

Review Article

# Maternal Knowledge and Associated Health Care Seeking Practices Regarding Neonatal Danger Signs: A Systematic Review

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## A B S T R A C T

*Introduction:* Many global strategies have been laid by the WHO and UNICEF for midwives' training for their skill enhancement and involvement of mothers along with family for the quality health care to be given to neonates. This study was undertaken to review knowledge and health care-seeking behavior among mothers of neonates, so that measures can be planned to deliver quality care to mothers and neonates in a more efficient and acceptable manner.

*Methodology:* A systematic review of quantitative studies published between January 2012 and March 2025 was undertaken using the following databases: CINAHL Plus, ERIC, Embase, Medline, SCOPUS, ProQuest, and ProQuest Dissertation. A systematic review of experimental studies (RCT), non-randomized controlled trials (non-RCTs), controlled before and after the implementation of an intervention, and controlled observational studies. Data were extracted using a narrative synthesis. Out of 1217 studies, only 42 studies were eligible for inclusion in the analysis.

*Result:* This review demonstrates that mothers had a lack of knowledge regarding danger signs, and poor health care-seeking behaviour was assessed among mothers. Many barrier factors were identified causing poor health-seeking behaviour, such as financial issues, limited knowledge among mothers, socio-cultural factors, and decision-making power in the family. Review has shown that interventions or programs are required for the improvement in behaviour and knowledge among mothers, but limited data are available regarding interventional programme implementation.

*Conclusion:* Overall, the knowledge and health-seeking behaviour among mothers was poor, but if a planned intervention is implemented from the ANC to PNC period, there will be an improvement in knowledge and health-seeking behaviour among mothers, which could reduce the neonatal mortality.

**Keywords:** New Born Danger Signs, Health Care Seeking Behaviour, Barriers To Poor Health- Seeking Behaviour, Systematic Review

## Introduction

Neonates are the new hope of life. The phase of giving birth till the arrival of life is very crucial period of life. As a neonate is started adjusting in extra uterine life they undergo many physiological changes in the body.<sup>1</sup> High risk neonate, they are the one irrespective of gestational age and have highest risk of morbidity and mortality.<sup>2</sup> New born danger signs are the signs that are shown by neonates which include not able to feed, or stopped feeding well, convulsed or fitted since birth, fast breathing (two counts of 60 breaths or more in one minute), chest in drawing, high temperature (37.5°C or more), very low temperature (35.4°C or less), yellow soles, movement only when stimulated, or no movement even on stimulation and signs of local infection such as umbilicus redness or draining of pus, skin boils, or eyes draining pus (UNICEF and WHO 2023)<sup>3</sup>. Healthcare seeking behavior (HSB) has been defined as, “any action taken by individuals or care givers who perceive to have some health problems and for that they have taken appropriate remedy”.<sup>4</sup> Many global strategies have been laid by WHO and UNICEF for midwives training for their skill enhancement and involvement of mothers along with family for the quality health care to be given to neonates. Neonates are completely dependent on care giver specially the mother as they are adjusting in the extra uterine environment and face a lot of challenges.<sup>2</sup> The knowledge regarding new born danger signs actually depends upon the mother’s basic education and antenatal services she had taken during her pregnancy. Health care seeking behavior mainly depends upon the post natal follow up which has been taken by mother. So emphasize on a good ANC and PNC care is required for good neonatal outcome.<sup>5</sup> Mothers had lack of knowledge regarding new born danger signs so there is a need of parental education and improvement in ANC and PNC services.<sup>6</sup> There are various factors which affect the health care seeking behavior of the mothers. Post natal care, financial security in a form of insurance, knowledge regarding new born danger signs, family type like joint or nuclear, decision maker of the family were the main factors affecting health care seeking behavior.<sup>7</sup> A systematic review was done in Ethiopia in 2020 to assess the women’s knowledge regarding new born danger signs. They studied fourteen cross-sectional studies with a total of 6617 study participants. They identified that mother’s knowledge regarding new born danger sign is low and there are several factors which affect this and these are educational status of the parents, mass media exposure, ANC and PNC follow up. They focused on ANC and PNC care with health information approach regarding new born danger signs.<sup>8</sup> Neonatal mortality reduction is a very important sustainable development goal and as per UNICEF 2020 report it has been reported that if neonatal mortality of three countries i.e. Afghanistan, India and Pakistan is

