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The prevalent practice and attitude toward neonatal danger signs among mothers in Eastern Province, Saudi Arabia

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ABSTRACT

Background: Neonatal danger signs were recommended by World Health Organization (WHO) and United Nations International Children's Emergency Fund (UNICEF), which categorized new-borns at higher risk of morbidity and mortality. Reporting any of these signs requires early detection. Appropriate and suitable care-seeking is crucial to improve neonatal health and survival. *Methodology:* In Saudi Arabia's Eastern Province, cross-sectional online research (based on a survey) was carried out. During the research period January to March 2023, the study targeted all mothers and neonatal caretakers in the Eastern province. Following a thorough literature study and expert consultation, the researchers created an online electronic questionnaire for collecting the data. *Results:* There were a total of 1664 neonate caregivers, of which 1609 (96.7%) were mothers and 55 (3.3%) were nannies. The ages of the participants ranged from 18 to over 40 years. The most well-known danger signs among study participants were convulsions (81.6%), new-born child abstains from breastfeeding completely at birth or later (73.6%), High temperature of more than 37.5 C (67.6%), rapid breathing (66.9%), inflammation signs (66%) and jaundice (64.2%). Twelve hundred eighty-seven (77.3%) of the study participants reported that their new-born infant exhibited one of the danger sign symptoms. *Conclusions:* The current study revealed that approximately two-thirds of mothers and caregivers were aware of their new-born's danger indicators, particularly convulsions and breastfeeding difficulties. Additionally, three-quarters of the mothers/caregivers observed at least one neonatal danger sign.

Keywords: Neonates, danger signs, alarms, mothers, awareness, experience, caregivers, Saudi Arabia.

1. INTRODUCTION

The neonatal period is a serious period demanding nearby observation due to the high risk of mortality during this period compared to long life periods (Hug et al., 2019). During 2020, there about 2.4 million cases of neonatal deaths worldwide were reported. Furthermore, during the 1st week of life those nearly 3 out of 4 neonatal deaths reported (Lawn et al., 2009; Okawa et al., 2015). In Saudi Arabia, the under-five mortality rate in 2017 was 7.4 per 1000 (Almuneef et al., 2021). There are many causes' stands behind high neonatal death where all are upsetting to the family as well as to the treating staff (Chowdhury et al., 2010).

The leading cause of neonatal death were preterm birth, which responsible of 30% of total neonatal deaths globally; followed by sepsis and pneumonia (27%); prenatal asphyxia (23%); congenital anomalies (6%); and diarrhea (3%) (Almuneef et al., 2021; Chowdhury et al., 2010). WHO defined nine danger signs including fever, hypothermia, being unable to breastfeed, convulsions, severe chest in-drawing, breathing difficulties, yellowish discoloration of the eyes, palms and soles, umbilicus infection and eye discharge. Additionally, some mothers and caregivers described more symptoms such as drowsiness, lack of movement, skin pustules and vomiting. Among all, the most common single-dangerous sign that reported by mothers and caregivers was fever (Lawn et al., 2005; Bryce et al., 2005; Eghrari et al., 2023).

In 1992, UNICEF and the WHO initiated IMCI (Integrated Management of Childhood Illness), which focuses on the health and general well-being of the child (Lawn et al., 2005). The chief goal of this approach is to lessen the mortality and promote the health of children who are under five years of age. So as to extend the coverage of IMCI upon neonatal dangerous signs, Integrated Management of Neonatal and Childhood Illness (IMNCI) have been announced for the first time in 2000. It included extra issues compared to the previous IMCI approach, with more concentration on nutrition, immunization, disease prevention, treatment of diseases and general health promotion. Actually, both the IMCI and IMNCI approaches are the recommended guidance for mothers and caregivers to seek medical care for major danger signs that present in the child (Lawn et al., 2005; Bryce et al., 2005).

This study aims to assess the prevalent practice and attitude of neonatal danger sings in which might help the local health authorities plan effectively to reduce the burdens and costs caused by the danger signs in the Al-Ahsa region specifically and in Saudi Arabia in general. Also, this study may benefit the Saudi Ministry of Health by raising the awareness of the Saudi population in general regarding the dangerous signs through special programs or campaigns and by helping to develop new strategies that focus on identifying the presence of danger signs and controlling the preventable cause of death during the neonatal period of life.

