Effect of Covid-19 Educational Bag on Knowledge, Attitude and Precautionary Practices of Institutionalized Elderly Persons

Neamit Ibrahim Elemam Elashri[1], Heba Ahmed Mohammed Elfadawy[2] & Raefa Refaat Alam[1]

(1) Assistant. Professor of Gerontological Nursing, Faculty of Nursing, Mansoura University, Egypt
(2) Lecturer of Gerontological Nursing, Faculty of Nursing, Mansoura University, Egypt

Abstract

Background: The COVID-19 pandemic is affecting the worldwide population drastically. Elderly people face significant risks of having severe illness if they are diseased because of their physiological changes associated with aging and the possible outcome of underlying health statuses. Public awareness about dealing with highly infectious respiratory diseases is extremely important and plays an imperative role in limiting and preventing the widespread of infection, especially in countries with low and middle-income. **Aim:** Assess the effect of Covid_19 Educational Bag on Knowledge, Attitude and precautionary Practices of institutionalized Elderly persons . Methods: A quasi-experimental study design was used. This study was carried out at El Amal elderly home, affiliated to Mansoura City and Dar El-Walaa affiliated to Meet khamr city-Dakahlia governorate-Egypt. The study involved a convenience sample of 72 elderly persons who are residence at El Amal and El Walaa elderly homes. Data collected over a period of 6 months from first of April 2020 till the end of September 2020.**Tools:** Four tools were used for data collection; Demographic and Clinical Data structured Interview Sheet, and Elder's Covid-19 Knowledge Questionnaire, Elder's Attitude towards Covid-19 Questionnaire, and Covid-19 Precautionary Practices Checklists .**Results:** Two thirds of the studied elders were selected from dar El Walaa, nearly one half of the subjects were middle old with a mean of 66.57±4.08 yrs. More than one half of the sample were females**.** A statistically significant improvement of COVID-19 knowledge, attitude, and precautionary practices of the studied elders immediately after implementation of COVID-19 educational bag than before it, and the improvement still apparent across all the studied sample regardless of their demographic characteristics and clinical data. The studied elders COVID-19 knowledge levels were positively associated with their attitude and precautionary practice. While no proven relation was found between studied elders COVID-19 attitude and precautionary practices **Conclusion:** A significant improvement of the studied elders means of score of COVID-19 levels of knowledge, attitudes and precautionary practices immediately, and two months after implementation of COVID-19 educational bag regardless of their demographic characteristics and clinical data. Recommendation: Development of an educational programs targeting vulnerable elderly population institutionalized in elderly homes in various Egypt governorates, designing a long-term plan by healthcare authorities to improve access to education and health services.

Introduction

At the end of 2019, the coronavirus disease (COVID-19) arose in China, and in Wuhan, and has spread to more than 200 countries and the World Health Organization (WHO) has been declared it a global pandemic. Up to the present time, there are over 5.6 million COVID-19 recorded positive cases with at least 350,000 deaths worldwide. Generally, health governments and authorities are warning elderly people who are at higher risks of more serious and possibly fatal disease associated with COVID-19 **(Azlan, et al., 2020).**

The mortality rate of the COVID-19 virus is higher than common contagious diseases. Oxford COVID-19 Evidence Service (25th March 2020) shows a 3.6% risk of mortality for elderly people in the age of 60 and increases to 8.0% and 14.8% in the age of 70 and over 80 (**Brooke & Clark, 2020).** The COVID-19 pandemic has focused a spotlight on the

harmful effects of deep-seated sexism, ageism, and racism on elderly people. Probably, these ongoing effects will suspiciously affect the elderly people who've been sicker, and more possible to die from the complications related to that virus (**Morrow-Howell., et al., 2020**). Owing to these unique features, an adequate strategy of management is recommended to combat that virus and save lives (**Baud et al., 2020**).

The COVID-19 pandemic is affecting the worldwide population drastically. In various countries, elderly people are facing the greatest challenges and threats in this period.
While all age groups are at risk of COVID-19, elderly people face significant risks of having severe illness if they are diseased because of their physiological changes that develop with aging and the possible outcome of underlying health statuses (**WHO, 2020**).

COVID-19 has increased the morbidities and mortalities in those with an underlying chronic disease and those with a suppressed immunity despite their ages, and in elderly people who were more vulnerable to have these conditions. While SARS-CoV-2 is severely infectious, there is a difference in its severity and its complications. Severe pneumonia, lung fibrosis, acute respiratory distress syndrome, cardiovascular events, stroke, acute kidney injury, prolonged hospital stay, and mortalities have been reported as results of pathogen-host interactions.

Aging hallmarks, interrelating to each other, have been imposed to impact the healthspan of the elderly, probably through mechanisms that regulate their immune system (**Salimi & Hamlyn, 2020**). As the increased age, health status related to aging, mainly the non-communicable diseases as; cancers, heart diseases, and autoimmune and metabolic diseases, associated with treatments of these diseases and with the immune senescence, substantially affect responses to vaccines and infectious diseases (**Koff & Williams, 2020**). Also, older adults suffer from unfavorable effects on the immune functions as a result of chronic inflammations, known as infammaging. Infammaging is associated with comorbidities such as atherosclerosis, cancers, Alzheimer's or Parkinson's diseases, neurodegenerative diseases,

all of which increase the likelihood of serious progression of viral infection. Also, the aging of the lungs' function and structure contribute to increased incidences of acute respiratory distress syndrome (ARDS), pneumonia, and sepsis in the elderly after respiratory viral infection (**Har-Noy& Or, 2020**). Thus, we know that some older adults are protected with the generally poorly-performing vaccines, and some vaccines work very well in these populations: the shingrix vaccine for shingles, for example, is 90% effective in people over 70 (**Tak, Marciniak, Savage & Ozawa, 2020**).

Fever is the most common clinical manifestation of COVID-19. Also, coughing, malaise, fatigue, and shortness of breath are other common symptoms. Universal concerns regarding that virus have increased owing to its higher transmission capabilities, which may be contributed to higher rates of morbidities and mortalities. The elderly people and patients with comorbid diseases are of higher possibilities to get the infection and are also more predisposed to serious complications, which may be related to ARDS and the cytokine storm (**Abdelhafiz, et al., 2020**). Mainly, the Coronavirus spreads from one person to another by close contacts within around six feet with the infected persons through respiratory; sneezes or coughs or transmitted via touching an object or a surface that the virus settles on it (**Giao, et al., 2020**). Till this time, there is no proven or evidenced treatments or vaccines against the COVID19. Compliance with infection control standard precautions is the primary solution to minimize the spread of that virus in the community and healthcare settings (**Li., et al., 2020**).

Knowledge, attitude and practice is the foreground for public cooperation and backbone for implementing any health policy that enlightens human lives and protects them from ignorance and darkness regarding all life aspect. Knowledge is the fuel that drives human lives, gaining knowledge is considered the main activity that prepares the person for a successful long life. The elderly must be saved from risks and stay strong and balanced during dangers and difficulties. An adequate level of knowledge helps in achieving effective measures. The most important aspect in limiting the spread of the virus locally is providing the elderly with the correct adequate

information and protective measures (**WHO, 2020 & Abdelhafiz et al., 2020**). So, this study aims to assess the effect of Covid_19 Educational Bag on Knowledge, Attitude and precautionary Practices of institutionalized Elderly persons.

