

Efficacy of early initiation of breastfeeding (EIB) for preventing hypothermia in newborns

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ARTICLE INFO

Article history

Received, 16th September 2021

Revised, 3rd December 2022

Accepted, 10th December 2022

Keywords

Effectiveness;
Breastfeeding;
Early Breastfeeding Initiation;
Skin to Skin;
Neonates;
Newborn Baby;
Hypothermia;

ABSTRACT

Newborns are at risk of losing body heat after birth. According to UNICEF, the global infant mortality rate is still worrying, in Sub-Saharan Africa, of 29 deaths per 1,000 births. It means that 80% of deaths are caused by asphyxia, complications at birth, hypothermia, and sepsis. In Indonesia, the causes of death for newborns 0-6 days include respiratory disorders (36.9%), prematurity (32.4%), sepsis (12%), hypothermia (6.8%) and jaundice (6.6%). Evidence suggests some technological interventions in preventing hypothermia in newborns, such as skin-to-skin contact between mother and baby. This study aimed to explore available technological evidence regarding the effectiveness of *IMD* in the prevention of hypothermia in newborns. The review is based on the integrative review method by following the modified design it consists of identifying topics, identifying problems/questions, collecting data with relevant evidence, evaluating data, analyzing, and interpreting data, concluding, and presenting results. PRISMA flow diagram is used to show the flow of evidence search. The results of the review included 10 articles. From the review, three facts were discovered, namely, EIB can increase temperature, increase breastfeeding levels, and increase low weight loss in the baby's first days. Infant mortality can be prevented with the role of trained health workers during ANC, delivery/postnatal, and EIB during the first/two hours of postpartum to prevent hypothermia.

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1. Introduction

Skin-to-skin contact (SSC) or Early Initiation of Breastfeeding (EIB) between mother and newborn should be implemented immediately, thus bringing many protective effects. As recommended by the Baby Friendly Hospital Initiative (BFHI), newborns should be placed in skin-to-skin contact with their mothers immediately after birth for at least one hour, and mothers should be assisted to initiate breastfeeding within half an hour of their baby's birth. The term skin-to-skin contact (SSC) is defined as the placement of a naked baby, occasionally with a diaper or hat, on the mother's bare skin, and the exposed side/back of the infant covered by a blanket or a towel. Movement of the baby's hand over the mother's breast during SSC causes increased oxytocin secretion, which results in increased milk secretion. It is known that SSC after birth promotes the regulation of newborn temperature, metabolic adaptation, and maintenance of blood glucose levels. By the time the baby is born, the baby has a reduced capacity to generate heat, which leads to a drop in temperature. This is why temperature

maintenance is one of the most important needs of a baby at birth. While the mother and baby perform SSC, heat will be transferred from mother to baby, where the mother's body temperature activates the baby's sensory nerves, which in turn results in relaxation of the baby, decreased sympathetic nerve tone, dilation of skin blood vessels, and an increase in temperature (Safari et al., 2018b).

Hypothermia is a major contributor to neonatal morbidity and mortality in low-and-middle-income countries. In addition, unsatisfactory settings and limited progress can increase the risk of death from hypothermia. In some resource-limited countries, some progress has been made in reducing mortality in children under 5 years of age, but little progress has been made to increase the subsistence of neonates or infants under 28 days of age. As a result, the lack of thermal protection is still a major underappreciated challenge for newborn survival in developing countries. To address the major challenges of neonatal hypothermia morbidity and mortality, it is necessary to identify its determinants. These determinants have a greater input to program managers and policymakers to design, implement and evaluate programs for reducing neonatal mortality and improving newborn care to achieve the third sustainable development goals (SDGs) to ensure healthy lives and promote well-being for all and at all ages (Tasew et al., 2018).

