



Home Families' Caregiver: Practices Regarding Infection Control Precautions for Coronavirus

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Abstract

Background: Coronavirus disease is a respiratory viral disease that has rapidly spread worldwide. It is associated with an international pandemic largely because of its rapid spread and its high mortality. The use of multiple infection control interventions will lead to a reduction in nosocomial transmission.

Aim of the Study: Assess families' caregiver practices toward the application of infection control precautions with coronavirus at home.

Research Design: A descriptive research design was applied to this study.

Sample: In this Study, 170 family caregivers who visited the outpatient clinics within three months were used by a convenience sample.

Setting: The outpatient clinics at the health insurance at Beni-Suef city.

Tools: Interviewing Questionnaire Sheet, which consisted of parts to assess caregivers' personnel characteristics, checklist for families' caregivers' practices regarding the application of infection control precautions at home for coronavirus.

Results: The result clarified that 95.9% had a satisfactory level of practices regarding coronavirus. Statistically significant relations were found between caregivers' total practice score and their financial condition, ages, educational level, and residence (P value < 0.05).

Conclusion: Most caregivers in the studied families demonstrated satisfactory coronavirus practices at home, influenced by sociodemographic factors. Higher practice scores were associated with younger age, technical or higher education, urban residence, and better financial conditions.

Recommendations: Utilization from the effort that is provided by the concerned parties to improve caregivers' knowledge through continuous educational program training and orientation programs about the coronavirus.

Keywords: Coronavirus, Practices; Families' Caregiver; Infection Control Precautions

Introduction

Coronavirus disease is a respiratory viral disease that has rapidly spread worldwide. It is associated with an international pandemic largely because of its rapid spread, its high mortality, and the lack of a cure or vaccine. Given its rapid spread, the disease is highly infectious, and its main clinical symptoms include fever, dry cough, fatigue, myalgia, and dyspnea. 18.5% of the patients with coronavirus develop to the severe stage, which is characterized by acute respiratory distress syndrome, septic shock, difficult-to-tackle metabolic acidosis, and bleeding and coagulation dysfunction [1-3].

The use of multiple infection control interventions initially led to a reduction in nosocomial transmission [4]. Educating caregivers on how to put on and take off Personal Protective Equipment (PPE) carefully. As an example, caregivers should first remove and dispose of 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

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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 when eating or drinking [5].

Preventive measures to reduce the chances of infection from the coronavirus include getting vaccinated, staying at home, wearing a mask in public, avoiding crowded places, keeping a distance from others at least one meter, ventilating indoor spaces, managing potential exposure durations, washing hands with soap and water often and for at least twenty seconds, practicing good respiratory hygiene, and avoiding touching the eyes, nose, or mouth with unwashed hands [6-9].

WHO and the US CDC recommend that individuals wear non-medical face coverings in public settings where there is an increased risk of transmission and where social distancing measures are challenging to maintain. Face coverings limit the volume and travel distance of expiratory droplets dispersed when talking, breathing, and coughing [10]. The CDC recommends that crowded indoor spaces be avoided. When indoors, increasing the rate of air change, decreasing recirculation of air, and increasing the use of outdoor air can reduce transmission. The WHO recommends ventilation and air filtration in public spaces to help clear out infectious aerosols [11].

Cleaning surfaces is the first. The CDC says that in most situations, cleaning surfaces with soap or detergent, not disinfecting, is enough to reduce the risk of transmission. Disinfecting indoor surfaces is a frequent and most straightforward step in preventing the spread of infection via surfaces and fomites. Cleaning reduces microbial burden by chemical deadsorption of organisms. Touched items should be cleaned and disinfected at least once per day and when visibly dirty; examples include doorknobs, elevator buttons, light switches, toilet handles, counters, handrails, touch screen surfaces, and keypads [12].

Personal protective equipment is essential to protect healthcare providers and others from infection while caring for suspected or confirmed coronavirus infections. PPE is created to protect people from exposure to blood, body fluids, and droplets in the air. Droplets from coronavirus can stay suspended in the air for some time. However, N95 masks, face shields, and gowns do not always need to be used in every type of interaction with non-COVID patients and clients [13].

Aim of the Study

The current study was conducted to assess families' caregiver practices toward the application of infection control precautions with coronavirus at home

Subject and Method

I. Technical design

Research design and setting: A descriptive research design was utilized for the study, which took place at outpatient clinics within the health insurance at Beni-Suef city.

