



Infection Control Precautions Application at Home for COVID-19: Families' Caregiver Perception

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Abstract

Background: Research indicates SARS-CoV originated from civet cats, while the zoonotic source of SARS-CoV-2 is still unidentified. Initial infection control measures reduced hospital transmission, but factors like test sensitivity limitations, symptomatic patient risks, nebulizer use, inconsistent eye protection, variable mask use, shared accommodations, and the index patient's placement in a positive-pressure room contributed to significant transmission.

Aim of the Study: assess families' perception toward the application of infection control precautions with corona virus at home.

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

Sample: A convenience sample of 170 family caregivers who attended the outpatient clinics within three months, one day/week.

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

Tools: Interviewing Questionnaire Sheet, which consisted of four parts to assess caregivers' personnel characteristics, knowledge, practices, and attitude for family caregivers regarding the application of infection control precautions at home for corona virus.

Results: The result clarified that 70.6% of caregivers had unsatisfactory knowledge toward covid 19, while, 95.9% had satisfactory practices, and 69.4% had positive attitude toward application of infection control precautions with corona virus at home.

Conclusion: Most family caregivers lacked adequate knowledge of COVID-19 infection control measures, despite having access to information. Knowledge correlated positively with sociodemographic factors such as age, marital status, education, residence, and income. Younger, better-educated, and wealthier caregivers displayed more effective management practices. Overall, attitudes towards control measures were generally favorable, especially among younger, married, highly educated, urban caregivers with sufficient income.

Recommendations: Continuous education and training for caregivers, along with proper PPE, are essential. Initiatives such as home visits and education foster community awareness about COVID-19, helping to reduce stigma and promote preventive measures like hand washing and mask-wearing. Community nurses are vital in health education and training.

Keywords: Infection Control; COVID-19; Caregiver; Perception

Introduction

Coronaviruses are zoonotic, facilitating transmission between animals and humans. MERS-CoV originated from dromedary camels, while SARS-CoV was transmitted from civet cats. The zoonotic source of SARS-CoV-2 (COVID-19) remains unidentified, with ongoing investigations to determine its origins [1-3].

The implementation of various infection control measures successfully decreased nosocomial transmission initially [4-6]. A patient tested negative for SARS-CoV-2 upon admission but later developed a fever and tested positive on day four. Contributing factors to transmission included test

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sensitivity limitations, heightened risk among symptomatic patients, the potential for nebulizers to aid transmission, inconsistent eye protection, variable mask usage, shared patient rooms, and the index patient's placement in a positive-pressure room [7].

Educating caregivers on proper PPE use involves careful removal and disposal of gloves followed by hand hygiene. Masks should be removed after glove disposal, and hands should be cleaned again. Caregivers must advise family members against sharing personal items like dishes and towels with patients, ensuring thorough cleaning of these items afterward. Thermometers should either remain unshared or be disinfected before use. Unmasked interactions, such as while eating or drinking, should be avoided [8].

A significant number of COVID-19 patients surpass hospital capacity, necessitating home isolation to prevent further transmission. The study aims to evaluate families' perceptions of infection control measures for coronavirus at home [9].

Limiting COVID-19 transmission in homes entails various infection prevention measures structured as a hierarchy of controls. Administrative controls at the organizational level focus on processes, systems, engineering controls, and appropriate work equipment to mitigate infection introduction and spread in healthcare settings. Key strategies include controlling exposure at the source through adequate ventilation and effective environmental decontamination, which significantly reduce infection risk [10].

Therefore, this study was conducted to assess families' perceptions of the application of infection control precautions for the coronavirus at home.

Aim of the Study

The study aimed to evaluate families' perceptions of infection control precautions for coronavirus at home by assessing their knowledge, application, and attitudes regarding these measures.

Subject and Method

Research design

A descriptive research design was used to conduct the study.

Research setting

The study was conducted at outpatient clinics at the health insurance branch of Beni-Suef city.

Sampling method and sample size

Sample type: The convenience sample technique was used in this study.

