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**NURSING SUPPORT FOR PARENTS DURING THE IDENTIFICATION AND TREATMENT OF JAUNDICE**

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**ABSTRACT**

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<p>Neonatal jaundice is a common newborn condition that is harmless most of the time. However, acute neonatal jaundice is a notable cause of brain damage, intellectual disability, physical disability and early death. Nursing intervention and support can assist parents in the early identification of jaundice and to seek treatment on time. Nursing support was divided into educational, emotional and psychological support. This research work contributes to the field of paediatric and family-centred nursing. It aims to improve awareness and to provide nurses and parents with up-to-date information about jaundice, evidenced-based nursing interventions in treating jaundice to minimize complications, and to support parents.</p> <p>The research method of this thesis was narrative literature review, which attempts to provide an overview in wide range of issues within a topic and research question. The target group for this research included registered nurses, especially those working in paediatric wards, parents and aspiring parents.</p> <p>The results of the study showed that nurses’ support is highly educative and informative. Nurses have a greater role of educating and informing parents about jaundice, and educating parents to identify jaundice at an early stage. When parents are educated before or during pregnancy, they can avoid certain conditions that could pose as risk factors to jaundice and prepare themselves ahead of time, should their newborns contract jaundice. There is need for more research on how nurses support the parents of newborns with jaundice. Most of the previous research focused more on education. There has been limited research on the social, psychological, and emotional support for parents.</p>		
<b>Key words</b> Bilirubin, hyperbilirubinaemia, jaundice, neonatal jaundice, nursing intervention, nursing support		

## ABSTRACT

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## 1 INTRODUCTION

Jaundice is a prevalent condition which often needs to be evaluated and treated in newborns. The clinical manifestation of jaundice usually occurs in 50% of term newborns and up to 85% of preterm newborns within the first week of life. Jaundice is the yellowing of the sclera, the white part of the eyes and skin due to excessive bilirubin in the skin and mucous membranes. It can be a sign of a disease and appears to be overlooked, thereby causing conditions that have potentially devastating effects. (WHO 2020.) Neonatal jaundice is also the main cause of most neonatal death. In most cases, it is not a sign of an underlying disease and might be harmless. Babies who feed entirely on breastmilk are at risk of developing physiological jaundice in the first week of their life than babies who feed on formula. A prolonged jaundice is usually harmless, but it can also be a sign of a serious liver disease which needs medical assessment. (NICE 2014.)

Jaundice is caused by unconjugated hyperbilirubinemia, which is further categorised as, physiological and pathological. High level of bilirubin has harmful effects and might cause long-term damage if left untreated. The purpose of this research is to describe the nursing care and nursing interventions to support parents during the identification and treatment process of jaundice. This thesis will expand knowledge in the nursing team on ways to support parents and reduce level of stress in parents, as well as enlighten parents to identify jaundice when it develops in-hospital stay or at home when discharged early. The objectives are to improve awareness, provide nurses and parents with up-to-date information and evidence-based nursing interventions in treating jaundice to minimize complications. This research also describes the underlying risk factors for jaundice in newborn as well as expand knowledge beyond the yellowing of the skin, and help readers to understand that in as much as jaundice can be mild, it can cause severe adverse effects on the child's nervous system. The research is targeted at registered nurses, especially those working in paediatric wards, parents and aspiring parents, and at nursing students. This is because the early identification of newborn jaundice ensures that the baby receives the right treatment thereby preventing complications and achieving the best clinical outcome. The visual inspection of jaundice is mostly what has been used to recognise the condition, but it is not a good tool to assess the clinical severity of the condition. The research will be carried out by literature reviews to study new and recent information about the topic.

It is not possible to care for a newborn with jaundice without referring to the mother or family. Therefore, this research deals with family-centred nursing. The term family as used in this research

includes the pregnant woman or mother and her support system. The support system could include spouse or partner, relatives and friends. Nurses and healthcare professionals are to encourage the participation of the family in decision making as it concerns the pregnant woman or mother's situation. The choices, values and cultural backgrounds of the expectant women, new mothers and their family members should be respected. An open and honest communication as well as sharing of information should be promoted for easy evaluation of care needs. Economic interests and decisions should not be prioritised over what is best for the newborn, the woman and the family. In the case when a newborn is moved to a different unit or hospital, the woman should have access to the unit or be transferred to the same hospital when medically feasible. The nursing care team must be able to maintain an individual sense of personal responsibility for the highest outcome of family life. (AAP, COFAN, & ACOG, COOP 2017, 3-4.)

The services provided by Finnish health care system in maternity clinics are also explained in this research as it supports parents about childbirth, family life and what to expect during pregnancy, delivery and after delivery. Some of the services include education, regular check-ups, support with substance abuse problems, childbirth planning and postpartum time planning. These services help in identifying risk factors on time and address problems that may arise.

## 2 JAUNDICE

Theory is a form of our everyday understanding which helps to ascertain outcomes to a great level based on previous experiences or studies (Hacklay 2010, 32). This chapter summarises the concept of jaundice as a sign of other diseases that could develop in newborn. It also explains the conditions that can lead to the appearance of jaundice which can be noticed at birth or afterwards. Furthermore, the different types of jaundice, possible treatments and complications are explained.

Newborn jaundice simply refers to jaundice after birth either in full-term or preterm babies. It is described as the yellow colouring of the skin and eyes caused by the excessive amount of the bile pigment known as bilirubin. Neonatal jaundice is the most typical issue in newborns as it occurs in 50 percent of full-term neonates and 85% of pre-term neonates. According to Cohen (2006, 202), the lifespan of newborn red blood cells is 70–90 days, whereas in older children it is 120 days. Most often, this does not pose a threat as it is the normal adaptive course of development at birth. (Lomax 2015, 85). Neonatal jaundice causes anxiety in parents and prompts physicians to consider the causes of neonatal jaundice. The National Neonatal Perinatal Database gives incidence of hyperbilirubinemia in neonates to be 3.3% in live births, while other studies suggest that hyperbilirubinemia-related morbidity can reach 22.1%. When these levels increase in neonates, skin discoloration is the first symptom that can be noticed. This is usually visible and can occur during the first weeks of life. A significant increase in the amount of bilirubin levels is usually toxic and can cause serious damage to the development of the central nervous system. Therefore, the management of hyperbilirubinemia is required in about 5 to 10% of neonates with jaundice to prevent these consequences. (Ullah, Rahman & Hedayati, 2016.)

### 2.1 Classification of Jaundice

Neonatal jaundice was identified as far as in the 18th century and has more clinical reports from the 19th century. As mentioned earlier, neonatal jaundice most often presents as physiological jaundice and is seen as one of the most common problem of newborns worldwide. However, other forms of neonatal jaundice such as pathological jaundice, breast milk jaundice and haemolytic jaundice. Haemolytic jaundice includes three subtypes such as, the Rh factor incompatibility, ABO blood group incompatibility and jaundice associated with glucose-6 phosphate deficiency. These different types of

jaundice are discussed below. Neonatal jaundice needs appropriate considerations to avoid long term neurological effects. (Shortland, Hussey & Chowdhury, 2008.)