reduced it will largely reduce the global mortality rate.<sup>9</sup> In India the main cause of neonatal mortality is preterm and low birth complications, but if we include family in the care and decision making for neonate it will largely increase the quality of life. As per the survey In Indian scenario in mostly families mothers are not taken as primary decision maker for her neonate it may be because of her lack of experience, lack of knowledge, lack of confidence or a social stigma. So educating a mother and helping her in decision making is very challenging phase. Then again there is debate that whether only educating the mother and family for the improvement in their knowledge will improve the health care seeking behavior of the mother.<sup>10</sup> They emphasis on the importance of regular and frequent post natal follow up and help the mother or the decision maker of the family to take quick decision for neonate’s health.<sup>7</sup> Researcher has done an extensive review of literature and a quick review revealed that there is a vast variation in the knowledge and health care seeking behavior of the mothers of neonates. At present there is lack of Indian studies to show the effect of any intervention for improvement in knowledge regarding new born danger signs and health seeking behavior, we have undertaken this review to synthesize the evidence. This systematic review seeks to systematically identify and evaluate the knowledge and health care behavior among mothers of neonates.

This study was undertaken to review the knowledge and health care seeking behaviour among mothers of neonates so that measures can be planned to deliver quality care to mothers and neonates in more efficient and acceptable manner.

## Material and Methods

A comprehensive search of academic databases was conducted to identify studies related to new born danger signs, knowledge an mothers. This search included studies published within ten years i.e. January 2012 and December 2025, to capture the most recent developments and research trends in the field of newborn danger signs and in improvement of the mothers in knowledge and health care seeking behavior regarding danger signs. The CINAHL Plus, ERIC, Embase, Medline, SCOPUS, ProQuest and ProQuest Dissertation databases were selected for their comprehensive coverage of healthcare and psychological research. The search strategy involved primary search terms and phrases were ‘knowledge regarding new born danger signs’, “ neonates”, “mothers of neonates” and ‘health care seeking behavior among mothers’. Reference lists of relevant papers and the websites of relevant nursing organizations were also searched. The combination of various databases and exact keyword selection, concentration on peer-reviewed research, limit to only English-language publications, and focus on recent

research (within the last ten years) resulted in a rigorous and systematic strategy to data collecting. This strategy aimed to ensure the incorporation of significant high-quality studies that reflect the latest state of knowledge and practices in the field of neonatal risk markers and their impact on the well-being of older people. The search focused on papers published during the last ten years. This time period has been chosen to capture the most recent developments and research trends in the field of newborn danger signs and their effects on psychological problems, well-being, and quality of life in the elderly, as older studies may not adequately reflect current geriatric care practices and approaches. The incorporation of these specific databases, as well as the search date range, aims to provide an entire and current collection of relevant studies in the subject. The included studies were different in terms of design, setting, intervention, comparator, outcome hence the researcher synthesized the data narrative.

### Study selection

Titles and abstracts of the related articles were read independently, and they were identified with the help of keywords. Abstracts of the related articles were read independently, and they were identified with the help of keywords that met the inclusion criteria. When the articles read were found relatable with the objective and eligible as per the inclusion criteria, the full text of those articles, including the abstract, was retrieved (Figure 1). Based on the full articles, data were extracted on study design, participants, setting, intervention, control group, and outcome, using a standardized data extraction protocol developed by the researcher.

### Research on bias in individual studies

The researcher independently assessed included studies for all biases, such as selection, participation, attrition, detection, reporting, and any other bias. The definition of these types of bias and judgment about their presence was based on the Cochrane Collaboration risk of bias assessment tool in the Cochrane handbook for systematic reviews of interventions. Any risk of bias that may affect the study's results was assessed.