A sample of 170 family caregivers was recruited from an eligible group, including those who attended the outpatient clinic, lived with the patient at home, and consented to participate in the study.

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

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

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), N = Population size.

Tool for data collection: The study utilized a structured

interviewing questionnaire, crafted by the researcher in straightforward Arabic, comprising three distinct parts to collect relevant data for its aim.

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: Knowledge questionnaire sheet for families' caregiver

Caregivers possess knowledge about COVID-19, including its definition, causative agent, transmission, signs and symptoms, and its similarities to cold and flu. They are aware of the incubation period, complications, types of coronaviruses, treatment options, and the ineffectiveness of antibiotics. Caregivers also recognize the importance of emergency contacts and preventive measures such as mask usage, handwashing, gloves, environmental sanitation, and protective clothing. Additionally, they understand home isolation protocols and dietary practices that enhance immunity, notably foods rich in vitamins C, A, D, and zinc.

Scoring system: Caregivers' knowledge scoring was as follows: complete correct answers received 2 points, partially correct answers received 1 point, and incorrect answers received 0 points. The total knowledge score was calculated and classified as satisfactory ($\geq 60\%$) or unsatisfactory ($< 60\%$).

Part III: Checklist for families' caregivers' practices

Caregivers implement various practices to prevent COVID-19, including: frequent hand washing after returning home and for at least 20 seconds, proper mask usage when interacting with infected patients, careful removal of masks by folding them inward and discarding them appropriately, and maintaining environmental sanitation through daily cleaning and adequate room ventilation. They also manage visitor protocols by ensuring shoes are removed outside and maintaining distance, as well as practicing respiratory hygiene by covering coughs and sneezes with tissues or towels. Additionally, caregivers emphasize a nutritious diet by consuming well-washed fruits and vegetables, soaking them in vinegar before consumption.

Scoring system: The caregivers' practices were scored based on responses: always-done (2 points), sometimes-done (1 point), and never-done (0 points). A mean practice score was calculated, with scores $\geq 60\%$ indicating satisfactory practice and scores $< 60\%$ indicating unsatisfactory practice.

Part IV: Caregivers' attitudes regarding COVID-19, such as having an important role in COVID-19 prevention, fear of infection of family members, belief that the COVID-19 pandemic will be overcome, etc.

Scoring system: The caregivers' attitude was assessed using a scoring system where agreed answers scored two points, neutral answers scored one point, and disagreed answers scored zero. The total scores were summed, and a mean attitude score was determined. A score of 60% or higher indicated a positive attitude, while a score below 60% indicated a negative attitude.

Content validity

The study tools were evaluated for face and content validity by five experts from the community health nursing department at Beni-Suef University, focusing on comprehensiveness, accuracy, and

clarity of language.

Reliability of Tool

The tool's reliability was evaluated using the Cronbach Alpha Coefficient test, yielding values of 0.79 for knowledge and 0.63 for practice.

Pilot study

The pilot study involved 10% of the total sample, consisting of 17 family caregivers, aimed at evaluating the clarity of tools, feasibility of fieldwork, and identifying potential obstacles to data collection. Modifications were made based on findings from the pilot study.

Fieldwork

This phase involved reviewing relevant local and international literature to understand the research problem, leading to the development of data collection tools. The data collection lasted three months, from April to September 2022, with the researcher attending outpatient clinics of the Beni-Suef Health Insurance branch weekly. Interviews with caregivers were conducted after obtaining consent, emphasizing ethical considerations. A brief study overview was provided, and the questionnaire was clarified for comprehensibility. Interview duration varied based on literacy, taking approximately 25-30 minutes for literate caregivers and 30-45 minutes for those who were not.

Administrative Design

Approval was secured from the Research and Ethics Committee and the Dean of the Faculty of Nursing at Beni-Suef University to conduct the study. Permission for data collection was sought from the director of the Beni-Suef Health Insurance Branch, with assurances of confidentiality and participant safety.