2. MATERIAL AND METHODOLOGY

An online cross-sectional study (survey-based study) was conducted in Eastern Province, Saudi Arabia during the period of January to March 2023 to assess prevalent practice and attitude of neonatal danger signs. The study targeted all mothers/neonates' caregivers in Eastern province during the study period. Any person who doesn't live in the Eastern Province, Saudi Arabia and respondent who is not a mother or a care giver were excluded.

The data were collected using an online electronic questionnaire initiated by the researchers after comprehensive literature review and consulting filed experts. The survey included 19 questions that measure prevalent practice and attitude of neonatal danger signs. The questionnaire validity, reliability and clarity were assessed with nay modifications were applied. After having informed consent, the final questionnaire was uploaded online using social media platforms with researchers and their relatives till no more answers were received. The data were collected, evaluated and then fed into version SPSS 21.

All statistical procedures employed a two-tailed, alpha-level of 0.05 and significance was determined if the P value was less than or equal to 0.05. Overall knowledge level regarding danger signs among neonates was assessed through summing up discrete scores for different correct knowledge items. The overall knowledge score was categorized to poor level if participants score was less than 60% of the overall score and good level of knowledge was considered if the participant s score was 60% or more of the overall score.

Descriptive analysis was done by prescribing frequency distribution and percentage for study variables including participants personal data, relation to neonate, neonate age and children number. Also, knowledge and experience regarding danger signs were tabulated while and overall knowledge was graphed. Cross tabulation for showing factors associated with study participants knowledge of danger signs was carried out with Pearson chi-square test for significance and exact probability test if there were small frequency distributions.

3. RESULTS

A total of 1664 neonate care givers were included, of which 1609 (96.7%) were mothers and 55 (3.3%) were Nanny. Participants' ages ranged from 18 to more than 40 years with mean age of 28.6 ± 12.4 years old. As for respondent's education, 844 (50.7%) had basic education level, 257 (15.4%) had secondary level of education and 285 (17.2%) had university level of education or above. A total of 548 (32.9%) had only one child, 859 (51.6%) had 2-5 children and 257 (15.4%) had more than 5 children. As for neonates ages, it was less than 1 week among 155 (9.3%), 1-2 weeks among 319 (19.2%), 3-4 weeks among 452 (27.2%) and more than 4 weeks among 296 (17.8%) (Table 1).

Table 1 Personal and neonate data of study participants, Eastern region, Saudi Arabia

Personal and neonate data	No	%
Relation to the child		
Mother	1609	96.7%
Nanny	55	3.3%
Respondent age in years		
18-25	261	15.7%
26-30	598	35.9%
31-40	354	21.3%
> 40	451	27.1%
Respondent educational level		
Illiterate	278	16.7%
Primary/intermediate	844	50.7%
Secondary	257	15.4%
University graduate	131	7.9%
Post-graduate	154	9.3%
Number of children		
1 child	548	32.9%
2-5 children	859	51.6%
> 5 children	257	15.4%
Neonate age in weeks		
< 1 week	155	9.3%
1-2 weeks	319	19.2%
2-3 weeks	442	26.6%
3-4 weeks	452	27.2%
> 4 weeks	296	17.8%

The prevalent practice and attitude of neonatal danger signs in Eastern Province, Saudi Arabia. The most known danger signs among study participants included convulsions (81.6%), new-born child abstains from breastfeeding completely from birth or stops breastfeeding later (73.6%), High temperature of more than 37.5 C (67.6%), rapid breathing (66.9%), inflammation signs (66%) and jaundice (64.2%). The least reported were withdrawing (50.4%) and weakness and lethargy (57.3%) (Table 2).

Table 2 Prevalent practice and attitude of neonatal danger signs among Mothers in Eastern Province, Saudi Arabia

Danger signs of neonates	Yes		No		I don't know	
	No	%	No	%	No	%
A newborn child abstains from breastfeeding completely from birth or stops breastfeeding later	1225	73.6%	439	26.4%	0	0.0%
Convulsions	1357	81.6%	307	18.4%	0	0.0%
Rapid breathing	1114	66.9%	550	33.1%	0	0.0%
Withdrawing	838	50.4%	266	16.0%	560	33.7%
High temperature of more than 37.5 C	1125	67.6%	272	16.3%	267	16.0%

Hypothermia of less than 35.5 ° C	1023	61.5%	331	19.9%	310	18.6%
Weakness and lethargy	954	57.3%	358	21.5%	352	21.2%
Jaundice	1069	64.2%	305	18.3%	290	17.4%
Inflammation signs	1098	66.0%	287	17.2%	279	16.8%

Overall prevalent practice and attitude of neonatal danger signs in Eastern Province, Saudi Arabia. Exact of 1043 (62.7%) of the study participants had an overall good knowledge level regarding neonatal danger signs while 621 (37.3%) had poor knowledge level (Figure 1).