### **2.1.1 Physiological Jaundice**

Physiological jaundice is the most common type of neonatal jaundice, which has no serious consequences. This type of jaundice happens due to the differences in the metabolism of bilirubin in neonates causing the rise of bilirubin load. This increase in bilirubin load occurs when red blood cells are broken down thereby releasing bilirubin into the blood. Due to the neonate's premature liver, metabolism and excretion of the bilirubin is not efficient. Physiological jaundice typically appears between the second and fifth days of life but disappears with time. (Ullah et al. 2016). In the first week after birth, serum level of bilirubin rises to  $>2\text{mg/dL}$  and to a peak of 6 to  $8\text{mg/dL}$  in three to five days old, a rise to  $12\text{ mg/dL}$  is in the physiologic limit. The peak may increase for preterm infants  $10$  to  $12\text{ mg/dL}$  on day 5 and may keep rising if not treated, even when there is no abnormality. However, it may take up to one month of age to see a level of  $<2\text{ mg/dL}$  in both full-term and preterm infants. (Hansen, Eichenwald, Stark, & Martin 2016.)

Conditions that lead to this type of jaundice include bruising during birth, cephalohaematoma, that is the accumulation of blood under the scalp as a result of minor trauma during birth process, polycythaemia, that is the increase of red blood cells, delayed breastfeeding, and delayed excretion of meconium. Bilirubin level in serum can be excessive due to maternal factors or factors that develop during labour or delivery. Some of these maternal factors are smoking and gestational diabetes during pregnancy. If a mother was induced with oxytocin or anaesthetic agents, serum bilirubin level can be excessive. Breastfeeding can also enhance physiological jaundice due to less fluid and calorie consumption in the early stage of breastfeeding and free fatty acid in breast milk. However, it may be associated with substance in the breast milk which prevents certain proteins in the baby's liver from breaking down bilirubin. It appears days after birth, and usually does not cause any problem and may disappear later. It is associated with breastfeeding, but it is safe to continue breastfeeding the baby during this period (Shortland et al. 2008.)

### **2.1.2 Pathological Jaundice**

Pathological jaundice is the most serious type of jaundice which usually occurs in the first 24 hours of life. It is considered dangerous because excess bilirubin present in the blood could be harmful. In some cases, if the amount of bilirubin becomes excessive, it may affect some of the brain cells. Symptoms, such as vomiting, temperature changes, lethargy and poor feeding, can lead to increased levels of bilirubin. The most likely cause for this type of jaundice is haemolysis, which is the destruction of the red blood cells. Another cause of pathological jaundice is the ABO blood incompatibility, which occurs when a woman who is Rh-negative has a baby with Rh-positive father. The most primary cause of infant jaundice is the increase in the level of bilirubin. Bilirubin is a waste product, that is produced after the breakdown of red blood cells. The haemoglobin of the red blood cells in the womb differs from the haemoglobin outside the womb, and the rate at which the new red blood is produced is faster. A high level of these cells at birth, and the short lifespan of red blood cells increase the development of jaundice. Other causes can be due to a disease process known as ABO haemolytic disease or Rh incompatibility. In some cases, the presence of bilirubin in infants is due to certain infections such as hypothyroidism, haemolytic diseases such as glucose-6-phosphate, dehydrogenase deficiency, hepatic diseases or biliary conditions and total parenteral nutrition. (Turnbull & Petty 2012, 261.)

### **2.1.3 Breastmilk jaundice**

Children who exclusively feed on breastmilk have a different pattern for jaundice compared to those that feed on artificial milk. Jaundice in breastfed babies usually appears within the first 24 to 72 hours of age and reaches its peak by 5 to 15 days of life. This usually disappears by the third week of life. Higher bilirubin level has been reported in these infants, as mild level of jaundice was observed in one third of most breastfed babies in the third week of life. This may continue for two to three months after birth for some babies. Decreasing the frequency of breastfeeding in this case will be associated with exaggerated physiological jaundice and should be checked with a physician. However, it is important to encourage mothers to breastfeed their babies more. (Ullah et al. 2016.)



### **2.1.4 Haemolytic jaundice**

Haemolysis is the rapid breakdown of the red blood cells, which results in an increase in the production of bilirubin. The most common causes are Rh haemolytic disease, ABO incompatibility, and Glucose-6-phosphate dehydrogenase (G-6-PD) deficiency. Rhesus haemolytic disease in newborns is caused by maternal red blood cell alloimmunization. This is a condition where maternal antibodies are produced against the foetal red blood cells. In this circumstance, the maternal immunoglobulin antibodies can cross into the foetal circulation through the placenta, resulting in a wide variety of symptoms to the foetus. These symptoms can be mild to severe, ranging from haemolytic anaemia and foetal hydrops. To facilitate early treatment for babies with the Rh factor, a blood group and Rh typing should be performed. A reticulocyte count, which is a test that measures how fast red blood cells are, should be taken before any exchange transfusion begins. Phototherapy and exchange blood transfusion are recommended treatments in this situation. (Ullah et al. 2016). ABO incompatibility is as a result of the ABO blood groups of the mother being different from that of the foetus. For example, a mother with a blood group O and a new-born with a blood group A or B. Jaundice caused by this incompatibility usually appears within 24 hours of birth and intensive phototherapy is used to treat this situation. (Ullah et al. 2016.)

## **2.2 The Treatment of Jaundice**

Timely identification of the symptoms of jaundice helps physicians to diagnose jaundice. In full-term babies, bilirubin levels peaks in three to five days, and in five to seven days in preterm babies. A normal newborn produces 6 to 10 mg of bilirubin/kg/day, greater than the adult production of 3 to 4 mg/kg/day. Low bilirubin levels are not dangerous, however, too much of it in the blood can circulate in brain tissues, which can cause seizures and damage the brain, a condition referred to as kernicterus. The need for treatment often depends on the level of bilirubin, the age of the child and possible underlying causes. The aim of the treatment is to reduce the level of bilirubin to manageable levels. (Davidson & Michele 2014, 74-76). Jaundice that prolongs beyond two weeks of age, is worth further investigations to rule out underlying diseases that may be causing it. Prolonged jaundice is often caused by congenital disorder of the digestive system. Serum bilirubin levels are essential in the diagnosis of Jaundice.

### **2.2.1 Phototherapy**

The most common type of treatment is phototherapy, which is done by laying the baby under special lights. These lights reflect on the baby's skin and affect the bilirubin. Phototherapy is usually started when serum bilirubin level exceeds the required limit for the child or keeps increasing rapidly. A bilirubin level of  $360 \mu\text{mol} / \text{l}$  is recommended by the American Academy of Paediatrics (AAP) as the limit for phototherapy in healthy full-term babies. If the baby also has some risk factors for jaundice, the therapy can be started earlier. (Kortessalmi 2018.) When initiating phototherapy, reducing the total serum concentration is part of the therapeutic benefit. Some other therapies such as oral bilirubin oxidase can also reduce serum bilirubin. Sometimes interrupting breastfeeding for 24 to 48 hours while giving the baby formula can help reduce bilirubin level for infants with breastmilk jaundice. (Hansen 2017.)