Ethical considerations

Formal consent was obtained from family caregivers for study participation, ensuring they were informed of their rights to refuse or withdraw at any time. Anonymity and confidentiality of data were guaranteed through coding, and participants were assured that data would not be reused without permission, with a promise to prevent any exposure to errors or conspiracies from the study.

Statistical Design

The data were encoded for processing and verified to minimize errors. Analysis utilized the Statistical Package for the Social Sciences (SPSS) with descriptive statistics such as numbers, percentages, averages (arithmetic mean, and standard deviation), and included tests like Chi-square.

Results

Table 1 showed that 41.2%, 47.6%, 44% of family caregivers, ages ranged from 20 to 30 years, had basic/middle education and had high education, respectively, 57.1% were married, and 65.5% were urban residences.

Figure 1 presents that 70.6% of individuals exhibited an unsatisfactory level of knowledge about COVID-19.

Figure 2 presents that 95.9% reported satisfactory practices concerning coronavirus.

Figure 2 presents that 69.4% of the sample exhibited a positive attitude towards COVID-19 preventive measures at home, whereas 30.6% showed a negative attitude.

Table 1: Percentage Distribution of Demographic Characteristics of the Family Caregivers.

Demographic characteristics	No (170)	%
Age		
20- years	70	41.2
30- years	36	21.2
40- years	58	34.1
50- years	6	3.5
Marital status		
Single	67	39.4
Married	97	57.1
Widowed/divorced	6	3.5
Residence		
Urban	108	63.5
Rural	62	36.5
Education		
Illiterate	4	2.4
Read and write	6	3.5
Basic education/middle education	85	47.6
High education	75	44
Income		
Not adequate	19	11.1
Adequate	62	36.5
Can save	89	52.4

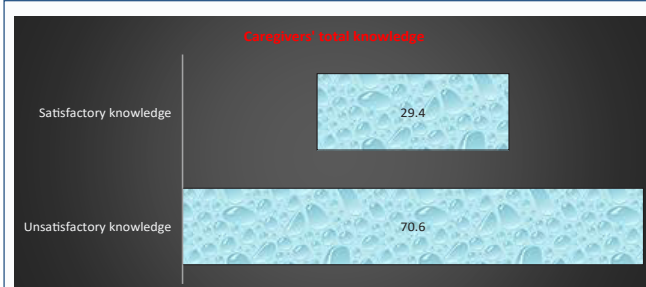


Figure 1: Percentage distribution of caregivers' total level of knowledge (%).

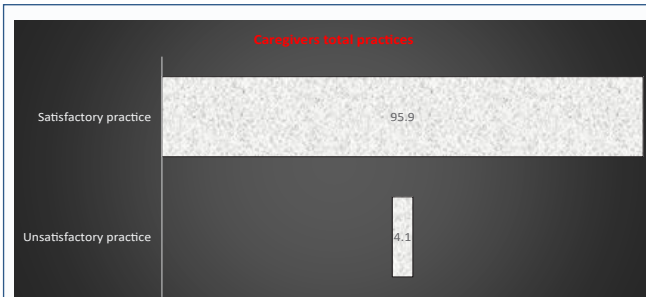
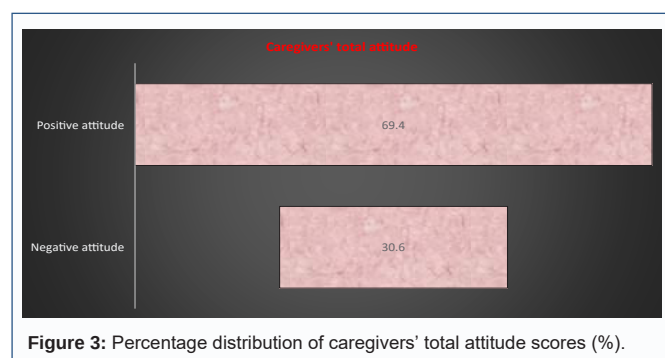


Figure 2: Percentage distribution of caregivers' total level of practice (%).