Significance of the study:

Public awareness about dealing with highly infectious respiratory diseases is extremely important and plays an imperative role in limiting and preventing the widespread of infection, especially in countries with low and middle-income, as healthcare systems have, at the best, the moderate capacity to deal with pandemics and outbreaks (**Bhardwaj, 2020**). Isolating the older adults may minimize the transmission, which is the most vital to delay the peak in cases and limit the widespread to the high-risk or the vulnerable groups. However, adherence to the isolation strategies is possible to decrease within time. Such mitigation measures must be efficiently scheduled not only to minimize the transmission but also to avoid increasing the morbidities of COVID-19 related to affective disorders (**Armitage, Nellums, 2020**).

Aims of the study:

- Assess the Effect of Covid_19 Educational Bag on Knowledge, Attitude and precautionary Practices of institutionalized Elderly persons

- Assess the relationship between Covid-19 knowledge, attitude and precautionary practices among institutionalized Elderly persons

Research Hypothesis:

1. **Research hypothesis**

- H1: Elderly persons' knowledge level, attitude and practices means score will be significantly improved post implementation of the Covid_19 Educational Bag

Subjects and method:

Design: A quasi-experimental study design was used to accomplish the aims of this study. It identified a pre-group that is as similar as possible to the post group in terms of

baseline characteristics. Differences in outcome between the pre and post group were noted (**Campbell and Stanley, 2015**).

Settings: This study was carried out was carried out in two elderly homes namely; El Amal elderly home, affiliated to Mansoura City and Dar El-Walaa affiliated to Meet Khamr City - Dakahlia governorate-Egypt   .

El Amal elderly home is located in El esawy affiliated to Mansoura City- Dakahlia governorate-Egypt and it consists of two floors, the 1st floor for administrative staff and the 2nd floor for residents. It contains single rooms, shared rooms either for men or women and big hall where meals can be taken. It provides three meals for residents. On the other hand, Dar El-Walaa is located in Meet Khamr City - Dakahlia governorate-Egypt and it consists of three floors, the 1st floor for administrative staff while the 2nd and the 3rd floor for residents. It contains single rooms, shared rooms either for men or women and big hall where meals can be taken. It provides three meals for residents.

Subject: The study subjects included a convenience sample of 72 elderly who are residence at previous mentioned settings; over a period of 6 months beginning at end of March 2020 till the end September 2020; aged 60 years and above, able to communicate and accept to participate in the study.

Tools:

Four tools were used for data collection: The survey questionnaire was designed in Arabic, and it covered the demographic characteristics, knowledge, attitude & precautionary practices toward COVID-19.

Tool I: Demographic and Clinical Data structured Interview Sheet: It was developed by the researcher after reviewing the related literature; and included two parts.

❖ **Part one:** It included: Demographic characteristics e.g., age, gender, occupation before retirement and income, educational level, source of income, and the living arrangement.

❖ **Part two:** Included medical history; the history of the chronic diseases and number of the present chronic disease.

The pattern of periodic medical checkup, and history of immunization.

Tool II: Elder's Covid-19 Knowledge Questionnaire: It was developed by the researcher after reviewing the related literature (**Giao et al., 2020; Al-Hanawi et al., 2020 & Zhou et al., 2020**). It was used to assess elder's knowledge towards covid-19. It consists of 25 questions regarding clinical presentations, transmission methods, and control of COVID-19. Elders' answers were compared with the model answers and each answer was scored by a dichotomous scale; score one if correct & score zero if incorrect. The total knowledge score was 25, The total score was summed up, and was judged based on: less than 50% was considered as a poor level of knowledge, if the score ranged from 50% to less than 75%, it was considered as a fair level of knowledge, and if it was more than or equal to 75%, it was considered as a good level of knowledge.

Tool III: Elder's Attitude towards Covid-19 Questionnaire: This questionnaire was developed by the researcher after reviewing the related literature (**Zhong et al., 2020 & Shi et al., 2020).** It was used to assess elder's attitude **towards Covid-it consist of** 18 questions which reflect the studied subject's opinion if COVID-19 will finally be successfully controlled. The attitude's total score ranged from **zero to 18,** as a higher score indicated a good attitude toward COVID-19. Scores ranging between **zero- 6** indicated negative attitudes, and scores ranging between **"7-12"** indicate neutral attitude towards COVID-19 and from **13-18** indicate a positive attitude. Elders' answers were scored on a two-point Likert scale as disagree (=0), I'm not sure (=1), Agree (=2). The scoring system ranges **from zero -18.**

Tool IV: Covid-19 Precautionary Practices Checklists: This tool was developed by the researcher after reviewing the related literature (**Alzoubi et al., 2020 & Chan et al., 2020)**. It was developed to assess elderly person ability to wash their hands and wear face masks correctly. The total score was summed up and then divided into two categories: satisfactory (>50%) and unsatisfactory (<50%). It consists of two parts:

A. Part one: Hand Washing Observational Checklist :

Involved of routine handwashing practice. It consists of 12 items. The scoring of handwashing observation checklist steps. A score of one (1) was checked when elderly person is able to completely be done the step of the procedure. While the score zero (0) was checked when elderly person not done the step. The hand washing checklist consists of 12 steps with total score 12; the scores of all steps were summed up and were described in terms of mean±SD.

B. Part Two: Face Mask Wearing Observational Checklist: face mask practice consist of 4 items. A scoring one (1) was checked when elderly person can completely done the step of the procedure. While scoring zero (0) was checked when elderly person not done the step. Finally; the scores of all steps were summed up and were described in terms of mean±SD.

Method:

1) **Validity of the study tools**: The tools' validity was tested by seven experts in the Medical and Gerontological nursing field to check the clarity, relevancy, applicability, and comprehensiveness of the questions. Recommended modifications were done accordingly, and the final form was modified.

2) The reliability of tool II and tool III questionnaires were tested by using the internal consistency method Cronbach's alpha reliability coefficient was r= 0.85.

3) **Pilot Study**: The Arabic version of the tools was done on 10% (5) of the total study participants to test and confirm the feasibility and the clarity of the study tools. Those who were tested in the pilot study were excluded from the total sample of the study.

4) Data collected over a period of 6 months from the first of April 2020 till the end of September 2020.

Field of Work :

Data was gathered in the following sequence:

a) Assessment phase: the study protocol was approved and official permission from dar El Amal and el Walaa elderly homes

director to carry out the study after identification of the purpose of the study was obtained. Data was collected throughout two phases of assessment by using four tools. The first phase of assessment was applied before applying the educational bag to obtain baseline data about the elderly people's knowledge, attitude, and practices toward COVID-19.

b) **Planning Phase**: this phase included the development of the educational material depending on the analysis of the data collected after reviewing the relevant literatures. The researcher developed it in Arabic with large-sized fonts and colored images were added to cope with the visual changes related to aging to improve the elderly's learning abilities, also researchers used teaching materials and media such as guiding videos for handwashing steps and face mask-wearing.

c) **Implementation phase:** data was collected at El Amal's elderly home and Dar El-Walaa. Data collection covered 6 months, the planned intervention conducted in three consecutive sessions at elderly home. Every session took 20-30 minutes; for each one individually. Education regardingCOVID-19 to each elderly person alone. Initially, they were proved information about COVID-19 modes of transmission, signs and symptoms, diet, and preventions. While taking into consideration the precautionary practices during the implementation of the educational bag such as wearing a face mask, and sterile gloves, saving the personal distance, frequent alcohol disinfection

d) **Evaluation phase**: The latest phase of the study's educational program. All the elderly persons were evaluated after applying the educational program with tools used before.

Ethical Considerations:

Official letters were issued to the directors of the elderly homes to obtain his approval in order to collect the necessary data. Then, the researcher met the elderly person individually at the elderly home and explained the aim of this study. Those who agreed to participate in the study were included and an oral consent

was obtained. Their confidentiality and anonymity of all information were assured.