According to the United Nations International Children's Emergency Fund (UNICEF), the global infant mortality rate is still worrying. In Sub-Saharan Africa, it accounts for the highest number of infant deaths under a month old. There were 29 deaths per 1,000 live births. 80% of deaths were caused by asphyxia, complications at birth, hypothermia, and sepsis. Newborn deaths can be prevented with the role of trained health workers during obstetrical examinations, during or after delivery, availability of clean water, disinfectants, and early initiation of breastfeeding during the first hour after birth (Hospita, 2018). Hypothermia is one of the causes of the Infant Mortality Rate (IMR). The data shows that causes of death for newborns 0-6 days in Indonesia include respiratory disorders 36.9%, prematurity 32.4%, sepsis 12%, hypothermia 6.8%, and jaundice 6.6%. Based on data from the United Nations (UN), the infant mortality rate in Indonesia in 2019 was 21.12. It decreased from the record in 2018 when the infant mortality rate in Indonesia still reached 21.86 or in 2017 reaching 22.62. Although it has decreased, the infant mortality rate in Indonesia is still relatively high compared to other Southeast Asian countries. In 2019, the Southeast Asian countries with the lowest infant mortality rates were Singapore (2.26), followed by Malaysia (6.65), Thailand (7.80), Brunei Darussalam (9.83), and Vietnam (16.50) (Parti et al., 2020).

Skin-to-skin contact economically provides an appropriate and affordable but high-quality technological alternative. It is easy to implement, even in small hospitals in very low-income countries, and has the potential to save newborns' and mothers' lives. It is important to prioritize the training of health care providers to implement SSC essential newborn care. Community involvement is also needed to ensure that all women and their families understand the benefits of SSC and early initiation of breastfeeding. EIB can reduce the prevalence of neonatal morbidity and mortality, early initiation of breastfeeding is simple prevention of hypothermia and can save costs with intervention (complementary) methods that are easily accessible to the mother and can be applied immediately after birth (Safari et al., 2018a).

Health care providers' inattention and inappropriate newborn care during labor are additional important factors that contribute to neonatal hypothermia. One of the mechanisms for preventing neonatal hypothermia is to maintain a "warmth" chain: warm delivery rooms, immediately, skin-to-skin contact, breastfeeding, delayed weighing and bathing, appropriate clothing and bedding, keeping mother and baby together, warm transport, warm resuscitation, and training, and awareness-raising (Ukke & Diriba, 2019). Having an understanding that delaying EIB can be a global health problem as well as in Indonesia. This study aims to analyze the effectiveness of EIB interventions in preventing hypothermia in newborns so that health workers or the public can understand and increase EIB coverage in Indonesia.

2. Methods

The method used in this study was an integrative review used as a precursor to an integrative study. It is also used to identify the types of evidence available according to the topic discussed, by looking for an overview of research conducted on a particular topic or area, identifying key characteristics or factors associated with a concept (Munn et al., 2018). This study discusses the effectiveness of EIB in preventing hypothermia in newborns. It is integratively to map the available literature on a topic and

synthesize the primary research to deepen, clarify, and summarize the results based on evidence to recommend further research. The stages in conducting an integrative review that must be carried out are focusing on the review, using the PEOS framework (Population/Problem, Exposure, Results, and Study design), identifying relevant studies, selecting studies using PRISMA flowcharts, charting, and mapping the data, as follows:

2.1 Identify the review question or focus of the review

This integrative review aims to determine “The Effect of Early Initiation of Breastfeeding on Preventing Hypothermia in Newborns”. The relevance of this literature review is a synthesis of research that aims to seek interventions on the effectiveness of EIB in reducing neonatal mortality due to hypothermia and identify key concepts, gaps in research, and sources of evidence to inform practice, policy, and research on the implementation of family or parental community care (Kyu et al., 2018). The final result obtained is a review of the following question: "How Effective the Early Initiation of Breastfeeding (EIB) is in Newborns for Preventing Hypothermia?"

2.2 Framework PEOS

The researcher used the Population, Exposure, Results, and Study Design (PEOS) Framework in managing and completing the review focus described in table 1, for developing the review focus and search strategy. The use of PEOS helps identify key concepts in question focus, develop appropriate search terms to describe the problem and determine inclusion and exclusion criteria.

