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Assessment of Nurse's Knowledge toward Human Herpes Virus 6 HHV-6 Infection in NICU

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Abstract: Background: The infant contracted Herpes Simplex Virus (HSV) during the process of being born. The worldwide occurrence of NH is approximately 10 cases per 100,000 births, and it is associated with substantial risks of illness and death. Objective: To evaluate nurses' level of understanding regarding HHV-6 infection in the neonatal intensive care unit (NICU) for newborn infants. The study employed a descriptive research design methodology to achieve its objective. A representative sample of 50 nurses currently employed in neonatal critical care units. Tool I: An Arabic-language structured interview questionnaire. The study encompassed many demographic factors of nurses, such as gender, age, educational attainment, years of experience in the Neonatal Intensive Care Unit (NICU), completion of training on HHV-6 infection, and the source of information. The second tool, the knowledge assessment sheet, focused on HHV-6 infection. The findings indicate that the study included exclusively female nurses, comprising 46.0% of the sample, while males accounted for 54%. Furthermore, the educational background of the participants primarily consisted of graduates from nursing institutes and colleges, with each group representing a substantial proportion of 34%. Conclusion: Our findings indicate that we have chosen to dismiss the null hypothesis, which posits that there is no correlation between the demographic attributes of nurses and their degree of understanding regarding herpes virus type 6 infection. Instead, we have opted to embrace the alternative hypothesis. Recommendations: Provide nurses with a thorough knowledge of the viral causes and risk factors linked to HSV type 6 infections in pregnant women.

Keywords: Nurses' Knowledge, Herpes Simplex Virus, Intensive Care Units.

1. INTRODUCTION

Neonatal herpes (NH) is a severe condition arising from a herpes simplex virus (HSV) infection acquired by an infant during childbirth. While the global incidence of NH is estimated at 10 per 100,000 births, it carries significant morbidity and mortality risks. The greatest

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vulnerability to NH occurs when a mother acquires a primary HSV infection during late pregnancy, as the infant's immune system is not fully developed (WHO, 2023)
Although the global incidence of NH is relatively low, it poses a significant threat to newborns, particularly those exposed to the virus for the first-time during delivery. This article aims to shed light on the nurse's knowledge critical aspects of NH, encompassing its risk factors, clinical presentation, and potential consequences. NH is a serious condition with potentially devastating consequences. It can lead to lasting neurological disabilities, such as intellectual impairment, blindness, and seizures. In severe cases, NH can be fatal (Blumberg,.2017). Neonatal herpes is a preventable yet potentially life-threatening condition. Raising awareness of the risk factors associated with NH and implementing effective preventative measures, including periconceptional counseling and antiviral prophylaxis in high-risk pregnancies, are crucial steps in reducing its incidence and mitigating its devastating effects on newborns. Human herpesvirus 6 (HHV-6) is a virus belonging to the family of herpesviruses, specifically the beta herpesvirus subfamily. This virus is relatively common and primarily affects young children. In most cases, HHV-6 infection is mild and causes cold-like symptoms. However, the infection can lead to serious complications in some cases, particularly in infants or immunocompromised individuals (Blumberg, .2017).

2. RELATED WORKS

There are two main types of human herpesvirus 6: HHV-6A: This is the most common type and causes the childhood illness known as roseola infantum. HHV-6B: This type causes a less common infection but can lead to more serious complications. Human herpesvirus 6 is spread through direct contact with infected bodily fluids, such as saliva or mucus (Ward, et.al, 2019). Transmission can occur through: Kissing, Coughing or sneezing, Sharing utensils or food, and Breastfeeding. Human herpesvirus 6 infection is a relatively common infection that primarily affects young children. In most cases, the infection is mild and causes cold-like symptoms. However, the infection can lead to serious complications in some cases, especially in infants or immunocompromised individuals. HHV-6 infection can be diagnosed using a blood test, but there is no specific treatment for the infection. The risk of infection can be reduced by following good hygiene practices (Foiadelli, ET al.2021).

3. METHODOLOGY

Objectives:
1. To evaluate the level of understanding among nurses on HHV-6 infection in the Neonatal Intensive Care Unit (NICU) for newborn infants.
2. To determine the correlation between the knowledge of nurses and their demographic information.

Proposed Conjecture:
1. H0: There is no correlation between a nurse's knowledge and their demographic data.
2. H1: This study aims to examine the correlation between a nurse's expertise and their demographic data.

