

The Impact of Maternal Experience and Type of Feeding on Neonatal Jaundice in Phototherapy Unit

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Abstract

One of the most prevalent issues in infants has a major impact on the mortality and morbidity of neonates. Neonatal jaundice (NNJ).

Objectives:

This study aimed to assess the effectiveness of different feeding methods in preventing neonatal jaundice, and to investigate the relationships between mothers' experiences with neonatal jaundice and their sociodemographic variables.

Methods:

There is a quantitative descriptive study (cross-sectional) conducted in Karbala Teaching Hospital for Children in Holy Karbala City in Iraq for the period of 28th December 2024 to 2th February 2025. Nonprobability (convenience) sample of 130 mothers of with neonatal jaundice. A pilot study is used to assess the questionnaire's reliability, and a panel of experts is used to determine the questionnaire's content validity consisted from (11) experts. Data were analyzed and interpreted through use application of Statistical Package for Social Sciences (SPSS), version 26.0.

Results:

Results: The total maternal age shows a significant positive relationship with experience ($r=0.346$, $p=0.001$). Similarly, a mother's level of education ($r=0.397$, $p=0.001$). Mothers' occupation ($r=0.252$, $p=0.004$). Mothers have moderate (46.9%) to good (49.2%) levels of previous experience. There is a significant difference in feeding methods for preventing neonatal jaundice: breastfed (73.17), bottle-fed (63.39), and mixed-fed (63.88) infants.

Conclusion:

The outcome of the current study shows significant relationships between mothers' experience and various sociodemographic variables. Mothers' previous experience regarding neonatal jaundice ranged from moderate to good. Recommendations: Educating mothers by implementing educational programs for mothers about neonatal jaundice. Promoting proper feeding practices, encouraging mothers to exclusively breastfeed.

Keywords: Neonatal Jaundice, Maternal Experience, Feeding Methods



1. Introduction

Worldwide, 80% of preterm neonates and 60% of term newborns suffer from neonatal jaundice (Tessema et al., 2024). Neonatal jaundice one of the most frequent reasons both term and preterm neonates are admitted to neonatal wards is this occurrence, which typically arises from an elevated level of bilirubin in the blood (Mojtahedi et al., 2018). Neonatal jaundice caused 113401 disability adjusted life years (DALYs) and 1309 deaths per 100,000 live births worldwide in 2016 (Khurshid et al., 2022). Neonatal jaundice, also known as neonatal hyperbilirubinemia is characterized by yellowing of the skin, mucous membranes, and sclera. This condition results from various factors, including physiological liver immaturity, blood type incompatibility, or genetic disorders (Ansong-Assoku et al., 2024). Neonatal jaundice is classified into pathological and physiological jaundice. Physiologic jaundice in newborns begins to develop approximately three days after birth, peaks at approximately seven days, and gradually disappears after ten days. Pathological jaundice, on the other hand, is caused by a number of rather complex factors, including hemolytic jaundice and breast milk jaundice. Jaundice in newborns is typically benign and self-limiting, but extremely high bilirubin levels can cause kernicterus, which is lifelong brain damage. Prompt recognition and treatment of jaundice are crucial to prevent severe complications. Healthcare providers often monitor bilirubin levels closely during the first days of life to ensure that intervention occurs before reaching dangerous thresholds (Shitran & Abed, 2020). To avoid these complications, hyperbilirubinemia must be controlled. Therefore, the two main options for treating jaundice are phototherapy and exchange transfusion (ECT) (Laylani et al., 2020). Children are a gift to the world, so it is the responsibility of society and the family to protect and care for them from diseases (Abd Ali & Musihb, 2023). Mothers are typically the main caregivers for their children, and many have had to change their work hours or abandon their employment in order to full-time care for their children. The roles of parents have also drastically changed in favor of childcare. The maternal experience with neonatal jaundice is important as it increases understanding of neonatal jaundice and how to respond to it. Mothers who have a previous child with neonatal jaundice have good knowledge, practice, experience, and positive attitudes in how to deal with neonatal jaundice. This experience helps in quickly identifying neonatal jaundice, its symptoms, causes, and risk factors. This process in turn leads to early detection and seeking immediate medical advice to find appropriate treatment before the condition worsens (Omar et al., 2018). This demonstrates the positive impact of firsthand experience on a mother's understanding and thus underscores the urgent need for educational programs targeting new mothers to raise awareness about neonatal jaundice (Said et al., 2018). Mothers are typically the family members most impacted. It's critical to support mothers of children with illnesses since they frequently face higher levels of stress and emotional demands than other mothers. The type of feeding a neonate can have a significant impact on the incidence of neonatal jaundice, whether he is breastfed or artificially fed. Evidence indicates that bilirubin levels may be significantly affected by the characteristics of breastfeeding; for example, delayed milk production in the mother or the frequency of breastfeeding the baby. On the other hand, breastfed neonates tend to defecate more frequently, which may help expel bilirubin and thus lead to a lower incidence of neonatal jaundice. On the other hand, breastfeeding in the correct manner, with appropriate quantities and the required frequency, reduces the severity of neonatal jaundice (Siu et al., 2018). For these reasons, the World Health Organization (WHO) and UNICEF recommend early breastfeeding initiation within an hour of delivery, exclusive breastfeeding during the first six months of an infant's life, and

