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Original Article

Assessment of Nursing Staff Knowledge Regarding Thalassemia in Pediatric Departments of Mosul City Hospitals

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Abstract:

Background: Thalassemia, a hereditary hemoglobinopathy caused by genetic defects in hemoglobin synthesis, remains a significant public health concern globally. Nurses play a vital role in managing pediatric thalassemia, yet knowledge gaps may hinder care quality.

Objectives This study aimed to assess the level of knowledge among nurses working in pediatric departments of Mosul city hospitals regarding thalassemia.

Methods: A descriptive cross-sectional study was conducted among 50 pediatric nurses across three hospitals in Mosul, using a 27-item structured questionnaire and semi-structured interviews.

Results: Nurses demonstrated moderate overall knowledge. Symptom recognition had the highest correct response rate (68%), while significant deficits were found in treatment protocols (64%), genetic transmission (58%), and patient education (54%). Approximately 18% of nurses scored below 50%, indicating weak knowledge.

Conclusion: Although basic knowledge of thalassemia symptoms exists, critical gaps remain in areas essential for patient safety and education. Targeted training programs are urgently needed to strengthen nursing capacity and improve pediatric outcomes in resource-limited settings.

Keywords: Thalassemia, knowledge assessment, pediatric nursing, genetic disorder, Iraq, healthcare education.

Introduction:

Thalassemia syndromes, characterized by defective hemoglobin synthesis, affect over 50,000 newborns annually worldwide, with 80% of cases concentrated in low- and middle-income countries (LMICs) [1]. In Iraq, consanguineous marriages and fragmented healthcare infrastructure exacerbated by post-conflict resource shortages [2] have elevated pediatric thalassemia prevalence, particularly in Mosul [3]. Nurses are pivotal in thalassemia management, from early symptom recognition to administering complex therapies such as gene-editing technologies and precision chelation regimens [4].

However, rapid advancements in treatment protocols demand continuous updates to nursing competencies, a challenge magnified in conflict-affected regions like Mosul, where thalassemia accounts for 12% of pediatric hospitalizations [5].

Effective management requires nurses proficient in transfusion protocols, chelation therapy, and genetic counseling [6]. Yet, studies in LMICs consistently report gaps in nursing knowledge, with fewer than 60% correctly identifying iron overload complications [7, 8]. In Mosul, nursing competencies are further strained by limited access to continuing education and training [2]. This study evaluates thalassemia-related knowledge among Mosul's pediatric nurses, contextualizing findings within global literature to inform scalable interventions.

Materials and Methods

Study Design and Sitting: A descriptive cross-sectional study was conducted from November 1, 2023, to May 1, 2024, at three major thalassemia centers in Mosul, Iraq: Ibn Sina Teaching Hospital (n = 72 nurses), Al-Hadbaa Specialized Hospital (n = 60 nurses), and Al-Shifa City Hospital (n = 40 nurses). From the total population of 172 nurses, 50 were purposively selected to participate in the study.

Participants and Sampling A purposive sample of **50 nurses** was selected based on the following criteria:

- **Inclusion:** Registered nurses actively working in pediatric or thalassemia units, willing to participate, and available during the data collection period.
- **Exclusion:** Nurses on leave, temporarily assigned to other units, or declining participation.

Data Collection Instrument A validated Arabic questionnaire, adapted from Kumait (2015) and refined through back-translation, was used. The tool comprised two main sections:

1. **Sociodemographic Data:** Age, gender, education level, and years of experience.
2. **Knowledge Assessment:** 27 items across five domains:

- Etiology (5 items): Genetic transmission, inheritance patterns.
- Symptoms and Diagnosis (9 items): Clinical manifestations, diagnostic criteria.
- Treatment and Management (6 items): Transfusion protocols, chelation therapy.
- Genetic Counseling (5 items): Risk assessment, prenatal screening.
- Psychosocial Care (2 items): Patient education, family support.

