

Families' Perception toward Application of Infection Control Precautions with Corona Virus at Home

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Abstract

Background: Coronavirus disease 2019 (COVID-19) had been recognized as a pandemic by the World Health Organization. Global efforts have been exerted to prevent the spreading of the disease through political decisions together with personal behaviors, which depend on awareness of the public population. **Aim of the study:** to assess families' perception toward application of corona virus infection control precautions at home. **Research Design:** A descriptive research design was applied at this study. **Sample:** Convenience sample was used in this study; Total sample size was 170 family caregivers who attended to the outpatient clinics within 3 months 1 day/week. **Setting:** The outpatient clinics at the health insurance branch in Beni-Suef city. **Tools:** One tool used to achieve the aim of this study: Interviewing Questionnaire which consisted of four parts to assess a-caregivers' personnel characteristics and home environment b- families caregiver knowledge questionnaire about Covid 19, home isolation measures and food c-families caregivers' opinion checklist regarding the application of corona virus infection control precautions at home. d-Caregivers attitude regarding COVID 19. **Results:** The result clarified that less than three quarter of caregivers (70.6%) had unsatisfactory knowledge toward Covid 19, almost all of the caregivers (95.9%) had satisfactory practices while more than two thirds of the caregivers (69.4%) had positive attitude toward application of infection control precautions with corona virus at home **Conclusion:** Utilization of the effort that provided by the concerned parties to improve caregivers' knowledge through continuous educational program training and orientation program about corona virus should be provided continuously. **Recommendations:** Awareness for all the society members about COVID-19 in different places as (home, MCH, school, universities....etc) should be increased.

Keywords: Family, Perception, Corona virus, Infection control at home

Introduction

A pneumonia outbreak of unknown origin, which was detected in Wuhan, Hubei province, China by the end of 2019, quickly became a global concern (De Rosa F. 2021). The responsible agent was found to be a virus from the *Coronaviridae* family (Li Q, 2020). The new virus was initially labelled 2019-nCoV and subsequently renamed SARS-CoV-2 due to its resemblance to the virus from the previous SARS-CoV pandemic. SARS-CoV-2 causes coronavirus disease 2019 (COVID-19) (Lupia T.2020). The virus started spreading globally, resulting in 171.6 million cases and 3.6 million attributed fatalities as of 3 June 2021 (Yan Y, 2020).

Coronavirus disease 2019 (COVID-19) is a highly contagious viral illness caused by severe acute respiratory syndrome SARS-CoV-

2. It has had a devastating effect on the world's demographics resulting in more than 5.3 million deaths worldwide. It has emerged as the most consequential global health crisis since the era of the influenza pandemic of 1918 (D.S. Hui 2019).

Empirical clinical data had shown that the overall case fatality rate of COVID-19 is 2.3% much lower than those of SARS (9.5%), MERS (34.4%), and H7N9 (39.0%). The ongoing COVID-19 epidemic spread very quickly, and by February 15, 2020, the virus had reached 26 countries altogether, resulting in 51,857 laboratory-confirmed infections and 1669 deaths, with nearly all infections and deaths. In response to this serious situation, the World Health Organization (WHO) declared it a public health emergency of international concern on January 30 and called for collaborative efforts of all countries to prevent

the rapid spread of COVID-19 (Huang, W, 2020).

Coronaviruses are zoonotic, meaning that the viruses are transmitted between animals and humans. It has been determined that MERS-CoV was transmitted from dromedary camels to humans and SARS-CoV from civet cats to humans. The source of the SARS-CoV-2 (COVID-19) is yet to be determined, but investigations are ongoing to identify the zoonotic source to the outbreak (Chen N, 2019; Sheha et al., 2021).

Infectivity is thought to begin before symptoms and decrease significantly around seven days after the onset of symptoms. The infectious period is reported to depend upon the seriousness and stage of the patient's infection (Seto W, 2020; Hassan, 2016).

Patients with suspected or confirmed COVID-19; Approach for most patients, the following infection control precautions should be used for all patients with suspected or confirmed COVID-19. When appropriate infection precautions are used, nosocomial transmission to staff or other patients becomes rare. Patients should be placed in a well-ventilated single-occupancy room with a closed door and dedicated bathroom. When this is not possible, patients with confirmed COVID-19 could be housed together. Patients with confirmed COVID-19 should not be in a positive-pressure room (Petrilli, J, Y, 2019; Elgendy et al., 2018)

The use of multiple infection control interventions that initially led to a reduction in nosocomial infection transmission, the patient tested negative for SARS-CoV-2 two times, 12 hours apart, on admission, but subsequently developed a fever on day 4 and tested positive for SARS-CoV-2. Factors felt to contribute to transmission of infection included the imperfect sensitivity of testing, the increased risk of transmission in symptomatic patients early in the course of disease, the potential role of nebulizers in enhancing transmission, the inconsistent use of eye protection, inconsistent mask wearing among patients, shared patient rooms, and the fact that the index patient turned out to be in a positive-pressure room (WHO, 2020).

Infection control precautions at home; Source control refers to use of well-fitting cloth masks, facemasks, or respirators to cover person's mouth and nose to prevent spread of respiratory secretions when they are breathing, talking, sneezing, or coughing. In addition to providing source control, these devices also offer varying levels of protection for the wearer against exposure to infectious droplets and particles produced by infected people (Chang, 2020).

To reduce transmission of Covid-19 in the home the following measures should be included Limiting the number of caregivers and, if possible, using caregivers who do not have risk factors for developing severe disease. Having patients use a separate bedroom and bathroom, if available. Minimizing patients' exposure to shared spaces and ensuring the shared spaces in the home with good air flow, such as an air conditioner or an opened window. When sharing spaces cannot be avoided, patients and caregivers should try to remain six feet (two meters) apart, if possible, and face masks should be used. Ensuring caregivers perform hand hygiene after any type of contact with patients or their immediate environment. In addition, caregivers should wear gloves when touching the patient's blood, stool, or body fluids, such as saliva, sputum, nasal mucus, vomit, and urine (Zhang, 2020).

Families who are not able to wear source control should be encouraged to use alternatives as on-site visits with patients (e.g., telephone or internet communication), particularly if the patient is at increased risk for severe illness from SARS-CoV-2 infection. Encourage Physical Distancing; Families requires close physical contact between patients and themselves. Examples of how physical distancing could be implemented for patients include: Limiting families to the facility to those essential for the patient's physical or emotional well-being and care (WHO 2020).

Educating caregivers on how to carefully put on and take off PPE. As an example, caregivers should firstly remove and dispose gloves, and then immediately clean their hands with soap and water or alcohol-based hand sanitizer. After that, the mask should be removed, and the caregiver should again perform hand hygiene. Family members should be instructed to avoid sharing dishes, drinking glasses, cups, eating utensils, towels, bedding, or other items with the patient. After the patient uses these items, they should be washed thoroughly; disposable gloves should be worn when handling these items. In addition, thermometers should not be shared, or should be thoroughly disinfected before use by other household members. Avoid unmasked time together such as during eating or drinking (Petrilli, 2019; Hassan et al., 2020).

Significance of thy study

A large number of patients having Covid-19 that exceed the capacity of the hospital which full occupied with Covid- 19 patients. So, patients had to isolate themselves in their home to prevent infecting others. So, the current study aimed to assess families' perception towards the application of corona virus infection control precautions at home.

Limiting transmission of COVID-19 in home setting requires a range of infection prevention and control measures which could be considered as a hierarchy of controls. Administrative controls are implemented at an organizational level (e.g. the design and use of appropriate processes, systems and engineering controls, and provision and use of suitable work equipment and materials) to help prevent the introduction of infection and to control and limit the transmission of infection in healthcare setting. Control the exposure to the source of infection the following measures should be including adequate ventilation systems and effective environmental decontamination will physically reduce exposure to infection (Ralph, 2020).

Therefore, this study was conducted to assess families' perception toward application of corona virus infection control precautions at home.

Aim of the Study

The aim of the study was to assess families' perception toward application of corona virus infection control precautions at home. This aim was fulfilled through:

- 1- Assessing families' knowledge about corona virus infection control precautions at home.
- 2- Assessing families' concerning about the application of corona virus infection control precautions at home.

Research questions:

- 1- What is the families' knowledge about corona virus infection control precautions at home for?
- 2- Were the families applying corona virus infection control precautions at home?

Subjects and Methods

Subjects and methods of the study have been portrayed under four main topics as following:

- 1- Technical design.
- 2- Operational design.
- 3- Administrative design.
- 4- Statistical design.

1-Technical design:

The technical design included research design, setting, subjects and tools for data collection.

Research design:

A descriptive research design was used to conduct the study.

Setting of the study:

The study was conducted at the outpatient clinics of Health Insurance Branch in Beni-Suef city. Beni-Suef Health Insurance Branch is one of the specialized important medical buildings in Beni-Suef city, the Health Insurance Branch consists of 8 Floors. This study was conducted at the outpatient clinics which located in the third and fourth floors in the building, it contains 13 outpatient clinics receive all people undergoing health insurance daily, its serving about 800 to 1000 patient every day.

