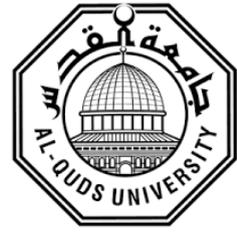**Deanship of Graduate Studies**

Al-Quds University

Neonatal Jaundice Knowledge, Attitude and Practice among Nurses Working in Neonate Intensive Care Units and Pediatric Wards

Sameh Mohammad Hasan Fayoumi

M.Sc. Thesis

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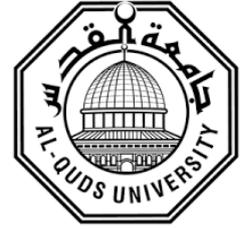
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Palestine 2018

الاهداء

عندما وقفت قدماي على مشوار البداية الذي كان طويلا حينها

لم يستطيع بصري على رؤية مداه

فقد كان لا يتجاوز خطواتي الصغيره

والآن وقد أوشكت على النهايه

إلى أول يوم من أيام هذا المشوار اشعر بالحنين

ولكن للطريق نهاية

ومازلت احمل عبء الشوق اللذي سيرافقني مدى الحياه

نجاحي وباقه ورد معطر اهدي...

الى

من ساهم في وصولنا لطريق النهايه

الى كل من علمني شيئا جديدا

وغذى فكري بالعلم والمعرفه

الى كل من وقف بجانبنا وساعدنا

إلى من جرع الكأس فارغاً ليسقيني قطرة حب سعادة

إلى من كلّت أنامله ليقدم لنا لحظة

ليمهد لي طريق العلم إلى من حصد الأشواك عن دربي

إلى القلب الكبير

(إلى والدي رحمة الله عليه)

إلى من أرضعتني الحب والحنان

إلى رمز الحب وبلسم الشفاء

إلى القلب الناصع بالبياض

الى والدتي

بكل الحب.. إلى رفيقة دربي

إلى من سارت معي نحو الحلم.. خطوة بخطوة

بذرناه معاً.. وحصدناه معاً

وسنبقى معاً.. بإذن الله

(إلى زوجتي الغالية)

Declaration

I certify that this thesis submitted for the degree of Master is the result of my own research, except where otherwise acknowledged and that this thesis (or any part of the same) has not been submitted for a higher degree to any other university or institution.

Signature:

Student's Name: Sameh Fayoumi

Date: 26/5/2018

Abstract

Background:

The incidence of Neonatal Jaundice is increased in infants of East Asian, Indian, American and Greek descents. Greater awareness is needed among nurses to assess jaundice and educate parents on how to assess jaundice and prevent complications. Nurses must have good practices to provide proper services to keep newborns free from any harm or malpractice that might lead to other complications. The overall aim of this study was to assess the knowledge, attitude and practice (KAP) of nurses working in (NICU) and Pediatric Wards.

Aim of the study:

To assess the knowledge, attitude and practice of nurses working in (NICU) and pediatric wards regarding Neonatal Jaundice in the northern area of the West Bank.

Study Design:

A descriptive, cross sectional study was done using a convenience sample of all nurses (n=174) working in the NICU and pediatric wards in 9 governmental and private hospitals in the Northern area of the West Bank.

Study Tools:

After reviewing the previous studies, a-68 items questionnaire was formulated by the researcher to assess the knowledge, attitude and practice among nurses working in NICU and pediatric wards regarding neonatal jaundice.

Results:

The study founded that 90.2% (157) of nurses had a moderate knowledge of neonatal jaundice. Most of the nurses gained high level of knowledge about various types of neonatal jaundice and differences among them. The results also showed that 157 (90.2%) participants

had moderate level of knowledge about signs and symptoms, treatments and complications of neonatal jaundice. No significant differences were found between knowledge and marital status, level of education, total experience, type of shift, place of residence, and the age of the participants. 81.6% (142) of nurses held positive attitudes about neonatal jaundice. 85.1% (148) nurses had moderate level of practice regarding neonatal jaundice. No significant differences were found between attitudes and practice of nurses with demographic factors except between attitudes and training. Results found a positive relationship between knowledge and practice. It also showed a positive relationship between attitude and practice.

However; the result showed no association between knowledge and attitude regarding Neonatal Jaundice.

Conclusion:

The study demonstrated that nurses working in (NICU) and pediatric wards had moderate knowledge and practice with a positive attitude regarding Neonatal Jaundice. This highlights the need of a more appropriate education for nurses. Ministry of Health must implement the necessary interventions that must standardize practice to ensure efficiency and effectiveness while securing children safety in the care delivered. This ultimately will most likely to prepare mothers for discharge, to reduce newborn readmission for jaundice, and enhance maternal satisfaction.

معرفة الممرضيين والممرضات حول صفار الاطفال حديثي الولادة في وحدة العناية المركزة للاطفال حديثي الولادة

واقسام الاطفال في مستشفيات شمال الضفة الغربي بفلسطين

اعداد: سامح محمد حسن فيومي

اشراف: دكتورة سلام الخطيب

الملخص

تزداد نسبة اليرقان الوليدي لدى الرضع من شرق آسيا والهند والأمريكيين واليونانيين, يتحمل الممرضين والممرضات مسؤولية تعليم أولياء الأمور عن اليرقان في وقت مبكر لأن الآباء هم الوحيدون الذين يبقون على اتصال مغلق مع الطفل بعد الخروج من المستشفى. هناك حاجة إلى مزيد من الوعي بين الممرضين والممرضات. يجب على الممرضيين والممرضات تقديم تقييم دقيق اليرقان وتثقيف الآباء على كيفية تقييم اليرقان من أجل منع المضاعفات, لذلك ، يجب أن يكون لدى الممرضيين والممرضات ممارسات جيدة لابعاد الاطفال عن أي ضرر أو سوء تصرف يؤدي إلى مضاعفات أخرى. ولهذا السبب ، كان الهدف العام للدراسة هو تقييم المعرفة والموقف والممارسة للممرضيين والممرضات العامليين في اقسام العناية الحثية للاطفال واقسام الاطفال.

الهدف من الدراسة:

تقييم معرفة وموقف وممارسة الممرضيين والممرضات العامليين في وحدات العناية المركزة للاطفال حديثي الولادة وأجنحة الأطفال فيما يتعلق باليرقان في المنطقة الشمالية من الضفة الغربية.

منهجية الدراسة:

اجريت دراسة مقطعية وصفية باستخدام عينة من جميع الممرضيين والممرضات (عددعم = 174) يعملون في وحدات العناية المركزة للأطفال حديثي الولادة وأجنحة الأطفال في 9 مستشفيات حكومية وخاصة, في المنطقة الشمالية من الضفة الغربية.

اداة الدراسة: بعد مراجعة الدراسات السابقة ، قام الباحث ببناء استبيان مكون من 68 سؤالا لتقييم المعرفة والمواقف والممارسات بين الممرضيين والممرضات العامليين في وحدات العناية المركزة للاطفال حديثي الولادة واقسام الاطفال فيما يتعلق باليرقان.

النتائج: اظهرت الدراسة أن (157) 90.2٪ من الممرضيين والممرضات كان لديهم معرفة معتدلة باليرقان. لم توجد فروق ذات دلالة إحصائية بين المعرفة والحالة الاجتماعية ، ومستوى التعليم ، والخبرة الكلية ، ونوع الوردية ، ومكان الإقامة ، وعمر المشاركين.(142) 81.6 ٪ من الممرضيين والممرضات لديها مواقف إيجابية حول اليرقان.(148) 85.1٪ من الممرضيين والممرضات لديهم مستوى معتدل من الممارسة فيما يتعلق باليرقان, لم يتم العثور على فروق ذات دلالة إحصائية بين مواقف وممارسة الممرضين والممرضات مع العوامل الديموغرافية باستثناء ما بين المواقف والتدريب. وجدت النتائج وجود علاقة إيجابية بين المعرفة والممارسة. كما أظهر وجود علاقة إيجابية بين الموقف والممارسة. ومع ذلك؛ أظهرت النتائج عدم وجود علاقة بين المعرفة والموقف فيما يتعلق باليرقان.

الاستنتاج: بينت الدراسة ان الممرضيين والممرضات العاملين في وحدات العناية المركزة للاطفال واقسام الاطفال لديهم معرفة وممارسة معتدلة مع موقف ايجابي إيجابي فيما يتعلق باليرقان الوليدي. هذا يسلط الضوء على الحاجة إلى تعليم أكثر ملائمة للمرضيين والممرضات. يجب على وزارة الصحة تنفيذ التدخلات اللازمة التي تؤدي الى توحيد الممارسة من أجل ضمان الكفاءة والفعالية مع ضمان سلامة الأطفال في الرعاية المقدمة. ومن المرجح أن يقوم هذا في نهاية المطاف بإعداد الأمهات من أجل اخراج الاطفال من المستشفى ، والحد من إعادة دخولهم الى المستشفى بسبب اليرقان, وتعزيز رضا الأمهات

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List of abbreviation

NNJ	Neonatal jaundice
G6PD Deficiency	Glucose-6-Phosphate Dehydrogenase Deficiency
KAP	Knowledge, Attitude, Practice
NICU	Neonate Intensive Care Unit
AAP	American Academy of Pediatric
RBC	Red blood cell
ABO incompatibility	A, B, and O are the three major blood types. The types are based on small substances (molecules) on the surface of the blood cells. When people who have one blood type receive blood from someone with a different blood type, it may cause their immune system to react. This is called ABO incompatibility.
RH incompatibility	Rhesus (Rh) factor protein found on the surface of red blood cells, Rh incompatibility is a condition that develops when a pregnant woman has Rh-negative blood and the baby in her womb has Rh-positive blood.
WHO	World Health Organization.
SPSS	Statistical Package for Social Science
DF	Degree of Freedom
SD	Standard Deviation

Chapter one

Introduction

1.1 Introduction

Physiological Jaundice is a condition in which bilirubin raises in the blood stream that caused yellowish skin and eyes in the first days of life (2ed-4th day). It affects 60% of full term babies and 80% of preterm babies. In the pathological jaundice, bilirubin raises in the first 24 hours and it is known to occur in 4-8% of newborn babies (Kulkarni, Dolas and Doibale, 2014). The unconjugated bilirubin in neonate can lead to acute bilirubin encephalopathy which first presented as lethargy, hypotonia and poor sucking (Arnolda et al., 2015). The normal total level of serum Bilirubin in newborn infants is between 0.2 mg/dl and 1.2 mg/dl, when it rises to 3mg/dl or higher skin and eyes become yellow (Selahudin et al., 2011).

The incidence of Neonatal Jaundice is increased in infants of East Asia, India, America and Greek descent (Hansen, 2017). Neonatal Jaundice first visible in the face and forehead, gradually it becomes visible on the trunk and extremities (Hansen, 2017). In most time, it does not caused problem and disappear within 2 weeks in the full-term baby but needs a good observation and a good assessment of the severity.

Bilirubin is formed by destruction of the red blood cells which have low life span (70-90 days) unlike adult red blood cells (RBC) which have along life span (120 days) (Berkowitsch et al., 2000). Immature system (gastro intestinal and liver), increased RBC destruction and decreased hepatic blood flow causes jaundice in the newborn (Cohen, 2006).

Signs and symptoms of Neonatal Jaundice depend on the severity of attack, including yellowish skin and eyes, poor feeding, apnea, hypothermia, bruising, vomiting, lethargy, weight loose, dark urine and other (Cohen, 2006).

The risk factor for developing hyperbilirubinemia includes early discharge, in which discharge from hospital at or before 48 hours postpartum and this increases risk of hyperbilirubinemia because the baby will not be under medical supervision (Wells and Musser, 2013). Another factor includes breast feeding difficulties (not enough breast-feeding jaundice). Therefore; difficulty in breast feeding can cause common and usually transient hyperbilirubinemia (Wells and Musser, 2013). Other risk factors include ABO incompatibility, septicemia RH incompatibility, G6PD deficiency (Kulkarni, Dolas and Doibale, 2014). Premature babies are at risk for developing hyperbilirubinemia due to inability to remove bilirubin from their bodies and develop mild or sever jaundice.

If there are missed diagnose, undiscovered or too much late diagnose of NNJ, complication will occur such as kernicterus. For example, a study that was conduct on trend on hospitalization for Neonatal Jaundice and kernicterus in the united states between 1988 - 2005" showed 2.7 per 1, 00, 000 diagnosed with the kernicterus, phototherapy or exchange transfusion was recorded for 15.6% new born, A study was done by (Bhutan et al., 2004) suggested that early detection, prevention and treatment of severe hyperbilirubinemia should make kernicterus a preventable disease.

Therefore, having knowledge, attitude and practice will help nurses to prevent this complication and so decrease hospitalization.

The criteria for intervention to control hyperbilirubinemia vary in different clinical situation, phototherapy is cheap, effective and safe method of management of neonatal hyperbilirubinemia, prophylactic phototherapy is indicated for infants weighing less than 1500 grams. Early Exchange transfusion is an effective method of lowering elevated bilirubin and reverses the transient bilirubin brain damage (Kulkarni, Dolas and Doibale, 2014). A study was done by Gupta, Nagdeve and Sarin (2005) showed nearly 25 – 50 % of all new born and a much higher percentage of premature babies developed hyper

bilirubinemia. It was also considered a possibility of extra hepatic biliary atresia, during management of a case of a direct hyperbilirubinemia, the result of the study showed that surgical intervention had better outcome (Gupta, Nagdeve and Sarin, 2005)

Increased knowledge of the incidence and consequences of severe hyperbilirubinemia is essential for planning, implementation and assessment of interventions to ensure that infants discharged as healthy from their birth hospitals, have a safer transition to home, avoiding morbidity due to hyperbilirubinemia and other disorder (Kavehmanesh et al., 2008). For successful management, nurses should have adequate knowledge on early detection, level of serum bilirubin and early interventions. Nurses, parents, physician must have early assessment for newborns jaundice before discharge and after by routine follow up and visit. Nurses must accurately assess the present and severity of jaundice and educate parents how to assess jaundice to prevent complications. There are so many complications related to the Neonatal jaundice such as mortality, hearing loss, harm caused by hospitalizations, failure of treatment, length of hospital stay (Cohen, 2006). Therefore, nurses must have good practices to provide proper services to keep babies from any harm or malpractice that lead to other complications. For the above-mentioned reasons, the overall aim of the study was to assess the knowledge, attitude and practice (KAP) of nurses working in (NICU) and Pediatric Wards.

