseases.	30	25.0		
Chronic respiratory diseases.	34	28.3		
Oncology disease	24	20.0		
Present chronic diseases? n=96				
One disease	17	17.7		
2 diseases	41	42.7		
3 diseases and more	68	70.8		
Smoking:				
Nonsmoker	108	90.0		
Smoker	14	11.6		
History of Coronavirus immunization:				
Yes	85	70.8		
No	35	29.2		

According to the research hypothesis:

Fidenle	- been been about Communities and its	Satisfactory Knowledge			D	
variant	ts	Pre- Health	Post- Health	${}^{1}X_{2}$	P- Value	Sig.
C		Education %	Education %			
1. Ele	evation in body temperature	55.8	88.3	20.03	0.00	HS
2. Co	bughing / shortness of breath	73.3	96.7	11.37	0.00	HS
3. Na	usea, vomiting or diarrhea	55.8	88.3	20.03	0.00	HS
4. Los	ss of smell and taste	71.7	95.8	13.19	0.00	HS
5. Soi	re throat	66.7	96.7	8.27	0.00	HS
6. He	eadache and joint pain.	69.2	97.5	6.90	0.00	HS
Risky g	groups:					
1. Eld	derly	73.3	96.7	11.37	0.00	HS
2. Pat	tients with chronic disease	68.3	95.8	11.25	0.00	HS
3. Ch	ildren	20 24 2	93.3 85 8	2.143	0.143	Not S.
4. 110	tients with immunodeficiency diseases	66.7	96.7	8 27	0.439	HS
Compli	ications of infaction:	00.7	90.7	0.27	0.00	115
1. De	eath	70.8	94.2	6.42	0.01	HS
2. Ac	cute respiratory failure	73.3	96.7	11.37	0.00	HS
3. Clots	s in the lung and other parts of the body	65.0	94.2	13.80	0.00	HS
4.Cardi	iovascular complications	70.0	86.0	17.80	0.00	HS
Mode of 1. The cou	of transmission: rough the droplets from the patient while ughing or sneezing	70.0	96.7	3.990	0.46	Not S.
2. By the	v touching contaminated surfaces and objects and en touching the mouth, nose, or eyes.	35.8	94.2	4.151	0.04	HS
3. Dir	rect contact with infected people.	76.7	92.5	0.544	0.46	Not S.
4. Eat	t raw foods, especially meat and eggs	70.8	94.2	6.42	0.011	HS.
5. Sha san	are food and drink utensils (water bottle, spoon, ndwich)	70.0	96.7	9.65	0.00	HS
6. Un ani	pprotected contact with wild animals or live farm imals.	71.7	96.7	10.46	0.00	HS
Preven	tive and control measures:					
1. Imj	portance of frequent hand washing	76.7	97.5	10.11	0.001	HS
2. Use	e a tissue when coughing or sneezing	77.5	99.2	3.47	0.062	HS
3. Phy me	ysical distancing (a distance of at least one ter between one person and the other)	67.5	92.5	20.20	0.00	HS
4. Av	oid shaking hands	70.0	95.8	12.17	0.00	HS
5. Av	oid kissing	60.8	91.7	16.94	0.00	HS
6. We	ear a mask	66.7	95.8	10.43	0.00	HS
<ol> <li>App avo</li> </ol>	ply home quarantine for people with colds and oiding direct contact with them to reduce infection	64.2	91.7	19.53	0.00	HS
8. Av	void crowded places	66.7	95.8	10.43	0.00	HS

 Table (3): Distribution of the Studied Elderlies Regarding Their General Knowledge about

 Coronavirus and its variants (N=120).



Figure (1): Distribution of the Studied Elderlies According to Their Total Percentage of Knowledge (5) Items Selected Regarding Coronavirus and its variants (n=120).

Figure (2): Distribution of the Studied Elderlies according to their Sources of Knowledge about Coronavirus and its variants (n=120).