Subjects:

Convenience sample technique was used in this study.

A sample of family caregivers was recruited from the eligible group. The sample included every family caregiver who was attended the outpatient clinic, living with pt at home, agrees to participate in the study until reaching sample size. Total sample size was 170 family caregivers.

Tools of data collection:

The data for this study were collected by using one tool divided into the following four parts:

Part I: Families caregivers' socio-demographic characteristics:

Caregivers' socio-demographic characteristics included.

- A- Age, marital status, job, educational level, number of family members, presence of elderly people at home, presence of children, residence financial condition and source of knowledge about corona virus.
- B- Home environment of the family caregivers, it included (number of house rooms, ventilation, noise, presence of external sources of pollution, presence of internal sources for pollution, caregivers' satisfaction with home sanitation)
- C- Medical status of the family, it included (presence of family members with chronic disease, age of the chronic diseased patient, type of the chronic disease, infectious disease (common communicable disease), immune deficiency disease for families and causes of low immunity)

Part II: Families' caregivers Knowledge questionnaire for:

- A- Knowledge of caregivers regarding COVID 19, it included (definition, causing agent, mode of transmission, manifestations, signs and symptoms, similar symptoms between cold flu and COVID 19, incubation period, complications, types of corona virus, treatment, infection cycle, effectiveness of antibiotics for COVID 19, action of

antibiotic in COVID 19, emergency number for COVID 19, importance of mask , types of and how use, importance of hand wash and how to do it, importance of gloves, how uses and when, importance of environmental sanitation, use of protective clothes and use of chloride and antiseptic solution)

- B- Caregivers' knowledge about home isolation such as (avoid going to work and general places, avoid exposure of family members inside and outside home, isolation with applying precautions and boiling patients' clothes, etc.....)
- C- Caregivers' knowledge about food that enhance immunity such as (food rich in vitamin C, vitamin A, vitamin D, and food rich in Zinc, etc.....)

Scoring system:

For the caregivers' knowledge, complete correct answers were scored 2 points, partially correct answers were scored 1point and incorrect answers were scored zero. All items were summed up and a mean knowledge score was calculated as the following:

The total knowledge score was further divided into:

- Satisfactory level of knowledge if the score was (> 60%).
- Unsatisfactory level of knowledge if the score was (< 60%).

Part III: Caregivers' practice:

Caregivers practice regarding hand washing to prevent COVID 19 such as (hand washing after returning home, hand washing frequently at home, hand washing for 20min, etc.....)

- A- Caregivers practice regarding use of mask to prevent COVID 19 such as (use mask when deal with infected patients, use mask correctly, avoid touching mask, etc.....)
- B- Caregivers practice regarding removal of the mask such as (remove mask without touching it, fold the mask from the inner to the outer side, discard mask in closed sac after disinfecting it, etc.....)

- C- Caregivers practice regarding environmental sanitation to prevent COVID 19 such as (take sufficient space at home, maintain home hygiene, clean home environment daily, ventilate rooms as needed, etc.....)
- D- Caregivers practice regarding visitors to prevent COVID 19 translation as (visitors puts off shoes outside the home, give sufficient spaces away from visitors, etc.....)
- E- Caregivers practice regarding cough and sneezing to prevent COVID 19 translation such as (cover nose and mouth when coughing and sneezing, coughing and sneezing in tissue papers, coughing and sneezing in towels, etc.....)
- F- Caregivers practice regarding foods to avoid COVID 19 translation such as (eat fruits and vegetables that contain all nutrients, wash vegetables well and soak them in vinegar before eating them, etc.....)

Scoring system:

For the caregivers' practices, always done answers were scored 2points, sometimes done answers were scored 1point and never done answers were scored zero. All items were summed up and a mean practice score was calculated:

The total practice score was further divided into:

- Satisfactory level of practices if the score was (> 60%)
- Unsatisfactory level of practices if the score was (< 60%)

Part V: Caregivers attitude regarding COVID 19

It including statements such as (having important role in COVID 19 prevention, fear from infection of family members, believe that the COVID 19 pandemic will be overcome, etc.....)

Scoring system

For the caregivers' attitude, agree answers were scored 2points, neutral answers were scored 1point and disagree answers were

scored zero. All items were summed up and a mean attitude score was calculated:

The total attitude score was further divided into:

- Positive attitude if the score was (> 60%)
- Negative attitude if the score was (< 60%)

2-Operational design:

The operational design for this study consisted of three phases included preparatory phase, pilot study and fieldwork.

A) Preparatory phase:

This phase included reviewing of local and international literature related to the various aspects of the research problem. This helped the investigator to be oriented with the magnitude and seriousness of problems and guided to prepare the required data collection tools.

B) Tool validity:

Face and content validity of the study tools was assessed by group of 5 experts in community health nursing department of faculty of nursing, Beni-Suef University for comprehensiveness, accuracy and clarity in language.

Reliability:

The reliability of the tool was assessed through measuring their internal consistency by Cronbach Alpha Coefficient test and its value was (0.79) for knowledge and (0.63) for practices.

C) The pilot study:

The sample of the pilot study was 10% from the total sample and included in the total study sample as there were no modifications needed in the study tools. A pilot study was conducted on 17 of family caregivers, it was done to evaluate the applicability and clarity of the tools, assessment of feasibility of fieldwork, and to detect any possible obstacles that might be faced by the investigator and interfere with data collection as well to estimate time needed to fill in the study tools.

D) Field work:

- Data collection process spanned about 3 months from April 2022 to September 2022.
- The investigator attended the outpatient clinics of Beni-Suef Health Insurance branch from 9:00 am to 7:00 pm, 1 day per week (Monday), through the three months data were collected from 14-15 caregivers a day as an average.
- The investigator interviewed the caregiver at the outpatient clinics.
- Each caregiver interviewed individually after getting the formal consent from the study participants according to the ethical issues.
- Firstly, the investigator introduced herself to the family caregiver in the outpatient clinic than a brief explanation about the nature and aim of the study was done before each interview.
- The investigator cleared the questionnaire to facilitate the understanding of any confusing or difficult question in the tool.
- The time needed for completing one tool for caregiver who read and write was about 25-30 minutes while caregiver who couldn't read and write the time needed to fill in was about 30- 45 minutes.

3-Administrative design:

An approval was obtained from the Research and Ethics committee at Faculty of medicine Beni-Suef University. An official approval was obtained from Dean of Faculty of Nursing-Beni-Suef University to conduct the study. A letter containing the title and aim of the study directed to the director of the Beni-Suef Health Insurance Branch to seeking the permission for data collection. Total confidentiality of any obtained information was ensured. Also, the study maneuvers couldn't harm the participants .

4) Statistical design

The collected data were collected and encoded in special format to be suitable for computer feeding. Following data entry, checking and verification process were carried

out in order to avoid any errors. Data were analyzed using the statistical package for social science SPSS. The following statistical analysis measures were used.

- **Descriptive statistical measures**, which include number, percentages, and averages (Minimum, Maximum, Arithmetic mean (X), Standard deviation (SD).
- **Statistical analysis tests**, which include Chi square, T test.

Results:

Table (1): showed that; less than half of the sample (41.2%, 47.6%, 44%) of family caregivers ages ranged from 20<30 years old, had basic / middle education and had high education respectively. More than half of the sample (57.1%) was married; the majority of them (87.6 %) were worked.

Table (2): revealed that; less than two thirds of the sample (67;7%, 63,5%) had 4-6 family members at home and were lived in urban area respectively. less than half of them (44,1%) had elderly people at home, nearly three quarters of them (74,7%) had children at home and the majority of them (88,9%) had adequate income per month.

Table (3): revealed that; more than half of the sample (52.9 %, 51.2%, 54.7%) say that; our home were crowded, moderate satisfaction and moderate ventilation respectively but more than two thirds of them (69.4 % , 67.1%) say that the home had moderate noise and not had external sources for pollution respectively also the majority of them (91.2%) say that they hadn't internal sources for pollution.

Table 4: showed that; two thirds from the sample (65.9%) had chronic disease and one thirds from them (35.9%) \pm 50 years age. Nearly less than half of the total number of sample 41.2 % had infectious disease, more than one third of the sample (37.6%) had immune deficiency disease but (11.8%) of them had immune deficiency disease due to severe anemia.

Table (5): showed that; according to care giver's knowledge regarding Covid 19 most of the sample had incorrect knowledge regarding Covid 19 (regarding to Def., Causing agent, Manifestations, Types of corona virus, infection

cycle, Effectiveness of antibiotics for Covid 19, Emergency number for COVID 19, Importance of mask, types and how to use, Importance of environmental sanitation, while the other items most of the sample give correct answer (completely and partially).

Table (6): showed that; according to caregiver's knowledge regarding home isolation more than two thirds of the total sample had correct answer (completely and partially) about all items of home isolation.