### **2.2.2 Fibre optic blankets.**

Fibre optic blanket is a treatment whereby, a fibre optic light source is transmitted through a cable, which delivers high-intensity uniform light. This method of treatment uses fibre optics, and it also represents advanced technology in phototherapy treatment either in hospital or at home. In this treatment, a pad of woven fibre is used as a means of transmitting light to the child. This covered pad is placed directly against the babies to bathe the skin in light. It is the absorption of this light by the skin that leads to the elimination of bilirubin. This biliblanket can be used 24 hours a day to provide continuous treatment if prescribed by a paediatrician. Blood will be drawn and tested daily to control the bilirubin level and to check if it has reached its normal level. Once normal levels of bilirubin are reached, the treatment is no longer needed. It should be noted that, biliblankets are not to be used on premature neonates that are less than 28 weeks of age or infants with broken skin due to the risk of dermal damage. (Donel 2019, 2232)

### **2.2.3 Exchange transfusion**

Exchange transfusion is another method of treatment, which rapidly reduces the circulation of bilirubin in order to avoid bilirubin neurotoxicity when other therapeutic measures have failed or are insufficient. This procedure is common with children who suffer from severe anaemia, hydrops or

both, even with the absence of high bilirubin levels. This procedure requires that the patient's blood be removed and replaced with fresh donor blood or plasma. This involves placing one or more thin tubes called catheters from veins, where the blood will be drawn and new blood is administered. In the past, this procedure was very commonly used as it was being performed on children with Rh isoimmunization. Currently, the number of children that need exchange transfusion is reduced as a result of immunotherapy in Rh-negative women whose children may be at risk for developing jaundice at birth. (Hansen 2017). Early transfusion can be implemented in the following situation: cord haemoglobin less than 1g/dl, increase level of cord bilirubin over 70 $\mu$ mol/l or 4.5 mg/dl or both. A level of serum bilirubin greater than 15-20 $\mu$ mol/l or 1mg/dl/h can be a pointer for exchange transfusion. With infants who have haemolytic jaundice, a serum bilirubin of 350 $\mu$ mol/l (20mg/dl) can require an exchange transfusion. Currently, many experts encourage individual approaches when it comes to exchange transfusion because it is not a risk-free procedure. (Hansen 2017).

### **2.3 Nursing intervention in the treatment of Jaundice**

The nursing process is a systematic guide to client-centred care with its five sequential steps, which are, assessment, diagnose, plan, implement and finally evaluate. Nursing interventions in the treatment of jaundice, will be to first identify infants that are at high risk of developing jaundice such as immature babies, bruising, delayed labour, which can cause accumulation of blood under the scalp as a result of minor trauma during birth process, polycythaemia, the increase of red blood cells, delayed breastfeeding, delayed excretion of meconium and underlying medical condition. The nurse can determine the condition after the assessment. This is done by checking the infant's body image, the affected skin integrity, and checking for abnormal blood profile. During the treatment of jaundice, it is important for the nurse to explain the process to the parents and why there is a need for treatment. Educating the parents is key to alleviate stress and worry, nurses should educate the parents that jaundice is a common newborn condition and that there is evidenced-based research to proof the success of the treatment. Educating parents on the process strengthens them and encourages parents to concentrate on keeping close contact with their babies during treatment. Written materials on jaundice in addition with verified and trusted links should be given to parents to read at their own time to be more informed.

Parents should be encouraged by the nursing staff and medical professionals to ask questions and be active in the treatment process of the newborn. By doing this, nurses ensure that the parents' concerns,

and wishes are known and together they can decide the best treatment plan for their newborn. (Lauwers & Shinskie 2004, 365-368). It is also advisable to explain the various equipment to be used and their functions as clinically indicated. This will also reduce stress and anxiety and encourage bonding between the parents and their newborn. As a process of phototherapy, hand washing is an important aspect before the process so parents should be advised on the washing techniques as it will help prevent cross infection. (Donel 2019, 2233). Mothers should be encouraged to nurse frequently to keep the infant hydrated and facilitate excretion. Thermoregulation is another important intervention in treating jaundice as it decreases stress and acidosis. (Davidson et al. 2014, 74-76.)

### 3 NURSING CARE OF JAUNDICE

Nursing care in the context of this research is the care given to pregnant women, first-time parents, older parents, and the newborn. Parents benefit from all the guidance and information that they can get to answer all the questions they may be concerned about, thus alleviating stress and anxiety. This chapter addresses the perinatal health care services at different stages in pregnancy. The perinatal period starts from week 20 to 28 weeks of gestation, and ends 1 to 4 weeks after birth. This includes the care given before, during and after birth. Care before birth is referred as obstetric care, and care after birth is referred to as paediatric care in this chapter. The basic care of nursing can be provided by obstetricians, family physicians, registered nurses, public health care nurses, midwives and clinicians with legal license to practice. Prenatal care, education and support for the expecting mother and family are provided by the Finnish maternity health clinic. The perinatal care focuses on reducing or preventing all the events that could occur leading to sudden death or severe physical or psychological injury. It also involves the quick analysis and solution in the case of a sudden and severe injury. Some of these events that could occur are maternal death as a result of the birth process, excess weight of the infant, releasing the child to the wrong family, haemolytic transfusion reaction e.g. blood group incompatibilities, and severe hyperbilirubinemia usually a bilirubin level greater than 30mg/dl. The goal of perinatal nursing is to reduce perinatal morbidity and death by cooperating with care providers to meet the woman's needs. (Alden, Lowdermilk, Cashion & Perry 2015, 12-15.)

#### 3.1 Obstetric care

The expected outcome of pregnancy and labour is clear: a healthy mother and baby. (Van, Dijksman, Keus, Scheele & Pampus 2020). To achieve this, obstetric care is necessary. The Finnish health care system provides maternity services in the maternity health clinic, to coach and support parents through parent-group activities about childbirth and family life as a parent. All pregnant women and their partners can participate in the planning and delivery of childbirth as part of family coaching. Pregnant women and their partners with special needs including fear of childbirth, problems with previous childbirth, mental disorders, or a substance abuse problem in the family require multidisciplinary childbirth planning, childbirth care, and postpartum time planning. Services are given in locations that are accessible and written materials on birth, delivery, care and raising a child are made available for parents. A safe and peaceful childbirth environment is planned for mothers which allow for privacy,

movement and relaxation. The coaching is based on the needs of the family, evidenced based practices and regionally up-to-date childbirth coaching knowledge. Coaching continues through the latent phase of childbirth, which helps mothers with no specific risk factor for childbirth to manage at home with the help of a support person and by telephone with the maternity ward staff. Good coaching prevents too early contact and arrival at the hospital and fewer procedures during childbirth.

Public health care nurses and midwives should pay attention to the distance between the home and hospital. and give proper guidance on the right time for departure so that the birth occurs in the right environment. Birth plans are also discussed and parents' wishes like pain relief, birth postures, first moments with the newborn and place of birth is taken into consideration. A contingency plan is also proposed in this meeting. All the information received during the obstetric care are properly documented and reported to ensure continuity. (Klemetti & Raussi 2016, 106-113). In addition to maternity clinics, specialized outpatient maternity clinics organize follow-up services, should risk factors during pregnancy, at birth or afterwards be identified. The identification helps to plan preventive measures and timely treatment to prevent long term complications and death. Preventive measures include diagnostic testing, referrals, consultations and basic specialty care. Care should be given at a facility that best meets the needs of a pregnant women and their infants. Complications can occur without prior warning which requires increased surveillance, monitoring and special care. Maternal blood group, the blood group of the neonate, Rh incompatibility, the weight of the foetus and the possible complications are determined as this could increase the risk of jaundice in newborns. (Asefa, Guesh, Hailemariam, Gebremichael, Birhane, Zereabruk, Zemicheal, Hailay, Abrha, Surafel, Areaya, Brhane, Ebud, Tekulu & Welay 2020, 1-8.)

