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

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## ABSTRACT

Background: 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: 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.

## Introduction

Worldwide, 80% of preterm neonates and 60% of term newborns suffer from neonatal jaundice [1]. 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 [2]. Neonatal jaundice caused 113401 disability adjusted life years (DALYs) and 1309 deaths per 100,000 live births worldwide in 2016[3]. 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[4]. 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 [5]. 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 [6]. To avoid these complications, hyperbilirubinemia must be controlled. Therefore, the two main options for treating jaundice are phototherapy and exchange transfusion (ECT) [7]. 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 [8]. 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 [9]. 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 [10]. 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 [11]. 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 [12]. 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 [13]. 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 [14].

**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.

**Methodology**

**Study Design:** A quantitative descriptive study (cross-sectional) was conducted from the period 28$^{th}$ December 2024 to 2$^{nd}$ 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.

**Study sample:** 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 (Seneadza et al.,2022). 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 28$^{th}$ December 2024 to 2$^{nd}$ 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.

**The results**

**Table (1)** presents the descriptive analysis of socio-demographic for mothers. The findings indicate that average age for mothers is 26.7±6.5 years, the highest percentage of mothers (27.7%) fall within age group of (21–25) year. The level of education for mothers refers to primary education among 28.5% of them. The occupation status indicates that higher proportion of mothers was housewives (65.4%). Concerning residency, more of mothers (76.9%) were reside in urban. Regarding economic status, more of mothers (70.8%) perceive enough to some extent monthly income. **Table (2)** reveals that 64.6% of mothers were multipara. The mode of delivery for mothers refers to Cesarean section among 50.8% of them. The history of pregnancy complications varies among mothers; the highly frequently reported complications are: anemia (14.6%), gestational hypertension (13.8%), and preterm labor (13.1%). A higher proportion of mothers (20.8%) reported a history of multi-complications during pregnancy. Regarding having baby with neonate jaundice, 61.5% of mothers reported a positive history with jaundice. **Table (٣)** reveals that 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, a mother's level of education significantly correlates with experience ($r$=0.397, p=0.001), with higher educational attainment associated with greater experience. Mothers' occupation also demonstrates a significant relationship, with employees showing higher experience levels ($r$=0.252, p=0.004), while housewives have lower experience scores. Residency has a moderate significant relationship, with urban mothers showing higher experience ($r$=0.216, p=0.014). Lastly, monthly income is significantly negatively related to experience ($r$=-0.349, p=0.001), suggesting that mothers with higher incomes tend to report more experience, possibly due to greater access to resources or information. **Table (٤)** demonstrates that mothers have moderate (46.9%) to good (49.2%) level of previous experience with mean score refers to Good with (M±SD= 5. 35± 1.569). **Table (٥)** shows that significant difference in feeding methods for preventing neonatal jaundice, as indicated by the Kruskal-Wallis test (H=2.789, df=2, p=0.048). Although breastfed infants had a slightly higher mean rank (73.17) compared to bottle-fed (63.39) and mixed-fed (63.88) infants, the difference is statistically significant. This suggests that in this sample, the type of feeding method have a clear impact on the prevention of neonatal jaundice.

 

**Table ١: The socio-demographic characteristics of mothers.**

| List | Characteristics | | F | % |
|---|---|---|---|---|
| 1 | **Age (year)**<br>**M±SD= 26.7 ± 6.5** | 17 – 20 | 29 | 22.3 |
| | | 21 – 25 | 36 | 27.7 |
| | | 26 – 30 | 31 | 23.8 |
| | | 31 – 35 | 22 | 16.9 |
| | | 36 – 40 | 8 | 6.2 |
| | | 41 + | 4 | 3.1 |
| | | ***Total*** | ***130*** | ***100*** |
| 2 | **Level of education** | Doesn't read & write | 5 | 3.8 |
| | | Read & write | 12 | 9.2 |
| | | Primary school | 37 | 28.5 |
| | | Intermediate school | 26 | 20 |
| | | Secondary school | 22 | 16.9 |
| | | Diploma | 5 | 3.8 |
| | | Bachelor | 18 | 13.8 |
| | | Master | 4 | 3.1 |
| | | Doctorate | 1 | .8 |
| | | ***Total*** | ***130*** | ***100*** |
| 3 | **Occupation** | Housewife | 85 | 65.4 |
| | | Employee | 28 | 21.5 |
| | | Free works | 17 | 13.1 |
| | | ***Total*** | ***130*** | ***100*** |
| 4 | **Residency** | Rural | 30 | 23.1 |
| | | Urban | 100 | 76.9 |
| | | ***Total*** | ***130*** | ***100*** |
| 6 | **Monthly income** | Enough | 14 | 10.8 |
| | | Enough to some extent | 92 | 70.8 |
| | | Not enough | 24 | 18.5 |
| | | ***Total*** | ***130*** | ***100*** |

