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Nurse-midwives' knowledge related to the preventive measures for TORCH diseases in maternity teaching hospitals in Babylon Province/ Iraq

Marwa Mohammed A. AL-Jaleel

PhD student at College of Nursing, University of Babylon
Corresponding author email:

Saadya Hadi Humade

Prof.Dr. College of Nursing, University of Al-Mustaqbal
Email: saadya.hadi@mustaqbal-college.edu.iq

Jenan Akbar Shakoor

Assist. Prof. Dr. College of Nursing, University of Kikuk

Abstract---TORCH infections cause congenital anomalies throughout the gestation period that can cross the placenta and damage the fetus. The study aimed to assess the nurse midwife's knowledge regarding preventive measures for TORCH infections. A descriptive design study was conducted on 138 nurse-midwives in maternity teaching hospitals in Babylon province using self-administered questionnaires. The data were analyzed by using descriptive statistics (frequency and percentage). A chi-square test was used to analyze categorical variables. The P-value was determined using a P-value of 0.05 to determine statistical significance. Results: The mean age and standard deviation (SD) for nurse-midwives in the study was 34.11+8.967; the majority of the sample was (37.7%) reported at age 21–30 years. The majority of the study participants (69.6%) had no prior knowledge of TORCH diseases. The level of knowledge about TORCH disease prevention is low.93% of nurse-midwives had moderate knowledge. There was a significant relationship between nurse-midwives' knowledge of TORCH diseases and their education level, their years of experience, and training sessions at a *p-value of 0.05*. The study concludes that the nurse-midwives' knowledge of toxoplasmosis and rubella diseases was moderate. While expressing knowledge related to chickenpox, cytomegalovirus, and herpes simplex virus diseases, nurses-midwives express a poor level of

knowledge. The nurse-midwives' knowledge of TORCH diseases was moderate.

Keywords---knowledge, preventive measures, nurse-midwives.

Introduction

Infections that can cross the placenta and harm the fetus in utero or be passed to the newborn during the peripartum phase of birth, resulting in neonatal illness, are known as congenital infections (1). Toxoplasmosis is caused by *Toxoplasma gondii* (*T. gondii*), an intracellular parasitic infection that causes abortion in humans (2). The parasite protozoan *Toxoplasma gondii* can be discovered in cat feces and uncooked meat. Infection develops when the parasite is consumed through undercooked meat or unclean hands (3). In Iraq, despite the fact that almost 70% of infected people are essentially asymptomatic, immunocompromised people with this infection have a high risk of morbidity and death (4). Although infection during the first trimester of pregnancy is more likely to cause major fetal injury, infection later in the pregnancy can still cause serious fetal harm (85 percent). Although 85 percent of infections are transmitted during the third trimester, the risk of fetal harm drops to about 10% (5). The identification of several types of antibodies, each of which has a distinct meaning, is still used to diagnose toxoplasmosis. The tests assess the levels of several kinds of antibodies, such as IgM, IgG, IgA, and IgE, which grow and decrease during and after infection. IgM detection in a patient's blood sample in the acute phase, whereas IgG detection indicates a previous infection. To avoid infection in pregnant women, various measures should be taken, the most important of which is touching a cat or the place where it resides (2). Spiramycin should be given to women who have been diagnosed with maternal infection to reduce the risk of fetal transmission, particularly in the first trimester (6). The varicella-zoster virus (VZV), a herpes virus, causes chickenpox. Chickenpox is transferred via droplets and by direct human touch (3). Chickenpox infection during pregnancy is rare, with an estimated frequency of 3/1,000 pregnancies in the United Kingdom (7). Primary varicella-zoster virus VZV infection during the first two trimesters of pregnancy may result in intrauterine infection in up to a quarter of the cases (8). Maternal chickenpox a few days before or after delivery may cause life-threatening neonatal chickenpox (9). There is a substantial risk of varicella in the infant if the mother becomes infected during pregnancy. Elective delivery should be postponed for 5–7 days following the commencement of the maternal rash to allow for passive antibody transmission from the mother to the newborn (10). Varicella and zoster are most commonly diagnosed clinically based on the distinctive widespread or unilateral dermatomal vesicular rashes. The following features are notable exceptions: atypical rashes, such as disseminated zoster or a minimal or absent dermatomal rash; zosteriform herpes simplex; modified varicella in vaccinated people; and rashes caused by enteroviruses, poxviruses, rickettsia, drug reactions, or contact dermatitis; and varicella-zoster virus (VZV) infection in the absence of a rash (9). For pregnant women with chickenpox, current recommendations indicate taking 800 mg of acyclovir five times per day for seven days (9). Hepatitis B virus (HBV) is a DNA virus (11) Hepatitis B is mostly spread by blood, but it can also be transmitted through other body fluids such as saliva,