Table (7): showed that; Most of the sample had correct answer (completely and partially) toward all items of the food that enhance immunity.

Table (8) show that; nearly three quarters of the total sample (70.6%) had unsatisfactory level of knowledge toward covid 19, while more than one quarter of them (29.4%) had satisfactory level of knowledge.

Table (9a) according to caregiver's practice regarding hand wash to prevent COVID 19 translation it showed that ; more than three quarters of the sample say "done" (always and sometime) all items of hand wash except nearly two thirds (62,9%) of them say" never" did wash hands after removing the mask.

Table (9B-C) according to the caregiver's practices regarding using and removing of the mask at home showed that; more than two thirds of the sample say "done" (always and sometime) with using and removing of the mask at home except nearly two thirds (62, 9%) say "never" wash hand after removing the mask.

Table (9D) showed that; most of the sample say "done" (always and sometime) all items of caregiver's practices regarding environmental sanitation to prevention translation of COVID 19 except disinfecting home with ordinary materials, the answer of "done" or "never" vary nearly too equally.

Table (9E) showed that; most of the sample "done" (always and sometime) all items of practices regarding visitors for preventing translation of COVID 19.

Table (9f) showed that; most of the sample say "done" (always and sometime) to all items regarding cough and sneezing for preventing translation of COVID 19 except nearly two thirds of them say "never" done Safe disposable of tissue papers after coughing and sneezing.

Table (9G) showed that; the majority of the sample say" done" (always and sometime) to all items of practices regarding food for preventing translation of COVID 19 .

Table (10) showed that; the majority (95.9%) of the caregivers had satisfactory level of practices while the minority of them (4.1%) had unsatisfactory level of practices.

Table (11) showed that; more than two thirds of the sample (agree and had neutral attitude toward all items of the table except nearly two thirds (61,8 %) say "disagree" with believe that the COVID 19 pandemic will be overcome ,less than half of them (45,3%) say "disagree with believe that governmental instructions adequate for COVID19 prevention and more than one third of them (40,6%) say "disagree" with believe that people comply with COVID 19 prevention respectively .

Table (12) showed that; more than two thirds (69.4%) of the caregivers had positive attitude regarding application of infection control precaution toward corona virus at home while only 30.6% of them had negative attitude.

Table (13) showed that; there is a statistically significant relation between caregivers' total knowledge and their ages, marital status, educational level, residence, and financial condition.

Table (14) showed that; there is a statistically significant relation between caregivers' total practice score and their financial condition, as $p=0,000$, and there is a statistically significant relation between caregivers' total practice scores and their ages, educational level, and residence. While there is no statistically significant relation with their marital status.

Table (15) showed that; there is no statistically significant relation between caregivers' total attitude scores and their ages, marital status, educational level, residence, and financial condition.

Table (16) showed that; there is a statistically significant correlation between caregivers' total knowledge and total attitude scores, while there is no statistically significant correlation with their total practices, also, there is no statistically significant correlation between caregivers' total attitude and their total practices.

Table (1): Percentage distribution of demographic characteristics of the family caregivers (n=170– place: outpatient clinics of Beni-Suef health insurance –year: 2022).

Demographic characteristics	No.	%
1. Age		
A) 20 <30 years	70	41.2
B) 30 <40 years	36	21.2
C) 40 <50 years	58	34.1
D) 50 years ±	6	3.5
2. Marital status		
A) Single (non-married)	67	39.4
B) Married	97	57.1
C) Widowed/divorced	6	3.5
3-Caregivers' job		
A) Not working	21	12.4
B) Working	149	87.6
B1) Financial and administrative work	17	10.0
B2) Teaching works	42	24.7
B3) Medical recorder	20	11.8
B4) Recreational works	26	15.3
B5) Secretary works	9	5.3
B6) Medical staff	5	2.9
B7) Drivers and free work	7	4.1
B8) Farmer	23	13.5
B9) Other	-	-
4-Educational level		
A) Illiterate	4	2.4
B) Read and write	6	3.5
C) Basic education/middle education	85	47.6
D) High education	75	44

Table (2): Distribution of Characteristics of the family socioeconomic state (n=170– place: outpatient clinics of Beni-Suef health insurance –year: 2022).

Items	No.	%
1. Number of family members		
A) 1-3 members	16	9.4
B) 4-6 members	110	64.7
C) 6 members ±	44	25.9
Mean ± SD	5.34 ± 1.46	
2-Presence of elderly people at home		
A) No	95	55.9
B) Yes	75	44.1
B1) 1-3 elderly peoples	54	32.8
B2) 4-6 elderly peoples	14	8.2
B3) 6 elderly peoples ±	7	4.1
3-Presence of children		
A) No children	43	25.3
B) Yes	127	74.7
B1) 1-2 children	73	42.9
B2) 3-4 children	38	22.4
B3) 4-6 children	16	9.4
B4) 6 children ±	0	0
4-Residence		
A) Urban	108	63.5
B) Rural	62	36.5
5-Financial condition		
A) Not adequate	19	11.2
B) Adequate	151	88.9

Table (3): Distribution of the family caregiver's opinion according to characteristics of their home environment (n=170– place: outpatient clinics of Beni-Suef health insurance –year: 2022).

Home environment	No.	%
1. Crowding:		
Opinion of family member about crowding at home :-		
A) Suitable	40	23.5
B) Not suitable	20	11.8
C) Crowded	90	52.9
D) unknown	20	11.8
Mean ± SD	3.15 ± 1.42	
2. Ventilation (sun/air)		
A) Good ventilation	71	41.8
B) Moderate ventilation	93	54.7
C) Poor ventilation	6	3.5
D) known	0	0
3. Noise		
A) High	25	14.7
B) Moderate	118	69.4
C) Low	27	15.9
4. Presence of external sources for pollution		
A) NO	114	67.1
B) Yes	56	32.9
B1) Presence Car exhaust	43	25.3
B2) Presence Garbage	13	7.6
5. Presence of internal sources for pollution		
A) No	155	91.2
B) Yes	15	8.8
B1) Low sanitation and sewage	15	8.8
6. Caregivers' satisfaction with home sanitation		
A) High satisfaction	49	28.8
B) Moderate satisfaction	87	51.2
C) Low satisfaction	28	16.5
D) No satisfaction	6	3.5

Table (4): medical status distribution of the family (n=170– place: outpatient clinics of Beni-Suef health insurance –year: 2022).

Medical history	No.	%
1. Presence of family members with chronic disease		
A) No	58	34.1
B) Yes	112	65.9
B1) Spouse	33	19.4
B2) Grandparents	61	35.9
B3) Brother/sister	5	2.9
B4) Son/daughter	0	0
B5) Other family member	13	7.6
2-Age of the chronic diseased patient		
A) No	58	34.1
B) Yes	112	65.9
B1) <10 years	6	3.5
B2) 10<20 years	6	3.5
B3) 20<30 years	6	3.5
B4) 30<40 years	13	7.6
B5) 40<50 years	20	12.4
B6) ≥50 years	61	35.9
3-Type of the chronic disease (N 112)		
A) HTN	19	11.2
B) DM	7	4.1
C) Cardiac disease	13	7.6
D) Renal disease	6	3.5
E) Pulmonary disease	7	4.1
F) Rheumatoid disease	8	4.7
G) Immunity disease	26	15.3
H) Liver disease	26	15.3
4-Infectious disease (common communicable disease)		
A)Yes	70	41.2
B)No	100	58.8
5- immune deficiency disease for families		
A)Yes	64	37.6
B)No	106	62.4
6- causes of low immunity		
A) Pregnancy	17	10.0
B) children	14	8.2
C)elderly	13	7.6
D) severe anemia	20	11.8

Table (5) Percentage distribution of caregivers' knowledge about COVID 19 (n=170– place: outpatient clinics of Beni-Suef health insurance –year: 2022).

Items	Correct		Partially correct		Incorrect	
	No.	%	No.	%	No.	%
(A) knowledge about COVID 19						
1. Definition	80	47.1	0	0	90	52.9
2. Causing agent	74	43.5	0	0	96	56.5
3. Mode of transmission	67	39.4	96	56.5	7	4.1
4. Manifestations	81	47.6	0	0	89	52.4
5. Signs and symptoms	68	40.0	46	27.1	56	32.9
6. Similar symptoms between cold flu and COVID 19	42	24.7	98	57.7	30	17.6
7. Incubation period	86	50.6	0	0	84	49.4
8. Complications	104	61.2	51	30.0	15	8.8
9. Types of corona virus	81	47.6	0	0	89	52.4
10. Treatment	68	40.0	46	27.1	56	32.9
11. infection cycle	30	17.6	42	24.7	98	57.7
12. Effectiveness of antibiotics for Covid 19	80	47.1	0	0	90	52.9
13. Action of antibiotic in Covid 19 cases	103	60.6	0	0	67	39.4
14. Emergency number for COVID 19	83	48.8	0	0	87	51.2
(B) knowledge about preventive method for corona virus						
15. Importance of mask, types and how use	28	16.5	53	31.2	89	52.4
16. Importance of hand wash and how do it	57	33.5	71	41.8	42	24.7
17. Importance of gloves, how use and when	104	61.2	51	30.0	15	8.8
18. Importance of environmental sanitation	81	47.6	0	0	89	52.4
19. Use of protective clothes	68	40.0	46	27.1	56	32.9
20. Use of chloride and antiseptic solution	104	61.2	51	30.0	15	8.8

Table (6) Percentage distribution of caregivers' knowledge about home isolation (n=170– place: outpatient clinics of Beni-Suef health insurance –year: 2022).