1.2 Justifications of the study:

Neonatal Jaundice is a common condition affecting newborn babies and it's the most clinical condition in the newborn that requiring evaluation and good management (Ng and Chong, 2014). It usually occurs in the first week of life. A study was conducted in neonate unit of Rangpur Medical Collage Hospital showed that 33% of newborn develop jaundice in 1-2 day, 42% of newborns develop jaundice within 3-4 day and 20% of newborn develop jaundice within 5-6 day, and 5% of newborn developed jaundice after 6 days. The objective of this study was to identify the model of postnatal continuity of care most likely to prepare mothers for discharge, to reduce newborn readmission for jaundice, and to enhance maternal satisfaction (Goulet, et al., 2007). Nurses have the responsibility of teaching parents about jaundice early sign because parents are the only one who will keep closed contact with baby after discharge.

A Study which was conducted on 1666 Iranian mothers between June 2004 and February 2007 showed that 77% of mother had moderate to high level of knowledge about Neonatal Jaundice (Amirshaghaghi, et al., 2008), this result indicates the importance of having nursing knowledge about Neonatal Jaundice to educate the mothers how to deal with this serious problem.

Another Study was conducted with health worker in Nigeria showed that only 54.4% the health worker had adequate knowledge of effective treatment, none of the participants knew any effective means of prevention (Ogunfowora and Daniel, 2006)

Neonatal nurses are in the first line that face Neonatal Jaundice and have the responsibility of answering parents' questions and having the determination to educate parents how to make early evaluation to their Neonatal Jaundice. Therefore, the results of this study will inform practice.

So a wide awareness is needed among nurses and parents because bilirubin concentration in newborn usually peaks between the third and fifth day (Goulet et al., 2007)

Unfortunately, and according to researcher knowledge there is neither accurate statistic relating to Neonatal Jaundice in Palestine, nor any study that assesses nurses' knowledge, attitudes and practice regarding Neonatal Jaundice, so it's important to fill the knowledge gap about this topic which ultimately will inform practice. It will provide inputs into developing feasible and sustainable interventions to improve neonatal survival.

1.3 Problem statement:

Through long experience of working with new babies, I found that Neonatal Jaundice is very common and become very serious to cause death in neonates from inadequate interventions. I also found there was dearth in the studies that addressed this issue in Palestine; therefore, studies are needed to fill the knowledge gap. In this study I assessed the level of knowledge, attitude and practice about Neonatal Jaundice among nurses who were working in NICU and pediatric Wards at the northern area of West Bank (Nablus, Jenin, Tulkarm, Qalqelia, and Tobas).

1.4 Aim of the study:

To assess the knowledge, attitude and practice of the nurse working in NICU and pediatric wards regarding Neonatal Jaundice in the north area of the West Bank.

1.5 Study objective:

1. To determine the level of knowledge, attitude and practice on Neonatal Jaundice among nurses in north area of West Bank.

2. To assess the association between knowledge score and selected demographic variables (gender, age, marital status, educational level, work status, total experience in neonate and pediatric wards, type of shift, receive training, and place of residence)

3. To assess the association between practice and attitude of nurse regarding Neonatal Jaundice with selected demographic variables (gender, age, marital status, educational level, work status, total experience, type of shift, receive training, and place of residence)

4. To assess the relationship between knowledge of nurses toward Neonatal Jaundice and their practice.

5. To assess the relationship between knowledge of nurses toward Neonatal Jaundice and their attitudes.

1.6 Study Hypothesis:

1. There will be a significant association between knowledge score and demographic variables.

2. There will be a significant association between attitude score and demographic variables.

3. There will be a significant association between practice score and demographic variables,

4. There will be a significant association between knowledge score and practice.

1.7 Limitations of the study:

Firstly, the cross-sectional design and limited study area meant that the knowledge, attitudes and practice of participants may not be representative to the entire population.

Secondly, while all attempts were made to provide the best possible environment in which to undertake this study, nurses were overloaded. This left little time for answering the long questionnaire, it took around 30 minutes so in other more controlled environments knowledge, practice and attitude responses may have slightly differed.

Thirdly, I acknowledge that truly representative samples can only be obtained through random sampling techniques, but by using purposive sampling, I was able to access the precipitants who were available and willing to provide information.

Chapter Two

Literature review

2.1 Introduction:

This chapter presents the studies about knowledge, attitude and practice of nurses and mothers of infants about NNJ.

2.2 Studies related to knowledge, attitude and practice about neonatal jaundice

A study was conducts by Shrestha (2013) aimed to determine the knowledge and practice of nursing staffs regarding the care of neonates with phototherapy. The investigator selected the descriptive and exploratory research questionnaire designed for the study regarding knowledge and practice among nursing personnel about the care of neonates on phototherapy.

Data collection was done within a period of two weeks from15th to 30th of April 2007 by the researcher herself. The level of knowledge score was converted into percentage and overall adequacy of knowledge was graded according to the following criteria: If score > 75% highly knowledgeable If score 50 % to 75% moderate knowledge If score <50% inadequate knowledge.

The sample size was fifty and the sampling technique was Purposive sampling technique. Semi structured questionnaire was used to collect data. The findings revealed that most of the respondents 28 (56%) were highly knowledgeable and 22 (44%) respondents were with average knowledge. No respondents were below 50% level.

Another study was conduct by Rajakumari (2015) to evaluate the effectiveness of structured education on knowledge, attitude and practice regarding phototherapy among nursing students. Data collection was done in English the questionnaire was distributed to each

nursing students. At the end of the teaching the doubts were cleared. Then 10 minutes was allotted for discussion. An oral consent was obtained from the students and confidentiality of the responses assured. All the students were participated with great interest. They were co-operative and attentive. After seven days of structured teaching program, post test was conducted with the same questionnaire for the same students. The investigator selected 50 nursing students who fulfilled the inclusion criteria. The finding indicated clearly that 48% of students had inadequate knowledge and 68% of them had negative attitude and 62% of them had poor practice regarding care of baby during phototherapy. A well planned structured teaching programmed given to the same group. The effectiveness of programmer showed high level of significant at $p<0.001$ level. It showed that structured teaching programmer was an effective method to improve the knowledge, attitude and practice of phototherapy.

Rodrigo and Cooray (2011) assessed the knowledge, attitude & behavior on Neonatal Jaundice of postnatal mothers in Provincial General Hospital, Badulla.

The study population comprised all postnatal mothers during the six-week study period. Severely ill mothers, those transferred within 48 hours of filling the questionnaire, mentally subnormal mothers and mothers who had not given consent for the study were excluded.

A structured questionnaire was formulated in English for collection of data and translated into Sinhala and Tamil. The questionnaire consisted of four parts recording information on socio demographic data of the mother and information related to the mother's knowledge, attitude, and behavior.

Results showed that the mean knowledge score was 31 ± 14, the mean attitude score 65.7 ± 20.6 and the mean behavior score 66.1 ± 18.8. Ethnicity, level of education and previous experience with Neonatal Jaundice showed a significant association with the

knowledge score. Knowledge of Neonatal Jaundice among postnatal mothers was low and this was significantly associated with educational level and ethnicity. There was a significant correlation of mothers' attitude and behavior scores with the knowledge scores.

Another cross sectional study was conduct by Adebami (2015) to assess the knowledge in the care of Neonatal Jaundice at the primary and secondary health care delivery in Nigeria. Twelve local government primary health and maternity centers and 2 state owned general hospitals (secondary health facilities) in Osun State, Southwest Nigeria were included in the study. The questionnaire contained questions to assess the knowledge of the health workers regarding Neonatal Jaundice causes, treatment and complications. Staff judgment on the effectiveness of methods and drugs being prescribed were also assessed. The results showed one hundred and forty-one (67.5 percent) were primary health care workers and 68 (32.5%) were staff in secondary health care facilities. There was significantly better understanding of causes, management and complications of Neonatal Jaundice among secondary health care workers than primary health care workers (p at least 0.007). Common pharmacological agents prescribed were Ampiclox (Ampicillin-Claxacillin formulation), Glucose water, Multivitamins, phenobarbitone, other antibiotics and injections at both health care levels.

Opara, Alex-Hart and Dotimi (2014) examined the knowledge of community Health Workers about Neonatal Jaundice among Community Health Workers in Southern Nigeria.

Convenient sample of community health workers, & a simple structured questionnaire adopted from a similar study carried out in the western part of Nigeria was used for data collection. Questionnaires were distributed randomly just before the commencement of one of the sessions of the workshop.

There were 200 participants, 91 males and 109 females giving a male to female ratio of 1: 1.2. The mean duration of service was 6.01±4.97 years. 191 (95%) had fair to adequate

knowledge of description of NNJ. However, only about 25% of respondents had good knowledge of its causes. Antibiotics and glucose water were perceived by 60.4% and 37.5% of community health workers as useful drugs in the management of NNJ, while 82% would recommend sunlight as effective treatment. Work experience was significantly associated with knowledge of the use of exchange blood transfusion.

Another study aimed to assess the knowledge and attitude levels on Neonatal Jaundice among Orang Asli in Sepang, Selangor was done by Nazrin et al. (2016). The population was mostly from the Mahmeri ethnic and currently most of them were working in private and government sectors. They easily accessed health facilities and school. A simple random sample of adults aged 18 years and above was selected. They are considered residents if they have been residing in the village for at least 3 months. The exclusion criteria include non-aboriginals, mute and/or visually challenged, or have hearing impairments and mental disorders. Respondents who refused to participate in the survey or were not there during the survey for about twice will be considered as non-respondents. Data were collected by an interviewed structured questionnaire

Results showed that 102 respondents (67%) were aware about neonatal jaundice. Most respondents who aware on Neonatal Jaundice were at the age of 31-40 years (30.4%), female (72%), had secondary education (47%), married (78.4%) and had children (86%). Among those who were aware on neonatal jaundice, 67.6% had good knowledge

Orimadegun and Ojebiyi (2017) assessed knowledge and practices relating to Neonatal Jaundice (NNJ) among community health workers (CHWs) and community birth attendants (CBAs) in Nigeria.A cross-sectional survey of all 227 CHWs and 193 registered CBAs in Ibadan, Nigeria.The target population for the study included CHWs (community health officers and community health extension workers) at the primary health centers and CBAs

in the 11 local government areas that made up Ibadan. At the time of the study, there were a total of 433 eligible health workers in the 11 LGAs selected for this study.

The data for the study were collected using an interviewer administered semi-structured questionnaire. The items in this questionnaire were adapted from the study by Ogunfowora and Daniel (2006). The questionnaire had three sections which covered questions on socio-demographic characteristics, knowledge and practice regarding NNJ, respectively.

The data were collected by the researcher and trained research assistants within a period of August 2013 − March 2014 and within the normal hours of work (8am − 4pm). Each participant was met by an interviewer, and informed consent was obtained. The interview took an average of 20 min − 25 min.

(64.5%) of the respondents could not correctly describe examination for NNJ (CHWs: 49.4%; CBAs: 50.6%). Of the 200 (47.6%) who treated NNJ 3 months prior to the study, 62.5% (CHWs: 66.9% and CBAs: 53.7%) treated NNJ with orthodox drugs. Drugs prescribed included: antibiotics (93.3%), antimalarial (5.3%), multivitamins (28.0%), paracetamol (6.2%) and phenobarbitone (7.1%). Significantly more CHWs than CBAs practiced exposure to sunlight (33.1% versus 16.4%) and administration of glucose water (28.6% versus 14.9%), while 58.0% of all respondents referred cases to secondary health facilities. Overall, 80.2% had poor knowledge (CHWs: 78.9%; CBAs: 81.9%) and 46.4% engaged in wrong practices (CHWs: 57.3%; CBAs: 33.7%). CHWs were more likely to indulge in wrong practices than CBAs (OR = 2.22, 95% CI = 1.03, 4.79).

So primary Health Workers in Ibadan had poor knowledge and engaged in wrong practices about NNJ. The needs to organize regular training programmers were emphasized.

Another study that assessed knowledge, attitude and practice was done by Abai et al. (2011) among nurses in Kuching District. The aim of the study was to increase the knowledge and practice of early detection of Neonatal Jaundice by nurses.

The sample comprised 113 nurses of all categories working in urban and rural maternal and child health clinics in Kuching District. Study Period: July 2009 until January 2010.A self administered questionnaire format was the tool of the study. Results showed that only 56.6% were able to identify the risk of factors causing jaundice; 94.6% able to define jaundice; 41.5% able to detect jaundice while 70.8% knew sign of Kernicterus. In term of recommended post natal nursing schedule only 40.7% able to practice the schedule while only 69.0% able to give advice on management of jaundice. Post intervention; 63.2% of nurses were able to identify the risk factors causing jaundice; 97.2% able to define jaundice while 97.2% were able to detect jaundice and 88.6% know sign of Kernicterus. On recommended post natal nursing schedule, 49.9 % practice the recommended schedule while 92.0% were able to give advice to mother on management of jaundice. The incident of jaundice of Severe Neonatal Jaundice dropped to 78 per 100, 000 live births in 2010.

Shrestha (2013) conducted a descriptive and exploratory research study to assess the knowledge and skills/practice of nurses regarding the care of neonates with phototherapy. The sample size was fifty and the sampling technique was purposive sampling technique, design was adopted for the study from 15th to 30th April 2007 for two weeks at Paropakar Shree Panch Indra Rajyalaxmi Devi Prasuti Griha Thapathali, Kathmandu. A semi structured questionnaire was designed to collect the data from 50 respondents working in different wards. The data collected were analyzed and interpreted based on descriptive and inferential statistics.

The findings revealed that most of the respondents 28 (56%) were highly knowledgeable (the knowledge level of the respondents more than 75 %) and 22 (44%) respondents were with average knowledge (more than 50% and less than75%). No respondents were below 50% level.

2.3 Summary:

This chapter summarizes the studies that were done to assess knowledge, attitude, and practice, for different sample of population (mothers, nurses, health workers, and students).

Chapter Three

Conceptual framework

3.1 Introduction:

This chapter discusses the conceptual framework of the study which was built according to the studied literature reviews assessing the same research topic. In addition, operational definitions will be presented.

3.2 Conceptual framework

The conceptual framework has two overarching concepts. The first is the core elements which are knowledge, attitude and practice, and are considered dependent variables. The second component is the demographic factors which are independent variables expected to affect the KAP variables regarding neonatal jaundice.

3.3 Study conceptual framework

Three factors (knowledge, attitudes and practice) are interrelated to reduce the incidences of severe effects of neonatal hyperbilirubinemia and to restore the health of newborns. Utilizing all available resources and changing the normal approach to care of the infants are needed to improve knowledge, attitude and practice of nurses in NICUs and Pediatric Wards.

Knowledge is the condition of knowing something with familiarity gained through experience (Dictionary of the English Language. Delux Encyclopedia 6th Edition).