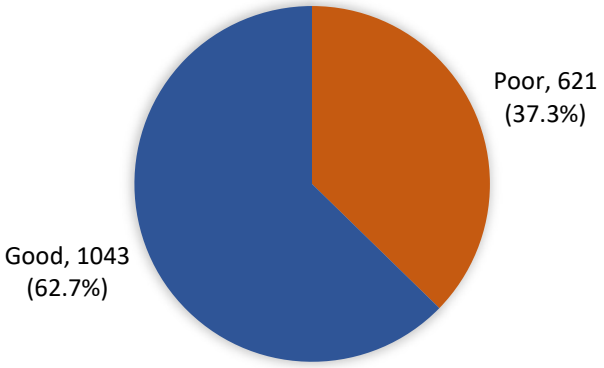

Figure 1 Overall Knowledge of Neonatal Danger Signs Among Mothers in Eastern Province, Saudi Arabia

A total of 1287 (77.3%) of the study respondents reported that their new-born child suffered from one of the danger sign symptoms. The most experienced among neonates included High temperature of more than 37.5 degrees Celsius (26.3%), Signs of inflammation (26.3%), rapid breathing (25%), Weakness and lethargy (24.8%) and Hypothermia of less than 35.5°C (24.2%). The least experienced danger symptoms are Convulsions (22.6%) and withdrawing (22.4%) (Table 3).

Table 3 Experience of Neonatal Danger Signs in Eastern Province, Saudi Arabia

Experience items	No	%
Has your newborn child ever suffered from one of these symptoms?		
Yes	1287	77.3%
No	377	22.7%
If yes, mention signs		
High temperature of more than 37.5 degrees Celsius	339	26.3%
Signs of inflammation	339	26.3%
Rapid breathing	322	25.0%
Weakness and lethargy	319	24.8%
Hypothermia of less than 35.5 ° C	312	24.2%
Abstaining from breastfeeding completely from birth or stopping breastfeeding later	311	24.2%
Jaundice	308	23.9%
Convulsions	291	22.6%
Withdrawing	288	22.4%

Factors associated with Overall Knowledge. None of the study respondents' factors showed a significant association with their overall knowledge level regarding danger signs among neonates (P >0.05 for all) (Table 4).

Table 4 Factors associated with Overall Knowledge of Neonatal Danger Signs among Mothers

Factors	Knowledge level				p-value
	Poor		Good		
	No	%	No	%	
Relation to the child					
Mother	600	37.3%	1009	62.7%	.893
Nanny	21	38.2%	34	61.8%	
Respondent age in years					
18-25	99	37.9%	162	62.1%	
26-30	224	37.5%	374	62.5%	.131
31-40	115	32.5%	239	67.5%	
> 40	183	40.6%	268	59.4%	
Respondent educational level					
Illiterate	97	34.9%	181	65.1%	
Primary/intermediate	330	39.1%	514	60.9%	.201
Secondary	87	33.9%	170	66.1%	
University graduate	56	42.7%	75	57.3%	
Post-graduate	51	33.1%	103	66.9%	
Neonate age in weeks					
< 1 week	63	40.6%	92	59.4%	
1-2 weeks	131	41.1%	188	58.9%	.244
2-3 weeks	158	35.7%	284	64.3%	
3-4 weeks	154	34.1%	298	65.9%	
> 4 weeks	115	38.9%	181	61.1%	
Number of children					
1 child	202	36.9%	346	63.1%	.961
2-5 children	323	37.6%	536	62.4%	
> 5 children	96	37.4%	161	62.6%	
Has your newborn child ever suffered from one of these symptoms?					.240[$]
Yes	490	38.1%	797	61.9%	
No	131	34.7%	246	65.3%	

P: Pearson X^2 test *$: Exact probability test*

4. DISCUSSION

It's vital to enhance the management of threatened premature labor, multiple pregnancies and the close control of the fetus (Simmons et al., 2010). In a study by Matendo et al., (2011) in Congo, authors revealed that greatest neonatal deaths occurred rapidly after birth and about 75% were caused by low birth weight/prematurity or asphyxia. The high mortality and morbidity rates are due to an important disruption in the continuity of care in the service-delivery plan after delivery. Postnatal clinic care is essential for both mother and child (Wall et al., 2009).