Table 2 shows that There is a highly statistically significant relationship between caregivers' total knowledge and factors such as age, marital status, educational level, residence, and financial condition. Additionally, caregivers' total practice scores show a strong correlation with their financial condition ($p=0.000$), and significant associations with age, educational level, and residence, but



not with marital status. However, there is no statistically significant relationship between caregivers' total attitude scores and any of the examined variables.

Table 3 shows that there is a statistically significant correlation between caregivers' total knowledge and total attitude scores, but

no significant correlation exists between total practices and either knowledge or attitude scores.

Discussion

Coronavirus disease is a highly infectious respiratory viral disease that has rapidly spread globally, leading to an international pandemic. Its clinical symptoms include fever, dry cough, fatigue, myalgia, and dyspnea. Severe cases, affecting 18.5% of patients, can result in acute respiratory distress syndrome, septic shock, metabolic acidosis, and coagulation dysfunction. The disease is marked by high mortality and the absence of a cure or vaccine [11].

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, counseling & appropriate referral [12-24]. Therefore, this study was conducted evaluate families' perceptions of infection control precautions for coronavirus at home by assessing their knowledge, application, and attitudes regarding these measures.

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

Personal Data	NO (170)	Knowledge (%)		P-Value	Practice (%)		P-Value	Attitude (%)		P-Value
		Unsatisfactory	Satisfactory		Unsatisfactory	Satisfactory		Negative	Positive	
Age										
20- years	70	36.5	4.7	0.000**	4.1	37.1	0.015*	12.4	28.8	0.257
30- years	36	14.1	7.1		0	21.2		4.1	17.1	
40- years	58	16.5	17.6		0	34.1		12.4	21.8	
50- years	6	3.5	0		0	3.5		1.8	1.8	
Status										
Single	67	34.7	4.7	0.000**	0	39.4	0.068	12.4	27.1	0.544
Married	97	35.9	21.2		4.1	52.9		16.5	40.6	
Widowed	6	0	3.5		0	3.5		1.8	1.8	
Education										
Illiterate	4	0	2.4	0.000**	0	2.4	0.038*	0	2.4	0.257
Read & write	6	3.5	0		0	3.5		1.8	1.8	
Basic	85	22.9	27.1		0	47.6		16.5	31.2	
High	75	44.2	0		4.1	42.4		12.4	34.1	
Residence										
Urban	108	58.8	4.7	0.000**	0	63.5	0.006*	18.2	45.3	0.623
Rural	62	11.8	24.7		4.1	32.4		12.4	24.1	
Income										
In adequate	19	7.6	3.5	0.000**	4.1	7.1	0.000**	2.4	8.8	0.193
Adequate	62	15.3	21.2		0	36.5		14.1	22.4	
Can save	89	47.6	4.7		0	52.4		14.1	38.2	

(**) Highly statistically significant correlation at P-value <0.01, (*) Statistically significant correlation at P-value <0.05.

Table 3: Correlation between Patients' Total Knowledge, Practice, and Attitude (N=170).

		Total knowledge	Total practice	Total attitude
Total knowledge	R	1.0	0.134	-0.048*
	P	--	0.082	0.536
Total practice	R	0.134	1.0	-0.073
	P	0.082	--	0.342
Total attitude	R	-0.048*	-0.073	1.0
	P	0.536	0.342	--

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

The patient initially tested negative for SARS-CoV-2 twice upon admission but developed a fever on day four and later tested positive. Factors contributing to the subsequent transmission included the limited sensitivity of tests, higher transmission risks among symptomatic patients, the potential influence of nebulizers, inconsistent use of eye protection and masks, shared patient rooms, and the patient being in a positive-pressure room [7]. In this study, it was found that less than 75% of caregivers had unsatisfactory knowledge about COVID-19, while over 25% possessed satisfactory knowledge. This aligns with the findings of Afulani et al. (2020), which reported that 69.9% of healthcare workers in Ghana had unsatisfactory total knowledge regarding COVID-19 [25].

