

Knowledge of neonatal danger signs and associated factors among mothers who gave birth the last four months attending immunization services in Harar town public health facilities, Ethiopia

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Research note

Keywords: Neonatal danger sign, Mothers' knowledge, Immunization

Posted Date: August 21st, 2019

DOI: <https://doi.org/10.21203/rs.2.13350/v1>

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Version of Record: A version of this preprint was published on October 10th, 2019. See the published version at <https://doi.org/10.1186/s13104-019-4677-2>.

Abstract

Objective The purpose of this study was to assess knowledge about neonatal danger signs and associated factors among mothers that gave birth in the last 4 months attending immunization services. **Result** The study allowed 432 mothers to participate in the study. The knowledge score of neonatal danger signs was found [32.9% (95% CI: 28.9%, 37%)]. Mothers educated to secondary level were 4.9 times more likely to know about neonatal danger signs [(AOR=4.9, 95% CI: (1.15, 21)]. Similarly, mothers whose husband educated to college and above [AOR=4.95, 95% CI: (1.15, 21)], and being multipara mother [(AOR=2.59, 95% CI: (1.05, 6.6)], were significantly associated factors of good knowledge of mothers about neonatal danger signs.

Introduction

Parenthood of a new life is a responsibility for protection and crucial to the health and safety of the little, immune suppressed newborn. Although the symptoms of illness in the newborn baby are difficult to recognize, mothers always needed to notice at their newborn for any signs of illness arose in their neonate early. Majority of parent's lacks awareness about how a sick baby reacts compared to a healthy baby. Thus, they lack experience in recognizing what is normal signs and what is evil [1]. Neonatal danger signs that arose in the first month of life are multiple and can be a manifestation of almost any fatal diseases [2]. The integrated Management of Newborn and Childhood Illness (IMNCI), which is developed by World Health Organization (WHO) introduces around ten general danger signs which determines illness of a neonate.

The critical period in newborn survival is often during the first week of life, when most neonatal deaths occur at home and without any contact with the formal health professional. These unable to seek care related problems are managed if mothers are aware of newborn danger signs through routine counseling by health professionals to help them develop the experience of early recognition. Thus, it is found necessary to assess mothers' knowledge and associated factors hindering and promoting awareness of neonatal danger signs.

Methods

Methods (*level 2 heading*)

The quantitative institutional based cross-sectional study design was applied to study a total of 433 mothers at immunization ward in different health facilities. Mothers with health problems like deafness, and caregivers (Maidservant) who immunize their employer's baby were excluded from the study for the purpose of increasing quality of data.

The required sample size was determined from the literature using a double population proportion formula by assuming 95% level of confidence, 5% margin of error, 80% power and the ratio of exposed to unexposed equivalent to 1. The highest number of sample was taken from the scenario at which mothers exposed to primary education to that of not taking formal education (18% vs. 8%) which yields 394. Adding 10% non-response rate, it becomes 433 samples. A total of six public health facilities (four health centers and two hospitals) were included in the study. Thus, systematic sampling technique was used from their registration frame to get a total 433 samples after proportionally allocate to size for every health facilities.

A structured, questionnaire developed by the principal investigator was used for study. The questionnaire was first prepared in English language, translated to local languages and pretested on 5% of population out of the study area. Finally, samples were interviewed face- to- face using the checked and pretested questionnaires.

Operational definition

Knowledge

A mother who mentions three of the ten WHO recognized danger signs of a neonate without prior prompt, or three and greater danger signs with a prior prompt are said to be had good knowledge. But, mothers capable of mentioning two and less key danger signs of neonate with and without prior prompt are said to be having poor knowledge [10].

The collected data was entered in to epi data and exported to SPSS version 20. All variables with p-value ≤ 0.2 , on bivariate logistic regression analysis were taken in to multivariate model to control the possible confounders. The odds ratio (OR) was used as a measure of strength and level of statistical significance was declared at p-value < 0.05 .