Adequate knowledge about Neonatal Jaundice will play a major role in detecting risk factors, preventing complications and providing appropriate management. Furthermore, adequate knowledge about Neonatal Jaundice causes and treatment measures will ensure that nurses will tackle the appropriate skills and actions to avoid complications.

Practice: can be described as the actual doing of something. In this study, practice relates to the nurses' way of demonstrating their knowledge and attitudes through their actions when performing and implementing Neonatal Jaundice management.

This will be essential in reducing the mortality and morbidity of neonates who suffered from neonatal jaundice. Although knowledge is a main force in influencing individual's choice of action, attitudes also has an important role in motivating positive practice.

Attitudes: refer to the relatively stable emotional tendency to react in a certain way towards a specific object, person or group of people (Robbins, Odendaal and Roodt, 2003, P, 72).

3.4 Dependent factors Knowledge, Attitudes, and Practice and relationship with independent factors

The conceptual framework of the study was based on the results of literature reviews that indicate a relationship of socio-demographic variables (Gender. Age, Marital status, Education level, Work status, Total experience in NICU and pediatric world, Type of shift, Receive training and Place of residence) on KAP about Neonatal Jaundice:

Previous study showed that employee in general were reluctant to share knowledge (Husted, Michailova and Minbaeva (2005), so it is very important to gain understanding about the demographic factors that influence the knowledge.

In term of relationship between gender and knowledge, a previous study by Shresttha (2013) reported that gender did not have significant impact on knowledge regarding Neonatal Jaundice. However, another study suggested that difference of age could be also a potential factor for knowledge level (Abai., et al., 2011) as they stated that majority of participants (nurses) were mature and responsible which made a significant relationship between the age of the participants and their knowledge regarding to the Neonatal Jaundice.

Level of education was also reported to not influence knowledge (Abai et al., 2011), but previous study like Shresttha (2013), mentioned that level of education played a major role in increasing the knowledge.

Mohamed et al. (2013) stated that there was a relationship between knowledge and experience regarding Neonatal Jaundice. While the previous studies found varied results about the relationship between sociodemographic factors, this study would be beneficial to examine the association between varied factors and knowledge, practice and attitudes of neonatal and pediatric nurses in Palestine.

3.5 Relationship between knowledge (independent) and practice (dependent)

Rafferty, Allcock, and Lathlean (1996) state that the theory/practice gap can never be sealed entirely; they are by nature always in dynamic tension, and this tension is essential for change to occur in clinical practice. This tension, seen from a positive point of view can motivate nursing professionals to work on the issue; it also provides room for avoiding stagnancy in the profession. Studies stressed that updating nurses' knowledge through training will ensure gaining accurate information and will also improve their management abilities and performance regarding Neonatal Jaundice (Ogunfowora and Daniel, 2006). The conceptual framework based on the relationship between the independent variable (knowledge) and dependent variable (practice) and claims the effect of nurses' knowledge and awareness regarding Neonatal Jaundice on their skills and management of babies with neonatal jaundice.

3.6 Relation between knowledge (independent) and attitude (dependent)

Knowledge is a structural property of attitudes that is a function of the number of beliefs and experiences linked to the attitude in memory and the strength of the associative links

between the beliefs or experiences and the attitude (Krosnick and Petty, 1995). Several studies have supported that increases in knowledge are associated with greater influence of attitudes. For example, Kallgren and Wood (1986) found that attitudes based on high amounts of knowledge were more predictive of environment-related behavior than were attitudes based on low amounts of knowledge. Similarly, Davidson et al. (1985) found that intentions were better predictors of behavior when they were based on high amounts of knowledge than when they were based on little knowledge, so conceptual framework built on the relationship between having good awareness and knowledge toward Neonatal Jaundice and positive attitude. Positive attitudes mean that nurses value and appreciate their role as a health care team member to promote the safe care of newborn at risk for developing jaundice.

Conceptual framework

Work status
Educational level
Total experience
Marital status
Types of shift
Age
Received training
Gender
Knowledge
Attitudes
Practice
Place of residence
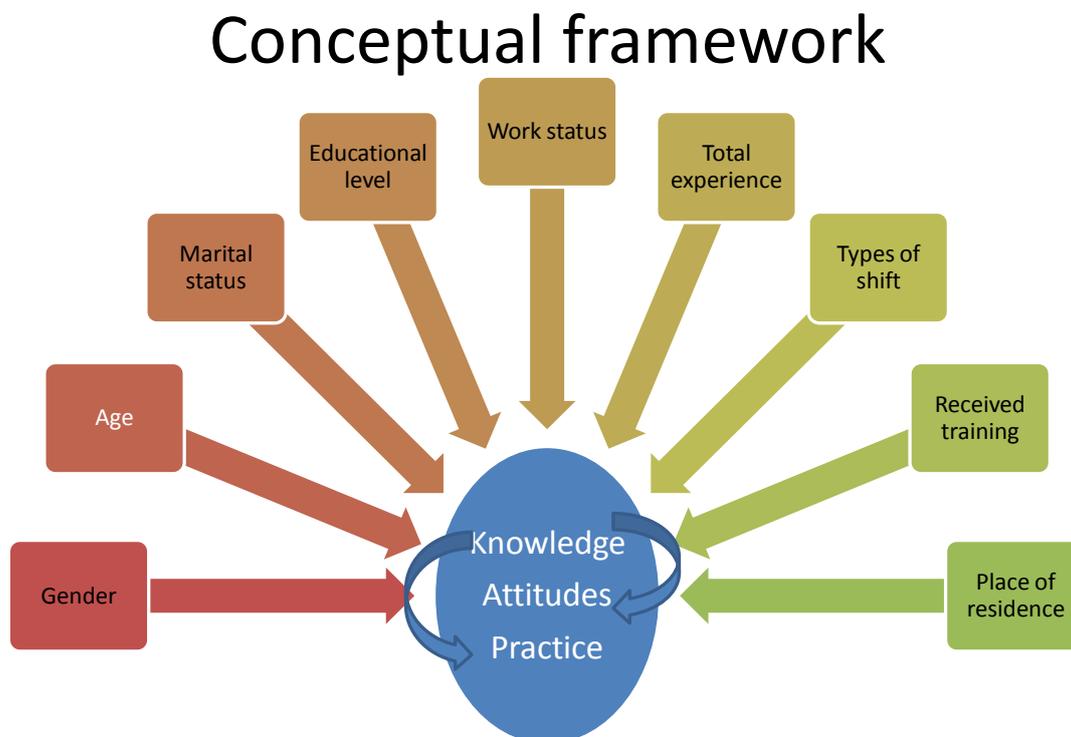
Figure (1) Conceptual Framework of the study

3.7 Definitions of terms

o **Assess**: To judge or decide the amount, value, quality or importance of something.

o **Neonate**: according to WHO, 2006 neonate, is a child under 28 days of age. During these first 28 days of life, the child is at highest risk of dying. It is thus crucial that appropriate feeding and care are provided during this period, both to improve the child's chances of survival and to lay the foundations for a healthy life.

o **Neonatal Jaundice:** Neonatal Jaundice refers to the yellow discoloration of the skin and sclera of newborn babies that results from hyperbilirubinemia**.**

o Knowledge is the condition of knowing something with familiarity gained through experience (Dictionary of the English Language. Delux Encyclopedia 6th Edition). The knowledge possessed by nurses refers to their understanding of neonatal jaundice.

o **Attitudes**: refer to the relatively stable emotional tendency to react in a certain way towards a specific object, person or group of people (Robbins, Odendaal & Roodt, 2003, P, 72). Attitudes can be positive or negative and can reflect the behavior of the individual person. For the purposes of this study, attitudes refer to the nurses' behavior toward Neonatal Jaundice

o **Practice**: can be described as the actual doing of something. In this study, practice relates to the nurses' way of demonstrating their knowledge and attitudes through their actions when performing and implementing Neonatal Jaundice management.

o **Knowledge on practice:** Knowledge on practice refers to awareness of nurses on skills and management of babies with neonatal jaundice.

o **Neonate intensive care unit:** A special area in the hospital for critically ill newborn or premature babies, for more closed observation and cared by specialized nurses' team.

o **Gender:** refer to male or female of nurses working in NICU and pediatric world who accept to participate

o **Age:** refer to the age of nurses, who accept to participate, it was divided to four group (20-29, 30-39, 40-49, 50-29)

o **Marital status:** refers to the marital status of the nurses and divided to four group (Single, married, Divorced, Widowed)

o **Educational level:** this refer to level of nursing education for the participants and it was divided to four group (Diploma, bachelor's degree, postgraduate degree, master's degree)

o **Work status:** refers to work status of the participants, it was divided to three group (head nurse, educator, and registered nurse)

o **Total experience in NICU and pediatric world:** this refer to the number of year in working on NICU and pediatric world and it divided to six group (less than 1 year, 1-5 years, 6-10 years, 11-15 years, 16-20 years, more than 21 years)

o Type of shift: refer to shift type and divided to three group (day. evening and night)

o **Previous training:** refers to training that received by participant to deal with NNJ, it divided to two group yes (received training) and no (did not received any training)

o **Place of residence:** refers to residence place for the participants and divided to (City, Village and camp)

3.8 Summary:

This chapter presents the conceptual framework of the study in relation to the previous studies. It also presented the definitions of the terms that the study addressed.

Chapter four

Methodology

4.1 Introduction:

This chapter describes the research methodology which used to assess the knowledge, attitude and practice about Neonatal Jaundice among nurses working in NICU and Pediatric Wards in the northern area of West Bank hospitals.

It explains the study design, study population and sampling technique, research instruments for data collection, validity and reliability, permissions and ethical considerations, and data analysis.

4.2 Study design

A descriptive, cross sectional study design. Descriptive because it assesses and describes knowledge, attitudes and practice of NICU and pediatric Wards nurses toward neonatal jaundice. Cross sectional because data were collected at the same time. Quantitative because it has measure data through self-administered questionnaire, and there were no interviews.

Quantitative methods are those research methods that use numbers as its basis for making generalizations about a phenomenon, these numbers originate from objective scales of measurement of the units of analysis called variables. The data can be gathered through surveys using instruments that require numerical inputs or direct measurements of parameters that characterize the subject of investigation (Regoniel, 2015)

4.3 Study area

The Study took place in Governmental and Private Hospitals in the Northern area of West Bank of Palestine. The researcher chose the northern area of West Bank to be as

sample. Rafidya Hospital in Nablus is the largest referral hospital in the northern West Bank and hence receives patients from all across the Palestinian Territory It contain many wards that provide different service for people, first one is the Emergency ward that provides surgical services as urgent case, surgical ward for operation, an operation room for minor and major operation, Urology ward, burn unit, pediatric ward which consists of (25) beds and (30) nurses and NICU that consists of (25) beds and (30) nurses. Specialized Arab hospital is private for profit hospital in Nablus, beds distributed on several wards, like emergency, women ward that give medical and surgical service and men ward also give medical and surgical service too, also the hospital had a cardiac center for medical and surgical intervention of heart disease, the hospital contains NICU which is a referral ward for difficult cases from all Palestine even from Gaza strip, the ward consists of 25 beds and 26 nurses, and so the hospital has the largest ophthalmic ward in the city.

Nablus Specialized hospital is private for profit hospitals in Nablus, contains (80) beds and (108) nurses and has many different departments like emergency, ICU, CCU, Surgical ward and medical ward, cardiac center for cath, medical and surgical management, and NICU ward that consists of 16 beds and 15 nurses.

The Thabet Thabet Hospital represents an important pillar for the city of Tulkarem and the surrounding villages; as it provides essential health services and specialty care for over 200, 000 people, many wards like other governmental hospitals, Al Zaka hospital is a private hospital that is placed in Tulkarm city, and contains (65) beds and gives service through many wards like emergency, surgical ward, ICU, medical ward, and NICU that has (8) beds and 10 nurses.

Jenin governmental hospital in Jennin district is a government hospital which has many departments like pediatric ward in which 17 nurses are working and NICU that

has 14 nurses. AL Razy hospital also located in Jenin and provides the services through many wards such as NICU wards that has 11 nurses. Finally, Darweesh Nazzal hospital that is placed in Qalqelia city and it provides services through many wards. NICU has 11 nurses, and pediatric ward has 12 nurses.

This study included all nurses who worked in NICU and pediatric wards in the above mentioned hospitals.

Note: the number of nurses and respondents in each hospital are presented in table 4.1.

4.4 Study population and sampling technique

Target population of this study was all nurses who were working in (NICU) and pediatric wards in the Northern area of West Bank hospitals at the time of data collection (from May 2017- August 2017), the total number of the population was 219. The total number of nurses who were included in the study were 174 (nurses who were available and agreed to participate).So the response rate reached 79.9%.

4.5 Eligibility criteria

Inclusion criteria:

The inclusion included:

- Nurses who were working in neonate and pediatric wards at the time of data collection.

- Nurses who accepted to participate and were available during data collection on visit.

Note: More than 3 visits were made to each hospital to cover the largest number of nurses.

Exclusion criteria:

Study excluded nurses who refused to participate in the study and who were not available at data collection time in the 3 visits.

Table (4.1): Distribution of the sample unit among the selected Hospitals:

Hospital name	NICU nurses No	pediatric nurses No	Total number	NICU nurses No of response	NICU nurses No of response	Total No of response	percentage of response
Rafedia governmental hospital (Nablus)	30	30	60	22	26	48	73.33%
Al-Itihad hospital (Nablus)	9	0	9	7	0	7	77.78%
Al Arabi Specialized hospital (Nablus)	26	0	26	20	0	20	76.92%
Nablus Specialized hospital (Nablus)	15	0	15	12	0	12	80.00%
Thabet Thabet governmental hospital (Tulkarem)	17	17	34	15	12	27	88.24%
Al Zaka hospital (Tulkarm)	10	0	10	8	0	8	80.00%
Jenin governmental hospital (Jennin)	14	17	31	11	13	24	78.57%
Al Razy hospital (Jennin)	11	0	11	9	0	9	81.82%
Darweesh Nazzall (Qalqelia)	11	12	23	9	10	19	81.82%
	143	76	219	113	61	174	78.83

4.6 Study instrument:

Since there was no previously designed questionnaire regarding KAP (Knowledge, Attitude and Practice) of nurses about Neonatal Jaundice, the researcher formulated a questionnaire that addressed all the study's variables that examined the knowledge, attitude and practice of nurses working in NICU and pediatric wards. The researcher used textbooks and previous questionnaires to formulate the questionnaire (Hockenberry, Wilson and Rodgers, 2016; Moawad, Abdallah, and Ali, 2016; National Collaborating Centre for Women's and Children's Health, 2010; Rabiyeepoor, Gheibi and Jafari, 2014).