Sampling type and size: The study employed a convenience sample technique, recruiting 170 family caregivers who attended the outpatient clinic, cohabited with the patient, and consented to participate until the sample size was met.

$$n_0 = \frac{Z^2 P(1-P)}{e^2}$$

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

n_0 =Cochran's sample size recommendation, e =Margin of error=0.05, p =Population proportion=0.5, $q=1-p=0.5$, z = from Z table =1.96 (at significance level 0.05), and N = Population size.

Tool for data collection: The study utilized a structured interviewing questionnaire, created by the researcher in simple Arabic, to collect data relevant to its objectives, comprising three parts.

Part I: Families' caregivers' socio-demographic characteristics: Socio-demographic characteristics of the caregivers included age, marital status, caregiver's job, and educational level.

Part II: checklist for families' caregivers' practices

- Caregivers' practices regarding hand washing to prevent coronavirus, such as hand washing after returning home, hand washing frequently at home, hand washing for 20 min., etc.
- Caregivers practice regarding the use of masks to prevent coronavirus, such as using a mask when dealing with infected patients, using a mask correctly, avoiding touching the mask, etc.
- Caregivers' practice regarding removal of the mask, such as removing the mask without touching it, folding the mask from the inner to the outer side, discarding the mask in a closed sac after disinfecting it, etc.
- Caregivers practice regarding environmental sanitation to prevent coronavirus, such as taking sufficient space at home, maintaining home hygiene, cleaning the home environment daily, ventilating rooms as needed, etc.
- Caregivers' practices regarding visitors to prevent coronavirus, such as visitors taking off shoes outside the home, giving sufficient space away from visitors, etc.
- Caregivers practice regarding cough and sneezing to prevent coronavirus, such as covering nose and mouth when coughing and sneezing, coughing and sneezing in tissue papers, coughing and sneezing in towels, etc.
- Caregivers' practices regarding foods to prevent coronavirus, such as eating fruits and vegetables that contain all nutrients, washing vegetables well and soaking them in vinegar before eating them, etc.

Scoring system: For the caregivers' practices, always-done answers were scored two points, sometimes-done answers were scored one point, 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 practice if the score was $\geq 60\%$ and Unsatisfactory level of practice if the score was $< 60\%$**

Reliability of Tool: The reliability of the tool was assessed through measuring their internal consistency by the Cronbach Alpha Coefficient test, and its value was 0.63 for practice.

II. Operational design

Preparatory phase: This phase involved reviewing both local and international literature concerning different facets of the research

problem, which allowed the researcher to understand the scope and severity of the issues and to develop the necessary data collection tools.

Pilot study: The pilot study comprised 10% of the total sample and involved 17 family caregivers. Its purpose was to evaluate the tools' applicability and clarity, assess the feasibility of fieldwork, and identify potential obstacles to data collection. Modifications were made based on the findings of the pilot study.

Fieldwork: The data collection took place over three months, from April to September 2022, during which the researcher visited Beni-Suef Health Insurance outpatient clinics one day a week. They interviewed approximately 14-15 caregivers daily after securing informed consent. Each interview began with an introduction and an explanation of the study's aims. For caregivers who could read and write, completing the questionnaire took about 25-30 minutes, while those who could not read and write required approximately 30-45 minutes.

Ethical Considerations: Formal oral consent was obtained from family caregivers for participation in the study, highlighting their right to refuse or withdraw at any time. Anonymity and confidentiality of the data were assured through coding, and no data would be reused for research without permission. Participants were also guaranteed protection against any potential errors or conspiracies arising from the study.

III. Administrative design

Approval was granted by the Research and Ethics Committee at Beni-Suef University's Faculty of Medicine, along with the Dean of the Faculty of Nursing, for the study. A request for permission to collect data was sent to the director of the Beni-Suef Health Insurance Branch, ensuring confidentiality and the safety of participants during the study.

IV. Statistical design

Statistical Design: The data were encoded for computer processing and subjected to verification to eliminate errors. Analysis was conducted using SPSS, employing descriptive statistics such as numbers, percentages, averages (arithmetic mean, and standard deviation), along with the Chi-square test.

Results

Table 1 showed that less than half of the sample of family caregivers, ages ranging from 20 to 30 years, had basic/middle education, 57.1% were married, and 65.5% were urban residences.