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What are the specific inquiries that will be investigated through research? What is the degree of awareness among nurses regarding HHV-6 infection in newborn intensive care units at the Maternity and Children Hospital in Diwaniyah City?

The study employed a descriptive research design to achieve its objective. This study was conducted at the intensive care sections of the Maternity and Children Hospital in Diwaniyah City. A representative sample of 50 nurses currently employed in neonatal intensive care units (NICUs). Measuring instruments utilized for data collection two instruments were employed for the purpose of gathering data.

First Tool: An Arabic-language structured interview questionnaire was utilized for the nurses involved in the study. The investigator created the questionnaire after conducting a thorough evaluation of the relevant literature. The study encompassed many demographic factors of nurses, such as gender, age, educational attainment, years of experience in the NICU, completion of training on HHV-6 infection, and the source of information.

The Second Tool, called the Knowledge Assessment Sheet, focused on HHV-6 infection. It covered various aspects such as general knowledge (including 15 questions about definition, risk factors, signs and symptoms, laboratory investigation, therapeutic management, and prevention), as well as specific knowledge about early and late HHV-6 infection (including 4 questions about the time of occurrence and method of transmission).

Scoring mechanism, the scoring system for assessing nurses' knowledge regarding HHV-6 infection assigns a value of two for each correct response, whereas a bad answer or a response of "do not know" receives a score of one. A score below 50% was deemed unsatisfactory, while a score of 50% or more was judged satisfactory in terms of knowledge level. Prior to commencing data collecting, pilot research was conducted on 10% of the overall sample, consisting of 5 nurses. The purpose of this pilot study was to assess the clarity and effectiveness of the proposed tools, as well as to estimate the amount of time needed to complete the questionnaire. No alterations were made and they were included in the study sample.

Validation and Assessment of Instrument Reliability

Content Validity: The instruments underwent a thorough evaluation by a panel of five specialists in the domains of Neonatology and Paediatric Nursing to confirm their content validity. The experts assessed the coherence of the sentences, relevance of the content, and the logical progression of the elements. According to their assessment, no changes were considered essential to improve the clarity of the content. The instruments' Content Validity Index (CVI) was computed as 0.792, showing a satisfactory level of consensus among the experts regarding the pertinence and comprehensiveness of the content. Internal Consistency: The dependability of the instruments was evaluated using the Cronbach's Alpha coefficient, which is a measure of how consistent the instruments are. A coefficient of 0.82 was observed, indicating a high degree of internal consistency within the instruments. This suggests that the components inside each instrument accurately assess the same fundamental concept.

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Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.82	.676	15

Ethical Considerations in Nursing Research: This research adhered to rigorous ethical principles to ensure the protection of all participants. The following steps were taken: Formal approval for the study was obtained from the Faculty of Nursing's ethical committee. This ensured the study design met the highest ethical standards and complied with relevant regulations. Official permission was granted by the director of Maternity and Children Hospital in Diwaniyah City. Additionally, the head of the Neonatal Intensive Care Unit (NICU) provided specific authorization for the study to be conducted within the unit. Prior to participation, nurses were individually interviewed. During these interviews, the nature and purpose of the study were thoroughly explained. Nurses who agreed to participate provided oral informed consent, ensuring their voluntary participation and full understanding of the research objectives. All participants were assured that the information they provided would be kept strictly confidential. The data would be used solely for the research purposes outlined in the study design. To further safeguard participant anonymity, each assessment sheet was assigned a unique code. Nurses' names were not included on the sheets, eliminating any possibility of identification. By following these comprehensive ethical considerations, the research fostered a safe and transparent environment for all participants. This commitment to ethical research practices is paramount in ensuring the integrity and trustworthiness of the study's findings.

Statistical Analysis: The gathered data were organized and subjected to statistical analysis using the Statistical Package for the Social Sciences (SPSS version 25) in order to evaluate the knowledge and practices of nurses on newborn sepsis. The statistical analysis comprised of percentage (%), mean, standard deviation (SD), and Chi square (x). The chi-square test (χ^2) was employed to examine the relationship between two categorical variables. The Fisher's exact test was employed to examine the relationship between two categorical variables or to identify disparities among more than two proportions. A P-value of ≤ 0.05 signifies a statistically significant result, whereas a P-value of > 0.05 indicates a result that is not statistically significant.

4. RESULTS AND DISCUSSION

Table (1): Demographic characteristic of nurses' (n=50).