Table 1. Framework Research Question

Population	Exposure	Outcomes	Study Research
Newborn	Hypothermia	Early Initiation of Breastfeeding (EIB)	Qualitative and Quantitative Studies

2.3 Identifying Relevant Studies

The article inquiry strategy was developed using several databases, which only focused on article reviews. The use of peer reviewed articles is expected to guarantee the credibility of the information contained in a scientific work that is more correct, accurate and all of its contents can be used as source data. The keywords used to search for articles on the topic are as follows: “Effectiveness* AND Breastfeeding* OR Early Breastfeeding Initiation* OR Skin to Skin* OR IMD* AND Neonatus* OR Newborn Baby* AND Hypothermia*”. There are three databases to find reviewed articles and the sources used are Pubmed, Proquest, ScienceDirect, EBSCO and one Gray Literature Google Scholar.

2.4 Study Selection

The selection of research articles was determined using inclusion and exclusion criteria. The inclusion and exclusion criteria are described in [Table 2](#).

Table 2. Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
- Articles published in English and Indonesian	- Opinion articles
- Articles published between 2011 and 2021	- Letters and book reviews
- Articles from developing and developed countries	- Reviewed articles
- <i>Original Research</i>	
- Qualitative and Quantitative Articles	
- Documents, reports and guidelines from WHO	

The use of PRISMA flow diagram is a way to track and write down the number of sources that were examined, selected or excluded for later use such as in a systematic review or meta-analysis ([Garrard, 2020](#)). PRISMA has a flowchart that provides details regarding the four main stages in the review process, consisting of identification, screening, eligibility and inclusion ([Gildboy & Bower, 2011](#)).

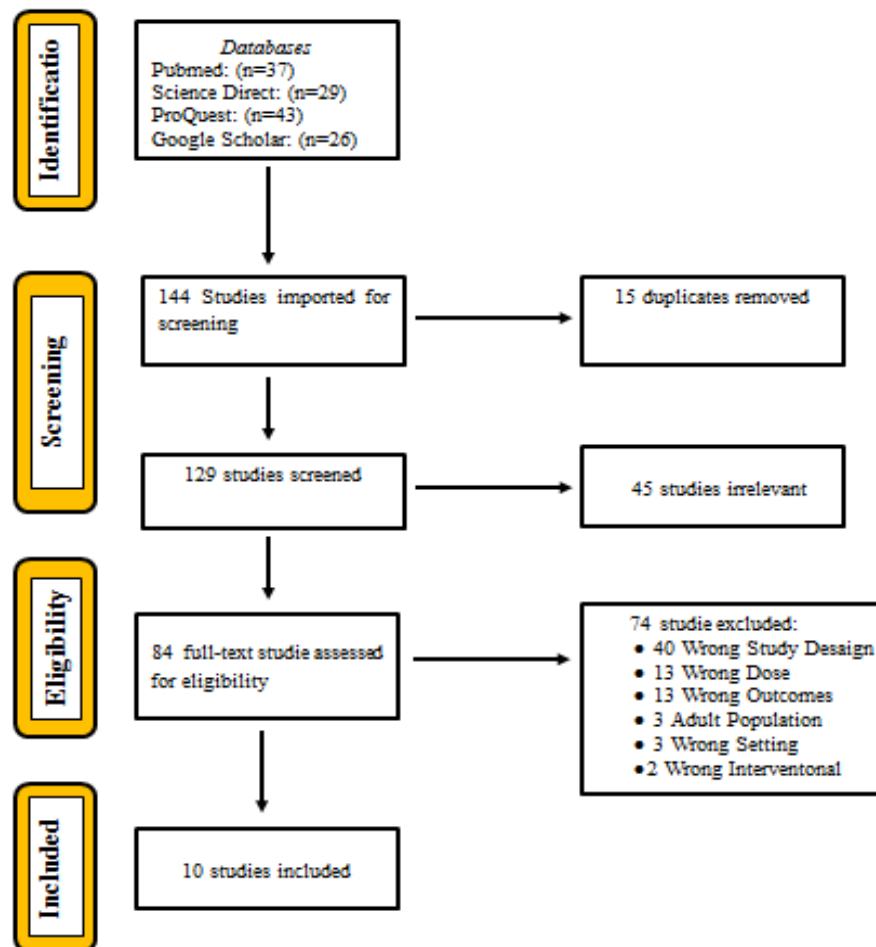


Fig. 1.PRISMA Flow Chart Diagram

2.5 Data Charting

Table 3. Data Charting Efektifitas Inisiasi Menyusui Dini (IMD) Pada Bayi Baru Lahir dalam Mencegah Hipotermi