### **3.2 Nursing care at the delivery ward**

Newborn problems are often anticipated before arriving at the delivery ward. Many infants who will need extensive care in the delivery ward can already be identified by careful consideration of risk factors. However, some infants without any risk factors may need extensive care in the delivery ward. The risk assessment is not a one-off tool but continues throughout the perinatal period. Early complications may occur at any time that may affect the decision to medically transfer a pregnant woman to a higher level of care. It is only after childbirth that it is finally known whether it was a minimal risk birth or not. According to WHO 2020, this has often led to the conclusion that all births should be treated as complicated childbirth. The criteria for a normal (minimal risk) birth are a

spontaneous start, 37-42 gestational weeks, low risk through the latent phase of labour to the pushing stage, the infant is born spontaneously headfirst, and mother and newborn are well. There should be a proper flow of information from the obstetric care provider to the delivery team. In the delivery ward, there should be an organized plan of action and access to necessary equipment and qualified personnel to tackle anticipated problems. In the delivery ward, information about the pregnancy and childbirth plan are revised, and mothers receive holistic client-centred care. Childbirth staff is responsible for ensuring that the mother is aware of the progress of the birth, so that she can be active in making decisions about the birth. Support during delivery is an important part of childbirth experience and it promotes the natural physiological progression of labour, promotes the mother's sense of control and confidence in her abilities. Interactive support during childbirth can take the form of physical and mental support, guidance and information, and acting as a representative of the mother. Continuous support during childbirth increases the likelihood of vaginal birth, satisfaction with childbirth, reduces the need for medical pain relief, and shortens the duration of childbirth. The progress of labour, the condition of the woman and the foetus is monitored as well as pain relief medications. Evidenced-based practice of pain relief medication and the effects of the medication are carried out according to the wishes of the woman. (Klemetti et al. 2016, 106-113).

After the baby is born, the Apgar scores are given at one and five minutes of age to assess the well-being of the newborn, which measures the baby's condition after birth. The nurse or midwives highlight the importance of the first breastfeeding and early skin contact as already educated during the pregnancy. The mother is offered guidance for non-urgent first breastfeeding if needed, and routine measures may be postponed if the newborn's condition allows it. Breastfeeding guidelines are found in the Finnish Ministry of Health's maternity counselling guide. Breastfeeding guidance and support provided by nurses and health care professionals is particularly important at the beginning of the breastfeeding process. Every mother should be given this guidance, but attention should be paid to those who need special support e.g. young people, lowly educated and single parents, as they should be given targeted guidance. However, support is also given to those who are unable to breastfeed, hence the need for adequate staff training. (THL 2013.)

### **3.3 Nursing care at the intensive ward and paediatric ward for the newborn**

A newborn can have problems and illnesses after birth. In the intensive care unit, babies are placed on a monitoring device, where the child's breathing and blood circulation are monitored. If necessary, a

ventilator, nasal overpressure or high-flow nasal cannula is used as respiratory support, depending on the degree of difficulty in breathing. Vascular cannulas are placed on the child for medication, nutrition, and blood sampling. Milk feeding is usually started as early as the first day of life through the nasogastric tube. The length of the intensive care period depends on the newborn's condition. Parents can participate in the baby's care as much as they want. The pediatric ward admits newborn and children with milder illness and those in the recovery phase. (Terveyskyla 2019.)

Education and breastfeeding should be supported and encouraged as long as there are no contraindications for it, and should continue throughout the pregnancy until weaning. About 8 – 12 breastfeeds every 24 hours decreases high bilirubin level and also affects how long jaundice lasts. Poor intake of milk, which is more noticeable among first-time breastfeeding mothers, caesarean birth, maternal diabetes and with preterm babies should be evaluated. Poor intake can lead to extreme weight loss in the first two weeks of life. Parents should be aware that lack of caloric intake can lead to drastic health hazards for the newborn. As mentioned in chapter two, breast milk jaundice is a physiological jaundice that persists for days and can last for a couple of weeks in breastfed infants. However, it must be evaluated if it prolongs over two weeks to rule out pathological causes, hence it is needed to be admitted in the ward or a pediatric intensive care unit. If the serum bilirubin level in a breastfed term healthy infant keeps rising, the physician may order for a phototherapy. It should be emphasized, that mothers should not stop breastfeeding during the phototherapy treatment. Feedings could be supplemented with mother's expressed milk, if available, or infant formula, which is substituted only if the mother's milk supply is not enough. The LATCH (Latch, Audible swallowing, nipple Type, Comfort, Help) score evaluation tool can be used to assess breastfeeding. The mother should be encouraged to record the time of each feeding, as well as the infant's urine and stool output, during the early days of breastfeeding to help evaluate the infant's milk intake. (AAP, COFAN, & ACOG, COOP. 2017.)

Among other ongoing newborn screenings in the ward, newborns should be assessed for the risk of developing high bilirubin levels in the first 24 hours, during their stay in the ward and before they are sent home. Clinical observation alone is not enough to estimate the extent of jaundice and should not be practised. According to the AAP 2017 guidelines, the recommended pre-discharge bilirubin measurements or evaluation of risk factors for severe jaundice should be carried out in the paediatric ward before discharge. The recommendations are for infants of 35 or more weeks of gestation, and are done in an estimated order of priority. The risk factors to be checked and evaluated are total serum bilirubin or transcutaneous concentration that is in the high-risk zone. A transcutaneous measurement



is done without using a needle, usually a meter is placed on the infant's head or chest, which sends a quick flash of light through the skin to measure bilirubin levels. Other risk factors are the observation of jaundice in the first 24 hours, blood group incompatibility with antiglobulin test being positive, haemolytic disease, elevated end-tidal carbon monoxide, gestational age is 35-26 weeks, previous sibling had jaundice or had received phototherapy, cephalohematoma or significant bruising, exclusive breastfeeding and especially if feeds are not successful, and excessive amount of weight loss. (AAP, COFAN, & ACOG, COOP. 2017, 388.) Parents should be well informed about newborn jaundice and be provided with written or verbal information on the condition. They should be informed what signs to look out for, the progression of the yellowing of the skin, and how the baby is feeding. They should be encouraged to call the ward nurse if they have any concerns about the newborn.

### **3.3.1 Short stay birth and outpatient birth**

According to Klemetti et al. (2016), the treatment given after delivery in Finnish hospitals have been shortened. In 1992, about 54% of mothers returned home no later than the fourth day after giving birth, 90% in 2012 and 45% were discharged in two days. As the health care system improves, reduced treatment days are recorded, which requires closer guidance, effective monitoring of well-being, and effective breastfeeding as well as support for the whole family. Short-term care is considered when the mother and newborn are discharged from the hospital in less than 48 hours after delivery. However, outpatient delivery is considered if mother and newborn are discharged 6 hours after birth. Follow-up of the mother and newborn after a short-term care varies depending on how quickly they return home after giving birth. People who have had a regular pregnancy and childbirth, who wish to be quickly discharged from the maternity hospital and whose new-borns do not show any abnormality can have short-term care. The recommendation for short-term care is discussed elaborately in the Ministry of Health and Welfare's maternity counselling guide. However, home birth is not recommended in Finland, but there are recommended guides for those who plan to have a home birth. (THL 2013.)

### **3.4 Care at Home**

In the case of an early discharge to home or outpatient birth, the child and maternity clinic should follow-up to assess the feeding and general health of the infant at home. According to Finnish law, home visits are made to all families expecting their first child, either during pregnancy or after the

birth of a child. The home visit is performed by a maternity clinic public health nurse or midwife, if necessary, in collaboration with, for example, a family or social worker. Home visits are made to families with special needs as required, with the number, timing and composition of home visits based on the individual needs of the family. There are detailed recommendations for home visits in the Maternity Counseling Guide. (THL 2013.)