Statistical analysis:

Data were analyzed using SPSS version 24. The 0.05 and 0.01 levels was used as the cut off value for statistical significance and the following statistical measures were used; The normality of data was first tested with a one-sample Kolmogorov-Smirnov test. Qualitative data were described using the number and percent. Association between categorical variables was tested using the Chi-square test. When more than 25% of the cells have an expected count of less than 5, Fisher's exact test was used. Continuous variables were presented as mean $\pm$ SD (standard deviation) for parametric data. The two groups were compared with the Student t-test. Analysis of Variance (ANOVA test) used for comparison of means of more than two groups. Pearson correlation used for correlation between continuous parametric data while spearman correlation to correlate between continuous non-parametric data
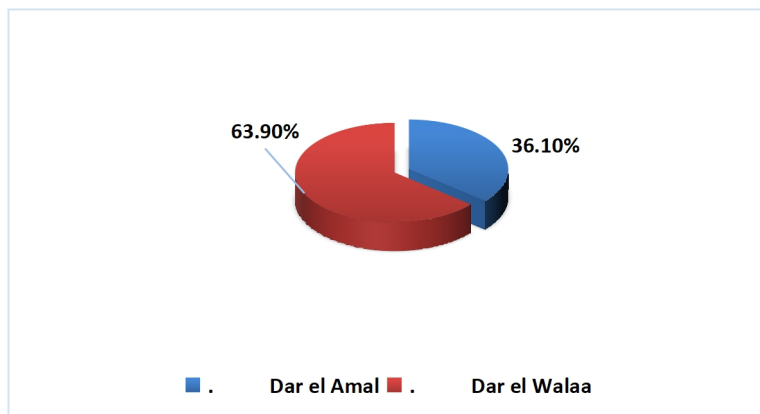
Results:

Table (I): Demographic and medical characteristics of institutionalized elderly: This table showed that, two thirds of the studied elders were selected from dar El Walaa, nearly one half of the subjects were middle old with a mean of 66.57±4.08 yrs. More than one half of the sample were females, approximately three quarter of the studied elders were widowed. 31.9% of the studied elders were illiterate and 34.7% have secondary education compared to few percent have higher educational level 13.9%, as for income 59.7% of the studied elders have inadequate income.

Table (I): Demographic characteristics of the studied elders   (N=72)

Items	Study Subjects	
	n=72	%
Age (in year):		
. 60-65	23	31.9
. 65-70	35	48.6
. 70+	14	19.4
(Mean±SD) =66.57±4.08) Minimum= 60yrs – Maximum 76.0yrs		
Sex:		
. Males	33	45.8
. Females	39	54.2
Marital status :		
. Single	18	25.0
. Widowed	54	75.0
Level of education:		
. Illiterate	23	31.9
. Primary education	14	19.4
. Secondary education	25	34.7
. University and higher	10	13.9
Live with		
. Alone	34	47.2
. With partner	32	44.4
. With many partner	6	8.3
Monthly income:		
. Adequate	29	40.3
. Inadequate	43	59.7
Pervious work		
. Employee	46	63.9
. Housewives	26	36.1

*Significant, at P ≤ 0.05, using Chi-Square (X^2)

Figure 1: Distribution of the studied elder according the selected setting

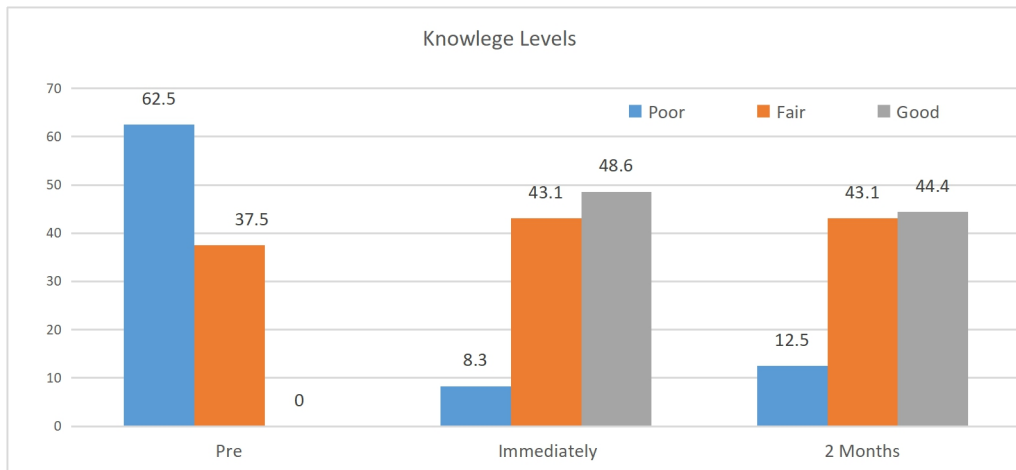
Table (II): Health history of the studied elders: It was observed that nearly two third of the studied elders have a history of chronic diseases, nearly one half were suffering from three chronic disease or more. Nearly two third of the studied elders complain of hypertension and heart disease, followed by 31.9% had respiratory diseases, 22.2% had oncology history. Approximately three quarter of the studied elders had no previous immunization. Less than three quarter of the studied elders didn't take influenza vaccine (72.2%). Less than two third of the studied elders had no periodic medical checkup.

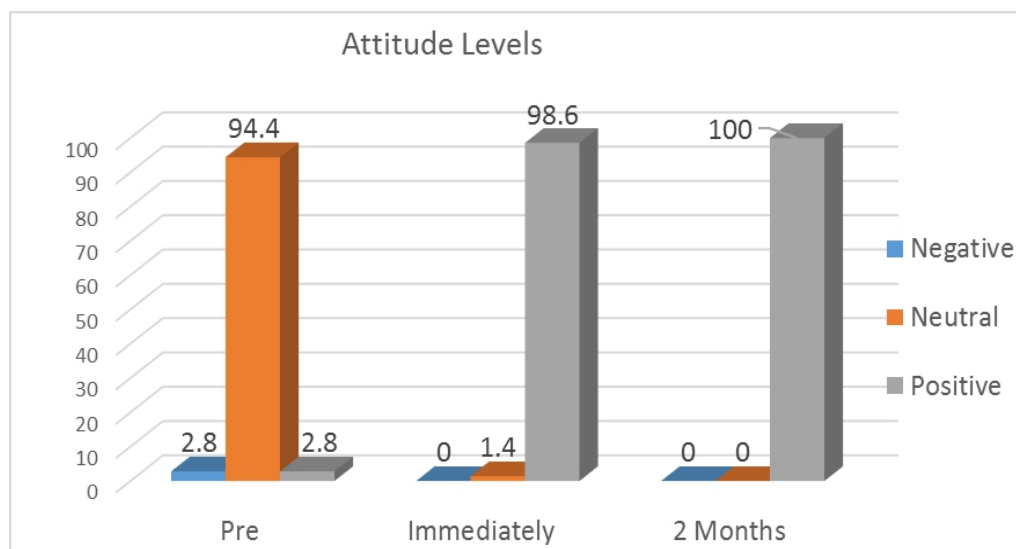**Table (II):** Health history of the studied elders:

Health history	Study subjects	
	n= 72	**%**
History of chronic disease		
. Yes	**48**	**66.7**
. No	**24**	**33.3**
. Hypertension	46	63.9
. Diabetes Melitus	10	13.9
. Heart disease	46	63.9
. Arthritic disease	10	13.9
. Respiratory disease	23	31.9
. Renal disease	6	8.3
. Liver disease	6	8.3
. Oncology disease	16	22.2
Numbers of the present chronic diseases?		
. One disease	13	18.1
. 2 diseases	24	33.3
. 3 diseases and more	35	47.6
History of immunization		
. Yes	18	25.0
. No	54	75.0
Influenza vaccine		
. Yes	20	27.8
. No	52	72.2
pattern of periodic medical checkup		
. NO	43	59.7
. Every 3 months	10	13.9
. Every 6 months	15	20.8
. Every year	4	5.6

*Significant, at $P \leq 0.05$, using Chi-Square (X^2)

Figure (2): Level COVID-19 Knowledge of the studied elders Before, Immediately and 2 Months After Implementation Of COVID-19 Educational Bag: This figure showed that the majority of the studied elders had poor knowledge before implementation Of COVID-19 Educational Bag (62.5%), while there was an improvement in knowledge score immediately after implementation Of COVID-19 educational bag (48.6% had good knowledge) and this improvement still present 2 months after implementation Of COVID-19 educational bag (44.4% had good knowledge).
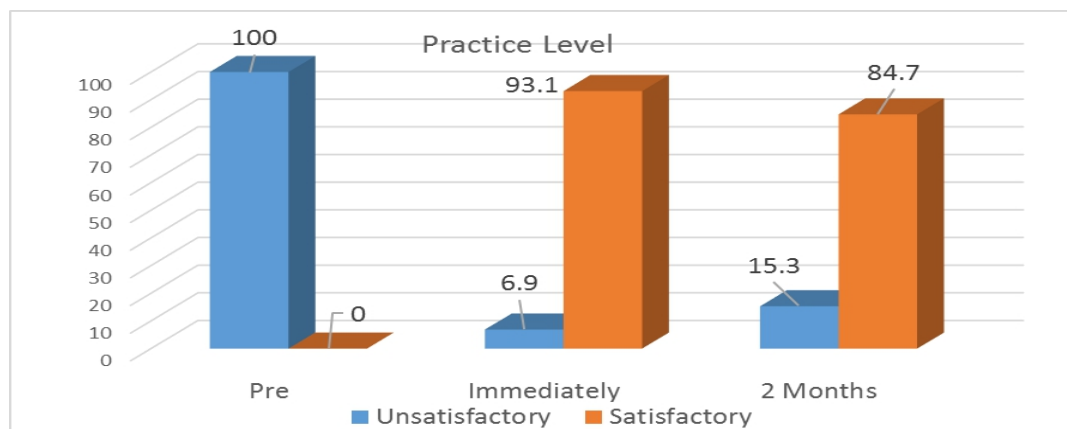

Figure (3): Level COVID-19 Attitude of the studied elders Before, Immediately and 2 Months After Implementation Of COVID-19 Educational Bag: This figure showed that the majority of the studied elders had neutral attitude before implementation Of COVID-19 educational bag (94.4%), while there was an improvement in attitude score immediately after implementation Of COVID-19 educational bag (98.6% had positive attitude) and this improvement become more apparent 2 months after implementation Of COVID-19 educational bag (100% had positive attitude).

Figure (4): Level COVID-19 precautionary practices of the studied elders before, immediately and 2 months after implementation Of COVID-19 educational bag: This figure showed that all the studied elders had unsatisfactory level of practices before implementation Of COVID-19 educational bag (100%), while there was an improvement in precautionary practices score immediately after implementation Of COVID-19 educational bag (93.1% had satisfactory level of practices) and this improvement still present 2 months after implementation Of COVID-19 educational bag (84.7% had satisfactory level of practices).

Table III: Comparison of the Demographic Characteristics and clinical data of the studied elders and total mean score of knowledge, attitudes, and precautionary practices before, immediately and two months after implementation of COVID-19 educational bag. A statistically significant improvement of COVID-19 knowledge of the studied elders immediately after implementation of COVID-19 educational bag than before it ($T=14.648$, $p=<.001$) and the improvement still apparent two months after implementation of COVID-19 educational bag ($T=13.734$, $p=<.001$). Also the statistical significant improvement of COVID-19 attitude and precautionary practices of the studied elders immediately after implementation of COVID-19 educational bag than before it ($T=29.742$, $P=<.001$, $T=23.974$, $p=<.001$) respectively and the improvement still apparent two months after implementation of COVID-19 educational bag ($T=28.914$, $P=<.001$, $T=11.488$, $p=<.001$) respectively. A statistically significant improvement of COVID-19 knowledge, attitude, and precautionary practices of the studied elders immediately after implementation of COVID-19 educational bag than before it, and the improvement still apparent across all the studied sample regardless of their demographic characteristics and clinical data. As all studied elders had mainly the same demographic characteristics and clinical data ($p=<.001$)

Table III: Comparison of Demographic Characteristics and clinical data of the studied elders before, and two months after implementation of COVID-19 Educational bag regarding their mean score of COVID-19 knowledge, attitude and precautionary practices.

Demographic and medical Characteristics	N	COVID-19 Knowledge (Mean±SD)			COVID-19 attitude (Mean±SD)			COVID-19 precautionary practices		
		pre	immed	Post 2	pre	immed	Post 2	pre	immed	Post 2
Overall score		10.92 ± 2.11	16.38±2.32	16.04 ±2.49	10.61±1.02	15.75±1.15	15.81±1.25	4.87 ±0.60	11.79±2.32	10.73 ±4.14
		P¹		P²	P¹		P²	P¹		P²
		t= 14.648 P = <.001		t= 13.734, P = <.001	T=29.742, P = <.001		28.914, P = <.001	T= 23.974, P = <.001		T= 11.488, P = <.001
Age (years):										
. 60-	23	11.96±1.02	16.52±2.25	16±2.51	10.95±0.87	15.56±1.12	16.04±1.29	4.78±0.599	11.65±2.49	11.34±3.31
. 65-	35	10.83±2.16	16.49±2.38	16.11±2.45	10.40±1.14	15.82±1.15	15.94±1.18	4.97±0.61	11.85±2.25	11.85±2.38
. 70+	14	9.43±2.47	15.86±2.35	15.93±2.73	10.57±0.85	15.85±1.29	15.14±1.23	4.78±0.57	11.85±2.38	9.88±5.01
P²- value		t= 7.772, t= 10.050 , t= 6.337 (P= <.001)			t= 16.211, t=21.028, t=12.741 (P= <.001)			t= 9.095, t= 11.171, t= 5.557 (P= <.001)		
Sex:										
. Male	33	11.27±1.61	16.70±2.30	16.24±2.35	10.60±0.99	15.72±1.17	15.81±1.21	4.84±0.56	11.93±2.53	9.9697± 4.81
. Female	39	10.62±2.45	16.10±2.33	15.87±2.62	10.61±1.06	15.76±1.15	15.82±1.315	4.89± 0.64	11.66± 2.15	11.38± 3.40
P²- value		t= 9.739, t= 9.697 (P= <.001)			T=20.028,T=20.628 (P= <.001)			t= 5.864, t= 11.262 (P= <.001)		
Marital status:										
. widow	54	11.11±2.08	16.28±2.33	15.72±2.52	10.61±1.05	15.62±1.12	15.75±1.22	4.81±.0.58	11.98±.2.14	10.81 ±.4.28
. Single	18	10.33±2.17	16.67±2.30	17.00±2.17	10.61±0.97	16.11±1.23	16.00±1.37	5.05± 0.63	11.22±.2.77	10.50±3.79
P²- value		t= 11.561, t= 8.330 (P= <.001)			t= 25.267,t=13.857 (P= <.001)			t= 6.018, t= 9.785 (P= <.001)		
Level of education:										
Illiterate	23	10.26±2.53	16.74±2.05	16.13±2.47	10.56±1.121	16.30±1.22	16.04±1.42	4.86±0.69	11.69±2.54	9.80±4.88
Primary	14	11.00±2.45	15.50±2.62	16.57±2.85	10.50±1.16	15.28±0.99	15.71±1.26	4.85±0.66	11.57±2.02	10.85±3.82
Secondary	25	11.36±1.85	16.24±2.44	15.84±2.27	10.64±0.86	15.64±1.07	15.800±1.25	4.96±0.45	11.96±2.28	11.65±3.47
University	10	11.20±.42	17.10±2.02	15.60±2.76	10.80±1.135	15.40±1.04	15.50±0.84	4.70±.674	11.90±2.60	10.80±4.10
P²- value		t= 7.306, t=6.556,t= 8.953,t= 4.906(P= <.001)			t=14.549 ,t=12.767, t=20.146,t=9.945 (P= <.001)			t= 4.680,t= 4.795,t= 5.811,t= 8.451 (P= <.001)		

