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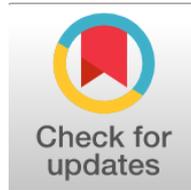
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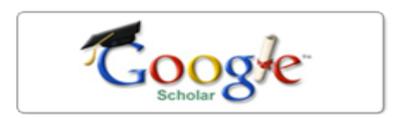
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## Assessment of Obstetric and Gynecological Nurses' Knowledge Regarding Water Birth in Mosul City: Penilaian Pengetahuan Perawat Obstetri dan Ginekologi Mengenai Persalinan Air di Kota Mosul

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### Abstract

**General Background:** Water birth has emerged as an alternative childbirth method that utilizes immersion in warm water to provide comfort for mothers and reduce stress during labor while maintaining physiological birth processes. **Specific Background:** Despite its potential benefits, the successful implementation of water birth in clinical settings largely depends on the knowledge and preparedness of healthcare professionals, particularly nurses working in obstetric units. **Knowledge Gap:** In Mosul city, limited empirical evidence exists regarding the knowledge level of obstetric and gynecological nurses concerning water birth practices and their clinical considerations. **Aims:** This study aimed to assess the knowledge level of obstetric and gynecological nurses regarding water birth and examine the relationship between knowledge and selected socio-demographic characteristics. **Results:** A descriptive cross-sectional study was conducted among 140 nurses working in obstetrics and gynecology departments in Mosul teaching hospitals using a structured questionnaire. The findings indicated that most nurses demonstrated an acceptable overall level of knowledge regarding water birth, while knowledge related to risks and indications requiring mothers to leave the water pool was frequently rated as not acceptable. Statistical analysis showed a significant association between nurses' knowledge and their educational level as well as access to scientific sources. **Novelty:** This study provides one of the first empirical assessments of nurses' knowledge regarding water birth practices in Mosul city. **Implications:** The findings highlight the need for improved educational programs, professional training, and greater access to scientific resources to strengthen nurses' competencies in supporting safe water birth practices.

**Keywords:** Water Birth, Nurses Knowledge, Obstetric Nursing, Maternal Care, Mosul Hospitals

### Key Findings Highlights

Majority of participants demonstrated acceptable understanding of hydrotherapy childbirth concepts.

Knowledge gaps identified in clinical risk recognition and maternal pool exit indications.

Educational attainment and scientific reading associated with higher professional competency levels.

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## Introduction

In the past, hydrotherapy has contributed to delivery and pain prior to labor and the appearance of the first documented water birth took place in 1803 in France (Aughey et al., 2021). Although the practice dates back to ancient Egyptian, Roman, and Greek medicine, modern water birth implies submerging the abdomen of the mother into warm water to help her feel free and comfortable during the subjective physiological and psychological childbirth (Brooks, 2018; Darsareh et al., 2018). The cervix usually dilates to about 5 cm, which is why clinical protocols prescribe immersion so that the mother could adopt a variety of positions, including squatting or kneeling (Nazir et al., 2020). The birth of water is however reserved to certain applicants. They are normally confined to healthy, low-risk pregnancies with a singleton fetus in cephalic position at 37 or higher weeks, with clear amniotic fluid and the normal fetal heart rate (Carlsson & Ulfsdottir, 2020).

In their turn, contraindications are the BMI over 25, unstable fetal heart rates, intrauterine growth retardation (IUGR), antepartum hemorrhage, or active infections such as herpes simplex (Aughey et al., 2021). The benefits of water birth are complex and reduce the birth stress on the neonate due to the resemblance with the amniotic sac. The water is naturally blocked by biological processes, including the dive reflex, the hypertonic character of lungs fluid, and others (Edwards et al., 2023).

To the mother, giving birth in water is related to a shorter time of the first phase of labor, much less need of epidural or spinal analgesia, and maternal satisfaction and control (Gaffka, 2016). Moreover, the studies show that there is no sign of heightened neonatal complications, and water birth is a safe method of enhancing skin-to-skin connection and thermoregulation (Carpenter et al., 2022; Cluett et al., 2018). Regardless of such advantages, lots of women have difficulties receiving information or locating medical specialists that can assist them in the process of water birth (Mahmood, 2016). This leaves an important burden on nurses and midwives to be mentally and physically ready to take candidates through the advantages and safety measures of hydrotherapy (Chua et al., 2023; Reviriego-Rodrigo et al., 2023).