Figure 1 portrays caregivers' practices regarding hand washing to prevent coronavirus. It showed that more than three-quarters of the sample done (always and sometimes) for all items of hand wash except 62.9% of them never done washing hands after removing the mask.

Figure 2 shows the caregiver's practices regarding using the mask at home. It revealed that more than two-thirds of the sample done (always and sometimes) with using the mask at home.

Figure 3 presents caregiver's practices regarding removing the mask at home. It showed that more than two-thirds of the sample done (always and sometimes) with removing the mask at home, except 62.9% who had never wash hands after removing the mask.

Figure 4 shows that most of the sample done (always and

Table 1: Percentage Distribution of Demographic Characteristics of the Family Caregivers (N=170).

Demographic characteristics	No.	%
1. Age		
20 to <30 years	70	41.2
30 to <40 years	36	21.2
40 to <50 years	58	34.1
≥ 50 years	6	3.5
2. Marital status		
Single	67	39.4
Married	97	57.1
Widowed/divorced	6	3.5
3. Residence		
Urban	108	63.5
Rural	62	36.5
4. Educational level		
Illiterate	4	2.4
Read and write	6	3.5
technical education	85	47.6
High education	75	44
5. Financial condition		
Not adequate	19	11.2
Adequate	62	36.4
Adequate and save	89	52.4

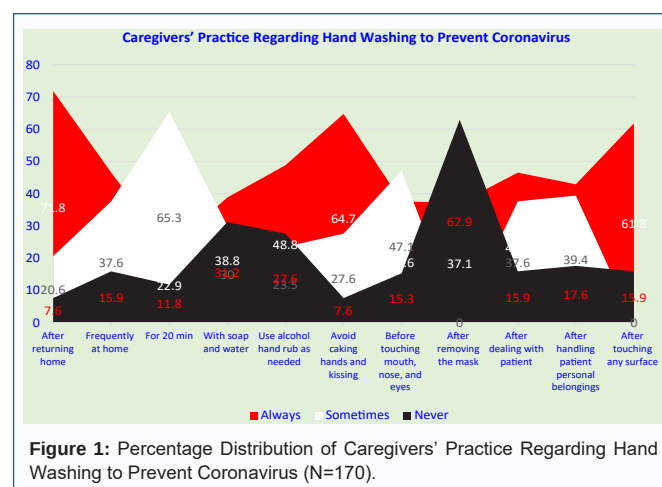


Figure 1: Percentage Distribution of Caregivers' Practice Regarding Hand Washing to Prevent Coronavirus (N=170).

sometimes) for all items of the caregiver's practices regarding environmental sanitation to the prevention of coronavirus except disinfecting the home with ordinary materials; the answer for "done" or "never" varies nearly too equally.

Figure 5 shows that most of the sample done (always and sometimes) all items of practices regarding visitors for the prevention of coronavirus.

Figure 6 shows that most of the sample done (always and sometimes) to all items regarding cough and sneezing for prevention of coronavirus, except nearly two-thirds of them never done safe disposal of tissue papers after coughing and sneezing.

Figure 7 shows that the majority of the sample done (always and

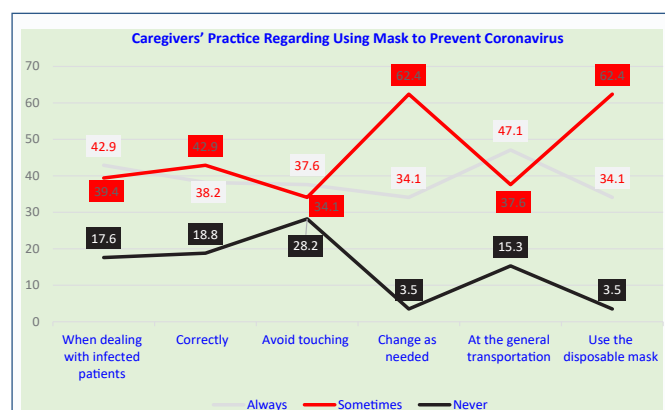


Figure 2: Percentage Distribution of Caregivers' Practice Regarding Using Mask to Prevent Coronavirus (N=170).