f: Frequency, %: Percentage, M: Mean, SD: Standard deviation

**Table (2): Obstetric history of mother.**

| List | History | | F | % |
|---|---|---|---|---|
| 1 | **Parity** | Primipara | 46 | 35.4 |
| | | Multipara | 84 | 64.6 |
| | | ***Total*** | ***130*** | ***100*** |
| 2 | **Mode of Delivery** | Vaginal Delivery | 64 | 49.2 |
| | | Cesarean Section | 66 | 50.8 |
| | | ***Total*** | ***130*** | ***100*** |
| 3 | **Pregnancy Complications** | None | 29 | 22.4 |
| | | Preterm Labor | 17 | 13.1 |
| | | Preeclampsia | 2 | 1.5 |
| | | Bleeding | 5 | 3.8 |
| | | Anemia | 19 | 14.6 |
| | | Gestational DM | 4 | 3.1 |
| | | Gestational Hypertension | 18 | 13.8 |
| | | Oligohydramnios | 5 | 3.8 |
| | | IUGR | 4 | 3.1 |
| | | Multi-complication | 27 | 20.8 |
| | | ***Total*** | ***130*** | ***100*** |
| 4 | **Have a neonate with neonatal jaundice?** | No | 50 | 38.5 |
| | | Yes | 80 | 61.5 |
| | | ***Total*** | ***130*** | ***100*** |

f: Frequency, %: Percentage, IUGR: Intrauterine Growth Restriction

**Table 3: Relationships between mothers' experience and their sociodemographic characteristic.**

| **Variables** | | **Experience** | | |
|---|---|---|---|---|
| | | **Mean** | **SD** | **Relationship** |
| **Age (year)** | 17 – 20 | 4.45 | 1.502 | $r^s$ **= .346** |

| | | | | |
|---|---|---|---|---|
| | 21 – 25 | 5.06 | 1.530 | **P-value= .001** |
| | 26 – 30 | 5.97 | 1.581 | **Sig= H.S** |
| | 31 – 35 | 5.95 | 1.133 | |
| | 36 – 40 | 5.75 | 1.669 | |
| | 41 + | 5.75 | .957 | |
| | ***Total*** | 5.35 | 1.569 | |
| **Level of education** | Not read & write | 4.20 | 1.483 | **$r^s$ = .397** **P-value= .001** **Sig= H.S** |
| | Read & write | 4.83 | 1.030 | |
| | Primary school | 5.11 | 1.612 | |
| | Intermediate school | 4.81 | 1.650 | |
| | Secondary school | 5.36 | 1.432 | |
| | Diploma | 6.40 | 1.140 | |
| | Bachelor | 6.44 | 1.042 | |
| | Master | 7.50 | .577 | |
| | Doctorate | 7.00 | . | |
| | ***Total*** | 5.35 | 1.569 | |
| **Occupation** | Housewife | 5.00 | 1.543 | **$r^s$ = .252** **P-value= .004** **Sig= H.S** |
| | Employee | 6.46 | 1.232 | |
| | Free works | 5.29 | 1.404 | |
| | ***Total*** | 5.35 | 1.569 | |
| **Residency** | Rural | 4.73 | 1.507 | **$r^*$= . 216** **P-value= .014** **Sig= S** |
| | Urban | 5.54 | 1.547 | |
| | ***Total*** | 5.35 | 1.569 | |
| **Monthly income** | Enough | 6.57 | 1.399 | **$r^s$ = -.349** **P-value= .001** **Sig= H.S** |
| | Barely enough | 5.38 | 1.540 | |
| | Not enough | 4.54 | 1.318 | |
| | ***Total*** | 5.35 | 1.569 | |

*$r^s$: Spearman Correlation coefficient, $r^*$: Biserial correlation coefficient, P: Probability, Sig: Significance, N.S: Not Significant, S: Significant, H.S: High Significant*

**Table 4: Overall assessment mothers' previous experience of neonate jaundice.**

| *Experience* | *F* | *%* | *M* | *SD* | *Ass.* |
|---|---|---|---|---|---|
| ***Poor*** | *5* | *3.9* | ***5.35*** | ***1.569*** | ***Good*** |
| ***Moderate*** | *61* | *46.9* | | | |
| ***Good*** | *64* | *49.2* | | | |
| ***Total*** | ***130*** | ***100*** | | | |

f: Frequency, %: Percentage. M: Mean for total score, SD: Standard Deviation for total score, Ass: Assessment. Poor= 0 – 2.66,Moderate= 2.67– 5.32, Good= 5.33 – 8

**Table 5: Significant difference in feeding methods for preventing neonate jaundice**

| *Jaundice Method* | *N* | *Mean Rank* | *Kruskal-Wallis H* | *Df* | *P-value* | *Sig* |
|---|---|---|---|---|---|---|
| ***Breast feeding*** | *82* | *73.17* | *2.789* | *2* | *.048* | ***S*** |
| ***Bottle feeding*** | *27* | *63.39* | | | | |
| ***Mixed*** | *21* | *63.88* | | | | |

*N: Number, df: Degree of freedom, P: Probability, Sig: Significance, N.S: Not significan*

## 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 [16]. 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 [17]. 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 [18].

 

That found 65% of mothers lived in urban areas, whereas 35% were from rural areas, supporting the current study. Another study by [19] 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 [17], 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 [15] 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 [21] 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 [22], 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 [23](*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 [23], 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 [24] 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 [16] 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±SD= 5.35±1.569). These results contradict the work done by [10] 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 [25] 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.

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## Competing interests

The authors declare that they have no competing interests.

## Abbreviations

Neonatal jaundice: NNJ; Intrauterine Growth Restriction **:**(IUGR).

## Authors’ contributions

The author contributed to the work by participating in the design, acquisition, analysis, and interpretation of data. Additionally, the author drafted and critically revised significant intellectual content, provided the final version for publication, and agreed to be accountable for all aspects of the

 

work. The author read and approved the final manuscript. The author takes responsibility for the integrity of the data and the accuracy of the data analysis.

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**Availability of data and materials**

The data used in this study are available from the corresponding author on request.

**Ethics approval and consent to participate** 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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