continuous breastfeeding for two or more years while incorporating complementary foods (Walters et al., 2019).

Objective of the study

1-This study aimed to assess the effectiveness of different feeding methods in preventing neonatal jaundice,

2-To investigate the relationships between mothers' experiences with neonatal jaundice and their sociodemographic variables.

2. Patients and Methods:

A quantitative descriptive study (cross-sectional) was conducted from the period 28th December 2024 to 2nd February 2025. The study was carried out at Kerbala Teaching Hospital for Children in Holy Karbala City, Iraq, to assess the impact of maternal experience and feeding type on neonatal jaundice.

2.1 Study Population

A nonprobability (convenience) sample, the researcher used time and availability to determine the sample size during the August, September, October, and November months (2024) to include a sufficient number of participants to address the research question. The sample included 130 mothers with neonatal jaundice admitted to the phototherapy unit, in addition to 13 mothers of newborns with neonatal jaundice for the pilot study, who gave the researcher permission to begin collecting samples. A pilot study is used to assess the questionnaire's reliability, and a panel of experts is used to determine the questionnaire's content validity consisted from (11) experts.

Administrative Arrangements: Protocol of study and official permission was taken from the College of Nursing\ University of Karbala to conducted the study. The College of Nursing's Ethics Committee assessed the study tools (questionnaire) and agreed to proceed with the study after receiving the title and the questionnaire. Also taking agreement from mother's during interview. **The Study Instrument:** A questionnaire was constructed by investigator for the purpose of the study. The questionnaire is based on the extensive review of related literature and previous studies. In addition to the investigator experiences. Questionnaire format was including four parts: **First part:** Demographic data for the mother as (age, educational level, occupation status, residential area, economic status, number of previous births, and mode of delivery). Demographic data for the child as (sex, birth weight, feeding method, bilirubin level, and gestational age): **Second part:** Assessing mothers' experiences and knowledge regarding neonatal jaundice. This section was divided into five parts: general knowledge: The first part evaluated mothers' general understanding of neonatal jaundice and

consisted of seven items. **Recognition of Symptoms:** The second part assessed mothers' ability to recognize the symptoms of neonatal jaundice and included eight items. **Understanding of Causes:** The third part examined mothers' knowledge about the causes of neonatal jaundice, consisting of ten items. **Preventive practices:** The fourth part explored the practices mothers adopt to reduce the risk of neonatal jaundice, comprising seven items. The fifth part focused on mothers' perceptions of how neonatal jaundice is treated in hospitals, comprising five items. **Third part:** Explored how mothers acquire knowledge and experience regarding neonatal jaundice, consisting of eight items. **Last part:** Examined mothers' opinions about neonatal jaundice in newborns, which included seven items. These specialists were requested to evaluate the study's instrumentation.

Reliability of the study: Cronbach's Alpha coefficients were used to test reliability of the current study instrument. The result of the test showed good evaluation for all scales; mothers' knowledge, perception practice, experience, and attitudes reflecting that the questionnaires had adequate level of internal consistency and equivalence measurability.

Data collection: Data were obtained through face-to-face interview with mothers of infants diagnosed with neonatal jaundice, and questionnaire formatting techniques were used as a data collection method. The questionnaire was filled out by the researcher personally, and all paragraphs were clarified for the mothers participating in the study in case of ambiguity. From 28th December 2024 to 2nd February 2025, an interview was conducted with mothers who attended the phototherapy unit at Karbala Teaching Hospital for Children in Holy Karbala City.