No.	Author/Year/ Title	Country	Purpose	Research Design	Data Collection	Population and Sample	Results
1.	(Srivastava et al., 2019)/ 2014/ Effect of Very Early Skin to Skin Contact on Success at Breastfeeding and Preventing Early Hypothermia in Neonates.	India	This study aimed to evaluate the effect of early skin-to-skin contact (SSC) between infants and their mothers, on breastfeeding success and neonatal well-being.	<i>Randomized Controlled Trials.</i>	The data was collected using a randomized control trial conducted in the tertiary care of a multispecialty hospital. Newborns were randomized into two groups, the study group, and the control group. Randomization was done by the block randomization method. Each block consisted of 50 subjects, 25 subjects, and 25 control subjects. The closed envelope technique used is for randomization.	A total of 298 mother-infant pairs were enrolled in this randomized control test. After excluding some pairs from the study, there were 122 infants assigned to the study group and 118 infants assigned to the control group.	The results of this study indicate that maternal satisfaction is high, there is an increase in body temperature and breastfeeding rate, and also the low weight loss in the baby's first days.
2.	(Battersby et al., 2018)/ 2018/ Study Protocol: Optimising Neeborn Nutrition During And After Neonatal Therapeutic Hypotermia In The United Kingdom: Observasional Study Of Routinely Collected Data Using Propensity Matching.	United Kingdom (UK)	This study aimed to determine optimal enteral nutrition and PN strategies for newborns with HIE during therapeutic hypothermia.	<i>Cohort Studies.</i>	The data collection of this study uses electronic patient data that is frequently recorded stored in the United Kingdom (UK) National Neonatal Research Database (NNRD).	Infants were born at 36 weeks gestational age between January 1, 2008, and December 31, 2016, who received therapeutic hypothermia for at least 72 hours or died during therapeutic hypothermia, in neonatal units in England, Wales, and Scotland. Groups suitable for performing two comparison checks: (1) risk of NEC between enteral-fed and non-enterally-fed infants, during therapeutic hypothermia; (2) risk of late-onset bloodstream infection between infants receiving intravenous dextrose without PN and infants receiving PN, during therapeutic hypothermia. The secondary outcomes, including survival, length of stay, breastfeeding on	38% (301/809) received enteral feeding, while 29% (238/809) received PN during hypothermia. Using these proportions, a sample size of 7,200 infants receiving therapeutic hypothermia would be able to detect (two-sided significance 5%, power 90%) a 0.7% difference in NEC with 2000 matched pairs, assuming that NEC levels are negligible in reference treatment, and 2% BSI with 1500 pairs, assuming 1% and 3% rates.

3.	(Thukral et al., 2021)/ 2012/ Early Skin-to-Skin Contact and Breast-Feeding Behavior in Term Neonates: A Randomized Controlled Trial.	India	This study aimed to evaluate whether early skin-to-skin contact (SSC) improved breastfeeding (BF) behavior and exclusive BF (EBF) levels in term infants at 48 hours of age.	<i>Randomized Controlled Trials.</i>	The data was collected from a video recording of one BF session of infants between 36 and 48 hours (the general time of discharge for all term infants/non-risk term infants) and assessing feeding behavior using modified infant BAT.	discharge, hypoglycemia, time to full enteral feeding, and growth, will also be examined. The comparison group will be compared based on demographic factors, mother, baby, and organization.	The results of this study were that baseline characteristics including birth and pregnancy weight were comparable between the two groups. There was no significant difference in BAT scores between the groups. EBF levels at 48 hours and 6 weeks were significantly higher in the initial SSC group than in the control group.
4.	(Safari et al., 2018b)/ 2018/ The Effect Of Mother And Newborn Early Skin-To-Skin Contact On Initiation Of Breastfeeding, Newborn Temperature And Duration Of Third Stage Of Labor.	Iraq	This study aimed to assess the effect of SCC on breastfeeding initiation, newborn temperature, and duration of the third stage of labor.	<i>Desain Penelitian Quasi Eksperimental</i>	Data was collected through structured interviews and the LATCH scale to document breastfeeding sessions.	A total of 108 healthy women and their neonates were divided into 2 groups. 56 women who received SSC were assigned to the intervention group, and 52 who only received routine care were assigned to the control group.	The results of this study show that the mean age of mothers in the SSC and routine care groups was 26.29 ± 6.13 (M \pm SD) and 26.02 ± 5.94 (M \pm SD). Based on the LATCH score, 48% of mothers who received SSC and 46% with routine care were successful in breastfeeding. Newborns receiving SSC started breastfeeding within 2.41 ± 1.38 (M \pm SD) minutes after birth; However, newborns receiving routine care started breastfeeding 5.48 ± 5.7 (M \pm SD) min. The duration of the third stage in mothers who underwent SSC after delivery was 6 ± 1.7 minutes, compared to 8.02 ± 3.6 minutes for mothers who received routine care ($p < 0.001$). The prevalence of hypothermia was 42% in newborns not receiving

