Effect of Self-Management Intervention for COVID-19 Patients on Their Knowledge

Hanan Elhosaniy Ibrahim[1], Wafaa Gameel Mohammed Ali[2], Hanaa Elsayed Amin[3],Shereen Abd El-Moniem Ahmed[4],

[1]) Nursing Teacher at Homayat Elabassia Nursing Techniqual Institute

[2] Professor of Medical Surgical Nursing, Faculty of Nursing, Mansoura University, Egypt.

[3] Assist Prof , Professorof Medical Surgical Nursing Faculty of nursing of Suez Canal University,

Abstract

Background: A considerable proportion of corona virus COVID-19 cases experienced at least one complication six months following the onset of the illness. Self-management interventions for COVID-19 patients involve empowering patients to take active roles in managing their health and well-being. This includes providing patients with the knowledge and skills, required to effectively manage symptoms and adhere to preventive measures. **Aim of the study :** to evaluate the effect of self-management interventions for covid-19 subjects on their knowledge. **Design:** A quasi-experimental research. **Subjects:** Composed of purposive sample of (90) individuals with covid-19 from both sexs. **Setting:** At isolation units of Tropical Ismailia Hospital & Tropical Elabassia Hospital. Data collection tools: Patients' structured interview knowledge survey including two parts, socio-demographic characteristics and knowledge regarding Covid-19. **Results:** Showed statistically substantial improvement in knowledge regarding covid-19 after self-management interventions in the study group. **Conclusion:** There was a positive effect of self-management interventions for covid-19 Patients on improving Patients' level of knowledge with (p0.000) after implementation of self-management interventions. **Recommendation:** Create customized educational materials about COVID-19 self-management that cater to different literacy levels, cultural backgrounds, and age groups to ensure accessibility and effectiveness.

Keywords: COVID-19, Knowledge, Self-Management.

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1. Introduction

Infectious diseases have caused destruction among societies. Throughout history, emerging and re-emerging infectious diseases are now occurring at unprecedented speed. According to the world health organization (WHO), the world has witnessed the emergence of several disease outbreaks and epidemics caused by more than 20 infectious agents over the past decade **(WHO, 2020).**

The COVID-19 is a major global human threat that has turned into a pandemic. In late December 2019, a cluster of patients were admitted to hospitals with an initial diagnosis of pneumonia of an unknown etiology **(Bogoch et al., 2020).**

The COVID-19 virus transmits through droplets that spread when an individual is in close contact (within 1 m) with COVID-19 affected person and is at risk of having mucosa of the mouth and nose or conjunctiva of eyes exposed to infective droplets. Therefore, COVID-19 transmission can occur by direct contact with infected people and indirect touch with surfaces in the immediate environment or with objects used on the infected individual such as stethoscope or thermometer **(Li et al., 2020).**

COVID-19 presentation range from mild manifestations to severe illness and mortality. Common signs include fever, cough, breath shortness, runny nose or congestion, fatigue, muscle or body aches, headache, taste or smell loss, sore throat ,vomiting or nausea and diarrhea. Other symptoms, such as malaise, sputum production, headache, altered mentality and respiratory distress, also may be presented. Symptoms require 2 days to 2 weeks to progress following viral exposure **(Almaghaslah et al., 2020).**

Symptoms of COVID-19 are similar to other respiratory diseases, lab tests are necessary to confirm a COVID-19 diagnosis. The primary, and preferred method for diagnosis is "real-time reverse transcription–polymerase chain reaction (RT-PCR)" which is done by collection of upper respiratory samples via nasopharyngeal (NP) and or pharyngeal swabs. Within 5-6 days of symptoms onset, COVID-19 patients demonstrate elevated viral loads in upper and lower respiratory tracts. An NP and/or an oropharyngeal (OP) swab are often preferred for screening or diagnosis of early infection **(Tahamtan & Ardebili, 2020).**

More than three-quarters of COVID-19 subjects experienced at least one complication six months post disease onset **(Huang et al., 2021).** COVID-19 is an infectious illness defined by pneumonia; however, complication affecting the cardiovascular system (CVS) is the most severe and fatal as the level of angiotensin converting enzyme (ACE) was extremely low **(South, Tomlinson & Edmonston, 2020)**. ACE declining leads to increase in the risk of myocarditis, hypertension, and even heart failure (HF) **(Souza-Silva et al., 2020)**.