Nurses are vital in the labor and delivery room in the Mosul city, and however, no research has assessed the unique competence of the nurses in this field. Thus, the current paper will evaluate the level of knowledge of nursing personnel on the topic of water birth and define the socio-demographic aspects that affect their clinical knowledge level of nursing personnel.

## 2. Method

To assess the knowledge levels of nursing staff about water birth, the descriptive cross-sectional design was used. The study was carried out in the obstetrics and gynecology units in three main teaching hospitals in Mosul namely Al-Salam, Al-Batool, and Al-Khansaa. The observation period was between December 12, 2025, and January 15, 2026, which presents an elaborate period of time of data collection in these clinical settings.

In order to achieve compliance with professional and ethical concerns, formal approval by the administrative body of the Nineveh Department of Health within the ministry of health was granted. The University of Mosul, College of Nursing also provided ethical clearance. The involvement was voluntary and informed consent of all the nurses taking part in the study was taken to be sure that the nurses were fully aware of the purpose of the study and that they had the rights to remain confidential.

The research adopted a non-probability purposive method of sampling where 140 female staff nurses were recruited. Namely, nurses in the labor, delivery, and gynecology wards who would be on duty at the morning and evening shifts were the target population. The sample was not invasive to preserve the integrity of the data, so nurses who did not belong to the related departments, those who refused to participate, and participants who took part in the pilot study were eliminated. The data were gathered by use of a two part self-administered questionnaire which was administered through face-to-face interviews. The first one was devoted to socio-demographic factors, such as age, level of education, years of clinical practice, or previous experience in training courses or scientific publications concerning the water birth. The second part determined clinical knowledge on five areas, including general concepts, benefits, dangers, contraindications, and causes of maternal leaving the pool.

The level of knowledge was measured on a scale of 25 where the scores were broken down as a Failure (1-5), poor (6-10), fair (11-15), good (16-20) and excellent (21-25) with a deep examination of level of knowledge. In, a pilot study was done on 10 nurses to determine the possible barriers and estimate the time needed to complete the questionnaires. The content validity was achieved when a panel of 14 experts was engaged to test the instrument with regard to its clarity and relevance, and only slight changes were made (Vakili and Jahangiri, 2018). Reliability was determined by a test-retest design with two weeks interval and internal consistency test. The instrument was found to be reasonably reliable with the Cronbachs alpha coefficient ( 0.801 ) value.

Statistical analysis was conducted using the Statistical Package for the Social Sciences (SPSS), versions 25 and 26. Descriptive statistics, including frequencies and percentages, were used to summarize socio-demographic characteristics and knowledge scores. Inferential statistics included Pearson's correlation coefficient (r) for reliability testing and the chi-square test ( $\chi^2$ ) to examine associations between demographic variables and overall knowledge levels among nurses.

## 3. Results

Variables	Items	Freq	%
Age	(20-25)	49	35.0
	<b>(26-30)</b>	<b>55</b>	<b>39.3</b>
	(31-35)	16	11.4
	(36-40)	12	8.6
	More than 40 years	8	5.7
Educational level	Preparatory school	24	17.1
	<b>Institute graduate</b>	<b>58</b>	<b>41.4</b>
	Bachelor's degree	54	38.6
	Master's degree	4	2.9
General service	<b>4 ≥ years</b>	<b>85</b>	<b>60.7</b>
	5-10 years	37	26.4
	11- 16 years old	15	10.7
	17-22 years	2	1.4
	23 ≤ years	1	0.7
Service in the maternity ward	<b>4 ≥ years</b>	<b>119</b>	<b>85.0</b>
	5-10 years	16	11.4
	11- 16 years old	5	3.6
Participated in courses	Yes	59	42.1
	<b>No</b>	<b>81</b>	<b>57.9</b>
Scientific sources	<b>Yes</b>	<b>71</b>	<b>50.7</b>
	No	69	49.3
<b>Total</b>		<b>140</b>	<b>100.0</b>

Figure 1. **Table (1): Statistical Distribution of the Demographic Variables for Sample**