If a newborn is unwell, the child should be evaluated and started on rehydration therapy if necessary, while supplementing with mother's milk or formula. Awareness of the potential signs of neonatal illness is of utmost importance, these signs include temperature instability, change in activity like refusing to feed, abnormal skin colour, abnormal breathing, vomiting and aspiration, excessive sleepiness, irritability, abnormal movements and abnormal changes in weight. The public health nurse or a nurse from the maternity clinic should visit the newborn at 3-5 days of age or arrange for the newborn to be seen in 48 hours after discharge by pediatrician or an experienced health care professional. During this visit, measurements of infant's weight, physical examination especially for jaundice and hydration, breast feeding problems, assessment of urine output and bowel movements in addition to stool transition from meconium to yellowish colour should be checked and documented appropriately. The expected urine outputs and bowel movement are three to five urine eliminations and three to four stool eliminations per day by 3-5 days of age. By age 5-7 days the urine output should be four to six and bowel movements three to six per day. At 3-4 days after birth, the stool should already be yellowish. Any abnormality is reported and appropriate action is taken. (AAP, COFAN, & ACOG, COOP. 2017.)

### **3.5 Nursing care at the Child Health clinic**

In Finland, municipalities have been obliged to organize extensive health examinations for families expecting a child and families with children under school age, as well as for the families with children in basic education. The extensive health check-ups provide an opportunity to discuss with the family issues related to the health and well-being of the whole family and the support and assistance they need. Counselling and school health care identify the needs of family support more broadly and gain a more diverse understanding of the assessment of a child's well-being. This ensures that the support and needs of the family are provided on time, and a prompt follow-up care is initiated. The task of the child health clinic is to organize extensive health examinations when the child is 4 months, 18 months, and 4 years of age. Extensive health examinations may also be carried out if there is a need to investigate or

monitor comprehensively the development of the child's or family's well-being and health. (Hakulinen, Hietanen, Hastrup, Wallin & Pelkonen 2012.)

Health check-up	Age								
	1-4 weeks	4-6 weeks	2 months	3 months	4 months	5 months	6 months	8 months	12 months
Extensive health check-up					x				
Nurse	x	x	x	x	x	x	x	x	x
Doctor		x			x			x	
Oral hygiene examination									x(or 18months)

TABLE 1. Periodic health examinations at the child health clinic and those who perform the examinations during the first year of life

For the purpose of this research, the focus is on the health check-up within weeks 1-4, as it is crucial for the identification and treatment of jaundice. Extensive health examinations at the child health clinic utilize the care that has already begun at the maternity clinic in assessing the well-being of the child and the whole family and focus on changes from the perspective of the child, parents, and the whole family. The parents are the most important source of information when treating children as they understand the behavioural pattern of their children better. The nursing care in the child health clinic also includes monitoring of the child's physical, mental, and social growth and development according to their age and monitoring of psychosocial and neurological development. In addition, the child's speech, language development and sensory development are also monitored. Vaccinations under the Finnish vaccination plan are also given during extensive health check-up. Health care professionals at maternity clinics, and child health clinics provide an opportunity for maternity discussion for all families with newborns. They offer for those who have undergone traumatic childbirth experience the opportunity for a new discussion 4-6 weeks after delivery in the maternity hospital and, if necessary, provide the support needed to go through a traumatic experience. (Hakulinen et al. 2012, 50-55).

#### **4 PURPOSE, OBJECTIVES AND RESEARCH QUESTIONS**

The purpose of this research is to describe nursing care and nursing interventions to support parents during the identification and treatment process of jaundice. This thesis will expand knowledge in the nursing team in ways to support parents and reduce the level of stress in parents, as well as to enlighten parents to identify jaundice when it develops during hospital stay or at home, when discharged early. The objective is to improve awareness, provide nurses and parents with up-to-date information about jaundice, and evidenced-based nursing interventions in treating jaundice to minimize complications. The research target group will be registered nurses, parents, especially first-time parents and nursing education.

The research question is:

How do nurses support parents during the identification and treatment of jaundice?

## **5 SUPPORT FOR PARENTS IN THE IDENTIFICATION AND TREATMENT OF JAUNDICE**

Jaundice can be assessed visually by assessing the color of the sclera, which is the white part of the eye, the skin, and gums. When assessing the newborn, ensure that there is a bright, preferably natural light. Jaundice can also be detected visually when blood bilirubin levels were approximately 50  $\mu\text{mol/l}$  or greater. (Ullah et al. 2016.) However, visually assessed jaundice, especially in preterm infants, is less reliable. It is also important to identify children that are in risk groups, such as premature or babies with low birth weight, parents who have previously had babies who suffered from jaundice, and to monitor them for symptoms of jaundice.

The newborn skin, especially that of the Caucasians, show a pale skin colour. The hands and feet are somewhat cyanosed in the first 24-48 hours until the newborn respiratory and circulatory systems adapts to its new environment. It may be more difficult to identify jaundice if the baby has a darker skin tone. In such cases, yellowing may be observed more in the sclera, in the mouth, on the sole of the feet and on the palm of the hands. The newborn can also develop red colouring of the skin, which is the result of excess red blood cells. The body breaks down the red blood cells, which may lead to the yellowing of the skin. This clears up on its own after a few days or can be prolonged for a few weeks if the baby is breastfed. However, yellowing of the skin that occurs immediately after birth or within the first 24 hours, is regarded as pathological in nature, and needs to be referred to a pediatrician. As a general rule, 2 weeks of age in a term baby and 3 weeks in a preterm baby are the limits for reconsidering a diagnosis of physiological jaundice. Because jaundice can be classified as either physiological or pathological, it is very important to examine the newborn in an evidence-based and safe manner in order not to miss a hidden cause for the unwell child. (Lomax 2015).

Some professionals tend to classify how severe jaundice is by using only the method of clinical visualization. This practice should be discouraged because differentiating the level of bilirubin this way is hard, tricky and very unrealistic in infants with darker skin tone. Serum blood level should be checked in the early hours of life if jaundice is seen clinically. (Lomax 2015.) Jaundice can also be identified by its symptoms, such as being sleepy and not wanting to feed or not feeding as usual. Newborn's urine is normally colourless, so a dark colour or yellow urine, as well as a pale stool could indicate jaundice.

## **5.1 Types of Support for Parents**

When a child is suffering from a disease, the parents are stressed, as they see their babies suffer. Parents experience changes in their role as parents, when their child is cared for by a health care personnel in a hospital environment, or at home. In order to cope with the stress, parents need to be provided with adequate information concerning their child's condition, the prognosis, test results and treatment plan. Giving them this information enables them get control of the situation. By giving them the necessary support, and necessary information about their child, most parents can overcome their challenges and in turn care for their child. This will enable them to also play their multiple roles in the family. It is the role of the nurse to provide all the support that parents need to take care of their unwell child as they have regular contact with the parents and the child. (Doupnik, Hill, Palakshappa, Worsely, Bae, Shaik, Qiu, Marsac & Feudtner 2017).

In this section, the various types of support the parents need such as educational support, emotional support, psychological support and social support are discussed. The nursing team can immensely enhance the birth experience and care afterward for the woman and the family. A caring attitude, assistance to understand the process, physical contact between infant and family to encourage family interaction are important. Care and support of the parents should not be neglected, as both infant and mother need care and need each other. The nursing staff should promote a woman's learning how to care for her own needs including that of the newborn. The care and support for the family, especially the woman, should be specific to her needs and vary depending on the kind of delivery and on any complication she might have had. Family-centred nursing should be encouraged and practiced by involving the mother's support system, which could include a spouse or partner, relatives and friends in decision making, not neglecting the values, beliefs, cultural background and choices of family. The goal is to instill a sense of responsibility, which affects the overall situation of family life. It is the duty of the nurse to educate the parents about the condition of their child, and be there to calm the parents in moments where they feel down. (AAP, COFAN, & ACOG, COOP 2017, 3-4.)

