Brief communication

Nursing knowledge, attitudes, and practices to prevent COVID-19 in a children's hospital

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Abstract
Introduction. The study of knowledge, attitudes, and practices related to COVID-19 prevention is a support tool for institutions, helping to determine measures that impact disease prevention. **Objective.** Identify the levels of knowledge, attitudes, and practices of nursing staff in preventing COVID-19 at the Benjamin Bloom National Children's Hospital. **Methodology.** Descriptive cross-sectional study, adapted from a survey conducted in the Dominican Republic. A total of 171 nursing professionals were selected using probabilistic sampling. **Results.** The majority were female (93 %) and had more than five years of academic nursing studies. Eighty-two percent of nursing professionals had a high level of knowledge, 78 % had a high level of prevention attitudes, and 65 % had a high level of prevention practices. **Conclusion.** The study population reflects a high level of knowledge about COVID-19 prevention. The attitudes verified in the prevention of COVID-19 infection s were high, and a high level of prevention practices was identified among nursing professionals at the children's hospital.

Keywords
Health Knowledge, Attitudes, Practice; Coronavirus; SARS-CoV-2; Hospital Nursing Staff; Nursing Evaluation Research.

Resumen
Introducción. El estudio de los conocimientos, las actitudes y las prácticas relacionadas con la prevención de COVID-19, es una herramienta de apoyo para las instituciones, que contribuye a determinar medidas que inciden en la prevención de la enfermedad. **Objetivo.** Identificar los niveles de conocimientos, actitudes y prácticas de enfermería para prevenir la COVID-19, en el Hospital Nacional de Niños Benjamín Bloom. **Metodología.** Estudio transversal descriptivo, adaptado a partir de una encuesta en República Dominicana. Fueron seleccionados 171 profesionales de enfermería, mediante un muestreo probabilístico. **Resultados.** La mayoría fueron del sexo femenino, con un 93 % y poseían más de cinco años de estudios académicos de enfermería. El 82 % de los profesionales de enfermería tienen nivel alto de conocimiento, el 78 % un nivel alto de actitudes de prevención y, el 65 %, nivel alto de prácticas de prevención. **Conclusión.** La población en estudio refleja un nivel alto de conocimientos sobre la prevención de COVID-19. Las actitudes verificadas en la prevención de contagio del COVID-19 fueron un nivel alto obtenido y se identificó un nivel alto de prácticas de prevención en los profesionales de enfermería del hospital de niños.

Palabras clave
Conocimientos, Actitudes y Práctica en Salud, Coronavirus, SARS-CoV-2, Personal de Enfermería en Hospital, Evaluación en Enfermería.

Introduction

The COVID-19 pandemic impacted the world and challenged healthcare systems, leading to significant changes in medical practices.[1] Globally, the spread of the SARS-CoV-2 virus caused alarm and posed unprecedented challenges for researchers and scientists, who analyzed its behavior and sought solutions for the disease.[2]

In Latin America, countries used various strategies to contain the spread of the virus and mitigate its effects.[3] El Salvador implemented contingency measures through the Ministry of Health for the proper management of patients.[4]

Despite the wealth of global information on COVID-19 since the beginning of the pandemic, in El Salvador, there is still no published nursing research documenting the levels of knowledge, attitudes, and nursing practices in local hospitals in response to COVID-19. Pediatric nursing staff had to comply with strict biosecurity measures and ensure care tailored to the characteristics of children, who are a vulnerable group. Therefore, there is a relevant information gap, as understanding this landscape is essential to strengthening the health system's response capacity and protecting the child population.

Likewise, studies on knowledge, attitudes, and practices (KAP) conducted in the prevention of COVID-19 transmission are important tools for assessing and providing information to institutions, enabling them to develop protocols and determine prevention measures.[5] KAP studies have designs and intervention strategies that serve to guide or focus educational efforts;[6] furthermore, their importance lies in their ability to assess the preparedness of health personnel, identify areas for improvement, and ultimately contribute to the safety of both professionals and patients.[7]

The Benjamín Bloom National Children's Hospital (HNNBB) in El Salvador made institutional efforts to adapt to the reality, establishing processes to train its staff, with an emphasis on prevention strategies. This highlighted the need to assess the knowledge, attitudes, and practices of frontline nursing professionals, who have had the most direct contact with patients infected with the SARS-CoV-2 virus.[8] In this context, the objective of this research was to identify the levels of knowledge, attitudes, and practices of nursing staff regarding COVID-19 prevention.