Demographic and medical Characteristics	N	COVID-19 Knowledge (Mean±SD)			COVID-19 attitude (Mean±SD)			COVID-19 precautionary practices		
		pre	immed	Post 2	pre	immed	Post 2	pre	immed	Post 2
Monthly income:										
. Adequate	29	10.72±2.36	16.62±2.08	15.38±2.16	10.55±1.18	15.86±1.12	15.65±1.34	4.79±.619	12.06±2.25	11.34±3.80
. Inadequate	43	11.05±1.05	16.21±1.21	16.49±1.49	10.65±0.922	15.67±1.18	15.93±1.20	4.93±0.59	11.60±.2.38	10.32±4.35
P²- value		t= 8.218, t= 11.017 (P= <.001)			t= 17.808, t=22.587(P= <.001)			t=7.826, t= 8.809 (P= <.001)		
Numbers of the present chronic diseases?										
No	13	12.23±1.01	17.00±2.16	15.92±2.69	11.15±0.98	15.69±1.10	15.76±1.16	4.76±0.59	11.84±2.44	11.76±1.92
Two diseases	24	10.29±2.48	16.38±2.30	16.17±2.53	10.33±1.007	16.00±1.17	16.25±1.39	5.08±0.58	12.58±2.04	11.37±4.16
3 diseases and more	35	11.03±1.90	16.03±2.43	16.06±2.40	10.63±0.99	15.48±1.093	15.42±1.06	4.50±0.707	12.50±0.70	12.50±0.70
P²- value		t= 4.506, t= 9.422, t= 9.040 (P= <.001)			t= 10.341T=,22.600, T=19.523 (P= <.001)			t= 12.891, t= 7.024, t= 5.772 (P= <.001		
Influenza vaccine										
. Yes	20	11.10±2.47	16.25±2.34	15.80±2.38	10.65±1.089	15.80±1.32	15.45±1.23	5.05±0.60	11.75 ±2.24	9.90±4.81
. No	52	10.85±1.98	16.42±2.33	16.13±2.54	10.59±1.014	15.73±1.10	15.96±1.25	4.80±0.59	11.80±2.37	11.05 ±3.86
P²- value		t= 6.092 , t= 12.422 (P= <.001)			t= 14.236 ,t=25.430 (P= <.001)			t= 4.368, t= 11.147 (P= <.001)		
pattern of periodic medical checkup										
. NO	43	11.21±2.13	16.05±2.42	15.81±2.55	10.60±1.0	15.65±1.06	15.62±1.1134	4.90±0.52	11.76 ±2.03	10.09±4.54
. Every 3 months	10	10.40±2.32	16.30±2.45	17.20±2.49	10.60±0.51	15.50±1.64	16.10±1.59	4.70±0.48	10.60±2.71	10.70±4.69
. Every 6 months	15	10.80±1.66	16.93±2.09	16.07±2.19	10.73±1.099	16.26±1.032	16.40±1.24	5.13±0.74	12.26±2.81	11.93±2.43
. Every year	4	9.50±2.89	18.00±.00	15.50±3.00	10.25±1.70	15.50±1.00	15.00±1.15	4.00±0.00	13.25±1.50	13.25±1.50
P²- value		T= 9.931,T= 6.815, T= 6.721(P= <.001) T= 2.640 (P = .078)			T=23.435, T=10.541, T=14.223,(P= <.001) T=3.800 (P= 0.032)			t= 7.209 (P= <.001),t= 3.855 (P= 0.004), T= 12.333, t= 10.251 (P= <.001		

(P¹= value) comparing the total mean score of variable pre versus immediately post implementation of COVID- 19 in each category

(P²₌ value) comparing the total mean score of variable pre versus 2 months post implementation of COVID- 19 in each category

Table IV: Correlation between the total mean score of COVID-19 knowledge, attitude and precautionary practices before, immediately and two months after implementation of the educational bag

There was a statistically significant positive relation was found between the total mean score of studied elders COVID-19 knowledge and attitude before the implementation of the educational bag (r=-0.496*, p=0.000). Also, a statistically significant relation was found between the total mean score of COVID-19 knowledge and attitude immediately after the implementation of the educational bag (r=0.277*, p=0.019). The higher mean score of COVID-19 knowledge, the higher score of COVID-19 attitude Also, a significant relation was found between the total mean score of COVID-19 knowledge and attitude two months after the implementation of the educational bag (r=0.313*, p=0.007). A statistically significant positive relation was found between the total mean score of studied elders COVID-19 knowledge and precautionary practices; before, immediately, and two months after implementation of the educational bag (r=0.258, p=0.001), (r=0.582, p=0.000*),(r=0.383, p=0.001) respectively.

Table IV: Correlation between the total mean score of COVID-19 knowledge, attitude and precautionary practices before, immediately and 2 months after implementation of the educational bag

overall score	Attitude pre	Attitude immed	Attitude Post 2	COVID-19 practices pre	COVID-19 practices immed	COVID-19 practices post2
COVID-19 Knowledge pre:	r =0.496 P=0.000*		-	r=0.258 P=0.001*		-
COVID-19 Knowledge immed:	-	r=0.277 P=0.019**	-		r= 0.582 P= 0.000*	-
COVID-19 Knowledge post 2:	-	-	r= 0.313 P=0.007*	-	-	r= 0.383 P= 0.001*
COVID-19 practices pre	r= 0.125 P= 0.296	-	-	-	-	-
COVID-19 practices immed	-	r= 0.048 P=0.687	-	-	-	-
COVID-19 practices post	-	-	r= 0.069 P=0.565	-	-	-

*. Correlation is significant at the 0.05 level (2-tailed).   **. Correlation is significant at the 0.01 level (2-tailed).*

Discussion:

Institionalized elders are considered the most vulnerable age group to acquire Corona virus infection, due to their weak self-immunity and their presence in one place without following the precautionary measures. Therefore; public health experts and policymakers should stress on the application of effective preventive measures as personal hygiene; hand washing, social distancing and stringent respiratory safeguards to halt the hasty transmission of COVID-19 in crowded setting and institutions **(Al zoubi, et al., 2020).**

Scare studies have investigated the levels of knowledge, attitude, and practices about overwhelming COVID- 19 infectious disease, a literature review has not discovered any open reports on information about corona virus among the elderly population in Egypt recently. The Egyptian Health Ministry have deserved their better effort through applying tremendous precautions to fight against this epidemic danger, Attention should be given to institutionalized elders as they far from the mass media to acquire adequate knowledge about COVID- 19. As for the socio-demographic and medical characteristics of institutionalized elderly two thirds of the sample were selected from dar El Walaa, nearly one half of the studied elders were middle old with a mean of 66.57±4.08 yrs. More than one half of the sample are females, approximately three quarter of the studied

elders were widowed. In Mexico City, a study by **Irigoyen-Camacho et al., (2020**) proved similar findings and referred that most of their studied elders were females.