## **5.2 Educational support**

The level of education parents receive about jaundice helps in achieving a high knowledge about the condition and affects the behavior of parents positively, when they have a jaundiced child. Educating

the parents about jaundice leads to early diagnosis and management of jaundice in neonates. It is the nurses' responsibility to inform parents about jaundice, what to look out for, what is normal, and when it is important to seek medical attention. Parents need to understand that breast milk jaundice may develop 5 to 7 days after birth and is completely harmless. However, breastfeeding should not be discontinued without first checking with the healthcare unit. It is important to ensure that the baby is eating enough in the first hours and days after delivery, as it is the best way to ensure the body can process the bilirubin. In some rare cases, untreated jaundice may cause developmental problems such as physical and intellectual disabilities. The common practice of putting jaundiced infants under the direct sun in developing countries should not be practiced, as this could result in dehydration and worsening of the condition. Nurses need to assess the family situation and support system, provide parents with appropriate information about home phototherapy, periodic recordings of the child's weight, input and output and general condition of the baby. Provision of referral of home therapy should be given if necessary, in case of lack of knowledge and support system. (Kashaki, Kazemian, Afjeh & Qorbani 2016)

### **5.3 Emotional support**

According to recent research, mild long-term depressive symptoms among mothers are connected with problems and health situations faced by their children. Depression among parents during and after pregnancy not only affects the person suffering from depression, but also has a long-term impact on the well-being of the newborn child. Even in cases of mild depression, it is important that the symptoms are identified and the parents are offered support as early as possible, if necessary already during the pregnancy. Emotional support can be provided by the nurses verbally or nonverbally, that is, the way the nurse communicates and gives reassurance to the parents. The parents' understanding of nursing support is largely influenced by, the nurse's confidence in their skills and how they present themselves professionally. In order to support the parents emotionally, care is to be provided in a non-judgmental manner, which will help the parents to relax and trust the nurse with the care of their child. The nurse is to encourage the parents to ask questions about their child's situation, by listening to them and attending to their concerns accordingly. In cases where the nurses cannot answer these questions asked by parents, it is advisable to find someone who can give them the right answers to their questions. The nurses also have the role to support parents to talk about feelings, concerns and worries

about their child's condition, and also show concern about the parent's wellbeing. (Doupnik et al 2017).

#### **5.4 Psychological support**

It is estimated, that about 9–16% of women who give birth have postpartum depression in Finland. (Klemetti, et al. 2016, 133). Postpartum depression, which peaks at 3 to 6 months after delivery and is associated with maternal depression, has also been reported in fathers. Postpartum depression can range from mild symptoms to psychotic depression. Puerperal psychosis is a serious mental health problem that usually erupts two weeks after delivery, and is typically associated with hallucinations. This affects 1-2 mothers out of a thousand. The treatment of sick mothers is carried out in special medical care. Mothers who have had previous mental disorders or depression during their pregnancy are at high risk of developing postpartum mood disorders. It is necessary to pinpoint pregnant women and postpartum women with depression, because it can be harmful for women, infants and the family as a whole. It is the responsibility of the nurse or care team to identify risk factors that can lead to mood disorders during and after pregnancy. Some of these risk factors are history of depression, unintended pregnancy, domestic violence, poor relationship quality, anxiety during pregnancy, experiencing a stressful life event during pregnancy or just after delivery, traumatic birth experience, preterm birth or infant admission to intensive care, a lack of support system, and breastfeeding problems. Any sign of this should be reported, and obstetric care providers should work together with pediatricians to promote treatment for mood disorders that are recognized during newborn care. (Klemetti et al. 2016.)

Nurses should ask mothers about their moods and how they are feeling as this could lead to discussion about depression and anxiety. Those women who have been identified to have anxiety and depression need close monitoring, evaluation and assessment. They could benefit from evidence-based psychological and psychosocial interventions and in some cases medication to decrease the effect of postpartum depression. However, if there are concerns for a more severe mental disorder, a referral to a psychiatrist should be initiated before starting any medication. After delivery, the family adjust to the changes and their new roles as parents. Hence, nurses have to consciously make efforts to assess how well the family is adapting to their new life and discuss supportive assistance if adaptation to new life is difficult. (AAP, COFAN, & ACOG, COOP. 2017, 294-296).



## **6 RESEARCH METHODOLOGY**

A research method is a specific procedure or technique used to select, identify, process, and analyse information about a topic. Narrative literature review will be used because it provides an overview of the association between informative education and communication, symptom management, and psychological support. (Moule & Goodman 2009, 146-147.) Narrative literature review critically analyzes the recent knowledge of the topic, which means the authors will read data and critically evaluate the validity and reliability of the studies. The authors will be able to see what has been written so far about the topic, understand the concepts and the results of other researchers, and most importantly demonstrate the author's own understanding and ability to critically evaluate research on this topic with evidence-based knowledge.

### **6.1 Narrative Literature Review**

A literature review is a method of research that gives up-to-date theoretical and scientific knowledge about a specific issue, which allows the author to synthesize what is known and unknown. In other words, a literature review includes a report of up-to-date information about a practical problem, recognition of the gap in knowledge and the expansion of current research to develop the knowledge in an area of study. The literature review should be broad in the sense that it should allow the reader to recognize the research problem, and narrow enough to include the most important sources. (Burns & Grove 2011.) There are two types of literature review: the narrative literature review and systematic literature review. The research question is descriptive, which aims to gather information that focuses on relationships and patterns. (Moule et al. 2009, 13.)

When reviewing literature, the writer focuses on summarizing, critical appraisal, and synthesis. Articles are summarized while checking the relevance of the literature, results, context, sample selection and methodology. Then information is critically appraised, by seeking to discover answers on the research questions. The writer assesses how the theoretical framework of the research supports the claims and findings of the research, confirms if the concept in the publication is well defined, observes the strengths and weaknesses of the article, and reviews the criteria for choosing participants, sample size, location and type of study. After this, the contents in the publications and how they connect to each other and to the writers' own work are identified, and finally the writer draws up a conclusion on

the literature. (Moule & Goodman 2014, 120). In summary, a good review of the literature should analyse a research problem and illustrate how it can be studied, it should simplify the importance of a research problem, analyse what is known about a problem and the gap in a particular field of knowledge. It should also give examples based on documented studies to answer a nursing issue. A good review provides evidence that a problem is of importance and identifies theoretical frameworks and conceptual models for organizing and conducting research studies, and finally provides a context for interpretation, comparison and evaluation of study findings. (Boswell & Cannon 2017.)

This thesis describes nursing care and nursing intervention to support parents during the identification and treatment process of jaundice. It aims to expand knowledge in the nursing team on ways to support parents and reduce level of stress in parents, as well as enlighten parents to identify jaundice when it develops in hospital stay or at home when discharged early. The criteria used when selecting the articles is that it matches the thesis purpose of the authors. Articles included in this thesis are summarized and critically analysed, the materials used are data from a reliable and trustworthy source. Theoretical sources are taken from reliable books, chapters in edited books, PhD dissertations and research that were retrieved from international e-journals, library database and research reports.