Methodology

The study design was a descriptive cross-sectional study conducted at the HNNBB, a tertiary care hospital focused on the care of children and adolescents.

The total number of nursing staff during the study period was 468: 17 supervising nurses, 22 head nurses, 282 hospital nurses, and 147 nursing assistants. In El Salvador, this career is subdivided into the following academic degrees: "Bachelor of Nursing" (five years of study), "Nursing Technologist" (four years of study), "Graduate Nurse" (three years of study), "Nursing Technician" (two years of study), and "Nursing Assistant" (one year of study).

To determine the sample size, the formula for finite populations was used, with a confidence level of 95 % and a margin of error of 5 %, resulting in a sample of 171 participants. The nursing staff included in the study was selected at convenience. The following areas of patient care at the HNNBB were included: emergencies, plastic surgery, operating room, intensive car units (pediatric, neonatal and surgical), internal medicine, neonatology, nephrology, infectious diseases, general surgery, hematology, otolaryngology, neurosurgery, oncology, contract services, orthopedics, and outpatient care.

Eligibility criteria included nursing staff in direct care at the HNNBB, with more than two years of service, permanently employed, and working as a nurse or hospital nursing assistant.

Sociodemographic variables such as sex, age, academic level, work experience, continuing education, training, and training methodology were identified. The variables related to knowledge about the disease were: symptoms, transmission routes, and prevention measures.[9] Attitude variables included preventive measures, immunization, use of personal protective equipment and biosafety, handwashing, strengthening knowledge through participation in training sessions, compliance with the COVID-19 vaccination schedule, compliance with isolation measures, and prevention of COVID-19 transmission. In addition, the prevention practice variables included COVID-19 prevention and vaccination measures[11,12] (including the use of personal protective equipment), biosafety measures, practices to prevent intra- and extra-hospital transmission of the disease, and compliance with technical guidelines for the comprehensive care of pediatric patients diagnosed with COVID-19.

Data collection took place from February 20 to April 10, 2023. Authorization was obtained from the local ethics committee under memorandum number 10022023-01. Data monitoring and analysis were carried out from May to July 2023. Data collection was performed using a self-administered questionnaire with closed-ended questions, structured around informed consent, identification data, sociodemographic variables, and variables related to knowledge, attitudes, and practices related to COVID-19 prevention. The questionnaire was adapted from another questionnaire

entitled: Knowledge, attitudes, and practices regarding COVID-19 in adults in the Dominican Republic.[13] To validate the data collection instrument, the reference questionnaire was used and subjected to an expert validation test to obtain approval for its adaptation to the local context.

The instrument was classified according to a Likert scale: "strongly disagree" (one point), "disagree" (two points), "undecided" (three points), "agree" (four points), and "strongly agree" (five points).[13,14] The level of knowledge was classified as: low (zero to eight points), medium (nine-16 points), and high (17-25 points). Prevention attitudes were classified into three levels: low (0-15 points), medium (16-30 points), and high (31-45 points). Prevention practice levels were classified as: low (zero-seven points), medium knowledge level (eight-13 points), and high knowledge level (1420 points). For the final result, the scores for each questionnaire were added up across all items in the instrument. The data was entered into a Microsoft Excel 2010 database. Frequency and percentages were used to describe the participants.

Results

A total of 171 nursing professionals were included in this KAP study. The majority were female (93 % or 159 women), and 45.6 % (78 participants) had more than five years of academic nursing studies, corresponding to a bachelor's degree in nursing.

Knowledge about the prevention of COVID-19 infection

The proportion of high level was 83 %, 13 % was medium, and 4 % was low. At the high level, most belonged to the 51-60 age group (42 people); at the medium level, they were professionals in the 31-40 age group (ten people); while at the low level, most were in the 41-50 age group (three people) (Table 1).

