Prevalence and socio-demographic determinants of diarrhea among children below 5 years in Bondhere district Somalia

Mahad Dahir Turyare, Japheth Nzioki Mativo, Mary Kerich, Alex Karuiru Ndiritu

Corresponding author: Alex Karuiru Ndiritu, Department of Environmental Health, University of Kabianga, Kericho, Kenya. alexask.n@gmail.com

Received: 30 Jan 2020 - Accepted: 08 May 2020 - Published: 21 Apr 2021

Keywords: Children, diarrhea, prevalence, sociodemographic

Copyright: Mahad Dahir Turyare et al. Pan African Medical Journal (ISSN: 1937-8688). This is an Open Access article distributed under the terms of the Creative Commons Attribution International 4.0 License (https://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Cite this article: Mahad Dahir Turyare et al. Prevalence and socio-demographic determinants of diarrhea among children below 5 years in Bondhere district Somalia. Pan African Medical Journal. 2021;38(391). 10.11604/pamj.2021.38.391.21636

Available online at: https://www.panafrican-med-journal.com//content/article/38/391/full

Prevalence and socio-demographic determinants of diarrhea among children below 5 years in Bondhere district Somalia

Mahad Dahir Turyare\textsuperscript{1,2}, Japheth Nzioki Mativo\textsuperscript{2}, Mary Kerich\textsuperscript{2}, Alex Karuiru Ndiritu\textsuperscript{3,}\textsuperscript{*}

\textsuperscript{1}Department of Nutrition, UNICEF, Mogadishu, Somalia, \textsuperscript{2}Department of Public Health, Jomo Kenyatta University of Agriculture and Technology, Juja, Kenya, \textsuperscript{3}Department of Environmental Health, University of Kabianga, Kericho, Kenya

*Corresponding author
Alex Karuiru Ndiritu, Department of Environmental Health, University of Kabianga, Kericho, Kenya
Abstract

Introduction: globally diarrhea is rated as the second leading cause of mortality among children below the age of five years. The highest rates of morbidity and mortality as a result of diarrhea are reported in sub-Saharan Africa and South East Asia. Studies have documented Somalia as among the countries with significant high rates of diarrhea among children below the age of 5 years. The aim of the study was to assess the prevalence and socio-demographic determinants of diarrhea. Methods: the study employed a descriptive cross-sectional study design where data was collected using semi structured questionnaires. Simple random sampling was employed to identify caregivers that were included in the study. The data collected was analyzed using SPSS version 20 at 95% confidence interval. Both descriptive and regression analysis were carried out. The data was presented using tables and graphs. Ethical clearance was sought from University of Eastern Africa Baraton ethical review committee. Permission and consent were sought from the administrative leadership of Bondhere district and caregivers respectively. Results: the prevalence of diarrhea among children under 5 years was 22.4%. Socio-demographic factors reported to significantly influence the prevalence of diarrhea among children under years were caregiver education level and number of children under 5 years. Conclusion: the prevalence of diarrhea among children under 5 years was considerably high. Several socio-demographic factors were associated with diarrhea. The study recommends improvement of education and sensitization of communities on family planning.

Introduction

Globally diarrhea is the second leading cause of childhood mortality. Children in developing countries are adversely affected by preventable and treatable diseases with modest and financially feasible interventions [1]. Furthermore, in developing countries childhood mortality is almost 10 times higher as compared to the developed nations. There are estimated 1.7 billion cases of diarrhea every year. Consequently, diarrhea accounts for about 525,000 deaths of children under 5 years annually [2]. Sub-Saharan Africa and Southeast Asia accounts for the highest rates of childhood mortality [3]. In Africa it is estimated that children below 5 years’ experience on the minimum five episodes of diarrhea yearly and about 800,000 children succumb to diarrhea annually [4]. In Somalia studies have reported high rates of diarrhea among children below 5 years and is thus reported to be leading cause of childhood morbidity and mortality in this region [5].