sperm, and vaginal fluids after delivery. Drug users who share needles are putting themselves in danger. **(12)**. Infection with the hepatitis B virus (HBV) is the tenth-largest cause of death worldwide, accounting for up to 1.2 million fatalities per year. Globally, roughly 2 billion people are affected. HBV is carried by almost 350 million people on a long-term basis (13). Surface antigen (HBsAg), surface antibody (HBsAb), core antigen (HBcAg), and core antibody (HBcAb) are all part of a conventional HBV infection screening panel (HBcAb). In a nutshell, HBV core antigen (HBcAg) emerges initially in acute infection, followed by seroconversion to core antibody (HBcAb). (14). The passive Ig gives rapid protection against any virus delivered to the newborn through blood contact during birth and should be given soon after (3). Rubella is caused by the Rubella virus, which is the only virus in the Rubi viral family (15). Postnatal rubella is disseminated through airborne respiratory droplets caused by coughing and sneezing, direct contact with an infected person's nasopharyngeal fluid, or urine of newborns with congenital rubella syndrome (CRS) (15). Rubella is still prevalent in many underdeveloped countries and around the world; each year, over 100,000 children are born with congenital rubella syndrome (CRS). Rubella infection is characterized by a fever rash, however, in 20–50% of instances, the mother is asymptomatic. Sensorineural deafness, congenital cataracts, blindness, encephalitis, and endocrine disorders are all possible symptoms of congenital rubella syndrome (CRS). The chance of congenital rubella infection decreases as the pregnancy progresses. If a fetus becomes infected, the resulting problems are less severe as the pregnancy progresses (16). Antibodies to IgM are present in the test. IgM test specimens can be purchased commercially. The sample should be taken at least three days after the rash appears and no later than six weeks after the rash appears (15). Vaccination during pregnancy is not recommended due to the possibility that the vaccine could be teratogenic due to the fact that it is a live vaccination. Women who have been vaccinated after giving birth should be recommended to utilize contraception for one month **(3)**. For a couple considering abortion due to a rubella diagnosis, nursing care and empathy are critical **(6)**. The herpes virus cytomegalovirus (CMV) is a deoxyribonucleic acid (DNA) virus (17). Vertical (through the placenta from the mother to the fetus) or horizontal (by sexual contact or contact with bodily fluids such as saliva, urine, maternal vaginal secretions, breast milk, or blood) transmission is possible (17). The prevalence of cytomegalovirus (CMV) was determined to be between 45 percent to 100 percent in both developed and developing countries (18). In most cases, the mother experiences no symptoms or mild flu-like symptoms as a result of the primary infection (3). The development of CMV antibodies in a seronegative woman who first develops CMV IgM antibodies and then IgG antibodies can be used to make a serological diagnosis of primary CMV (3). The most prevalent viral cause of infection in the human fetus is cytomegalovirus (CMV). It affects between 0.5 and 2% of all births. Although 85 percent to 90 percent of infected fetuses will be asymptomatic at birth, the remaining 10% to 15% will have varying degrees of abnormalities (6). The Herpes simplex virus (HSV) is a DNA virus with two strands. HSV-1 and HSV-2 are the two types of viruses. HSV-1 is the most common cause of oro-labial infections. These infections are most commonly acquired through direct physical contact during childhood (19). HSV-1 infection affects an estimated 3.7 billion people under the age of 50 (67%) worldwide (20). Single or grouped vesicles on the genitalia, perineum, buttocks, upper thighs, or perianal areas that ulcerate before resolving to constitute a visible outbreak (21).