It is very important and right for the patients to be health teached and empowered to be able to take care of self through riching their knowledge and improving their practice regarding taking care of themselves by

providing adequate information about COVID-19 , and instructions related to illness prevention including, staying at home, social distancing, frequent hand washing and cleaning the touched surfaces area **(Charles , 2020).**

Significance of the Study:

According to WHO from the begining of the pandemic until November 10, 2024, over 776.8 million confirmed COVID-19 patients and over 7 million confirmed mortalities were recorded across 234 countries. The majority of COVID-19 related mortality occurred in 2020, 2021, and 2022, with elevated immunity leading to a considerable reduction in mortality. Globally, 77 countries from 14 October to 10 November 2024, reported COVID-19 cases and 27 deaths. The frequency of reported cases reduced by 39%, with over 200, 000 new cases and 36% of new mortality, compared to the previous 28 days **(WHO, 2024).**

According to **(Abdelhafiz et al., 2020),** who explored "knowledge, perceptions, and attitude of Egyptians towards COVID-19**"**, found significant lower knowledge score among participants especially older participants, patients living in rural areas, with lower educational and monthly income levels. Therefore, after reviewing literature related to the specific topic, the researcher found that performing a self-management intervention for COVID-19 patients is important to appraise self-management in COVID-19 patients and enhance suitable lifestyle. Thereby, improving COVID-19 patients' knowledge about covid-19 disease, self-management behaviors, and healthy lifestyle during and after the disease will prevent the complications resulting from COVID-19, which will have a direct impact on patients' quality of life.

The Aim of the study:

This study aimed to evaluate the effect of self-management interventions for covid-19 patients on their knowledge and lifestyle.

Research questions:

1-What is the level of knowledge among COVID-19 patients?

2- Is there a statistical relationship between the total knowledge score of COVID-19 patients and their socio-demographic data?

3- Is there statistical significance difference in patients' knowledge regarding COVID-19 after implementation of self-management interventions?

2. Subject and Method

Research design:

A quasi experimental research design was used in this study.

Setting of the study:

The study was conducted at isolation units of Tropical Ismailia Hospital & Tropical Elabassia Hospitals. Isolation units of Tropical Ismailia are divided into two units (male and female),each one consists of (53) beds. Quarantine units, of Tropical Elabassia are divided into five units each one consists of (20) beds, each unit composed of two rooms, each room composed of 10 beds separated by curtness.

Sampling size and technique:

-A purposive sample of (90) confirmed COVID-19 subjects (testing specimens from nose or mouth, chest C-T, and COVID-19 clinical symptoms). The sample was divided into two equal groups (control group and study group), each group consists of 45 patients.

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

N=population size D=error proportion

Z=confidence level P= probability

n = 100 * 0.50 (1 – 0.50) / [100 – 1 * {(0.05)2 / (1.96)2] + 0.50 (1– 0.50)]

=100 * 0.50 * 0.50 / [99 * (0.0025 / 3.841)] + 0.50 * 0.50]

= 100*0.25 / [99 * 0.00065] + 0.25]

= 25 / 0.04485 + 0.25

= 25 / 0.295 = 84.74

Inclusion criteria:

- Adult patients ages from (18-60) years old.
- Patients able to communicate to be able to learn.
- Patients newly diagnosed with COVID-19and admitted to inpatient to have time for self-management interventions implementation.

Exclusion Criteria:

- Patients who are complicated by Covid-19 as it will affect the result of the study.
- Patients have chronic diseases such as cardiac diseases, blood disorders, or cancers were excluded as they are high risk for morbidity and mortality.

Tools of data collection:

Patients' Knowledge survey: *It involved two sections: socio-demographic, and patients' knowledge regarding covid-19.*

Part I: Socio-demographic for patient: It encompassed four items (age, gender, marital status and education).

Part II: Patients' knowledge regarding covid-19. It was established by the researcher relying on relevant literature **(Brugliera et al., 2020. WHO, 2021)**. It consisted of ten closed ended items in Arabic language. It included items as definition of corona virus (2items), causative agent (3items), manifestations (8 items), incubation period (3items), methods of transmission (3 items), risk groups (4 items), complication (6 items), diagnostic methods (3 items), preventive measures to control spread of COVID-19 (6 items) and factors affecting patients' nutrition (6 items).

Scoring system:

The patients' knowledge regarding covid-19 included a multiple choice items which consisted of different number of options. The scoring system was distributed according to **(Raesi et al., 2021)** which scored correct answer by (1) degree, and incorrect answer and un known answer by (Zero).

The total scores of the knowledge was (36). Such scores were converted into a percent score. Satisfactory knowledge was considered at percent score of (60%) which equal (22 points) or more and unsatisfactory if less than (60%) (less than 22 points).

household work due to menstruation, foods that menstruating girls should avoid, menstruating girls are dirty/ unclean and whether menstruation is too shameful to discuss.

Validity of tools:

Five experts in medical surgical nursing filed reviewed the face and content validity to determine whether the items are understandable, comprehensive, suitable, applicable and clear to achieve the aim of the work. The needed modifications were done according to the experts' opinions.