As for educational level, around one third of the studied elders had secondary education, illiterate compared to few percent have higher educational level. The same finding was reported by a study done in Saudi Arabia by **(Al-Alalawi, M, et al., 2018)** around two thirds of respondents had secondary school education while nearly one quarter had graduation and above level of education. As for income, more than one half of the studied elders have inadequate income, this is in line with a study done in Egypt by **(Abdelhafiz et al., 2020)** who reported that nearly half of the study subjects had inadequate income.

With regards to the health history of the studied elders nearly two third of them have a history of chronic diseases, while nearly one half are suffering from three chronic disease or more; hypertension and heart diseases were prevailing among nearly two third of them. This result in line with a study done in Northwest Ethiopia by **(Akalu, Ayelign & Molla, 2020)** who reported that hypertension and heart disease were most common among the study subjects followed by respiratory diseases and this may be due to normal physiological changes in elderly.

Regarding the pattern of periodic medical check-up and vaccination, less than three quarter of the studied elders didn't take influenza vaccine. Less than two third of the studied elders had no periodic medical check-up. This is in the same line with a study done in Nepal by **(Vaidya, et al., 2020)**, as they found that routine vaccination against pneumonia and flu in countries with low or middle incomes is seldomly followed. Most of the studied elders denied changing their attitude concerning vaccination practice.

This in contrast with other studies done in Italy by **(Marin-Hernandez, Schwartz & Nixon, 2020 & in Brazil by Fink et al., 2020)** who reported that elderly population had previous immunization by influenza vaccine. This result may be attributed to lack of knowledge of elderly people and elderly misconception about immunization that it have negative effect on their health and that it may increase incidence of morbidity and mortality.

Institutionalized elders' compliance with infection control measures is affected by their level of knowledge, attitude, and practice (KAP) on COVID-19. As a result of evaluating the public awareness and levels of knowledge regarding COVID-19, markable insights into the existing public perceptions and practice could be obtained, thus, aiding in recognizing the attributes that influence the public in adopting proper practice and responsive behaviors **(Al-Hanawi et al., 2020).** The present study revealed a statistically significant improvement of COVID-19 knowledge of the studied elders immediately after implementation of COVID-19 educational bag than before it and the improvement still apparent two months after implementation of COVID-19 educational bag. On the same line, a study done in Jordan by **(Elayeh et al., 2020)** reported a significant improvement in the mean knowledge scores of the respondents before and after reporting the case. A study in Saudi Arabia (2018) found that the levels of knowledge about MERS-Corona Virus among the Saudi Arabian population were relatively low. Also, another study done in Northwest Ethiopia by **(Akalu, 2020)** reported that there was a high prevalence of poor knowledge among the study subjects. Other studies in China by **(Li, et al., 2020)** & in Australia by **(Alqahtani, 2016)** & in Hong Kong by **(Chan et al., 2007)** reported that knowledge, attitude, the practice had been improved after the implementation of health education program about COVID-19 and severe acute respiratory syndrome (SARS). This result may be explained by the majority of the elderly population had no access to the internet, so they had limited access to COVID-19-related updates and preventive measures posted online by the official government health authorities and different media that are shown to have a positive effect for improving knowledge.

A statistically significant improvements in the mean scores of COVID-19 attitude and precautionary practices of the participant elders immediately after applying the COVID-19's educational bag than before it and the improvement still apparent two months after

implementation of COVID-19 educational bag respectively. This agrees with other studies done in China by **(Li et al., 2020 & in Hong Kong by Chan et al., 2007)** reported that attitude and practice had been improved after the implementation of a health education program about COVID-19 and SARS. Also, in Jordan, a study by **(Elayeh, E et al., 2020)** reported a significant change in the attitude and practices of the participants in many aspects was noticed after reporting cases of COVID-19 illnesses in Jordan. This result may be explained by intensive efforts of government and WHO in different mass media about methods of disease transmission, its clinical manifestations, and preventive measures to control the disease spread.

As for the comparison of the studies elders regarding their demographic characteristics and the study three variables. A statistically significant improvement of COVID-19 knowledge of the studied elders immediately after implementation of COVID-19 educational bag than before it, and the improvement still apparent across all the studied sample regardless of their demographic characteristics and clinical data. As all studied elders had mainly the same demographic characteristics and clinical data.

This can be explained by our study sample have the similar demographic characteristic and COVID-19 is recent discovered infectious diseases and all of citizen have the same background. A study done in Egypt by **(Abdelhafiz et al., 2020)** reported similar finding that knowledge level's mean scores was observed for participants of both genders with no statistically significant difference, significant lower mean score of levels of knowledge was obtained for participants 50s to less than 60 and those over 60s. Also, in Pakistan, a study by **(Salman et al., 2020)** found that there were no statistically significant differences between knowledge scores across all demographic variables except economic class. In contrast with our finding, a study done in Ethiopia by **(Haftom et al., 2020)** referred that gender, age, and educational status were significant predictors of knowledge score.

With regards to the comparison of the studies elders regarding their demographic characteristics and COVID-19 attitude; a statistically significant improvement of COVID-19 attitude of the studied elders immediately after implementation of COVID-19 educational bag than before it, and the improvement still apparent across all the studied sample regardless of their demographic characteristics and the clinical data. As all participant elders had mainly the same demographic characteristics and clinical data. In the same line, a study done in Pakistan by **Salman M et al., (2020)** reported that attitude scores did not significantly differ between age, economic class, education and participant categories, while attitude score was significantly differing in sex and place of residence. In contrast of this finding a study done in Saudi Arabia by **Al-Hanawi, et al., (2020)** reported a statically significant difference between attitude and gender and among the study subjects. Also, in Ethiopia, a study by **Haftom et al., (2020)** found that educational status and levels of knowledge scores were significantly associated with attitudes regarding COVID-19. This difference ought to small sample of the present study and mainly the most of them are females.

As for the relation between the study's three variables; knowledge, attitude and practices. There was a statistically significant positive relation was found between the total mean score of COVID-19 knowledge and attitude before, immediately, and two months after the implementation of the COVID-19 educational bag. These findings are consistent with other studies done in Northwest Ethiopia by **Akalu, Ayelign & Molla, (2020)** and in China by **(Zhong et al., 2020)** who reported that patients with poor levels of knowledge were more likely to have poor levels of attitudes.

This result may be justified by the knowledge is the main modifier of the positive attitudes toward precautionary practices of COVID-19 and these activities are practiced after increasing awareness and levels of knowledge about activities to be practiced. In the same line, a study done in Bangladeshis by **Paul et al., (2020)** referred a statistic significant, positive linear correlation was observed between knowledge and attitude.

Also, a study done in Ethiopia by **Haftom et al., (2020**) revealed that the high level of education and better level of knowledge were significantly related to a favorable attitude towards the pandemic. In similarity, a study done in Greece by **Papagiannis et al., (2020)** who pointed that knowledge scores were significantly associated with both attitudes score's and practices scores signifying that 'participants with high levels of knowledge proved to have more positive perceptions levels on precautionary measures and practiced more preventive measures. In contrast, a study done in Menoufia Governorate, Egypt by **(Gabr, Seif & Allam, 2020),** reported non-significant correlations were found between levels of knowledge scores and attitudes' scores of the studied group. This result may be attributed to having better levels of knowledge might result in positive perception and attitude and thus in better practice, therefore, helping in the prevention, control and treatment of the infectious diseases.