21): Diagnosing genital herpes only on the basis of clinical symptoms is frequently inaccurate and can be deceptive (21). Women who have recurrent breakouts throughout pregnancy should start antiviral medication after 36 weeks of pregnancy. Oral antiviral medications such as acyclovir (Zovirax), famciclovir, and valacyclovir are available (22).

Gaining knowledge has been regarded as an important goal toward improving an individual's health status. It also helps to gain a means of preventing TORCH infection from pregnant women to nurse-midwives (23). The study aimed to assess the nurse midwife's knowledge regarding preventive measures for TORCH infections.

Methodology

A descriptive design study was carried out at a maternal teaching hospital from 1st October/2020 to 1st January/2021. The study setting was conducted in two maternal teaching hospitals in Babylon province. The researcher selected maternal and children's Babylon teaching hospital and Imam Al-Sadiq teaching hospital in Babylon province. sample of the study: using a non-probability convenient sampling technique of (138) nurse midwives, the researcher selected (75) from maternal and children's Babylon teaching hospital and (63) from Al-Sadiq teaching hospital were selected from the maternity ward, emergency room, delivery room, and maternal operating room. The study's instrument: The researcher developed and constructed the study instrument after reviewing related literature and studies relevant to the study problem, and also added incorrect items for all domains of TORCH diseases. The instrument was translated to Arabic and presented to an expert in the Arabic language for linguistic correction. The study instrument consists of two parts:

Part I Demographic Characteristics include age, level of education, years of experience, training courses in TORCH diseases, and source of information. Part II of nurse-midwives knowledge regarding preventive measures for TORCH disease includes the following parts: The knowledge base regarding toxoplasmosis consists of (22) items, chickenpox consists of (28) items, hepatitis B consists of (19) items, rubella consists of (20) items, cytomegalovirus consists of (31) items, and knowledge regarding herpes simplex virus consists of (24) items. The researcher distributed the instrument to (17) experts with more than ten years of experience in the specialty to ensure the instrument's validity and to confirm the accuracy, relevancy, and adequacy of the questionnaires before they were ready for sample collection. The experts evaluated the instrument. Some of them recommended deleting some items and others added items. The researcher took the expert adjustments into consideration and the final copy of the instrument became organized and appropriate to conduct the study.

Pilot Study

The researcher conducted the pilot study before the collection of data to determine the reliability of the questionnaires from the period (6th to 30th April 2021) conducted on (20) nurse-midwives at the maternal ward, maternal emergency room, labor and birth room, and maternal operating room.

Reliability of the Questionnaires

Internal consistency dependability was calculated using the coefficient alpha (Cronbach's Alpha). For knowledge items, the coefficient alpha revealed (0.77) was greater than (0.70), which was statistically acceptable.

Ethical Consideration

The Research Ethics committee at the University of Babylon, College of Nursing, discussed the application of the study and approved the study to be conducted on March 6, 2021, so the Research Committee of the Training and Human Development Center agreed to conduct the research on May 10, 2021.

Method of Data Collection

The researcher has started the collection of data from the period 2nd June to 1 August/ 2021. All nurse-midwives were interviewed and informed about the study objectives. After that, the researcher offered adequate information for nurse-midwives and enabled them to consent to or refuse participation voluntarily. The researcher then obtained verbal and informed consent from the nurse-midwives and selected the nurse-midwives based on convenient sampling. Data collection was completed through the use of a self-administered report in an Arabic language questionnaire. All nurse-midwives were interviewed and given information on the study's goals. Three-level scale (correct, uncertain, and incorrect) to measure the knowledge of the nurse-midwives regarding preventive measures of TORCH diseases. Scoring of the three-level or correct question (3=correct, 2=uncertain and 1=incorrect), and for incorrect question (3=incorrect, 2= uncertain and 1=correct). The Research Committee of the Training and Human Development Center in Babylon agreed to conduct the research. "Frequencies, percent, mean, and standard deviation" are among the statistical procedures for data analysis using descriptive data analysis. Pie charts and bar charts are used in a graphical presentation. Cronbach's alpha test and Chi-squared test(x²) are used in inferential data analysis to calculate the instrument's reliability coefficient. Statistical Package for the Social Sciences (SPSS) version 25 is used to test hypotheses concerning proportional differences, just like crosstab (24) does. For the abbreviations of the comparison significant (C.S.), the statistical analysis considered the level of significance when: -NS: Non-significant at P probability-value > 0.05, S: Significant at P probability-value < 0.05, and HS: Highly significant at P probability-value < 0.0.