Items	Correct		Partially correct		Incorrect	
	No.	%	No.	%	No.	%
1. Avoid go to work and general places	53	31.2	91	53.5	26	15.3
2. Avoid exposure family members inside and outside home	60	35.3	87	51.2	23	13.5
3. Isolation with apply precautions	63	37.1	55	32.4	52	30.6
4. Notify others to take suitable precautions	50	29.4	80	47.1	40	23.5
5. Avoid sharing food utilities and towels, and billows with others	48	28.2	96	56.5	26	15.3
6. Isolation in good ventilated room with separate toilet	55	32.4	78	45.9	37	21.8
7. Discard wastes in well closed plastic sac	52	30.6	79	46.5	39	22.9
8. Boiling patients' clothes	83	48.8	58	34.1	29	17.1
9. Separate patients' clothes away from other clothes	56	32.9	73	42.9	41	24.1
10. Clean surfaces with chloride using disposable gloves	93	54.7	49	28.8	28	16.5

Table (7) Percentage distribution of caregivers' knowledge about foods that enhance immunity (n=170– place: outpatient clinics of Beni-Suef health insurance –year: 2022).

Items	Correct		Partially correct		Incorrect	
	No.	%	No.	%	No.	%
1. Food rich in vitamin C (orange, lemon ...)	39	22.9	86	50.6	45	26.5
2. Food rich in vitamin A(spanch ,fish ,meet)	77	45.3	73	42.9	20	11.8
3. Food rich in vitamin D (yogurt , ege ,cereals)	73	42.9	77	45.3	20	11.8
4. Food rich in zinc (nuts, red meet...)	68	40.0	64	37.6	38	22.4
5. Food rich in animal protein (meet, fish, milk, ege ...)	69	40.6	34	20.0	67	39.4
6. Food rich in plant protein (cereal)	114	67.1	43	25.3	13	7.6
7. Food rich in carbohydrate (rice, microna, cereal)	77	45.3	73	42.9	20	11.8
8. Food rich in fats (butter, white meet ,egg)	77	45.3	73	42.9	20	11.8
9. Food rich in ommega3(nuts ,olive oil ,fish)	83	48.8	58	34.1	29	17.1
10. Food rich in folic acid (liver , egg , vegetables)	55	32.4	73	42.9	42	24.7
11. Suitable and mixed meals	60	35.3	87	51.2	23	13.5
12. Water intake	73	42.9	77	45.3	20	11.8

Table (8) Percentage distribution of caregivers' total level of knowledge (n=170– place: outpatient clinics of Beni-Suef health insurance –year: 2022).

	Caregivers' total knowledge	
	NO	%
Satisfactory knowledge	50	29.4
Unsatisfactory knowledge	120	70.6

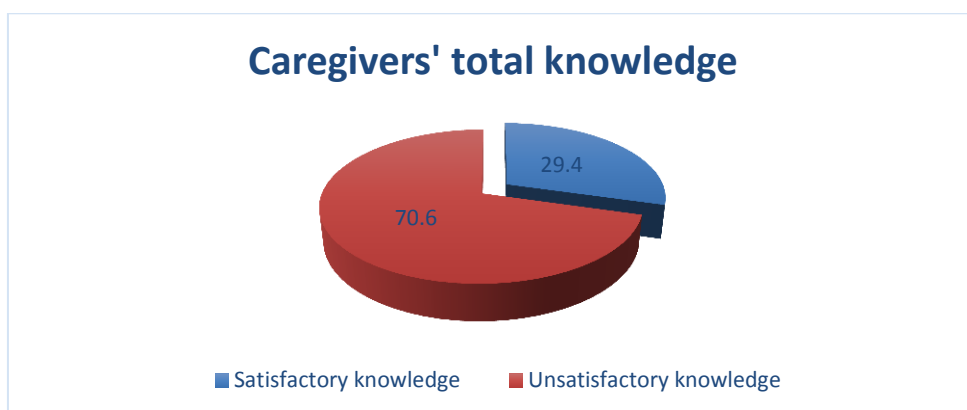
**Figure (1):** Percentage distribution of caregivers' total level of knowledge (n=170).

Table (9a): Percentage distribution of caregivers' practice regarding hand washing to prevent of COVID 19 (n=170 – place: outpatient clinics of Beni-Suef health insurance –year: 2022).

Items	Always		Sometimes		Never	
	No.	%	No.	%	No.	%
1. Hand washing after returning home	122	71.8	35	20.6	13	7.6
2. Hand washing frequently at home	79	46.5	64	37.6	27	15.9
3. Hand washing for 20 min	39	22.9	111	65.3	20	11.8
4. Hand washing with soap and water	66	38.8	51	30.0	53	31.2
5. Use alcohol hand rub as needed	83	48.8	40	23.5	47	27.6
6. Avoid caking hands and kissing	110	64.7	47	27.6	13	7.6
7. Hand washing before touching mouth, nose, and eyes	64	37.6	80	47.1	26	15.3
8. Wash hands after removing the mask	63	37.1	0	0	107	62.9
9. Hand washing after dealing with patient	79	46.5	64	37.6	27	15.9
10. Hand washing after Handling patient's personal belongings	73	42.9	67	39.4	30	17.6
11. Hand washing after touch any surface	115	61.8	38	22.4	27	15.9

Table (9b): Percentage distribution of caregivers' practice regarding using mask to prevent of COVID 19 (n=170– place: outpatient clinics of Beni-Suef health insurance –year: 2022).

Items	Always		Sometimes		Never	
	No.	%	No.	%	No.	%
1. Use mask when deal with infected patients	73	42.9	67	39.4	30	17.6
2. Use mask correctly	65	38.2	73	42.9	32	18.8
3. Avoid touching mask	64	37.6	58	34.1	48	28.2
4. Change mask as needed	58	34.1	106	62.4	6	3.5
6-Use mask at the general transportation	80	47.1	64	37.6	26	15.3
7- Use disposable mask	58	34.1	106	62.4	6	3.5

Table (9C): Percentage distribution of caregivers' practice regarding removing of the mask (n=170– place: outpatient clinics of Beni-Suef health insurance –year: 2022).

Items	Always		Sometimes		Never	
	No.	%	No.	%	No.	%
1. Remove mask without touching it	75	44.1	75	44.1	20	11.8
2. Fold the mask from the inner to the outer side	85	50.0	60	35.3	25	14.7
3. Discard mask in closed sac after disinfecting it	79	46.5	26	15.3	65	38.2
4. Discard the sac in safe manner	93	54.7	62	36.5	15	8.8
5. Wash hands after removing the mask	63	37.1	0	0	107	62.9
6. Use suitable type of masks	118	69.4	33	19.4	19	11.2

Table (9D) Percentage distribution of caregivers' practice regarding environmental sanitation to prevention of COVID 19 (n=170– place: outpatient clinics of Beni-Suef health insurance –year: 2022).

Items	Always		Sometimes		Never	
	No.	%	No.	%	No.	%
1-Take sufficient space at home	66	38.8	50	29.4	54	31.8
2-Maintain home hygiene	93	54.7	26	15.3	51	30.0
3-Clean home environment daily	97	57.1	54	31.8	19	11.2
4-Ventilate rooms as needed	67	39.4	65	38.2	38	22.4
5-Presence of ventilation devices at home	73	42.9	35	20.6	62	36.5
6-Close windows when using air conditioners	79	46.5	26	15.3	65	38.2
7-Presence of separate room at home	93	54.7	62	36.5	15	8.8
8-Disinfecting home with ordinary materials	42	24.7	50	29.4	78	45.9
9-Disinfecting home with specific materials	19	11.2	125	73.5	26	15.3
10-Disinfecting all things before usage	74	43.5	70	41.2	26	15.3
11-Exposer of furniture for sun daily	56	32.9	63	37.1	51	30.0
12-Put off shoes outside the home	49	28.8	86	50.6	35	20.6
13-Give sufficient spaces at transportation	90	52.9	38	22.4	42	24.7
14-Open care windows frequently	75	44.1	75	44.1	20	11.8

Table (9E): Percentage distribution of caregivers' practice regarding visitors to prevention of COVID 19 (n=170– place: outpatient clinics of Beni-Suef health insurance –year: 2022).