### Eligibility criteria

Studies were included if they met the following criteria:

- **Study design:** Experimental studies (RCT), non-randomized controlled trial (non-RCTs), controlled before and after the implementation of an intervention and observational studies.
- **Participants:** We have included mothers of high-risk neonates.
- **Intervention:** We defined knowledge of mothers regarding new born danger signs and health care

seeking behaviour as action taken by mothers when they perceive any abnormal sign from the neonates and they took help from the health institution.

- **Comparison:** No restrictions were placed on the intervention provided to the comparator group.
- **Outcomes:** We included studies that reported outcomes related to knowledge and health care seeking behaviour and the factors affecting and barriers faced by the mothers. (as per inclusion and exclusion criteria).

### Inclusion criteria

The studies with following criteria were included:

- Knowledge regarding new born danger signs and health care seeking behaviour among mothers of neonates.
- The studies published in English language.
- Any articles in indexed journal and publication date, duration from January 2012 and March 2024.
- The studies with experimental and descriptive research design.

### Exclusion criteria

- Studies related to mothers of neonates, infants or any children were not included.
- Studies related to knowledge regarding new born danger signs and health care seeking behaviour among healthcare professionals or ASHA of high-risk neonates.
- Studies related to attitude and practice towards newborn danger signs and health care seeking behaviour.

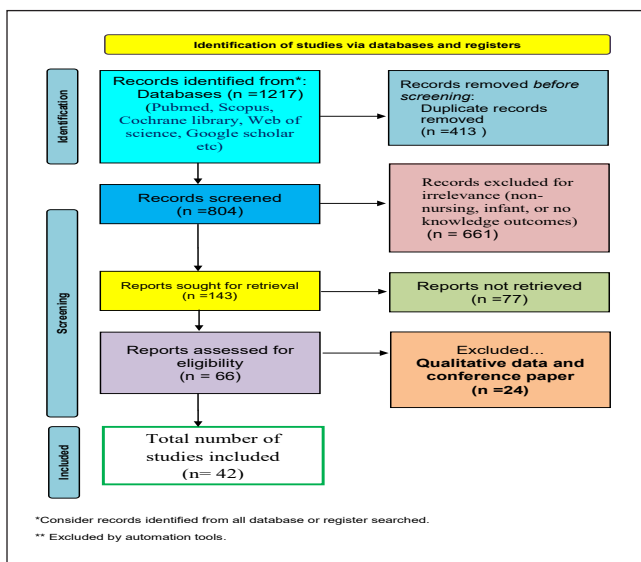


Figure 1. Prisma Diagram Showing The Selection Of The Articles

### Information sources for the search strategy

A systematic review of quantitative studies published between January 2012 and March 2024 was undertaken

using the following databases: CINAHL Plus, ERIC, Embase, Medline, SCOPUS, ProQuest and ProQuest Dissertation and Theses Database.

The search strategy involved primary search terms and phrases such as 'knowledge regarding new born danger signs', " neonates", " mothers of neonates" and 'health care seeking behavior among mothers'. Reference lists of relevant papers and the websites of relevant nursing organizations were also searched.

The combination of various databases and exact keyword selection, concentration on peer-reviewed research, a limit to only English-language publications, and a focus on recent research (within the last ten years) resulted in a rigorous and systematic strategy for data collection. This strategy aimed to ensure the incorporation of significant high-quality studies that reflect the latest state of knowledge and practices in the field of neonatal risk markers and their impact on the well-being of older people.

### Search

The search focused on papers published during the last ten years. This time period has been chosen to capture the most recent developments and research trends in the field of newborn danger signs and their effects on psychological problems, well-being, and quality of life in the elderly, as older studies may not adequately reflect current geriatric care practices and approaches. The incorporation of these specific databases, as well as the search date range, aims to provide an extensive and current collection of relevant studies in the subject.