Finally, before the data collection process started, ethical clearance was secured from Haramaya University Institutional Health Research Ethics Review Committee (IHRERC). Official letter was disseminated from Haramaya University College of health and medical sciences to each selected health facilities.

Results

A total of 432 mothers of babies aged up to 4 months were included in the study. The median age of the mothers was 25 years with a range of 15–45 years (*Table S1*).

Out of the 432 recruited mothers, 130 (30.1%) didn't know about neonatal danger signs totally, but the remaining 302(69.9%) mothers were aware about the following number of mentioned neonatal dangers sign, one, 60(13.9%), two, 100(23.1%) and 142(32.9%) three & above. Mothers who full fill the WHO criteria for good knowledge was found 142 (32.9% with 95% CI: 28.9%, 37%). Among the prompted neonatal danger signs cord bleeding, redness followed by pus, and fever mentioned by 95.8%, while Hypothermia, convulsion, and vomiting are the least mentioned neonatal danger signs accounted for 45.8%, 63.4%, and 68.3% respectively (*Figure 1*).

Figure –1: Knowledge of prompted neonatal danger signs among mothers who gave birth the last four months attending immunization in Harar town public health facilities, Eastern Ethiopia, February 2017.

Out of 432 mothers, 393(90.9%) had antenatal care follow up (ANC) during the latest pregnancy. Counseling related to neonatal danger signs were the least of all area of counseling covered with 34.2%. Similarly, out of 432 mothers less than half, 133 (30.8%) had postnatal care visit (PNC) and only 70 (52.6) mothers got counseled about neonatal danger signs (*Table S 2*).

The median parity of mothers was two (2), ranging from 1- 8 live births with multipara mothers 226 (52.3%) accounted the highest number in the parous status of the respondents. Related to the place of delivery the majority of mothers 352 (81.5%) delivered their current baby in a hospital for labor and delivery (*Figure S 1*).

Regarding to the source of information 253 (83.8%) mothers from those who were aware of neonatal danger signs got informed from different sources. Among these 81 (31%) received information from health professionals, while the remaining 49 (16.2%) mothers were not informed (*Figure 2*).

Figure –2: First source of information about neonatal danger signs for mothers who gave birth the last four month attending baby immunization in Harar town public health facilities, Eastern Ethiopia, February 2017(n = 253).

The majority, 280 (64.8%) mothers had knowledge about cord care. Regarding to cord care practice, 218 (78.2%) put nothing on cord, 42 (14.6%) butter, and 18 (6.4%) others remedies. Most of mothers 306 (70.8%) reported as the exact time of breastfeeding initiation is within 1 hour.

Factors Associated With knowledge of neonatal danger signs (level 3 heading).

The multi-variable analysis result showed that educated mothers to the level of college and above as well as secondary level were more likely to recognize neonatal danger signs (Table 1).

Table –1: Factors associated with knowledge of neonatal danger signs among mothers who gave birth the last four month attending immunization in Harar town public health facilities, Eastern Ethiopia, February 2017.