F. =Frequency, %=Percentage

Table (1) presents the statistical distribution of the demographic variables for sample, that 39.3% (55) of the sample at age (26-30) years, 41.4% (58) of the sample graduated from institute graduate at educational level, 60.7% (85) of the sample having 4 ≥ years of general service, 85.0% (119) of the sample having 4 ≥ years of service in the maternity ward, 57.9% (81) of the sample not having participated in courses, 50.7% (71) of the sample reading scientific sources regarding water birth

	Estimate	Freq	%
Nurses' knowledge about water birth in general	Fail	28	20.0
	Not acceptable	43	30.7
	<b>Acceptable</b>	<b>33</b>	<b>23.6</b>
	Good	27	19.3
	Excellent	9	6.4
Nurses' knowledge about the benefits of water birth	Fail	13	9.3
	Not acceptable	11	7.9
	<b>Acceptable</b>	<b>39</b>	<b>27.9</b>
	Good	37	26.4
	Excellent	40	28.6
Nurses' knowledge about the risks of water birth	Fail	39	27.9
	<b>Not acceptable</b>	<b>52</b>	<b>37.1</b>
	Acceptable	29	20.7
	Good	16	11.4
	Excellent	4	2.9
Nurses' knowledge about cases in which water birth is contraindicated	Fail	30	21.4
	Not acceptable	21	15.0
	<b>Acceptable</b>	<b>33</b>	<b>23.6</b>
	Good	37	26.4
	Excellent	19	13.6
Nurses' knowledge about the reasons for the mother leaving the water birth pool	Fail	21	15.0
	<b>Not acceptable</b>	<b>46</b>	<b>32.9</b>
	Acceptable	25	17.9
	Good	23	16.4
	Excellent	25	17.9
<b>Total</b>		<b>140</b>	<b>100.0</b>

Figure 2. **Table (2): Statistical Results for Nurses' Knowledge level regarding Water Birth**

**Fail**= (0-1) answer for knowledge score, **Unacceptable** = (2) answer for knowledge score, **Acceptable** = (3) answer for knowledge score, **Good** = (4) answer for knowledge score, **Excellent** = (5) answer for knowledge score. **F**=Frequency, **%**=percentage

Table (2) shows the statistical results for nurses' knowledge level regarding water birth that the nurses' knowledge about water birth in general are 23.6% (33) most of the sample results at acceptable level, nurses' knowledge about the benefits of water birth are 27.9% (39) most of the sample results at acceptable level, nurses' knowledge about the risks of water birth are 37.1% (52) most of the sample results at not acceptable level, nurses' knowledge about cases in which water birth is contraindicated are 23.6% (33) most of the sample results at acceptable level, nurses' knowledge about the reasons for the mother leaving the water birth pool are 32.9% (46) most of the sample results at not acceptable level.

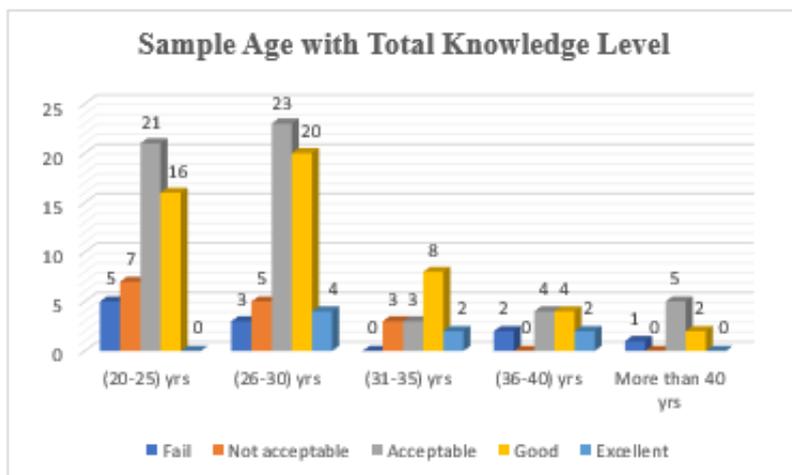


Figure 3. **Figure (1): The Statistical Distributions of Sample Age with Total Nurses' Knowledge level**

Estimate	Freq	%	X <sup>2</sup>	P.value	Sign
Fail	11	7.9	75.929	0.000	HS
Not acceptable	15	10.7			
Acceptable	56	40.0			
Good	50	35.7			
Excellent	8	5.7			

Figure 4. **Table (3): Statistical Results for Total Nurses' Knowledge level regarding Water Birth**