Age Of Nurse	Frequency	Percent
20-30	16	32.0
31-40	15	30.0
41-50	14	28.0
51 And More	5	10.0
Total	50	100.0

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Level Of Education	Frequency	Percent
Secondary School Graduate	15	30.0
Institute Graduates	17	34.0
College Graduate	17	34.0
Post Graduate	1	2.0
Total	50	100.0
Sex	Frequency	Percent
Male	27	54.0
Female	23	46.0
Total	50	100.0
Resident	Frequency	Percent
Urban	31	62.0
Rural	19	38.0
Total	50	100.0
Years Of Experience	Frequency	Percent
5-10 Years	**2**2	**4**4.0
11-15years	**13**	2**6**.0
16-20years	15	**3**0.0
Total	50	100.0
Training course	Frequency	Percent
(Attended training courses)	7	14.0
(Didn't attend)	43	86.0
Total	50	100.0
Source Of Information	Frequency	Percent
Internet	20	40.0
Study	14	28.0
Other Source	16	32.0
Total	50	100.0

Table (1) shows that all of the nurses studied were female, at a rate of 46.0%, while the percentage of males was 54%, while the educational level was among graduates of nursing institutes and colleges, with a high rate of 34% for each of them. This is similar to study by (You, S. J. 2020).

The ages of male and female nurse's range between 20-30 years, at a rate of 32%. Their place of residence is urban residents, at a rate of 62%. Their experience working in paediatric wards and the neonatal intensive care unit was 44% from 5 to 10 years. As for training courses on this type of viral infection in particular, the largest percentage did not take training courses, and the percentage was 86%. The sources of information about this type of viral infection are through general information from the Internet, at a rate of 40%. These demographic characteristics are similar to a previous study by (Ibrahim. et.al, 2019) and (You, S. J. 2020).

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Table (2): Knowledge levels of studied nurses related to HHV-6 infection (n=50).

Nurses' knowledge of HHV-6 infection of neonatal	**Satisfactory knowledge**		**Unsatisfactory knowledge**		**Total**	
	Frequency	Percent	Frequency	Percent	No.	%
Definition	38	76.0	12	24.0	50	100.0
Maternal risk factors	18	36.0	32	64.0	50	100.0
Neonatal risk factors	44	88.0	6	12.0	50	100.0
Environmental risk factors	6	12.0	44	88.0	50	100.0
Signs and symptoms	15	30.0	35	70.0	50	100.0
Laboratory investigations	17	34.0	33	66.0	50	100.0
Therapeutic management	10	20.0	40	80.0	50	100.0
Prevention	14	28.0	36	72.0	50	100.0

Table 2: Knowledge Level of Nurses Regarding Neonatal Herpes Simplex Virus (HSV) Type6. The data presented in Table 2 highlights the knowledge gaps among nurses concerning neonatal herpes simplex virus (HSV) type 6. Over two-thirds of the participating nurses exhibited unsatisfactory knowledge of various aspects of this viral infection. However, their overall understanding of general infection prevention and control measures was evident, likely stemming from their education and exposure to general information. A significant knowledge gap was observed regarding the etiology and risk factors associated with HSV type 6 among pregnant women. A concerning 64% of nurses demonstrated unsatisfactory knowledge in this area. Similarly, a substantial knowledge deficit was evident concerning the role of environmental factors in the transmission of HSV type 6. A staggering 88% of nurses exhibited inadequate knowledge in this regard this result is in agreement with the study (Al Khalili, Y. 2022).

Nurses' understanding of the clinical presentation of HSV type 6 infections was also found to be lacking. 70% of participants demonstrated unsatisfactory knowledge in identifying the characteristic symptoms of these infections this result is consistent with study (Hamunyela. et al. 2024). The ability to recognize the necessary laboratory tests for diagnosing HSV type 6 infections was also suboptimal among nurses. 66% of participants exhibited unsatisfactory knowledge in this area. Despite the overall knowledge gaps, nurses demonstrated a relatively unsatisfactory understanding of treatment and preventive measures for HSV type 6 infections. 80% and 72% of participants, respectively, exhibited satisfactory knowledge in these domains this result is in agreement with the study (Heldman. etal.2021).

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Table (3): overall assessment of nurse's knowledge.

Descriptive Statistics						
	N	Minimum	Maximum	Mean	Std. Deviation	Assessment
mean of score	50	1.00	1.50	1.2300	.16110	Unsatisfactory
Valid N (listwise)	50					

Table (3): The table shows the nurses' knowledge assessment about herpes viral infection in newborns. It shows that the level is not satisfactory as measured by the participants' overall knowledge rate, as the participants' rating was 1.2300, which is less than the level required to pass the knowledge assessment.