Based on years of study in the nursing profession, the majority across the three levels correspond to the five-year study group, which contributed the largest number of personnel analyzed. However, in that group of professionals, 62 participants (79.49 %) had a high level. In terms of years of work, in the three levels of knowledge, the highest percentage was in the group with two to nine years of work, with 56 people at the high level, ten at the medium level, and two at the low level, along with the group with 18 to 25 years of work. However, in the total group with two to nine years of work experience, 56 participants (82.35 %) had a high level of knowledge.

Table 1. Level of knowledge about COVID-19 prevention measures among nursing staff at HNNBB, February to April 2023

Variable	Category	Low level		Intermediate level		High level	
		Frequency	%	Frequency	%	Frequency	%
Sex	Female	5	83.33 %	22	95.65 %	132	92.96 %
	Male	1	16.67 %	1	4.35 %	10	7.04 %
Age	21-30 years	2	33.33 %	3	13.04 %	26	18.31 %
	31-40 years	0	0.00 %	10	43.48 %	33	23.24 %
	41-50 years	3	50.00 %	7	30.43 %	38	26.76 %
	51-60 years	1	16.67 %	3	13.04 %	42	29.58 %
	> 60 years	0	0.00 %	0	0.00 %	3	1.75 %
Years of nursing studies	5	4	66.67 %	12	52.17 %	62	43.66 %
	3	2	33.33 %	1	4.35 %	17	11.97 %
	4	0	0.00 %	3	13.04 %	16	11.27 %
	1	0	0.00 %	4	17.39 %	22	15.49 %
	2	0	0.00 %	3	13.04 %	25	17.61 %
Years of work	2-9	2	33.33 %	10	43.48 %	56	39.44 %
	10-17	1	16.67 %	5	21.74 %	18	12.68 %
	18-25	2	33.33 %	4	17.39 %	29	20.42 %
	26-33	1	16.67 %	4	17.39 %	36	25.35 %
	> 33	0	0.00 %	0	0.00 %	3	2.11 %

COVID-19 prevention attitudes

The proportion of high level was 78 %, 17 % have a medium level, and 5 % have a low level. One hundred and twenty-seven women (79.8 %) (127/159) and nine men (75.0 %) obtained a high level. By age, the 51-60 age group had the highest percentage of high attitudes (29.41 %), while the 21-30 age group had the highest proportion of low attitudes (50 %). Based on years of professional study, all groups had a high level. With different years of work experience, they had a high level (Table 2).

Prevention practices

The proportion of high level of prevention practice was 63 %, 30 % medium, and 7 % low. One hundred and one women (63.52 %) and six men (50 %) have a high level. In terms of age, the group with the highest percentage of high-level practices was 51 to 60 years; the highest percentage of medium level practices was in the 31 to 40 age group; and the 41 to 50 age group had the highest percentage of low-level practices.

According to the number of years in the nursing profession, of the total number of people with five years of professional study, 41 participants (52.56 %) had a high level, while 20 people (76.92 %) of the total

number of participants with only one year of professional training had a high level. Finally, according to years of work, the group with two to nine years of work obtained the highest percentage of high practice level with 36.45 % (Table 3).

Discussion

This study highlights the need to update staff knowledge to foster contribute to attitudes and practices that promote compliance with measures to prevent the spread of COVID-19 among patients and frontline staff.[15,16]

The results show that the majority of staff evaluated had a high level of knowledge about COVID-19. These data are similar in Latin America, where healthcare personnel have been reported to recognize the importance of COVID-19 prevention through strategies such as vaccination.[17] Patients also have a high level of knowledge, as in Argentina, where high knowledge of the disease was verified regarding symptoms, prevention measures, forms of transmission, vulnerable people, isolation in case of illness, social isolation, mask guidelines, and actions that spread the disease. These results were obtained from people in that country who had suffered from COVID-19, with high knowledge rates of 80 % - 90 % among the patients included.[9]

Table 2. Level of attitudes toward COVID-19 infection prevention measures among nursing staff at HNNBB, February to April 2023