Diarrhea is normally characterized by passage of three or more loose or liquid stools daily. Diarrhea is normally an outcome of intestinal tract infections which are normally caused by viral, bacterial or parasitic infestation. Diarrhea is normally spread through drinking or eating contaminated water and food and also from one person to another due to poor hygiene [2]. In most African countries, diarrhea tops the list of waterborne infections as a consequence of poor sanitation. The incidences of diarrhea are more rampant within the first two years of life and declines as the child progresses in age [4]. Studies have documented that diarrhea is not purely medically related but is as well associated with economic, social, environmental and behavioral factors [6]. Some of the socioeconomic factors influencing diarrhea includes; low maternal education levels, poor sanitation, overcrowding and inadequate access to clean and drinkable water [7]. Similarly based on a study conducted in Ethiopia, father’s occupation, educational level and age of the child were cited as key factors influencing diarrhea among children below 5 years [6]. Studies have also documented the use of infants feeding bottles, poor hand washing, poor disposal of faecal matter and failure to breastfeed children up to the age of one year as factors influencing diarrhea among children below 5 years [8,9]. This study therefore aims at investigating the prevalence and socio-
demographic factors influencing diarrhea among children below the age of 5 years in Bondhere district, Somalia which are not extensively documented to the best of our knowledge.

Methods

Study site: the study was conducted in Bondhere district. Bondhere district is located in the southeastern part of Banaadir region Somalia. Bondhere district is an administrative region and its coordinates are 2°1'59.999"N, 45°21'0.000"E. Bondhere district is one of the districts in the Banaadir region. The region has a population size of 1,650,227 with an inclusion of 369,288 internally displaced persons (IDPs) [10]. The region is bordered by lower Shebelle, middle Shebelle and the Somalia sea.

Study design: the research employed descriptive cross-sectional design which helped in determining factors influencing adoption of hygienic practices associated with diarrhea among children under 5 years in Bondhere district.

Experimental procedure: data on socio-demographic factors and rate of diarrhea was collected using a semi structured questionnaire during the period between May and July 2019 from caregivers of children below 5 years. The questionnaires were interviewer administered by data clerks who had prior experience and training on data collection. The study was ethically approved by University of Eastern Africa Baraton. Permission and consent was sought from the administrative leadership of Bondhere district and caregivers respectively. A sample size of 246 caregivers was computed using fisher’s formula and clustered simple random sampling was used to enroll participants in the study. Bondhere district was clustered into the 4 sub districts i.e. Nasib Budo, Yusuf Al-Kownayn, Daljirka and Sinay. Study participants were then simple randomly selected from the four sub districts.

Data analysis and presentation: data was cleaned, coded and data entry done. The data was analyzed using Statistical Package for Social Scientists (SPSS version 20.0). Binomial regressions were computed to show the interactions between the socio-demographic variables and prevalence of diarrhea. The regression analysis was done at 95% confidence level.

Results

Socio-demographic characteristics: in this study 35.8% of the caregivers that were interviewed were household heads while 64.25% were not household heads. Seventy-six-point one percent (76.1%) of the caregivers were married, 13.4% were divorced, 6.0% were single and 4.5% were widowed. Sixteen-point four percent (16.4%), 6.2% and 22.4% had one, two to three and three and above children under 5 years respectively. Of the children below 5 years, 53.5% were male and 46.5% were female. Forty-point three percent of the caregivers had no formal education, 25.4% of the caregivers had attained primary education, and 24.5% and 9.0% of the caregivers had studied up to secondary and tertiary level respectively. Sixty-four-point two percent percent (64.2%) of the caregivers were livestock keepers, 8.1% of the caregivers were salaried employees, 8.9% were formal business owners, 15.9% were informal business owners and 2.9% the caregivers were crop farmers (Table 1). In the current study 22.4% of the caregivers reported that their children had experienced diarrhea in the last two weeks before the survey was conducted while the 77.6% of the caregivers reported that their children had not experienced diarrhea in the last two weeks before the survey was carried out.