Reliability of tools:

Cronbach Alphas were estimated for the knowledge questionnaire and the result was (0.943). The rule of thumb for internal consistency using Cronbach's alpha was implemented as follows; $\alpha \geq 0.9$ = excellent, whereas good score at $0.8 \leq \alpha < 0.9$, $0.7 \leq \alpha <$

0.8 was acceptable, $0.6 \leq \alpha < 0.7$ was questionable, $0.5 \leq \alpha < 0.6$ was poor and $\alpha < 0.5$ = unacceptable.

Ethical considerations:

Primary approval was obtained from the research ethics committee at the faculty of nursing-Suez Canal University with ethical code (175/9/2022). The ethical considerations involved explaining the nature and aim of the work, informing the possibility of withdrawal at any time. The researcher confirmed that participation is totally voluntary, with confidentiality and anonymity of participants. Verbal consent received from the participants.

Pilot study:

It was established on 10% of the studied subjects According to the findings of this study, some items were modified, omitted and added. Patients who participated in the pilot study were excluded from the study sample.

Administrative design:

Official permission was obtained from responsible authorities (Tropical Ismailia & Tropical Elabassia Hospitals. This was done by submission of a formal letter from the vice dean of the faculty of nursing for post- graduate and research affairs and dean of the faculty of nursing with explaining the objectives of the study. Meeting and discussion were held between the researcher and the nurses who worked in the units to make them aware about the aim of the study and purposes of the research, as well as to get better cooperation during the implementation phase.

Statistical Analysis:

Data was collected, revised, coded and entered to "the statistical software statistical package for the social sciences (SPSS) version 24". The required graphs were designed using Microsoft office excel. After data manipulation was done, all numeric data were expressed in the form of frequency, distribution, range, descriptive statistics including mean and standard deviation (SD), Paired T-test and Chi-square test (x^2) .

3. Results

Table (1) displays the socio-demographics of the groups. It shows that (62.2%) of study category and (71.1**%)** of control were male. With regard to age (40.0 %) of study category and (71.1%) of controls aged 18 <40 years.

Also, the same table shows that the predominant percentage which equals (35.6%) of the study category had university education and (48.8%) of controls had basic

education. It was apparent that the main percentage of the two groups study and control were married in (64.5% & 62.2%) respectively.

Moreover there was no significance difference between socio-demographics among both categories except in age.

Table (2) reveals highly statistical considerable variance among study group knowledge regarding definition of corona virus as (51.1%) of study group answers were incorrect pre-program and improved to (96.2%) correct after program. While no significant variation was found among controls regarding definition of corona virus as (51.1%) of control group answers were incorrect pre-program and post program.

Also, it demonstrates highly markedly difference regarding causative agent of corona virus among study group level of knowledge as (44.4%) of study group answer was correct pre-program and improved to (98.2%) after program. While there was no significant variation among controls regarding causative agent of corona virus as (71.1%) of control group answer was incorrect pre-program and post program.

Moreover, high significant difference was found in knowledge in all items regarding occupation period of corona virus among study group level of knowledge as (20%) of study group answers were correct pre-program and improved to (97.03%) correct after program. While there was no considerable difference among controls regarding causative agent of corona virus as (62.2%) of control group answers were incorrect pre-program and post program.

Also, it refers to high substantial difference in all items regarding signs of corona virus among study group. As (46.1%) of study group answer was correct pre-program and improved to (83.1%) after program adoption.

There was no substantial variance among controls regarding signs &symptoms of corona virus. As (45.8%) of control group answer was correct pre-program and slightly improved to (50.0%) after program implementation.

There was highly substantialdifference in all items regarding high risk groups for corona virus infection among study group. As (28.9%) of study group answer was correct pre-program and improved to (74.5%) after program implementation.

There was no considerable difference among controls regarding signs and symptoms of corona virus. As (50.4%) of control group answer was correct pre-program

and slightly improved to (51.7%) after program implementation.

There was a considerable variation in all items regarding mode of transmission of corona virus among study group. As (46.4%) of study group answer was correct pre-program and improved to (91.0%) after program provision.

There was no considerable difference among control category regarding signs and symptoms of corona virus. As (57.8%) of control group answer was incorrect pre /post program provision.

Also, a highly significant difference was found in in all items regarding diagnosis of corona virus among study group. As (34.8%) of study group answer was correct pre-program and improved to (82.3%) after program provision.

No significant difference was detected among controls regarding diagnosis of corona virus. As (39.3%) of control group answer was correct pre-program and improved to (45.9%) after program.

There was highly statistical significant difference in all items regarding complication of corona virus among study group. As (34.08%) of study group answer was correct pre-program and improved to (81.11%) after program.

There was no substantial variance among controls in complication of corona virus. As (37.43%) of control group answer was correct pre-program and slightly improved to (40.0%) after sessions implementation.

There was statistical significant difference in all items in preventive measures to restrict the spread of the corona virus among study group. As (41.5%) of study group answer was correct pre-program and improved to (87.08%) after program.

There was no significant difference among controls in preventive measures to limit spread of corona virus. As (42.46%) of control group answer was correct pre-program and slightly improved to (44.45%) after program.

