An-Najah National University

Faculty of Graduate Studies

ASSESSMENT OF CURRENT PRE-DISCHARGE NEONATAL JAUNDICE SCREENING PRACTICES IN GOVERNMENTAL HOSPITALS OF WEST BANK

By

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2024

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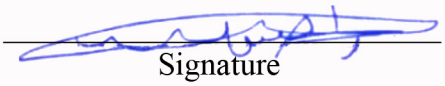
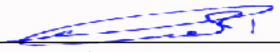
Dr. Raya Sawalha Co-Supervisor	 Signature
Dr. Ahmad Ayed External Examiner	 Signature
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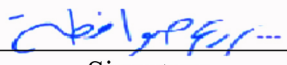
Dr. Reem Sawafta Co-Internal Examiner	 Signature

Dedication

I dedicate this master's thesis to my mother, who always encouraged me while I was working on my master's thesis. And to my husband who helped me have the courage to finish my master's degree, To DrWafa’ Menawi and DrRayaSawalhawho supported me and helped me achieve my goal and successfully complete my thesis.

With sincere appreciation

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Declaration

I, the undersigned, declare that I submitted the thesis entitled:

ASSESSMENT OF CURRENT PRE-DISCHARGE NEONATAL JAUNDICE SCREENING PRACTICES IN GOVERNMENTAL HOSPITALS OF WEST BANK

I declare that the work provided in this thesis, unless otherwise referenced, is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification.

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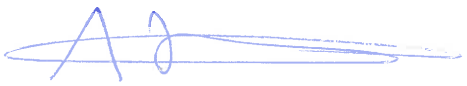
Signature: 

Date: **7/2/2024**

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ASSESSMENT OF CURRENT PRE-DISCHARGE NEONATAL JAUNDICE SCREENING PRACTICES IN GOVERNMENTAL HOSPITALS OF WEST BANK

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Abstract

About (60%) of mature and (80%) of premature newborns experience jaundice in the first 7 days of life, and about (10%) of themstay jaundiced till one month. Pre-Hospital discharge jaundice screening for early detection of newborns who are at risk is essential. This is the first study to assess the current practice of pre-discharge neonatal jaundice screening in governmental hospitals inthe West Bank.

A questionnaire-based quantitative study was conducted among all pediatrician doctors who work at 8 West bank governmental hospitals, between September 2022 and May 2023. A structured Self-administered questionnaire was administered to participants who obtained from Personnel Affairs in selected Palestinian governmental hospitals a month before the data acquisition.

A full of 138 pediatrician doctors participated in this study, which showed a relative weakness in adherence to jaundice screening guidelinesand the results of pediatricians' practices regarding the screening of neonatal jaundice were relatively low.

pediatricians doctors shows low adherence levels and inadequate practices regarding screening of neonatal jaundice pre-hospital discharge. Studies are needed in our country to evaluate the impact of this practice on infants with jaundice.

Keywords: Adherence, Neonatal Jaundice, Hyperbilirubinemia, Pediatrician, Practices.

Chapter One
Introduction and Theoretical Background

This chapter deals in detail with the problem that this study focused on. It is divided into four parts: The first part, consists of an introduction, a problem statement, a discussion, study importance, the purpose and objectives, and research questions. The second part discusses operational concepts and definitions. The third part presented the previous studies related to the research problem.

1.1 Introduction

Jaundice or in other term newborn hyperbilirubinaemia "is the yellow discoloration of the skin and other tissues of a newborn infant and ordinarily, their conjunctiva because of the bilirubin accumulation" (Kudavelly et al., 2011).

Neonatal jaundice is generally not harmful and is a self-restricting condition. However, very high levels of bilirubin may lead to brain damage, a condition called kernicterus (Brits et al., 2018).

Jaundice in newborns or neonates isan ordinary issue. A research of a government hospitals and health clinics found that roughly (75%) of newborns develop jaundice in their first days of life (kinshella et al., 2022).

Jaundice discoloration is a singe used to distinguish neonate whose at risk of developing sever hyperbilirubinemia which can cause severe complications to their nervous system, and possibly causing brain damage (kinshella et al., 2022).

Clinical assessment typically doesn't discover levels of jaundice. The first area to show jaundice is the eye-sclera related to the high elastin level in it's tissue and the fondness of bilirubin for it (Bakar et al., 2017).

Transcutaneous bilirubin testing devices offer a fast, painless tool for assessing serum bilirubin levels. Previous researches have shown accuracy in assessing serum bilirubin levels at low serum bilirubin levels in an ethnically homogeneous population (Campbell et al., 2011).

Delays in discovery and management of neonatal jaundice, because of a dearth in health providers, shortage of appropriate diagnostic tools, is common in developing countries and cause non-treatable cases of neuro-system damage, disability and sometimes dying (Hatzenbuehler et al., 2010).

Some studies have suggested that pre-discharge bilirubin screening for early discovery of newborns at risk so that management could be started as early as possible (Afjeh et al., 2015).
According to a study in Palestinian hospitals resulted with, neonatal hyperbilirubinemia is one of the measure causes of newborn medical admission across westbanck, related to the inadequacy of neonatologists, neonatal nurses, and pediatric subspecialties (Massad et al., 2020).

As so for The American Academy of Pediatrics recommendations, all newborns should be screened for jaundice before hospital discharge and serum bilirubin level should be measured in newborns at risk. Moreover, the Canadian Academy of Pediatrics protocols emphasize that serum bilirubin levels must be assessed within 24 - 72 hours for all newborns after birth pre- hospital discharge (Afjeh et al., 2015).

A search conducted in India showed that the incidence of neonatal jaundice with G6PD (Glucose-6 phosphate Dehydrogenase) significantly higher when compared with other risk factors of jaundice besides ABO and Rhesus incompatibility (Ullah et al., 2016).

The main objectives of pre- hospital discharge screening process are not just for early recognition of high-risk newborns and to start management to avoid sever jaundice, but also avoidance of over-treatment of newborns who reachs a therapeutic levels of hyperbilirubinemia. Several recent research has shown a more correct prediction of pathologic hyperbilirubinemia by using both the prehospitaldischarge of bilirubin level with risk factors assessment than the use of either method alone, using different tools and models such as the prediction model or graphic tool (Han et al., 2015).

1.2 Problem Statement

Providing high-quality neonatal health care is one of most important requirements that the Palestinian Ministry of Health aims to achieve and to improve the neonatal mortality rate.

Lack of data about neonatal jaundice prevelance and casess seen in Palestine, but several studies in other nations of world have shown an increase in neonatal jaundice prevalence.

Pre-discharge bilirubin level screening for early recognition of newborns whoes at risk is important so that management could be initiated as early as possible. And so decline the length of stay in hops and decreases the possible rate of re-hospitalization. This is the first study to assess the current practice of pre-discharge neonatal jaundice screening in governmental hospitals on the West Bank. That could be used to re-enable the current policy to improve neonatal health as one of the ways to decrease neonatal mortality rates.

Lack of implementation of neonatal jaundice screening policy the policy agreed by the Palestinian ministry of health in governmental hospitals has a significant negative effects on the level of quality of health services designed for neonatal health.

1.3 The importance of study

To pediatrician doctors

The Palestinian Ministry of Health will focus on results from this study for improving the training of pediatrics doctors working in postnatal word .

Results from this search will help healthcare policy generators to follow up neonatal screening policy in all neonates before discharge and how to manage them.

To nursing practice

The results will make the selected hospital to deal with the most common obstacles of the neonatal jaundice screening at their hospital and how to resolve them.

The results will also help in screening of newborns jaundice with defining the gaps and obstacles of the practice of neonatal jaundice.The selected hospitals will develop the

policies that may improve the areas of weakness in neonatal jaundice screening strategies in post natal word in the hospitals.

To nursing research

Studies will use results for accurate data on the newborns jaundice screening guidelines in west bank hospitals, and they will make it as a source for further research.

To nursing education

Student will use the study as a foundation for further researches and nursing education will use this research in developing of curriculum essential in teaching obstacles related to newborns jaundice screening.

1.4 Purpose of the study

The goal of this study is to investigate the current practice of pre-discharge neonatal jaundice screening in governmental hospitals of West Bank.

Secondary objectives:

- To assess pediatricians' adherence to jaundice guidelines .
- To assess Pediatricians' practice regarding methods of pre-discharge screening of neonatal jaundice.
- To determine barriers to implementing jaundice screening policy at the time of newborn discharge.

1.5 Hypotheses of Study

H_1 : There are no statistically significant differences at the significance level ($\alpha<0.05$) in the adherence of pediatriciansto jaundice screening guidelines according to the location the of hospital.

H_2 : There are no statistically significant differences at the significance level ($\alpha<0.05$) in Pediatricians' practices regarding the screening of neonatal jaundice according to their ages.

H_3 : There are no statistically significant differences at the significance level ($\alpha<0.05$) in following risk factors associated with jaundice in neonates and request TSB or TcB measurement pre-hospital discharge according to their ranks.

H_4 : There are no statistically significant differences at the significance level ($\alpha<0.05$) in barriers to implement pre-hospital discharge newborn jaundice screening policy according to their sex.

1.6 Significance of the study

Lack of data about neonatal jaundice is seen in Palestine while several studies in other nations of the world have shown an increase in neonatal jaundice prevalence.

A study carried out in the Pediatric Department, Faculty of Medicine, Aswan University Hospital, Included 100 healthy full-term newborns. Results significant of high incidence rate of neonatal hyperbilirubinemia up to (64%) (Ullah et al., 2016).

A Systematic Review & Meta-Analysis of 84 articles aimed to determine the prevalence of SNJ, described using clinical outcome markers, in all World Health Organization (WHO) regions in the world, demonstrate adverse clinical outcomes of sever neonatal jaundice continues to be a leading cause of neonatal admissions and death. The study highlights global prevalence of SNJ with ranges varying from (3.34%) in the African and (2.58%) in the South-East Asian regions to (1.73%), (1.42%), (1.31%) and (0.74%) in the Americas, Eastern Mediterranean, European and Western Pacific regions (Satrom et al., 2023).

Whereas, a search carried out in Nigeria showed that total prevalence of neonatal jaundice in females was lower than total prevalence in males. The search emphasis that (70.5%) of the newborns experience jaundice within the first seven days of life (Kolawole et al., 2016).

Furthermore, another search carried out in Nigeria also found that the incidence of severe neonatal jaundice was hospital-based. Maine incidence of severe jaundice was at least (5.5%) according to that search. The incidence of neonatal jaundice was mostly to be under-reported in hospital which was not carried out an adequate post discharge surveillance until the first week of life (Olusanya et al., 2016).

Providing high-quality neonatal health care is one of the most important requirements that the Palestinian Ministry of Health aims to achieve and to improve the neonatal mortality rate.

Pre-discharge bilirubin level screening for early recognition of newborns at risk is important so that management can be initiated as early as possible. And so decline the length of stay in hospitals and decreases the possible rate of re-hospitalization.

1.7 Definition of significant terms as used in the study

Neonate: “or new-born infant is a child under 28 days of age (Annual Health Report, Palestine 2021- moh). In this study, a neonate is a child under 28 days.”
Jaundice: “is a yellowdiscoloration of the skin, mucous membranes, and the withes of the eyes in the new-born.” (Annual Health Report, Palestine 2021- moh).

1.8 Previous Studies and Theoretical Background

Introduction

A systematic review was used to collect previous published papers, which discussed the same title, objectives, and keywords this study. This gives us access to a robust database of our research. The keywords used in database search process are adherence, neonatal jaundice, hyperbilirubinemia, pediatrician, practices. A set of keywords linked to study title and study objectives were pre-selected. The literature review of scientific research is basis of clarifying the researchers' approachs to topics related to the research topic. Previous studies considered a nucleus for drawing scientific frame works for research, it is not possible establish any scientific research without previous studies. The following is a demonstration of the main and most essential studies available to researchers from previous studies have been labeled. The goals of this study, which are directly related to the current study and others are partly related to its components. The focus was on the main objectives of the studies and the most important results that were reached so that we can compare them with the results of the current research

1.8.1 International studies

Study from England

Jaundice is a widely recognized issues needs clinical management in newborn infants. About (60%) of mature and (80%) of premature newborns whoes experience jaundice in the first seven days of life, and around (10%) of breastfed newborns are jaundiced until thirty days after birth (Singh et al., 2017).

Two Studies from India

More than (80%) of newborns will develop jaundice, which considered the clinical signs of hyperbilirubinemia, in the first few days after birth. Hyperbilirubinemia can be harmless at low levels but it cause damage to the brain at higher levels.

Th1e level of hyperbilirubinemia need thereby is determined by age in hours and risk factors for exhibiting severe Hyperbilirubinemia (Devi et al., 2018).

Jaundice is the most common issue in the first week after birth. About (25-50%) of all full-term neonates, a higher percentage of preterm newborns exhibit clinical jaundice within the neonatal period. It is the most common cause of admission to NICU in the neonatal period (Chen et al., 2015).

Study from Canada

As up to the Clinical examination for prevention of severe complications of jaundice and identification of significant hidden risk factors requires that all newborn in the pre-discharge planning policy to:

Applying assessment measures for risk factors of visual assessments tools for jaundice. In neonates with significant risk factors, such as prematurity and newborns at risk for hemolytic disorders, testing level of jaundice by using transcutaneous bilirubin levels (TCB) and/or total serum bilirubin (TSB) is likely effective. All jaundiced neonates needs a pre-discharge screening assessment including risk and full clinical assessments (Campbell et al., 2011).

For the American Academy of Pediatrics association (AAP) and the Canadian Pediatric guidelines (CPS), all neonates must to be assessed for jaundice pre-hospital discharge and serum bilirubin level should be measured in newborns at risk, both academies have recommended that assessment of jaundice by measuring the total serum bilirubin (TSB) or a transcutaneous bilirubin (TCB) levels used to recognize neonates with significant jaundice may require re-assessments or phototherapy (Campbell et al., 2011)**.**

Study from Malaysia

Hyperbilirubinemia of newborns is divided into two main categories, are physiological hyperbilirubinemia and pathological hyperbilirubinemia (Zulkarnay et al., 2015).

By definition, physiological hyperbilirubinemia developed within 24 - 72 hours after

birth, at tops by 4 to 5 days in the mature newborns and 7 days in premature ones. Then, disappears by 10 - 14 days of life. This jaundice type usualy resolves without treatment (Zulkarnay et al., 2015).

- Study from new york – America

  Present of hemolytic disease and the newborn's gestational age is the most critical risk factor for jaundice, when the newborn age in hours is combined with the pre-discharge of bilirubin level is more effective in diagnosis of jaundice and predicting severe causes (Maisels, 2015).