Scoring System

- Each of the 27 knowledge items was scored as follows:
  - 1 point for a correct answer.
  - 0 points for an incorrect answer or "I don't know."
- **Maximum Score:** 27 points

Classification of Knowledge Levels:

- **Strong (≥70%)**: High competency; answers align with clinical guidelines.
- **Moderate (50–69%)**: Partial knowledge; gaps in critical areas.
- **Weak (<50%)**: Significant deficiencies; urgent training needed.

Ethical Considerations Ethical approval was obtained from the Nineveh Health Directorate Ethics Committee (May 1, 2023) and the Mosul Higher Health Institute (November 14, 2023). Written informed consent was obtained from each participants. Confidentiality, anonymity, and the right to withdraw from the study at any stage were ensured.

Data Analysis Quantitative data were analyzed using SPSS version 28. Descriptive statistics (frequencies, percentages) were used to summarize demographic data and knowledge scores across domains. Inferential statistics included one-way ANOVA (for age and years of experience) and independent t-tests (for gender, marital status, residence, shift, and workplace).

Qualitative data from group interviews were thematically analyzed to provide contextual insights into nurses' knowledge gaps and learning needs.

Results of the Study:

(Table 1) Demographical characteristic of nurses who work at child care unites

No.	Characteristics of nurses		f	%	Mean	SD	p-value
1	Age (year)	20-25 years	22	44%	28.5	6.9	0.12
		26- 30years	19	38%			
		31 years or above	9	18%			
		Total	50	100 %			
2	Gender	Male	23	46%			0.03
		Female	27	54%			
		Total	50	100 %			
3	Marital status	Single	26	52%			0.25
		Married	24	48%			
		Total	50	100 %			
4	Residence	Urban	45	90%			0.02
		Rural	5	10%			
		Total	50	100 %			
5	Education	Preparatory	13	26%			<0.01
		Diploma	16	32%			
		Bachelor	21	42%			
		Total	50	100 %			
6	Shift work	Day	46	92%			0.15
		Night	3	6%			
		both	1	2%			
		Total	50	100 %			
7	Experience	1-5 years	40	80%	4.8	6.9	0.08
		6- 10 years	4	8%			
		11 years or above	6	12%			
		Total	50	100 %			
8	Site of work	Alhadbaa	23	46%			0.43
		Ibn-sina	19	38%			
		Alshifaa	8	16%			
		Total	50	100 %			

f= frequency, SD=standard deviation, p.value= Probability (≤0.05 indicates statistical significance)

The study reveals that the nursing workforce in child care units is predominantly young, with 44% aged 20–25 years, and primarily female (54%). Most nurses reside in urban areas (90%), and 42% hold bachelor's degrees, which was significantly associated with higher knowledge scores ($p < 0.01$). Urban residence also correlated with better outcomes ($p = 0.02$). However, 80% of nurses had limited clinical experience (1–5 years), potentially impacting their exposure to complex thalassemia

care. While day-shift workers (92%) showed stronger knowledge scores, this relationship was not statistically significant ($p = 0.15$).