Data Analysis: The data were analyzed and interpreted through use of the application of Statistical Package for Social Sciences (SPSS), version 26.0.

3. Results

Table (1) presents a descriptive analysis of patients undergoing hemodialysis; the findings reveal that average age in the intervention group was 41.7 ± 11.5 years, while in the control group it was 43 ± 11.6 years. The highest percentage of age group seen with age group "30 – 39 years" among 32.5% in the experimental group while in control group seen with age group of "30-39 years" and "40-49 years" with percentage of 25.6% for each age group. The variance test shows no significant difference based on age between study and control groups ($\Lambda = .124, P = .726$). The sex of patients refers to males in the intervention group (82.5%), and females in the control group (51.2%). The variance test shows high significant difference

based on sex between study and control groups ($\Lambda = 30.550$, $P = .001$). (The marital status indicates that more of patients are married in study group 75% and control group 69.85. The variance test illustrates no significant difference based on marital status between study and control groups ($\Lambda = .190$, $P = .664$). The level of education reveals that highest percentage seen with “primary school graduate” among patients in the study group (37.5%) and control group (34.9%). The variance test shows no significant difference based on level of education between study and control groups ($\Lambda = .685$, $P = .410$). The occupational status displays that 25% of participants in the experimental group are jobless, while 20% are employees and 20% are housewives. In the control group, more than half of patients are housewives (55.8%). The variance test shows no significant difference based on occupation between study and control groups ($\Lambda = 3.405$, $P = .069$).

Table 1: Distribution of Patients according to their Socio-demographic Characteristics

No.	Characteristics		Study group		Control group		Variance test
			f	%	f	%	
1	Age (year)	> 20	1	2.5	1	2.3	$\Lambda = .124$ $P = .726$ Sig= N.S
		20 – 29	4	10	5	11.6	
		30 – 39	13	32.5	11	25.6	
		40 – 49	11	27.5	11	25.6	
		50 – 59	7	17.5	12	27.9	
		60 +	4	10	3	7	
		Total	40	100	43	100	
	<i>M ± SD</i>	<i>41.7 ± 11.5</i>		<i>43 ± 11.6</i>			
2	Sex	Male	33	82.5	21	48.8	$\Lambda = 30.550$ $P = .001$ Sig= H.S
		Female	7	17.5	22	51.2	
		Total	40	100	43	100	
3	Marital status	Unmarried	7	17.5	6	14	$\Lambda = .190$ $P = .664$ Sig= N.S
		Married	30	75	30	69.8	
		Widowed/er	0	0	5	11.6	
		Divorced	3	7.5	2	4.7	

	<i>Total</i>	<i>40</i>	<i>100</i>	<i>43</i>	<i>100</i>		
4	Level of education	Doesn't read and write	4	10	15	34.9	$\Lambda = .685$ $P = .410$ Sig= N.S
		Read and write	2	5	4	9.3	
		Primary	15	37.5	15	34.9	
		Intermediate	11	27.5	6	14	
		Secondary	6	15	2	4.7	
		Diploma	1	2.5	0	0	
		Bachelor +	1	2.5	1	2.3	
		<i>Total</i>	<i>40</i>	<i>100</i>	<i>43</i>	<i>100</i>	
5	Occupation	Jobless	10	25	6	14	$\Lambda = 3.405$ $P = .069$ Sig= N.S
		Worker	7	17.5	0	0	
		Farmer	0	0	0	0	
		Employee	8	20	11	25.5	
		Retired	6	15	2	4.7	
		Housewife	8	20	24	55.8	
		Student	1	2.5	0	0	
		<i>Total</i>	<i>40</i>	<i>100</i>	<i>43</i>	<i>100</i>	

No: Number, f: Frequency, %: Percentage, Λ = Levene's Test, P: Probability value, Sig: Significance, N.S: Not significant, S: Significant, H.S: High significant

Table (2) displays the clinical characteristics of patients; the findings indicate that 32.5% of patients in the study group undergone hemodialysis for “4-6 years” while in the control group, 39.5% have period of “1-3 years”. The variance test shows no significant difference based on hemodialysis duration between study and control groups ($\Lambda = .206$, $P = .651$). The number of sessions refers to 3 sessions among 70% of patients in the study group and 50% in the control group. The variance test shows no significant difference based on number of session between study and control groups ($\Lambda = 6.053$, $P = .186$). Regarding comorbid diseases, 75% of participants in the study group and 69.8% in control group reported history of comorbid diseases. The variance test shows no significant difference based on comorbid diseases between study and control groups ($\Lambda = .452$, $P = .504$). The medications of chronic diseases are varying in both group; the highly frequent reported medication is “Amlodipine” in both group; study (50%) and control (32.6%).