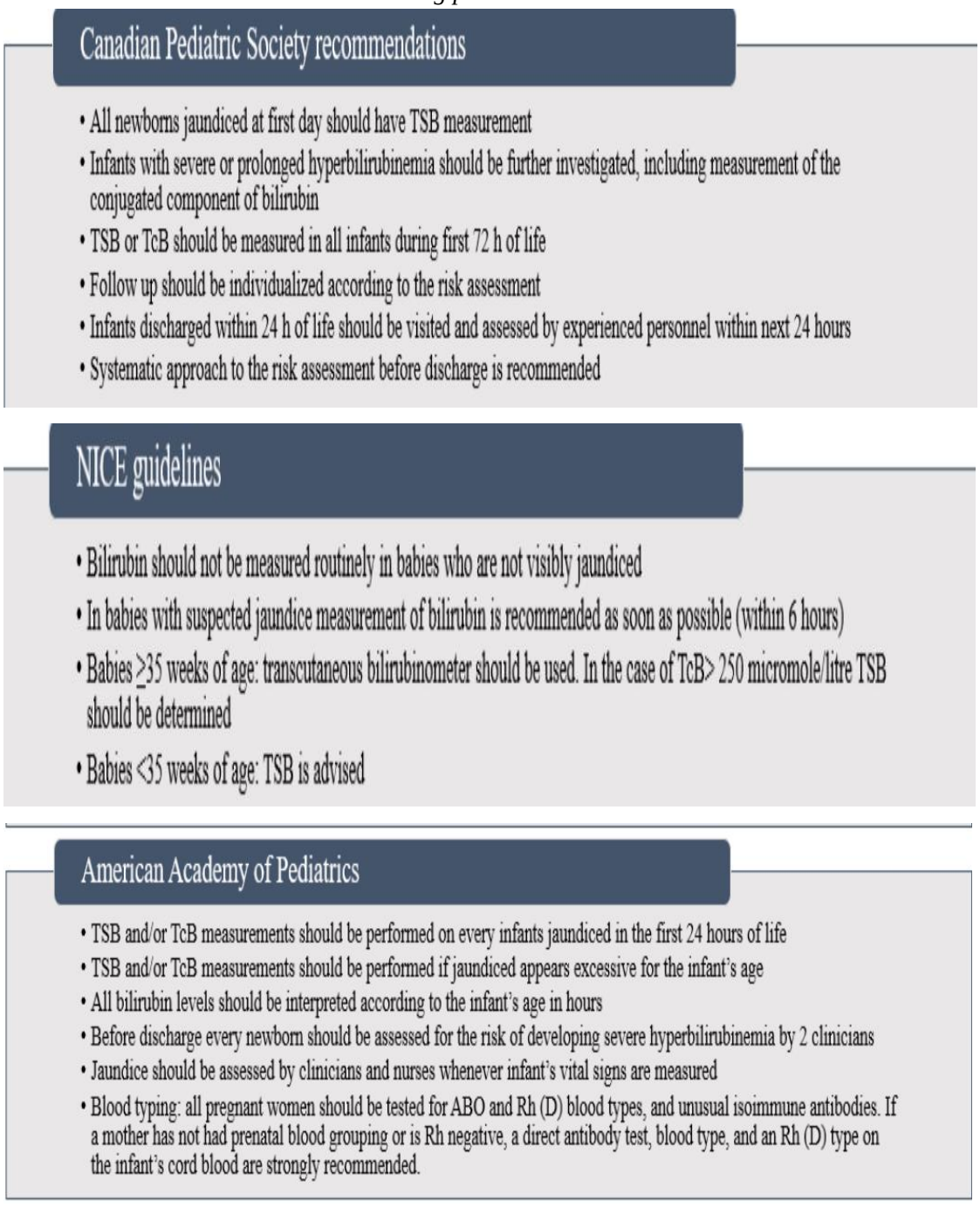
  New researches have shown that by mixing the pre-discharge bilirubin level with the neonate's gestational age and other risk factors leads towards a level of positive prediction of newborns at risk (Maisels, 2015).

- Study from Pakistan

  Late diagnoses and treatment of neonatal jaundice, because of shortage in health worker and lack of adequate diagnostic tools, is a common issues in developing countries and cause many permanent cases of neuro-system damage, disability and sometimes dying (Hatzenbuehler et al., 2010).

Figure 1

International Neonatal Jaundice Screening protocols and Recommendations



Soures: National Institute for Health and Care Excellence, 2020

Canadian Pediatric Society recommendation:

- All newborn jaundice at first day should have TSB measurement.
- Infants with severe or prolonged hyperbilirubinemia should be further investigated, including measurement of the conjugated component of bilirubin.
- TSB or TCB should be measured in all infants during first 72 hour of life
- Follow up should be individualized according to the risk assessment.

- Infant discharged within 24 hour of life should be visited and assessed by experienced personnel within next 24 hours.
- Systematic approach to the risk assessment before discharge is recommended.

NICE guidelines

- Bilirubin should not be measured routinely in babies who are not visibly jaundiced.
- In babies with suspected jaundice measurement of bilirubin is recommended as soon as possible (with 6 hours).
- Babies >35 weeks of age:transcutaneous bilirubinometer should be used in the case of TSB> 250 micromole\liter TSB should be determined.
- Babies <35 weeks of age: TSB is advised .

American Academy of Pediatrics :

- TSB and\or TCB measurements should be performed on every infants jaundiced in the first 24 hours of life .
- TSB and\or TCB measurements should be performed if jaundiced appears excessive for the infant's age in hours.
- All bilirubin levels should be interpreted according to the infant's age in hours.
- Before discharge every newborn should be assessed for the risk of developing severe hyperbilirubinemia by 2 clinicians.

1.8.2 Regional Studies

- **Tow Study from Iran**

  Neonatal jaundice is diagnosed when increased levels of bilirubin in the blood serum, an issue labeled as hyperbilirubinaemia. Pathologic levels of bilirubin may leads to permanent disorders such as bilirubin encephalopathy which defined as kernicterus (Simkiss & martin, 2012).

  Developing of jaundice is high with newborn infants. And all infants are routinely discharged from hospitals departments, thus providing screening assessment before discharge for discovering of jaundice is essential (Afjeh et al., 2015).

The treatment of newborns jaundice relies on the phototherapy, Feeding, hydration and exchange transfusion (Ullah et al., 2016).

- **Tow Study in Iraq**

  The routine process, early discharge strategy bedside with limited follow-up services in developing nations and lack of communication between physicians and parents led to negative effect on applying screening measurements of hyperbilirubinemia in these neonates (Khan et al., 2017).

  GPs and EPs show lower adherence levels for the management of neonatal jaundice than PDs, which indicates that these physicians adhere well to current management guidelines from the WHO, AAP and NICE (Hameed et al., 2020).

1.8.3 Local studies

- **Study in Palestine(west bank , Gaza strip, East Jerusalem)**

  According to a study done in Palestinian hospitals, resulted in that neonatal jaundice is one of the main causes of neonatal hospitalizations and readmission cases across the WB, as a result of inadequate in numbers of neonatologists, neonatal nurses & pediatric specialties (Massad et al., 2020).

- **National neonatal protocol in Palestine**

  Pre-discharge screening policy must be used to discover severe neonatal jaundice in late premature& mature newborns, as so risk factor assessment and bilirubin levels (TCB or TSB) must be applied (State of Palestine : Humanitarian Situation Report, End of Year 2020 - Occupied Palestinian Territory, 2021).

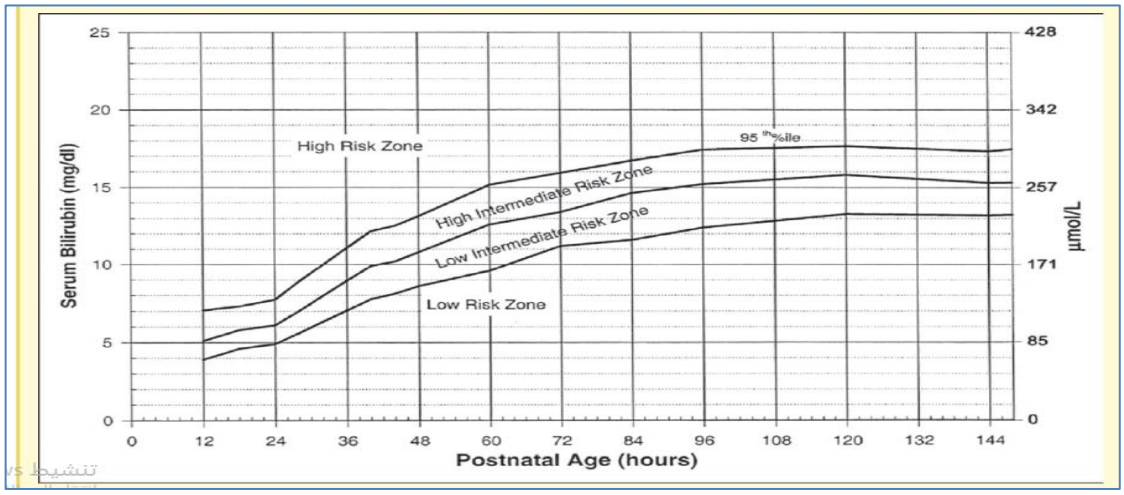
Clinical risk factors to be considered with predischarge TCB or TSB levels:

- Isoimmune (ABO or Rhesus) haemolytic disease, G6PD deficiency or other.
- haemolytic diseases.
- Exclusive breastfeeding, if nursing is not going well, &/or weight loss is >8-%10.
- Previous sibling with jaundice.
- Cephalhaematoma or significant bruising.
- Gestational age.

Clinical risk factor assessment or/& pre-discharge bilirubin levels (TCB or TSB) is used to identify the newborn risk zone accordine to the namogram as shows in figer 2 (State of Palestine : Humanitarian Situation Report, End of Year 2020 - Occupied Palestinian Territory, 2021)**.**

Figure 2

Nomogram of hour-specific serum total bilirubin (TSB) concentration in healthy term and near-term newborns

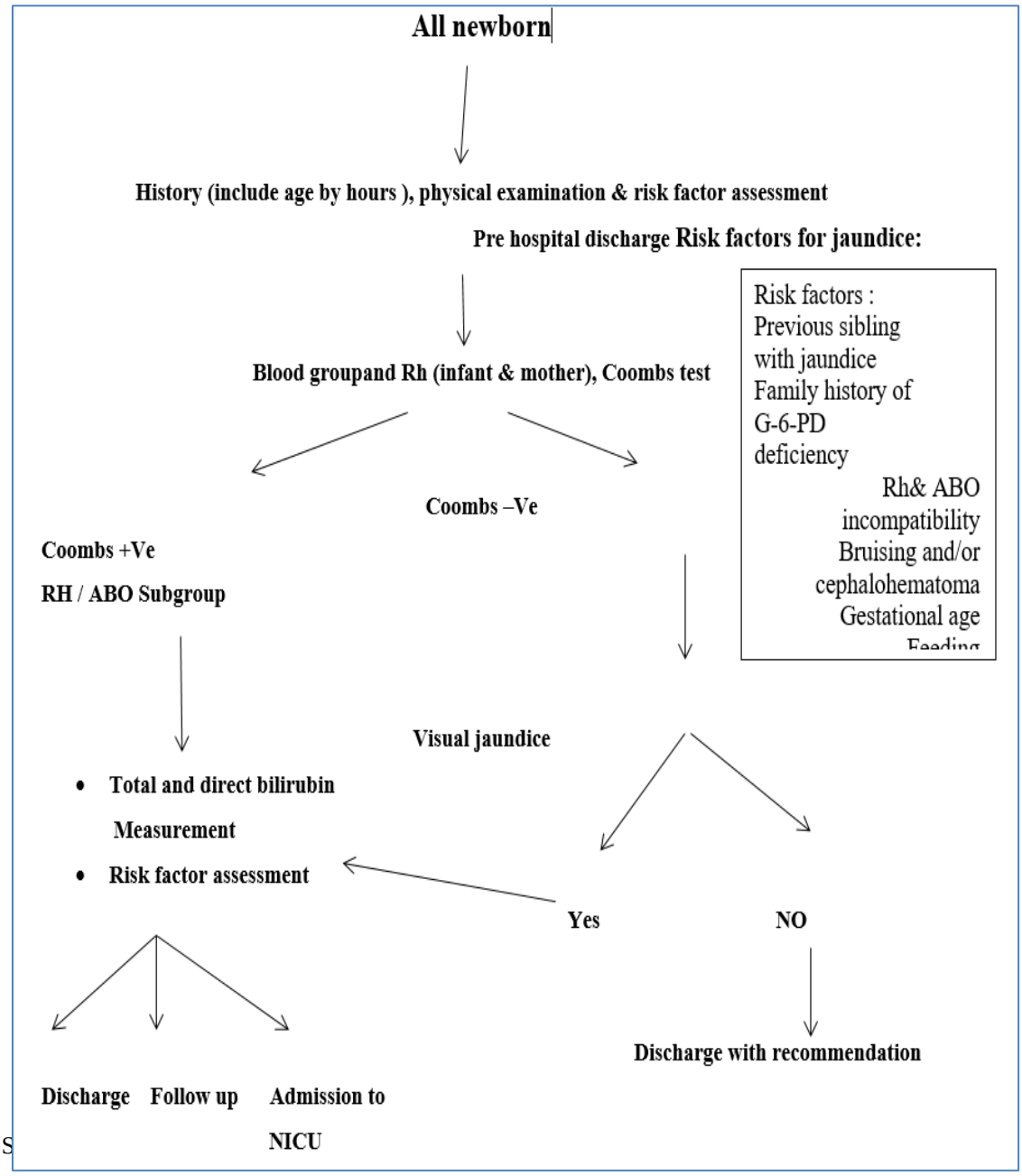


- Risk zones are designated according to percentile:high (TSB ≥ 95th),high intermediate (95th > TSB ≥ 75th),low intermediate (75th > TSB ≥ 40th),and low (TSB < 40th). (State of Palestine : Humanitarian Situation Report, End of Year 2020 - Occupied Palestinian Territory, 2021)

New born with values in the high risk zone are at increased risk for the development of clinically significant hyperbilirubinemia which requires intervention (State of Palestine : Humanitarian Situation Report, End of Year 2020 - Occupied Palestinian Territory, 2021).

Figure 3

Conceptual framework: Queensland Clinical Guideline



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Chapter Two
Methodology

Introduction

In this chapter, methods that were used to answer the study objective are presented in details. This reflects on study design, study setting, participants, used tool, study sample and sampling technique.

2.1 Study Design

The study adopted a quantitative cross-sectional research design. A descriptive survey has specified research objectives, which permits data gathering to be relevant and sufficient to the study topic.

The quantitative cross-sectional research approachs is one more appropriate for studies which characterize & illustrate features of an event, scenario, or a group of individuals, community, or population as they exist. This approach was appropriate since there was a requirement to define responders in terms of pre discharge jaundice screening policy for all newborn is implemented by pediatrician doctors at the all Palestinian west bank governmental hospitals.