**Fail** = (0-5) answer for knowledge score, **Unacceptable** = (6-10) answer for knowledge score, **Acceptable** = (11-15) answer for knowledge score, **Good** = (16-20) answer for knowledge score, **Excellent** = (21-25) answer for knowledge score. F=Frequency, %= percentage, X<sup>2</sup> = chi-square, HS= high significant, Significant at P.value ≤ 0.05 level

Table (3) presents the statistical results for total nurses' knowledge level regarding water birth that the nurses' knowledge about water birth in general are 40.0% (56) most of the sample results at acceptable level with chi-square (75.929) and high significant at p. value (0.000)

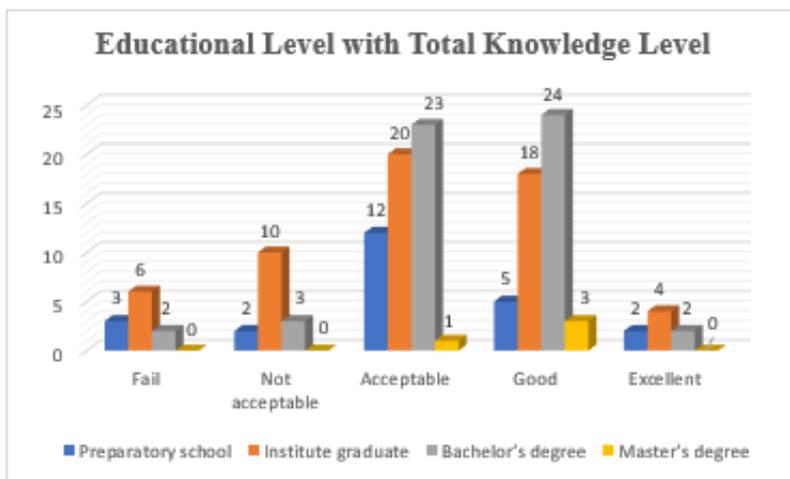


Figure 5. **Figure (2): The Statistical Distributions of Sample Educational Level with Total Nurses' Knowledge level**

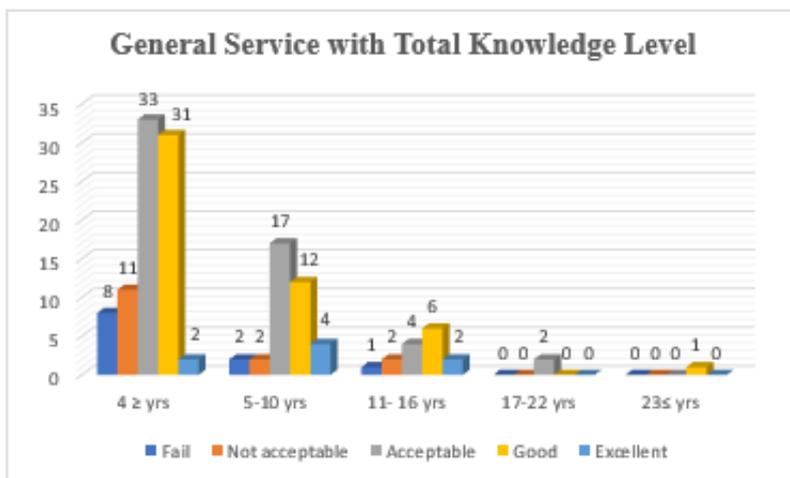


Figure 6. **Figure (3): The Statistical Distributions of Sample Gender Service with Total Nurses' Knowledge level**

	Total Nurses Knowledge	
	P.value	Sign.
Age	0.266	NS
Educational level	<b>0.044</b>	<b>S</b>
General service	0.130	NS
Service in the maternity ward	0.118	NS
Participated in courses	0.239	NS
Scientific sources	<b>0.031</b>	<b>S</b>

Figure 7. **Table (4): The Statistical Correlations Relationship for Total Results of Nurses Knowledge with the Demographic Variables**

Significant at P.value  $\leq$  0.05 level

Table (4) presents the statistical correlations relationship for total results of nurses' knowledge with the demographic variables at p.value  $\leq$  0.05 level, there are non-significant correlations relationships between the total results of nurses' knowledge with the demographic variables except with educational level there are significant correlations relationships at p.value (0.044), and also with scientific sources at p.value (0.031) only.