Results

Table (1): Distribution of the Study Sample According to Demographic Variables (n=138)

Variables	Rating	Freq.	%
Age/years (Mean+ S.d= 34.11+8.967)	20-30years old	52	37.7
	31-40years old	25	18.1
	41-50years old	45	32.6

	51and older	16	11.6
	Total	138	100.0
Education Level	Secondary Midwifery Education	67	48.6
	Diploma Nursing	68	49.3
	College of Nursing and above	3	2.2
	Total	138	100.0
Years of Experience	<5 years	60	43.5
	5-10 years	32	23.2
	11-15years	15	10.9
	≥16 years	31	22.5
	Total	138	100.0
Entered Courses of TORCH diseases	Not entered courses	96	69.6
	One course	11	8.0
	Two courses	28	20.3
	More than two courses	3	2.2
	Total	138	100.0
Sources of Knowledge	Educational Institution	28	20.3
	Social Media	11	8.0
	Courses	12	8.7
	Work Place	87	63.0
	Total	138	100.0

(Table 1) this table illustrates the observed frequencies and percentages of socio-demographic variables: The mean age and standard deviation (SD) for Nurse-midwives in the study were (34.11+8.967); most of the sample (37.7%) was between the ages of 21 and 30, while the lowest percent (11.6%) was over 51. The highest percentage (49.3%) of the sample has a diploma in nursing followed by those who are secondary midwifery graduates (48.6%) and followed by those who are college of nursing graduates (2.2%). Most midwives (43.5%) in the study have (1-5) years of experience followed by those who are 5-10 years (32.2%), followed by those who are more than 16 years (22.5%), and followed by those who are 11-15 years (10.9%). The majority of the study sample (69.6%) have no training about TORCH diseases, followed by those who are two sessions of training ($n=28$; 20.3%), followed by those who are one session of training ($n=11$; 8%), and followed by those who are more than two sessions ($n=3$; 2.2%). Most of the nurse-midwives (63%) in the study acquired information about TORCH diseases from the workplace followed by those who are in education institutions (20.3%), followed by those who are in courses (8.7%), and followed by those who are on social media (8%).

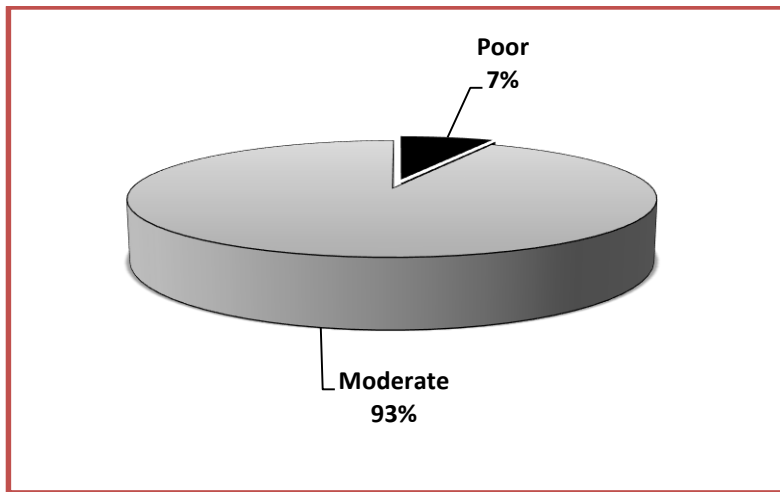


Figure (1): Overall Assessment of Nurse-Midwives' Knowledge related to TORCH Diseases

Figure (1): show that the majority of (92.8%) nurses-midwives expressed moderate knowledge