Binary regression was computed to determine socio-demographic factors influencing prevalence of diarrhea among children under 5 years. The Nagelkerke R Square value of the model was 0.566 which implies that there was a combined variation of 56.6% of the factors influencing prevalence of diarrhea (Table 2). The model was significant with a p value of 0.010 as shown in Table 3 thus the relationship between the socio-demographic variables and prevalence of diarrhea was
significant. The regression analysis shows that socio-demographic factors that had significant influence on prevalence of diarrhea among children below 5 years were number of children below 5 years (p = 0.049) and level of education (p = 0.037) while household head (p = 0.998), marital status (p = 0.92), occupation (p = 0.24) and monthly income (p = 0.068) had no significant influence on prevalence of diarrhea (Table 4).

**Discussion**

The dominant diseases affecting children below the age of 5 years in developing countries includes: diarrhea, malnutrition and respiratory infections [11]. Somalia is catastrophically affected by diarrhea with significant number of children being affected. The incidences of diarrhea in Somalia tends to increase with intensification of drought conditions [12]. The overall two weeks prevalence of diarrhea among children under 5 years in this study was 22.4%. Similarly based on a study conducted in Eastern Ethiopia, the prevalence of diarrhea among children below the age of 5 years was 22.5% [8]. Equally in a study done in Northwest Ethiopia the prevalence of diarrhea was reported as 21.5% [1]. However, the prevalence of diarrhea reported in this study was considerably higher than 19.5% reported in Somalia based on a 2011 Ethiopian Demographic and Health Survey [13]. Relatedly based on a study conducted in Burundi higher prevalence (32%) of diarrhea were reported as compared to the values reported by this study [3]. The variation in prevalence of diarrhea could be potentially attributed to differences in study area, infant and young children feeding and hygiene and sanitation [11].

Socio-demographic factors reported to significantly influence the prevalence of diarrhea among children below the age of 5 years were: number of children below 5 years and level of education. Based on this study over 80% of the caregivers had over two children below the age of 5 years thus the considerable demand for maternal care could result to lower adherence on hygiene and sanitation by the caregivers hence resulting to diarrhea. Similarly based on a study conducted in Northwest, Ethiopia having more than two children under the age of five years was cited as a determinant of diarrhea [14]. Relatedly based on studies conducted in Egypt and Eritrea the prevalence of diarrhea was reported to increase with the increase in number of children below the age of years [15,16]. According to Kawakatsu *et al.* [17] high prevalence of diarrhea was reported among children of illiterate caregivers. In this study over two thirds of the caregivers were reported to have primary as their highest level of education. Relatedly studies have cited that, children of mothers with an education below secondary level are more likely to experience diarrhea [18]. Studies have documented that maternal education is crucial to population health and its impacts are evident at individual and community level [19]. Additionally, studies have cited that well educated caregivers are more likely to have adequate personal hygiene and sanitation and better health seeking behavior which cumulatively potentially reduces the prevalence of diarrhea [20].

The current study documents that marital status, occupation and monthly income had no significant influence on the prevalence of diarrhea. Similarly based on a study conducted in Ethiopia, occupation and monthly income had no significant association with diarrhea among children under 5 years [21]. However, studies have reported significant association between family income and the occurrence of diarrhea among children below 5 years [22]. For instance, studies have reported that caregivers with high income will tend to seek modern treatment for diarrhea for their children [23]. Relatedly based on a study done in sub-Saharan Africa occupation was reported to significantly influence prevalence of diarrhea [24]. The disparities between the current study findings and other studies could be attributed to differences in maternal attention and study designs [21].
Conclusion

The prevalence of diarrhea among children under the age of the last two weeks prior to the survey was 22.4%. Socio-demographic factors that were reported to significantly influence the prevalence of diarrhea were; number of children below the age of five years and caregiver education level. Therefore, the Somalia government and other partners in the health sector should devise strategies to educate people on family planning and ensure accessibility of formal and informal education.

What is known about this topic
- Strategies being implemented by government and other partners to reduce diarrhea.