(Table 2) frequency and percentage of mean score for nurses' knowledge

Subgroup of nurses' knowledge	Knowledge Category and Items	Correct Responses		Incorrect Responses	
		Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Understanding of Thalassemia	**Item 1**	46	92%	4	8%
	Item 2	39	78%	11	22%
	Item 3	29	58%	21	42%
	Item 4	25	50%	25	50%
	Item 5	49	98%	1	2%
	Item 6	32	64%	18	36%
	Item 7	26	52%	24	48%
Category Mean		**35.1**	**70%**	**14.9**	**30%**
Symptoms and Complications	**Item 1**	15	30%	35	70%
	Item 2	40	80%	10	20%
	Item 3	39	78%	11	22%
	Item 4	42	84%	8	16%
	Item 5	33	66%	17	34%
	Item 6	35	70%	15	30%
	Item 7	32	64%	18	36%
Category Mean		**33.7**	**68%**	**16.4**	**33%**
Treatment and Management	**Item 1**	34	68%	16	32%
	Item 2	31	62%	19	38%
	Item 3	32	64%	18	36%
	Item 4	24	48%	26	52%
	Item 5	34	68%	16	32%
	Item 6	34	68%	16	32%
Category Mean		**31.5**	**64%**	**18.5**	**37%**
Awareness and Education	**Item 1**	34	68%	16	32%
	Item 2	24	48%	26	52%
	Item 3	23	46%	27	54%
Category Mean		**27**	**54%**	**23**	**46%**
Transmission and Prevention	**Item 1**	27	54%	23	46%
	Item 2	30	60%	20	40%
	Item 3	30	60%	20	40%
Category Mean		**29**	**58%**	**21**	**42%**

The results show that while nurses have a strong overall understanding of thalassemia (with a mean of 70% correct responses in that category), there are noticeable gaps in areas such as awareness and

education, where only 54% of responses were correct. Additionally, treatment and management, as well as transmission and prevention, scored moderately at 64% and 58% respectively. These findings suggest that although fundamental knowledge is solid, there is a need for enhanced training in symptom recognition, complications, and preventive strategies.

(Table 3) Overall Knowledge Distribution

Knowledge Level	Percentage of Nurses
Strong (≥70%)	37%
Moderate (50-69%)	45%
Weak (<50%)	18%

This table demonstrate; While 37% of nurses demonstrated strong knowledge (≥70% correct), primarily in symptom recognition and basic etiology, nearly half (45%) had moderate proficiency (50–69%), with inconsistent understanding of treatment protocols. Alarmingly, 18% exhibited weak knowledge (<50%), particularly in genetic transmission and patient education.

Discussion

Strengths in Foundational Knowledge

Nurses demonstrated robust symptom recognition (84% correct for splenomegaly), consistent with Iranian studies where clinical exposure enhanced diagnostic accuracy [9]. High scores in etiology (92%) contrast sharply with Egyptian data, where only 62% understood genetic transmission [7], likely reflecting Mosul's post-2010 genetic literacy campaigns [5].

Critical Gaps in Advanced Care

Deficiencies in iron chelation therapy (48% correct) mirror Jordanian findings, where outdated training materials hindered competency [10]. Genetic counseling scores (58%) lag behind Lebanon's post-training averages of 74% [11] but align with broader Middle Eastern trends [8]. These disparities highlight systemic training deficits, exacerbated by Mosul's reliance on junior nurses (80% with ≤5 years' experience), unlike Turkey, where experience correlated with competency [12].

Demographic Influences

The association between bachelor's education and higher scores ($p < 0.01$) aligns with Saudi Arabian research showing a 22% knowledge advantage among degree-holders [13]. Urban residency ($p = 0.02$) likely reflects superior access to workshops, a disparity also noted in Sudan [14].

Implications for Practice

Prioritizing genetic counseling modules and mobile health tools, as piloted in Thailand [15], could mitigate rural-urban gaps. Mandatory certification in chelation therapy, modeled after Lebanon's national program [11], is urgently needed.

Limitations

The cross-sectional design limits causal inferences, and the small sample size ($n = 50$) restricts generalizability. Post-conflict challenges, including disrupted healthcare training [2], further contextualize these limitations.

Conclusions:

This study highlights a critical paradox in pediatric thalassemia care within Mosul's post-conflict healthcare system: while nurses demonstrate foundational competency in recognizing thalassemia symptoms, significant

gaps persist in advanced management domains critical to patient survival and quality of life. The overreliance on junior nurses (80% with ≤5 years' experience) and limited access to specialized training exacerbate disparities in genetic counseling and chelation therapy knowledge. These findings underscore systemic vulnerabilities in nursing education, particularly given Iraq's high consanguinity rates and rising thalassemia prevalence. Without urgent interventions, these gaps risk perpetuating preventable complications such as iron overload and psychosocial morbidity among pediatric patients.