2.2 Study Setting

West bank governmental hospitals in palestinian medical complex Ramallah, Rafedia hospital Nablus, Thabet-Thabet hospital -Tulkarm, Khalil Solaiman hospital -Jenin, Tobas-Alturky hospital, Selfeet hospital, Allia hospital- Hebron, Bet-Jalla hospital Betlahem, A total of 8 governmental hospitals .

2.3 Study Population

The study population includes all pediatrician doctors works at west bank governmental hospitals and registered in the Palestinian ministry of health.

The study sample included must meet the following inclusion criteria:

- Pediatrician doctors.
- Works at west bank governmental hospitals and registered in the Palestinian ministry of health.
- Consent to participate in the study.

Exclusion criteria:

- General doctors.
- Pediatrician working in privet hospitals and clinics.

2.4 Study sample

Subject Recruitment

A list of pediatricians' doctors was obtained from Palestinian annual health report 2019, month before the data collection procedure begins and were 519 work in governmental and privet and primary health care centers.

After contacting with each hospital affaires at selected hospitals the total number was 150 PDs. A total of 138 PDs were reached, the other 12 PDs 8 of them refused to participate and 4 of them were off duty during data collection.

The selected participant meets the inclusion criteria were contacted by verbal consent and obtained to participate in the research and all others were excluded .

A total of 138 at West bank governmental hospitals of PDs doctors according to each hospital affaires, in the palestinian medical complex Ramallah (40), Rafedia hospital Nablus (27), Thabet Thabet hospital –Tulkarm (14), khalil solaiman hospital –Jenin (17), Tobas altuky hospital (5), Selfeet hospital (4), Allia hospital- Hebron (25), Betjalla Hospital –Betlahem (16), A total of 8 governmental hospitals .

2.5 Data collection tool

A availed & well questionnaire designed by (Hameed et al., 2020) for the assessment of adherence level for neonatal jaundice screening by pediatricians and a questionnaire by (Petrova et al., 2006) for screening the neonatal jaundice, Pediatricians' practices and educational requirements, modifications were made to fit the questionnaire with the aim of our study and to achieve the study objectives. The structured questionnaire consisted of 41 questions (Appendix 2) consisting of five sections as follow:

The first section addressed the participants' demographic data, including age, sex, work experience, location of the hospital and rank on pediatricians'speciality program.

The second section of the questionnaire contained 8 questions for the part of evaluation the adherence to jaundice screening guidelines by pediatricians. Questions included: the

length hospital stay (discharge time) of neonates, physician policy about pre-discharge bilirubin level test, physician policy of timing of post-discharge follow-up, guidelines used by the physician (WHO, AAP ,and NICE) and nature of guideline access.

And a Case scenario. Additionally, a case scenario presented to physicians, as follows.

“A 30-year-old mother, with blood group O+,gave birth to a 2.8 kg male infant with cephalic hematoma after 37 weeks of gestation. Before discharge, at 36 hours after birth, the infant appeared jaundiced. I would do?”

The following options provided to the participants: discharge and follow-up, laboratory tests of bilirubin and blood group, cancel discharge and start phototherapy without further evaluation, refer to a pediatrician.

The third section of the questionnaire contained 10 questions for the evaluation the Pediatricians’ practices regarding the screening of neonatal jaundice. All questions were designed using a yes/no and either single or multiple-choice format, we assessed pre discharge newborn jaundice screening methods such as: Using cephalocaudal (head to toe) assessment (visual assessment), Testing Blood group and Rh of the newborn and the mother, Testing Coomb’s test for newborn, Using TCB assessment, TSB testing with clinical jaundice before discharge, TSB testing with clinical jaundice post-discharge (for follow up), and Recommendations to the mother regarding the baby's jaundice based on clinical judgment before discharge, The following options were provided to the physicians: Bring baby to the pediatric emergency for follow up, Put baby in the sunlight, Refer baby for TSB measurement, and Stop breastfeeding .

The fourth section of designed questionnaire contained 9 questions for the evaluation of pediatrician's considerations’ regarding the risk factors associated with severe jaundice and request TSB or TCB measurement pre-hospital discharge. A scale type format (never, rarely, sometimes, often, always)was used to assess these questions.

A scale type format (hardly at all, to a small degree, to a moderate degree, to a very high degree, and not applicable) was used.

We assessed the following risk factors: jaundice presenting in first 24 hours, jaundice noted at discharge, previous siblings with jaundice with visible jaundice, gestationalage between 35 and 36 weeks with visible jaundice, exclusive breastfeeding with visible

jaundice, bruising/cephalohematoma, Rh incapability, ABO incapability, and family history of G-6-PD deficiency with visible jaundice.

The fifth section of the questionnaire contained 7 questions, To determine barriers of implementing pre-hospital discharge newborn jaundice screening policy. A scale type format (never, rarely, sometimes, often, always) was used to assess these questions. We assessed the availability of qualified setting available for new born examination (proper light, devices), the pedications' resistance through asking about (Examining all babies Before discharge, Ensuring appropriate practices of results with parents and Arranging post discharge follow-up for babies who live far from hospital), difficulties arranging access for total serum bilirubin or trans-cutaneous bilirubin blood testing, availability of transcutaneous bilirubin devices, availability of total serum bilirubin testing available in the hospital laboratory, avoidance of multiple tests prevents over testing of newborn, avoidance of multiple tests for newborn in order to go with hospital policy in preventing cost overruns.

2.6 Validity and Reliability of the Questionnaire

Randomization: systemic randomized sampling technique conducted on 8 governmental hospitals, face to face administration questionnaire for data collecting.

Test for validity (content and construct) was calculated, internal consistency measured using Cronbach's alpha measure reliability value of more than (0.70) was utilized.

A pilot study conducted on (10%) of the sample size of all PDs in hospitals affairs, and it 10 was excluded from the study. This action was to determine the clarity of the questionnaire. A final modified version was prepared, as shown in the appendix (2).

Data collection may take more time due to various obstacles such as transportation and political issues. This may lead to prolonging period of data and thus affect validity and design.

2.7 Data Analysis

The statistical analysis was done by using Statistical Package for Social Since (SPSS), quantitative variable described in mean and SDs, and qualitative variable is described in proportion, the association of qualitative variable assessed by the chi-square test, and P value less than 0.05 will be considered statistically significant.

2.8 Ethical consideration

Written informed consent was taken from all participants who agree to participate in the study. Approval obtained from the IRB committee at Faculty of Graduate Studies at AL-Najah National University. All procedures compiled with Declaration of Helsinki. Confidentiality and anonymity assured. Verbal informed consent was obtained prior to data collection. Consent forms, including information on objectives and significance. They informed that their participation is voluntary. Furthermore, the confidentiality and anonymity of participants were guaranteed. They were also informed of the possibility of their withdrawal from the study at any time without any punishment. Moreover, data security ensured and only used for research purposes, and the questionnaires coded by serial numbers and kept in a locked cabinet.

Chapter Three

Results

3.1 Demographic characteristics of pediatricians

A total of 138 of pediatrician doctors participating in this study the most of them were from the age group less than 34 years (32.6%), while the age group above 55 years was less than (13%) and most of them were male (62.3%). As for years almost half (55.8%) of them had experience under 5 years. Moreover, (29%) of the participants in the study were from the Hebron region, and it represented the largest percentage of the regions. About half, (46.4%), were in their 5th years of specialization. See table 1

Table 1

Demographic characteristics of pediatricians by the type of practice

		Frequency	Percent
Age in years:	< 34	45	32.6
	35 – 44	43	31.2
	45 – 54	32	23.2
	55 – 64	17	12.3
	> 65	1	.7
Sex	Male	86	62.3
	Female	52	37.7
Years of experience	< 5 years	77	55.8
	5 – 10 years	42	30.4
	11 - 16 years	18	13.0
	> 16 years	1	.7
Location of hospital	Tulkarm	17	12.3
	Nublus	26	18.8
	Jenin	16	11.6
	Ramallah	27	19.6
	Selfeet	4	2.9
	Tobas	3	2.2
	Hebron	40	29
	Bethlehem	5	3.6
Rank on pediatricians' specialty program in the current hospital	1st year	3	2.2
	2nd year	27	19.6
	3rd year	16	11.6
	4th year	17	12.3
	5th year	64	46.4
	Specialist	11	8.0

3.2 Adherence to jaundice screening guidelines by the pediatrician

Table 2 presents extent of pediatricians' adherence level to the screening guidelines, as it reflected the participant was, on average, examining 2-5 newborns for each examination time, while, unfortunately, when asked about their adherence to measure a baby's bilirubin level before discharge, only about (1%) was adhered to conducting the test as a general rule. While most of them adhered to doing the examination if they noticed yellowing or the presence of risk factors indicating the disease. It was also noted that only (2.2%) of the specialists on average, discharge a healthy, term and vaginally-born newborn (C.S. newborns are excluded) from the hospital after 49-72 hours, while the majority (60%), discharge them in less than 24 hours. Also, (29%) considered jaundice in 24 hours after birth as warning signs of severe jaundice.

While the others (18.1% and 25.4%) considered visual the palms of the hand and the soles of the feet are yellow (18.1%) and jaundiced baby with pale stools (25.4%), fever as warning signs of severe jaundice. According to clinical judgment, the first schedule for the first post- discharge follow-up after discharge from the hospital, the majority (59.4%) of participants scheduled the first post- discharge follow-up within 49-72 hours from time of discharge. And when they were asked about the use a specific guideline regarding the screening of jaundice, (79.1%) answered by yes, and the Ministry of Health was main source for (37%) of them, then the American Academy of Pediatrics (31.9%), and it was easily accessible by the participants (89.9%). While (29%) stated that the main source of information was hospital policies, unfortunately, the majority of (43.5%) stated that the main source for them was the online internet.

When participants were asked about a case of a 30-year-old mother, blood group O+, gave birth to a 2.8 kg male infant with cephalohematoma after 37 weeks of gestation. Before discharge, at 24 hours of age, the infant appeared have signe jaundiced, (33.3%) of the participants answered correctly that laboratory tests (blood typing, Rh, coombs & bilirubin measurement) should be requested for the child, while the majority (41.3%) answered the newborn can discharged from the hospital and given an appointment for follow upas an outpatient.

Table 2

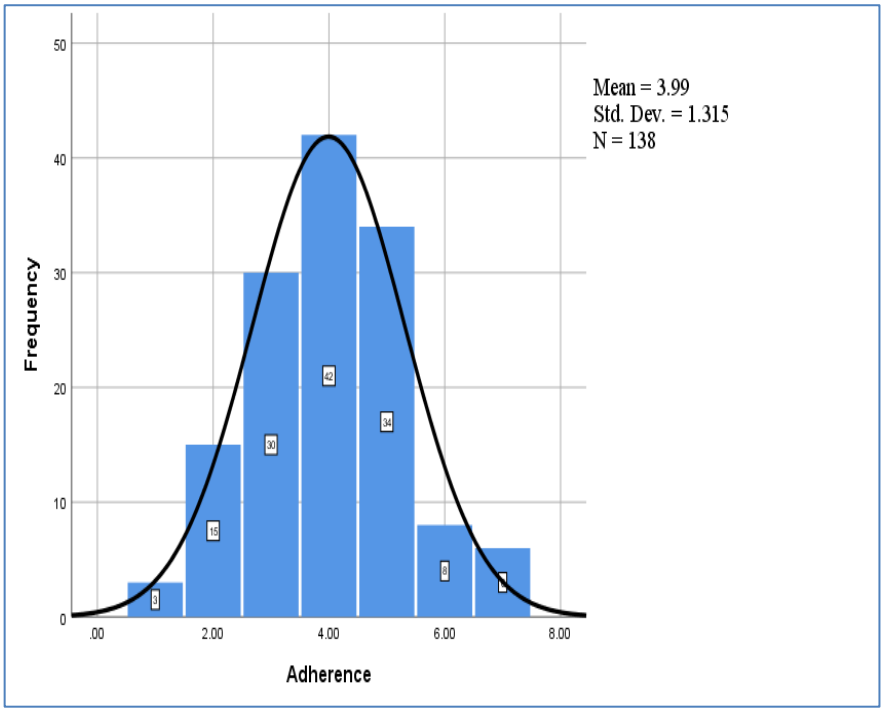
Adherence to jaundice screening guidelines by the pediatrician

		n(%)
On average, how many newborns do you examine for each examination time	2 – 5	29 (21.0)
	6 – 9	55(39.9)
	≥ 10	54(39.1)
Do you measure a baby's bilirubin level before discharge for all newborn	Yes, as a rule	1(.7)
	Yes, if the baby looks jaundiced	54(39.1)
	No, I never do	20(14.5)
	Sometimes if risk factors of jaundice present	63(45.7)
On average, at what age do you discharge a healthy, term and vaginally-born newborn (C.S newborns are excluded) (State the length of stay in hours)?	≤ 24 hours	83(60.1)
	25 – 48 hours	52(37.7)
	49-72 hours	3(2.2)
What do you consider warning signs of severe jaundice?	Visual: the palms of the hand and the soles of the feet are yellow	25(18.1)
	Jaundice within < 24 hours after birth	41(29.7)
	Jaundiced baby with pale stools, fever	35(25.4)
	Rate of rise of total bilirubin level > 0.2 mg/DL/Hour in term infant	37(26.8)
According to clinical judgment, at what age in hours do you schedule the first post-discharge follow-up (state the number of hours)?	≤ 24	3(2.2)
	25 – 48	23(16.7)
	49 – 72	82(59.4)
	> 72	30(21.7)
use a specific guideline regarding the screening of jaundice?	No	4(2.9)
	Yes	134(97.1)
Iyes, please specify:	Hospital Care for Children (World Health Organization, [WHO])	23(16.7)
	The guideline issued by the American Academy of Pediatrics (AAP)	44(31.9)
	The guideline issued by the National Institute for Health and Clinical Excellence(NICE)	16(11.6)
	Palestinian ministry of health (MOH)	51(37.0)
	Other	4 (2.8)
Have easy access to that guideline?	No	14(10.1)
	Yes	124(89.9)
If yes , please specify:	Books	7(5.1)
	Online	60(43.5)
	Hospital policy	40(29.0)
	Your own notes and experience	31(22.5)
A 30-year-old mother, blood group O+, gave birth to a 2.8 kg male infant with cephalohematoma after 37 weeks of gestation. Before discharge, at 24 hours of age, the infant appeared jaundiced. would you (choose one answer that the most adherent to your practice):	Discharge the baby & schedule a follow-up as an outpatient.	57(41.3)
	Ask for lab test: blood typing, Rh, coombs & bilirubin measurement	46(33.3)
	Cancel discharge & start phototherapy without further assessment	2(1.4)
	Refer the baby to a second higher level pediatrician	33(23.9)

Figure 4 shows that the rate of adherence level to the jaundice screening guidelines in children among the pediatric specialists participating in the study was 3.99 out of 10 ± 1.31, which reflects relatively poor level in the adherence to these jaundice screening guidelines. See figure 1

Figure 4

Adherence to jaundice screening guidelines by the pediatrician



Pediatricians' practices regarding the screening of neonatal jaundice:

Table No. 3, which is concerned with practices regarding the screening of neonatal jaundice in children, the majority (99.3%) used the head to toe physical evaluation, and (43.5%) examined the compatibility of blood types and the Rh factor of the child and the mother, and (50.7%) performed the Coombs test. Unfortunately, only (1.4%) of the participants did the TCB blood test and (54.3%) of them tested for total bilirubin before discharge, and the percentage was (40.6%) when checking after discharge. And (100%) of the participants were instructing the mother to bring baby to the pediatric emergency for follow up if any signs of jaundice appeared. And (63%) did not advise the mother to put the newborn under the sunlight in the case of jaundice appeared. And (65.9%) of the participants were instructing the mother to check the level of bilirubin in the case of jaundice, and (86.2%) had instructed the mother not to stop breastfeeding in the case of jaundice.