## **6.2 Data Collection**

According to Boswell et al. (2017), data collection is the basic piece of all aspects of the research process. Specifying the outcome of each stage in the data collection plan is important, because the potential of accidentally removing an important part of data is reduced. To answer the research question in this thesis, secondary data, which is evidenced based was collected from already written literature publications. The used data sources were Cinahl, PubMed, Ebsco, Sage journals and ProQuest. The research was carried out in different stages, including data collection based on the title, data collection based on the abstract, and finally, data collection based on the full text. The search words “Nursing intervention” OR “Neonatal” AND “Jaundice” OR “Hyperbilirubinemia” were used to search for data. For this research, certain limitations were set in the year of publication e.g., data collection is limited to data published from 2011 –2021. Only data published in English were included. However, there were a few relevant articles published within 2010-2021, an article from 2009 was chosen because it was quite relevant and important to the authors’ research topic. In the second phase, abstracts of the publication were read because the abstract gives a general view of the publications, and the publications are then chosen based on full text.

TABLE 2. Initial search results

Search Terms	CINAHL	SAGE	PubMed
Support for newborn jaundice	222	349	1
Support for parents when treating jaundice	168	2	41
Nursing interventions or nursing care AND jaundiced in newborns	8	-	4
Support to parents with jaundiced baby	144	124	120
Neonatal jaundice, causes and management	359	433	2
Jaundice or hyperbilirubinaemia or bilirubin AND nursing AND support	1233		269
Nursing interventions AND jaundice in newborns	1	186	17
Support AND jaundice in newborns	1	389	1
Support AND jaundice in newborns AND nursing	89	-	1
Jaundice in Newborns AND Nursing	2	41	10

The table above shows the relevant hints and the initial search results retrieved from three database sources. The literature search and review process retrieved about 4300 articles.

TABLE 3. Inclusion and exclusion criteria for the chosen articles

<b>Inclusion criteria</b>	<b>Exclusion criteria</b>
Article is available in free full text	Article not available in free full text
The article is published in English	Article is not published in English
The article is relevant to the topic	Article is not relevant to the topic
The article is published between 2011 - 2021	Articles published before 2011
The article has open access	Article does not have open access

The table above shows the inclusion and exclusion criteria for the chosen articles. After applying the inclusion and exclusion criteria, seven articles had relevant information that answer the authors' research question.

### 6.3 Results

During the process of data collection, seven articles were found to be relevant to the study. These articles were used and were critically appraised and analysed. The term data analysis refers to how researchers move from a collection of mass data to meaningful observations of the data. There are many different data analysis methods depending on the type of research. With the help of data

analysis, the discussion will be developed by matching the results of the study with what has been found from previous research and then ascertain whether the results are significant for use. (Boswell et al. 2017.) The authors seek to discover the answers to the research question: How do nurses support parents during the identification and treatment of jaundice? In this research, the critical appraisal will be divided into two, which are the education, information and communication part and the psychological support of care. Thereafter, the researchers will add value and recommendations to the pre-existing knowledge in the field of research.

TABLE 4. Table of Articles

Author and article name	Journal and year	Summary
Kashaki, Kazemian, Seyyed Abolfazl & Mostafa. <i>Effects of educational intervention on the knowledge and practice among parents of new-borns with jaundice</i>	International journal of paediatrics 2016 (Research gate)	Educational intervention and raising awareness to mothers about jaundice has a key role to play in preventing jaundice complications. Mothers who received educational programs and information about jaundice could better manage the condition of their baby.
Turnbull & Petty. <i>Early onset jaundice in the Newborn: understanding the ongoing care of mother and baby</i>	British Journal of Midwifery 2012 (Research gate)	Nurses support parents by showing empathy and provide coping strategies to parents with sick children. Timely intervention of jaundice prevents the severity of the disease.
Olantunde, Christianah, Olarinre, Bidemi, Temidayö, Adebukola, Tolulope, Bamidele, Oludare & Simeon. <i>Neonatal jaundice: Perception of Pregnant women attending antenatal clinic at a Tertiary Hospital in Southwest, Nigeria</i>	SAGE Journals 2020	Adequate knowledge of the causes, danger signs, treatment options and complication of jaundice by pregnant women and women of reproductive age will support mother's health care, thereby avoiding complications. It is very important to train healthcare workers about effective communication skills to ensure appropriate flow of information to the clients whenever they have contact with healthcare personnel.
Ogunlesi & Ogunlesi. <i>Family socio-demographic factors and meternal</i>	PUBMED 2012	Intensive health education of families improves their health

<p><i>obstetric factors influencing appropriate health-care seeking behaviours for newborn jaundice in Sagamu, Nigeria.</i></p>		<p>care-seeking behaviours for newborn jaundice. Increasing knowledge about the need for early identification, early commencement of effective treatment and consequence of severe jaundice are vital to the planning and implementation of interventions required to minimize the risk for kernicterus. Counselling of expectant mothers should be incorporated into routine health programs at the antenatal, immunization and postnatal clinics.</p>
<p>Doupnik, Douglas, Palakhappa, Worsely, Bae, Shaik, Qiu, Marsac &amp; Feudtner. <i>Parents coping support interventions during acute paediatric hospitalization.</i></p>	<p>PubMed 2017(AAP Journal)</p>	<p>Parents who got support and intervention had lower risk of anxiety, lower stress symptoms, lower depression, and a better way of managing their child's condition.</p>
<p>Sanjari, Shirazi, Heidari, Salemi &amp; Rahmani. <i>Nursing support for parents of hospitalized children: Issues in comprehensive paediatric nursing vol 32</i></p>	<p>PUPMED 2009</p>	<p>Support from nurses goes a long way to assist parents to maintain their role of parenting and promote a quality nursing care. Nurses' support helps facilitate the care process of the sick child and help parents cope emotionally, socially, and psychologically.</p>
<p>Stremler, Haddad, Pullenayegum, &amp; Parshuram. <i>Psychological Outcomes in parents of critically ill Hospitalized children.</i></p>	<p>PUBMED 2017 (Journal of Paediatric Nursing.)</p>	<p>Social support and assessing parents' psychological distress is a significant role to promote family health during the hospitalization of a child.</p>

The first article concerning education characterizes clearly the important part of the nurse in supporting parents during the identification and treatment of jaundice in newborn. According to Olatunde, there is a need for intense public understanding and awareness about newborn jaundice, as well highlighting the risk factors, danger signs and preventive measures. The role of the nurse is to offer information both verbally and in writing, and to ensure effective communication skills to disperse information to parents whenever they have contact with the health care professionals. (Olatunde 2020.) This also explains the importance of education and how much knowledge about jaundice is known, however it does not assess the content of the education received by the participants before the survey.

Ogunlesi & Ogunlesi (2011), also describe the importance of education in line with Olatunde, (2020). They however, stress that educating parents about jaundice is a good tool for early assessment of newborns for hyperbilirubinemia. Ogunlesi et al. (2011) noted social factors as one of the issues that affect parents to seek early treatment for jaundice. According to the authors, empowering the patients educationally may improve care-seeking behaviours for new-born jaundice. Families with low socio-economic status present with more severe outcomes of jaundice, the nurses' role is to counsel parents and discourage self-treatment at home while encouraging early contact with health care professionals and the hospital. (Ogunlesi, 2011.)