### Study selection

Titles and abstracts of the related articles were read independently, which were identified with the help of keywords and which met the inclusion criteria. When the articles read were found relatable with the objective and eligible per the inclusion criteria, the full text of those articles, including the abstract, was retrieved.

### Data collection process

Based on the full articles, data were used regarding study design, participants, setting, intervention, control group and outcome using a standardized data extraction by the researcher.

### Research of bias in individual studies

The researchers independently assessed included studies for all the biases, such as selection, participation, attrition, detection, reporting, and any other bias. The definition of these types of bias and judgment about their presence was based on the Cochrane collaboration risk of bias assessment tool in the Cochrane handbook for systematic reviews of intervention<sup>8</sup>

### Synthesis of results

The included studies differed in terms of design, setting, intervention, comparator, and outcome;

Therefore, the researcher synthesized the data narratively.

### Risk of bias in included studies

Any risk of bias that may affect the study's results was assessed as described above for individual studies.

**Table I. Studies assessing the knowledge regarding new born danger signs among mothers of neonates**

S. No.	Year	Author	Aim/objective	Methodology (Research design, sample size and setting)	Findings
1.	2013	OOMMEN, Accamma; VATSA, Manju.	to assess mothers' awareness regarding danger signs of neonatal illnesses and to identify the factors influencing their awareness	Research design- descriptive cross sectional survey n-70 mothers Setting- Trivandrum	Postnatal educational intervention especially before discharge need to be given.
2.	2014	Robert Kuganab-Lem, Adadow Yidana	Exploring Women Knowledge of Newborn Danger Signs: A Case of Mothers with under Five Children	Research design- Field data n-300 mothers Setting- East Mamprusi District of the Northern Region of Ghana.	Women have limited knowledge regarding new born danger signs and they focus on before discharge education to mothers.

3.	2014	Sandberg J etal.	To explore the knowledge of key newborn danger signs among mothers.	Research design- survey n-765 postnatal mothers Setting- south western Uganda	Antenatal education of mothers needs to be done. To improve neonatal outcome birth preparedness is very essential.
4.	2015	Nigatu, S.G., Worku, A.G. & Dadi, A.F	To determine the level of mother's knowledge about neonatal danger signs and to identify factors associated with good mother's knowledge.	Research design- Community based cross sectional Study  n-603 mothers February to May 2014  Setting- North west Ethiopia.	Low knowledge regarding new born danger signs and need to focus on ANC and PNC services, special focus was given on mass media utilization.
5.	2015	Adem N, Berhe KK, Tesfay Y	To assess the awareness level and factors associated towards neonatal danger sign among mothers	Research design- cross sectional study n- December 2014 to June 2015 Setting- public health institutions of Mekelle City, Tigray, Ethiopia.	Majority of mothers had lack of knowledge regarding new born danger sign and special focus should be given to community based education.
6.	2016	Feyisso etal.	Assessment of knowledge of mother on danger signs of neonatal and postnatal illness and health seeking behaviour among pregnant and postpartum mother.	Research design- n-1,694,868, out of which 849,484 are male and 845,384 are females. Setting-Gedeo Zone, which is located about 365 Kms to the South of Addis Ababa, the capital city of Ethiopia, and 85 Kms to Awassa the regional capital city of SNNPR. The total area is estimated to be 1347 sq.km	Mothers had lack of knowledge regarding newborn danger signs.
7.	2016	Kibaru EG, Otara AM.	To determine the level of knowledge of mothers attending well baby clinics on postnatal neonatal danger signs and determine the associated factors.	Research design- Cross sectional design. n-414 mothers attending well baby clinics Setting- Nakuru Central District, Kenya	Despite of education in Antenatal period mothers had lack of knowledge regarding neonatal danger signs.