						SSC treatment developed hypothermia; whereas in newborns who received SSC only 2% experienced hypothermia after birth.	
5.	(Raihana et al., 2019)/ 2019/ Early initiation of breastfeeding and severe illness in the early newborn period: An observational study in rural Banglades.	Banglades	This study aimed to examine the effect of timing of breastfeeding initiation on the primary outcome of severe illness in the early neonatal.	<i>Randomized Controlled Trial.</i>	This study uses data from a community-based trial in Bangladesh in which we enrolled pregnant women from 2013 to 2015	Pregnant women from 2013 to 2015, including 30,646 newborns.	The results of this study show that there were 30,646 live births during the study period, and the timing of breastfeeding initiation was 29,873 (97.5%) infants. The remaining 773 women had no information about their breastfeeding status, and we excluded them from the analysis. Two-thirds of newborns (66.7%) with breastfeeding initiation status were known to have started breastfeeding within 1 hour of birth. The average time to start breastfeeding, among children with a record time of initiation of breastfeeding, was 3.8 hours (SD 16.6 hours). At the end of 48 hours, all but 5.7% of infants were breastfed.
6.	(Mukunya et al., 2021)/ 2021/ Neonatal Hypothermia In Northern Uganda: A Community-Based Cross Sectional Study	North Uganda	This study aimed to determine the prevalence, predictors, and risk of hypothermia in neonates.	<i>Cross Sectional</i>	Data collection was carried out by a team consisting of 42 research assistants collecting data and measuring temperature on the first day of birth or as soon as possible after birth.	The population in this study was 1330 neonates. The participants were initially enrolled in a cluster-randomized controlled study. The participants were those who had a neonatal hypothermia intracluster correlation coefficient of 0.044. and a mean cluster sample size of 65, giving us a design effect of 3.8, and an effective sample size of 350, yielding absolute precision.	The results of this study were the prevalence of hypothermia (<36.5°C) was 678/1330 (51.0%, 95% CI 46.9 to 55.1). Overall, 32% (429/1330), 95% CI 29.5 to 35.2 had mild hypothermia, while 18.7% (249/1330), 95% CI 15.8 to 22.0 had moderate hypothermia. None experienced severe hypothermia. In multivariable analysis, predictors of neonatal hypothermia included: home: birth (adjusted prevalence ratio, aPR, 1.9, 95% CI 1.4 to 2.6); low birth weight (aPR 1.7, 95% CI 1.3 to 2.3), and delayed initiation of breastfeeding (aPR 1.2, 95% CI 1.0 to 1.5). The prevalence of neonatal hypothermia is very high, one of the interventions that can be used to treat hypothermia through the early promotion of