Variable	Category	Low level		Intermediate level		High level	
		Frequency	%	Frequency	%	Frequency	%
Sex	Female	5	83.33 %	27	93.10 %	127	93.38 %
	Male	1	16.67 %	2	6.90 %	9	6.62 %
Age (years)	21-30	3	50.00 %	6	20.69 %	22	16.18 %
	31-40	1	16.67 %	8	27.59 %	34	25.00 %
	41-50	2	33.33 %	9	31.03 %	37	27.21 %
	51-60	0	0.00 %	6	20.69 %	40	29.41 %
	> 60	0	0.00 %	0	0.00 %	3	2.21 %
Years of nursing studies	5	4	66.67 %	15	51.72 %	59	43.38 %
	4	0	0.00 %	4	13.79 %	15	11.03 %
	3	1	16.67 %	4	13.79 %	15	11.03 %
	2	1	16.67 %	3	10.34 %	24	17.65 %
	1	0	0.00 %	3	10.34 %	23	16.91 %
Years of work	2-9	3	50.00 %	15	51.72 %	50	36.76 %
	10-17	1	16.67 %	4	13.79 %	19	13.97 %
	18-25	1	16.67 %	5	17.24 %	29	21.32 %
	26-33	1	16.67 %	5	17.24 %	35	25.74 %
	> 34	0	0.00 %	0	0.00 %	3	2.21 %

Table 3. Level of practice regarding COVID-19 infection prevention measures among nursing staff at HNNBB, February to April 2023

Variable	Category	Low level		Intermediate level		High level	
		Frequency	%	Frequency	%	Frequency	%
Sex	Female	12	100.00 %	46	88.46 %	101	94.39 %
	Male	0	0.00 %	6	11.54 %	6	5.61 %
Age (years)	21-30	2	16.67 %	10	19.23 %	19	17.76 %
	31-40	4	33.33 %	16	30.77 %	23	21.50 %
	41-50	6	50.00 %	13	25.00 %	29	27.10 %
	51-60	0	0.00 %	13	25.00 %	33	30.84 %
	> 60	0	0.00 %	0	0.00 %	3	2.80 %
Years of nursing studies	5	8	66.67 %	29	55.77 %	41	38.32 %
	4	2	16.67 %	5	9.62 %	12	11.21 %
	3	0	0.00 %	6	11.54 %	14	13.08 %
	2	2	16.67 %	6	11.54 %	20	18.69 %
	1	0	0.00 %	6	11.54 %	20	18.69 %
Years of work	2-9	4	33.33 %	25	48.08 %	39	36.45 %
	10-17	3	25.00 %	8	15.38 %	13	12.15 %
	18-25	5	41.67 %	7	13.46 %	23	21.50 %
	26-33	0	0.00 %	12	23.08 %	29	27.10 %
	> 34	0	0.00 %	0	0,00 %	3	2,80 %

Regarding prevention attitudes, most participants had high levels. A study conducted on adults in Peru revealed that the negative attitudes towards COVID-19 expressed were "being healthy is a matter of chance for each person" (90.40 %) and "medicalization solves the problems of contagion" (75.10 %)[18].

The high level of COVID-19 prevention practices is similar to that reported in a study in Paraguay, in which participants' practices to avoid or reduce the risk of contracting the virus and limit its spread were positive.[19] Similarly, a study conducted in the Dominican Republic reported that the majority of the population surveyed had followed preventive practices during the COVID-19 pandemic.[13] The CAP in Paraguay, conducted among healthcare personnel, also indicates that the majority avoided attending crowded places.[19] However, negative results have been reported, such as a study conducted in Mexico among healthcare personnel that found a 65 % deficiency in correct handwashing practices as a measure to prevent COVID-19 infection.[20]

It is important to note that information, education, and communication activities aimed at nursing professionals during the pandemic are related to the acquisition of knowledge, attitudes, and practices for the prevention of COVID-19 infection.[21,22] In El Salvador, the approach to caring for people with COVID-19, to reduce morbidity and mortality and the spread of the disease among the population, was the main objective for implementing preventive actions.