8.	2017	Mersha et al.	to assess level of knowledge about neonatal danger signs based on 10 WHO recognized danger signs among mothers.	Research design- Community based cross sectional Study  n-630 mothers February 8- 28, 2017  Setting- Chench District, Southern Ethiopia.	Mothers had low knowledge regarding new born danger signs and they emphasised on promotion of facility based services along with community awareness.
9.	2017	R, R., S, G., & PM, U	to assess the level of knowledge regarding essential new born care among the mothers.	Research design- community based cross sectional study  n-100 mothers  Setting- Kancheepuram district, Tamil Nadu.	Poor knowledge regarding new born care and awareness programme is needed on community basis.
10.	2018	Jemberia et al.	to assess knowledge about neonatal danger signs and its associated factors among postnatal mother	Research design- Community based cross sectional Study  n- January–May, 2017.  Setting- Woldia general hospital, Ethiopian	Mothers had lack of knowledge regarding new born danger signs and they focus on parental education.
11.	2018	Desalegn et al.	Level of Knowledge About Neonatal Danger Signs and Associated Factors Among Mothers Who Delivered at Home	Research design- community-based cross-sectional study n-2018 from 845 mothers who delivered in the last six months Setting- Fogera District, South West, Ethiopia	Mothers had limited knowledge. Birth preparedness and training of health attendant is important to enhance knowledge.
12.	2018	Yadeta TA.	To determine women knowledge on key neonatal dander sign and associated factors among women recently gave birth	Research design- community based cross sectional n- All mothers who gave birth in the last 2 years (May 2010– April 2012) Setting- East Hararge Zone, Oromia Region, eastern Ethiopia	Urgent need for awareness programme for mothers to improve their knowledge and focus on facility based delivery.
13.	2019	Abu-Shaheen A et al.	To investigate the knowledge and the experience of mothers and caregivers towards the WHO suggested neonatal danger signs.	Research design- community-based cross-sectional survey  n-1428 mothers  Setting- Saudi Arabia	There is need to develop an intervention to improve mothers knowledge.

14.	2020	Kebede etal.	Mother's Knowledge of Neonatal Danger Signs and Health-Seeking Practices and Associated Factors	Research design- Community-Based Cross-Sectional n-772 mothers, July 1st to August 10 <sup>th</sup> Setting- Debretabor town, northwest Ethiopia	Maternal knowledge was limited and birth preparedness is an important step to improve knowledge.
15.	2020	Demis A etal.	To assess the women knowledge towards neonatal danger signs in Ethiopia.	Research design- systematic review and meta-analysis n- Fourteen cross-sectional studies with a total of 6617 study participants. Setting- Ethiopia	Poor knowledge among mothers and they have focused on ANC,PNC care, Follow up and special emphasis was given on community level dissemination of information.
16.	2020	Yosef T, Nigussie T, Asefa A.	To assess knowledge of neonatal danger signs and its associated factors among mothers	Research design- facility-based cross-sectional n- 351 mothers Setting- Sheko District in Southwest Ethiopia	Need to enhance the awareness among mothers regarding danger sign to reduce neonatal mortality.
17.	2020		To assess the parents' knowledge of NDS and associated factors within the neonatal period	Research design- descriptive cross-sectional n- 209 parents Setting- four health centres in Kigali, Rwanda	Educational efforts are needed to improve knowledge among parents.
18.	2020	Dangol, R. and Koirala, R	To measure the awareness of fathers regarding newborn danger signs.	Research design- descriptive cross-sectional n- 103 fathers Setting- Tertiary Level Hospital of Kathmandu, Nepal	Moderate level of awareness regarding danger signs and there is a need for awareness programme.
19.	2021	Grace G etal.	Knowledge of danger signs in neonates among postnatal mothers of babies admitted in tertiary care neonatal intensive care unit	Research design- Facility based cross sectional study n- 2 tier town Setting- Two-tier town in South India	Maternal counselling is important to reduce neonatal mortality.
20.	2021	Abdulbari Ahmed etal.	To assess that how well informed are the newborns' mothers.	Research design- cross-sectional n- 850 mothers Setting- Aseer region in Saudi Arabia.	Participants had lots of experience to neonatal danger signs but then also they were not able to identify danger signs.
21.	2021	Singh etal.	To evaluate mother's awareness of NDS and health seeking behaviour.	Research design- descriptive cross-sectional n- January 2020 to 31st March 2020. A total of 550 mothers Setting- Tertiary Healthcare Centre in Punjab, India	Education and counselling of mother is needed to improve knowledge and early identify the danger signs.