Table 3

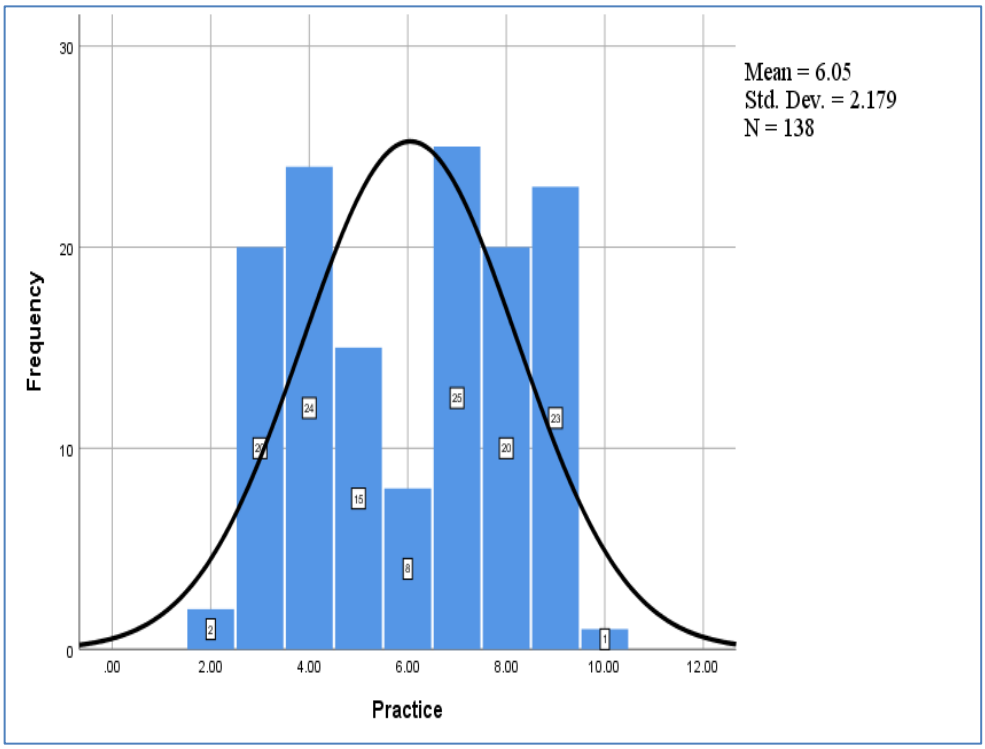
Pediatricians' practices regarding the screening of neonatal jaundice

		n(%)
Using cephalocaudal (head to toe) assessment (visual assessment)	No	1(.7)
	Yes	137(99.3)
Testing Blood group and Rh of the newborn and the mother	No	78(56.5)
	Yes	60(43.5)
Testing Coomb's test for newborn	No	68(49.3)
	Yes	70(50.7)
Using TcB assessment	No	136(98.6)
	Yes	2(1.4)
TSB testing with clinical jaundice before discharge	No	63(45.7)
	Yes	75(54.3)
TSB testing with clinical jaundice post-discharge (for follow up)	No	82(59.4)
	Yes	56(40.6)
Recommendations to the mother regarding the baby's jaundice based on clinical judgment before discharge:		
Bring baby to the pediatric emergency for follow up	Yes	138(100.0)
Put baby in the sunlight	No	87(63.0)
	Yes	51(37.0)
Refer baby for TSB measurement	No	47(34.1)
	Yes	91(65.9)
	No	119(86.2)
	Yes	19(13.8)

Figure 5 shows the discrepancy in the rates of pediatricians' practices regarding the screening of neonatal jaundice among the pediatric specialists participating in the study, where rate was 6.05 out 10 ± 2.17,and the results of pediatricians' practices regarding screening of neonatal jaundice were relatively low, Figure 2 shows the discrepancy in rates of pediatricians' practices regarding the screening of neonatal jaundice among the pediatric specialists participating in the study, where the rate was 6.05 out 10 ± 2.17, and the results of pediatricians' practices regarding the screening of neonatal jaundice were relatively low.

Figure 5

Pediatricians' practices regarding the screening of neonatal jaundice



Risk factors associated with jaundice in neonates and request TSB or TCB measurement pre-hospital discharge:

Table No. 4 was expressing risk factors contributing to jaundice in neonates and request TSB or TCB measurement pre-hospital discharge. The highest risk factor which was associated with jaundice in neonates and request TSB or TCB measurement pre-hospital discharge from point view of pediatrician participants was exclusive breastfeeding with visible jaundice (RM= 4.49out of 5), noticing jaundice before discharge (RM= 3.82out of 5), or jaundice appearing in the first 24 hours of birth (RM= 3.19out of 5).

While the least risk factor associated with jaundice in neonates and request TSB or TCB measurement pre-hospital discharge from point view of the pediatrician participants was the presence of a family history jaundice was (RM= 1.12out of 5), and the presence of a previous child in the family who had previously had jaundice, with a ratio of (RM= 1.71 out of 5).

Table 4

Risk factors associated with jaundice in neonates and request TSB or TcB measurement pre-hospital discharge

	Never n(%)	Rarely n(%)	Some n(%)	Often n(%)	Always n(%)	RM
Jaundice presenting in the 1st 24 hrs	5(3.6)	56(40.6)	28(20.3)	6(4.3)	43(31.2)	3.19
Jaundice noted at discharge	1(.7)	25(18.1)	35(25.4)	14(10.1)	63(45.7)	3.82
Gestational age with visible jaundice	55(39.9)	19(13.8)	37(26.8)	23(16.7)	4(2.9)	2.29
Exclusive Breastfeeding with visible jaundice	7(5.1)	0(0)	42(30.4)	13(9.4)	76(55.1)	4.09
Bruising & /or cephalohematoma	5(3.6)	26(18.8)	100(72.5)	6(4.3)	1(.7)	2.80
Rh incompatibility	64(46.4)	4(2.9)	8(5.8)	45(32.6)	17(12.3)	2.62
ABO incompatibility	65(47.1)	3(2.2)	3(2.2)	44(31.9)	23(16.7)	2.69
Family history of G6PD deficiency with visible jaundice	124(89.9)	12(8.7)	2(1.4)	0(0)	0(0)	1.12
Previous sibling with jaundice with visible jaundice	61(44.2)	56(40.6)	21(15.2)	0(0)	0(0)	1.71

3.3 Barriers to implementing pre-hospital discharge newborn jaundice screening policy

Table No. 5 was expressing the obstacles that reduce compliance with the implementing the pre-hospital discharge newborn jaundice screening policys. The highest barriers to implementing pre-hospital discharge newborn jaundice screening policy, was examine babies before discharge (RM= 4.91out of 5) for all nwborns, followed by total serum bilirubin testing available in hospital laboratory (RM= 4.74 out of 5).

While the lowest barriers to implementing pre-hospital discharge newborn jaundice screening policy was avoidance of multiple tests for newborn in order to go with the hospital policy in preventing cost overruns (RM= 1.13 out of 5), followed by avoidance of multiple tests to prevent over testing of newborn (RM= 1.25out of 5).

Table 5

Barriers to implementing pre-hospital discharge newborn jaundice screening policy

	Never n(%)	Rarely n(%)	Some n(%)	Often n(%)	Always n(%)	RM
Is qualified setting available for new born examination (proper light, devices)	13(9.4)	50(36.2)	8(5.8)	19(13.8)	48(34.8)	3.28
Examine all babies Before discharge	0(0)	0(0)	0(0)	12(8.7)	126(91.3)	4.91
Ensuring appropriate practices of results with parents	0(0)	0(0)	5 (3.6)	81(58.7)	52(37.7)	4.34
Arranging post discharge follow-up for babies who live far from hospital	0(0)	2(1.4)	59(42.8)	53(38.4)	24(17.4)	3.72
Do you work under pressure and feel overloaded and cover multiple words at the same time?	Rarely	16(11.6)	59(42.8)	30(21.7)	33(23.9)	3.58
Are there any difficulties arranging access to total serum bilirubin or trans-cutaneous bilirubin testing	97(70.3)	40(29.0)	1(.7)	0(0)	0(0)	1.30
Transcutaneous bilirubin devices available	91(65.9)	43(31.2)	2(1.4)	1(.7)	1(.7)	1.39
Total S. bilirubin testing available in hospital laboratory	0(0)	1(.7)	0(0)	33(23.9)	104(75.4)	4.74
Avoid multiple tests to prevent over testing of newborn	107(77.5)	29(21.0)	1(.7)	0(0)	1(.7)	1.25
Avoid multiple tests for newborn in order to go with hospital policy in preventing cost overruns	125(90.6)	10(7.2)	2(1.4)	0(0)	1(.7)	1.13
lack places to admit newborn, so give instructions to follow up instead	20(14.5)	66(47.8)	40(29.0)	12(8.7)	0(0)	2.32

3.4 Factors affect the adherence to jaundice screening guidelines by the pediatrician

Table No. 6 shows age, experience, and location had a statistically significant difference with level adherence to jaundice screening guidelines by the pediatrician participating in the study (p = 0.027, 0.012 & 0.004 respectively).

As for age, it was statistically significant (X^2 = 9.126 &p = 0.027) with the adherence to jaundice screening guidelines by the pediatrician participating in the study. Post-hoc test showed that pediatric specialists aged below 35 years and those aged over 55 years were responsible for this statistical difference. Where the percentage of participant with good adherence level for jaundice screening guidelines by pediatrician participating aged less than 35 years was higher than those pediatric specialists aged above 55 years (46.7% vs. 11.1% respectively).

As for experience, it was statistically significant (x^2 = 8.790 &p = 0.012) with the adherence to jaundice screening guidelines by the pediatrician participating in the study. Post-hoc test showed that pediatric specialists with years of experience of less than 5 years and highly experienced pediatric specialists over 11 years were responsible for the statistical difference. Where percentage of participant with high level for adherence to jaundice screening guidelines by the pediatrician participating in the study with years of experience of less than 5 years was higher than those pediatric specialists with a high experience over 11 years (44.2% vs. 10.5% respectively).

As for the third statistically significant factor with the jaundice screening guidelines by the pediatrician participating in the study was the location (X^2 = 19.279 & p = 0.004), where the post-hoc tests showed that the percentage of participant with high level of adherence to jaundice screening guidelines by the pediatrician participating in the study working in the Hebron region was less than those working in Nablus and Ramallah (11.1% vs. 42.3% & 47.5% respectively).

Table 6

Factors affect the adherence to jaundice screening guidelines by the pediatrician

		Adherence		Total		
		Poor	Good	n (%)	X^2	*P* Value
Age (years)	<34	24(53.3%)	21(46.7%)	45(32.6%)	9.126	.027
	35 – 44	26(60.5%)	17(39.5%)	43(31.2%)		
	45 – 54	24(75.0%)	8(25.0%)	32(23.2%)		
	55 - 64	16(88.9%)	2(11.1%)	18(13.0%)		
Gender	Male	60(69.8%)	26(30.2%)	86(62.3%)	2.083	.149
	Female	30(57.7%)	22(42.3%)	52(37.7%)		
Experience (years)	<5	43(55.8%)	34(44.2%)	77(55.8%)	8.790	.012
	5 – 10	30(71.4%)	12(28.6%)	42(30.4%)		
	11 - 16	17(89.5%)	2(10.5%)	19(13.8%)		
Location	Tulkarm	10(58.8%)	7(41.2%)	17(12.3%)	19.279	.004
	Nublus	15(57.7%)	11(42.3%)	26(18.8%)		
	Jenin	13(81.3%)	3(18.8%)	16(11.6%)		
	Ramallah	21(52.5%)	19(47.5%)	40(29.0%)		
	Selfeet	1 (25.0%)	3(75.0%)	4(2.9%)		
	Tobas	1(33.3%)	2(66.7%)	3(2.2%)		
	Hebron	24(88.9%)	3(11.1%)	27(19.6%)		
	Bethlehem	5(100.0%)	0(0.0%)	5(3.6%)		
Rank	1st year	1(33.3%)	2(66.7%)	3(2.2%)	6.709	.227
	2nd year	13(48.1%)	14(51.9%)	27(19.6%)		
	3ed year	12(75.0%)	4(25.0%)	16(11.6%)		
	4th year	11(64.7%)	6(35.3%)	17(12.3%)		
	5th year	7(63.6%)	4(36.4%)	11(8.0%)		
	Specialist	46(71.9%)	18(28.1%)	64(46.4%)		

3.5 Factors affect the pediatrician practice to jaundice screening guidelines

Table No. 7 regarding practices related to the neonatal jaundice for pediatric specialists shows that the place of work is the variable that has a statistical significance with the practices of pediatric specialists related to neonatal jaundice (KW = 11.60 &p< 0.001). Where the mean rank of practices neonatal jaundice among pediatric specialists working in Tulkarm region is lower than the mean rank of practices related to neonatal jaundice for pediatricians working in Nablus, Salfit and Ramallah regions (Mean rank= 50.62 vs. 100.13, 115.25 & 103.60 respectively).

As for the rest of the variables, none of them had any statistical significance with the pediatrician practice to jaundice screening guidelines, but the mean rank of practices among females of the pediatric specialists related to neonatal jaundice was higher than the mean rank of males working in the same field (71.37 vs. 68.37 respectively), and the rate of practices was relatively low with age and increased relatively with increasing experience.

Rgarding practices related to neonatal jaundice for pediatric specialists shows that the place of work is variable that has a statistical significance with the practices of pediatric specialists related to neonatal jaundice (KW = 11.60 &p< 0.001). Where the mean rank of practices related to neonatal jaundice among pediatric specialists working in Tulkarm region is lower than the mean rank of practices related to neonatal jaundice pediatricians working in Nablus, Salfit and Ramallah regions (Mean rank= 50.62 vs. 100.13, 115.25 & 103.60 respectively).