Table (2): Relationship between Nurses-midwives Knowledge and their Demographic Characteristics

variable	Rating	Knowledge		Total	d.f	Sig.	
		Poor	Moderate				
Age	20-30years old	3	49	52	3	χ^2 obs.=0869 χ^2 crit.=7.815 P-value=0.833	NS
	31-40years old	2	23	25			
	41-50years old	3	42	45			
	51and older	2	14	16			
	Total	10	128	138			
Education Level	Rating	Knowledge		Total	d.f	Sig.	
		Poor	Moderate				
	Secondary Midwifery	1	66	67	2	χ^2 obs.=7.163 χ^2 crit.=5.991 P-value=0.028	S
	Diploma Nursing	9	59	68			
	College and above	0	3	3			
Total	10	128	138				
Experience	Rating	Knowledge		Total	d.f	Sig.	
		Poor	Moderate				
	<5 years	9	51	60	3	χ^2 obs.=9.784 χ^2 crit.=7.815	S
	5-10 years	0	32	32			
	11-15years	0	15	15			
≥16 years	1	30	31				

	Total	10	128	138		P-value=0.020	
Courses	Rating	Knowledge		Total	d.f	Sig.	
		Poor	Moderate				
	No trained	1	95	96	3	χ^2 obs.= 24.733 χ^2 crit.= 7.815 P-value=0.001	S
	One session	1	10	11			
	Two sessions	8	20	28			
	More than two sessions	0	3	3			
Total	10	128	138				
Sources of information	Rating	Knowledge		Total	d.f	Sig.	
		Poor	Moderate				
	Educational Institution	2	26	28	3	χ^2 obs.= 2.270 χ^2 crit.= 7.815 P-value=0.518	NS
	Social Media	2	9	11			
	Courses	1	11	12			
	Work Place	5	82	87			
Total	10	128	138				

" χ^2 obs. = Chi-square observer, χ^2 crit. = Chi-square critical, Df= Degree of freedom, P-value= Probability value, S= significant, NS= non-significant, S= significant, HS= high significant"

Table (2): This table indicates, at a p-value of >0.05, that there was no significant relationship between nurse-midwives knowledge of TORCH diseases and their age groups, as well as their sources of knowledge. At a p-value of 0.05, there was a significant relationship between nurse-midwives knowledge of TORCH diseases and their educational level, years of experience, and training sessions.

Discussion: table (1): The present study reveals that more than one-third (37.7%) of the sample was reported at age (21–30) years, and the mean age and standard deviation (SD) was (34.11+8.967). The study was done by Elnashar et al., (2019) among health care providers in the Al Taif area, Saudi Arabia, found the mean age to be (17.7 10.13) and mentioned that the majority of the sample was aged between 18 and 29 years old. A study in Al-Karhk maternity hospitals in Baghdad city done by Hamood & Khairi, (2017) disagrees with the present result and shows that the highest percentage (19%) of the sample's age was (20–24) years. Another study in Babylon province done by Al-Hellaly & Chyad (2019) found that the age of the sample was (20–24)years old. Most of the midwives with experience refused to participate in the study, and this explains why the large proportion of the sample is between the ages of 21 and 30 years. Regarding education level, the findings reveal that less than half of the sample (49.3%) had an education diploma in nursing. This result disagrees with the study done by Elnashar et al. (2019) in the Al Taif area of Saudi Arabia, which shows that three-quarters of the sample (76.8%) regarding educational level completed college education. Another study in Babylon province, done by Al-Hellaly & Chyad (2019), which disagrees with the present study, shows that most of the sample have secondary education. As well in a study in Al-Karhk maternity hospitals in Baghdad city done by

Hamood & Khairi (2017), the present results reported that the highest percent of the midwives are midwifery secondary school graduates. This explains why midwives seek to develop themselves by obtaining a diploma in midwifery sciences. The findings reveal that more than two-fifths (43.5%) of nurse-midwives experienced between 1 and 5 years of experience. This finding disagrees with a study done in the Al Taif area/Saudi Arabia by Elnashar et al., (2019), which indicates that more than half of the sample (59.1%) have less than two years of experience. Another study in Iran done by Joukar et al., (2017) is incompatible with the present study. It appears that two-fifths (41.4%) of the sample have more than ten years of experience. As well as, a study in Al-Karhk maternity hospitals in Baghdad city done by Hamood & Khairi (2017), incompatible with the present result, reveals that two fifths (42%) of midwives had the experience of less than one year. More than two-thirds of the sample (69.6%) have no training courses related to TORCH diseases. A study in Al-Karhk maternity hospitals in Baghdad city done by Hamood & Khairi (2017) agrees with the present result showing that the vast majority (96%) of the study sample did not participate in any training course on TORCH diseases so the study done by Devi et al. (2018) stated that the majority of the sample (83%) had no training about TORCH diseases. This means that midwives need more courses about TORCH diseases. Concerning the source of information, less than two-thirds of nurse-midwives (63%) acquired information on TORCH diseases from their workplace. This result disagrees with the study done in Iran by Joukar et al. (2017), which shows that three-quarters of the sample (71.7%) acquired information from books.