Moreover, most caregivers demonstrated a satisfactory level of practice regarding COVID-19, aligning with findings by Tsegaye et al. (2020) indicating 97.6% satisfactory practices among subjects in Ethiopia [26]. It was noted that higher educational and occupational status positively influenced caregivers' practices. However, this contrasts with the World Health Organization's (WHO) 2020 report, which suggested that many individuals needed improvement in their COVID-19 practices [7].

Additionally, more than two-thirds of caregivers exhibited a positive attitude towards COVID-19, aligning with Roya et al. (2020), who found 69.1% positivity in their sample [27]. This contrasts with Ferdous et al. (2020), who reported that 78.9% had negative attitudes [28].

Results showed a significant relationship between caregivers' knowledge scores and their ages and educational levels, with knowledge being higher among older individuals, those with technical education, rural residents, and those with adequate income. Rural living conditions, such as access to green space and wider homes, facilitate better health practices. Married individuals feel a sense of responsibility towards their families, motivating them to be knowledgeable caregivers. These findings align with Bazaid et al. (2020) regarding age and education as key factors in caregiver awareness and practices [29].

There is a highly statistically significant relationship between caregivers' total practice scores and their financial conditions, ages, educational levels, and residence. Caregivers with better financial resources tend to have improved housing sanitation, nutrition, and access to medical supplies and healthcare facilities. These findings are consistent with Al-Hanawi et al. (2020), which noted a strong relation between caregivers' practices and their residence, but differ regarding marital status [30].

The study found no statistically significant relationship between caregivers' total attitude scores and their ages, marital status, income, or educational level. These results align with previous research by Abdelhafiz et al. (2020) [9]. However, younger individuals, those with higher education, urban residents, and individuals with adequate income exhibited more positive attitudes, likely due to better housing conditions, nutrition, and access to healthcare.

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 clarified that there is a highly statistically significant correlation between caregivers' total knowledge and their total practices [31]. This may be why caregivers

who have good knowledge have a good attitude.

Conclusion

Most family caregivers displayed poor knowledge of COVID-19 infection control measures, despite using professional sources for information. Knowledge levels correlated positively with sociodemographic factors such as age, marital status, education, residence, and income. Caregivers practiced satisfactory home management of the virus, particularly younger individuals and those with advanced education and better financial stability. While attitudes toward control measures were generally positive, younger, married, highly educated, urban caregivers with sufficient income exhibited the most favorable attitudes.

Recommendations

To enhance caregiver knowledge and performance regarding COVID-19, the following recommendations are suggested:

1. Continuous educational programs and orientations should be implemented.
2. Sufficient personal protective equipment (PPE) and associated training are essential for all caregivers.
3. Awareness initiatives must reach all community members through various venues like home visits and educational institutions.
4. It's important to foster positive attitudes toward COVID-19 to mitigate stigma and emphasize effective preventive measures such as hand washing and wearing masks.
5. Community nurses should play a crucial role in health education and training programs.

References

1. Chen N, Zhou M, Dong X, Qu J, Gong F, Han Y. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. *Lancet*, 2020; 395: 507–513. doi: 10.1016/S0140-6736(20)30211-7.
2. Mostafa H, Hassan H, Atea Sh, Ahmed M. Families' Perception toward Application of Infection Control Precautions with Corona Virus at Home. *Egyptian Journal of Health Care*, 2024; 15 (2): 511-533. doi: 10.21608/EJHC.2024.354543.
3. Malk R, Hassan E, Mohamed A, Amr E, Hassan H. Effect of an Educational Program on Nurses Performance Regarding COVID-19 in the Obstetrics and Surgical units. *Egyptian Journal of Health Care*, 2022; 13(4): 251-269. doi: 10.21608/EJHC.2022.260885
4. Hassan H, Malk R, Abdelhamed A, Genedy A. 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*, 2020; 8(4): 412-425. doi: 10.12691/ajnr-8-4-1.
5. Sheha E, Hassan H, Elsherbeny E, Elgendy A. Integrated Intervention Program for Pregnant Women toward ZIKA Virus Infection in Upper Egypt. *International Journal of Studies in Nursing*, 2021; 6(1): 36-53. doi: org/10.20849/ijsn.v6i1.870.
6. Said D, Gooda W, Mohamed E, Hassan H. Effect of Continuous Care Model on Recurrence of Vulvovaginal Candidiasis Infection among Pregnant Women. *Egyptian Journal of Health Care*, 2026; 17 (1): 121-144. doi: 10.21608/ejhc.2026.479146.
7. WHO. PHE investigating a novel strain of COVID-19. GOV.UK. 14 December 2020. Retrieved 15 December 2020.
8. Petrilli CM, Jones SA, Yang J. Factors associated with hospital admission