As for the rest of the variables, none of them had any statistical significance with the pediatrician practice to jaundice screening guidelines, but mean rank of practices among females doctors the pediatric specialists related to neonatal jaundice was higher than the mean rank of males working in the same field (71.37 vs. 68.37 respectively), and rate of practices was relatively low with age & increased relatively with increasing experience.

Table 7

Factors affect the pediatrician practice to jaundice screening guidelines

		N	Median	Mean Rank	MWU/ KW	*p* value
Gender	*Male*	86	6.0	68.37	2139.0	.666
	Female	52	7.0	71.37		
Age (years)	*<34*	45	7.0	75.76	2.662	.447
	35 – 44	43	7.0	70.17		
	45 – 54	32	5.0	61.05		
	55 – 64	18	6.0	67.28		
Experience (years)	*< 5*	77	6.0	67.38	0.800	.670
	5 – 10	42	7.0	74.04		
	11 - 16	19	7.0	68.05		
Location	*Tulkarm*	17	5.0	50.62	111.60	<.001
	Nublus	26	8.0	100.13		
	Jenin	16	5.0	46.75		
	Ramallah	40	8.0	103.60		
	Selfeet	4	8.5	115.25		
	Tobas	3	3.0	19.83		
	Hebron	27	3.0	18.93		
	Bethlehem	5	4.0	40.70		
Rank	*1st year*	3	6.0	67.17	.906	.970
	2nd year	27	7.0	69.54		
	3rd year	16	5.0	62.53		
	4th year	17	7.0	73.56		
	5th year	11	7.0	75.05		
	Specialist	64	6.5	69.30		

Chapter Four

Discussion, Conclusion, and Recommendations

In this chapter, a discussion, conclusions, and recommendations is presented.

4.1 Demographic characteristics of pediatricians

A total of 138 of pediatrician doctors participating in this study the most of them were from the age group less than 34 years (32.6%), while the age group above 55 years was less than (13%) and most of them were male (62.3%).
This is related to that numbers of pediatricians in specialty programs is higher than the specialists working in governmental hospitals. These programs are usually joined a year or more after graduation, so most of them are young.

As for experience years almost half (55.8%) of them had experience under 5 years. Moreover, (29%) of the participants in the study were from the Hebron region, and its represented the largest percentage of the regions. About half, (46.4%) were in their 5th year of specialization.

4.2 Adherence to jaundice screening guidelines by the pediatrician

This study showed, that pediatrician's on average examining 6- 9 newborn for each examining time, while protocols shows that the average in 2-5 newborn, this reflect the shortage in human resources (pediatricians) and the large number of newborn births .

In a cross-sectional study found a lack of resources, disparate in distribution of infant health services, and obstacles for reaching newborns services in Palestin (Massad et al., 2020).

According to the annual report Palestinian ministry of health, 2020, the number of newborns births in Palestine reached 129,896 births, including 76,406 of them in West Bank. The percentage of reported infant births in 2020 and those delivared in health facilities (hospitals and birth centers) was (99.9%), and shows in west banck, number of physician specialized physicians 519 of all specialty programes including pediatrician, that pediatrics distributed by (19.3%) of MoH Hospital Beds.

In other study showed that public hospitals have a lack of staffing, shortages of supplies and high level in bed occupancy rates (Lindblad et al., 2021).

Unfortunately, when asked about their adherence to measure a baby's bilirubin level before discharge, only (1%) was conducting test as a general rule, while (63%) of them were adherent to doing the examination if risk factors present and (54%) if baby looks jaundice.

As for MOH jaundice screening guidelines, Serum bilirubin or transcutaneous bilirubin must be evaluated for every newborn at least once before discharge and even more than that for babies at risk (State of Palestine : Humanitarian Situation Report, End of Year 2020 - Occupied Palestinian Territory, 2021).

This due to, inadequate in Human Resources (pediatricians) and Laboratory Tests.

As shown in a study conducted in Palestine resulted in a shortage in the availability of pediatric doctors across Palestine. Furthermore, it was reported that 23/27 hospitals in the WB pediatricians on duty in the delivery ward and in other wards at the hospital during their assigned duty shift (Fink, 2011).

And found shortage of resources, laboratory tests availability, unequal distribution of neonatal services. All hospitals provided maternal and newborn health services and had at least one clinical officer trained in paediatrics and one healthcare worker available 24 hours a day to provide care to sick neonates. All hospitals had a separate nursery ward or unit dedicated to neonatal care though bed capacity varied. All hospitals had clinical protocols for managing labour complications pasted on the walls of the labour and postnatal wards. Some essential supplies and laboratory tests were always available (Fink, 2011).

However, many essential drugs and basic supplies were not always available for mothers and newborns. Clinical protocols for neonatal resuscitation process, infection prevention, care of small and preterm babies, care of the sick neonate and essential newborn care are not available among some hospitals. Staff reported several barriers for providing high-quality care including inadequate beds, electric power & water supplies, inadequate ambulances, inadequate in-service staff training, unavailability of other staff cadres during the night (as only nursing staff is always available), lack of paediatrician

specialists, inadequate drugs, supplies and essential laboratory tests,absence of newborn clinical protocols and inadequate support from management teams (Massad et al., 2020).

It was also noted that only (2.2%) of the specialists on average, discharge a healthy, term and vaginally-born newborn (C.S newborns are excluded because the differences between length of stay from normal delivers) from the hospital after 49-72 hours, while the majority, (60%), discharge them in less than 24 hours. This related to lack of bed in governmental hospital and the newborn discharge is related directly to the mother discharge.

A Cross-sectional study on the length of stay after birth, including thirty low-income and middle-income nations, found that (28%) of mothers were discharged within 24 hours after a vaginal delivary (Campbell et all., 2011).

Furthermore, in Western nations, the length of stay after delivery in a facility care unit has steadily declines since the 1950s. The standard length of time a woman stays in hospital after giving birth varies between countries. In Australia, a 5 - 7 day stay the norm until the mid-1990s, but in most other Western countries a shorter length of postnatal hospital stay had become standard well before this time. As a result of these variations in practice, a length of stay of less than three days postpartum,which would have been considered standard in the late 1980s in countries such as the UK and the USA, would have been considered 'early discharge' in a country like Australia, at the same time point in history. This variation is reflected in the published literature on early discharge, with study participants discharged as early as six to 12 hours postpartum and as late as three to four days after the birth being considered in the early discharge category (Fink et al., 2015).

In other hands, All the protocols assess physical and psychosocial risk factors for the mother and newborn that must be considered by the healthcare worker before early discharge after a delivery such as, signs of pre-eclampsia, postpartum hemorrhage, domestic abuse, and signs of newborn jaundice. Furthermore, the recommendations for follow-up plans after discharge within 24 hours after delivery differ from one to other (Brits et al., 2018).

Futhermore, A retrospective cohort study showed that re-hospitalization of the neonate after discharge within 24 hours after delivery has a statistically significant increased risk of readmission than neonates discharged after a one or two days stay in the hospital. Regarding the reason for readmission, the study found interesting differences from earlier studies. In this study, the five leading reasons for readmission were respiratory tract infection (29.68%), jaundice (13.70%), feeding difficulties or vomiting (10.96%), urinary tract infection (9.13%), and umbilical cord issues (6.85%) (Lindblad et al., 2021).

In this study, the majority of PDs (29%) account jaundice in less than 24 hours of life as an sign of severe jaundice. This is in agreement with the study by Hameed and Abdul Razak that showed that (76%) of PDs agreed that newborns developing jaundice in the first 24 hours as a sign of severe jaundice confirm similar results: (77%) of pediatrics agreed that jaundice developed (Boskabadi et al., 2020).

Several studies in the literature indicate the importance of early first-day measurement of bilirubin levels since elevated levels are correlated strongly with later severe complications (Khan et al., 2017).

While the others (26.8% and 25.4%) considered rate of rise of total bilirubin level>0.2 mg/dl/hour in term infant (26.8%) and jaundiced baby with pale stools (25.4%), fever as warning signs of severe jaundice. These relatively similar results may be due to the length of stay, as most of these warring signs need more than 24 hour to be recognized.

According to clinical judgment, the first schedule for the first post- discharge follow-up after discharge from the hospital, the majority (59.4%) of participants scheduled the first post- discharge follow-up within 49-72 hours from the time of discharge. This go along, the majority of participant using Palestinian ministry of health MOH guidelines for jaundice screening with a percentage of (37%). Which recommend dor a follow up plans after 48-72 hour after discharge (State of Palestine : Humanitarian Situation Report, End of Year 2020 - Occupied Palestinian Territory, 2021).

The result shows, (79.1%) of participant confirm using a specific guideline regarding the screening of jaundice, and the Ministry of Health was the main source for (37%) of them, then American Academy of Pediatrics (31.9%), These relatively close percentage because the Palestinian ministry of health relies on American academy for newborn jaundices screening guild line as a main reference. Whereas (2.9 %) of them confirm not using any guidelines, those maybe the old age, old school doctors who rely on their own experience and notice in work.

Despite the development of several guidelines (including the American Academy of Pediatrics (AAP) in 2004) to optimize the management of HBR, still the rate of inappropriate and insufficient therapy is rising , and consequently, the rate of morbidity will increase. These facts raise a lot of concerns about knowledge translation from and physician awareness of available guidelines in the literature and how much they use these in their daily practice (Khan et al., 2017).

Approximately (66%) of pediatricians reported a high level of awareness to neonatal hyperbilirubinemia clinical practice guidelines, and only (54%) of the pediatricians initiated treatment in accordance with recommended parameters. This study aimed to assess the levels of adherence of the pediatrice physicians to different guidelines of management of neonatal hyperbilirubinemia in a multi-clinic survey in Iraq (Khan et al., 2017).

And (89.9%) of participants stated they have easily accessibility to guidelines, the majority of (43.5%) stated, the main available source for them was the online internet, because its available and easy access from any department they cover during shift as they cover multiple departments during duty, while books and written hospital policies are available in only one department in hospitals .

When participants were asked about a case study mentioned in the second section of the questionnaire, (33.3%) of participants answered correctly that laboratory tests (blood typing, Rh, coombs and bilirubin measurement) should be requested for the newborn, while the majority (41.3%) answered the newborn can be discharged from the hospital and given an appointment for follow up as an outpatient.

In other studies (showed the majority of PDs confirm that laboratory tests bilirubin and blood group is the answer to the case scenario with percentage of (91.7%) (Isa et al., 2017).

While in other study, showed different answers to a similar case scenario and lower correct answer with percentage up to (54%) of PDs, but in all studies all showed higher rate for the correct answer (Sampurna et al., 2018).

This may be due to the shortage of laboratory tests and kits, the results of test take a long time to be done so conflict with the early discharge plane on newborn and mother occurs, lack of follow up and accountability by hospital officials and shame and fear of being humiliated by the specialist supervising the specialty program.

In this study shows that the rate of adherence level to jaundice screening guidelines in newborns among the pediatrician's doctors participating in the study was 4.01out of 10 ± 1.31, which reflect the relative weakness in adherence to these jaundice screening guidelines.

Our study results showed that compliance with policies regarding the screening of neonatal jaundice is weak. This confirms that the application of the new policies must be recognized with all different barriers in knowledge and practice across pediatrics and applicable across health services settings. At our facilities, these results suggest a need for setting development resources.

Adoption of the 2022 CPG (clinical policy guidelines) provides a chance for pediatric healthcare services for the improve practice and reduce variation in management across pediatrician doctors .

Where as, in a study conducted in Iraqi hospitals, showed a high PDs adherence rate regarding the screening of neonatal jaundice, following current guidelines (WHO, AAP, and NICE guidelines), especially AAP guidelines (Owerko et al., 2023).

Another study conducted in Indonesia showed that one-third of the pediatricians have a weak adherence to newborn jaundice screening guidelines. The study indicates that the knowledge of pediatric residents in teaching hospitals in Indonesia on the management of hyperbilirubinemia in full-term and preterm newborn infants is limited and their use

of management guidelines is variable. Such a weak level of adherence may be because of either disagreement with protocols or weak level the motivation to improve current practice, a lack of proper training may also account for how the residents' performance.

Proper training is a responsibility of both the tresident and the trainer, Proper training is necessary to lower the incidence of severe hyperbilirubinemia (Mansour et al., 2012).

When the knowledge of the pediatricians about the management of hyperbilirubinemia and the infrastructure for diagnosis, therapy and referral of cases are optimal, then the occurrence of severe hyperbilirubinemia will be limited. For this reason, we need to warn our colleagues to duly adjust and improve educational programs. Trainers must carry out self reflections about the methods and techniques in teaching and practice with regard to the management of hyperbilirubinemia.

In addition, consensus is needed among trainers in academic teaching hospital to obtain a uniform method of training the residents in the management of hyperbilirubinemia. Furthermore, additional research is needed to explore these variouse barriers to be able to improve residents' adherence level to guidelines and to improve the quality of care for newborns with hyperbilirubinemia.

Pediatricians appear to depend on their clinical judgment and experience, while it is recognized that clinical judgment cannot reliably differentiate between jaundice cases that need thereby versus cases that do not need therapy (Mansour et al., 2012).

Hospital affiliation among health care providers is one of the strongest predictors of adherence to practice guidelines, which is one of the possible explanations of the high rate of good knowledge about the management of neonatal jauindice shown in the present study. Barriers to adherence include low awareness, no agreement, and inertia of previous practices (Mansour et al., 2012).

There are several constraints why protocols may not be followed or why they are not adhered to form doctors, inadequate of hospital affiliation of health care workers and fragility of the accountability, monitoring and accounting for work and low level of awareness, no agreement, and inertia of previous practice.

4.3 Pediatricians' practices regarding the screening of neonatal jaundice

In this study, the majority of participants with (99.3%) used the head to toe physical evaluation as a main practice of the screening of neonatal jaundice in newborns. These result similar to the result of a study conducted in New Jersey shows that most of PDs reported applying cephalocaudal assessment of jaundice to identify the severity of jaundice despite the frangibility of this model especially in darkly pigmented newborns (Petrova et al., 2006).

While another researche conducted on the reliability of visual assessment of jaundice as a screening tool and resulted in: " visual assessment is unreliable as a screening tool to detect clinically significant jaundice with relatively high false negative rates" (Maah & Zeiter., 2018).

And, According to American Academy of Pediatrics (AAP), Although jaundice before 24 hours of age may not have a well known cause, when a cause is known, it is most likely a hemolytic disorders. The sign of early newborn jaundice reflected by significant hemolysis diagnosed by TSB or TCB measurement. This recommendation for visual assessment does not displace needs to do at least a screening TSB or TCB test. Finally, visual assessment must be supported by measuring TSB or TCB levels.

In this study, (43.5%) examined the compatibility of blood types and the Rh factor of the child and the mother, (50.7%) performed the Coombs test, this is a low percentage when compared to neonatal jaundice protocol in Palestine stated, as Initial evaluation for jaundice screening by: testing bilirubin level, Blood type and Rh for both newborn and mother, Direct Coombs Test for the newborns (State of Palestine : Humanitarian Situation Report, End of Year 2020 - Occupied Palestinian Territory, 2021).