Figure (1): The findings illustrate that the vast majority (93.5%) of nurse-midwives' knowledge related to TORCH was of a moderate level. These findings contradict Devi et al. (2018)'s study of TORCH in Gurugram, India, which found that the majority (80%) of the sample had inadequate knowledge.

Table (2): The results demonstrated a non-significant relationship between knowledge and age of nurse-midwives (p -value 0.05). As it is clear from the absence of a relationship between knowledge and age, knowledge is not affected by age. A descriptive design study was done by Latha et al., (2020) in Villupuram district, India, which agrees with the present results which state that there is a non-significant relationship between knowledge and age of the sample. Another study done by Elnashar et al., (2019) in Saudi Arabia supports the present findings that state a significant relationship between knowledge and age of the sample. This result is also supported by a study done by Pereboom et al., (2013) who stated that there is a highly significant relationship between knowledge and the age of the sample. The findings showed a significant relationship between knowledge and the level of education of nurse-midwives (p -value 0.01). This great difference in the educational level of midwives and its impact on the extent of increased knowledge, and is evident through the existence of a relationship between the knowledge and educational level of midwives. In addition, however, the educational level of nurse-midwives is very important in knowing the risk when dealing with pregnant women who have TORCH disease. A descriptive design study conducted by Latha et al., (2020) in Villupuram district, India, disagrees with the current findings, which state a non-significant relationship between knowledge and level of education of the sample. However, another study conducted by Elnashar et al., (2019) in Saudi Arabia, supported the present

findings, which stated a significant relationship between knowledge and the level of education of the sample. The findings demonstrated that there is a significant relationship between knowledge and years of experience for nurse-midwives (p-value 0.05). Years of experience enhance the level of knowledge of nurse-midwives. In addition, years of experience enable the midwives to decide whether to act in the absence of a specialist obstetrician physician. This result is in disagreement with and is not supported by a study among nurse-midwives conducted by Mursy and Mohamed (2019), which states that there is a non-significant relationship between knowledge and experience of nurse-midwives, as well as a study conducted by Joukar et al. (2017) in Iran, which disagrees with the current results and reports that there is no significant relationship between knowledge and years of experience of nurse-midwives. The present results revealed that there is a significant relationship between knowledge and training courses of nurse-midwives about TORCH diseases (p-value 0.05). Education courses about TORCH diseases and how to prevent them play a key role in enhancing knowledge for nurse-midwives, whether inside or outside the hospital. This result is not supported by a study conducted by Hamood and Khairi (2017), which reported that there was no significant relationship between knowledge and training courses about TORCH diseases. The findings illustrated that there is no significant relationship between nurse midwives' knowledge and the source of information about TORCH diseases (p-value > 0.01). Various sources of information play a major role in acquiring knowledge for midwives to prevent TORCH diseases, but in this case, no relationship affected their level of knowledge. This finding is in agreement with a study conducted by Joukar et al. (2017) in Iran, which stated that there was no significant relationship between nurse-midwives knowledge and the source of information about TORCH diseases.

Conclusion

The study concludes that the nurse-midwives' knowledge of toxoplasmosis and rubella diseases was moderate. While expressing knowledge related to chickenpox, cytomegalovirus, and herpes simplex virus diseases, nurses-midwives express a poor level of knowledge. The nurse-midwives' knowledge of TORCH diseases was moderate. There is a significant relationship between knowledge and level of education, training courses about TORCH diseases, and years of experience at a p-value < 0.05.

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