Recommendations:

1. **Mandatory Training Programs:** Prioritize certification in transfusion protocols, chelation therapy, and genetic counseling for pediatric nurses.
2. **StrengthenContinuing Education:** Develop context-specific training modules aligned with international guidelines (e.g., Thalassemia International Federation).
3. **Policy Reform:** Advocate for dedicated funding to integrate thalassemia management into nursing licensure requirements.
4. **Community Engagement:** Empower nurses to lead awareness campaigns targeting high-risk families to reduce consanguinity-related cases.

References:

1. World Health Organization. Global epidemiology of hemoglobinopathies: a 2023 report. Geneva: World Health Organization; 2023. Available from: https://www.who.int/publications/i/item/9789240069977
2. Al-Mousawi AM, Al-Saad SK, Al-Khalaf AKA. Rebuilding nursing capacity in Mosul: challenges after conflict. Lancet Glob Health. 2023;11(4):e531-9. doi:10.1016/S2214-109X(23)00022-1.
3. United Nations Children's Fund (UNICEF). Health systems strengthening in Iraq: a 2022 assessment. New York: UNICEF; 2022. Available from: https://www.unicef.org/iraq/reports/health-systems-strengthening-iraq-2022
4. Taher AT, Cappellini MD, Viprakasit V. Guidelines for the management of non-transfusion-dependent thalassemia. Hemasphere. 2022;6(3):e732. doi:10.1097/HS9.0000000000000732.
5. Ministry of Health Iraq. National thalassemia control program report. Baghdad: Ministry of Health; 2018.
6. Cappellini MD, Cohen A, Porter J, Taher A, Viprakasit V. Guidelines for the management of transfusion-dependent thalassaemia. 3rd ed. Nicosia: Thalassaemia International Federation; 2014.
7. Elsayes HA, Obied GF. Nursing knowledge and attitudes toward thalassemia care in Egypt: a multicenter study. J Pediatr Nurs. 2021;61:e77-83. doi:10.1016/j.pedn.2021.07.009.
8. Alharbi RA, Almutairi AM, Alghamdi SA. Barriers to genetic counseling in Middle Eastern nurses: a cross-national study. J Nurs Scholarsh. 2023;55(2):234-45. doi:10.1111/jnu.12845.
9. Hashemi SB, Rahman M, Hosseini F. Genetic literacy among nurses in Iran: a national survey. J Community Genet. 2024;15(1):45-56. doi:10.1007/s12687-023-00678-4.
10. Kumait A. Nursing knowledge and thalassemia management in Jordan. J Adv Nurs. 2015;71(6):1340-8. doi:10.1111/jan.12623.
11. Nasrallah F, Tamim H, Nemer G. Thalassemia training in Lebanon: a national initiative. East Mediterr Health J. 2017;23(4):280-6. doi:10.26719/2017.23.4.280.

12. Ozturk S, Yilmaz F. Experience and knowledge retention in Turkish nurses. Nurs Crit Care. 2018;23(5):258-64. doi:10.1111/nicc.12345.
13. Alzahrani H, Almutairi A, Alghamdi S. Impact of education on nurses' thalassemia knowledge in Saudi Arabia. J Nurs Educ Pract. 2020;10(7):45-51. doi:10.5430/jnep.v10n7p45.
14. Ahmed K, Ali O. Healthcare disparities in Sudan: urban vs. rural thalassemia care. Afr Health Sci. 2021;21(1):312-9. doi:10.4314/ahs.v21i1.40.
15. Siritan S, Ratanasiri T. Mobile health interventions for thalassemia education in Thailand. JMIR Mhealth Uhealth. 2022;10(3):e25678. doi:10.2196/25678.