1- Demographic Data Questionnaire it included the following information: Gender, age, marital status, educational level, work status, experience, type of shift, previous training, and place of residence. (See annex A)

2- Nurses knowledge regarding neonatal jaundice

This part had two sections; the multiple questions and true / false questions (see annexes A). Participants who selected a correct choice from a certain item were considered to have knowledge on that item. Participants who selected wrong choice from a certain item were considered to have no knowledge on that item. Bearing in mind that most of the multiple choice questions had more than one correct answer; if the participant answered less than the half of the correct answer, he was considered having low level of knowledge. And if his answers was the half of the correct answer, he was considered having moderate knowledge and finally if he/she answered more than the half of the correct answer, he was considered having high level of knowledge for example: question No. 1: the physiological jaundice is characterized by which of the following:

The answer of this question is (A) branch and (B) branch, the participant who answered both (A) and (B) was considered having high level of knowledge, answered one of the correct answer was considered having moderate knowledge and if did not answer any of the correct answer, he was considered having low level of knowledge.

First section contained 19 multiple choices and the answers of these questions were ranked from 0 to 2. The following table showed the cut off points for total knowledge score of the first section, the researcher classified the total knowledge to low, moderate and high as the following:

Table (4.2): Scoring of Knowledge about neonatal jaundice

Mean	Item No.	Cut off points	Calculation method	Knowledge score
0.49 – 0	19	0-9	19*0=0 19*0.49=9.31	Low level of knowledge
1.49-0.5	19	10-28	19*0.5= 9.5 19*1.49=28.31	Moderate knowledge
2-1.5	19	29-38	19*1.5=28.5 19*2=38	High level of knowledge

The levels of knowledge were rated according to the above table (see the table 4.2 above)

- **low level of knowledge: if the total of knowledge ranked from 0-9**

- **moderate level of knowledge: if the total of knowledge ranked from 10-28**

- **high level of knowledge: if the total of knowledge ranked from 29-38**

Second section of knowledge scales contains 10 True / false questions: Questions were scored as:

- **0 for incorrect answer**

- **1 for correct answer**

Nurse's practice regarding neonatal jaundice

In this part, the researcher designed a 21-items questionnaire.

The first part: contains13 multiple choice questions (the participants must know it is possible to circle more than one answer in some question) the answers of these questions were ranked according to the table number (4.3):

The total numbers of the questions were 13 and the highest score was 2 so the total score was 26 and the degrees of practice were classified into three categories:

- **Low level of practice: if the total of practice ranked from 0-6**

- **Moderate level of practice: if the total of practice ranked from 7-19**

- **High level of practice: if the total of practice ranked from 20-26**

Table (4.3) Scoring of Practice about neonatal jaundice

Mean	Item No.	Cut off points	Calculation method	Practice score
0.49 – 0	13	0-6	0*13 =0 0.49*13 = 6.37	Low level of practice
1.49-0.5	13	7-19	0.5*13=6.5 1.49*13=19.37	Moderate level of practice
2-1.5	13	20-26	1.5*13=19.5 13*2=26	High level of practice

Second part of attitude scales was a 5-likert scale questionnaire that contained (9) items, and were ranked according to the table number (4.4).

All questions in this part were 9 and the highest code was 5 so the total score was 45 and classified to

- **-Strongly disagree (1): if the total of practice ranked from 0-13**

- **Disagree (2): if the total of practice ranked from 14-22**

- **Neutral (3): if the total of practice ranked from 23-31**

- **Agree (4): if the total of practice ranked from 32-40**

- **5-Strongly agree (5): if the total of practice ranked from 41-45**

Table (4.4) Scoring of practice of Neonatal Jaundice (5-likert scale questionnaire)

Mean	Item No.	Cut off point	Calculation method	Practice score
1.49 – 0	9	0-13	9 *0=0 9*1.49=13.41	Strongly disagree
2.49-1.5	9	14-22	9*1.5=13.5 9*2.49=22.41	Disagree
3.49-2.5	9	23-31	9*2.5=22.5 9*3.49=31.41	Neutral
4.49-3.5	9	32-40	9*3.5=31.5 9*4.49=40.41	Agree
5-4.5	9	41-45	9*4.5=40.5 9*5=45	Strongly agree

Nurses' attitude regarding neonatal jaundice

Nurses' attitude regarding Neonatal Jaundice was a 5-likert scale questionnaire and contained 17-items.

Total questions were 17 and highest score 5 so the total score were 85 and the answers of these questions were ranked as:

- **Strongly disagree (code is1): if the total of attitude ranked from 0-25**

- **Disagree (code is 2): if the total of attitude ranked from 26-42**

- **Neutral (code is 3): if the total of attitude ranked from 43-59**

- **Agree (code is 4): if the total of attitude ranked from 60-76**

- **Strongly agree (code is 5): if the total of attitude ranked from 77-85**

Note: 1-3 (0-59) negative attitude and above 3 (60-85) positive attitude

Table (4.5) Scoring of attitudes of nurses about neonatal jaundice

Mean	Item No.	Cut off point	Calculation method	Practice score
1.49 – 0	17	0-25	0*17=0 1.49*17 = 25.33	Strongly disagree
2.49-1.5	17	26-42	1.5*17=25.5 2.49*17=42.33	Disagree
3.49-2.5	17	59-43	2.5*17=42.5 17*3.49=59.33	Neutral
4.49-3.5	17	76-60	17*3.5=59.5 17*4.49=76.33	Agree
5-4.5	17	85-77	17*4.5=76.5 17*5=85	Strongly agree

4.7 Questionnaire validity:

Validation of the instrument proceeded in two distinct phases. The initial phase involved a group of referees and panel of expert arbitrators, who provided some comments on the tool. The second phase involved the implementation of a pilot study (N=23) to validate the survey using exploratory factor analysis for attitude about NNJ. The researcher presented the questionnaire to a group of 4 experts who were specialized in nursing and pediatric. Their comments were considered by the researcher and modified the questionnaire accordingly.

Pilot study was done for 23 participants in 3 hospitals in Nablus city (Nablus Specialized hospital, Al Arabi specialized hospital and Al Itihad hospital). Factor analysis was done and showed that all items exceeded 0.60 (0.63 to 0.88), which means that those items are suitable in measuring every item of the study topic among the sampled population.

Note: pilot study did not include in the total study

Table 4.6: Factor Analysis

Communalities		
	Initial	Extraction
Neonatal Jaundice is a common problem in newborn	1.000	.883
Neonatal Jaundice is not considered a serious problem	1.000	.636
It is usual for Neonatal Jaundice to last more than 2 weeks in a newborn	1.000	.809
Breast milk is the main reason for neonatal jaundice	1.000	.828
Infection increases the risk of neonatal jaundice	1.000	.844
Severe jaundice may cause death in neonates	1.000	.630
Differences between fetal-maternal blood groups increase the risk of neonatal jaundice	1.000	.705
Phototherapy is the only effective treatment for neonatal jaundice	1.000	.785
Dressing the baby with yellow clothes during jaundice will decrease bilirubin level	1.000	.663
Exposing the baby to sun light will treat jaundice	1.000	.665
Oral herb helps in treating jaundice	1.000	.830
Oral water with sugar will treat jaundice	1.000	.780
Physiological jaundice can simply be treated at home	1.000	.752
Early feeding can help to in increase intestinal motility and increase bacterial flora and so decrease bilirubin	1.000	.831
Conjugated bilirubin is not dangerous like unconjugated bilirubin	1.000	.835
Physiological jaundice is associated with breast milk jaundice	1.000	.867
During phototherapy oily lubricant can be used to moist body	1.000	.665

4.8 Reliability of the study

The reliability was tested using Cronbach's Alpha and Guttman split-half coefficients to ascertain reliability and consistency of the survey. Cronbach's Alpha and Guttman split-half for the survey instrument was 0.75 and 0.71, respectively, indicating a moderate degree of reliability and consistency.

4.9 Data collection and recruitment strategy

After getting the permission from MOH and the selected hospital administrations in the Northern area of West Bank, the researcher distributed the questionnaire by himself. The participants who agreed to participate and were available during data collection filled in the questionnaire sheet. The filling a questionnaire took around 25 minutes, the researcher told them that all data will be confidential and it will be only used for research purpose.

4.10 Permissions and Ethical considerations

Permission was obtained from MOH to begin data collection by distributing questionnaires in government hospitals. After agreement, a written request of agreement was send to all hospitals in order to facilitate researcher's work, in Private hospitals nursing top directors' permission was obtained.

After that, purpose of the study was explained to nurses working in NICU and pediatric wards, oral verbal consent form was obtained from nurses who participated, they had the right to stop or retrain from answering any question. They assured that all data will be confidential. Also the cover page cleared that all the participation in this study was voluntary and they can withdraw at any time (annex A).

4.11 Data analysis

The data was analyzed using Statistical Package for Social Sciences (SPSS) software version 20; the purpose of this analysis was to answer the research questions.

Descriptive statistics had been done to answer all questions (what are the knowledge / attitude / practice score of NNJ among nurses working in NICU and pediatric wards in the area of Northern of West Bank. Percentage of high/ moderate/ low and correct /incorrect and 5 likert scale answers were computed to determine the knowledge/practice/attitude scores, Mean and standard deviation scores of NICU and pediatric Ward's nurses' knowledge

/attitude /practice related to Gender, Age, Marital status, Educational level, Work status, Total experience in neonatal intensive care unit, Type of shift, Receive training were calculated.

T test and ANOVA was utilized to answer the questions that related to the association between knowledge/attitude/practice score of NNJ and selected demographic factor in the northern area of West Bank. Correlation table was done to investigate if there was association between knowledge and practice, knowledge and attitude.

4.12 Summary:

This chapter provides an overview of the methodology that including study design, study population and sampling technique, research instruments for data collection, validity and reliability, permissions and ethical considerations, and data analysis.

<div align="center">

Chapter Five

Results

</div>

5.1 Introduction

In this chapter, study results will be presented. Study population characteristics will be shown in a descriptive analysis. Univariate analysis will also be presented in this chapter.

5.2 Study population

The results showed that the respondents consisted of 174 nurses working in the governmental and private hospitals in the northern area of West Bank, 132 were females (75.9%) and only 42 were males (24.1%), most of the participants were between 20-30 years of age (119) (68.4%) and 98 (56.3%) were married.

Most of the participants were with bachelor degree 94 (54%), and 159 (91.4%) were registered nurses. According to total experience of respondents, the result showed that the most (40.8%) were within 1-5 years of experience. 95 participants (54.6%) had previous training about how to deal with NNJ and most of them lived in the city 75 (43.1%).

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Table 5.1: Distribution of Demographic variables of Participants:

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Demographic Information		Number	Percentage
Gender	Female	132	75.9%
	Male	42	24.1%
Age	20-29 years	119	68.4%
	30-39 years	46	26.4%
	40-49 years	8	4.6%
	50-59 years	1	0.6%
Marital status	Single	72	41.4%
	Married	98	56.3%

	Divorced	3	1.7%
	Widowed	1	0.6%
Education level is	Diploma degree.	61	35.1%
	Bachelor degree	94	54%
	Postgraduate degree	8	4.6%
	Master degree	11	6.3%
Work status	Registered Nurse	159	91.4%
	Educator	8	4.6%
	Head nurse	7	4%
Total experience in neonatal intensive care unit and pediatric world	less than 1	49	28.2%
	1-5 years	71	40.8%
	6– 10 years	42	24.1%
	11– 15 years	9	5.2%
	16 – 20 years	2	1.1%
	21 years	1	0.6%
Type of shift	Day	107	61.5%
	Evening	32	18.4%
	Night	35	20.1%
previous training	Yes	95	54.6%
	No	79	45.6%
Place of residence	City	75	43.1%
	Village	71	40.8%
	Camp	28	16.1%

5.3 knowledge about neonatal jaundice

In this part the questions that related to knowledge are divided into section1 that reflects the multiple choice and section 2 that reflects YES / NO, and they are illustrated in the subsequent tables.

5.3.1 Section one: Knowledge level using multiple choices answers:

The percentage and frequencies were calculated of section1, and they are presented in the table (5.2). Knowledge section 1 asked questions about type of NNJ, signs and symptoms, treatments of NNJ and complications of NNJ. The results showed that 157 (90.2%) participants had a moderate level of knowledge (moderate knowledge means that total answers are equal to half of correct answers) (they took code1). Whereas, the results showed 12 (6.9%) had low level of knowledge (Low level of knowledge means that total answers are below the half of correct answers and they took code 0). Interestingly, only 5 (2.9%) nurses had high level of knowledge (High level of knowledge means that total answers are above the half of correct answers, they took cod 2). Interestingly, 121 (69.5%) participants did not know that neonate should be reevaluated in the first 5 days of life to check for jaundice. This question is considered one of the basic knowledge levels that nurses should have about neonatal jaundice.

Table 5.2: Knowledge level using multiple choice questions

Number of items	Items (multiple choice questions)(questions 1-19)		low level of knowledge	moderate knowledge	high level of knowledge	Total
1	physiological jaundice is characterized by which of the following	Count	43	117	14	174
		Percent	24.7%	67.2%	8%	100%
2	pathological jaundice is characterized by which of the following	Count	44	120	10	174
		Percent	25.3%	69%	5.7%	100%
3	RH incompatibility is a condition develop when	Count	49	0	125	174
		Percent	28.2%	0%	71.8%	100%
4	women with positive indirect coombs test means	Count	88	0	86	174
		Percent	50.6%	0%	49.4%	100%
5	ABO incompatibility is a condition develops when?	Count	53	2	119	174
		Percent	30.5%	1.1%	68.4%	100%
6	In G6PD deficiency, hyperbilirubinemia is secondary to	Count	25	88	61	174
		Percent	14.4%	50.6%	35.1%	100%
7	Jaundice is caused by	Count	57	107	10	174
		Percent	32.8%	61.5%	5.7%	100%
8	normal neonate will appear jaundiced when serum bilirubin level reaches	Count	62	1	111	174
		Percent	35.6%	0.6%	63.8%	100%
9	You should contact the pediatrician if you noted that	Count	104	60	10	174
		Percent	59.8%	34.5%	5.7%	100%
10	If you observe yellow skin color in the lower trunk &thighs you suspect that bilirubin level reaches	Count	93	0	81	174
		Percent	53.4%	0%	46.6%	100%
11	All neonate should be reevaluate in the first 5 days of life to check for jaundice when	Count	121	48	5	174
		Percent	69.5%	27.6%	2.9%	100%
12	How would you check a baby for the presence of jaundice	Count	84	58	32	174
		Percent	48.3%	33.3%	18.4%	100%

13	When a baby is jaundice, urine color can a appear	Count	34	0	140	174
		Percent	19.5%	0%	80.5%	100%
14	In the early phase of acute bilirubin encephalopathy, severely jaundice infants become	Count	41	8	125	174
		Percent	23.6%	4.6%	71.8%	100%
15	complication of high bilirubin is rare, but serious complication can include	Count	90	78	6	174
		Percent	51.7%	44.8%	3.4%	100%
16	complication of exchange transfusion can include	Count	82	82	10	174
		Percent	47.1%	47.1%	5.7%	100%
17	Long term consequences of chronic bilirubin encephalopathy include	Count	53	88	33	174
		Percent	30.5%	50.6%	19%	100%
18	Neonatal Jaundice can be treated by	Count	21	120	33	174
		Percent	12.1%	69%	19%	100%
19	Neonatal response to the treatment by phototherapy depends on	Count	75	85	14	174
		Percent	43.1%	48.9%	8%	100%
Total	**All Items**	Count	**12**	**157**	**5**	**174**
		Percent	**6.9%**	**90.2%**	**2.9%**	**100 %**

5.3.2 Section two: Knowledge level using Yes/ No answers:

Results showed that the total of 159 (91.38%) of the precipitants answered correctly to the knowledge questions about neonatal jaundice while only 15 (8.62%) participants answered incorrectly. This means that the majority of the nurses gained high level of knowledge about Neonatal Jaundice and particularly about various types of Neonatal Jaundice and differences among them.