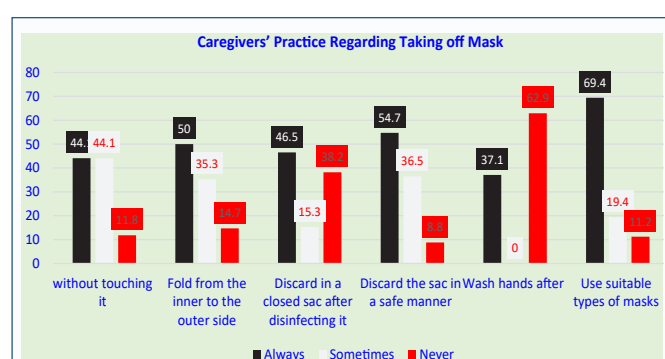


Figure 3: Percentage Distribution of Caregivers' Practice Regarding Taking off Mask (N=170).

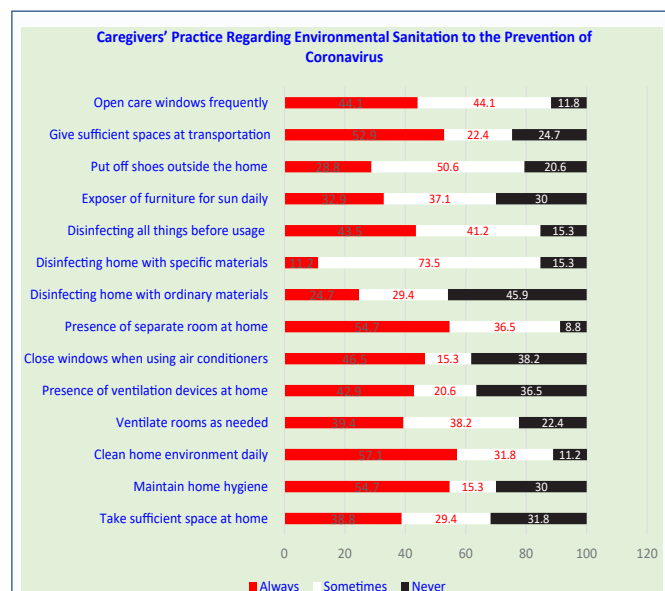


Figure 4: Percentage Distribution of Caregivers' Practice Regarding Environmental Sanitation to the Prevention of Coronavirus (N=170).

sometimes) to all items of practices regarding food for the prevention of coronavirus.

Figure 8 presents that 95.9% had a satisfactory level of practices regarding coronavirus.

Table 2 shows that there is a highly statistically significant relation



Figure 5: Percentage Distribution of Caregivers' Practice Regarding Visitors to the Prevention of Coronavirus (N=170).

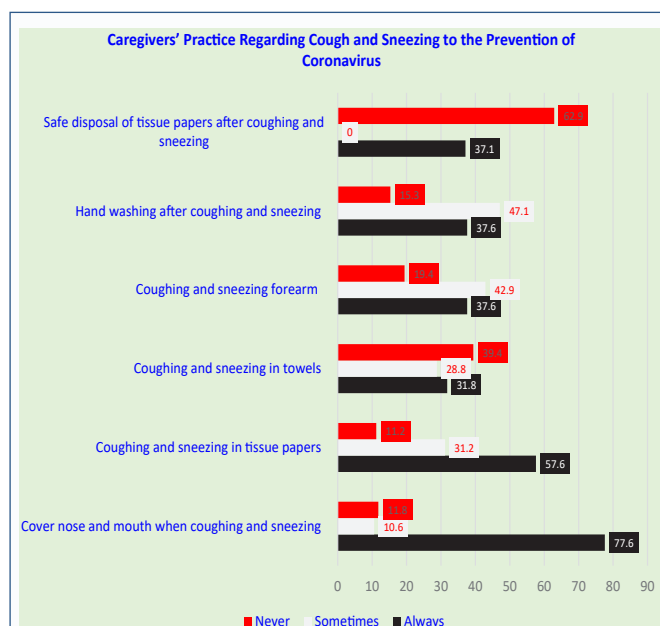


Figure 6: Percentage Distribution of Caregivers' Practice Regarding Cough and Sneezing to the Prevention of Coronavirus (N=170).