Furthermore, a greater proportion of mothers with multiple pregnancies, low education, low socio-economic status and fathers that have low education had babies with kernicterus, because of not seeking early treatment or not knowing the early signs of hyperbilirubinaemia. This is in line with Turnbull et al. (2012) as the authors describe how timely identification and treatment of jaundice prevent complications like kernicterus. These articles also explain the importance of family-centred nursing and the need to involve parents in the care of their child. This means nurses must also provide parents with information on where to seek financial help especially for low-income parents. Supporting them in every way possible is the duty of the nurse. For example, in this article, the authors talked about the importance of breast milk for the child and the lactation process, and how to store breastmilk. Nurses must support parents by telling them the importance of continuous breastfeeding even though the child has breastmilk jaundice. Kashaki et al. (2016) elaborates the importance of raising awareness on the disease and how educating parents can help prevent the severity of jaundice. Their study confirmed the benefits of educational support to parents of new-borns with jaundice. Parents who did not get any educational support had an elevated risk for their new-born having jaundice complications. Educating the parents led to early diagnosis and management of the condition. The study also reveals the importance of raising awareness on the diagnosis of jaundice, treatment, causes, and the symptoms to look out for. (Kashaki et al. 2016)

The article published by the American Academy of paediatrics highlights support and interventions that parents need when caring for a sick child. In this article, Douppnik et al. (2017) focused on support for parents during the hospitalization of a child. This also was in line with what Stremler, Haddad, Pullenyegum & Parshuran (2017) discussed in their article. Both articles illustrated how the sickness of a child can lead parents to suffer from anxiety depression and stress. If the parent go through mental problems, the child's process of care is likely not to go well. These authors stated that interventions designed to support parents of sick children can help parents to experience lower stress and be able to

participate in the child's care. Interventions designed to support parents to cope with the hospitalisation or care of their child is shown through communication, education, empathy, and sufficient resources. It was noted, that educational intervention gave parents the skills and knowledge to care for their sick child. This education was carried out by giving out workbooks, audio, and video recordings of educational materials, and training of clinical staff. Emotional interventions were mostly focused on parents' self-care such as activities to promote relaxation, teaching parent's techniques to manage anxiety and depression, and encouraging parents to adapt emotionally. Visiting the family at home helps to alleviate the challenges they face with the sick child, and this is an important social support. The study revealed that parents who got support, and intervention had a lower risk of anxiety and stress symptoms, or risk of depression. (Doupnik et al. 2017)

According to Sanajari, Shirazi, Heidari, Salemi & Rahmani. (2009), having a sick child is a stressful experience for most parents. Hence, nurses must develop means of support to assist these parents. They also stated that nurses have a significant role to promote the quality of family care and should have a knowledge of the several types of nursing support to meet the needs of parents and alleviate them from stress. Just like Doupnik et al. (2017), the aspect of communication was raised. Sanajari et al. (2009) stated that, it is important for nurses to learn about new methods to communicate with parents, especially when providing support to them. The majority of parents that took part in Sanajari et al. (2009) survey outlined how communication support, emotional support and educational support helped them during the care process of their unwell child.

## 7 CONCLUSION

This research has shown that the role of the nurse to support parents in the identification and treatment of jaundice is important to early commencement of treatment as well as the prevention of severe complications that may arise in newborns. The aim of this thesis was to answer the research question as to how nurses can support parents in the identification and treatment of jaundice in newborn. From the critical analysis and appraisal of articles, the outcome has been that the duty of the nurse is continuous education and delivering of evidenced-based information to parents about the topic. In addition to education, the nurse guides, advises and supports patients emotionally and psychologically if the need arises. Good communication skills are also one of the important factors that nurses use to support parents. Communication skill is important because, nurses can properly manage the treatment plan, coordinate care, and ensure an effective follow-up to evaluate the parents understanding of the information that they have received. A positive patient-nurse or family-centred nursing relationship in line with this study leads to advancement of care and psychosocial development of the family.

There is a need for more research on how nurses support parents with jaundiced newborns. Most of the previous research focused more on education. There is a lack of parent's involvement in the treatment of their newborn. The results from the articles, which explore education, awareness, information and communication, show that education and awareness have a significant role in preventing severe complications in jaundiced newborn. From the articles analysed, it is known that many parents do not view jaundice as a severe condition, but mere physiological and do not seek help on time. Education and counselling about jaundice, its causes, treatment, danger signs, complications and how to identify jaundice is insufficient in developing countries. There is need for more awareness on the topic and knowledge on the treatment options.

Clinical perception of the nurse is important in analysing those parents and newborns who are at risk. Some of the risk factors include foetal-maternal blood group incompatibility, previous affected siblings, maternal illnesses and drugs, cephalohaematomas, bruising during birth, and delayed meconium passage. A nurse who has knowledge of this topic and has experience in treating such patients will realize the risk factors in advance and will be able to support the family by delivering timely interventions in order to prevent further harm.



## 8 VALIDITY AND RELIABILITY

This research is based solely on reproducing and analysing information that has already been studied about the topic. The data is reported honestly. This section focuses on the trustworthiness of the research data. In the medical field, decisions, diagnosis, and treatment of patients are done as a result of reliable and valid test results. If these results were not reliable or valid, there could be an emergency for the patient. In the same way, if research data is not reliable, the results or findings are not trusted. Reliability is therefore the consistency of test results, the better the reliability of the data, the more accurate the results. Validity is the extent of truth in the results found, and if reliability and validity is missing from the data, there is uncertainty about the trustworthiness of the results (Boswell et al. 2017.) Data was collected from trusted and reliable electronic academic databases, namely Cinahl, PubMed, Ebsco, Sage and ProQuest.

The chosen articles reviewed in this research came from different journals, but they all were similar as they had the same ideas about the types of support parents need. These articles have explained the notion of the research as well as associating the concepts by using theories and previous studies. The general findings, measures and method of analysis used in this thesis have been combined to demonstrate the originality of the work and showed that theories were from the studies were from evidence-based results. The trustworthiness of this thesis has been measured by using proceedings according to the methodology. Exclusion criteria included materials that were not relevant to the research question, and the materials that were not in English. The materials used in this research were assessed by reflecting on the content and deliberating whether they, answered the research question.

This thesis was supervised by a lecturer with a long working experience in child and family nursing, and the authors believe that she added value to the thesis as her knowledge and experience of working life is important to this work and made it more reliable. This thesis was conducted under constant supervision, which required many corrections and changes. This was necessary in order to measure the reliability and validity as well as ensuring the trustworthiness of the final work.

## **9 ETHICAL CONSIDERATION**

Ethical issues in general are important regardless of the area of research or methodology. Nurses practice in a world with various norms, controls, rules, and regulations, which also binds nursing researchers. Some of these ethical issues include the need for voluntary consent of the participant, ethical issues related to the environment for research, rights, privacy and confidentiality of the participants and trustworthiness of the researcher in making sure that valid results are from the study. Boswell et al. (2017). The articles that were used followed ethical guidelines and recommendations, the authors of the articles had ensured participants' anonymity, and confidentiality was maintained and consent obtained. References for each study in the research have been cited after the sentence or paragraph, and have also been included in the reference page. The authors' personal opinions were not included, and the findings were solely based on scientific articles. Several principles such as openness and respect for intellectual property, honesty, objectivity and integrity are applicable for maintaining ethical issues. Negligence or mistakes were avoided, as well as plagiarism while respecting the patents, copyrights and other forms of intellectual property. (Rensik 2011).

In this narrative review of nursing support for parents during the identification and treatment of jaundice, the authors have followed all the principles mentioned above. Bias, falsification or misrepresentation of the research has been avoided. Data used in the final work has been referenced clearly in text and in the reference section. Articles reviewed have been critically analysed and findings were truthfully reported.

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