Table 2: Distribution of Patients according to their clinical data

No.	Characteristic	Study group		Control group		Variance test	
		F	%	f	%		
1	Hemodialysis duration (Years)	> 1	8	20	5	11.6	Λ= .206 P= .651 Sig= N.S
		1 – 3	12	30	17	39.5	
		4 – 6	13	32.5	12	27.9	
		< 6	7	17.5	9	20.9	
		Total	40	100	43	100	
2	Number of hemodialysis per week	2	12	30	19	44.2	Λ= 6.053 P= .186 Sig= N.S
		3	28	70	24	55.8	
		Total	40	100	43	100	
3	preexisting chronic diseases	No	10	25	13	30.2	Λ= .452 P= .504 Sig= N.S
		Yes	30	75	30	69.8	
		Total	40	100	43	100	
4	Medication of chronic diseases	None	10	25	12	27.9	Λ= 3.308 P= .073 Sig= N.S
		Amlodipine	20	50	14	32.6	
		Amlodipine + Carvedilol	2	5	0	0	
		Amlodipine + Insulin	3	7.5	11	25.6	
		Insulin + Warfarin	1	2.5	0	0	
		Bisoprolol	1	2.5	2	4.7	
		Bisoprolol + Kadomet	1	2.5	0	0	
		Amlodipine + Insulin + Isosorbide	1	2.5	0	0	
		Carvedilol + Nifedepine	1	2.5	0	0	
		Insulin	0	0	3	7	
		Amlodipine + Januvia	0	0	1	2.3	
		Total	40	100	43	100	

No: Number, f: Frequency, %: Percentage, Λ= Levene's Test, P: Probability value, Sig: Significance, N.S: Not significant, S: Significant, H.S: High significant

Table (3) highlights a significant reduction in fatigue in the intervention group, where the mean score dropped from 39.60 (SD = 6.702) in the pre-test to 3.33 (SD = 2.832) in the post-test, with 100% of patients reporting only mild fatigue after the intervention. In dissimilarity, the control group exhibited no improvement, with the mean fatigue score increasing slightly from 40.95 (SD = 4.386) in the pre-test to 41.84 (SD = 3.031) in the post-test, and 100% of patients continuing to experience severe fatigue. These results underscore the effectiveness of the intervention in significantly alleviating fatigue among hemodialysis patients.

Table 3: Overall assessment of fatigue among patients in the experimental and control groups

Fatigue	Experimental Group								Control Group							
	Pre-test				Post-test				Pre-test				Post-test			
	F	%	M	SD	f	%	M	SD	f	%	M	SD	f	%	M	SD
Mild	1	2.5	39.60	6.702	40	100	3.33	2.832	0	0	40.95	4.386	0	0	41.84	3.031
Moderate	4	10			0	0			4	9.3			0	0		
Severe	35	87.5			0	0			39	90.7			43	100		
Total	40	100			40	100			43	100			43	100		

f: Frequency, %: Percentage, M: Mean of total score, SD Standard deviation

Mild= 0 – 17.33, Moderate= 17.34 – 34.66, Severe= 34.67 – 52

Table (4) presents significant differences in fatigue scores for patients in the study group (leg exercise intervention) and the control group (without intervention). For the pre-test, the study group had a mean score of 39.60 (SD = 6.702), with a mean rank of 20.50, resulting in a Z-value of -5.516 and a p-value of .001, indicating a highly significant difference. In contrast, the control group had a pre-test mean score of 40.95 (SD = 4.386), with a mean rank of 22.00, yielding a Z-value of -5.727 and a p-value of .070, which is not statistically significant. For the post-test, the study group showed a significant reduction in fatigue, with a mean score of 3.32 (SD = 2.832), while the control group exhibited a post-test mean score of 41.84 (SD = 3.031), demonstrating the effectiveness of the leg exercise intervention in reducing fatigue among patients.