	Positive				
Elderly attitudes	Pre- Health Education %	Post- Health Education %	<sub>1</sub> X <sup>2</sup>	P- Value	Sig.
1.I think that coronavirus vaccination is effective.	61.7	92.5	15.65	0.00	HS
2.I think that the coronavirus epidemic is something real.	65.8	95.0	12.16	0.00	HS
3.I am convinced of the importance of the vaccine in reducing the spread of the Coronavirus.	60.8	93.3	13.31	0.00	HS
4.I fear post-vaccination symptoms.	76.7	96.7	13.59	0.00	HS
5.I think that vaccination protects from severe infection with the Coronavirus.	65.0	91.7	20.26	0.00	HS
6. I think that coronavirus vaccination is safe.	68.3	95.8	19.53	0.00	HS
Total	66.3%	94.1%	11.61	0.00	HS

Table (4): Distribution of Studied Elderlies Regarding their Attitude Toward Coronavirus and its Vaccination (n=120).

# Table (5): Distribution of Studied Elderlies Regarding Their Reported Precautionary Behavior Practices Toward Coronavirus and its variants (n=120).

Elderly reported precautionary behavior practices		Reported Posi Prac	$\mathbf{v}^2$	D	a.	
		Pre- Health Education %	Post-Health Education %	14	r- Value	51g.
1. out of th	I wash my hands frequently when I'm e house	70.0	95.8	12.17	0.00	HS
2.	I use hand sanitizers like alcohol	60.8	91.7	16.94	0.00	HS
3. coughing	I cover my face while sneezing and g	62.5	91.7	12.82	0.00	HS
4. house	I wear a mask when I'm out of the	70.0	96.7	9.65	0.00	HS
5. nose whe	I avoid touching my face, eyes, and en I'm outside	66.7	95.8	10.43	0.00	HS
6. house	I wash my hands when I enter the	64.2	91.7	19.53	0.00	HS
7.	I put my shoes outside my house	75.8	96.7	12.98	0.00	HS
8. family w	I isolate myself from the rest of the hen I feel symptoms of a cold	66.7	92.5	19.45	0.00	HS
9. infection	Wash my hands to reduce the spread of	78.3	96.7	14.96	0.00	HS
10.	Avoid shaking hands	70.8	95.8	12.67	0.00	HS
11.	Follow the precautionary measures	65.0	94.2	13.80	0.00	HS
Total		62.7%	94.4%	11.34	0.00	HS

Figure (3): Distribution of Studied Elderlies According to Their Total Percentage of Satisfactory Self-Reported Performance of Hand Washing Practice, Reported Performance of Face Mask Wearing and Taking Off, and Reported Performance of Coughing and Sneezing Pre-Post Health Education (n=120).



# **Discussion:**

According to **Table (1)**, the current study showed that more than half of the elderly under study aged 60–65 years, the mean age was  $65.39\pm3.226$ . in addition, 80% of the studied elderly have chronic diseases, **Table (2)**. The previous findings agree with **Li et al., 2020**, who reported that 93.3% of the elderly under study aged 60- 69 years with a mean age of  $65.43\pm3.526$ .

Concerning elderly knowledge regarding symptoms of Coronavirus and its variants Table (3) revealed that; more than half of the studied elderly had satisfactory knowledge pre-health education that nausea, vomiting and elevation in body temperature, are symptoms of Coronavirus or its variants which improved to be satisfactory knowledge for most of the studied elderly posthealth education with highly statistically significant differences. These study's results of the pre-health education assessment contradict those of Okaka and Omondi. 2021. in a crosssectional study conducted at two selected informal nursery homes in Nairobi City among 150 elderly, aimed to assess elderly knowledge perception, and risk regarding levels, Coronavirus and its variants, they found that 96%, 94%, and 32.2% had unsatisfactory knowledge that nausea, vomiting, elevation in

body temperature or sore throat are not from symptoms infection of Coronavirus and its variants. This may be due to the difference in culture.