The current study aimed to assess prevalent practice and attitude of neonatal danger signs among mothers in Eastern Province, Saudi Arabia. The study revealed that about two-thirds of the study mothers/caregivers had good awareness and knowledge level regarding neonatal danger signs. In more details, the most known signs included convulsions (more than three-fourths), new-born child abstains from breastfeeding completely from birth or stops breastfeeding later (about three-fourths), High temperature of more than 37.5 C (two-thirds), rapid breathing (two-thirds), inflammation signs (two-thirds) and jaundice (two-thirds).

This estimated high knowledge level was nearly uniformly distributed by the mothers/caregiver's personal data so; none showed a significant association with their knowledge. Though, there is a huge difference in the estimated knowledge and experience level in each region and country. A study done in Ethiopia including 2424 mothers showed that 64.6% of them

mentioned at least one danger sign which is similar to the current study finding (Kebede et al., 2022). In China, a study with 112 participants showed that 42% of mothers had good knowledge of neonatal danger signs (Zhou et al., 2022).

In Kenya, a study revealed that knowing at least one danger sign of neonates was 51.2% in women and 50% in men (Kibaru and Otara, 2016) a much lower knowledge level in Uganda was assessed by Sandberg et al., (2014) who estimated approximately 58.2% of respondents were able to identify one and 14.8% were able to identify two of the most important neonatal danger indicators. Also, in Ghana, Kuganab-Lem and Yidana, (2014) it was discovered that many women have limited knowledge of neonatal hazard indicators. In Saudi Arabia, studies on prevalent practice and attitude of neonatal danger signs are limited.

In Riyadh, a study conducted revealed that 89% of the mothers recognized at least one danger sign which is much biter than estimated by the current study. Though, only 37% of the participants knew three more danger signs (Abu-Shaheen et al., 2019). As for experiencing danger signs among study neonates by their caregiver, the study showed that more than three out of each four respondents experienced at least one danger sign among their neonates. The most experienced included high temperature of more than 37.5 degrees Celsius, signs of inflammation, rapid breathing, weakness and lethargy (24.8%) and Hypothermia of less than 35.5°C (24.2%).

Okawa et al., (2015) revealed that t 25% of the neonates has danger sings after birth. There was significant relationship found between the neonatal danger sings and antenatal complications. Kebede et al., (2022) it was found that just 11.0% of moms had seen danger indications in their infants. Around 54 (49.1%) of the moms of these babies realized their presence within 24 hours after birth, while 37 (33.6%) did so after 48 hours. Similar rate was estimated by Masaoud et al., (2019) who reported that he 80% of included mothers neonates had early neonatal danger sign with a most common one was neonatal jaundice.

5. CONCLUSION

In conclusion, the current study revealed that about 2 out of each 3 mothers/caregivers were knowledgeable for their neonate's danger signs mainly convulsions and breastfeeding problems. Also, three-fourths of the mothers/caregivers experienced at least 1 neonatal danger sign mainly fever, inflammations, with breathing changes. Researchers recommended that health care staff with also concerned persons in the health care field should pay more effort to increase the neonate's caregiver's knowledge regarding danger signs and the advantage of early medical care seeking.

Author contribution

Ali Tawfiq Alamer: Writing the proposal, review of the manuscript

Mohammed Ali Alshayeb, Hassan Nassir M Bumejdad, Kadhem Hussain Alhaddad, Mohammed Saeed Alramadan, Jalal Khaled Aldandan, Ahmed Eissa Aleissa, Ali Ameer Al-Mohammedsaleh, Mohammed Hussain Al Ali, Raghad Yousof Alturaifi, Fatimah Mohammed Alshakhs, Sawsan Sami Albattat, Zainab Hussain Buzaid, Fares Ahmad AlFares, Sirar Ahmad Alali: Data collection, data entry and analysis with review of the manuscript

All authors of this study were equally involved in the design of the study, data collection, analysis, drafting and correction of the final draft and the author was responsible for the proper implementation of the study at all stages. There is no author whose name is not listed in the authors list.

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Informed consent

Written & Oral informed consent was obtained from all individual participants included in the study. Additional informed consent was obtained from all individual participants for whom identifying information is included in this manuscript.

Ethical approval

The study was approved by the King Faisal University, Al-Ahsa, Saudi Arabia (Ethical approval code KFU-REC-2023-JAN-ETHICS489)

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Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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