Items	Always		Sometimes		Never	
	No.	%	No.	%	No.	%
1. Visitors puts off shoes outside the home	85	50.0	60	35.3	25	14.7
2. Give sufficient spaces away from visitors	108	63.5	32	18.8	30	17.6
3. Separate equipment for visitors	83	48.8	40	23.5	47	27.6
4. Disinfect all furniture with chlorine after the visitor leaving the home	97	57.1	54	31.8	19	11.2

Table (9F): Percentage distribution of caregivers' practice regarding cough and sneezing for prevention of COVID 19 (n=170– place: outpatient clinics of Beni-Suef health insurance –year: 2022).

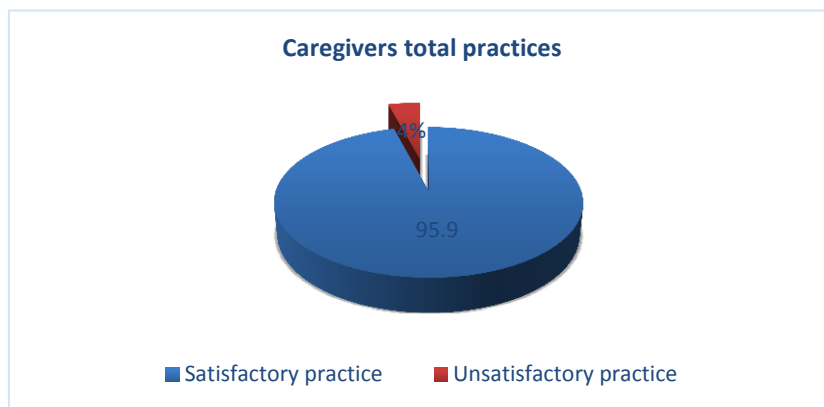
Items	Always		Sometimes		Never	
	No.	%	No.	%	No.	%
1-Cover nose and mouth when coughing and sneezing	132	77.6	18	10.6	20	11.8
2-Coughing and sneezing in tissue papers	98	57.6	53	31.2	19	11.2
3-Coughing and sneezing in towels	54	31.8	49	28.8	67	39.4
4-Coughing and sneezing forearm	64	37.6	73	42.9	33	19.4
5-Hand washing after coughing and sneezing	64	37.6	80	47.1	26	15.3
6- Safe disposable of tissue papers after coughing and sneezing	63	37.1	0	0	107	62.9

Table (9G): Percentage distribution of caregivers' practice regarding foods for prevention of COVID 19 (n=170– place: outpatient clinics of Beni-Suef health insurance –year: 2022).

Items	Always		Sometimes		Never	
	No.	%	No.	%	No.	%
1-Eat fruits and vegetables that contain all the nutrients	132	77.6	18	10.6	20	11.8
2-Wash vegetables well and soak them in vinegar before eating them	64	37.6	80	47.1	26	15.3
3-Take fresh vegetables and fruits	75	44.1	75	44.1	20	11.8
4-Use lemon, honey and ginger	85	50.0	60	35.3	25	14.7
5. Use hot drinks	108	63.5	32	18.8	30	17.6
6. Avoid outside foods	105	61.8	58	34.1	7	4.1
7. Avoid exchanging foods and equipment with others	118	69.4	33	19.4	19	11.2

Table (10): Percentage distribution of caregivers' total level of practice (n=170– place: outpatient clinics of Beni-Suef health insurance –year: 2022).

	Caregivers' total practice	
	NO	%
Satisfactory practice	163	95.9
Unsatisfactory practice	7	4.1

**Figure (2):** Percentage distribution of caregivers' total level of practice (n=170).

Part IV: Caregivers' attitude regarding COVID19

Table (11) Percentage distribution of caregivers' attitude about COVID 19 (n=170– place: outpatient clinics of Beni-Suef health insurance –year: 2022).

Items	Agree		Neutral		Disagree	
	No.	%	No.	%	No.	%
1. Having an important role in COVID 19 prevention	65	38.2	80	47.1	25	14.7
2. Fear from infection of family members	133	78.2	0	0	37	21.8
3. believe that the COVID 19 pandemic will be overcome	44	25.9	21	12.4	105	61.8
4. ready for cooperation for prevention of COVID 19	64	37.6	72	42.4	34	20.0
5. believe that COVID 19 pandemic increases in crowded places	85	50.0	38	22.4	47	27.6
6. believe that COVID 19 can be prevented by health education	97	57.1	60	35.3	13	7.6
7. believe that COVID 19 can be prevented by disinfecting the general places	113	66.5	44	25.9	13	7.6
8. believe that governmental instructions adequate for COVID prevention	28	16.5	65	38.2	77	45.3
9. believe that people comply with COVID 19 prevention	28	16.5	73	42.9	69	40.6
10. believe that COVID 19 can be prevented by staying homes	24	14.1	103	60.6	43	25.3
11. believe that COVID 19 can be prevented by frequent hand hygiene	47	27.6	110	64.7	13	7.6
12. Agree with taking COVID vaccine	59	34.7	71	41.8	40	23.5
13. Agree with using disinfectants for hand hygiene	108	63.5	50	29.4	12	7.1
14. Avoid dealing with infected cases	103	60.6	37	21.8	30	17.6
15. Agree with using disinfectants for home clean	83	48.8	68	40.0	19	11.2
16. Agree with using separate room for isolation at home	49	28.8	72	42.4	49	28.8
17. Don't hide from peoples fear of scandal	72	42.4	54	31.8	44	25.9
18. Hide from peoples fear of scandal	34	20.0	80	47.1	56	32.9
19. Comply with precautions and isolation during COVID infection	15	8.8	105	61.8	50	29.4

Table (12): Percentage distribution of caregivers' total attitude scores (n=170– place : outpatient clinics of Beni-Suef health insurance –year :2022).

	Caregivers' total attitude	
	NO	%
Positive attitude	118	69.4
Negative attitude	52	30.6

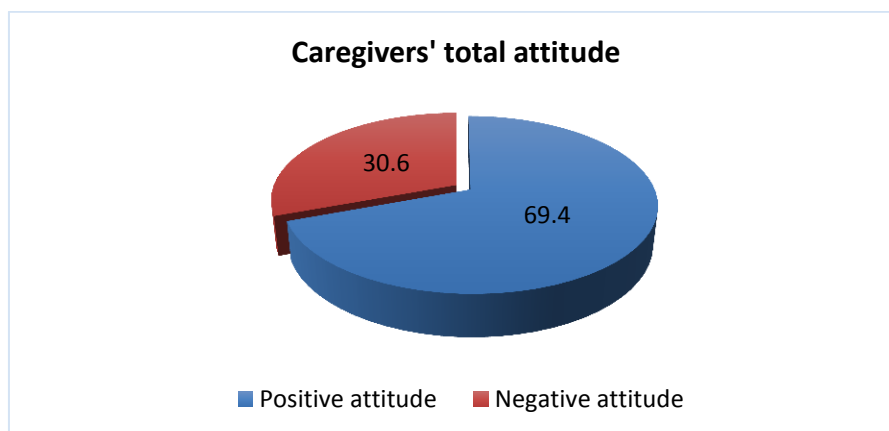
**Figure (3):** Percentage distribution of caregivers' total attitude scores (n=170).

Table (13): The relation between caregivers' demographic characteristics and their total knowledge (n=170–place: outpatient clinics of Beni-Suef health insurance –year: 2022).

Demographic characteristics	NO	Unsatisfactory knowledge		Satisfactory knowledge		X ²	P-Value
		No	%	No	%		
1. Age							
A) 20-<30 years	70	62	36.5	8	4.7	27.6	.000**
B) 30-<40 years	36	24	14.1	12	7.1		
C) 40-<50 years	58	28	16.5	30	17.6		
D) ≥50 years	6	6	3.5	0	0		
2. Marital status							
A) Single	67	59	34.7	8	4.7	27.1	.000**
B) Married	97	61	35.9	36	21.2		
C) Widowed	6	0	0	6	3.5		
3. Educational level							
A) Illiterate	4	0	0	4	2.4	74.3	.000**
B) Read and write	6	6	3.5	0	0		
C) Basic education	85	39	22.9	46	27.1		
D) High education	75	75	44.2	0	0		
4. Residence							
A) Urban	108	100	58.8	8	4.7	69.1	.000**
B) Rural	62	20	11.8	42	24.7		
5. Financial condition							
A) Not adequate	19	13	7.6	6	3.5	42.4	.000**
B) Adequate	62	26	15.3	36	21.2		
C) Adequate and save	89	81	47.6	8	4.7		

Table (14): The relation between caregivers' demographic characteristics and their total practice (n=170–place: outpatient clinics of Beni-Suef health insurance –year: 2022).