Concerning elderly knowledge regarding risky groups to Coronavirus and its variants Table (3) showed that one-fifth and about onequarter of the elderly under study had satisfactory knowledge that the children and healthcare workers are risky groups for Coronavirus and its variants pre-health education which improved to satisfactory knowledge for most of them post-health education, with a highly statistically significant difference. These results agree with Adhena and Hidru, 2020, who in a cross-sectional study among 422 elderly aged 60 years or more; they found that 36% of the elderly in the study did not know the highest risk group for Coronavirus and its variants.

As well, **Table (3)** clarified that; nearly one-third of the elderly in the present study had unsatisfactory knowledge about complications of Coronavirus and its variants that clots in the lungs and other parts of the body, cardiovascular complications and death are not from complications of Coronavirus and its variants, pre-Health education which improved to satisfactory knowledge for most of them post-Health education with highly statistically significant differences. These study findings agree with those of **Witharana et al.** (2021), who in their online descriptive crosssectional study to assess, knowledge, attitudes, and practices on long-term complications of Coronavirus, in 201 participants, they found a lack of knowledge about the complications of Coronavirus and its variants, this may be due to the short duration of the pandemic, (two years), and people are not aware of the long-term consequences.

As regards the total percentage of studied elderly knowledge, Figure (1) shows that there is an improvement in the satisfactory knowledge total percentage of post-health education compared with pre-health education with a highly statistically significant difference. This result is congruent with that of El emam El ashri et al. (2021), who in a quasiexperimental study, in one of Egyptian city on 72 elderly residences, in two nursing homes to assess the effect of Coronavirus educational bag on knowledge, attitude and precautionary practices of the elderly persons, they showed that 62.5% of the studied elderly had poor knowledge before implementation of Coronavirus educational bag while there was an improvement in knowledge score after implementation of the educational bag, with statistically significant relation. This may be because the elderly tend to know this disease because they realize its seriousness and its serious effect on them.

The current study results go in the same line as those of **Abd El Aziz and Awad (2022)**, in their quasi-experimental study on 50 elderly aimed to determine the effect of a health education program about Coronavirus on older adults' knowledge, practice, and perception of the Egyptian older adults clubs, there was a highly statistically significant difference between knowledge level for the studied sample in pre and post-test P=0.000 as good knowledge level score increased from 43% in pre-test to 82% in post-test.

Concerning sources of elderly knowledge regarding Coronavirus and its variants **Figure (2)** illustrates that; the majority of the studied elderly main source of knowledge about Coronavirus and its variants is the television and/or radio. This study result is in accordance with that of Filho et al. (2021), who in a cross-sectional study, of 30 elderly to knowledge levels concerning investigate Coronavirus in elderly patients with type 2 diabetes mellitus; they found that their most information source reported was television. This may be because the elderly participants in the present study had low levels of education, which may have impaired their access to online information. Besides, the availability of TV sets in most of their rooms is an easy source of knowledge.

Regarding elderly attitudes toward Coronavirus and its variants and toward Coronavirus vaccination. table (4) shows that: more than one-third of the studied elderly had a negative attitude toward Coronavirus and its variants as they believe that the Coronavirus vaccine has no importance and thought that it is not effective and were convinced that it does not protect from severe infection. Besides, this negative attitude turned to a positive attitude post-program for most of the elderly under study with highly statistically significant post-health differences between pre- and education. These results disagree with those of O'Conor et al. (2020), who in a longitudinal survey of 673 elderly to characterize high-risk adults' knowledge of Coronavirus and its variants symptoms and prevention behaviors they found that; more than four-fifths of the studied sample reported that they are convinced about preventive measure for Coronavirus infection.

regards As elderly self-reported precautionary behavior practices toward Coronavirus and its variants Table (5) clarifies that: about two-fifths of the studied sample. reported negative behaviors such as neglecting to use hand sanitizers, and not covering their face while sneezing and coughing, neglecting their hands wash when returning from outside all these reported behaviors improve to positive behavior post-program for most of the elderly, post-program with highly statistically significant differences between pre and post-program. This may be because people need to believe that washing hands would keep

them from being infected rather than informed so, to perform and sustain the positive behavior.