22.	2022	Zhou et al.	To examine the knowledge of neonatal danger signs and risk factors of poor knowledge among mothers in a rural county of southwest of China.	Research design- Community based cross sectional Study n-112 mothers November 2020 to February 2021. Setting Wenshan, a rural county of southwest of China.	Instead of expansion of maternal services the knowledge regarding new born danger sign is poor. There is a great need for individualized approach for mothers to educate them about new born danger signs.
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**Table 2. Studies assessing the health care seeking behavior among mothers of neonates**

S. No.	Year	Author	Aim/objective	Methodology (Research design, sample size and setting)	Findings
1.	2024	Dida, N et al	To assess mothers'/ caregivers' awareness, healthcare seeking behaviors for neonatal danger signs and their determinants in the developing regional state of Ethiopia	Research design- community based cross-sectional study n- 6,706 mothers and primary caregivers of children aged below five years in February 2021. Setting-Ethiopia	Region, religion, mothers'/caregivers' age, and need for permission to travel to a health facility were predictor variables for neonatal danger sign awareness. Better ANC services can improve health care seeking behavior.
2	2023	Gyaase, et al.	to assess the health seeking behaviour and knowledge on neonatal danger signs among lactating mothers in the Upper Denkyira East Municipality	Research design- community based descriptive and analytical study n- 376 mothers and or care-givers Setting- four communities in 4 of the 17 Local Government Areas (LGA) of Enugu State.	Focused on strengthening of knowledge on danger sign to improve health care seeking behaviour.
3.	2023	Gesese SS, Mersha EA, Balcha WF	To assess knowledge of danger signs of pregnancy and health-seeking action among pregnant women.	Research design- facility-based cross-sectional study n- 414 Setting- Bahir Dar city	Increasing education is important to improve health seeking behaviour.
4.	2023	Molalegn Mesele et al.	To assess health care seeking behavior of mothers' in related to neonatal danger signs.	Research design- community based cross-sectional study n- 410 participants in Wolaita Sodo, From October 1 to October 30, 2019 Setting- southern Ethiopia	Educational status of the mother's husband, communication media, residence, ANC follow-up, and PNC follow-up all predicted the mothers' health-care seeking behavior. Mothers had lack of health seeking practice

5.	2023	Joshi et al.	To explore the perception of care givers regarding danger signs of illness and practices followed in young infants.	Research design- Qualitative study n- 11 care givers Setting-Amritsar Punjab	Lack of awareness regarding danger signs leads to delay in decision making.
6.	2023	Elias Ezo et al.	To assess health care seeking behavior towards neonatal danger signs and associated factors among mothers	Research design- A community based cross sectional study design n- February 1 to 30/2020. A total of 588 mothers Setting-Kamba Zuria District, South Ethiopia	Health education approach should be used for the mother so that early decision making can be done.
7.	2023	Hunde GA, Kelkay MM, Yimer B	To assess mothers' knowledge and associated factors on neonatal danger signs in Nekemte town, Western Ethiopia.	Research design- A community based cross sectional study design n- March 2019, 727 mothers Setting- Nekemte town, Western Ethiopia	Counselling services need to be given to mother for danger signs to improve health seeking behaviour.
8.	2023	Mesele M et al.	To assess health care seeking behavior of mothers' in related to neonatal danger signs.	Research design- A community based cross sectional study design n- 410 participants in Wolaita Sodo, From October 1 to October 30, 2019. Setting- Sodo town, Wolaita Zone, SNNPR, Ethiopia	Mothers had low health care seeking pattern. They found that lack of maternal education, lack of ANC and PNC follow up and role of partner is important factor for health care seeking behaviour.
9.	2022	Tesfaye et al.	To assess maternal health-seeking behavior for neonatal danger signs and associated factors among postpartum mothers in Southeast Ethiopia.	Research design- Community based cross sectional Study n-400 women with sick neonates from June 1st, 2020 to 27th, November Setting Southeast Ethiopia.	Postnatal care follow-up, health insurance, good knowledge of neonatal danger signs, living with a partner, and decision-making power were predictors of appropriate healthcare-seeking behaviour and they focused on creating awareness among mothers.