This study highlights the level of knowledge, attitudes, and practices of nursing staff at a pediatric hospital in the context of clinical care for patients affected by COVID-19, enabling the identification of strengths in the adoption of preventive measures and compliance with biosafety protocols. However, has some limitations, as the results are from a single institution, limiting the generalizability to other hospital contexts or different levels of health care. Likewise, the absence of longitudinal measurements, which could have allowed observation of changes over time in relation to the pandemic's evolution and the implementation of new guidelines. Despite this, the study provides a basis for future research, such as exploring the impact of specific educational interventions, improving attitudes and practices among healthcare personnel, and analyzing the relationship between knowledge levels and the effectiveness of practices in reducing infection risk.

Conclusion

Most of the nursing staff evaluated reported having a high level of knowledge, attitudes, and practices for the prevention of COVID-19. The highest level of knowledge was found among nursing staff with longer tenure at the institution and staff with more years of academic training. It was found that the staff with the highest level of attitude assessed were male and in the 21-30 age group. In addition, staff in the 21-30 age group with more years of nursing study and female staff obtained the highest level of COVID-19 prevention practices.

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References

1. Sun P, Lu X, Xu C, Sun W, Pan B. Understanding of COVID-19 based on current evidence. Journal of Medical Virology. 2020;92(6):548-551. DOI: 10.1002/jmv.25722

2. López-Ortiz E, López-Ortiz G, Mendiola-Pastrana IR, Mazón- Ramírez JJ, Díaz-Quiñonez JA. From the response to an outbreak caused by an unknown pathogen in Wuhan to preparedness and response to the COVID-19 emergency in Mexico. Gaceta Médica de México. 2020;156(2). DOI: 10.24875/GMM.20000046

3. Escudero X, Guarner J, Galindo-Fraga A, Escudero- Salamanca M, Alcocer-Gamba M, Del-Río C. The SARS-CoV-2 Coronavirus pandemic (COVID-19): Current situation and implications for Mexico. Archives of Cardiology of Mexico. 2020;90(91). DOI: 10.24875/ACM.M20000064

4. Plan de Preparación y Respuesta ante el COVID-19, El Salvador 2020. Ministerio de Salud. San Salvador, El Salvador. 2021. Available at: https://mcpelsalvador.org.sv/wp-content/uploads/2021/06/2.-Plan-de-Preparacion-y-Respuesta-ante-el-COVID-19-El-Salvador-Jn2021.pdf

5. Vieira Girão Arcanjo R, Pompeu Christovam B, Dantas de Oliveira Souza NV, Silvino ZR, da Costa TF, Vieira Girão Arcanjo R, et al. Knowledge and practices of nursing workers regarding occupational risks in primary health care: an intervention study. Enfermería Global. 2018;17(51):200-237. DOI: 10.6018/eglobal.17.3.294821

6. Andrade C, Menon V, Ameen S, Kumar Praharaj S. Designing and Conducting Knowledge, Attitude, and Practice Surveys in Psychiatry: Practical Guidance. Indian J Psychol Med. 2020;42(5):478-481. DOI: 10.1177/0253717620946111

7. Laza Vásquez C, Sánchez Vanegas G. Indagación desde los conocimientos, actitudes y prácticas en salud reproductiva femenina: algunos aportes desde la investigación. Enfermería Global. 2012;11(26):408-415. Available at: https://scielo.isciii.es/scielo.php?script=sci_abstract&pid=S1695-61412012000200025DOI: 10.4321/S1695-61412012000200025

8. Informe de Gestión 2021. Hospital Nacional de Niños Benjamín Bloom. San Salvador, El Salvador. 2022. Available at: https://www.transparencia.gob.sv/descarga_archivo.php?id=NDkwOTQy&inst=490942

9. Beltrán MA, Basombrío AM, Gagliolo AA, Leroux CI, Masso MF, Quarracino C, et al. Conocimientos, actitudes y prácticas sobre COVID-19 en Argentina. estudio tranversal. Medicina (Buenos Aires). 2021;81(4):496-507. Available at: https://www.medicinabuenosaires.com/PMID/34453791.pdf

10. Bullón-Vela V, Toledo D, Vera-Punzano N, Godoy P, Cenoz MG, Pardos-Plaza J, et al. Nivel de conocimientos, de actitudes y utilización de medidas preventivas entre los contactos domiciliarios de casos de COVID-19 tras la fase aguda de la pandemia. Anales del Sistema Sanitario de Navarra. 2024;47(1):e1070-e1070. DOI: 10.23938/ASSN.1070