Only (1.4%) of participants did TCB test, This low use of TCB level of measurement the severity of newborn jaundice was reported by most of pediatricians may explained their uncertainty of their diagnostic methods accuracy or the availability of the devices needed. However, another studies have shown that measuring bilirubin by measuring TCB or TSB levels is the most and main accurate method to discover newborn jaundice in the first 24–48 hr of life among newborns (Gross & Van., 2020).

In this study, (54.3%) of the respondents identifiedthe presence of clinical jaundice as a

need to measure serum bilirubin (TSB) level before the newborn's discharge from hospital, whereas post-discharge, is (40.6%) respond that TSB was indicated for follow up. This result similar to a study conducted in Canada, found that after discharge follow up practices may lead to the discovery of misdiagnosed pathological neonatal jaundice because of the early discharge policy and the development of jaundice mostly after 72 hr of life. These pediatricians' practices towards the low performance of laboratory diagnosis methods for the screening of jaundice after discharge and weak assessments of the risk factors that lead to the presence of severe jaundice increase the risk for complications (Houlihan et al., 2011).

As for recommendations to the mother regarding the baby's jaundice based on clinical judgment before discharge, newborns are discharged early from hospitals, therefore mothers play an important role to recognize jaundice and control it properly. Mothers had moderate knowledge on neonatal jaundice, especially very low knowledge over complications and types of neonatal jaundice, which has to be improved by doctors through adequate education from antenatal period itself. Positive attitude to improved in breastfeeding newborn during a neonatal jaundice period as its essential to prevent the complications.

In this study, (100%) of the participants were instructing the mother to bring baby to the pediatric emergency for follow-up if any signs of jaundice appeared this may relatively to the early discharge of newborns from hospitals >24hr, as most of pathologic jaundice start to appear on third day of birth as reported in previous studies in literature review, PDs trying to absolve themselves of accountability, away to avoid any complication associated to undiagnosed jaundice, a way to compensate for weak adherent to jaundice screening guidelines, are possible explanation for the high percentage for follow up .

And (63%) of PDs did not advise the mother to put the newborn under the sun in the case of jaundice appeared, because none of the neonatal jaundice guidelines support the use of sun light for treating jaundice, other (37%) of PDs who recommended mother this instruction to make them able to distinguish baby skin color as it usually appears yellow a baby with jaundice. The best way to see jaundice is in white light, such as day light, especially mother from different educational and social levels. The mixing of formal maternal instruction programs with simple screening methods can prevent the

presenting of severe jaundice by declining the delay in seeking appropriate medical management (Satrom et al., 2023).

A study showed that total knowledge score of mothers regarding hyperbilirubinemia was unsatisfactory. Most of mothers had an agree attitude toward hyperbilirubinemia. More than half of mothers had a misconception, that the neon lambs aid in treatment of hyperbilirubinemia. Mothers of newborns with previous history of hyperbilirubinemia have a satisfactory knowledge than mothers without past history of jaundice.

There were a fair association between occupation and educational level of mothers and their total knowledge score with highly statistically significant difference and there was weak association between their total attitude score and age of mothers. It concluded that no statistically significance difference between mothers who have previous experience with hyperbilirubinemia and their attitudes to the disease (Satrom et al., 2023).

A (65.9%) of the participants were instructing the mother to check the level of bilirubin in the case of jaundice, as a follow up plan post discharge, early discharge from hospital >24 hours after birth, TSB level not checked during the hospital stay, shortage in laboratory test in hospitals and to prevent complications of pathologic jaundice, are a possible explanation for the high percentage for this recommendations (Massad et al., 2020).

A (86.2%) PDs had emphasize the mother not to stop breast feeding in the case of jaundice. As Multiple and frequent breast feeding increases the mother’s milk supply and, in turn, improve newborns intake and hydration of the newborn, and reducing the increased bilirubin level. As this goes along with discharge plan instruction for parents in neonatal national protocols in Palestine (State of Palestine : Humanitarian Situation Report, End of Year 2020 - Occupied Palestinian Territory, 2021).

Over all this study, shows the discrepancy in rates of pediatricians' practices regarding the screening level of neonatal jaundice among the pediatric specialists participating in the study, where rate was 6.05 out 10 ± 2.17, and the results of pediatricians' practices regarding the screening of neonatal jaundice were relatively low.

The result of our study agreed with those in a study conducted in the Midwest United States that shows noncompliance with clinical practice protocols is reported to be as

high as (70%) which conducted in academic teaching hospitals, where protocols often developed. Constrains for such noncompliance include inadequacy of awareness or un agreement, static practice and low motivation to change, and external factors such as lack of time (Lin et al., 2022).

lack of motivation refers to having a deficient level of passion and enthusiasm in doing a job. Furthermore, can be interpreted as an uncaring attitude toward what one supposed to do. It has been experienced by everyone, including students, as it is a situation where a student does not want to learn due to the difficulty in following the lesson. And the high-pressure cause to have low motivation in learning, resulting in poor performance (Lin et al., 2022).

Despite the positive attitude towards learning and implementing guidelines among PDs, these doctors feel that they have inadequate knowledge and skills in practice. They need effective practical educational training programs, clinical appraisal, and literature searching skills. Importantly, the attitudes of policymakers and senior staff need to be changed to promote the practice of guidelines within the health services (Lin et al., 2022).

Resistance to change has historically been viewed with negative consequences due to its potential impact on organizational success, It is because employees and organizations simply do not like change, and organizational culture (context and environment of the organization) that is conservative and may strengthen the resistance that can prevent the implementation of new changes. This kind of resistance is the result of the cognitive and behavioral reactions of recipients of change towards change, which is often in conflict with the organizational identity, causes an unpleasant image of individual, and threats organizational identity. Although the effect of resistance to change is not static: instead, it can have a negative, festering effect on relationships with perceived organizational effectiveness and commitment to the organization over time (Lin et al., 2022).

One of the factors that inhance the resistance to the change is structural factors such as organizational characteristics, resources, budget, job characteristics, and environmental changes, along with other organizational factors, are vary effective factors in creating resistance to change in health care workers (Lin et al., 2022).

Changes can be challenging because they contradict humans' basic need for a stable environment research has shown that organizational changes are often associated with employees' psychological uncertainty about how changes affects their work situation, role and overall life. High rates of organizational change level have well-documented effects on employee health and well-being, as assessed by a range of indicators, e.g. Reduced organizational commitment, loss productivity, work-related stress, emotional exhaustion, mental health problems, change fatigue, poor self-rated health, adverse sleep patterns, sickness absence, hospital admissions and stress-related prescriptions (Boskabadi et al., 2020).

It is difficult for pediatrics to adhere to new guidelines of clinical practice without updating their medicalknowledge. Low discrepancy percentage has occurred across specialties in our study results, but our pediatric residents, with the least years in practice, were stuck to the most overall correct answers, numerous factors can influence the acceptance and use of guidelines, which may occur at the micro (individual behavioural, including clinicians and consumers), meso (organizational) or macro (context and system) level. Some of these factors are intrinsic to the nature of newly recommended practice or technology itself, individual characteristics of healthcare professionals, and organizational capacity of health services to collect, adapt, share and apply evidence. Other factors that are intrinsic to the guidelines; for example, when recommendations are not at all explicit, or they are distorted or ambiguous, due to conflict of interest, variable methodological quality, or being poorly written, they may be viewed as inapplicable to patients or as reducing clinician autonomy. This reflects the commitment of residents to learning process while in training. As articulated by the Accreditation Council for Graduate Medical Education, 2022, lifelong learning is a basic of competency in any profession.

4.4 Risk factors associated with jaundice in neonates and request TSB or TcB measurement pre-hospital discharge:

In this study showed that the highest risk factor associated with jaundice in neonates and request TSB or TCB measurement pre-hospital discharge from the point view of the pediatrician participants was exclusive breastfeeding with visible jaundice.

These results similar to the result of meta- analysis of related English and Chinese

researches that discussed risk factors for newborns jaundice (Boskabadi et al., 2020).

Newborns who develop breast milk jaundice have a high progression rates, but on other hands (58–81.4%) of newborns with severe jaundice are exclusively breastfed (Han et al., 2015).

With the emphasis on breastfeeding education, breastfeeding percentage has increased, and the incidence rate of jaundice related to breast milk feeding has increased with time (Yang et al., 2020).

Infants with breast milk hyperbilirubinemia have a good prognosis, but (58–81.4%) of infants with severe hyperbilirubinemia are exclusively or mainly breastfed. With the popularity of breastfeeding education, the breastfeeding rate has increased, and the incidence rate of breast milk jaundice has increased year by year (Li et al., 2020).

Breast milk jaundice may be related to the presence levels of glucuronosyltransferase inhibitors in the mother's colostrum and the lack of bilirubin reuptake inhibitors in the infant's small intestine. A partial reason for increased unconjugated bilirubin in breast milk jaundice is that breast milk contains more highly active glucuronic acid, which increases intestinal and liver circulation (Li et al., 2020).

The amount of breastfeeding after birth may be related to the severity of jaundice. It should be emphasized that the relationship between breastfeeding and neonatal hyperbilirubinemia is complex. First of all, whether to choose breastfeeding and the method of breastfeeding (including exclusive breastfeeding and mixed feeding) are related to maternal age and mode of delivery. These factors combined influence the occurrence of neonatal hyperbilirubinemia.

Secondly, a study showed that exclusive breastfeeding is a risk factor for neonatal hyperbilirubinemia in infants with nutritional problems (Yang et al., 2020).

On the other hand, for infants without nutritional problems, exclusive breastfeeding is protective for neonatal hyperbilirubinemia. Another study emphasized that insufficient breastfeeding, rather than breastfeeding per day, is the main risk factor for neonatal hyperbilirubinemia (Yang et al., 2020).

Finally, others have reported that increasing breastfeeding frequency can reduce the risk of hyperbilirubinemia. The incidence of hyperbilirubinemia was significantly lower in infants who breastfed ≥8 times/day than in infants who breastfed less than that frequency.

The American Academy of Pediatrics recommends breastfeeding between 8 and 12 times/day in the first few weeks of life. The time of first feeding is also associated with neonatal hyperbilirubinemia (Satrom et al., 2023).

Newborns jaundice related to breastfeeding, also known as breastfeeding failure jaundice, occurs within the first seven days after birth and is due to a lowintake of breast milk causing dehydration (Satrom et al., 2023).

A study showed that mainly breastfeeding method is a risk factor for newborns jaundice in neonates with nutritional disorders (Boskabadi et al., 2020).

On the other hand, for newborns without nutritional problems, mainly breastfeeding is protective for newborn jaundice (Scrafford, 2013).

The incidence of jaundice was significantly decreased in newborns who breastfed ≥8 times/day than in newborns who is breastfed less frequently than that. The American Academy of Pediatrics advises mothers to breastfeed their newborns at least 8 to 12 times/day in the first weeks after birth (Boskabadi et al., 2020).

Special instruction should be given to mothers who choose to exclusively breast fed before discharge. About adequate feeding, number of feeds/ day and number of dipper changed /day .

Clinicians should promote breastfeeding support for all mothers and breast milk feeding within the first hour after birth with frequent feeding on demand (ie, at least 8 times in 24 hours). Signs of suckling adequacy include appropriate urine output and transitional stooling, normal weight loss by the hours of age and delivery method, absence of maternal discomfort, and audible swallowing as the mother’s milk volumes increase (Maisels & Newman, 2012).

In this study, the least risk factor associated with jaundice in neonates and request TSB or TCB measurement pre-hospital discharge from the point view of the pediatrician participants was the presence of a family history of of G6PD deficiency.

Whereas, a study revealed that ABO incompatibility followed by G6PD deficiency is one of the most identified risk factors for developingsevere neonatal jaundice. The global prevalence of G6PD deficiency was estimated to be (4.9%), amounting to approximately 400 million people affected worldwide, making it the most prevalent human enzyme deficiency.

There is a wide geographical distribution of G6PD deficiency, with the highest prevalence reported across the sub-Saharan Africa. This is followed by the Arabian Peninsula, central and southeast Asia, as well as in Mediterranean Europe and Latin America.Due to high population density, the majority of G6PD-deficient individuals are predicted to be from Asian countries (Maisels & Newman, 2012).

Another study confirmed that a major risk factor for newborns jaundice is G6PD deficiency and many reports have shown that G6PD deficiency in newborns are significantly at high rate for developing sever jaundice and may lead to complications such as kernicterus (Isa et al., 2017).

In infants, the risk of neonatal jaundice and hyperbilirubinemia is increased in frequency and severity. G6PD deficiency in newborn infants is well-recognized to cause a sudden rise in bilirubin levels that in many cases only exchange transfusion may be able to rapidly alleviate the toxicity from bilirubin accumulation. The impact of this deficiency on neonatal health especially in hyperbilirubinemia and kernicterus has led many countries with moderate to high prevalence to implement universal screening. Even so, much more can be done in newborn screening globally (Isa et al., 2017).

Furthermore, G6PD tests takes long wait times. These wait times directly impact patient discharge times and increase the length of stay, as infants are often kept unnecessarily for 2 hours or more until test results are reported and interpreted (Satrom et al., 2023).

4.5 Barriers to implementing pre-hospital discharge newborn jaundice screening policy

In this study, The highest barrier to implementing a pre-hospital discharge newborn jaundice screening policy was examining all newborns before discharge (RM= 4.91out of 5), this form a load work pressure on PDs as they work in more than one site during their shift, and examining all newborns done as a whole physical assessment not only for newborn jaundice screening. Followed by total serum bilirubin testing available in the hospital laboratory (RM= 4.74 out of 5).

Our result is similar to a result of a study conducted in southern Malawi, which found that lack of bilirubin testing at the tertiary hospital, absence of TCB devices and human resource shortages were the major constraints in the both tertiary and district hospitals (Kinshella et al., 2022).

Another study found that Serum bilirubin measurement is the gold methods for diagnosing newborns with jaundice, but can be timely intensive and need expensive equipment and trained workers, although these still aren't always available and this form a major challenge for jaundice screening (Satrom et al., 2023).

While the lowest barriers to implementing pre-hospital discharge newborn jaundice screening policy was avoidance of multiple tests for newborns in order to go with hospital policy in preventing cost overruns (RM= 1.13 out of 5), followed by avoidance of multiple tests to prevent over-testing of newborn (RM= 1.25 out of 5).

In other study found that the expenses of follow-up testing is less than the expenses of initial screening (Grosse & Van., 2020).