Table (4): Relations between nurses' Demographic characteristic and their total knowledge levels (n = 50)

Chi-Square Tests (Fisher's exact test)						
Demographic characteristic	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
mele and female						
Pearson Chi-Square	9.971[a]	6	.126	.097		
Likelihood Ratio	12.674	6	.049	.071		
Fisher's Exact Test	9.685			.097		
Linear-by-Linear Association	.133[b]	1	.716	.771	.386	.004
N of Valid Cases	50					
resident						
Pearson Chi-Square	7.274[a]	6	.296	.281		
Likelihood Ratio	8.242	6	.221	.319		
Fisher's Exact Test	7.292			.256		
Linear-by-Linear Association	3.036[b]	1	.081	.081	.046	.006
N of Valid Cases	50					

age of nurse						
Pearson Chi-Square	25.234[a]	18	.119	.[b]		
Likelihood Ratio	26.037	18	.099	.113		
Fisher's Exact Test	22.853			.084		

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Linear-by-Linear Association	2.404[c]	1	.121	.122	.057	.000
N of Valid Cases	50					
level of education						
Pearson Chi-Square	39.458[a]	18	.002	.040		
Likelihood Ratio	45.531	18	.000	.000		
Fisher's Exact Test	42.844			.000		
Linear-by-Linear Association	1.696[b]	1	.193	.196	.105	.001
N of Valid Cases	50					
source of information						
Pearson Chi-Square	13.061[a]	12	.365	.365		
Likelihood Ratio	14.921	12	.246	.356		
Fisher's Exact Test	12.573			**.345**		
Linear-by-Linear Association	3.981[b]	1	.046	.045	.024	.001
N of Valid Cases	50					
years of experience						
Pearson Chi-Square	33.835[a]	12	.001	.000		
Likelihood Ratio	41.262	12	.000	.000		
Fisher's Exact Test	33.207			.000		
Linear-by-Linear Association	.836[b]	1	.360	.352	.176	.003
N of Valid Cases	50					

Table No. (4): The above table shows the relationship between the knowledge level of nurses about viral herpes infection that affects newborns and the demographic characteristics of nurses using Fisher's chi-square scale for comparisons. It highlighted the presence of an effective relationship at a high level of importance of more than 0.05, where the level of importance reached 0.97 when comparing the level of knowledge and gender, this result agrees with the study. (Bilal, et al. 2017).

Which is statistically significant, as most of the participants of both genders had an unsatisfactory level of knowledge. While the place of residence, when compared with the level of knowledge, urban and rural residence also had an unsatisfactory level of knowledge, with a greater level of significance than expected, as it was 0.256. This result is agreed with the study of (Al-Khalidi,. et al.2022). As for the age of the nurses participating in evaluating their knowledge about the medical condition, the index of statistical significance was .084 in all age groups participating in the questionnaire This result is agree with the study of (Baalbaki,. et al. 2019). Finally, the sources of obtaining information had an impact on the relationship between it and the cognitive level at a statistical significance of .345. This result is agreed with the study of (Villanueva, etal.2019).and disagree with study of (Ibrahim, et. Al, 2019).

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5. CONCLUSION

The study clarifies the results as shown in the previous pages, discussing them, and comparing them with previous studies, and through description and statistical analysis, it appears that we reject the null hypothesis, which states that there is no relationship between the demographic characteristics of nurses and their level of knowledge about herpes virus type 6 infection, which infects newborns, and we accept the alternative hypothesis. Which states that there is a relationship between them. This is what was focused on in the study according to the research objectives that were mentioned above and answered the research question as well.

Recommendations

The findings of this study underscore the need for targeted educational interventions to enhance nurses' knowledge and understanding of HSV type 6 infections. Specifically, training programs should focus on:

1. Equipping nurses with a comprehensive understanding of the viral etiology and risk factors associated with HSV type 6 infections among pregnant women.
2. Educating nurses on the impact of environmental factors on the transmission of HSV type 6 infections.
3. Enhancing nurses' ability to recognize and differentiate the clinical presentation of HSV type 6 infections.
4. Imparting knowledge of the necessary laboratory tests for diagnosing HSV type 6 infections.
5. Reinforcing nurses' understanding of effective treatment and preventive measures for HSV type 6 infections.

By addressing these knowledge gaps, nurses can effectively contribute to the early identification, management, and prevention of HSV type 6 infections, improving patient outcomes and safeguarding public health.

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