## 4. Discussion

Although water birth has been mentioned in medical literature since the 19th century, it has not been performed until recently in the past decade, and it has been suggested that water birth has some benefits compared to the traditional birth method; these benefits include reduced pain during childbirth and reduced bleeding (Griffiths et al., 2020).

The levels of knowledge were seen in 5 categories, Fail, not acceptable, acceptable, good and excellent. Our study results found the level of knowledge of staff nurses was acceptable. By Almoghrabi, (2018) reported study to assess the knowledge of staff nurses working in the maternity ward regarding knowledge about water-birth (WB). The results showed that a quarter of a percent had adequate knowledge, while 31% of working nurses had acceptable knowledge, but forty acceptable percent of working nurses had good knowledge about water-birth among nurses who work in maternity department.

The age means and S.D  $26.08 \pm 6.39$ ; more than half of study sample (62.02%) were their age are between 15-26 years old, this result is consistent with that obtained by Scheidt and Brüggemann (2016) who stated that the age of their study sample was (15-26) years. Also, this finding is supported by (Vidiri et al., 2022).

Another study was done by Rose et al., (2012) who reported the knowledge of staff nurses about water birth among nurses, through a cross-sectional survey study included nurses who worked in the obstetrics department and demonstrated that almost half of the nurses not acceptable knowledge about water births, while only few had an acceptable level of knowledge. In addition, the educational levels and general service of nurses in our findings were similar to the findings conducted in Cleveland by Al-Mughrabi, (2018). While they dissimilar with another study conducted by (Kaur & Singh, 2019).

In our results, we found that highly-percentage of participants were not knowledge about risk of water birth. This result has been revealed in other studies which done in, Australia and Iran (Lewis et al., 2018 and Darsareh et al., 2018).

On the other hand, decreased obstetric interventions in labor and decreased requirement for analgesia in labor; and risk on the newborn during using waterbirth, the current result of this study founded it had been reported by the nurse's staff regarding advantage and disadvantage of water birth, they show highly level knowledge. This result consistent with study which done by Snapp et al., (2020), while inconsistent with Jaipurkar et al., (2019) were done in India who reported nursing staff had average knowledge level toward scoring the benefits and risk the effect pregnant women about WB.

Furthermore, Carlsson and Ulfsdottir (2020) conducted a study to explore the retrospective experiences of women who had a water birth in Sweden; they reported that respondents had a lack of general and specific information related to waterbirths.

Regarding knowledge of nurse's staff about barriers of using water-birth, most of the study participants were not acceptable knowledge. This study was inconsistent with Milosevic et al., (2019) done in the United Kingdom, while consistent with Cooper et al., (2023) who reported the nurses staff had poor and not acceptable knowledge level toward barriers of using water-birth.

However, A previous study was conducted in USA which agree with present study to assess the knowledge of staff nurses regarding knowledge about alternate birthing methods WB among nurses working in OBG department and labor room (Suarez, 2020).

Based on the scoring system used to determine the level of knowledge on reasons for leaving the mother of pooling of water

birth among nursing staff, it has been found that the vast of participants had a acceptable level. This may reflect the importance of publishing more information and arranging educational programs about this domina. This result was supported by Mahmood, (2016) who reported about the reasons of leaving the pooling of water birth; many reasons consider the importance of leaving the pool which affects the life of mother and newborn.

The result of current study demonstrated that there was statistically significant association between socio-demographic of participants and total knowledge regarding water-birth. This result similar with Scheidt and Brüggemann (2016). However, dissimilar with the study of Da Costa Silveira de Camargo et al., (2023), they found that non-significant at  $p > 0.05$  between socio demographic and overall knowledge.

## 5. Conclusion

Based on the study results, it is concluded that although the majority of the nursing staff are young professionals (aged 26-30 years), hold institute-level diplomas, and possess specialized experience in maternity departments, their overall knowledge regarding water birth remains only at an acceptable level, with a statistically significant difference ( $p < 0.001$ ). Notably, clear knowledge deficits were identified in relation to the risks associated with water birth and the clinical indications requiring maternal exit from the pool, both of which were rated as not acceptable. Furthermore, the findings revealed a statistically significant association between nurses' knowledge levels and their educational attainment as well as their engagement with scientific literature.

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