Methodological challenges inviduals with NBS disorders in unscreened population cohorts, confounding of the availability of screening with the availability of effective treatments, and changes over time in the clinical management of conditions, with improved outcomes that may be independent of the availability of screening. The use of outcomes data from historical controls can substantially overstate the health and economic impacts of NBS by confounding screening with improved health outcomes resulting from improved treatments. Available information on treatment costs is often incomplete and inconsistent. Estimates of the proportional reduction in hospitalization

costs for children with cystic fibrosis attributable to NBS for cystic fibrosis included in economic evaluations range from (0% to 85%). in economic evaluations of NBS include gaps in knowledge of health outcomes and costs of care (Grosse & Van., 2020).

The cost-effectiveness of neonatal screening, in middle-income regions to achieve the possible benefit from it which includes decreased deaths rate and permanent complications for infants may be substantially larger than in high-income countries, but difficult to obtain.

Currently, reliable detection of noanatal juaindice depends on invasive or expensive methods, such as transcutaneous bilirubinometer (TCB) devices and total serum bilirubin (TSB) blood tests, which are limited in most low- and middle-income countries (LMICs) as well as in non-hospital settings (Owerko et al., 2023).

In higher-income countries, increased accuracy of newborn screening policies may improve cost-effectiveness, Low- and middle-income countries often lack accurate methods for detecting neonatal jaundice and rely on visual assessment, resulting in a higher incidence of adverse consequences. Picterus Jaundice Pro, an easy-to-use and affordable smartphone-based screening device for the condition, has demonstrated higher accuracy than visual assessment in Norwegian, Philippine and Mexican newborns. This study aimed to identify the barriers and facilitators to implementing Picterus JP in public health services in low-income settings in Mexico by exploring the current process of neonatal jaundice detection and stakeholders' perspectives in that context (Grosse & Van., 2020).

Although, the early screening and recognition of neonatal jaundice cases can lead to reducing the burden on families, hospitals, primary care physicians, and pediatric doctors, by allowing early application of treatment prior to the presence of serious signs (Grosse & Van., 2020).

4.6 Factors that affect the adherence to jaundice screening guidelines by the pediatrician

In this study showed that age, experience, and place had a statistically significant difference with adherence levels to the jaundice screening guidelines by the pediatrician participating.

As for the adherence to jaundice screening guidelines by the pediatrician participating in the study the age group less than 34 years was higher than the adherence of the age group after 55 years. Those are similar results to a study conducted in United stat (Owerko et al., 2023).

Challenges to adherence include low awareness or agreement rates, static practice low motivation to change, and external factors such as insufficient time.

Where the adherence to jaundice screening guidelines by the pediatrician participating in the study with years of experience of less than 5 years was higher than the adherence of pediatric specialists with high experience over 11 years. We reflect this to the commitment of residents as they learn while in training. As articulated by the Accreditation Council for Graduate Medical Education, 2022, lifelong learning is a basic component of any profession.

Cultural and socioeconomic barriers often contribute to a delay in diagnosis of SNJ. Families may delay seeking care due to a cultural expectation to stay home during the postpartum period, for a traditional naming ceremony, for instance. The advice from other family members to use traditional remedies or other treatments prior to seeking medical help can also contribute to a delay. Many families reported from this and other studies the use of herbal supplements, vitamins, antibiotics, and/or direct sunlight to treat the infant at home prior to seeking care (Owerko et al., 2023).

The adherence to jaundice screening guidelines by the pediatrician participating in the study working in the Hebron region was less than the adherence of working pediatric specialists in Nablus and Ramallah. The number of births in Hebron is 28,124/year, while in Ramallah it is 8,273 and in Nablus is 11,022.This puts great pressure on pediatricians to provide comprehensive care. (State of Palestine : Humanitarian Situation Report, End of Year 2020 - Occupied Palestinian Territory, 2021).

In addition to a shortage in the number of pediatricians and a shortage in the number of beds, all of which constitute obstacles to the full implementation of policies.

4.7 Factors that affect the pediatrician practice of jaundice screening guidelines

In this study, Where the rate of practices related to neonatal jaundice among pediatric specialists working in the Tulkarm region is lower than the rate of practices related to neonatal jaundice for pediatricians working in Nablus, Salfit and Ramallah regions this may related to Nablus, Salfit and Ramallah hospital are educational hospital have full residency programs and considers as a central hospital in west bank .

While the average of practices among females of the pediatric specialists related to neonatal jaundice was higher than the rate of males working in the same field. This result is similar to the result of a study that confirmed that women physicians seem to be outperforming male physicians (Yang et al., 2020).

Other study confirmed that female physicians are more likely to follow guidelines, collaborate with specialists a and spend more time with patients .

Gender-mediated behavioral differences that are difficult to measure through routinely collected electronic data may also play a role in explaining the mortality difference. Some studies have shown than female physicians are more likely than male physicians to provide patient centered focused care, spend longer communicating with their patients, provide more nonverbal feedback,and show higher levels of empathic concern. Humanistic relationships with patients may enable increased patient disclosure of medical information and foster stronger relationships among health team members, thereby improving patient care (Yang et al., 2020).

Furthermore, female physicians, on average, may obtain more frequent informal consultations with colleagues and be more focused on reading clinical research studies or reviewing a patient’s chart when making clinical decisions. Taken together, these differences in process may help to explain the modestly lower mortality rates among general medical patients treated by female physicians in ways that cannot be captured through electronic health records or administrative data (Yang et al., 2020).

4.8 Conclusions

PDs show low adherence levels and inadequate practices regarding screening of neonatal jaundice pre-hospital discharge, Studies are needed in our country to evaluate the impact of this practice oninfants' health.

4.9 Recommendations

1. Nursing guidelines must include the ability of measurement total serum or transcutaneous bilirubin without a physician’s order for any newborn that develop jaundice in the first 24 hours.
2. Studies are needed in our country to evaluate the impact of this practice on infants with health.
3. Researches are neededto evaluate the prevalence of neonatal jaundice in Palestine .
4. As for nursing education institutions use this study in the elaboration of curriculum necessary in teaching barriers associated with neonatal jaundice screening.
5. Identified gaps and constraints to the practice related to neonatal jaundice, the selected hospitals must establish protocols and policies to improve the areas of weakness in screening for neonatal jaundice in post-natal word in the hospitals.

4.10 Limitations

Several limitations of the present study should be acknowledged. First, barriers to the practice regarding neonatal jaundice were assessed by a quantitative method and this provides us only with general information. Second, our study focused on pediatricians’ doctors’ adherence and practices and did not explore the perspective of policymakers. Thirdly, lack of time for data collection,to various obstacles such as transportation and political issues. This may lead to prolonging the period of data and thus affect validity and design.

List of Abbreviations

Abbreviation	Meaning
WHO	World Health Organization
NJ	Neonatal jaundice
AAP	American academy of pediatrics
PDs	Pediatricians doctors
TSB	Total serum bilirubin
TcB	Transcutaneous bilirubin
RM	Rank mean

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Appendices

Appendix A

Research Consent Form

Researcher: AbeerBarhoush.

Department of Pharmacy and Health Sciences, College of Graduate Studies, Al-najah national University.

Title of study:

Assessment of current pre discharge neonatal jaundice screening practice in governmental hospitals of West Bank.

Please read and complete this form carefully. If you are willing to participate in this study, ring the appropriate responses and sign and date the declaration at the end. If you do not understand anything and would like more information, please ask.

I have had the research satisfactorily explained to me in written form by the researcher. **YES / NO**

I understand that I may withdraw from this study at any time without having to give an explanation. **YES / NO**

I understand that all information about me will be treated in strict confidence and that I will not be named in any written work arising from this study **YES / NO**

I understand that any data collected will be used solely for research purposes and will be erased on completion of your research. **YES / NO**

I understand that the data will only be discussed within the research team

YES / NO

I understand that survey participants and their respective organization's will not be named in subsequent write ups and material submitted for publication

YES / NO

I freely give my consent to participate in this research study and have been given a copy of this form for my own information.

Signature: ……

Name (capital letters) ……...

Date: ……

Appendix B

Questionnaire

Section 1:

Demographic and other characteristics of the pediatricians by the type of practice:

1- Age in years: ☐<34 ☐34-44 ☐ 45-54 ☐ 55-64 ☐>65

2- Sex: ☐ M ☐ F

3- Years of experience: ☐< 1 year ☐ 1 – 2 year☐ 3–5 year ☐>6

4- location of hospital : ☐Tulkarm☐Nublus☐ Jenin ☐Ramallah ☐selfeet

☐Tobas☐Hebron ☐Bethlehem

5- Your rank on paediatricians' speciality programme in the current hospital:

☐ 1st year ☐ 2nd year ☐ 3ed year ☐ 4th year ☐ 5th year ☐ specialist

Section 2:

Adherence to jaundice screening guidelines by pediatricians

No	Please encircle the one answer that best describes your practice
1-	On average, how many newborns do you examine for each examination time ? 1. ≤ 1 2. 2 – 5 3. 6 – 9 4. D. ≥ 10
2-	Do you measure a baby's bilirubin level before discharge for all new borns? 1. Yes, as a rule 2. Yes, if the baby looks jaundiced 3. No, I never do 4. d. sometimes if risk factors of jaundice present
3-	On average, at what age do you discharge a healthy, term and vaginally-born newborn (state the length of stay in hours)? 1. ≤ 24 2. .25 – 48 3. 49-72 4. >72
4-	What do you consider warning signs of severe jaundice?

	1. Visual: the palms of the hand and the soles of the feet are yellow 2. Jaundice within < 24 hours after birth 3. Jaundiced baby with pale stools, fever 4. Rate of rise of total bilirubin level> 0.2 mg/dL/hour in term newborn
5-	According to clinical judgment, at what age in hours do you schedule the first post-discharge follow-up (state the number of hours)? 1. ≤ 24 2. 25 – 48 3. 49 – 72 4. > 72
6-	Do you use a specific guideline regarding the screening of jaundice ? ☐ yes ☐ no If yes , please specify: 1. Hospital Care for Children (World Health Organization, WHO) 2. The guideline issued by the American Academy of Pediatrics (AAP) 3. The guideline issued by the National Institute for Health and Clinical Excellence (NICE) 4. Other(s). State the name(s) …….
7-	Do you have easy access to that guideline? ☐ Yes ☐NO

	If yes please specify: 1) Books 2) Online 3) Hospital policy 4) Your own notes and experience
8-	A 30-year-old mother, blood group O+, gave birth to a 2.8 kg male infant with cephalohematoma after 37 weeks of gestation. Before discharge, at 24 hours of age, the infant appeared jaundiced. would you(choose one answer that the most adherent to your practice): 1. Discharge the baby and schedule a follow-up as an outpatient. 2. Ask for lab testing: blood typing, rhesus, coombs and bilirubin level measurement 3. Cancel discharge and start phototherapy without further assessment 4. D. Refer the baby to a second higher level pediatrician

Section 3:

Pediatricians' practices regarding the screening of neonatal jaundice:

Do you perform the following Pre discharge newborn jaundice screening methods
1. Using cephalocaudal (head to toe) assessment (visual assessment) Yes ☐ NO☐
2. Testing Blood group and Rh of the newborn and the mother Yes ☐ NO☐
3. Testing Coomb's test for newborn Yes ☐ NO☐
4. Using TcB assessment Yes ☐ NO☐
5. TSB testing with clinical jaundice before discharge Yes ☐ NO☐
6. TSB testing with clinical jaundice post-discharge (for follow up) Yes ☐ NO☐
7. Recommendations to the mother regarding the baby's jaundice based on clinical judgment before discharge: 1. Bring baby to the pediatric emergency for follow up Yes ☐ NO☐ 2. Put baby in the sunlight Yes ☐ NO☐

3. Refer baby for TSB measurement	Yes ☐	NO☐
4. Stop breastfeeding	Yes ☐	NO☐

Section 4

Do you consider the following risk factors are associated with jaundice in neonates and request TSB or TcB measurement pre-hospital discharge?

Risk factors :	never rarely sometimes often always
1. Jaundice presenting in the first 24 hours	☐☐☐☐☐
2. Jaundice noted at discharge	☐☐☐☐☐
3. Gestational age with visible jaundice	☐☐☐☐☐
4. Exclusive Breastfeeding with visible jaundice	☐☐☐☐☐
5. Bruising and/or cephalohematoma	☐☐☐☐☐
6. Rh incompatibility	☐☐☐☐☐
7. ABO incompatibility	☐☐☐☐☐
8. Family history of G-6-PD deficiency with visible jaundice	☐☐☐☐☐
9. Previous sibling with jaundice with visible jaundice	☐☐☐☐☐

Section 5

Barriers of implementing pre-hospital discharge newborn jaundice screening policy:

Questions	Answer Please tick the one answer that best describes barriers in practice
	never rarely sometimes often always
1. Is qualified setting available for new born examination (proper light, devices)	□□□□□
2. As predication do you : 1) Examine all babies Before discharge 2) Ensuring appropriate practices of results with parents 3) Arranging post discharge follow-up for babies who live far from hospital	□□□□□ □□□□□ □□□□□
3. Is there any difficulties arranging access to total serum bilirubin or trans-cutaneous bilirubin testing	□□□□□
4. Is transcutaneous bilirubin devices available	□□□□□
5. Is total serum bilirubin testing available in hospital laboratory	□□□□□
6. Do you avoid multiple tests to prevent over testing of newborn	□□□□□
7. Do you avoid multiple tests for newborn in order to go with hospital policy in preventing cost overruns	□□□□□

The end, Thank

Appendix C

Ethical approval obtained from the Institutional Review Board (IRB) at AN-NAJAH University in Nablus

An-Najah National University
Faculty of Medicine & Health Sciences
Institutional Review Board

جامعة النجاح الوطنية
كلية الطب وعلوم الصحة
لجنة اخلاقيات البحث العلمي

Ref: Mas. Sep. 2022/6

IRB Approval Letter

Title of Research:

Assessment of Current Pre-Discharge Neonatal Jaundice Screening Practice in Governmental Hospitals at the West Bank

Submitted by:
Abeer Mohammad Barhoush

Supervisor:
Wafaa Menawi

Approved:
8th Sep, 2022

Your Study Title **" Assessment of Current Pre-Discharge Neonatal Jaundice Screening Practice in Governmental Hospitals at the West Bank."** reviewed by An-Najah National University IRB committee and was approved on 8th Sep, 2022.

Hasan Fitian, MD

IRB Committee Chairman

Faculty of Medicine
An-Najah National University

Appendix D

Task facility of the General Administration of Health Education and Scientific

An-Najah
National University
Faculty of Graduate Studies

جامعة
النجـــاح الوطنية
كلية الدراسات العليا

التاريخ : 2022/10/3

حضرة الدكتور عبد الله القواسمي المحترم

الموضوع: تسهيل مهمة الطالبة / عبير محمد راتب برهوش رقم تسجيل (11952779)
تخصص ماجستير ادارة الصحة العامة

تحية طيبة وبعد ،،،

الطالبة/ عبير محمد راتب برهوش، رقم تسجيل 11952779، تخصص ماجستير ادارة الصحة العامة في كلية الدراسات العليا، وهي بصدد اعداد الاطروحة الخاصة بها والتي عنوانها:

(تقييم الممارسات الحالية لفحص اليرقان الوليدي قبل الخروج من المستشفيات الحكومية في الضفة الغربية)
Assessment of current pre discharge neonatal jaundice screening practices in governmental hospitals of West Bank.