Table 5.3: Knowledge level in yes/no questions

Number of items	Items yes/no questions (question 20-29)		wrong answer	correct answer	Total
20	breastfeeding jaundice is seen in breastfed babies during the first week of life	Frequency	13	161	174
		Percent	7.5%	92.5%	100%
21	breastfeeding jaundice is more likely to occur when babies do not nurse well or the mother milk is slow to come in	Frequency	40	134	174
		Percent	23%	77%	100%
22	breast milk jaundice may appear in some healthy breastfed babies after day 7 of life it is likely to peak during week 2 and 3 but may last at low levels for a month or more	Frequency	60	114	174
		Percent	34.5%	65.5%	100%
23	brast milk jaundice may be due to substances and factors in breast milk that either inhibit the conj or decrease excretion of bilirubin	Frequency	52	122	174
		Percent	29.9%	70.1%	100%
24	breast milk jaundice is different than breastfeeding jaundice	Frequency	62	112	174
		Percent	35.6%	64.4%	100%
25	breast milk jaundice is more common than breast feeding jaundice	Frequency	109	65	174
		Percent	62.6%	37.4%	100%
26	supplementation of breastfeeding with water or dextrose lowers the serum bilirubin	Frequency	64	110	174
		Percent	36.8%	63.2%	100%
27	phototherapy and blood exchange are only effective in treating pathological jaundice a among neonates	Frequency	101	73	174
		Percent	58%	42%	100%
28	discontinuation of phototherapy in a healthy term neonate is usually associated with rebound hyperbilirubinemia	Frequency	63	111	174
		Percent	36.2%	63.8%	100%
29	premature babies are at more risk for jaundice more	Frequency	20	154	174

	than mature babies	Percent	11.5%	88.5%	100%
Total	All Items	Frequency	15	159	174
		Percent	8.62%	91.38%	100%

In this study, it was founded that (92.5%) of nurses had high level of knowledge about the occurrence of jaundice during the first week of life for breast feeding babies (question no. 20). However, only (37.4%) of nurses knew that breast milk jaundice is more common than breast feeding jaundice (Q 25). Surprisingly, only 42% of nurses answered correctly to Q 27 that addressed different treatment strategies for jaundice.

5.3.3 Total Knowledge score of the two sections (multiple choices and Yes / No):

The total knowledge score in section 1 (multiple choices) and section 2 (Yes/No) is divided by the total knowledge question in section 1 and 2 (30 question) then the individual mean is classified according to cut off points to low level / moderate / high level knowledge. The total mean score of knowledge of the participants was (0.80) which is located between (0.5 - 1.49) and demonstrated a moderate level of knowledge among nurses.

Table 5.4: Mean and standard deviation of knowledge score. (multiple choice and yes/no questions)

Variable	size of sample	Mean	standard deviation
Knowledge level in multiple choice questions	174	0.9413	0.30136
Knowledge level in yes/no questions	174	0.6644	0.16965
total mean score of knowledge	**174**	**0.8028**	**0.19172**

Note 1: Total mean score of knowledge was calculated by adding mean section 1 to mean section 2 divided by 2. As a summary, the knowledge score is at moderate level.

5.4 Ppractice of nurses on neonatal jaundice

In this part the questions that related to assess the practice are divided into two sections: multiple choice and 5-liker scale questionnaire.

5.4.1 Ppractice level using multiple choices questions:

The results showed that 148 (85.1%) participants had a moderate level of practice, and only 5 (2.9%) participants had high level of practice. In this study, it was founded that (81%) of nurses had high level of practice about the areas that should be covered for male babies during phototherapy (question No 41). However, only 4% of nurses knew that application of oil on the skin of babies on phototherapy leads to (question No 40). Surprisingly, only 9.2% of nurses answered correctly to (question No 32) that asked about nursing care during phototherapy.

The percentage and frequencies were calculated as seen in table 5.7 below

Table 5.5: Practice level in multiple choice questions

No.	Q3 multiple choice question (questions 30-42)		low level of practice	moderate level of practice	high level of practice	Total
30	Nursing care during phototherapy may include….	Frequency	47	103	24	174
		Percent	27%	59.2%	13.8%	100%
31	Nursing care during phototherapy may include	Frequency	60	98	16	174
		Percent	34.5%	56.3%	9.2%	100%
32	During phototherapy…	Frequency	12	142	20	174
		Percent	6.9%	81.6%	11.5%	100%
33	Complication of phototherapy include	Frequency	22	78	74	174
		Percent	12.6%	44.8%	42.5%	100%
34	Which of the following factors should be strongly considered in determining …	Frequency	81	5	88	174
		Percent	46.6%	2.9%	50.6%	100%
35	nurses should support breastfeeding --------	Frequency	64	0	110	174
		Percent	36.8%	0%	63.2%	100%
36	When bilirubin levels are extremely high, the nurse should	Frequency	110	49	15	174
		Percent	63.2%	28.2%	8.6%	100%
37	The phototherapy should be ----------CM above newborn infant	Frequency	84	1	89	174
		Percent	48.3%	0.6%	51.1%	100%
38	Factors deciding effectiveness of phototherapy	Frequency	120	40	14	174

		Percent	69%	23%	8%	100%
39	Dryness of the skin caused by phototherapy can be decreased by	Frequency	51	1	122	174
		Percent	29.3%	0.6%	70.1%	100%
40	Application of oil on the skin of the baby on phototherapy leads to--	Frequency	151	16	7	174
		Percent	86.8%	9.2%	4%	100%
41	The areas that should be covered for male baby during phototherapy are	Frequency	33	0	141	174
		Percent	19%	0%	81%	100%
42	In dark skin infant jaundice can be evaluated easily in	Frequency	130	1	43	174
		Percent	74.7%	0.6%	24.7%	100%
Total	All Items	**Frequency**	**21**	**148**	**5**	**174**
		Percent	**12.1%**	**85.1%**	**2.9%**	**100%**

5.4.2 Ppractice score using Likert scale questions' answers:

The overall results showed that most nurses held moderate level of practice toward Neonatal Jaundice. Whereas the results showed that the number of those who disagreed to the questions was only 3 (1.7%), 10 (5.7%) Agreed, 111 (63.8%) strongly agreed.

The percentage and frequencies were calculated as seen in the below table:

Table 5.6: Practice level in 5 Likert scale questions

Number of items	Q4 - 5 Likert scale (questions 43-51)		Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
43	Eye cover or patches should be removed every 4-6 hourly for eye care …	Frequency	3	3	3	80	85	174
		Percent	1.7%	1.7%	1.7%	46%	48.9%	100%
44	Phototherapy units should be turned off during collection of blood for TSB /SBR	Frequency	0	0	13	93	68	174
		Percent	0%	0%	7.5%	53.4%	39.1%	100%
45	Babies must be fed every 2 -3 hours	Frequency	4	0	8	88	74	174
		Percent	2.3%	0%	4.6%	50.6%	42.5%	100%
46	The infant temperature should be monitored and recorded at least hourly or more frequently …	Frequency	0	4	15	92	63	174
		Percent	0%	2.3%	8.6%	52.9%	36.2%	100%
47	Phototherapy should be switched off before removing the eye shields	Frequency	3	4	18	78	71	174
		Percent	1.7%	2.3%	10.3%	44.8%	40.8%	100%
48	Nurses must avoid prolong exposure to blue phototherapy light; because the retina may be harmed in some cases	Frequency	2	7	14	91	60	174
		Percent	1.1%	4%	8%	52.3%	34.5%	100%
49	Decontamination of hands should be carried out prior to commencing phototherapy …	Frequency	1	8	19	100	46	174
		Percent	0.6%	4.6%	10.9%	57.5%	26.4%	100%
50	Monitor the infant s intake and output closely	Frequency	2	4	23	95	50	174
		Percent	1.1%	2.3%	13.2%	54.6%	28.7%	100%
51	The eye shield should be cut to the appropriate size and secured with the Velcro fastening	Frequency	6	9	13	93	53	174
		Percent	3.4%	5.2%	7.5%	53.4%	30.5%	100%
Total	All Items	**Frequency**	**0**	**3**	**10**	**111**	**50**	**174**
		Percent	**0%**	**1.7%**	**5.7%**	**63.8%**	**28.7%**	**100%**

The total practice mean scores for multiple choice questionnaire and Likert scale questionnaire were calculated as seen in the below table and showed a moderate level of practice but in multiple choice questions (means 0.9; SD 0.328) and a high level of practice in Likert scale questions (mean 4.19; SD 0.35). As both sections addressed practice of nurses toward phototherapy treatment, so these differences could be stem from the nature of the questions and the different scales. Most of the multiple choice questions had more than one correct answer and there is a note at the beginning of these questionnaire to remind the participants to take care of this, but the Likert scale question in nature is more easily to fill as there is one answer for each question.

Note: Mean in multiple choice questions and Likert scale questions can't be calculated because the scale was different.

Table 5.7: Mean and standard deviation of practice score

Variable	Size of sample	Mean	Standard Deviation SD
Practice level-multiple choice questions	174	0.9107	0.32811
Practice level- Likert scale questions	174	4.1935	0.35465

5.5 Attitude towards Nneonatal Jjaundice

The results showed that the majority of the nurses (57.5%) held neutral attitudes toward Neonatal Jaundice which may indicate. Surprisingly, less than the third of nurses held positive attitudes toward Neonatal Jaundice. More than third of nurses agreed that dressing the baby yellow clothes during jaundice will decrease bilirubin which reflected a low level of attitude. This type of question considered being under the heading of customs, traditions and folk medicine, where many believe this kind of treatments and nurses could be influenced by these traditions. (see table below)

Table 5.8: Attitude level toward Neonatal Jaundice

No.	Q5: (questions 53-68)		Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
52	Neonatal Jaundice is a common problem in newborn	Frequency	4	0	10	88	72	174
		Percent	2.3%	0%	5.7%	50.6%	41.4%	100%
53	Neonatal Jaundice is not considered a serious problem	Frequency	11	28	18	77	40	174
		Percent	6.3%	16.1%	10.3%	44.3%	23%	100%
54	It is usual for Neonatal Jaundice to last more than 2 weeks in newborn	Frequency	0	20	32	91	31	174
		Percent	0%	11.5%	18.4%	52.3%	17.8%	100%
55	Breast milk is the main reason for Neonatal Jaundice	Frequency	11	35	27	74	27	174
		Percent	6.3%	20.1%	15.5%	42.5%	15.5%	100%
56	Infection increases the risk of Neonatal Jaundice	Frequency	8	14	18	89	45	174
		Percent	4.6%	8%	10.3%	51.1%	25.9%	100%
57	Sever jaundice may cause death in neonate	Frequency	5	315	22	83	49	174
		Percent	2.9%	8.6%	12.6%	47.7%	28.2%	100%
58	Differences between fetal -maternal blood groups increase the risk of Neonatal Jaundice	Frequency	4	6	12	106	46	174
		Percent	2.3%	3.4%	6.9%	60.9%	26.4%	100%
59	Phototherapy is the only effective treatment for Neonatal Jaundice	Frequency	8	43	29	66	28	174
		Percent	4.6%	24.7%	16.7%	37.9%	16.1%	100%
60	Dressing the baby yellow clothes during jaundice will	Frequency	33	42	39	47	13	174

	decrease bilirubin level	Percent	19%	24.1%	22.4%	27%	7.5%	100%
61	Exposing the baby to sun light will treat jaundice	Frequency	21	41	58	34	20	174
		Percent	12.1%	23.6%	33.3%	19.5%	11.5%	100%
62	Oral herb helps in treating jaundice	Frequency	29	54	52	34	5	174
		Percent	16.7%	31%	29.9%	19.5%	2.9%	100%
63	Oral water with sugar will treat jaundice	Frequency	23	43	68	27	13	174
		Percent	13.2%	24.7%	39.1%	15.5%	7.5%	100%
64	Physiological jaundice can simply treated at home	Frequency	18	31	31	82	12	174
		Percent	10.3%	17.8%	17.8%	47.1%	6.9%	100%
65	Early feeding can help to increase intestinal motility and increase bacterial flora and so decrease bilirubin	Frequency	13	17	17	96	31	174
		Percent	7.5%	9.8%	9.8%	55.2%	17.8%	100%
66	Conjugated bilirubin is not dangerous like unconjugated bilirubin	Frequency	4	20	39	97	14	174
		Percent	2.3%	11.5%	22.4%	55.7%	8%	100%
67	Physiological jaundice is associated with breast milk jaundice	Frequency	4	22	29	97	22	174
		Percent	2.3%	12.6%	16.7%	55.7%	12.6%	100%
68	During phototherapy oily lubricant can be used to moist body	Frequency	34	39	36	50	15	174
		Percent	19.5%	22.4%	20.7%	28.7%	8.6%	100%
Total	**All Items**	Frequency	0	3	100	66	5	174
		Percent	0%	1.7%	57.5%	37.9%	2.9%	100%

. The mean and standard deviation were calculated for attitudes toward neonatal jaundice and presented in the table (5.9) below. The results showed that attitude of nurses is positive (mean 3.43; SD 0.45919)

Table 5.9: Mean and standard deviation of Attitude score

Variable	size of sample	Mean	standard deviation
attitude	174	3.4307	0.45919

Note 3: The individuals whose mean is between (1-3) are considered to have negative attitudes and between (3-5) are considered to have positive attitudes. The results showed that most nurses (81.6%) held positive attitudes toward neonatal jaundice. This is shown in the table below (5.10).