Demographic characteristics	NO	Unsatisfactory practice		Satisfactory practice		X ²	P-Value
		No	%	No	%		
1. Age							
A) 20-<30 years	70	7	4.1	63	37.1	10.4	.015*
B) 30-<40 years	36	0	0	36	21.2		
C) 40-<50 years	58	0	0	58	34.1		
D) ≥50 years	6	0	0	6	3.5		
2. Marital status							
A) Single	67	0	0	67	39.4	5.49	.068
B) Married	97	7	4.1	90	52.9		
C) Widowed	6	0	0	6	3.5		
3. Educational level							
A) Illiterate	4	0	0	4	2.4	9.41	.038*
B) Read and write	6	0	0	6	3.5		
C) Basic education	85	0	0	81	47.6		
D) High education	75	7	4.1	72	42.4		
4. Residence							
A) Urban	108	0	0	108	63.5	12.7	.006*
B) Rural	62	7	4.1	55	32.4		
5. Financial condition							
A) Not adequate	19	7	4.1	12	7.1	58.1	.000**
B) Adequate	62	0	0	62	36.5		
C) Adequate and save	89	0	0	89	52.4		

Table (15): The relation between caregivers' demographic characteristics and their total attitude (n=170– place: outpatient clinics of Beni-Suef health insurance –year: 2022).

Demographic characteristics	NO	Negative attitude		Positive attitude		X ²	P-Value
		No	%	No	%		
6. Age							
A) 20-<30 years	70	21	12.4	49	28.8	4.24	.257
B) 30-<40 years	36	7	4.1	29	17.1		
C) 40-<50 years	58	21	12.4	37	21.8		
D) ≥50 years	6	3	1.8	3	1.8		
7. Marital status							
A) Single	67	21	12.4	46	27.1	1.21	.544
B) Married	97	28	16.5	69	40.6		
C) Widowed	6	3	1.8	3	1.8		
8. Educational level							
A) Illiterate	4	0	0	4	2.4	4.24	.257
B) Read and write	6	3	1.8	3	1.8		
C) Basic education	85	28	16.5	53	31.2		
D) High education	75	21	12.4	58	34.1		
9. Residence							
A) Urban	108	31	18.2	77	45.3	1.42	.623
B) Rural	62	21	12.4	41	24.1		
10. Financial condition							
A) Not adequate	19	4	2.4	15	8.8	3.29	.193
B) Adequate	62	24	14.1	38	22.4		
C) Adequate and save	89	24	14.1	65	38.2		

Table (16) Correlation between patients' total knowledge, practice, and attitude (n=170– place: outpatient clinics of Beni-Suef health insurance –year: 2022).

		Total knowledge	Total practice	Total attitude
Total knowledge	R	1	.134	-.048*
	P	--	.082	.536
Total practice	R	.134	1	-.073
	P	.082	--	.342
Total attitude	R	-.048*	-.073	1
	P	.536	.342	--

Pleas revise all % in Table with yellow color

Discussion

COVID-19 is the latest emerging infectious disease confronting the world. It was first discovered in December 2019, in Wuhan city, Hubei Province, China. COVID-19 is a respiratory disease, caused by SARS-Cov2 virus and rapidly transmitted among people directly via respiratory droplets and secretions and indirectly through contaminated surfaces. Its incubation period is on average 5-6 days and could range from 1-14 days (Wu et al., 2020).

WHO organization declared it as a new pandemic representing a devastating threat to livelihoods and human lives. Early during the first wave of the pandemic, there was no specific vaccine or antiviral therapy even the complete epidemiological nature of the disease was not

known. So, the WHO declared global action plans and public health protocols to prevent infection with the virus and control spread of the disease in communities (Abdelhafiz et al., 2020).

So, the current study aimed to assess families perception toward application of corona virus infection control precautions at home through: assessing families knowledge, attitude and practices towards application of corona virus infection control precautions at home.

Part 1: Socio-demographic characteristics of the studied sample.

Regarding socio-demographic characteristics of our studied caregivers, the results of the current study showed that; less the half of the studied caregivers their age from 20 to < 30 years old.

This was in agreement with the study carried out by Abdelhafiz et al., (2020) who assessed Knowledge, Perceptions and Attitude of Egyptians towards the Novel Coronavirus Disease (COVID -19). In Journal of Community Health and found that 40.9% of subjects age were between 20 to 30 years old.

Regarding to marital status of the studied caregivers, the current study found that; more than half of the studied caregivers were married. This result approved with a study finding done by Al-Hanawi et al., (2020) who assessed Knowledge, Attitude and Practice of COVID-19 among the Public in the Kingdom of Saudi Arabia: A Cross-Sectional Study. Front. Public Health and stated that 55.6% of the sample were married.

According to the caregiver's job, the current study demonstrated that; the majority of the studied sample were working. This result was congruence with a study carried out by Azlan et al., (2020) who assessed Public knowledge, attitudes and practices towards COVID-19: A cross-sectional study in Malaysia illustrated that the majority of subjects had jobs.

From the investigator's point of view, these findings could be due to nearly half of the studied caregivers their age from 20 to < 30 years old, this period of life the person is more active for work and had more responsibilities.

Regarding the educational level, the current study revealed that; nearly half of the studied caregivers had basic\ middle education. The present study was in difference with a study carried out by Bante et al., (2021) who assessed Adherence with COVID-19 Preventive Measures and Associated Factors among Rural Residents of Dirashe District, Southern Ethiopia. Patient Preference and Adherence showed that more than half of the studied sample (53.7%) were illiterate.

Regarding to presence of elderly people at home, the current study explained that; less than half of the studied caregivers had elderly people at homes. These findings were also in accordance with a study done by Ferdous et al., (2020) who assessed Knowledge, attitude, and practice regarding COVID-19 outbreak in Bangladesh: An online based cross-sectional study and illustrated that 43.8% of subjects lived with elderly people.

The current study showed that; about three-quarters of the participants had children. This finding was in the same line with a study done by Bazaid et al., (2020), who assessed Knowledge and practice of personal protective measures during the COVID-19 pandemic: A cross-sectional study at Saudi Arabia and reported that 75.25% of the study sample had young children.

From the investigator's point of view, these findings could be due that more than half of the studied caregivers were married.

The current study showed that; about three-quarters of the participants had children. This finding was in the same line with a study done by Bazaid et al., (2020), who assessed Knowledge and practice of personal protective measures during the COVID-19 pandemic: A cross-sectional study at Saudi Arabia and reported that 75.25% of the study sample had young children.

From the investigator's point of view, these findings could be due to more than half of the studied caregivers were married.

Concerning residence, less than two thirds of the studied caregivers lived in urban areas and most of them had adequate income. This result was in the same line with a study done by Guo et al., (2020) who assessed the origin, transmission, and clinical therapies on coronavirus disease 2019 (COVID-19) outbreak - an update on the status. Military Medical Research and found that less than two thirds (63%) of the sample lived in urban places and almost all of them had sufficient income.

From the investigator's point of view, these findings could be due to good socio-economic status because 88.9% of studied caregivers had adequate income, worker, and live in urban areas there is increased social resources.

In relation to number of family members, the current study showed that; more than half of the studied caregivers had crowded homes. These findings were consistent with the study conducted by Koo et al., (2020) who assessed Interventions to mitigate early spread of SARS-CoV-2 in Singapore: A modeling study. Lancet Infected and reported that more than half (51.2%) of sample had crowded houses.

From the investigator's point of view, these findings could be due to high percentage of

sample had 4:6 family member at home and nearly to half of the sample had elderly people at home and three-quarters of the participants had children which leads to crowded at home.

More than half of the sample say that their home was moderately ventilated and less than two third of them say that their home is noise. These results were in agreement with the results obtained from a study done by Iddir et al., (2020) who assessed Strengthening the Immune System and Reducing Inflammation and Oxidative Stress through Diet and Nutrition: Considerations during the COVID-19 Crisis. Nutrients indicated that more than half of subjects (59%.3) had moderate ventilation and noise.

From the investigator's point of view, these findings could be due to high percentage of sample had 4:6 family member at home and three-quarters of the participants had children this leads to moderate ventilation and noise at home.

The result of the present study also showed that; the majority of caregivers do not had internal sources of pollution. This result disagreed with the study conducted by Parry, (2020) who assessed China coronavirus: cases surge as official admits human to human transmission and discussed that half (50.9%) of the sample had internal sources of pollution.

Regarding caregivers' satisfaction with home sanitation, the current study explained that; more than half of them had moderate level of satisfaction. This finding agreed with a study carried out by Roya et al., (2020) who assessed knowledge, attitude, and anxiety in Indian population during COVID-19 pandemic. In Asian Journal of Psychiatry and found that; (52.1%) of the sample had moderate level of satisfaction. The result of the present study clarified that; less than two thirds of caregivers had family history with chronic disease and one third from them their age was ± 50 years or more.

These findings were in the same line with a study done by Shereen et al., (2020) who assessed COVID-19 infection: origin, transmission, and characteristics of human coronaviruses and illustrated that, less two thirds (63.8%) of study sample had elderly persons with chronic diseases.

Part II: Caregivers knowledge regarding COVID 19

In relation to knowledge of caregivers regarding COVID 19, the result of the current study revealed that; the majority of the sample had corrected (completely and partially) answers about COVID 19, mode of transmission, similar symptoms with cold flu, complications, importance of gloves, how to use and when also, how to use the chloride and antiseptic solution.