7. (Tasew et al., 2018)/ 2018/ Determinants of hypothermia on neonates admitted to the intensive care unit of public hospitals of Central Zone, Tigray, Ethiopia 2017	Ethiopia	This study aimed to identify the determinants of hypothermia in neonates in the neonatal intensive care unit of the Tigray Central Zone General Hospital, Ethiopia.	<i>Case Control</i>	Data were collected by using a questionnaire. The questionnaire was initially prepared in English and then translated into the local language Tigrigna. Data were collected from maternal, neonatal, and neonatal charts using an interviewer-administered structured questionnaire adapted and modified from different types of literature and observational. Four nurses with previous experience in data collecting were recruited to carry out the data collection process. A digital thermometer was used to identify cases and controls, which measured the surface temperature at the axillary site according to WHO recommendations.	The population and samples used were all pairs of neonatal mothers who were treated in the neonatal intensive care unit of the general hospital in the study area during the study period. Cases were neonates with hypothermia (<36.5°C) admitted to the neonatal intensive care unit of four general hospitals in the Central Zone. The control group included neonates without hypothermia or 36.5°C admitted to the NICU in the same case health institution.	breastfeeding initiation and skin-to-skin care. There were 88 cases and 176 controls involved in this study. Ninety-one percent of cases and 86.4% of controls were in the first week of neonatal age. Multivariable logistic regression analysis showed that breastfeeding initiation was delayed [AOR=7.23; 95% CI (2.75, 18.99)], low birth weight [AOR=8.51; 95% CI (2.71, 26.73)], premature [AOR=3.689; 95% CI (1,359, 10,012)], low APGAR score at 5 min [AOR=3.71; 95% CI (1.57, 8.79)], skin-to-skin contact [AOR=6.23; 95% CI (2,523, 15358)], night delivery [AOR=6.25; 95% CI (2.58, 15.12)] and bathed within 24 hours [AOR=10.06; 95% CI (3.86, 26.22)] were independent risk factors for neonatal hypothermia.
8. (Ukke & Diriba, 2019)/ 2019/ Prevalence and factors associated with neonatal hypothermia on admission to neonatal intensive care units in Southwest Ethiopia.	Southwest Uganda	This study aimed to assess the prevalence and factors associated with neonatal hypothermia on admission to a neonatal intensive care unit in southwest Ethiopia.	<i>Cross Sectional</i>	This data was collected by four nurses who work in hospital units by using questionnaires and checklists that have been tested previously in a semi-structured manner.	The population and samples used were all neonates treated in the NICU of Arba Minch and Jinka General Hospitals.	The results of this study were that the prevalence of neonatal hypothermia upon admission to the neonatal intensive care unit in the study area was 50.3%. Weight goes under 2500 grams. (AOR = 3.61, 95% CI: 2.10, 6.18), delayed initiation of breastfeeding (AOR = 2.42, 95% CI: 1.45, 4.02), early bathing (AOR = 2.63, 95% CI: 1.23 , 5.63), admission during winter (AOR = 1.72, 95% CI: 1.04, 2.84), and presence of obstetric complications during pregnancy/delivery (AOR = OR 2.46, 95% CI: 1.07, 5.66) were factors significantly associated with