Table 4: Significant Differences in Fatigue Score for Patients in the Study Group (Leg Exercise Intervention) and Control Group (Without Intervention)

Fatigue	Study Group (N=40)						Control Group (N=43)					
	M.	SD	Mea n Ran k	Z	p- value	Sig.	M.	SD	Me an Ran k	Z	P- valu e	Si g.
Pre-test	39.60	6.702	20.50	-5.5	.001	H.S	40.95	4.386	22.00	-5.7	.070	N.S
Post-test	3.32	2.832	20.00	16			41.84	3.031	27			

M: Mean, SD: Standard Deviation, Z: Z-score (Wilcoxon Signed Rank), p: Probability, Sig.: Significance, HS: High Significant, N.S: Not Significant

4. Discussion

The result of the current study the findings indicate that the average age for mothers is 26.7 ± 6.5 years; the highest percentage of mothers (27.7%) fall within the age group of “21–25 years,” followed by the age group “26–30 years” (23.8%). These findings are in agreement with the study that was conducted in Pakistan by [15] which similarly reported that most participating mothers were aged 21–25 (30.75%), followed by those aged 26–30 (25.75%). Regarding level of education According to the current study's findings, 28.5% of mothers had only completed their primary schooling. This outcome is consistent with a research by (Fadil et al., 2021). The results of the current study are consistent by their investigation, which found that nearly one-third (33.5%) of the women had only completed primary school. Regarding the occupational status, the finding of the current study shows that the majority of mothers in this study are housewives (65.4%), which is consistent with (Kamal Muhammed & Hasan, 2022). research in Sulaymaniyah, that show higher percentage (79.5%) of mothers providing home care were housewives. Regarding the residency, the finding shows, the majority of mothers (76.9%) reside in urban areas, while only 23.1% live in rural areas. These findings consistent with a study done by (Hussein & Aziz, 2016). That found 65% of mothers lived in urban areas, whereas 35% were from rural areas, supporting the current study. Another study by (Mohammed & Hassanein, 2023) found that most mothers (78.4%) lived in urban areas, while a vast (21.6%) resided in rural areas. These consistent findings across studies highlight the predominance of urban residency among mothers, which may be affected by better access to healthcare, education, and awareness programs in urban settings. Regarding economic status, the result showed that 70.8% of mothers characterized their income as "somewhat sufficient." These results are agreement with those of , who found that 68.4% of participants had a moderate socioeconomic status. According to the researcher opinion view The consistency of these findings suggests that there may be a connection between financial situation and the capacity to care for newborns. Table (2) reveals that 64.6% of mothers are multiparous, while 35.4% are prim parous. The results of the study are consistent with the results of the study conducted by [20], which reported that most of the mothers are multiparous (55.9%), while only 44.1% of them are primipara. regarding The mode of delivery for mothers the current study indicates cesarean section among 50.8% while the normal vaginal delivery” among 49.2% of them. this result agreement with the result of study conducted by (Saddozai et al., 2022) which reported that cesarean-section (54.75%) while Normal vaginal delivery is (45.25) regarding to the Pregnancy Complications Mothers have various experiences of pregnancy difficulties, but the most typical are preterm labor (13.1%), gestational hypertension (13.8%), and anemia (14.6%). The percentage of mothers who had a history of multiple pregnancy problems was greater (20.8%).The findings match with the (Boskabadi et al., 2020) examination to assess the maternal risk factors for hyperbilirubinemia in newborns. The most frequent complications for mothers during pregnancy were bleeding, diabetes mellitus, hypertension, preeclampsia, and preterm. Regarding the issue of "having a baby with neonatal jaundice," the current study shows that 38.5% of mothers reported no experience of neonatal jaundice, while 61.5% of mothers reported a positive history of having a baby with neonatal jaundice. This finding is consistent with that of a study by (Ng & Chong, 2014), which found that 2.92% of the mothers had no history of neonatal jaundice, whereas 3.11% of mothers reported a positive history of having a baby with neonatal jaundice. The outcome of the current study in table (3) show significant relationships between mothers' experience and various sociodemographic variables. Specifically, maternal age shows a significant positive