Additionally, there was a statistically significant positive relation was found between the total mean score of COVID-19 knowledge and precautionary practices before, immediately, and two months after the implementation of the COVID-19 educational bag. An Egyptian study done in Menofiya, Egypt by **Gabr, Seif, & Allam, (2020)** reported that a significant positive correlation between knowledge and practice of the studied group toward COVID-19. Similar finding was asserted by **Akalu, Ayelign, & Molla, (2020)** who noted that knowledge levels about COVID-19 reduces the risks of infection by enhancing patients' practice. Also, other studies done in Ethiopia by **Haftom et al., (2020),** a study done in China by **Zhong et al., (2020),** & a study done in India by **Tomar et al., (2020)** revealed that low reports of practices to avoid COVID-19 were significantly associated with education level and a low level of participants' knowledge scores (high knowledge and education levels proved better practice). In similarity, a study done in Greece by **Papagiannis et al (2020)** who pointed that knowledge scores were significantly correlated to both attitudes score's and practice's scores signifying that participants with high levels of knowledge

scores proved more positive perceptions on the precautionary measures and might practice more precautionary measures. In contrast, in Iran, a study by **Honarvar et al., (2020)** revealed that the practices were not related to knowledge in two-third of the participants. Our finding may be attributed to having adequate knowledge and being educated, this in turn will result in exhibiting good practices.

Finally, the precautionary practices mean score of studied elders had no relation with their total mean score of COVID-19 attitude before, immediately, and two months after the implementation of the COVID-19 educational bag. In contrast, a study done in Greece by **Papagiannis et al., (2020**) revealed that attitudes' score was significantly associated with practices' score proving that the participants with higher attitude scores were more liable to apply precautionary practice to prevent SARS-CoV-2 transmission. Also, a study done in Bangladeshis by **Paul et al., (2020**), referred a significant and positive linear correlation was found between attitude and practice. This finding may be due to a large gap between people's intention and behavior, including health behavior. Also, elderly people may acquire enough knowledge about certain disease but may not have the intension to apply it in their daily life.

No confirmed treatment modalities or vaccinations are accessible to control or manage the spread of COVID-19, this makes a significant threat to the healthcare authorities. So, it's strongly important to apply strict prevention and control measures and raise levels of awareness on proper hygienic measures and social distancing (**Bruinen de Bruin et al., 2020).**

Conclusion:

Our educational bag achieved its aim in enabling elderly home residents to gain optimistic attitude and perform proper precautionary practice toward COVID-19. A significant improvement of the studied elders means score of COVID-19 knowledge, attitudes and precautionary practices immediately, and two months after implementation of COVID-19 educational bag regardless of their demographic characteristics

and clinical data. The studied elders COVID-19 knowledge levels were positively correlated with their attitude and precautionary practice. While no proven relation was found between studied elders COVID-19 attitude and precautionary practices.

Recommendation:

- Development of an educational programs targeting vulnerable population institutionalized in elderly homes in various Egypt governorates.

- Designing a long-term plan by healthcare authorities to improve access to education and health services

- Raise COVID-19 awareness among high risk groups using mass media

- Emphasize the importance of follow the precautionary measures in all crowded setting.

Acknowledgment

Reference

Abdelhafiz, A. S., Mohammed, Z., Ibrahim, M. E., Ziady, H. H., Alorabi, M., Ayyad, M., & Sultan, E. A. (2020). Knowledge, Perceptions, and Attitude of Egyptians Towards the Novel Coronavirus Disease (COVID-19). Journal of Community Health, 1-10.https://doi.org/10.1007/s10900-020-00827-7

Akalu, Y., Ayelign, B., & Molla, M. D. (2020). Knowledge, attitude and practice towards COVID-19 among chronic disease patients at Addis Zemen Hospital, Northwest Ethiopia. Infection and drug resistance, 13, 1949. .https://doi.org/10.2147/IDR.S258736

Al-Alalawi, M., Alsolami, A. A., Alghanmi, A., Said, H., Alatawi, A., & Lhajooj, A. (2018). The Knowledge and Attitude of King Abdul-Aziz University Hospital Outpatient Clinic Visitors toward Coronavirus. The Egyptian Journal of Hospital Medicine, 70(5), 723-727. https://doi.org/10.3389/fpubh.2020.00482

Al-Hanawi, M. K., Angawi, K., Alshareef, N., Qattan, A. M., Helmy, H. Z., Abudawood, Y. & Alsharqi, O. (2020). Knowledge, Attitude and Practice Toward COVID-19 Among the Public in the Kingdom of Saudi Arabia: A Cross-Sectional Study. Frontiers in Public Health, 8. https://doi.org/10.3389/fpubh.2020.00217

Alqahtani, A. S., Wiley, K. E., Mushta, S. M., Yamazaki, K., BinDhim, N. F., Heywood, A. E., & Rashid, H. (2016). Association between Australian Hajj Pilgrims' awareness of MERS-CoV, and their compliance with preventive measures and exposure to camels. Journal of travel medicine, 23(5). https://doi.org/10.1093/jtm/taw046

Alzoubi, H., Alnawaiseh, N., Al-Mnayyis, A. A., Lubad, M. A., Aqel, A., & Al-Shagahin, H. (2020). COVID-19-knowledge, attitude and practice among medical and non-medical University Students in Jordan. Journal of Pure and Applied Microbiology, 14(1), 17-24. https://doi.org/10.22207/JPAM.14.1.04

Armitage, R., & Nellums, L. B. (2020). COVID-19 and the consequences of isolating the elderly. The Lancet Public Health, 5(5), e25;j6. https://doi.org/10.1016/S2468-2667(20)30061-X

Azlan, A. A., Hamzah, M. R., Sern, T. J., Ayub, S. H., & Mohamad, E. (2020). Public knowledge, attitudes and practices towards COVID-19: A cross-sectional study in Malaysia. *Plos one*, *15*(5), e0233668. https://doi.org/10.1371/journal.pone.0233668

Baud, D., Qi, X., Nielsen-Saines, K., Musso, D., Pomar, L., Favre, G., 2020. Real estimates of mortality following COVID-19 infection. Lancet Infect. Dis. https://doi.org/10.1016/S1473-3099(20)30195-X.

Bhardwaj, R. (2020). Mitigating the Adverse Consequences of Pandemics: A Short Note with a Special Reference to COVID-19. Available at SSRN 3565460.https://dx.doi.org/10.2139/ssrn.3565460

Brooke, J., & Clark, M. (2020). Older people's early experience of household isolation and social distancing during COVID-19. *Journal of clinical nursing*, *29*(21-22), 4387-4402. https://doi.org/10.1111/jocn.15485

Bruinen de Bruin Y, Lequarre A, McCourt J, Clevestig P, Pigazzani F, Zare Jeddi M et al. Initial impacts of global risk mitigation measures taken during the combatting of the COVID-19 pandemic. Saf Sci 2020; 128 https://doi.org/10.1016/j.ssci.2020.104773

Campbell, D. T., & Stanley, J. C. (2015). Experimental and quasi-experimental designs for research. Ravenio Books.accessed at https://www.sfu.ca/~palys/Campbell&Stanley-1959

Chan, S. S., So, W. K., Wong, D. C., Lee, A. C., & Tiwari, A. (2007). Improving older adults' knowledge and practice of preventive measures through a telephone health education during the SARS epidemic in Hong Kong: A pilot study. International journal of nursing studies, 44(7), 1120-1127.

https://doi.org/10.1016/j.ijnurstu.2006.04.019

Elayeh, E., Aleidi, S. M., Ya'acoub, R., & Haddadin, R. N. (2020). Before and after case reporting: A comparison of the knowledge, attitude and practices of the Jordanian population towards COVID-19. Plos one, 15(10), e0240780. https://doi.org/10.1371/journal.pone.0240780

Fink G, Orlova-Fink N, Schindler T, Grisi S, Ferrer AP, Daubenberger C, Brentani A. (2020). Inactivated trivalent influenza vaccine is associated with lower mortality among Covid-19 patients in Brazil. medRxiv https://doi.org/10.1101/2020.06.29.20142505.