Table 5.10: Total Attitude level toward Neonatal Jaundice

Attitude	Frequency	Percent	Valid Percent	Cumulative Percent
Negative attitude	32	18.4%	18.4%	18.4%
Positive attitude	142	81.6%	81.6%	100%
Total	**174**	**100%**	**100%**	

Briefly, the results showed that most nurses had moderate level of knowledge and moderate level of practice about Neonatal Jaundice and most them held positive attitudes about it.

5.6 The association between knowledge and selected demographic factors:

T-test was used to examine the association between knowledge and variable (gender, training), Table (5.11). Gender and training were not statistically significantly associated with knowledge.

However, in yes/no questionnaire of knowledge, the result showed that the knowledge of females nurses was better than male nurses in regarding to neonatal jaundice. The study also found that nurses who had previous training had significantly better knowledge than who had not received training.

Table 5.11: Relationship between knowledge of Neonatal Jaundice and variable (gender, training)

Variable		Gender	size of sample	mean	Std Deviation	T	df	Sig. (2-tailed)
Gender	Knowledge multiple choice questions	Female	132	.096	.29	.182	172	1.339
		Male	42	.089	.33			
	Knowledge Yes/ No questions	Female	132	6.81	1.60	2.330	172	0.021*
		Male	42	6.12	1.89			
Training	Knowledge multiple choice questions	Yes	95	0.96	0.27	1.116	172	0.266
		No	79	0.91	0.33			
	Knowledge Yes/ No questions	Yes	95	7.76	1.70	2.459	172	0.015*
		No	79	7.09	1.89			

One way ANOV Analysis test was performed to assess the association between knowledge and demographic variables (age, marital status, education level, work status, total experience in neonatal intensive care unit, type of shift, and place of residence),

table (5.12). The result showed that there was no statistically significant relationship between demographic variables (age, marital status, education level, total experience in neonatal intensive care unit, type of shift, and place of residence) and knowledge.

Table 5.12: Association of knowledge with demographic variables

Variable			Sum of squares	Df	Mean Square	F value	Sig
Age	Knowledge multiple choice questions	Between Groups	0.370	3	0.123	1.365	0.255
		Within Group	15.342	170	0.090		
		Total	15.711	173			
	Knowledge Yes/ No questions	Between Groups	9.012	3	3.004	1.045	0.374
		Within Group	448.896	170	2.876		
		Total	497.908	173			
Marital status	Knowledge multiple choice questions	Between Groups	0.381	3	0.127	1.409	0.242
		Within Group	15.330	170	0.090		
		Total	15.711	173			
	Knowledge Yes/ No questions	Between Groups	15.314	3	5.105	1.798	0.149
		Within Group	482.594	170	2.839		
		Total	497.908	173			
Education level	Knowledge multiple choice questions	Between Groups	0.377	3	0.126	1.393	0.247
		Within Group	15.334	170	0.090		
		Total	15.711	173			
	Knowledge Yes/ No questions	Between Groups	7.438	3	2.479	0.859	0.463
		Within Group	490.470	170	2.885		
		Total	497.908	173			
Work status	Knowledge multiple choice questions	Between Groups	0.219	2	0.110	1.210	0.301
		Within Group	15.492	171	0.091		
		Total	15.711	173			
	Knowledge Yes/ No	Between Groups	23.546	2	11.773	4.244	0.016*
		Within Group	474.363	171	2.774		

	questions	Total	497.908	173			
Total Experience in NICU	Knowledge multiple choice questions	Between Groups	0.481	5	0.096	1.062	0.383
		Within Group	15.230	168	0.091		
		Total	15.711	173			
	Knowledge Yes/ No questions	Between Groups	24.214	5	4.843	1.718	0.133
		Within Group	473.694	168	2.820		
		Total	497.908	173			
Type of shift	Knowledge multiple choice questions	Between Groups	0.446	2	0.223	2.500	0.085
		Within Group	15.265	171	0.089		
		Total	15.711	173			
	Knowledge Yes/ No questions	Between Groups	11.280	2	5.640	1.982	0.141
		Within Group	486.628	171	2.846		
		Total	497.908	173			
Place of residence	Knowledge multiple choice questions	Between Groups	0.044	2	0.022	0.240	0.787
		Within Group	15.667	171	0.092		
		Total	15.711	173			
	Knowledge Yes/ No questions	Between Groups	3.644	2	1.822	0.630	0.534
		Within Group	494.264	171	2.890		
		Total	497.908	173			

As regard to work status, the table showed that in yes/no knowledge questionnaire there was statistically significant difference between work status and knowledge. In order to know who is responsible for the differences, remote comparisons of arithmetic averages were performed using a method (LCD) (table 5.13). The result showed that registered nurses had higher knowledge than the educators (P 0.014).

Educator is the nurse who works in NICU or pediatric ward and has interest in the educational process, like, Educational lectures, and instructor for new nurses or nursing student.

Table 5.13: The relationship between work status types and knowledge

work status variable		Registered nurse	Educator	Head nurse
Registered nurse	Mean Difference		1.505*	1.040
	sig		0.014	0.108
Educator	Mean Difference	-1.505*		-0.464
	sig	0.014		0.591
Head nurse	Mean Difference	-1.040	0.464	
	sig	0.108	0.591	

5.7 Association between attitudes of nurse regarding Neonatal Jaundice with selected demographic variable

The table below (5.14) shows no statistical significance relationships between attitudes and the variables gender and training.

Table 5.14: Relationship between attitude and variable (gender, training)

Variable		gender	size of sample	mean	Std Deviation	T	Df	Sig. (2-tailed)
gender	**5 likert scale**	**Female**	132	3.42	0.47	-0.441	172	0.660
		Male	42	3.46	0.43			
training	**5 likert scale**	**Yes**	95	3.45	0.47	0.612	172	0.541
		No	79	3.41	0.44			

One way ANOVA analysis test was performed to examine the association between attitude of nurse regarding neonatal jaundice and the demographic variables (age, marital status, education level, work status, total experience in neonatal intensive care unit, type

of shift, and place of residence) and found no statistically significant relationships between them. Table (5.15).

Table 5.15: Association between attitude and demographic variables

Attitude		Sum of squares	Df	Mean Square	F value	Sig
Age	Between Groups	0.358	3	0.119	0.562	0.641
	Within Group	36.120	170	0.212		
	Total	36.477	173			
marital status	Between Groups	1.048	3	0.349	1.676	0.174
	Within Group	35.430	170	0.208		
	Total	36.477	173			
education level	Between Groups	0.489	3	0.163	0.770	0.512
	Within Group	35.988	170	0.212		
	Total	36.477	173			
Work status	Between Groups	0.554	2	0.277	1.319	0.270
	Within Group	35.923	171	0.210		
	Total	36.477	173			
total experience in NICU	Between Groups	0.906	5	0.181	0.856	0.512
	Within Group	35.571	168	0.212		
	Total	36.477	173			
type of shift	Between Groups	1.100	2	0.550	2.658	0.073
	Within Group	35.378	171	0.207		
	Total	36.477	173			
place of residence	Between Groups	0.147	2	0.073	0.345	0.708
	Within Group	36.331	171	0.212		
	Total	36.477	173			

5.8 Association between practice and selected demographic factors

The table below (5.16) showed that in both scales (multiple choice question and 5 likert scale questions) that there are no statistically significant differences between practice and gender variable (p. 0.514; 0.739) respectively.

For attitudes multiple choice questions, the results showed that nurses who had previous training hold significantly better practice than who had not received training (p. 0.034)

Table 5.16: Relationship between practices and the variables (gender, training)

Variable		gender	size of sample	mean	Std Deviation	T	df	Sig. (2-tailed)
Gender	Practice multiple choice questions	Female	132	0.90	0.32	-0.653	172	0.514
		Male	42	0.94	0.35			
	Practice likert scale questions	Female	132	4.20	0.55	0.334	172	0.739
		Male	42	4.17	0.49			
Training	Practice multiple choice questions	Yes	95	0.96	0.35	2.138	172	0.034*
		No	79	0.85	0.30			
	Practice likert scale questions	Yes	95	4.23	0.52	1.088	172	0.278
		No	79	4.14	0.55			

One way ANOVA test was performed to examine the association between practices of nurse regarding Neonatal Jaundice and demographic variables and showed no statistically significant relationships between them.

Table 5.17: The effect of the demographic characteristics on practice

Variable			Sum of squares	Df	Mean Square	F value	Sig
Age	Practice multiple choice questions	Between Groups	0.057	3	0.019	0.175	0.913
		Within Group	18.567	170	0.109		
		Total	18.624	173			
	Practice likert scale questions	Between Groups	0.442	3	0.147	0.505	0.680
		Within Group	49.600	170	0.292		
		Total	50.042	173			
Marital status	Practice multiple choice questions	Between Groups	0.051	3	0.017	0.157	0.925
		Within Group	18.573	170	0.109		
		Total	18.624	173			
	Practice likert scale questions	Between Groups	0.616	3	0.205	0.707	0.549
		Within Group	49.425	170	0.291		
		Total	50.042	173			
Education level	Practice multiple choice questions	Between Groups	0.726	3	0.242	2.297	0.079
		Within Group	17.899	170	0.105		
		Total	18.624	173			
	Practice likert scale questions	Between Groups	0.780	3	0.260	0.898	0.444
		Within Group	49.261	170	0.290		
		Total	50.042	173			
Work status	Practice multiple choice questions	Between Groups	0.349	2	0.175	1.634	0.198
		Within Group	18.275	171	0.107		
		Total	18.624	173			
	Practice likert scale questions	Between Groups	0.309	2	0.155	0.531	0.589
		Within Group	49.732	171	0.291		
		Total	50.042	173			
Total experience in NICU	Practice multiple choice questions	Between Groups	0.705	5	0.141	1.322	0.257
		Within Group	17.919	168	0.107		
		Total	18.624	173			
	Practice likert scale questions	Between Groups	0.868	5	0.174	0.593	0.705
		Within Group	49.174	168	0.293		

		Total	50.042	173			
Type of shift	Practice multiple choice questions	Between Groups	0.086	2	0.043	0.397	0.673
		Within Group	18.538	171	0.108		
		Total	18.624	173			
	Practice likert scale questions	Between Groups	0.160	2	0.080	0.275	0.760
		Within Group	49.881	171	0.292		
		Total	50.042	173			
Place of residence	Practice multiple choice questions	Between Groups	0.516	2	0.258	2.436	0.091
		Within Group	18.108	171	0.106		
		Total	18.624	173			
	Practice likert scale questions	Between Groups	0.045	2	0.022	0.076	0.926
		Within Group	49.997	171	0.292		
		Total	50.042	173			

5.9 Association between knowledge and practice regarding Neonatal Jaundice

Pearson correlation was calculated between the association knowledge and the practice. The results found that knowledge was significantly associated with practice. This indicates that there is a positive relationship between knowledge and practice. There is no indicator that indicating the strength or weakness of the relationship between variables

Table 5.18: The association between knowledge and practice regarding Neonatal Jaundice

Variable		Practice multiple choice questions	Practice likert scale questions
Knowledge multiple choice questions	Pearson Correlation	0.478**	0.226**
	Sig (2-tailed)	0.000	0.003
	Size of sample	174	174
Knowledge Yes/	Pearson Correlation	0.213**	0.187*

No questions	Sig (2-tailed)	0.005	0.014
	Size of sample	174	174

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5.10 Association between knowledge and attitude regarding Neonatal Jaundice

Pearson correlation was calculated between the association knowledge and the attitude that regarding neonatal jaundice. The table below shows no relationship between knowledge-multiple choice questions and attitude. However, it showed that the correlation coefficient between knowledge-Yes/ No questions and attitude reached (0.022) and the level of significant (0.771), which is not statistically significant at the level of (0.01) and (0.05). This indicates that there is a positive but weak relationship and is statistically significant.

Table 5.19: The association between knowledge and the attitude regarding Neonatal Jaundice

Variable		Attitude
Knowledge multiple choice questions	**Pearson Correlation**	0.064
	Sig (2-tailed)	0.400
	Size of sample	174
Knowledge Yes/ No questions	**Pearson Correlation**	0.022
	Sig (2-tailed)	0.771
	Size of sample	174

5.11 Association between attitude and practice regarding Neonatal Jaundice

Pearson correlation was calculated between the attitude and the practice that regarding Neonatal Jaundice. The table shows that the correlation coefficient between attitudes multiple choice questions and practice is (-0.083) and p value is (0.276) indicating no association between attitudes multiple choice questions and practice.

The table below shows that there is a statistically significant relationship between attitudes-likert scale and practice. This indicates that there is a positive relationship between attitude and practice. There are no indicators indicating the strength of the relationship between variables.

Table 5.20: The association between attitude and practice regarding Neonatal Jaundice

Variable		Practice multiple choice questions	Practice likert scale questions
Attitude	**Pearson Correlation**	-0.083	0.288**
	Sig (2-tailed)	0.276	0.000
	Size of sample	174	174

Chapter Six

Discussion

6.1 Introduction:

In this chapter, the researcher gives a logical analysis and explanation of the results. The important findings of the study are discussed and compared with the results of other studies.

6.2 Levels of Knowledge among Participants and the demographic factors:

The current study showed that, participants' knowledge about NNJ was moderate, and due to lack of previous studies on nurses' knowledge about NNJ in NICU and pediatric wards, the researcher will make comparison with other health sectors similar to nursing sector sample that deal with NNJ.

Current study finding is contradicted with Ahmad and Hani study (2017) that was conducted in Minia governorate. Their study found that 92.7% of nurses had satisfactory knowledge about NNJ. Shrestha (2013) also found that the majority of the respondents (56%) were highly knowledgeable. One of the explanations of this limitation in nursing knowledge regarding Neonatal Jaundice in Palestine is the fact that the Palestinian hospitals generally are lacking of continuous teaching and training program that focus on increasing the knowledge of NICU and pediatric world nurses (Hussien, 2016). Rajakumari (2015) in his study to evaluate the effectiveness of structured education on knowledge, attitude and practice regarding phototherapy among nursing students also found that half of nursing students (48%) had inadequate knowledge regarding Neonatal Jaundice.

A study was done by Opara, Alex-Hart and Dotim**i** (2014) to assess the knowledge among health workers in Southern Nigeria about NNJ among 200 participants, found that 95% had fair to adequate knowledge of description of NNJ, and only 25% of respondents had good knowledge of its causes.