There was great difference in all items regarding factors affecting food intake of coronavirus patients among study group. As (48.5%) of study group answer was correct pre-program and improved to (89.95%) after sessions implementation.

While there was no statistical significant difference among control group regarding factors affecting food intake of corona virus. As (45.2%) of control group answer was correct pre-program and slightly improved to (51.48%) after program.

Table (3) demonstrates high statistical

significance variation between gender, age, educational level, marital status and total patients knowledge with (p 0.013, 0.043, 0.027 and 0.006) respectively preprogram implementation in study group. Also, there was great significance between age, educational level and marital status and total patients knowledge with (p 0.000, 0.000 and 0.002) respectively after program implementation and significance variance between gender and total patients knowledge with (p0.046) in the study group.

Table (4) illustrates no potential difference between gender, age and total patients knowledge with (p 0.784, 0.448, 0.809 and 0.364) respectively pre / post implementation in controls. Also, there was significance difference between marital status and total patients knowledge with (p 0.009 and 0.012) pre / post program implementation. Moreover, there was no significance difference between educational level and total patients knowledge preprogram implementation and high statistical significance difference between educational level and total patients knowledge with (p0.000) after program implementation.

Figure (1) shows highly significant improvement among study subjects in total knowledge regarding covid-19 as (73.3%) of total knowledge was unsatisfactory at the pre-implementation phase and improved to be satisfactory in (93.3%) after implementation. There was no significant improvement among the controls in level of knowledge after implementation as (80%, 77.8%) respectively had unsatisfactory knowledge pre/ post implementation.

4. Discussion

Coronavirus spreading and its complications raise chances of death because of the significant proportion of the elderly population that suffers from chronic diseases in Egypt, as Egypt is one of the Middle East's and Africa's most highly populated nations **(Abdelhafiz et al. 2020).**

To manage COVID-19 infection, early diagnosis, appropriate treatment, and future control measures are all essential to limit the spread of the virus. However, self-care practices can also play a crucial role in managing symptoms, boosting immunity, and promoting overall well-being during the COVID-19 pandemic **(Rakhshani et al. 2024).**

Self-management interventions for COVID-19 patients involve empowering patients to

take active roles in managing their health and well-being. This includes providing patients with knowledge, skills, and tools needed to effectively manage symptoms, adhere to preventive measures, and make healthier lifestyle choices. These interventions aim to promote self-care practices, such as regular physical activity, balanced nutrition, and adherence to hygiene protocols, to improve overall health outcomes **(Liu et al., 2021).**

In terms of the socio-demographics of the participants, we found that around three-fifths of the study group and about three-quarters of the control group were males. This result agreed with **(Goshayeshi et al., 2021)** in the research "Demographic and clinical characteristics of severe Covid-19 infections: a cross-sectional study from Mashhad University of Medical Sciences, Iran" found that COVI-19 infection was higher among males.

Also, **Rastogi et al. (2021)** in a study titled "Impact of Yoga-based Interventions on Self-Care among COVID-19 Patients" reported that more than half and three- fifths of the study and controls were males respectively.

At the opposite side (**Brog et al., 2022)** in a work "Effects of an Internet-based self-help intervention for psychological distress due to COVID-19", among the 107 German participants reported that the majority of the study and controls were female.

Also this finding disagrees with **(Saleh et al., 2021)** in research titled "Effectiveness of an Educational Program on Improving Self-Care Practices for COVID-19 Patients." who reported that three-fifths of the study cases and more than half of the controls were females.

Regarding age, this work revealed that, two-fifths of the study subjects and about three quarters of the controls were aged from eighteen to less than forty years old. These results are in agreement with **(Kaim et al., 2020)** in a publication titled "Impact of a Brief Educational Intervention on Knowledge, Perceived Knowledge, Perceived Safety, and Resilience of the Public During COVID-19 Crisis" who found that two- fifths of study group aged from twenty two to forty years.

Also, **(Rastogi et al., 2021)** in "Impact of Yoga-based Interventions on Self-Care among COVID-19 Patients", mentioned that

three-fifths were aged from twenty five to thirty five years of the study and the control category.

But such findings disagree with **(Elnemr et al. 2023)** in "Clinical and laboratory predictors of disease severity and outcome in COVID 19 infected patients in Suez Canal University Hospital, single center study from Egypt", found that, about three-fifths of study group aged more than sixty years old.

The current research showed that the predominant percentage which equals approximately one-third of the study subjects had a university education and nearly half of them had basic education.

These findings followed the results of **(Lee et al., 2021),** which mentioned that nearly three-fifths of their studied patients had a high school, followed by one-third of bachelor's degree. While these findings were contradicted by **(Brog et al., 2022)** who mentioned that around three-fifths of the patients were single , in " *Knowledge, Attitudes, and Practices (KAP) toward COVID-19",* in Korea.In contrast, **(Saleh et al., 2021),** reported that two-thirds had secondary education in the study group. control groups.