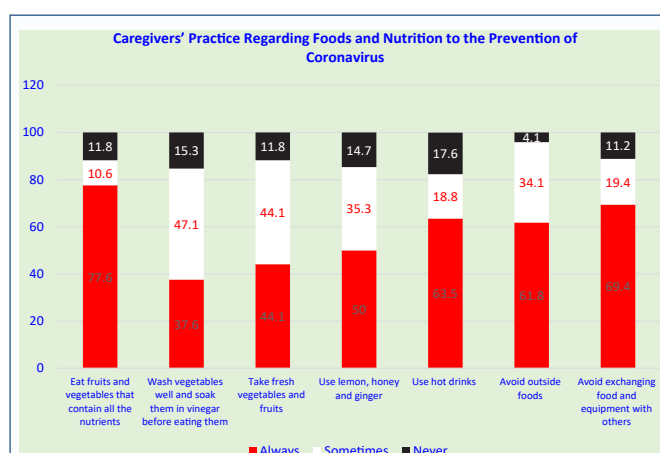
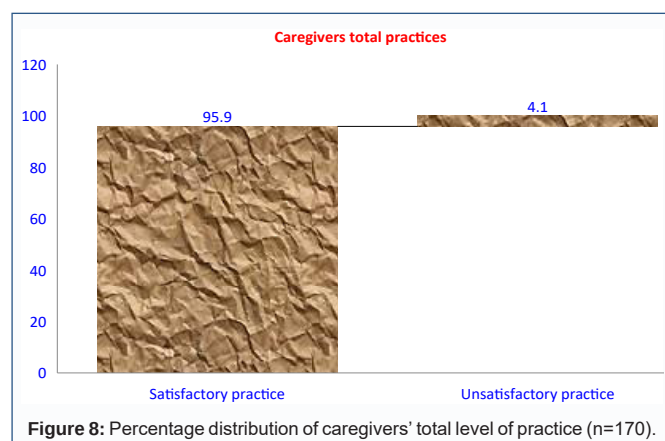


Figure 7: Percentage Distribution of Caregivers' Practice Regarding Foods and Nutrition to the Prevention of Coronavirus (N=170).

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.

Discussion

Limiting the transmission of coronavirus in a home setting requires a range of infection prevention and control measures, which can be considered 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 the 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. The control of exposure at the source, including adequate ventilation systems and effective

environmental decontamination, will physically reduce exposure to infection [14].

Nurses play a crucial role in the pandemic eras which provides care, education and support. At the same time, the nurse can provide health promotion & psychosocial services include assessment, health education, counselling & appropriate referral [15-27]. Therefore, this study was conducted to assess families' caregiver practices of the application of infection control precautions for the coronavirus at home.

The present study showed that, concerning practices regarding hand washing to prevent coronavirus, fewer than three-quarters of the caregivers who had been studied always did hand washing after returning home. This result was supported by Maleki et al. (2020), who reported that 72.5% of the subjects did hand washing after returning home. The present study also revealed that less than two-thirds of the caregivers who were studied sometimes did hand washing for 20 minutes and never did hand washing after removing the mask [28]. These results were in the same line as Ebrahimi & Nemati (2020), who assessed Iranian nurses' knowledge and anxiety toward COVID-19 during the current outbreak in Iran and clarified that 63.7% of the study sample sometimes did hand washing for 20 minutes but never did hand washing after removing the mask [29].

Regarding a study using a mask to prevent coronavirus, the present study showed that more than two-fifths of the studied caregivers always use a mask in general transportation and when dealing with infected persons. These findings agreed with the study conducted by Adhikari & Paudyal (2020) about knowledge, attitude,

Table 2: The Relation between Caregivers' Demographic Characteristics and their Total Practice.

Demographic characteristics	NO	Unsatisfactory practice		Satisfactory practice		X ²	P-Value
		No	%	No	%		
1. Age						10.4	0.015*
20-<30 years	70	7	4.1	63	37.1		
30-<40 years	36	0	0	36	21.2		
40-<50 years	58	0	0	58	34.1		
≥50 years	6	0	0	6	3.5		
2. Marital status						5.49	0.068
Single	67	0	0	67	39.4		
Married	97	7	4.1	90	52.9		
Widowed	6	0	0	6	3.5		
3. Educational level						9.41	0.038*
Illiterate	4	0	0	4	2.4		
Read and write	6	0	0	6	3.5		
Technical education	85	0	0	81	47.6		
High education	75	7	4.1	72	42.4		
4. Residence						12.7	0.006*
Urban	108	0	0	108	63.5		
Rural	62	7	4.1	55	32.4		
5. Financial condition						58.1	0.000**
Not adequate	19	7	4.1	12	7.1		
Adequate	62	0	0	62	36.5		
Adequate and save	89	0	0	89	52.4		

(**) Highly statistically significant correlation at P-value <0.01

(*) Statistically significant correlation at P-value <0.05

and practice regarding COVID-19 among A workers in Chitwan, Nepal, and reported that more than two-fifths (67.8%) of the sample always used a mask in transportation [30]. Result was agreed with Olum et al. (2020), who clarified that only about one quarter (24.1%) of subjects wore masks when dealing with infected persons [31].