These results were supported by a study done by Roya et al., (2020) who stated that most (91.3%) of the study subjects had correct information about complications, mode of transmission, use of gloves and antiseptic solution.

These findings were disagreed by the finding of a study done by Shigemura et al., (2021) who assessed the public responses to the novel 2019 coronavirus in Japan: target populations and found that only two fifths (40.2%) of study sample had correct knowledge about definition, complications, and mode of transmission of OVID 19.

From the investigator perspective: Our results may be due to increase caregivers' awareness because most of the sample had high education and had a job in the educational field.

The results of the present study proved that; two thirds of the sample had corrected (completely and partially) answers about COVID 19, signs and symptoms, treatment, and use of protective clothes. These results were in congruence with a study done by Zegarra et al., (2020) who assessed Knowledge, perception, and attitudes in Regard to COVID-19 Pandemic in Peruvian Population and clarified that two thirds (66.3%) of the sample had correct knowledge regarding signs and symptoms, treatment and using protective clothes for COVID 19.

Concerning knowledge of caregivers regarding home isolation, the results of the current study showed that; the majority of the caregivers had corrected (completely or partially) answers about home isolation regarding: avoid sharing food, or to avoid go to work and general places, boiling patients' clothes and clean surfaces with chloride using disposable gloves.

These results were agreed with the finding of a study done by Wang, Zhou & Liu, (2021) and assessed Reasons for A workers becoming infected with novel coronavirus disease 2019 (COVID-19) in China, they found that; most of the sample (89.4%) had completely and partially correct answers regarding home isolation issues.

These results agreed with a study done by Bhagavathula et al., (2020) who assessed Knowledge and perceptions of COVID-19 among A workers: Cross-sectional study. MIR Public Health Surveillance and indicated that half (51.4%) of the subjects had correct knowledge about home isolation items.

Regarding knowledge of caregivers about foods that enhance immunity, the current study illustrated that; the majority of caregivers had corrected (completely or partially) answers about foods that enhance immunity in the following items as: food rich in vitamin A and D, food rich in plain protein, carbohydrate, fats, and omega 3.

These results were in the same line with a study done by Abdullah & Allen, (2021) who review the managing at intensive care admissions when there are no enough beds during the COVID-19 pandemic: a systematic review cleared that the majority (83.7%) of sample had correct knowledge regarding foods that enhances immunity.

In relation to total knowledge of caregivers regarding COVID 19, the result of the current study demonstrated that; less than three quarters of them had unsatisfactory knowledge, meanwhile more than one quarter of caregivers had satisfactory total knowledge regarding COVID 19.

These findings were supported by the finding of a study done by Afulani et al., (2020) who assessed Perceived preparedness to respond to the COVID-19 pandemic: as well a study with A workers in Ghana and found that 69.9% of healthcare workers had unsatisfactory total knowledge regarding COVID 19.

Also these results were in the same line with the finding of a study done by Engdaw, Gebrehiwot & Andualem, (2020) who evaluate COVID-19 Pandemic and its Implication on Hand Hygiene Status by Alcohol-based Hand Sanitizers among A Workers in Jimma, Ethiopia and indicated that; more than one quarter (28.6%)

of subjects had satisfactory knowledge regarding COVID 19.

While these results were dissimilarity to a study done by Adhikari & Paudyal, (2020) who assessed Knowledge, attitude and practice regarding COVID-19 among A workers in Chitwan, Nepal and found that; more than half (55.6%) of the study sample had satisfactory total knowledge about COVID 19.

This unsatisfactory level of knowledge may be due to most of the sample not work in medical field thus the answer true but incomplete and little number work in medical field and had enough knowledge

Part III: Caregivers practice regarding COVID 19

The present study showed that; concerning practices regarding hand washing to prevent COVID 19, less than three quarters of the studied caregivers always done hand washing after returning home. This result was supported by a study done by Maleki et al., (2020) who reported that; 72.5% of the subjects done hand washing after return home.

The present study also cleared that; less than two thirds of the studied caregivers sometimes done hand washing for 20 minutes and never done hand washing after removing the mask. These results were in the same line with a study done by Ebrahimi & Nemati, (2020) under the title Assessment of Iranian Nurses' Knowledge and Anxiety toward COVID-19 during the Current Outbreak in Iran and clarified that 63.7% of the study sample sometimes done hand washing for 20 minutes but never done hand washing after removing the mask.

Regarding our study using a mask to prevent COVID 19, the present study showed that; more than two fifths of the studied care givers always using mask at the general transportation and when deal with infected person. These findings were agreed with the study conducted by Adhikari & Paudyal, (2020) about Knowledge, attitude and practice regarding COVID-19 among A workers in Chitwan, Nepal and reported that; more two fifths (67.8%) of the sample always using mask at transportation.

Our result was agreed with a study done by Olum et al., (2020) who clarified that only about

one quarter (24.1%) of subjects wearied mask when dealing with infected person.

Our result also illustrated that; less than two thirds of the studied caregivers sometimes change mask as needed and use disposable mask. These results agreed with a study done by Phan et al., (2019) who studied Personal protective equipment doffing practices of Aworkers and identified that nearly two thirds (64.1%) of subjects sometimes wearied disposable gloves.

Our result proved that; more than two thirds of the sample always using suitable type of masks. This result was disagreed with Roshan et al., (2020) who assessed Rigorous Hand Hygiene Practices among Workers during the COVID-19 Pandemic and stated that the majority (79%) of studied sample didn't use suitable masks

The current study also demonstrated that; less than two thirds of the studied caregivers never wash hands after removing the mask. This result was in the same line with a study done by Russell et al., (2021) who assessed Factors for compliance with infection control practices in home toward infection control regarding COVID 19 and found that the majority (78.3%) of the sample never done hand washing after removing gloves.

Regarding caregivers practice with the environmental sanitation to prevent COVID 19, the current study cleared that; more than half of the studied caregivers always clean home environment daily and maintain home hygiene. These findings were in the same line with a study done by Sahiledengle et al., (2020) who assessed Infection prevention practices for COVID19 and associated factors among a workers in governmental facilities in Addis Ababa and stated that 55.6% of the sample cleaned home environment daily.

The present study also indicated that; less than half of the studied caregivers never disinfecting home with ordinary materials. This result was disagree with a study done by Saito et al., (2020) who assessed Alcohol-based hand rub and incidence of infections due to COVID 19 in a rural regional referral in Uganda and indicated that the majority of subjects (81%) sometimes disinfect home with ordinary materials.

Concerning caregivers practice regarding visitors to prevent COVID 19, the current study

illustrated that; less than two thirds of the studied caregivers always give sufficient spaces away from visitors. This result agreed with a study done by Saqlain et al., (2020) who found that; 64.1% of subjects had enough space from others.

This study also revealed that; more than three quarters of the studied caregivers always cover nose and mouth when coughing and sneezing. This result was in similarity with a study done by Tamang et al., (2020) who assessed COVID-19: A national survey on perceived level of knowledge, attitude and practice in Nepal BMC public health and clarified that; 77.8% of subjects always cover nose when sneezing.

Regarding caregivers practice regarding foods to prevent COVID 19, more than three quarters of the studied caregivers always eats fruits and vegetables that contain all the nutrients. This result agreed with the finding of a study done by Tan et al., (2020) who found that 77.9% of the samples always eat foods that contained all nutrients.

In relation to total practices of the caregivers, the current study proved that; majority of them had satisfactory level of practices. This finding agreed with the finding of a study done by the finding of a study done by Tsegaye et al., (2020) who assessed Knowledge and preventive practices towards COVID-19 and associated factors among A workers in Illu Aba Bor and Buno Bedelle Zones, Southwest Ethiopia and cleared that almost all (97.6%) of the subjects had satisfactory total level of practices regarding COVID 19.

Although this result was disagree with World Health Organization (WHO), (2020) which; assessed Coronavirus disease 2019 (COVID- s19) Situation Report-51. Geneva and found that most of the study subjects had unsatisfactory practices regarding COVID 19.

Caregivers' attitude regarding COVID 19

Our results of the current study clarified that; the highest degree of caregivers had agreed attitude about COVID 19 in the following: fear from infection of family members, believe that COVID 19 pandemic increases in crowded places, believe that COVID 19 could be prevented by health education and disinfecting of the general places.

These results were similar with the finding of a study done by Guan et al., (2020) who assessed Clinical characteristics of coronavirus disease 2019 in China and showed that the majority of the subjects agreed about issues of corona virus.

Our current study also revealed that; the highest percentage of the caregivers had disagreed attitude about COVID 19 in the following items: believe that COVID 19 pandemic will be overcome and believe that governmental instructions adequate for prevention.

These findings were in the same line with Bhagavathula et al., (2020) who illustrated that high number of the study sample disagreed about ending COVID 19 and governmental rules weren't sufficient to prevent it.