9. (Beiranvand et al., 2019)/ 2014/ The Effects of Skin-to-Skin Contact on Temperature and Breastfeeding Successfulness in Full-Term Newborns after Cesarean Delivery	West Iran	The purpose of this study was to determine the effect of skin-to-skin contact on the baby's temperature and the success of breastfeeding in term infants after delivery by cesarean section.	<i>Randomized Controlled Trial</i>	The data collection consists of four parts. The first section was from maternal demographic data including age, weight, and gestational age, number of miscarriages, number of children, lactation history, and history of problems during pregnancy, as well as demographic data. Then the data collection tool also uses a questionnaire prepared from authentic scientific sources and has been tested its validity confirmed through experts from faculty members at the Faculty of Nursing and Midwifery in Khorramabad (Western Iran).	In this randomized clinical trial, 90 infants/mothers delivered by cesarean section were randomized to SSC (= 46) and routine care (= 44). In the experimental group, skin-to-skin contact was performed for one hour, and in the routine-care group, the babies were dressed and laid in bed according to the hospital care routine.	hypothermia at admission to the neonatal intensive care unit. The results of this study show that there were skin-to-skin contact between the baby and the mother and the success of breastfeeding.
10. (Demissie et al., 2018)/ 2018/ Neonatal hypothermia and associated factors among neonates admitted to neonatal intensive care unit of public hospitals in Addis Ababa, Ethiopia	Ethiopia	This study aimed to assess the prevalence of Neonatal hypothermia and its associated factors in neonates admitted to the Neonatal Intensive Care Unit of the General Hospital in Addis Ababa.	<i>Cross Sectional</i>	Data were collected by using a semi-structured pre-test questionnaire whose instrument was adopted and modified from research conducted in Ethiopia, Gondar University Hospital, Nigeria, and Uganda. In addition, other data such as medical diagnosis and history of CPR were collected from newborn charts. Meanwhile, socio-demographic data and obstetric history were collected from their mothers using a semi-structured pre-test questionnaire. The data collection of this study was	The population in this study were randomly selected neonates who were treated in the NICU room of the General Hospital in Addis Ababa from March 30 to April 30, 2016. As for the sample in this study, 356 neonates and their mothers were selected using the single population proportion formula and considering a 10% response rate for no participants.	The result of this study is that the prevalence of neonatal hypothermia in neonates in the NICU room at the Addis Ababa Hospital is reasonably high, namely 228 (64%). Judging from the results of factors associated with neonatal hypothermia, neonates aged 24 hours are two times more likely to experience hypothermia when compared to those aged more than 24 hours. Premature neonates are 4.8 times more likely to experience hypothermia when compared to term delivery. Newborns who are born with not having skin-to-skin contact with their mother immediately after delivery were 4.3 times more likely to develop hypothermia compared to those who had skin-to-skin contact. Neonates who

carried out carefully by six BSc nurses.

did not initiate early breastfeeding within one hour of birth had a 3.7 chance times more likely to develop hypothermia compared with neonates who were initiated within one hour of birth. Neonates who received resuscitation at birth (CPR) were 3.6 times more likely to develop hypothermia when compared with those who were not resuscitated. Therefore, it is essential to pay special attention to normal and premature babies for immediately suggested by the principle of early initiation of breastfeeding and skin-to-skin contact after delivery.

3. Mapping/Scoping

3.1 Geographical Characteristics

Pada hasil penelusuran sistematis didapatkan sepuluh artikel dengan terbitan 2011-2021, sepuluh artikel yang digunakan adalah artikel dengan kualitas grade A dan seluruh artikel tersebut merupakan studi penelitian Kuantitatif yang terdiri dari Randomized Controlled Trials, Cohort Study, Quasi Exsperimental, Cross Sectional, dan Case Control. Sepuluh artikel didapatkan dari negara maju dan berkembang yang terdiri dari India, United Kingdom (UK), Irak, Banglades, Uganda, Ethiopia, dan Iran.

3.2 Thematic

Dari hasil review ditemukan beberapa tema yang sesuai dengan fokus review yang terlihat pada [Tabel 4](#).

Table 4. Thematic Mapping

Themes	Sub Themes
Efforts to Increase EIB in Mothers and Newborns for Preventing Hypothermia	a. Providing health education b. Open communication between mothers and health workers c. Involvement of health workers and families
Barriers to health services in increasing EIB in mothers and babies	a. High cultural value b. Lack of parental knowledge c. Lack of involvement of health workers

4. Results and Discussion

Hypothermia occurred in newborns is due to a decrease in body temperature caused by various conditions, especially due to the high demand for oxygen and a decline in room temperature.

EIB can be a prevention of hypothermia in neonates because heat loss in newborns in both term and preterm babies can be done by skin-to-skin contact.

A review of the articles obtained was to find out how Effective the Early Initiation of Breastfeeding (EIB) in Newborns is in Preventing Hypothermia based on the results of mapping from charting data carried out as follows:

Early SSC has a significant effect on infant suckling competence. Temperature regulation in the postnatal period results in a continuation of exclusive breastfeeding from mother to baby that occurs when the baby is born until the age of 2 years and can prevent hypothermia ([Battersby et al., 2018](#)).