The result also illustrated that less than two-thirds of the studied caregivers sometimes change masks as needed and use disposable masks. These results agreed with Phan et al. (2019), who studied the personal protective equipment doffing practices of workers and identified that nearly two-thirds (64.1%) of subjects sometimes wore disposable gloves [32]. The result said that more than two-thirds of them always use suitable types of masks. This result was in disagreement 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 the studied sample didn't use suitable masks [33].

The current study also demonstrated that less than two-thirds of the caregivers who were studied never washed their hands after removing the mask. This result was in the same line as Russell et al. (2021), who assessed factors for compliance with infection control practices in the home toward infection control regarding COVID-19 and found that the majority (78.3%) of the sample had never done hand washing after removing gloves [34].

Regarding caregivers' practices with environmental sanitation to prevent coronavirus, the current study clarified that more than half of the studied caregivers always clean their home environment daily and maintain home hygiene. These findings were in the same line as Sahiledengle et al. (2020), who assessed infection prevention practices for COVID-19 and associated factors among workers in governmental facilities in Addis Ababa and stated that 55.6% of the sample cleaned their home environment daily [35].

The present study also indicated that less than half of the studied caregivers never disinfect their home with ordinary materials. This result was in disagreement with Saito et al. (2020), who assessed alcohol-based hand rub and the incidence of infections due to COVID-19 in a rural, regional referral in Uganda and indicated that the majority of subjects (81%) sometimes disinfected their home with ordinary materials [36].

Concerning caregivers' practices regarding visitors to prevent coronavirus, the current study illustrated that less than two-thirds of the studied caregivers always give sufficient space away from visitors. This result agreed with Saqlain et al. (2020), who found that 64.1% of subjects had enough space from others [37].

This study also revealed that more than three-quarters of the caregivers who were studied always covered their noses and mouths when coughing and sneezing. This result was similar to Tamang et al. (2020), who assessed COVID-19: A national survey on the perceived level of knowledge, attitude, and practice in Nepal (BMC Public Health) and clarified that 77.8% of subjects always covered their nose when sneezing [38].

Regarding caregivers' practices regarding foods to prevent coronavirus, more than three-quarters of the studied caregivers always eat fruits and vegetables that contain all the nutrients. This result agreed with Tan et al. (2020), who found that 77.9% of the samples always eat foods that contain all nutrients [39].

In relation to the total practices of the caregivers, the current

study proved that the majority of them had a satisfactory level of practice. This finding agreed with 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 clarified that almost all (97.6%) of the subjects had the satisfactory total level of practices regarding COVID-19. From the investigator's point of view, educational status can increase the awareness of caregivers, and occupational status helps in increasing good practices [40]. However, this result was in disagreement with the World Health Organization (WHO) (2020), which assessed Coronavirus disease 2019 (COVID-19) Situation Report-51. Geneva and found that most of the study subjects needed to improve their practices regarding COVID-19 [41].

It is not a surprise to find a highly statistically significant relation between the studied caregivers' total practice score and their financial condition and statistically significant ones with their ages, educational level, and residence. This is expected, as those ones will have better housing sanitation, better nutrition, and better medical supplies and health care facilities as well. These results were similar to Al-Hanawi et al. (2020), who reported that there was a highly statistically significant relation between the studied caregivers' practices and their residence, while dissimilar to marital status [42].

Conclusion

Based on the results of the current study, it is concluded that the majority of the studied families' caregivers held a satisfactory level of practices regarding coronavirus at home, with a significant impact from sociodemographic characteristics. Better scores of practices were more prevalent among younger individuals, those with technical and higher education, urban residents, and individuals with better financial conditions.

Recommendations

- Increase caregiver knowledge and performance through continuous educational program training and orientation programs about the coronavirus.
- Sufficient quantities of personal protective equipment (PPE) and training are needed.
- Utilization from the effort that is provided by the concerned parties to improve caregivers' knowledge through continuous educational program training and orientation programs about the coronavirus.

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