Orimadegun and Ojebiyi (2017) assessed knowledge and practices relating to NNJ among community health workers in Nigeria, the result showed that in overall, 80.2% had poor knowledge, and so they recommended for the needs to organize regular training programs.

Conversely, some question in this study had a high level of knowledge, for example: the question No. (3) that discussed RH incompatibility is a condition develop when, 71.8% of nurses answered correctly to this question. This high level of knowledge could be related to the fact that nurses in the pediatric wards and NICU were on daily contact with babies who have different parents' blood group, so in the first step nurses usually check the mother blood group and babies' blood group. This procedure stems from the importance of knowing differences between mother's blood group and her babies, and so nurses are aware of the dangerous of this condition and the importance of documenting this difference on mother's file. While some questions had incorrect answers, for example the question No (11) "All neonate should be reevaluate in the first 5 days of life to check for jaundice" this is one of the fundamental and basic knowledge nurses should have in regarding to jaundice detection and when knowledge is lacking, the life of babies may be threatened. A study was conducted by Samantha et al. (2015) to examine the association between early discharge from hospital after birth and readmission to hospital for jaundice among term infants, and among infants discharged early. The result showed that infants born at 37 weeks' GA and sent home between 0 to 2 days were 9 times more

likely to be readmitted for jaundice compared with infants born at 39 weeks' GA and sent home between 3 to 4 days. From this finding we noted that it is important for those babies who sent home early to be reevaluated for jaundice detection.

The important of this reevaluation especially in the first week of life is to discover the early sign for NNJ and to provide early management for NNJ in order to prevent more complications.

Expectedly, in this study more than 60% of nurses answered correctly to question:

Normal neonate will appear jaundiced when serum bilirubin level reaches---------,

but there are paucity in knowledge among nurses about danger signs and symptoms of jaundice as 53% of them failed to answer correctly to the danger signs of jaundice (Q10): "yellow skin color in the lower trunk & thighs you suspect that bilirubin level reaches". This result is very significant as this will affect early detection and will delay proper management of jaundice. Dantas et al. (2017) in his study about nursing diagnosis of neonatal jaundice found that nursing diagnosis of Neonatal Jaundice was present in 31% of the sample which consisted of 100 newborns aged between 24 h and ten days. The most frequent defining characteristics were yellow-orange skin color (65%) and abnormal blood profile (75%). Yellow mucous membranes, yellow-orange skin color and bruised skin showed statistically significant sensitivity and specificity. Yellow mucous membranes, yellow sclera and yellow-orange skin color were statistically associated with Neonatal jaundice. Yellow mucous membranes showed the best diagnostic accuracy measurements.

Furthermore, in this study one third of nurses did not know the long term consequences of chronic bilirubin such as encephalopathy. Ogunfowora and Daniel (2006) conducted a study to assess the knowledge of primary health care workers about NNJ, and to detect

the ability of the health workers to recognize signs of danger or complications in NNJ. The result showed that 45.5% were able to choose the six correct answers (refusal of feed, high-pitched cry, arching of the back, convulsions, down-turning of the eyes and fever). 28.8% of them got 5 correct answers, and 9.1% chose 4 correct answers, 13.1% respondents however did not know more than one or two of the danger signs. Ogunfowora and Daniel also found that primary health care workers demonstrated a fairly adequate awareness of some complications of NNJ. Nonetheless, there is a need to reinforce the knowledge of community health workers about other serious conditions such as cerebral palsy, mental retardation, sensori-neural deafness and epilepsy that can result from severe NNJ.

Inability of nurses to understand the danger of jaundice on babies' health may be indicative of poor actions which was agreed by Brethauer and Carey (2010) who mention that there is a need for nurses to be qualified and trained to perform early detection of jaundice, as a way to provide an adequate nursing care, aimed at clinical recovery and prevention of future complications of the newborn infant. Similarly, in this study 81% of nurses reported that their need for receiving training about jaundices which is considered one of significant result in this study. Although most of nurses had moderate knowledge about jaundice they admitted their shortcomings and the paucity of knowledge they had in relation to complications, symptoms and treatments of jaundice.

As regard to the relationship between socio-demographic data and nurses' knowledge regarding NNJ, it found that no significant relationship between knowledge and gender. Bearing in mind that the majority of the participants in this study were female, therefore; the variety was not achieved among them, and male nurses sample size is smaller in relative to female nurses sample size in this study so this issue could limit the

generalization of this finding. But result showed that there is significant relationship in section 2 (yes/no questions) of knowledge and gender, previous training and work status. So further research is needed in order to validate this assumption. Similarly, Shrestha (2013) found no significant relationship between knowledge and gender.

Surprisingly, the current study found no significant relationship between participants' age and their knowledge regarding to the Neonatal Jaundice. The majority of the participants belonged to the age group 20 to 30 years old and this might explain this result as the variety was not achieved among them. This is one of the shortcomings of this study as this might limit generalizability. This result is contradicted with Abai et al. (2011) who found significant relationship between participants' age and their knowledge regarding to the Neonatal Jaundice for the favor of old nurses.

One of the striking results in this study was the insignificant relationship between knowledge and the educational level. Bearing in mind that the majority of nurses held a Bachelor degree (54%=94 participants). Therefore, it was expected that their knowledge level has to be better compared with those who held a diploma. Furthermore, as regarding work status, result found that registered nurse average mean was higher than that of Educator, which may indicate that there are other factors that affected nurses' knowledge and professional development rather than continuous education program or their degree or work status.

The literature discussed broadly the relationship between individual characteristics such as personal motivation and intention of learning and self-developing, and the effects on incentive for enhancing personal development. As this study was a crosses-sectional, further studies such as qualitative and other quantitative methodologies could provide in depth understanding of intrinsic factors such as motivation, living and work conditions

related to learning's intentions among neonatal nurses in Palestine. Future studies may provide explanation of the cause of the weak relation between level of education and knowledge of Palestinian nurses.

As regard to period of experience, this study found that 71 participants (40.8) had experience range between 1-5 years, Shrestha (2013) also found that the majority of nurses in his study had experience less than 5 years and the study revealed no relationship between level of experience and training among nurses. It is ironic to know that long-term nursing experience had no effect on nurses' knowledge regarding jaundice. We can assume that education about jaundice is better than clinical experience when it comes to jaundice among neonate. Further studies can validate the accuracy of this assumption.

The finding in this study which regards total experience (1-5) years was supported by Watson (2011) who mentioned that all participants had length of service ranged from 1-5 years and there was no significant association between knowledge and experiences. This is contradicted with Shrestha (2013) who found that the knowledge level of the participants who's total experience below 5 years was higher than (30%) the participants who's total experience over 5 years.

The current study finding disagreed with El sayed et al. (2013) who mentioned that in relation to their years of experience in NICU, the result revealed that the years of experience in NICU were 5-11 and there was significant relationship between experience and knowledge. Ahmed and Hani (2017) study found that 39.1 of the total participants had experience ranged from 1-5 years and according to the researcher there was a significant relationship between the knowledge and total experience.

In current study, participants who had received previous training had no significant differences in their knowledge with untrained participants (but in section 2- Q2 significant relationship was founded) and this could be related to lack of continues training for NNJ for nurses generally. Therefore, we can assume that whether nurses received training or not, their knowledge will not last for their lifetime without receiving advanced structured ongoing and updated training with specific guidelines in how to deal with NNJ. The current study finding disagreed with El sayed et al. (2013) who found that large sector of nurses did not receive any course or training result also showed that no significant relationship was found between knowledge and training.

Another study was done by Nazrin et al. (2017) which disagreed this study in regarding previous training, her study found that major sector of nurses (70.7%) had previous training with a significant relationship with knowledge.

6.3 Levels of practice mean score among Participants and its association with the demographic factors:

The current study showed that, nurses 'practice about NNJ was moderate in section 3 (multiple choice question which mainly asked about treatment of NNJ especially phototherapy, exchange transfusion, breast feeding, but high in section 4 (5 likert scale questions) which mainly asked about practice procedure that must be considered during phototherapy. The results showed that 148 participants (85.1%) with moderate practice, and only (5) participants with high practice (2.9%). In this study, it was found that (81%) of nurses had a high practice about the areas that should be covered for male baby during phototherapy (question No 41). However, only (4%) of nurses answered correctly about the question that application of oil on the skin of the baby on phototherapy leads to---- (question No 40). Surprisingly, very limited number of nurses

(9.2%) answered correctly to question no. 31 that asked about nursing care during phototherapy. Although this is one of basic and well-known treatment to control billirubin serum, and phototherapy is consider one of the major treatment that prevent complication of NNJ. Therefore, lack of nursing care during phototherapy could lead to harm the newborn. This could be related to lack of training on how to deal effectively with jaundiced neonate under phototherapy.

Current study finding is contradicted with Nazrin et al. (2017) who stated that the majority of nurses were competent regarding practices related to hyperbilirubinemia which reflected high practice score. Rajakumari (2015) mentioned that most of the nurses had applied good practice during the care of the baby with phototherapy after structured education on practice, but before educational program practice score was poor (62% of them had poor practice). This suggested that when nurses are provided with structured and continuing education about NNJ, they will have good practice abilities. This could explain the result of the study about low level of practice.

Furthermore, some questions were with low level of practice, for example; the question: "Application of oil on the skin of the baby on phototherapy leads to" 86.8% of the total participants answered incorrectly to the previous question indicating low level of practice toward one of the standard treatment for Neonatal Jaundice. This can be resolved by providing regular training to nurses.

The current study found no significant relationship between participants' age and their practice regarding to the Neonatal Jaundice. The majority of the participants belonged to the age group 20 to 30 years old, Similarly, Nazrin et al. (2016) found no significant relationship between age variable and practice score. Abai et al. (2011) found a significant relationship between participants' age and their practice regarding to the

NNJ. They elaborated that 31.9% of the participants were between 41-50 years old and from their point of view the participants were mature and responsible and claimed that this led to better practice.

The study also found that the majority of nurses in this study had less than 5 years' experience and the study revealed a weak relationship between length of experience and practice among nurses. According to Baclig (2017) clinical experiences provide an opportunity for nurses to expand their skills and knowledge to practice safe patient care. Clinical experiences are important throughout a nurse's career, because they provide a roadmap to patient care decisions and professional development. Without this, nurses are unable to function in an autonomous role as patient advocates, as well as contribute to global healthcare initiatives. It is ironic to know that long-term nursing experience had no effect on nurses' practice regarding jaundice. Undergraduate nursing programs do not offer a specifically program for advanced pediatric nurses and lacking of advanced practice environment may explain the weak relationship between long experience and good practice. McHugh and Lak (2010) hypothesized that working in a hospital with higher mean levels of education and experience and a more professional practice environment would have a contextual effect on an individual nurse's expertise level even after controlling for the individual nurses' level of education and experience. Therefore, hospital contextual factors and individual characteristics have important effects on expertise and must be considered when making human resource decisions. These assumptions have to be examined for accuracy in future studies.

6.4 Levels of attitude mean score among Participants and its association with the demographic factors:

The current study showed that, nurses' attitude about NNJ was positive which is contradicted with Rajakumari. (2015) who found 68% of nurses had negative attitude in the study that done to evaluate the effectiveness of structured education on knowledge, attitude and practice regarding phototherapy among nursing students.

These results reflected that most of the participants had high awareness and relevant beliefs toward Neonatal Jaundice as a total. For example, 88% of the participants agreed that Neonatal Jaundice is a common problem in newborn and about 85% agreed with the statement "sever jaundice may cause death in neonate". This showed full awareness about NNJ and that it must be taken as serious disease, this study is agreed by Nazrin et al. (2016) found that (67%) of the participants were aware about neonatal jaundice.

6.5 Association between knowledge and practice:

In order to be effective, knowledge must result in improved care and practice Ajani and Moez (2011). The term practice is defined as the act or the process of doing something; performance or action (Ajani and Moez, 2011). In definition these terms appear to be at odds with each other but when considered in terms of professional setup they have to enable the application of Knowledge and practice cannot be separated, as both are very critical to any professions. It is its ability to grow and change as the world changes Ajani and Moez. (2011). Another positive approach is also mentioned in Rafferty, Allcock and Lathlean (1996) who mentioned that the theory/practice gap can never be preserved entirely; they are by nature always in dynamic tension, and this tension is essential for change to occur in clinical practice. In current study it was founded that there was a positive relationship between knowledge and practice. The limited studies that

addressed the relationship between knowledge and practice made it difficult to compare the findings to other studies or setting. However, having a relationship between knowledge and practice regarding NNJ is a significant finding for policy makers in order to focus on education and building knowledge of neonatal nurses in order to change practice and the way of working of nurses. Demonstrating new and correct practice will lead to improved quality and patient safety.

6.6 Association between knowledge and attitude:

Knowledge is a structural property of attitudes that is a function of the number of beliefs and experiences linked to the attitude in memory and the strength of the associative links between the beliefs or experiences and the attitude (Krosnick and Petty, 1995). Kallgren and Wood (1986) assessed attitudes toward protecting the environment and measured attitude-relevant knowledge using an open-ended knowledge listing task. They found that attitudes based on high amounts of knowledge were more predictive of environment-related behavior than were attitudes based on low amounts of knowledge. Similarly, Davidson et al. (1985) found that intentions were better predictors of behavior when they were based on high amounts of knowledge than when they were based on little knowledge.

In current study it was founded that there was a positive relationship between knowledge and attitude regarding NNJ. This means that they have sincere intention to acquired knowledge and translate this knowledge to effective practice. This suggested that teaching nurses about NNJ will reduce their negative attitudes and myths. Nurses can learn the required attitudes through training and regular education.

Chapter Seven

Conclusion and recommendation

7.1 Conclusion:

The results of the study have showed that nurses in NICU and pediatric wards had moderate knowledge and moderate practice regarding Neonatal Jaundice and positive attitude regarding NNJ. Furthermore, demographic factors did not influence the knowledge, attitude and practice. But there was positive relationship between knowledge, practice, knowledge and attitude. This study adds to literature in showing the importance of having a good knowledge, attitude and practice in order to deal more effectively with NNJ and improve the outcome.

This study emphasized the importance of continuous educational program and training for nurses who are working in NICU and pediatric wards. Therefore ministry of health in collaboration with hospital administration and continuous education department should focus on establishing protocol and educational program and to increase the staff number in order to decreases overload of the work which will enable them to provide proper interventions to children with neonatal jaundice.

7.2 Recommendation:

Nursing plays an important role in the health team cycle in facing NNJ, so increasing knowledge, attitude and practice are essential factors and the main challenge for nurses in order deal effectively with children health and wellbeing

7.2.1 Recommendation for policy makers and nurses managers:

1- Policy makers should put the guideline and protocol of how to deal with NNJ, check the efficiency of these guideline and protocol regularly.