- 1) There is insufficient evidence to recommend optimal feeding and PN strategies during hypothermia for infants with HIE. This protocol describes a retrospective observational study that seeks to address the clinical uncertainty that exists.
- 2) SSC between mothers and infants does not increase breastfeeding behavior but significantly increases exclusive breastfeeding rates in neonates born at term ([Thukral et al., 2021](#)).
- 3) Skin-to-skin contact (SSC), provides an alternative method for appropriate, affordable, high-quality, and easy-to-implement technology in small hospitals for low-income countries. In addition, skin-to-skin contact between mother and baby has the potential to save the life of newborns to maintain body temperature loss and prevent hypothermia ([Kyu et al., 2018](#)).
- 4) Early initiation of breastfeeding during the first 1 hour of newborns is a significant way to prevent very severe disease in the early period of a baby's life. Implementing an early breastfeeding initiation program and promoting the program is one of the interventions that can be done to prevent the occurrence of LBW in infants, suppress the firstborn baby, prevent hypothermia, and jaundice in infants ([Rahman et al., 2018](#)).
- 5) The promotion of early initiation of breastfeeding and providing skin-to-skin care from mother to baby can prevent the risk of hypothermia in neonates. Babies born with low weight and babies

- born to families with poor economic status can initiate early breastfeeding and perform skin-to-skin care as an intervention and recommendation for low-cost promotion in preventing hypothermia (Mukunya et al., 2021).
- 6) Delay in initiating early breastfeeding, low birth weight, premature, low Apgar score at 5 minutes, night delivery, bathing within 24 hours after delivery, and not making skin-to-skin contact between mother and baby are risk factors for hypothermia in newborns (Gayatri & Dasvarma, 2020).
 - 7) The delay in initiating early breastfeeding, bathing the baby less than 24 hours after birth, the presence of obstetric problems during pregnancy/delivery, low birth weight, and hospitalization during winter were factors that were significantly associated with hypothermia in newborns.
 - 8) Skin contact made by the skin of the mother and baby after delivery via cesarean section can prevent an increase in the risk of hypothermia in neonates (Idayanti et al., 2019).
 - 9) Premature birth, age 24 hours, no skin contact after delivery, delayed initiation of breastfeeding, resuscitation at birth are predictors of hypothermia in newborns. Therefore, it is necessary to pay attention to the care of normal and premature newborns in the use of low-cost protection from the warm chain, namely early initiation of breastfeeding, and skin-to-skin contact immediately after delivery, to warm resuscitation (Demissie et al., 2018).

5. Conclusions

Hypothermia occurring in newborns is due to a decrease in body temperature caused by various conditions, especially due to the high demand for oxygen and a decline in room temperature. Efforts to prevent hypothermia, are prioritizing midwives to suggest mothers who give birth to carry out EIB and make skin contact as prevention of hypothermia in newborns. By doing EIB, the mother's chest can be a place to warm the baby properly. It is because there can be an attachment between the skin of the mother and the baby on the mother's chest. It results in a heat transfer from the mother to the baby.

6. Recommendations

Based on the results of reviewing ten articles, it is found that several problems that still often occur in newborns with hypothermia are delays in doing EIB after the birth process and lack of skin contact between the baby and the mother. So that the efforts that can be completed by the Health Officer and the Head of IBI are to collaborate and coordinate together to provide education to midwives to perform and ensure the implementation of EIB and skin-to-skin contact as an effort to prevent hypothermia in all newborns. In addition, midwives must prioritize childbirth by initiating early breastfeeding for every mother giving birth so that the baby is healthy, avoiding hypothermia, and even infant death. In addition, it is needed to strengthen health education to provide counseling on the importance of breastfeeding in the first hour of delivery and delaying bathing the baby ≤ 24 hours after birth, because it can prevent hypothermia in newborns.

7. Strengths and Limitations

The topic raised in this review scope is to find out how effective EIB is in newborns in preventing hypothermia. In this review, there are numerous ways, actions, and efforts that can be done to prevent hypothermia in newborns. Therefore the scope of article journals to review was arranged from several selected databases and gray literature in developing countries so that they can be applied. The limitations found in the article are that the journals obtained have discussed a lot about ways, efforts, and actions for the prevention of hypothermia. However, the journals obtained still do not explain much specifically about the effectiveness of EIB for hypothermia in newborns.

Acknowledgment

The author thanks the supervisor, so that the author can complete the preparation of this health technology assesment.

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