Referring to marital status, the present work displayed the main percentage of the two groups was married by more than three-fifths These findings followed the results of a study titled *"Knowledge, Attitudes, and Practices (KAP) toward COVID-19"*, in Korea by **(Lee et al., 2021)**, which mentioned that more than three-fifths were married. This may be due to the prenominal age group of the study & control groups lies between 18-40 years old which is the age of marriage and child bearing.

This work found a significant improvement in the study category's levels of knowledge regarding the definition of coronavirus, causative agent, and the incubation period post-program implementation, while there was no significant difference among the controls regarding the same items pre/post-implementation.

This finding was in accordance with a study of **(Rakhshani et al., 2024)** in Iran, titled *"The effect of a self-learned virtual learning package on knowledge, attitude, and self-care behaviors of COVID-19".* which indicated that the ducational interventions were effective in improving knowledge

toward COVID-19 and **reported** significant improvement in knowledge of COVID-19 patients after intervention, **including** the causative agent. **As,** pre-intervention, nearly half of study subjects answered incorrectly about the definition of coronavirus, which improved to most of patients having correct answers post-intervention.

The current study found high statistical significant improvements in the study category's knowledge about signs and symptoms of coronavirus post-implementation while, there was no statistical significant improvements in the control's knowledge about signs and symptoms of coronavirus post-implementation.

These findings were enhanced by **(Smith & Johnson, 2021),** in a study in the U.S., entitled "Impact of Educational Programs on health knowledge during the COVID-19 pandemic. ”who found that the educational program showed significant improvement in understanding of COVID-19 symptoms with correct answers increasing from less than half of patients in pre-program implementation to the majority of subjects in post-program implementation. The controls showed no significant change, aligning with the present findings.

These results are consistent with **Zhang et al. (2023),** who found significant improvement regarding the study group in recognizing symptoms of COVID-19 from two- fifths correct answers pre interventions to majority post- intervention, while there was slight improvement in control group from about one-third pre interventions to half post interventions, in **"***Effects of Educational Interventions on COVID-19 Knowledge and Self-care".*

These results might be due to the current program likely covering a wide range of COVID-19 symptoms, including less common ones like muscle and joint pain, diarrhea, and loss of appetite. This comprehensive approach helped participants recognize a broader spectrum of symptoms and identify potential cases earlier. In addition, the study group reflects the initial knowledge levels of the participants before the intervention. It's common to see a significant proportion of people having incorrect information about complex topics like COVID-19, especially at the beginning of a pandemic or when misinformation is prevalent.

This study also found significant improvements in the study subjects' knowledge about high-risk groups for Coronavirus infection in post-program while, there was no statistical significant improvement in control group post-program implementation.

These outcomes are in accordance with **(Tien et al., 2023),** who found statistically significant improvements in the study category's knowledge about high-risk groups for coronavirus infection as, half of the study subjects had correct answers in pre-intervention and improved to the majority post program. In the control group, there were no significant improvements as two-fifths of the control group had correct answers in pre-program implementation and slightly improved to the half post program implementation in a study titled "Effectiveness of an educational intervention on COVID-19 prevention behaviors among patients".

These results are opposite to **(Smith & Johnson, 2021),** who reported statistical significant improvements in the control group knowledge about high-risk groups for coronavirus infection as, one-quarter of the control group had correct answers in pre-program implementation and improved to two- thirds post program implementation.

With regard to mode of transmission for coronavirus infection, this study revealed high statistical significant improvements in the study group after program implementation while, there was no statistical significant improvements in the control group post program implementation.

These results matched with the results of **(Lee et al., 2021),** whose study found that knowledge significantly improved post-intervention, and seemed to be knowledgeable about the mode of transmission through droplets of infected cases as most of the studied participants answered correctly. These might be due to mass media and stressing on the disease modes of transmission.

As regards the study category's knowledge about the diagnosis of coronavirus, this study revealed statistical significant improvements in the study caregory knowledge while there was no potential improvements in the control group post program implementation.

These findings were enhanced by

(Patterson & Smith, 2021), in the U.K, who found that participants who underwent a targeted educational program showed a significant improvement in their knowledge about COVID-19 diagnostic tools, with correct answers increasing from two-fifths preprogram to the majority post-program implementation. And the control group showed no significant change, aligning with the present findings pre/post program implementation, in a study titled "Effectiveness of a targeted educational program on COVID-19 diagnostic knowledge."

Also, such findings were in accordance with **(Liu et al., 2021)** who found improvement of the study group knowledge about the diagnosis of coronavirus post-intervention implementation. While in the control group there was no improvement post-intervention.

However, this outcome disagreed with **(Zhang et al., 2023),** who reported statistical significant improvements in the controls post program regarding the knowledge about diagnosing Coronavirus.