2- Hospital administration and through the assistance of the continuing education department should establish a structured educational program for nurses focusing on increasing KAP of nurses regarding neonatal jaundice.

3- As the study found that most of participants were between 1-5 years in the total service in NICU and pediatric ward, so new nurses' orientation must include the same educational program which is followed in the hospital in order to enhance their KAP, and effective training focus on how to deal with NNJ in the safe way. Furthermore, hospital administrations have to encourage highly educated nurses to focus on implementing their knowledge into practice.

4- Continues education team must provide all kinds of learning resources such as article, journal, electronic resources and these recourses must be up to date.

5- Nurses who work in NICU and pediatric ward must be provided with procedure handbook and manuals in order to work safely with newborn.

6- The results of the study provided evidence that experience had no significant relationship with KAP. Therefore, lack of incentives and intrinsic, extrinsic motivation in the work environment may be one of the reasons of this poor relation. Motivation program could help and encourage nurses to be ambitious to increase their KAP by effective dealing with educational program.

7- Improve quality in nursing care, it must focus on measuring and improving through close monitoring of patient care services. This could not be achieved without designing and implementing guidelines for inpatient management of NNJ.

8- Media should be encouraged to play an activate role in disseminating information about NNJ to public

7.2.2 Recommendation for nurses working in NICU and pediatric wards

1- Nurses must take initiative to improve their KAP by dealing seriously with educational programs.

2- Nurses must deal effectively with babies' family and empowered them to detect signs of jaundice in the first week of life.

3- Nurses must make a good discharge plan for NNJ babies and family must be told when to return to the hospital if needed

7.2.3 Recommendations for future research

The result of the study allowed trends for further research in:

1-Additional studies are needed in Palestine to examine NNJ from several aspects such as (incidence, risk factors, management, treatment and complication) in order to fill the literature gap and to cover all aspect that related to NNJ, also this study must include observational studies in order to evaluate nurses' practice.

2-Further research with larger sample is recommended in order to compare the result with our findings and to test if the result can be generalized.

3-Qualitative studies are needed to explore families' experiences and perception of Neonatal Jaundice.

4- Further studies are needed to identify the factors that affect nurses' knowledge and attitudes toward NNJ.

5-As this study was a cross-sectional, further studies such as qualitative and other quantitative methodologies could provide in depth understanding of intrinsic factors such as motivation, living and work conditions related to learning's intentions among neonatal nurses in Palestine. Future studies may provide explanation of the cause of the weak relation between level of education and knowledge of Palestinian nurses.

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Annex A

AL QUDS UNIVERSITY COLLEGEOF HEALTH PROFESSIONS

DEPARMENT OFNURSING

Master Program in Pediatric Nursing

Neonatal jaundice knowledge, attitude and practice among nurses working in neonate intensive care unit and pediatric world

This is a self-administered questionnaire for nurses who are working in neonatal intensive care unit and pediatric world to assess and evaluate their knowledge, attitude and practice about neonatal jaundice

Your effective participation has it is own importance for neonatal jaundice. This research study may helping finding possible solutions and recommendations to increase the nurse's knowledge, and improve their skills.

This questionnaire needs 25 minutes. Names are not required Your participation in this study is voluntary and you are free to withdraw your participation at any time. The information in this study will only be used for research purposes and nobody can identify the information no fan participant.

Thank you for your kind cooperation

Sameh Fayyoumi.

Faculty of Health Professions Nursing Department

Al-Quds University

Demographic Information:

Gender	|___|Female	|__| Male
Age	|___|20–29years |___|40–49years	|___|30–39years |___| 50–59years
Marital Status:	|___|Single |___|Divorced	|___|Married |___|Widowed
Educational level	|___|Diploma degree. |___|Postgraduate degree	|___|Bachelor degree |___|Master degree
Work status	|___|Head nurse |___|Educator |___|Registered Nurse	
Total service in neonatal intensive care unit	|___|lessthan1 |___|6–10years |___|16–20years	|___| **1** -5years |___| **1 1** –15years |___|>21years
Type of Shift	|___|Day |___|Evening |___|Night	
Did you receive any training toward how to deal with neonatal jaundice	|___|Yes |__|No	
Place of residence	|___|City |___| Village |___|Camp	

Nurses Knowledge regarding Neonatal jaundice:

Please circle the correct answer, and note that it is possible to circle more than one answer in some questions:

1. Physiological jaundice is characterized by which of the following:

A. Onset after 24hours

B. Caused by massive destruction to RBCS C.Jaundiceinthefirst24hours

D. Level of billirubin not depend on age, weight

2. Pathologicaljaundiceis characterized by which of the following:

A.   Jaundice after 24 hours

B.   Rapidly rising billirubin

C.   Increased bilirubin load as hemolytic disease the newborn

3. RH incompatibility is a condition develop when:

A. pregnant women has RH negative blood and the baby in her womb has RH positive blood B.pregnantwomenhasRHpositivebloodandthebabyinherwombhasRHpositiveblood C.pregnantwomenhasRHpositivebloodandthebabyinherwombhasRHnegativeblood

4. Women with positive indirect coombs test means:

A.   Women become not sensitized, so that she did not develop anti bodies in her blood stream

B.   Women become sensitized, so that she develops antibodies in her blood stream and future baby with RH positive Is at risk of severe anemia and so develop jaundice

C.   Women become sensitized, so that she develops antibodies in her blood stream and future baby with RH negative is at risk of severe anemia

5. ABO incompatibility is a condition develop when:

A. Mother blood group is O and the baby blood group is A or B B. Mother blood group is O and the baby blood group is O

C. Mother blood group is A or B and the baby blood group is O

6.In G6PD deficiency, hyperbilirubinemia is secondary to:

A.hemolysis

B. decreased conjugation

C.both

D.neither

7.Jaundice is caused by

A. Massive destruction of RBCs with short life span
B. Immature liver and increase intra hepatic circulation
C. Low albumin level
D. Immature intestine

8.Normal neonatal will appear jaundiced when serum billirubin level reaches:

A. 5-7mg/dl or greater
B. 1-2mg/dl
C. 2-4mg/dl

9. You should contact the pediatrician if you noticed that:

A. Jaundice is severe (the skin is bright yellow)
B. Jaundice continues to increase in the normal full term infant, and lasts longer than 2 weeks ,or other symptoms develop
C. The feet, especially the soles, are yellow

10. If you observe yellow skin color in the lower trunk &thighs you suspect that bilirubin level reaches:

A. A.8-16 mg/dl
B. B.4-8 mg/dl
C. C.20-25 mg/dl
D. D.5-12mg/dl

11.All neonate should be reevaluate in the first 5 days of life to check for jaundice when:

A.   Infants who spend less than 24 hours in a hospital should be seen by age72 hours.

B.   Infants who are sent home between 24 and 48 hours should be seen again by age 96 hours. C. Infants who are sent home between 48 and 72 hours should be seen again by age120 hours.

12. How would you check a baby for the presence of jaundice?

A. Blanching the skin over forhead and cheeks

B. By looking at the palms or soles of the foot

C. By the color of the urine

D. By the color of the stool

E. By other means [specify]

13. When a baby is jaundiced, urine color can appear

A. White

B. Yellow or dark amber and concentrated

C. Greenish-yellow

D. Any other color [specify

14.In the early phase of acute bilirubin encephalopathy, severely jaundiced infants become:

E. Lethargy
F. hypotonic
G. Poor sucking
H. A &C

15.Complication of high bilirubin is rare, but serious complications can include

A. Cerebralpalsy

B. Deafness

C. Kernicterus

D. Opisthotonus

16.Complications of exchange transfusion can include

A. Airembolism

B. Vasospasm

C. Infection

D. Convulsion

17. Long term consequences of chronic bilirubin encephalopathy include

A. Death of ababy

B. Brain damage in the baby

C. Mental retardation

D. Physical handicap

E. Attacks of convulsion later in life

F. Learning difficulties

G. G .Abnormal behavior later inlife

H. Other effect [s][specify

18. Neonatal jaundice can be treated by

A. Medicatation

B. Phototherapy

C. Blood Exchange

D. D.Ventilation

E. By the sun

19. Neonatal response to the treatment by phototherapy depends on

A. light wavelength and intensity

B. The exposed surface area

C. The rate at which isomerized bilirubin is removed from skin and blood

D. The distance of the phototherapy from the neonatal body

The following questions are about assessing your knowledge about neonatal jaundice. Please put

(X) On the option that matches your answer:

NO.	Statement	True	False	Don't know
20	Breast feeding jaundice is seen in breastfed babies During the first week of life.			
21	Breast feeding jaundice is more likely to occur When babies do not nurse well or the mother's milk is slow to come in.			
22	Breast milk jaundice may appear in some healthy, Breast fed babies after day 7 of life .It is likely to peak during weeks 2 and 3 but may last at low levels for a month or more.			
23	Breast milk jaundice may be due to substances And factors in breast milk that either inhibit the conj or decrease excretion of bilirubin.			
24	Breast milk jaundice is different than Breast feeding jaundice.			
25	Breast milk jaundice is more common than breast Feeding jaundice.			
26	Supplementation of breastfeeding with water or Dextrose lowers the serum bilirubin.			
27	Phototherapy and blood exchange are only Effective in treating pathological jaundice among neonates.			
28	Discontinuation of phototherapy in a Healthy term neonate is usually associated with rebound hyperbilirubinemia.			
29	Premature babies are at more risk for Jaundice more than mature babies.			

Nurses' Practice regarding neonatal jaundice

The following questions are about assessing your practice about neonatal jaundice.

Please circle the correct answer, and note that it is possible to circle more than one

answer in some questions:

30. **Nursing care during phototherapy may include**

   A. Remove clothing .but keep the diapers

   B. Turn infant frequently to expose all skin area.

   C. Record and report any changes in jaundice and blood levels of bilirubin. D. Record and report any change in body temperature and feeding

31. **Nursing care during phototherapy may include:**

   A. Cover eyes with eye patches to prevent eye injury.

   B. close eyes before applying eye patches

   C. Eye patches should be loose enough to avoid pressure.

   D. Eye patches should be changed every 8 hourly and eye care given.

32. **During phototherapy**

   A. Nurse should expect the infant's stools to be green and the urine dark because of

   B. Photo degradation products.

   C. Serum bilirubin and hematocrit should be monitored during therapy and for 24 hours following therapy.

   D. Maintain feeding intervals to prevent dehydration and add oily lubricant to skin to treat dryness of skin.

   E. The phototherapy instead should be in contact to baby skin to have more effect

33. Complications of phototherapy include (Select all correct answers)

A. Overheating–

B. Water loss and dehydration

C. Diarrhea

D. Ileus (preterm infants)

E. Rash

F. Retinal damage

G. 'bronzing' of neonates with conjugated hyperbilirubinaemia

34. Which of the following factors should be strongly considered in determining whether an exchange transfusion is indicated in a term neonate with an indirect tbilirubin of 21 mg.%

A. Age of the neonate (time since birth)).Increase ½ mg/kg/hour.

B. Whether the cause is hemolytic or non-hemolytic.

C. The presence of other clinical factors such as intraventricular hemorrhage or meningitis. D. All of the above.

D. None of the above

35. Nurse should support breastfeeding times per day for the first several days of life in order to decrease total serum bilirubin levels

A. 5-7

B. 8 to12

C. 20

D. None of the above

36. When bilirubin levels are extremely high, the nurses should

A. Expose as much of the infant's surface area to phototherapy as possible

B. lining the sides of the bassinet or incubator with aluminum foil or a white cloth

C. Keep infant's diaper

D. Remove infant's diaper

37. The phototherapy should be ------------- cm above newborn infant:

A. 5-10cm

B. 11-15cm

C. 16-20cm

D. 30-40cm

38. Factors deciding effectiveness of phototherapy:

A. Blue light & Intensity of the light

B. The greater the surface area of the skin exposed

C. The closer the light source to the baby, the more effective

39. Dryness of the skin caused by phototherapy can be decreased by

A.   Application of oil lubricants.

B.   Administration of additional fluid.

C.   Apply powder.

D.   Massaging the skin .

40. Application of oil on the skin of the baby on phototherapy leads to

    A. Cooling.

    B. Drying.

    C. Painting.

    D. Tanning .

41. The areas that should be covered for male baby during phototherapy are

    A. Eyes and ear.

    B. Eyes and mouth.

    C. Eyes and chest.

    D. Eyes and genital area

42. In dark skin infant jaundice can be evaluated most easily in

    A. Sclera of the eyes

    B. Abdomen

    C. Palms

The following questions are about assessing your practice about neonatal jaundice. Please put

(X) on the option that matches your answer:

NO	Statement	Strongly agree	agree	neutral	disagree	Strongly Disagree
43.	Eye covers or patches should be removed every 4-6 hourly for eye care during infant cares or feeding. Observe for discharge /infection /damage and document any changes.					
44.	phototherapy units should be turned off during collection of blood for TSB/SBR levels					
45.	Babies must be fed every 2 to 3 hours.					
46.	The infant's temperature should be monitored and recorded at least 4 hourly or more frequently as clinically indicated.					
47.	phototherapy units should be switched off before removing the eye shields					
48.	Nurses must Avoid prolonged exposure to blue phototherapy lights. The retina may be harmed in some cases					
49.	Decontamination of hands should be carried out prior to commencing phototherapy and/or attending to care needs of the infant.					
50.	Monitor the infant's intake and output closely.					
51.	The eye shields should be cut to the appropriate size and secured with the Velcro fastening.					

Nurses' attitude regardingneonatal jaundice

The following questions are about your attitudes about neonatal jaundice. Please put(X) on the option that matches your answer:

NO	Statement	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
52	Neonatal jaundice is a common problem in newborn					
53	Neonatal jaundice is not considered a serious problem					
54	It is usual for neonatal jaundice to last more than 2weeks in a newborn					
55	Breast milk is the main reason for neonatal jaundice					
56	Infection increases the risk of neonatal jaundice					
57	Severe jaundice may cause death In neonates					
58	Differences between fetal-maternal blood groups increase the risk of neonatal jaundice					
59	Phototherapy is the only effective Treatment for neonatal jaundice					
60	Dressing the baby with yellow clothes during jaundice will decrease billirubin level					
61	Exposing the baby to sun light will treat jaundice					
62	Oral herb helps in treating jaundice					
63	Oral water with sugar will treat Jaundice					
64	Physiological jaundice can simply Treated at home					

65	Early feeding can help to increase intestinal motility and increase bacterial flora and so decrease	92				
66	Conjugated billirubin is not dangerous like unconjugated					
67	Physiological jaundice is associated with breast milk jaundice					
68	During phototherapy oily Lubricant can be used to moist					