Independent variables	Frequency (%)	Knowledge of neonatal danger signs		COR (95% CI)	AOR (95% CI)
		Good	Poor		
Maternal level of education					
College and above	95 (27.3)	53	42	3.99 (1.86, 8.6)**	5.4 (1.3, 22.7)*
Secondary level	83 (23.9)	38	45	2.7 (1.22, 5.83)*	4.9 (1.15, 21.1)
No formal education	50 (14.4)	12	38	1.00	1.00
Time of breast feeding initiation					
<1 hour	306 (70.8)	113	193	1.87(1.17, 3)**	3.23 (1.11-9.7)
>1 hour	126 (29.2)	30	96	1.00	1.00
Husband/partner level of education					
College and above	88 (20.6)	44	44	3.4 (1.72, 6.75)**	4.95 (1.15, 21.32)**
Secondary level	106 (24.8)	43	63	2.34 (1.2, 4.53)*	4.7 (1.15, 19.23)
No formal education	75 (17.5)	17	58	1.00	1.00
Parity					
Primi para	188(43.5)	46	142	1.00	1.00
Multi para	226 (52.3)	85	141	1.9 (1.2, 2.9)**	2.59 (1.05, 6.58)*
ANC neonatal danger sign counseling					
Yes	121 (34.2)	76	45	4.87(3.04, 7.8)**	4.34 (1.61, 11.7)
No	233 (68.8)	60	173	1.00	1.00
ANC visit within 6 days					
Yes	145 (33.6)	74	71	3.29 (2.16, 5.02)**	3.32 (1.26, 8.67)
No	287 (66.4)	69	218	1.00	1.00
Source of information					
Yes	253 (83.8)	127	126	2.29 (1.19, 4.4)*	6.04 (1.63, 22.4)**
No	49 (16.2)	15	34	1.00	1.00
Mode of delivery					
Spontaneous vaginal delivery (SVD)	248 (57.4)	51	197	1.00	1.00
Caesarian section	148 (34.2)	80	68	4.5 (2.9, 7)**	3.86(1.46, 10.25)
First source of information					
Family	52(19.9)	12	40		
Health professional	81(31)	47	34	4.6 (2.1, 10.6)**	5.45(1.27, 23.3)*
Media	68 (26.1)	35	33	3.5 (1.6, 7.9)*	5.08(1.16, 22.36)*

Discussion

In this study, the knowledge of neonatal danger signs was found to be (32.9% with 95% CI: 28.9%, 37%). It was found satisfactory on educated mothers and those who got ANC counseling about neonatal danger signs at their current ANC follow up visit. The knowledge of neonatal danger signs in this study was lower than the study done in India (2006), which was 39% [11], in Nigeria (2009) which was 78.3% [12], in Egypt (2008) which was 69% [13] and in Tigray region Ayder referral hospital (2011), 64% [14]. Even

though, the most frequently mentioned danger sign was fever, in all four studies, which is congruent with this study; the knowledge gap may be due to socioeconomic differences lead to owning an advanced health care delivery system.

According to this study, mothers who learned to secondary level and college and above were more likely to know about neonatal danger signs compared to those who didn't take formal education. This was nearly consistent with the study conducted in Gondar, (2012) that mothers with the same level of education were more prone to know ≥ 3 neonatal danger signs with and without prior prompt [17]. This might be because of education increases the tendency to get service and read materials related to their baby.

The study revealed that mothers who get counseled about neonatal danger signs during their current ANC follow up and those who had PNC visit during the first six days postpartum were more likely to had good knowledge about neonatal danger signs. This was nearly consistent with the study conducted in Finche town Oromia region in 2012 [18], and in Gondar, 2012 [17]. This is due to the fact that the increased maternal ANC and PNC utilization promote the likelihood of counseling and knowledge acquisition.. This study tried to test new variables, among them a mode of delivery was found to be significantly associated. Mothers who delivered through cesarean section were found more knowledgeable about neonatal danger signs compared to those who delivered by spontaneous vaginal delivery (SVD). This might be the longer they stay at a health facility in the postnatal period, the more to get counseled about neonatal danger signs.

Mothers who had a source of information about were six times more to know the danger signs compared to those who didn't have. In line with that, mothers who got information from health professionals and media were more knowledgeable about neonatal danger signs. This is congruent with the study conducted in India by 2012, where poor knowledge was due to other sources than health professional [20] and with the study conducted in Gondar (2012), by which mothers got their first information about neonatal danger sign from health professionals and media were significantly resulted good knowledge [17].

This study showed mothers who knew the exact breastfeeding initiation, as less than one hour (78%) were found more knowledgeable compared to those who reported as later than one hours. This is consistent with the study in Nepal, Chitwan district (2011) even though the number of mothers who reported as less than one hour differs (78% vs. 52%) [21], this consistency might because more emphasis is given by the government upon counseling breastfeeding habit of mothers, which increases bonding and identifying the possible newborn illness.