Gabr, H. M., Seif, A. S., & Allam, H. K. (2020). Knowledge, attitudes, and practices toward COVID-19 at Menoufia Governorate, Egypt. Kasr Al Ainy Medical Journal, 26(1), 21. https://doi: 10.4103/kamj.kamj_22_20.

Giao, H., Han, N. T., Van Khanh, T., Ngan, V. K., Van Tam, V., & Le An, P. (2020). Knowledge and attitude toward COVID-19 among healthcare workers at District 2 Hospital, Ho Chi Minh City. Asian Pac J Trop Med, 13. https://doi: 10.4103/1995-7645.280396

Haftom, M., Petrucka, P., Gemechu, K., Mamo, H., Tsegay, T., Amare, E., ... & Gebremariam, A. (2020). Knowledge, Attitudes, and Practices Towards COVID-19 Pandemic Among Quarantined Adults in Tigrai Region, Ethiopia. Infection and Drug Resistance, 13, 3727. https://doi.org/10.2147/IDR.S275744

Har-Noy, M., & Or, R. (2020). Allo-priming as a universal anti-viral vaccine: protecting elderly from current COVID-19 and any future unknown viral outbreak. *Journal of Translational Medicine*, *18*, 1-11. https://doi.org/10.1186/s12967-020-02363-3

Honarvar, B., Lankarani, K. B., Kharmandar, A., Shaygani, F., Zahedroozgar, M., Haghighi, M. R. R., & Hashemi, S. M. (2020). Knowledge, attitudes, risk perceptions, and practices of adults toward COVID-19: a population and field-based study from Iran. International journal of public health, 65(6), 731-739.

https://doi.org/10.1371/journal.pone.0233668

Irigoyen-Camacho, M. E., Velazquez-Alva, M. C., Zepeda-Zepeda, M. A., Cabrer-Rosales, M. F., Lazarevich, I., & Castaño-Seiquer, A. (2020). Effect of Income Level and Perception of Susceptibility and Severity of COVID-19 on Stay-at-Home Preventive Behavior in a Group of Older Adults in Mexico City. International Journal of Environmental Research and Public Health, 17(20), 7418. https://doi.org/10.3390/ijerph1720741 8

Koff, W. C., & Williams, M. A. (2020). Covid-19 and immunity in aging populations—a new research agenda. New England Journal of Medicine.

https://doi. 10.1056/NEJMp2006761

Li, J. Y., You, Z., Wang, Q., et al. (2020). The epidemic of 2019-novel-coronavirus (2019-nCoV) pneumonia and insights for emerging infectious diseases in the future. Microbes and Infection,22(2), 80–85. https://doi.org/10.1016/j.micinf.2020.0 2.002

Li, W., Liao, J., Li, Q., Baskota, M., Wang, X., Tang, Y., ... & Fukuoka, T. (2020). Public health education for parents during the outbreak of COVID-19: A rapid review. Annals of translational medicine, 8(10). https://doi.org/10.21037/atm-20-3312

Marín-Hernández, D., Schwartz, R. E., & Nixon, D. F. (2020). Epidemiological Evidence for Association between Higher Influenza Vaccine Uptake in the Elderly and Lower COVID-19 Deaths in Italy. Journal of Medical Virology.

https://doi.org/10.1002/jmv.26120

Morrow-Howell, N., Galucia, N., & Swinford, E. (2020). Recovering from the COVID-19 Pandemic: A Focus on Older Adults. Journal of Aging & Social Policy, 1-9 https://doi.org/10.1080/08959420.202 0.1759758

Papagiannis, D., Malli, F., Raptis, D. G., Papathanasiou, I. V., Fradelos, E. C., Daniil, Z., ... & Gourgoulianis, K. I. (2020). Assessment of knowledge, attitudes, and practices towards new coronavirus (SARS-CoV-2) of healthcare professionals in Greece before the outbreak period. International journal of environmental research and public health, 17(14), 4925. https://doi.org/10.3390/ijerph1714492 5

Paul, A., Sikdar, D., Hossain, M. M., Amin, M. R., Deeba, F., Mahanta, J., ... & Nath, T. K. (2020). Knowledge, attitudes, and practices toward the novel coronavirus among Bangladeshis: Implications for mitigation measures. PloS one, 15(9), e0238492. https://doi.org/10.1371/journal.pone.0 238492

Salimi, S., & Hamlyn, J. M. (2020). COVID-19 and Crosstalk between the Hallmarks of Aging. https://doi.org/10.1093/gerona/glaa14 9

Salman, M., Mustafa, Z. U., Asif, N., Zaidi, H. A., Hussain, K., Shehzadi, N., ... & Saleem, Z. (2020). Knowledge, attitude and preventive practices related to COVID-19: a cross-sectional study in two Pakistani university populations. Drugs & Therapy Perspectives, 1. https://doi.org/10.1007/s40267-020-00737-7

Shi, Y., Wang, J., Yang, Y., Wang, Z., Wang, G., Hashimoto, K., ... & Liu, H. (2020). Knowledge and attitudes of medical staff in Chinese psychiatric hospitals regarding COVID-19. Brain, Behavior, & Immunity-Health, 100064. https://doi.org/10.1016/j.bbih.2020.10 0064

Tak, C. R., Marciniak, M. W., Savage, A., & Ozawa, S. (2020). The essential role of pharmacists facilitating vaccination in older adults: the case of Herpes Zoster. Human vaccines & immunotherapeutic, 16(1), 70-75. https://doi.org/10.1080/21645515.202 0.1771988

Tomar, B. S., Singh, P., Nathiya, D., Suman, S., Raj, P., Tripathi, S., & Chauhan, D. S. (2020). Indian communitys Knowledge, Attitude & Practice towards COVID-19. medRxiv. https://doi.org/10.1101/2020.05.05.20 092122

Vaidya, B., Bhochhibhoya, M., Baral, R., & Nakarmi, S. (2020). Knowledge, attitudes, and practice regarding COVID-19 among patients with musculoskeletal and rheumatic diseases in Nepal: a web-based cross-sectional study. Open Access Rheumatology: Research and Reviews, 12, 167. https://doi. org/10.2147/OARRR.S265816

World Health Organization (2020) accessed at https:// www. who. int/ publications/i/item/clinical-management-of-covid-19

Zhong, B. L., Luo, W., Li, H. M., Zhang, Q. Q., Liu, X. G., Li, W. T., & Li, Y. (2020). Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online cross-sectional survey. International journal of biological sciences, 16(10), 1745. https://doi.org/

Zhou, M., Tang, F., Wang, Y., Nie, H., Zhang, L., You, G., & Zhang, M. (2020). Knowledge, attitude and practice regarding COVID-19 among healthcare workers in Henan, China. Journal of Hospital Infection. https://doi.org/10.2196/22628