11. García Osorno ZR, Perón Medina LÁ, Ramírez Velázquez IO, Morales Fernández JA, Mosqueda Martínez EE, Vilchis HJ, et al. Vacunas contra la COVID-19. Acta médica Grupo Ángeles. 2021;19(3):429-444. DOI: 10.35366/101742

12. Rojas G, Romero R. Gestión e impacto de las medidas de intervención para la reducción de casos por COVID-19 en Costa Rica. Rev Panam Salud Publica. 2023;46:e23. DOI: 10.26633/RPSP.2022.23

13. López Fañas RF, Capellán Vásquez ED, Martínez-Rodríguez NL, López Fañas RF, Capellán Vásquez ED, Martínez-Rodríguez NL. Conocimientos, actitudes y prácticas sobre la COVID-19 en adultos de la República Dominicana. Revista Cubana de Salud Pública. 2021;47(2). Available at: https://revsaludpublica.sld.cu/index.php/spu/article/view/2770

14. Martínez T del RF, Coca JBA, Ríos N del C. Conocimientos, actitudes y prácticas de prevención sobre enfermedad renal en

pacientes diabéticos e hipertensos. Alerta, Revista científica del Instituto Nacional de Salud. 2021;4(1):12-18. DOI: 10.5377/alerta.v4i1.9538

15. Sandoval-Gutiérrez JL. COVID-19 y la bioseguridad en Latinoamérica. Retos y oportunidades. Neumol Cir Torax. 2021;80(1):9-10. DOI: 10.35366/99448

16. Iglesias-Osores S, Saavedra-Camacho JL, Acosta-Quiroz J, Córdova-Rojas LM, Rafael-Heredia A. Percepción y conocimiento sobre COVID-19: Una caracterización a través de encuestas. Revista del Cuerpo Médico Hospital Nacional Almanzor Aguinaga Asenjo. 2020;13(4):356-360. DOI: 10.35434/rcmhnaaa.2020.174.763

17. Organización Panamericana de la Salud. Conocimientos, actitudes y prácticas del personal de salud relacionados con las vacunas contra la COVID-19 en América Latina. OPS. 2022. 85 p. Available at: https://iris.paho.org/items/c85f007a-24c1-4ae4-94a6-ddfdc1f9542e

18. Ruiz-Aquino MM, Diaz-Lazo AV, Ortiz-Aguí ML. Creencias, conocimientos y actitudes frente a la COVID-19 de pobladores adultos peruanos en cuarentena social. Revista Cubana de Enfermería. 2020;36. Available at: https://revenfermeria.sld.cu/index.php/enf/article/view/4251/0

19. Real RE, Dávalos JC, Molinas SK, Real RE, Dávalos JC, Molinas SK. Conocimientos, percepción de riesgo y prácticas del personal de salud acerca de la enfermedad por nuevo coronavirus 2019 (COVID-19). Anales de la Facultad de Ciencias Médicas (Asunción). 2021;54(2):17-24. DOI: 10.18004/anales/2021.054.02.17

20. Elizarrarás-Rivas J, Cruz-Ruiz NG, Elizarrarás-Cruz JD, Robles-Rodríguez PV, Vásquez-Garzón VR, Herrera-Lugo KG, et al. Measures for the protection of health personnel in the coronavirus pandemic (COVID-19). Revista mexicana de anestesiología. 2020;43(4):315-324. DOI: 10.35366/94945

21. Loyola da Silva TC, de Medeiros Pinheiro Fernandes ÁK, Brito do O'Silva C, de Mesquita Xavier SS, Bezerra de Macedo EA. El impacto de la pandemia en el rol de la enfermería: una revisión narrativa de la literatura. Enfermería Global. 2021;20(63):502-543. DOI: 10.6018/eglobal.454061

22. Lara Jaque R. Educación en enfermería en tiempos de pandemia: desafíos presentes y futuros. Ciencia y enfermería. 2020;26. DOI: 10.29393/ce26-14eerl10014