- and critical illness among 5279 people with coronavirus disease 2019 in New York City: prospective cohort study. *BMJ*, 2020; 369: m1966. <https://doi.org/10.1136/bmj.m1966>
9. Abdelhafiz A. S, Mohammed Z, Ibrahim M. E, Ziady H. H, Alorabi M, Ayyad M & Sultan E. A. Knowledge, Perceptions, and Attitude of Egyptians towards the Novel Coronavirus Disease (COVID-19). *Journal of Community Health*, 2020; 45(5): 881–890.
 10. Ralph R, Lew J, Zeng T. 2019-nCoV (Wuhan virus), a novel Coronavirus: human-to-human transmission, travel-related cases, and vaccine readiness. *J Infect Dev Ctries*, 2020; 14(1): 3-17. <https://doi.org/10.3855/jidc.12425>
 11. Guo YR, Cao QD, Hong ZS, Tan YY, Chen SD, Jin HJ, Tan KS, Wang YD, Yan Y. The origin, transmission and clinical therapies on coronavirus disease 2019 (COVID-19) outbreak - an update on the status. *Military Medical Research*, 2020; 7(1): 11.
 12. Zaki S, Hassan H, Nady F. Female Workers' Knowledge about Breast Cancer at Beni-Suef University: Effect Socio-demographic Characteristics. *American Journal of Public Health Research*, 2025; 13(3): 140-144. doi: 10.12691/ajphr-13-3-5
 13. Abd-Elfattah N, Mohamed A, Hassan H. Enhancing Females' Knowledge regarding Oocyte Cryopreservation: Effect of an Educational Program. *International Journal of Clinical Research and Reports*, 2025; 4(6): 2-8. doi: 10.31579/2835-785X/109.
 14. Abd-ELghafar F, Hassan H, Ali E. Lifestyle modifications among infertile women with poly cystic ovary syndrome. *Nursing & Care Open Access Journal*, 2026; 12(1): 1-10. doi: 10.15406/ncoaj.2026.12.00332
 15. Mohamed A, Hassan H, Mohamed N. Oocyte Cryopreservation Knowledge, Attitude, and Intention Effect of an Educational Program on Working Females at Beni-Suef University. *Journal of Health Care Research*, 2026; 3(1): 199-221. doi: 10.21608/jhcr.2026.410856.1070
 16. Nashed N, Hassan H, Gooda W. Impact of Post Abortion Counseling Based on PLISSIT Model on Women's Life Style. *Egyptian Journal of Health Care*, 2025; 16 (2): 1009-1028. doi: 10.21608/ejhc.2025.438157.
 17. Zaki S, Nady S, Hassan H. Preventive Measures of Breast Cancer Female Workers' Knowledge. *Journal of Clinical and Laboratory Research*, 2025; 8(2): 1-6. doi:10.31579/2768-0487/169
 18. Mohamed H, Hassan H, Masoud H. Call for Enhancing Pregnant Women's Knowledge Regarding Teratogenic Medications and Most Common Drugs That Cause Congenital Anomalies. *NL Journal of Medical and Pharmaceutical Sciences*, 2025; 1(3): 27-35.
 19. Abd-Elfattah N, Mohamed A, Hassan H. Effect of an Educational Program on Women's Intention regarding Oocyte Cryopreservation. *Journal of Comprehensive Nursing Research and Care*, 2025; 10(2): 1-8. doi: <https://doi.org/10.33790/jcnrc1100221>.
 20. Said D, Gooda W, Mohamed E, Hassan H. Effect of Continuous Care Model on Recurrence of Vulvovaginal Candidiasis Infection among Pregnant Women. *Egyptian Journal of Health Care*, 2026; 17 (1): 121-144. doi: 10.21608/ejhc.2026.479146.