relationship with experience ($r = 0.346$, $p = 0.001$), indicating that older mothers tend to have higher experience levels. Similarly, maternal education level was significantly related to experience ($r = 0.397$, $p = 0.001$), with greater mothers' experience being associated with a higher educational level. Maternal occupation was also significantly related to experience, with employed mothers showing higher levels of experience ($r = 0.252$, $p = 0.004$), while homemakers had less experience. Monthly income was significantly negatively related to experience ($r = -0.349$, $p = 0.001$), suggesting that mothers with higher incomes tend to report more experience, perhaps due to easier access to resources or information. These study findings are consistent with those of a study (Allahony et al., 2017) ($r = -0.349$, $p = 0.001$), suggesting that mothers with higher incomes tend to report more experience. The finding of the study is consistent with the finding of a study conducted by (Allahony et al., 2017), which also found a statistically significant association between mothers' experiences with newborn jaundice (NNJ) and their age, occupation, income, and level of education. The idea that education is essential in developing mothers' knowledge and awareness is further supported by their research, which revealed that 74% of mothers had good experiences and that the majority had a university degree. However, the results of the current study are disagree with the result of a study done in Baghdad by (Allahony et al., 2017) which reported no significant correlation, at the $P \leq 0.05$ level, between the social and demographic characteristics of mothers (age, occupation, level of education, and place of residence) and their experience with jaundice in newborns. Regarding to mother's residency the findings indicate a significant relationship between residency and maternal experience, with urban mothers showing higher levels ($r = 0.216$, $p = 0.014$). This agree with Iraqi research, conducted by (Fadil et al., 2021) which also found greater knowledge among urban mothers. according to the researcher that urban environments provide better healthcare access, information, and support systems, which enhance maternal knowledge and experience, Regarding the assessment mothers' previous experience about neonate jaundice Mothers' previous experience appears to be moderate 46.9% to good 49.2% as indicated in Table (4), with the average score suggesting good experience level ($M \pm SD = 5.35 \pm 1.569$). These results contradict the work done by (Omar et al., 2018) which found that 38.9% of mothers had prior experience with neonatal jaundice and over half, 52.1%, of mothers had at least one child who had neonatal jaundice. Per this study, the researcher believes these discrepancies result from differing population traits, differences in healthcare provision, and existing awareness campaigns. Although most mothers being shown to have good prior experience in this study suggest improved health education, the actual use of this knowledge is what needs to be assessed. Regarding the type of feeding and its relationship to neonatal jaundice The finding of current study in table (5) found that significant differences in the method of feeding for preventing neonatal jaundice, as demonstrated by the Kruskal-Wallis test ($H = 2.789$, $df = 2$, $p = 0.048$). Although the mean scores of breastfed infants were slightly higher (73.17) compared to formula-fed infants (63.39) and mixed-fed infants (63.88), the difference was statistically significant. This suggests that the type of feeding method in this sample has a clear impact on the prevention of neonatal jaundice. The results of the study consistent with the results of the study conducted by (Ridson et al., 2022) that also found significant variations in the level of bilirubin for between infants who were breastfed and those who were fed formula. In contrast to formula-fed newborns, breastfed infants displayed a decreased degree of jaundice, according to Ridson et al., supporting the notion that breastfeeding may be preventive against neonatal jaundice.

Conclusions

The outcome of the current study shows significant relationships between mothers' experience and various sociodemographic variables. Mothers' previous experience regarding neonatal jaundice ranged from moderate to good. The type of feeding method in this sample has a clear impact on the prevention of neonatal jaundice.

Recommendations: Educating mothers by implementing educational programs for mothers about neonatal jaundice, including identifying its causes, signs and symptoms, risk factors, and early warning signs, is essential to improve awareness and provide timely intervention. Promoting proper feeding practices, encouraging mothers to exclusively breastfeed, and educating mothers about the importance of frequent breastfeeding to help lower bilirubin levels in new-borns. Distributing brochures to mothers regarding breastfeeding methods and their effects on children with neonatal jaundice. Enhancing postnatal follow-up by conducting routine new-born screenings to monitor bilirubin levels and ensuring early detection and management of jaundice.

5. Acknowledgment

The researcher extends heartfelt gratitude to all members and administrators of the phototherapy unit for their invaluable contributions to this study by providing access to the necessary data.

Conflict of Interest

The authors declare that they have no conflicts of interest.

Ethics Approval

The Protocol of study and official permission was taken from the College of Nursing/ University of Kerbala to conducted the study. Approval was also obtained from the administration of the phototherapy unit to access the necessary data. Confidentiality of participants' names and anonymity of data collection forms were ensured. Consent for publication by submitting this document, the author declares his consent for the final accepted version of the manuscript to be considered for publication.

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