Concerning the study subjects' knowledge about complications of coronavirus the present study showed statistical significant improvement from about one- third correct answers preprogram implementation to four-fifths correct answers post program. There was no substantial improvement in controls as, three-fifths of patients had incorrect answers pre /post program implementation.

Similarly, a study evaluated the COVID-19 educational program for patients by **(Khan & Soares, 2021),** conducted in India, matched with the current study findings and indicated that intervention groups exhibited significantly improved knowledge about complications compared to control groups. They reported that their educational sessions improved knowledge about complications like dyspnea and cardiac problems by about three -quarters in intervention groups, with minimal change in control groups.

As regards the study group's knowledge regarding preventive measures pre/ post program, the current research displayed that less than half, about half, and less than half of the study category had correct answers toward the use of hand sanitizers that contain alcohol, wear face masks, and cleaning touchable surfaces in pre-program implementation, and improved to most, almost all, and most of patients had correct answers about same items post-program

respectively with substantial difference .

Also, this research displayed that more than half of the controls had incorrect answers about the use of hand sanitizers that contain alcohol, wearing face masks, and avoiding using other people's tools or sharing food and drinks pre and post-program.

These findings were enhanced by **(Lee et al. 2021)** who stated that about half of the subjects replied that wearing a general medical mask helps prevention was correct. The most frequently performed practice was wearing face masks, followed by hand hygiene and social distancing.

In contrast, another research was conducted to identify the influence of a self-management intervention on COVID-19 patients' knowledge, attitudes, and behaviors" by **Liu et al. (2021)** and found that the intervention significantly improved participants' knowledge about COVID-19 and self-management behaviors. As well as before the intervention implementation, about one- third of the participants reported consistently following recommended preventive measures (e.g., mask-wearing, hand hygiene). After the intervention implementation, this increased to three quarters as consistently following recommended preventive measures.

This dramatic improvement underscores the efficacy of the educational intervention in enhancing participants' knowledge and understanding of critical preventive measures, which led to significant improvement in the study subjects' knowledge about using hand sanitizers that contain alcohol, wearing face masks, and cleaning touchable surfaces during their hospital stay which also confirm that simple education either direct or indirect during hospitalization lead to knowledge improvement.

Referring to knowledge regarding factors affecting food intake in coronavirus patients, this work revealed significant improvement in the study category from about half correct answers preprogram implementation to more than four- fifths post program. There was no considerable improvement in control group.

These outcomes were congruent with **Tien et al. (2023),** who discovered significant improvement in the study group from less than two-fifths correct answers preprogram implementation to three- quarters correct

answers post program implementation.

In the same line**, Smith & Johnson, (2021)** reported significant improvement in the study group from one- third correct answers preprogram to almost three- quarters correct answers post program with regard to the same knowledge point.

But, **(Liu et al. 2021)** who investigated *"Effectiveness of a Self-Management Intervention on COVID-19 Knowledge, Attitudes, and Behaviors"*. reported significant improvement in the controls post intervention.

This research displayed statistically significant improvement in the study group's total level of knowledge regarding COVID-19, as about three-quarters of the total level of knowledge was unsatisfactory at the pre-implementation phase and improved to satisfactory in most of patients after program. No significant improvement was discovered in the controls' knowledge after program as the majority had an unsatisfactory knowledge pre/post-implementation.

In the same line**, Smith & Johnson, (2021)** agreed and reported that there was substantial improvement in the study category's knowledge regarding health during the COVID-19 pandemic. Around three- fifths of the study subjects had unsatisfactory knowledge levels before the program implementation, which improved to more than four- fifths achieving satisfactory knowledge after the program. In contrast, the controls showed no remarkable improvement, as about three -quarters of participants had unsatisfactory knowledge before and post the program implementation

Similarly, **Zhuo, et al. (2024)** agreed and reported that a planned web-based educational intervention led to significant improvement in knowledge and preventive behaviors among the study category. Approximately more than three fifth of the study group demonstrated low knowledge and preventive behaviors pre-program, which improved to majority achieving high levels post- implementation. But the control group did not exhibit a statistically significant change, with about 75% maintaining low knowledge and behaviors pre- and post-program, reflecting similar trends as in the user's study regarding control group outcomes.

In addition, these outcomes were enhanced

by **Abdelhafiz et al. (2020),** who discovered that the average knowledge score was in a high level of concern, and sought information actively, which likely improved the knowledge about COVID-19. This aligned with the current work's findings that educational interventions can significantly enhance knowledge.

Also, **Liu et al. (2021)** congruently reported that regarding the total participants' knowledge**,** before the program intervention, only two-fifths of participants had adequate knowledge about COVID-19. And after the program intervention, increased to the majority.

Conversely**, Tomaszek, et al. (2021)** disagreed and reported that the control group improved slightly from one- fifth to one - third, highlighting limited impact without intervention.