Limitation

- As this study used cross sectional study design, it is weak to show temporal relationship between cause and effect.
- Although mothers immunize their baby to BCG were given special emphasis, including mothers up to four month post-partum may face recall bias as neonatal danger signs are common in the first month of life.

List Of Abbreviations And Acronyms

ANC Antenatal care

AOR Adjusted odd ratio

BCG Bacillus Calmette Guerin

CI Confidence interval

HEWs Health Extension Workers

HC Health center

HU-IHRERC Haramaya university institutional health research ethics review committee

IMNCI Integrated management of newborn and childhood illness

OR Odds ratio

PI Principal Investigator

PNC Postnatal care

SNNP Southern nation nationalities and peoples of Ethiopia

SPSS Statistical package for social science

SVD Spontaneous vaginal delivery

UNICEF United nation Children's Emergency Fund

WHO World health organization

Declarations

Ethical approval and consent to participate

Before starting of the data collection process, ethical clearance was secured by Haramaya University Institutional Health Research Ethics Review Committee (IHRERC, Tel: +251256661899, P. O.Box 235, Harar), to each selected health facilities. Informed, written and signed consent was obtained from each head of every facility involved in the study and participant mothers after the purpose and benefits of the study is explained. Participants were informed about the minimal risk that it had participating in the study, their volunteerism and the right to stop the interview at any time they want. Parental consent was also obtained for participants under sixteen. Confidentiality of the study participant's information was also ensured. Eventually, mothers who had poor knowledge were informed about the ten (10) key danger signs prompted in the questionnaire immediately after the interview is finished.

Consent for publication

"Not applicable"

Availability of data and materials

The datasets during and/or analyzed during the current study available from the corresponding author on reasonable request

Competing interests

"The authors declare that they have no competing interests"

Funding

Not applicable

Authors' contributions

FT proposed, designed the study. NA supervised, advised and helped analysis to the author. GA developed the first version of the data collection tool. NE assisted interpretation of the result and preparation the draft of the manuscript. MB assisted on proposal development and the final write up of data collection tool. MG performed the statistical analysis to the study. SG wrote the first draft plus final write up of the research paper. Eventually, it has been done to read the last version of this manuscript by all contributors for possible modifications they want to make. The manuscript is then amended and gets approved by every author before it is being sent to publication.

Acknowledgment

I would like to acknowledge heads of each Harar public health facilities, Harar town health office and staffs of each health facility for the necessary information provided and all individuals (Data collectors, supervisors, and my friends) who take part up and invest undeserved effort on developing this research paper.