10.	2022	Idris et al.	To assess healthcare-seeking behavior on newborn danger signs and associated factors among mothers who gave birth in the last 12 months in the Anlemo district.	Research design- community based cross-sectional study n- 421 Setting- Anlemo District.	Mother education plays an important role for decision making to take the neonate is get sick so mothers need to be educated regarding danger signs.
11.	2021	K. Prageetha, Kumutha.	To find out mother's knowledge on neonatal danger signs and health seeking behaviour in a tertiary care hospital.	Research design- cross sectional descriptive Study n- mothers January 2021 to April 2021 Setting- Paediatrics and Department of Obstetrics and Gynaecology, Saveetha Medical College, Thandalam	Good antenatal check up and post natal follow up leads to good health care seeking behaviour.
12.	2021	Yitayew et al.	to assess the knowledge of neonatal danger signs and associated factors among mothers attending pediatric immunization clinics.	Research design- A community based cross sectional study design n- September 1-30, 2020, among 399 mothers. Setting- immunization clinics in Gidan district health centers, North Wollo, Ethiopia.	Mothers education in post natal services regarding danger sign is important steps to improve health seeking behaviour.
13.	2020	Bekele et al.	to assess the risk factors associated with knowledge and health seeking behavior of mothers about neonatal danger signs.	Research design- Community based cross sectional Study n- mothers living in Fiche town from November 1, 2018 to October 30, 2019 Setting- Fiche town, Oromia region, Ethiopia.	Lack of knowledge regarding new born danger signs leads to inappropriate health care seeking behaviour.
14.	2020	Habtamu Alemayehu Abate et al.	To assess mother's knowledge and health seeking practice about neonatal danger signs and its associated factors.	Research design- community based cross-sectional study n- 624 Setting- East Belesa Woreda Northwest Ethiopia.	Mothers knowledge and health seeking behaviour was found low.

15.	2020	Nusrat K et al.	To assess knowledge among pregnant women regarding neonatal danger signs and to evaluate their healthcare seeking behaviour.	Research design- A community based cross sectional study design n- 468 mothers. Setting- Civil Hospital, Karachi, from February to April 2018	Mothers knowledge regarding danger signs is very important to enhance health seeking which is poor in the present study.
16.	2020	Edem M et al.	To examine the health practices, care-seeking behavior, and referral of sick outborn neonates to a district and regional hospital in the Upper West Region of Ghana.	Research design- A community based cross sectional study design n- 153 care giver Setting- Upper West Region of Ghana and St. Joseph's Hospital (SJH)	Majority of care givers took health facility while found out any sickness in neonate but then also some neonate died as conclude that socio-cultural factors place an important role in health care seeking behaviour.
18.	2019	Lassi ZS et al.	To identify factors associated with delays that lead to serious maternal and neonatal morbidity and mortality.	Research design- Systematic review n- Sep 16, 2016 and then searches were revised on September 27, 2017 Setting-	Contributing factors which cause delay in health seeking behaviour need to be improved so that neonatal mortality and morbidity can be reduced.
19.	2019	Chamara et al.	To assess maternal knowledge on neonatal danger signs among mothers attending CWC in Piliyandala MOH area.	Research design- A community based cross sectional study design n- August to November 2017, 294 mothers Setting- CWC in Piliyandala MOH area	Mothers education need to be focused for improvement in health seeking approach.