This study revealed no remarkable difference between gender, age, educational level, marital status and total patients knowledge in the study group after program implementation. While, there was statistical significant difference between educational level, marital status and total patients knowledge in the control group after program implementation.

Such results were matched with **(Lee et al., 2021)** who agreed and mentioned that there was statistical difference between gender, educational level, and total knowledge level among study category post- implementation.

Also, **(Altena et al., 2020)** who examined a telematic mindfulness-based program focusing on sleep management during the pandemic, showed a remarkable variation between participants' age and gender with knowledge improvements post-program implementation. In addition, the control group showed no remarkable variance difference between the age, gender, marital status and the total knowledge scores.

These results are in the opposite line with **(Brog et al., 2022),** who reported no significance between gender, age, educational level, marital status and total knowledge level among study group post-program implementation.

5. Conclusion:

Based on the results of this work,it can be concluded that, most of study group patients had improved knowledge regarding covid-19 after program implementation from

unsatisfactory to satisfactory level of knowledge with statistical significance difference, while most of controls had unsatisfactory level of knowledge regarding covid-19 pre/ post intervention.

6. Recommendations:

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

1- Replication of the study on large sample size .

2- Create customized educational materials that cater to different literacy levels, cultural backgrounds, and age groups to ensure accessibility and effectiveness

3- Establish regular feedback systems where patients can share their experiences and challenges with self-management, helping refine and adapt the intervention for better outcomes.- impaired schools for generalization of results.

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Table (1): Distribution of the participants based on their Socio-Demographics (n=90).

Characteristics	Study (n=45)		Control (n=45)		Test of significance	
	No	%	No	%	X^2	P
Gender					0.800	0.251
Male	28	62.2	32	71.1		
Female	17	37.8	13	28.9		
Age					8.933	0.011*
18 <40	18	40.0	32	71.1		
40 <60	15	33.3	8	17.8		
≥ 60	12	26.7	5	11.1		
Educational Level					5.019	0.285
Don't read or write	7	15.6	5	11.1		
Basic education	13	28.9	22	48.8		
Secondary Education	2	4.4	3	6.7		
University education	16	35.6	12	26.7		
Post graduate	7	15.6	3	6.7		
Marital Status					0.061	0.970
Married	29	64.5	28	62.2		
Divorced	0	0.0	0	0.0		
Widow	5	11.1	5	11.1		
Single	11	24.4	12	26.7		

(* A significant P ≤ 0.05)

Table (2): Distribution of Groups regarding Knowledge About Covid-19Covid-19 pre/ post program (n=90)

Knowledge about Covid-19	Pre				Post				Chi-square			
	Study (n=45)		Control (n=45)		Study (n=45)		Control (n=45)		X^2 1	P	X^2 2	P
	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect				
	%	%	%	%	%	%	%	%				
Definition	48.9	**51.1**	37.8	**62.2**	**96.2**	3.8	37.8	**62.2**	30.896	0.000**	0.048	0.500
Causative agent	**44.4**	55.6	28.9	**71.1**	**98.2**	1.2	28.9	**71.1**	25.714	0.000**	0.277	0.406
Incubation period	20.0	**80.0**	37.8	**62.2**	**97.03**	2.97	37.8	**62.2**	60.010	0.000**	0.000	1.000
Signs & Symptoms of corona virus	46.1	53.9	45.8	54.2	83.1	16.9	50.0	50.0	19.275	0.000**	0.875	0.0947
High risk groups for corona virus infection	28.9	71.1	50.4	**49.6**	74.5	25.5	51.7	**48.3**	17.284	0.000**	0.197	0.548
Mode of Transmission of corona virus	46.6	53.4	42.2	**57.8**	91.0	9.0	42.2	**57.8**	28.430	0.000**	0.000	1.000
Corona virus can be diagnosed through	34.8	65.2	39.3	60.7	82.3	17.7	45.9	54.1	29.108	0.000**	1.150	0.149
Complication of corona virus	34.08	65.92	37.43	62.57	81.11	18.89	40.0	60.0	22.480	0.000**	0.277	0.406
Preventive measures	41.5	58.5	42.46	57.54	87.08	12.92	44.45	55.55	19.278	0.000**	0.900	0.951
Factors affecting food intake of coronavirus patients	48.5	51.5	45.2	54.8	89.95	10.05	51.48	48.52	20.112	0.000**	0.177	0.411
Total	26.7	73.3	20.0	80.0	93.3	6.7	22.2	77.8	0.500	0.067	0.000**	41.667

X^2 1: Between study category preprogram, and post
X^2 2: Between control group preprogram, post program
(* A significant P ≤ 0.05 **, A highly significant P ≤ 0. 001)

Table (3): Relation between Total Patients` Knowledge and their socio demographic Characteristics throughout Program Phases in the study category (n=45)