References

- [1]. Vincent L. Common newborn problem. Available from URL: [HTTP:// pediatric.about.com/cs/ ages stages/a/two- weeks-3htm](http://pediatric.about.com/cs/ages_stages/a/two-weeks-3htm). 2011.
- [2]. Baqui A, Rahman M, Zaman, K., El Arifeen, S. Chowdhury, H. A population-based study of hospital admission incidence rate and bacterial etiology of acute lower respiratory infections in children aged less than five years in Bangladesh. *Journal of health, population, and nutrition* 2007. 25 (2): 179–188
- [3]. World health organization and United Nations Children's Fund. *Caring for the newborn at home. A training course for community health workers; community health workers manual*. Geneva. 2012. Accessed on August 30, 2016 from [www.who.int/child adolescent health/documents newborn/en](http://www.who.int/child_adolescent_health/documents/newborn/en).
- [4]. Marsh R, Darmstadt L, Moore J, Daly P, Tinker A. Advancing neonatal health and survival in developing countries: a conceptual framework. *J Perinatol*. 2006. 22 (7): 572–576.
- [5]. Rajaratnam JK, Marcus JR, Flaxman AD, Wang H, Levin-rector A, Dwyer L, et al. Neonatal, post neonatal, childhood, and under-5 mortality for 187 countries, 1970–2010: a systematic analysis of progress towards Millennium Development Goal 4. 2010; 6736(10):1–21.
- [6]. Sen A, Mahalanabis D, Singh A, Bandyopadhyay T. The impact of a district level sick newborn care unit on neonatal mortality rate 2-year follow up. 2009. 29(2):150–155
- [7]. Claeson M, Bos R, Mawji T. Reducing child mortality in India in the new millennium. *Bull World Health Organ*. 2009. 78: 1192–1199.
- [8]. Lawn E, Cousens S, Zupan J. 4 million neonatal deaths: when? Where? Why? *Lancet* 365. 2005. (9462): 891–900.
- [9]. EDHS (Ethiopia Demographic and Health Survey) report. Central Statistical Agency. Report. *International Classification of Functioning, Disability, and Health*. Addis Ababa, Ethiopia Calverton, Maryland, USA. 2008–2011.
- [10]. Wim van L, Annick M, Zoe M. IMCI Integrated management of childhood illnesses. *World health organization handbook*. Geneva and New York. 2005. Accessed on, September 2, 2016, from link.library.deakin.edu.au/.../Handbook-IMCI-integrated-management-of/Z5jR-QBGr4.
- [11]. Awashti S, Verma T, Agarwal M. Danger signs of neonatal illnesses: perceptions of caregivers and health workers in northern India. *Bull World Health Organ*. 2008. 84 (10): 819- 826.
- [12]. Ekwochi U, Ndu IK, Osuorah CDI, Amadi OF, Okeke IB, Obuoha E, et al. Knowledge of danger signs in newborns and health seeking practices of mothers and caregivers in Enugu state, South-East Nigeria. *Italian Journal of Pediatrics*. 2015; 1–7.
- [13]. Essa RM, Akl OA, Mamdouh HM. Factors associated with maternal knowledge of newborn care among postnatal mothers attending a rural and an urban hospital in Egypt. *Bulletin of High Institute of Public Health*. 2010; 40(2).
- [14]. Hadush A, Kassa M, Kidanu K, Tilahun W. Assessment of Knowledge and Practice of Neonatal Care among postnatal mothers attending in Ayder and Mekelle Hospital. *SMU medical journal*. 2016; 3 (1): 2349–1604.
- [15]. Callaghan-koru JA, Seifu A, Tholandi M, Graft-johnson J De, Daniel E, Rawlins B, et al. Newborn care practices at home and in health facilities in 4 regions of Ethiopia. *BMC Pediatrics* 2013. 13:198.
- [16]. Kuganab-lem R, Yidana A. Exploring Women Knowledge of Newborn Danger Signs: A Case of Mothers with under Five Children. *Public Health Research*. 2014; 4(5):195–202.

[17]. Nigatu SG, Worku AG, Dadi AF. Level of mother's knowledge about neonatal danger signs and associated factors in North West of Ethiopia: a community based study. BMC Res Notes [Internet]. 2015; 4–9. Available from: "<http://dx.doi.org/10.1186/s13104-015-1278-6>"

[18]. Eshetu Y. Assessment of level of knowledge and practice of essential newborn care and its determinants among recently delivered women in Ficthe town, North shewa zone, Oromia region, Ethiopia (Unpublished work).2015.

[19]. Senarath U, Fernando DN, Vimpani G, Rodrigo I. Factors associated with maternal knowledge of newborn care among hospital-delivered mothers in Sri Lanka. Transactions of the royal society of tropical medicine & hygiene. 2007;(101): 823–830

[20]. Jiji D, Wankhede R. Benjamin B. A descriptive study on newborn care among postnatal mothers in selected maternity centers in Madurai, Tamilnadu. IJAMSCR.2014. 2 (2).