## Results

### Knowledge of Mothers Regarding New Born Danger Signs

The outcomes of the included studies are in table 1. Total 22 studies were included in the review; all the articles have mentioned that mothers have limited knowledge regarding new born danger signs. Instead of the expansion of maternal services, mothers also had limited knowledge. All the articles have emphasized that postnatal follow-up, postnatal education, and maternal counseling played an important role in the improvement of knowledge regarding newborn danger signs. (Table-1)

### Health Care Seeking Behavior of Mothers Regarding New Born Danger Signs

One study showed<sup>(20)</sup> that parents had good health-seeking behavior, and they took help from the health center, but the neonate also died. (Table 2) One study has shown improved health-seeking behavior due to proper ANC and PNC follow-up.<sup>(12)</sup> Other studies have shown that mothers had poor health-seeking behavior and predictors for causing poor health-seeking were socio-cultural factors, low finances, lack of awareness, and lack of knowledge among mothers.<sup>1,11,13,19</sup>

## Discussion

The purpose of this systematic review was to explore the knowledge and health care seeking behaviour among mothers of neonates so that measures can be planned to deliver quality care to mothers and neonates in a more efficient and acceptable manner. This systematic review indicates that knowledge regarding newborn danger signs among mothers is lacking, and health care-seeking behavior is also poor. Studies have emphasized the need for nurse-led interventions to promote education among mothers regarding newborn danger signs, as studies concluded that if mothers are educated about newborn danger signs, their health care-seeking behavior will also improve. The result of the present study is reported on the knowledge of mothers and health-seeking behavior of mothers regarding newborn danger signs. The studies have shown many barriers that may affect health-seeking behavior among mothers. The findings of the current study findings are similar to previous studies. This systematic review included 42 primary studies reporting the knowledge and health seeking behavior among mothers of neonates regarding new born danger signs. Most included studies demonstrated a statistically significant limited knowledge<sup>(1-22)</sup>, and many studies have shown that poor health-seeking behavior.<sup>(1-11, 13-19)</sup> One study<sup>(20)</sup> evaluated that mothers had good health-seeking behavior. One study has shown the barriers affecting health-seeking behavior among mothers.<sup>[12]</sup> The study has many strengths. The review was based on a thorough search of available literature. The review includes experimental studies (RCT), non-randomized controlled trial (non-RCTs), controlled before and after the implementation of an intervention and controlled observational studies. To ensure quality of data, article was screened properly and data extraction was done independently by both the authors to avoid subjective bias.

The studies included in our study were published after January 2012 and December 2024, with the earliest study published in January 2012. Performance bias is, as the participant or the researcher is not blinded during data collection.

## Strengths

The strengths of the studies identified that an educational intervention in the antenatal and postnatal period were effective in improving the knowledge among mothers, which improves the healthcare-seeking behavior among mothers. Many of the studies reported statistically significant results ( $p < 0.05$ ), which indicates a strong likelihood that the observed effects are not due to chance. The studies often concluded with practical recommendations for implementing these interventions in the early period of antenatal or in-home care services, making the research directly applicable to real-world scenarios. These strengths

suggest that the interventional studies regarding newborn danger signs may be a milestone that benefits the mothers and improves neonatal health.

## Conclusion

The present review suggested that mothers had a lack of knowledge regarding newborn danger signs. The parity and age of the mother also varied across the studies; hence, no conclusion can be drawn about the effect of age on knowledge of newborn danger signs. Many factors were identified as barriers to mothers' health care-seeking behavior, such as Postnatal care follow-up, financial limitations, limited knowledge of neonatal danger signs, living in a joint family, and decision-making power in the family. Thus, further research should be done to find out the different levels of effects on health seeking behavior and measures by which we can improve the health seeking behavior and knowledge of mothers regarding newborn danger signs. So that a policy can be developed to support the successful implementation of the program and enhance mothers' health-seeking behavior, along with their knowledge of danger signs in neonates.

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