Socio demographic Characteristics		Knowledge					
		Pre program			Post program		
		$\bar{X}$±SD	F/t	P- value	$\bar{X}$±SD	F/t	P- value
Gender	▪ Male ▪ Female	18.71±7.77 24.70±10.14	t= 2.232	0.013*	43.67±3.63 43.52±5.82	t= 2.091	0.046*
Age	▪ 18 <40 ▪ 40 <60 ▪ ≥ 60	26.16±2.85 24.20±8.92 19.16±2.82	F= 3.401	0.043*	41.77±4.38 46.86±3.77 42.33±3.60	F= 6.201	0.000**
Education	▪ Don't read or write ▪ Basic education ▪ Secondary Education ▪ University education ▪ Post graduate	9.71±3.90 13.30±4.26 28.50±6.36 28.62±4.48 26.85±6.36	F= 4.268	0.027*	43.42±1.82 43.07±2.75 47.50±2.12 43.68±6.07 43.57±3.77	F= 12.852	0.000**
Marital Status	▪ Married ▪ Widow ▪ Single	20.96±9.93 10.60±3.04 25.72±2.68	F= 5.755	0.006*	45.10±4.29 41.60±1.14 40.63±4.52	F= 7.102	0.002**

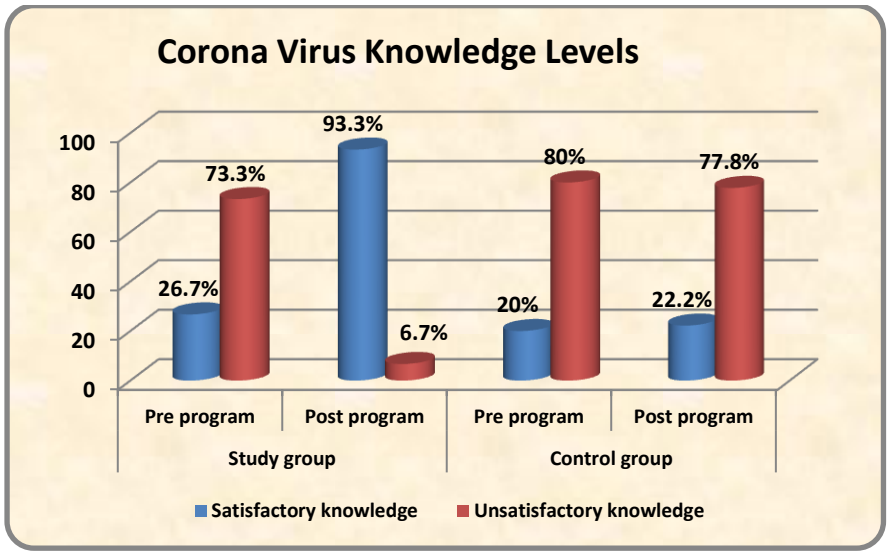
(* A statistical significant difference P ≤ 0.05 **, A highly statistical significant difference P ≤ 0. 001)

Table (4): Relation between Total Patients` Knowledge and Their Socio demographic Characteristics throughout Program Phases in the Control group (n=45)

Socio demographic Characteristics		Knowledge (Control group)					
		Pre program			Post program		
		$\bar{X}$±SD	F/t	P- value	$\bar{X}$±SD	F/t	P- value
Gender	**Male** **Female**	**22.70±9.70** **21.52±9.83**	**t= 0.276**	**0.784**	**22.03±9.43** **21.29±8.15**	**t= 0.248**	**0.809**
Age	**18 <40** **40 <60** **≥ 60**	**18.83±7.98** **21.40±8.47** **27.66±9.06**	**F= 0.818**	**0.448**	**20.11±8.91** **21.40±7.96** **24.66±8.92**	**F= 2.148**	**0.364**
Education	**Don't read or write** **Basic education** **Secondary Education** **University education** **Post graduate**	**14.00±2.82** **14.68±8.21** **22.28±8.03** **20.07±4.82** **22.28±5.02**	**F= 0.392**	**0.813**	**16.50±3.53** **14.00±3.53** **21.28±9.14** **29.84±5.75** **26.42±5.91**	**F= 9.920**	**0.000****
Marital Status	**Married** **Widow** **Single**	**22.20±9.00** **33.00±5.14** **16.63±8.92**	**F= 5.265**	**0.009***	**22.13±9.20** **32.00±5.61** **16.09±8.26**	**F= 5.824**	**0.012***

(* A significant variation P ≤ 0.05 **, A highly difference P ≤ 0. 001)

Figure (1): Frequency and Percentage of both categories regarding Total Knowledge at pre/ post program implementation (n=90)



X ^{2} 1: Between study category pre-and post-program,

X ^{2} 2: Between controls preprogram, post program
(A highly statistical difference P ≤ 0. 001)**

Chi-square			
X ^{2} 1	P	X ^{2} 2	P
41.667	0.000**	0.067	0.500

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