Concerning total attitude of caregivers regarding COVID 19, the current study verified that; more than two thirds of the caregivers had positive attitude while only less than one third of them had negative attitude. These findings were in the same line with the finding of a study done by Roya et al., (2020) who revealed that 69.1% of the studied sample had positive attitude toward corona virus.

These results were dissimilar to the results of Ferdous et al., (2020) who reported that most (78.9%) of the subjects had negative attitude regarding COVID 19.

Part V: Statistical relations between study variables

Our results revealed that; there was a statistically significant relation between the studied caregiver's total knowledge scores and their ages and educational level, while insignificant with marital status. These results were supported by the finding of a study done by Bazaid et al., (2020) who found that age, educational status of the respondent is significant factors

From the investigator's point of view, the educational status could increase the awareness of caregivers. And occupational status helps in increasing good practices.

Our results reveal that; there was a statistically significant relation between the studied caregivers total practice score and their financial condition, also was statistically significant with their ages,

educational level, and residence. There was no statistically significant with the marital status.

These results were similar to the finding of a study done by Al-Hanawi et al., (2020) who reported that there was a statistically significant relation between the studied caregiver's practice and their residence, while dissimilar with marital status.

Our results indicated that; there was no statistically significant relation between caregiver's total attitude score and their ages, marital status, educational level. These findings agreed with A the finding of a study done by bdelhafiz et al., (2020) who found that there was no statistically significant relation between the studied sample total attitude score and their ages, marital status and educational level.

Our results illustrated that; there was no statistically significant correlation between caregivers total knowledge and their total practices, also there is no statistically significant correlation between caregivers total attitude and their total practices. These findings disagreed with Zhong et al., (2020) who cleared that there is statistically significant correlation between caregivers' total knowledge and their total practices. Because of this, caregivers who had good knowledge expected to have a positive attitude.

Conclusion

Based on the results of the present study and research questions, the researcher can conclude that:

Nearly half of the sample had the following basic education, elderly people at home, crowded, moderate ventilation, moderate satisfaction of home sanitation and more than two third from them had the following moderate noise, family member with chronic disease as (liver disease, immunity disease, HTV, renal disease, rheumatic disease, pulmonary disease, DM respectively) and 3 quarter from them had children.

Less than three quarters from the sample had unstatistical significant knowledge (uncompleted knowledge) regarding COVID 19, less than one third of them had negative attitude. In additional that there was a statistically significant relation between the studied caregiver's total knowledge and all their demographic characteristic and there

was a highly statistically significant relation between the our studied caregiver 's total practice and their financial condition, ages, educational level while no statistically significant relation with marital status. There was no statistically significant relation between caregiver's total attitude and their entire demographic characteristic. There was also statistically significant correlation between caregiver's total knowledge and their total attitude, while there was no statistically significant correlation between their total knowledge and their total practices, and there was no statistically significant correlation between their total attitude and their total practices.

Recommendations

Based on the previous results of the present study and conclusion, the following recommendations are suggested

- Increase caregiver knowledge and performance through continuous educational program training and orientation program about corona virus
- Providing sufficient quantities of personal protective equipment (PPE) and training of all.
- Increase awareness for all the society members about COVID-19 in different place as (home visit, MCH, school , university,.....etc)
- Improve positive COVID –19 attitude to change the public negative attitude and get rid of the associated stigma.
- Emphasize the importance of effective preventive measures, as (hand washing, mask, etc).

In further research:

This study must be conducted on larger sample than the researcher's sample to obtain more comprehensive information.

References:

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*, 2020; 45(5):881–890.

Chang, M., Lin, L., Wei, L., Xie, G., Zhu, C.S., & Delacruz, E. (2020) Epidemiologic and clinical characteristics of novel coronavirus infections involving 13 patients outside Wuhan, China *JAMA*.

Chen, N., Zhou, M., Dong, X., Qu, J., Gong, F., & Han, G. (2020). Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study.

D.S. Hui, I.A. E, T.A. Madani, F. Ntoumi, R. K ock, O. Dar, (2020) The continuing 2019-nCoV epidemic threat of novel coronaviruses to global health – the latest 2019 novel coronavirus outbreak in Wuhan, China *Int J Infect Dis*, 91 (2020), pp. 264-2661.

De Rosa F.G., Palazzo A., Rosso T., Shbaklo N., Mussa M., Boglione L., Borgogno E., Rossati A., Mornese Pinna S., Scabini S. (2021) Risk Factors for Mortality in COVID-19 Hospitalized Patients in Piedmont, Italy: Results from the Multicenter, Regional, CORACLE Registry. *J. Clin. Med.* 2021;10:1951. Doi: 10.3390/jcm10091951.

Elgendy A., Hassan H., Elsaid F., EL-Sherbeny E. (2018): Nurses' Awareness Regarding Zika Virusin Beni-Suef Governorate. *American Research Journal of Public Health*; 1(1): 30-42. DOI: 10.21694/2639-3042.18003. DOI: 10.21694/2639-3042.18003

Hassan H. (2016): Infertility profile, psychological ramifications and reproductive tract infection among infertile women, in northern Upper Egypt. *Journal of Nursing Education and Practice*; 6(4): 92-108. [https:// doi. org/ 10. 5430/ jnep. v6n4p92.](https://doi.org/10.5430/jnep.v6n4p92)

Hassan H. (2019): The Impact of Evidence-Based Nursing as The Foundation for Professional Maternity Nursing Practices. *Open Access Journal of Reproductive System and Sexual Disorder*; 2(2): 195-197. OAJRSD.MS.ID.000135. DOI: 10.32474/OAJRSD.2019.02.000135.

- Hassan H. (2020):** Evidence-Based Practice in Midwifery and Maternity Nursing for Excellent Quality of Care Outcomes. *American Journal of Nursing Research*; 8(6): 606-607. doi: 10.12691/ajnr-8-6-3.
- Hassan H., Malk R., Abdelhamed A., Genedy A., (2020):** Infection Control Knowledge and Practices: Program Management in Labor Units According to Standard Infection Control Precautions in Northern Upper Egypt. *American Journal of Nursing Research*; 8(4): 412-425. doi: 10.12691/ajnr-8-4-1.
- Huang, C., Wang, Y., & Li, X. (2020).** Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet*. 2020, 395:497-506.
- Li Q., Guan X., Wu P., Wang X., Zhou L., Tong Y. (2020)** Early transmission dynamics in Wuhan, China, of novel coronavirus- infected pneumonia. *N Engl J Med*. 2020 Jan 29 doi: 10.1056/NEJMoa2001316.
- Lupia T., Corcione S., de Rosa F.G. COVID-19.** (2020) In the uncertainty, do not try this at home. *Intern. Emerg. Med*. 2020 ;15:1599–1600. doi: 10.1007/s11739-020-02471-4
- Petrilli CM, Jones SA, Yang J, (2020):** Factors associated with hospital admission and critical illness among 5279 people with coronavirus disease 2019 in New York City: prospective cohort study. *BMJ*, 369: m1966. <https://doi.org/10.1136/bmj.m1966>
- Ralph R, Lew J, Zeng T, (2020):** 2019-nCoV (Wuhan virus), a novel Coronavirus: human-to-human transmission, travel-related cases, and vaccine readiness. *J Infect Dev Ctries.*; 14(1): 3-17. <https://doi.org/10.3855/jidc.12425>
- Seto W.H., Tsang D., Yung R.W.H., Ching T.Y., Ng T.K., Ho M., Ho L.M., Peiris J.S.M.** Effectiveness of precautions against droplets and contact in prevention of nosocomial transmission of severe acute respiratory syndrome (SARS) *Lancet*. 2003;361:1519–1520. doi: 10.1016/S0140-6736(03)13168-6.
- Sheha E., Hassan H., Elsherbeny E., Elgendy A. (2021):** Integrated Intervention Program for Pregnant Women toward ZIKA Virus Infection in Upper Egypt. *International Journal of Studies in Nursing*; 6(1): 36-53. doi.org/10.20849/ijsn.v6i1.870.
- World Health Organization (WHO), (2020).** "WHO-recommended handrub formulations". WHO Guidelines on Hand Hygiene in Health Care: First Global Patient Safety Challenge Clean Care Is Safer Care. 19 March 2019. Retrieved 19 March 2020).
- Wu F, Zhao S, Yu B, Chen Y-M, Wang W, Song Z-G, et al.** A new coronavirus associated with human respiratory disease in China. *Nature* 2020; 579:265 -9.
- Yan Y., Shin W.I., Pang Y.X., Meng Y., Lai J., You C., Zhao H., Lester E., Wu T., Pang C.H.(2020)** The First 75 Days of Novel Coronavirus (SARS-CoV-2) Outbreak: Recent Advances, Prevention, and Treatment. *Int. J. Environ. Res. Public Health*. 2020;17:2323. doi: 10.3390/ijerph17072323.
- Zhang W, Du RH, (2020):** Molecular and serological investigation of 2019-nCoV infected patients: implication of multiple shedding routes. *Emerg Microbes Infect.*; 9(1): 386-389. <https://doi.org/10.1080/22221751.2020.1729071>.