 21. Masoud H, Mohamed H, Hassan H. Effect of An Educational Program on Pregnant Women's Knowledge Regarding Possible Side Effects of Drugs Used During Pregnancy on Fetus and Mother. *American Journal of Pharmacological Sciences*, 2026; 14(1): 1-6. doi: 10.12691/ajps-14-1-1.
 22. Gaafar H, Saad H, Hassan H, Omran A. Maternity Nurses' Knowledge Regarding Nursing Care of First Stage of Normal Labor and Partogram Through Instructional Package. *Journal of Women Health Care and Issues*, 2026; 9(1): 1-8. doi:10.31579/2642-9756/256
 23. Nady F, Zaki S, Hassan H. Beni-Suef University Female Workers' Breast Self-Examination Practices. *International Journal of Family & Community Medicine*. 2026; 10(1): 42-47. doi: 10.15406/ijfcm.2026.10.00410
 24. Gooda W, Hassan H, Nashed N. Women's General Knowledge Regarding Abortion: Impact of Counseling Based on PLISSIT Model. *International Journal of Health & Medical Research*, 2026; 5(2): 90 – 101. doi: 10.58806/ijhmr.2026.v5i2n01
 25. Afulani PA, Gyamerah AO, Aborigo R, Nutor JJ, Malechi H, et al. Perceived preparedness to respond to the COVID-19 pandemic: a study with healthcare workers in Ghana. *J Glob Health Sci*, 2020; 2(2): e24.
 26. Tsegaye D, Shuremu M, Donacho DO, Dubale S, Geneti GB and Bidira's K. Knowledge and preventive practices towards COVID-19 and associated factors among healthcare workers in selected health facilities of Illu Aba Bor and Buno Bedelle Zones, Southwest Ethiopia. 2020. <https://doi.org/10.21203/rs.3.rs-49537/v2>. Available at: <https://www.researchsquare.com/article/rs-49537/v2>
 27. Roya D, Tripathya S, Kara SK, Sharmaa N, Vermaa SK, Kaushalb V. Study of knowledge, attitude, anxiety & perceived mental healthcare need in Indian population during COVID-19 pandemic. *Asian Journal of Psychiatry* 2020; 51: 102083.
 28. Ferdous MZ, Islam MS, Sikder MT, Mosaddek ASM, Zegarar-Valdivia JA, Gozal D. Knowledge, attitude, and practice regarding COVID-19 outbreak in Bangladesh: An onlinebased cross-sectional study. *PLoS ONE*, 2020; 15(10): e0239254.
 29. Bazaid A. S, Aldarhami A, Binsaleh N. K, Sherwani S & Althomali O. W. Knowledge and practice of personal protective measures during the COVID-19 pandemic: A cross-sectional study in Saudi Arabia. *PLoS ONE*, 2020; 15(12): e0243695.
 30. Al-Hanawi MK, Angawi K, Alshareef N, Qattan AMN, Helmy HZ, Abudawood Y, Alqurashi M, Kattan WM, Kadasah NA, Chirwa GC and Alsharqi O. Knowledge, Attitude and Practice Toward COVID-19 Among the Public in the Kingdom of Saudi Arabia: A Cross-Sectional Study. *Front. Public Health*, 2020; 8: 217.
 31. Zhong BL, Luo W, Li HM, Zhang QQ, Liu XG, Li WT, Li Y. Knowledge, attitudes, and practices towards COVID-19 among Chinese residents during the rapid rise period of the COVID-19 outbreak: a quick online cross-sectional survey. *International Journal of Biological Sciences*, 2020; 16(10): 1745-52.