يرجى من حضرتكم تسهيل مهمتها في توزيع الاستبانة أداة الدراسة في المشافي التالية بغية تقييم ممارسات الحالية لفحص اليرقان الوليدي قبل الخروج من المستشفيات الحكومية في الضفة الغربية ، والمستشفيات هي:

- المجمع الطبيّ الفلسطيني – رام الله، مخاطبة الدكتور احمد البيتاوي.
- مستشفى رفيديا الحكومي – نابلس، مخاطبة الدكتور خالد الصالح.
- مستشفى ثابت ثابت – طولكرم، مخاطبة الدكتور هيثم شديد.
- مستشفى خليل سليمان – جنين، مخاطبة الدكتور نجي نزال.
- مستشفى طوباس التركي – طوباس، مخاطبة الدكتور صالح نزال.
- مستشفى سلفيت – سلفيت، مخاطبة الدكتور محمد الرمحي.

علماً بأن البيانات والمعلومات سوف تستخدم لأغراض البحث العلمي واستكمال مشروع البحث فقط.
شاكرين لكم حسن تعاونكم.

مع وافر الاحترام ،،،

أ.د. وليد صويلح
عميد كلية الدراسات العليا

فلسطين، نابلس، ص.ب 7،707 هاتف:/2345115، 2345114، 2345113 (09)(972)* فاكسميل:2342907(09)(972)
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Appendix E

Literature Review summery

Study	Sitting	Tittle	Aim	Sample techniques	Result
1. Massad S,2020	Palestine (WB,GS,EJ)	Improving Newborn Health in Countries Exposed to Political Violence: An Assessment of the Availability, Accessibility, and Distribution of Neonatal Health Services at Palestinian Hospitals	to evaluate available resources in neonatal units throughout Palestine.	A cross-sectional, hospital-based study was conducted in 2017 using the World Health Organization's "Hospital care for mothers and newborn babies: quality assessment and improvement tool."	Almost all hospitals suffer from shortages in human resources, equipment, drugs, and essential blood tests, as well as frequent disruptions in the availability of based amenities
2. Afjeh, A.,2015	Iran-tahran	Pre-Discharge Screening Trans-Cutaneous Bilirubinometry in Healthy Newborns in Mahdieh Hospital, Tehran	to compare the accuracy of cutaneous v/s serum bilirubin measurements in this regard.	prospective cross sectional study conducted in Mahdieh hospital	TcB is an inexpensive, noninvasive and precise pre-discharge screening test for evaluation of hyperbilirubinemia, with a high PPV. It is highly recommended to be performed routinely due to high incidence of hyperbilirubinemia in neonates.
3. Brits,	Bloemfonte	The prevalence of	to determine the prevalence of	cross-sectional studyThe	More than half (55.2%) of healthy

H,2018	in, South Africa.	neonatal jaundice and risk factors in healthy term neonates at National District Hospital in Bloemfontein	neonatal jaundice and secondly to explore its risk factors in healthy term neonates.	mothers were interviewed and their case records were reviewed for risk factors for neonatal jaundice	term neonates developed neonatal jaundice. As it is difficult to clinically diagnose neonatal jaundice in darker pigmented babies, it is recommended that the bilirubin level of all babies should be checked with a non-invasive bilirubin meter before discharge from hospital or maternity unit as well as during the first clinic visit on day 3 after birth.
4. Amanda Yaworski,2017	India	Detection of Neonatal Jaundice among the Newborn Using Kramer's Criteria	o determine the incidence of Neonatal jaundice by Kramer's criteria among Newborns in the Postnatal ward. To assess the risk factors that leads to Neonatal Jaundice o determine the incidence of Neonatal jaundice by Kramer's criteria among Newborns in the Postnatal ward. To assess the risk factors that leads to Neonatal Jaundice o determine the incidence of Neonatal jaundice by Kramer's criteria among Newborns in the	he research approach was Quantitative approach and Non experimental research design was adopted for this study. The sample size was 80 Newborns and purposive sampling technique was used he research approach was Quantitative approach and Non experimental research , purposive sampling technique was used	Visual inspection of Neonatal jaundice by using Kramer's criteria" is a suitable low-cost and a feasible alternative modality for early detection of neonatal jaundice in a poor resource setting

			Postnatal ward. To assess the risk factors that leads to Neonatal Jaundice To determine the incidence of Neonatal jaundice by Kramer's criteria among Newborns in the Postnatal ward. To assess the risk factors that leads to Neonatal Jaundice.		
5. S.Han, 2015	China	A Model for Predicting Significant Hyperbilirubinemia in Neonates From China	To develop and validate a predischarge risk stratification model by using transcutaneous bilirubin (TcB) values and clinical factors to predict significant postdischarge hyperbilirubinemia in healthy term and late preterm Chinese neonates.	a prospective cohort study	A risk classification model, combining discharge transcutaneous bilirubin values and clinical risk factors, separated term and late preterm Chinese neonates into 6 risk classes for the timely follow-up of postdischarge hyperbilirubinemia detection
6. Campbell, D,2011	Tornoto-Canada	Transcutaneous bilirubin measurement at the time of hospital discharge in a multiethnic newborn population. Paediatrics& child health,	To compare the accuracy of the TSB measurement with the Tcb measurement in term and near term infant befor discharge.	a prospective cohort study	Perform assessment for the risk factors and repeated In newborns with significant risk factors (e.g. unwell babies, preterm babies, babies at risk for haemolytic conditions), measuring using transcutaneous bilirubinometry (TcB) and/or TSB is

					likely to be effective. All jaundiced newborns require a pre-discharge screeing assessment including history and a full clinical examination
7. Olusanya, B.,2016	Nigeria	The burden and management of neonatal jaundice in Nigeria: A scoping review of the literature	to describe the epidemiology of neonatal hyperbilirubinemia as well as the practices and challenges in the care of infants with significant neonatal hyperbilirubinemia (SNH) in Nigeria	Systematic review research	SNH accounted for about one in five neonatal admissions and has been associated consistently with substantial case fatality and neuro-developmental sequelae such as cerebral palsy and auditory impairments, especially among out-born babies. Glucose-6-phosphate dehydrogenase (G6PD) deficiency, prematurity/low birth weight, infection, and ABO incompatibility were most frequently, and Rhesus disease rarely, associated with SNH.
8. Singh, K.,2017	Bahrain	Neonatal indirect hyperbilirubinemia and glucose-6-phosphate dehydrogenase deficiency	to determine the prevalence of glucose-6-phosphate dehydrogenase (G6PD) deficiency among infants with neonatal indirect hyperbilirubinemia (NIH)	case-control retrospective study	G6PD deficiency is an important risk factor for severe NIH. In G6PD-deficent neonates, management of NIH should be hastened to avoid irreversible neurological complications.

9. Kolawole, S.2016	Nigeria	Prevalence of neonatal jaundice in Eku Baptist Community Hospital in Delta State Nigeria	to determine the prevalence, pattern of occurrence, and associated risk factors of neonatal jaundice among the newborn babies aged between 1 and 28 days.	A prospective study	The prevalence of neonatal jaundice at Eku Hospital was low, but the occurrence of neonatal jaundice and few deaths due to sepsis cannot be overlooked. Health care providers working with neonates should play a key role in identifying the associated risk factors and assessing neonates for pathological jaundice. Parental counseling, education for early detection, regular antenatal care, and longer hospital stay are required in order to prevent this condition.
10. Dulal A,2016	India - Gauhati	AETIOLOGICAL PROFILE OF NEONATAL HYPERBILIRUBINEMIA IN NEONATAL INTENSIVE CARE	to know the aetiology of hyperbilirubinemia in neonate admitted in neonatal intensive care unit of Gauhati Medical College and Hospital	observational stud	Among the various aetiologies causing neonatal hyperbilirubinemia, the most common causes were physiological jaundice 224 (43.07%), ABO incompatibility 108 (20.76%),

		UNIT OF GAUHATI MEDICAL COLLEGE AND HOSPITAL, GUWAHATI, ASSAM			Idiopathic 54 (10.43%), neonatal sepsis 36 (6.92%), G6PD deficiency 35 (6.73%) and Rh Incompatibility 31 (5.96%). Other less common causes were cephalhematoma 15 (2.88%), intrauterine infection 7 (1.34%), breast milk jaundice 6 (1.15%) and hypothyroidism 4 (0.76%).
11. Z. Zulkarnay,2015	Malaysia	An Overview on Jaundice Assessment in Newborn : Types of Hyperbilirubinaemia, Kramel's Rule and Optical Density Method	To determine different types of neonatal jaundice and methods to investigate jaundice level	Systematic review	There are several types of method or assessment to investigate the jaundice level which is Kramer‟s rule, Abdominal Ultrasonography, and Transcutaneous Bilirubinometer. Kramer‟s rule is not really suitable for baby that has dark skin, so blood test need to be done and this categorized it in invasive method.
12. Ullah, S.,2016	Iran	Hyperbilirubinemia in Neonates: Types, Causes,	This review article focuses on a brief introduction to jaundice, its types and	A Narrative Review Article	Neonatal jaundice due to breast milk feeding is also sometimes observed.

		Clinical Examinations, Preventive Measures and Treatments: A Narrative Review Article	causes, measuring the bilirubin level, clinical approaches towards hyperbilirubinemia, different precautionary measures for the parents of babies suffering from hyperbilirubinemia and different remedial therapeutic measures for its treatment.		Hemolytic jaundice occurs because of the incompatibility of blood groups with ABO and Rh factors, when the fetus and mother blood groups are not compatible and the fetus blood crosses the barrier of the umbilical cord before birth causing fetus blood hemolysis owing to severe immune response.
13. Hameed NN,2020	Iraq	Assessment of adherence level for neonatal hyperbilirubinemia management by various physicians in Iraq: a multi-clinic study	to assess the adherence level of various physicians to different guidelines of management of neonatal hyperbilirubinemia in Iraq.	An observational cross-sectional study	GPs and EPs show lower adherence levels for the management of neonatal jaundice than PDs, which indicates that these physicians adhere well to current management guidelines from the WHO, AAP, and NICE.
14. Petrova ,2016	New Jersey	Management of neonatal hyperbilirubinemia: pediatricians' practices and educational needs	evaluated the New Jersey pediatricians' practices and beliefs regarding the management of neonatal hyperbilirubinemia and their compliance with the recommendations made by the American Academy of Pediatrics (AAP)	A survey questionnaire	The pediatricians' practices regarding the low utilization of laboratory diagnosis for the quantification of jaundice after discharge and underestimation of risk factors that contribute to the development of severe hyperbilirubinemia are

					associated with initiation of phototherapy at lower than AAP recommended treatment parameters and recognition of neonatal hyperbilirubinemia as an important public health concern.
15. Maisels MJ,2015	New York	Managing the jaundiced newborn: a persistent challenge	To describe challenges in neonatal jaundice management	Systematic Review	combining the gestational age with the predischarge, hour-specific bilirubin level (transcutaneous or total serum level), one can, with considerable confidence, quantify the risk of severe hyperbilirubinemia in most newborns. With appropriate follow-up of infants, most cases of kernicterus can be prevented, although G6PD deficiency remains an important challenge.
16. Khan KA,2017	Bangladesh	Predicting Neonatal Hyperbilirubinemia Using First Day Serum Bilirubin Level in Late Preterm and Term Healthy Newborn	to determine the predictability of day1 total serum bilirubin (TSB) level as a screening test and identify the best cutoff value which would predict neonates likely to develop significant hyperbilirubinemia.	observational analytical study By purposive sampling method	early discharge policy along with limited follow-up facilities in developing countries and inadequate communication between physicians and parents necessitates a prognostic test to predict hyperbilirubinemia in

					these newborns;
17. M. N. Mansor,2012	Malaysia	Jaundice in Newborn Monitoring using Color Detection Method	to promote a new first aid of jaundice newborn monitoring.	Experimental study	The experimental results reveal that the proposed method can minimize the morbidity and mortality than the conventional method.
18. Hatzen buehler L,2010	Pakistan	Validity of neonatal jaundice evaluation by primary health-care workers and physicians in Karachi, Pakistan	to validate primary health-care workers' and physicians' visual assessment of neonatal hyperbilirubinemia in Karachi, Pakistan.	questionnaire	Primary health-care workers identified hyperbilirubinemic neonates with adequate sensitivity. With proper training and supervision, their assessment could improve the referral of hyperbilirubinemic neonates in low-resource settings in the developing world.

جـامعـــة النجاح الوطنية

كليـــة الدراســـات العليـــا

تقييم الممارسات الحالية لفحص اليرقان الوليدي قبل الخروج من المستشفيات الحكومية في الضفة الغربية

إعداد

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قدمت هذه الرسالة استكمالا لمتطلبات الحصول على درجة الماجستير في ادارة الصحة العامة، من كلية الدراسات العليا، في جامعة النجاح الوطنية، نابلس– فلسطين.

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الملخص

يعاني حوالي 60% من الأطفال الناضجين و80% من الأطفال حديثي الولادة المبتسرين من اليرقان في الأيام السبعة الأولى من حياتهم، ويظل حوالي 10% منهم مصابين باليرقان لمدة شهر واحد. يعد فحص اليرقان قبل الخروج من المستشفى للكشف المبكر عن الأطفال حديثي الولادة المعرضين للخطر أمرًا ضروريًا. هذه هي الدراسة الأولى لتقييم الممارسة الحالية لفحص اليرقان الوليدي قبل الخروج من المستشفى في المستشفيات الحكومية في الضفة الغربية.

أجريت دراسة كمية مبنية على الاستبيان بين جميع أطباء الأطفال الذين يعملون في 8 مستشفيات حكومية في الضفة الغربية. بين سبتمبر 2022 ومايو 2023. تم إجراء استبيان منظم ذاتيًا على المشاركين الذين حصلوا عليه من شؤون الموظفين في مستشفيات حكومية فلسطينية مختارة قبل شهر من الحصول على البيانات.

شارك في هذه الدراسة 138 طبيب أطفال، مما أظهر ضعفًا نسبيًا في الالتزام بإرشادات فحص اليرقان وكانت نتائج ممارسات أطباء الأطفال فيما يتعلق بفحص اليرقان الوليدي منخفضة نسبيًا.

يُظهر أطباء الأطفال مستويات التزام منخفضة وممارسات غير كافية فيما يتعلق بفحص اليرقان الوليدي قبل الخروج من المستشفى، وهناك حاجة إلى دراسات في بلدنا لتقييم تأثير هذه الممارسة على الرضع المصابين باليرقان.

الكلمات المفتاحية: الالتزام، اليرقان الوليدي، فرط بيليروبين الدم، طبيب الأطفال، الممارسات.