[21]. RajaniS,Bimala S, Vishnu K, Usha K, Pandey A, Vishwokarma D, Kumar M.Factors associated with neonatal deaths in Chitwan district of Nepal. BMC Research Notes. 2015 8:818 DOI 10.1186/s13104-015- 1807-3

Figures

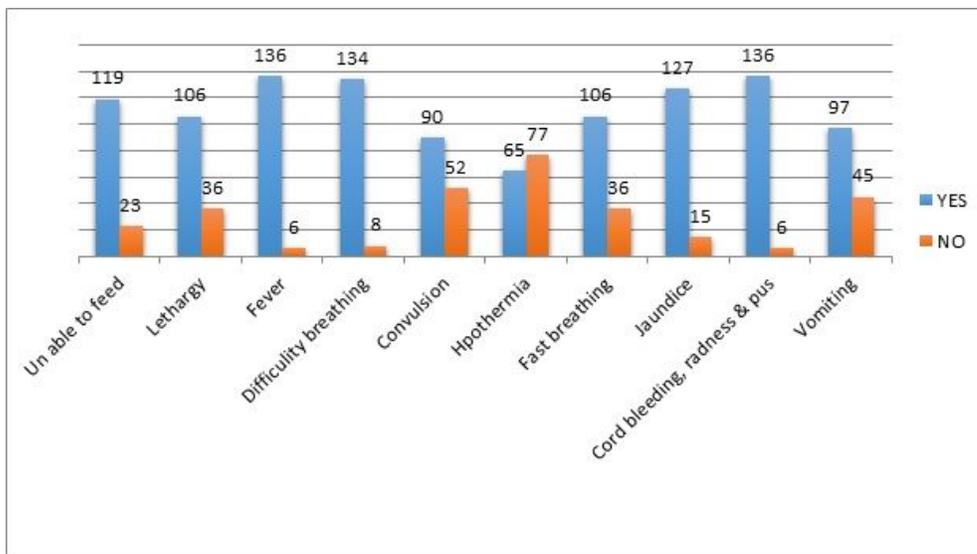


Figure 1

Figure -1: Knowledge of prompted neonatal danger signs among mothers who gave birth the last four months attending immunization in Harar town public health facilities, Eastern Ethiopia, February 2017.

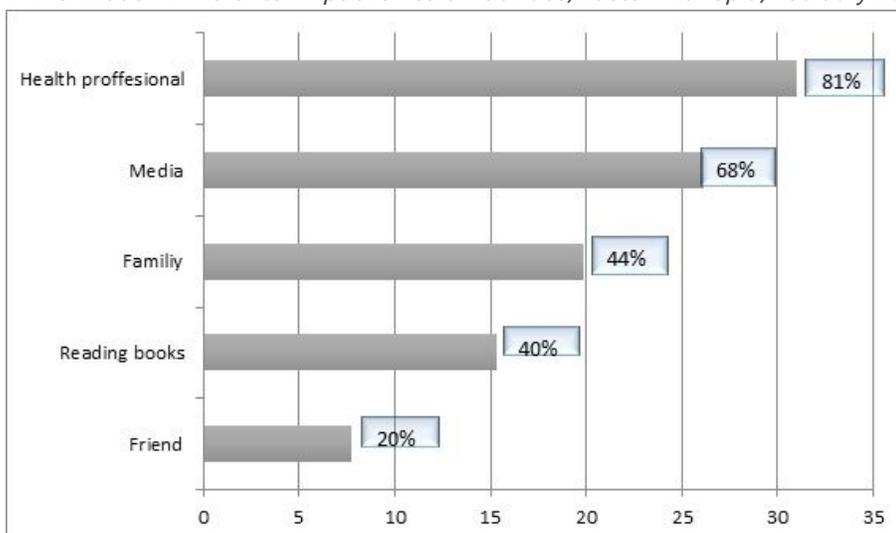


Figure 2

Figure -2: First source of information about neonatal danger signs for mothers who gave birth the last four month attending baby immunization in Harar town public health facilities, Eastern Ethiopia, February 2017(n=253).

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