The previous findings are in the same line with those of **Adhena and Hidru**, (2020), who found that 36.5% of the participants were not covering their mouth and nose with any material or tissue during sneezing and coughing, 56.6% of the participants neglected washing their hands and touch their eyes and nose before washing their hands by water, soap, or using a hand sanitizer daily.

Figure (3): Based on the overall total percentage practices, the current study findings revealed highly statistically significant differences between the total percentage of the studied elderly of observed satisfactory performance of the hand washing practice prehealth education from nearly two-thirds which improved to satisfactory performance for most of the elderly post-health education. The results go with that of Yang et al. (2019), in a community health survey among Korean adults who had received education on correct hand washing aimed to examine associations between hand-washing education and self-reported handwashing behaviors, they found that the majority had higher scores in both self-reported handwashing method and self-reported handwashing frequency than did those who did not have such experiences. The researchers view that even without the risk of Coronavirus, seniors should focus on keeping their hands and living spaces clean and sanitary.

This result agrees with that of Pui-Lai et al. (2020), who in a cross-sectional study that included 433of elderly aged 65 or above, in Hong Kong, to investigate the association between health literacy and hand hygiene practices of older adults, they found that 62% with improper hand hygiene practices, they explained that hand washing is an effective way to prevent transmission of infectious diseases. Possible explanations of such results are that education and promotional materials about hand washing may change individuals' awareness of hand washing.

Concerning the elderly total percentage of the self-reported performance of face mask wearing and taking off practice **Figure (4)**  illustrates that: more than one-third of the elderly under study had an unsatisfactory selfreported performance of face mask wearing and take off pre-health education, which improved to satisfactory one, for the most of them posthealth education with highly statistically significant difference. The pre-health education result goes in the same line as that of Kasemy et al. (2020), who in a cross-sectional study of 3712 participants to assess the level of knowledge, attitude, and practice (KAP) among Egyptians toward Coronavirus, they found that; 64.1% had satisfactory facemask practices, the research results go in the same line with that of (lee et al. (2020), who in a cross-sectional descriptive design, in Hong Kong, of 1500 adults to compare the differences in practice and technique amongst adults, they found that; none of the participants performed all the required steps in using face mask correctly.

Considering the elderly total percentage of the self-reported performance of coughing and sneezing practice Figure (5) shows that; slightly less than two-fifths of the elderly in the present study had an unsatisfactory self-reported performance of coughing and sneezing prehealth education which improved to satisfactory performance for the most of them post-health education with a highly statistically significant difference. This result goes in the same line with Toama et al. (2021) in a quasiexperimental study, of two geriatric clubs, in one of Egyptian cities, aiming to investigate the effect of a health education program for Coronavirus and its variants on knowledge, perceptions and practice among the elderly, who found that 29.2%, of the elderly reported, cover their nose and mouth during coughing or sneezing with the elbow pre-program, improved to 94.2% post-health education.

## Conclusions

According to the present study findings and research hypothesis, the mean age of the elderly in the study was  $65.39\pm3.226$ . Highly statistically significant differences were found between the total percentage of satisfactory knowledge pre-health education compared to post-health education implementation. The health education has positively affected the elderly knowledge; reported precautionary practices and self-reported attitude regarding elderly Coronavirus and its variants infection control and prevention with statistically significant differences between pre-program and post-health education implementation.

### **Recommendations:**

Based on the findings of the present study, the following recommendations are suggested:

1) Providing further health education for the elderly on control and preventive measures for Coronavirus and its variants for positive awareness.

2) Providing health education for the elderly with chronic diseases on control and preventive measures for Coronavirus and its variants to empower and improve their awareness.

3) Emphasize the importance of adherence to the precautionary measures for the elderly for control and prevention of Coronavirus and its variants in all elderly crowded settings such as geriatric homes, places for a warship (mosques & churches), and elderly clubs.

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### Conflicts of interest disclosure:

The authors declare that there are no competing interests.

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