What this study adds
- Prevalence of diarrhea among children under 5 years in Bondhere district;
- Caregivers’ socio-demographic determinants of diarrhea;
- The way forward in reducing the prevalence of diarrhea among children under 5 years.

Competing interests

The authors declare no competing interests.

Authors' contributions

Mahad Dahir Turyare was responsible for developing the study concept, study design, data collection, data analysis, interpretation of results and drafting of the manuscript. Japheth Nzioke Mativo and Mary Kerich reviewed and provided guidance at all the stages of the manuscript development. Alex Karuiru Ndiritu provided statistical support. All the authors have read and agreed to the final manuscript.

Acknowledgments

We wish to thank the administrative leadership of Bondhere district for their support in this study. We also wish to appreciate the participants of this study for their waived cooperation.

Tables

Table 1: socio-demographic characteristics of the caregivers
Table 2: regression analysis model summary
Table 3: regression analysis Omnibus tests of model coefficients
Table 4: regression analysis of socio-demographic factors influencing diarrhea

References

1. Anteneh ZA, Andargie K, Tarekegn M. Prevalence and determinants of acute diarrhea among children younger than five years old in Jabithennan District, Northwest Ethiopia, 2014. BMC Public Health. 2017 Jan 19;17(1): 99. PubMed | Google Scholar
2. WHO. Diarrhoeal disease. 2017. Accessed January 30 2020.
3. Diouf K, Tabatabai P, Rudolph J, Marx M. Diarrhoea prevalence in children under five years of age in rural Burundi: an assessment of social and behavioural factors at the household level. Glob Health Action. 2014 Aug 21;7: 24895. PubMed | Google Scholar
4. Dairo MD, Ibrahim TF, Salawu AT. Prevalence and determinants of diarrhoea among infants in selected primary health centres in kaduna north local government area, nigeria. Pan Afr Med J. 2017 Oct 4;28: 109. PubMed | Google Scholar
5. ESHRB. Report of Diarrheal Diseases in the Region. ESHRB. 2014.
6. Hashi A, Kumie A, Gasana J. Prevalence of diarrhoea and associated factors among under-five children in Jigjiga District, Somali Region, Eastern Ethiopia. Open J Prev Med. 2016;6(10): 233-46. Google Scholar
7. Mengistie B, Berhane Y, Worku A. Prevalence of diarrhea and associated risk factors among children under-five years of age in Eastern Ethiopia: A cross-sectional study. Open J Prev Med. 2013;3(7): 446-53. Google Scholar

8. Mengistie B, Berhane Y, Worku A. Household water chlorination reduces incidence of diarrhea among under-five children in rural Ethiopia: a cluster randomized controlled trial. PLoS One. 2013 Oct 23;8(10): e77887. PubMed | Google Scholar

9. Berhe F, Berhane Y. Under five diarrhea among model household and non model households in Hawassa, South Ethiopia: A comparative cross-sectional community based survey. BMC Public Health. 2014 Feb 20;14: 187. PubMed | Google Scholar

10. UNFPA. Population estimation survey 2014 for the 18 pre-war regions of Somalia. 2014. Accessed January 30 2020.

11. Avachat SS, Phalke VD, Phalke DB, Aarif SMM, Kalakoti P. A cross-sectional study of socio-demographic determinants of recurrent diarrhoea among children under five of rural area of western Maharashtra, India. Australas Med J. 2011;4(2): 72-5. PubMed | Google Scholar

12. UNICEF Somalia. Emergencies; reaching every child in emergencies. 2017. Accessed January 30 2020.

13. EDHS. Ethiopia Demographic and Health Survey 2011. EDHS. 2012.

14. Mihrete TS, Alemie GA, Teferra AS. Determinants of childhood diarrhea among underfive children in Benishangul Gumuz Regional State, North West Ethiopia. BMC Pediatr. 2014 Apr 14;14: 102. PubMed | Google Scholar

15. El-Gilany A, Hammad S. Epidemiology of diarrhoeal diseases among children under age 5 years in Dakahlia, Egypt. East Mediterr Heal. 2005 Jul;11(4): 762-75. PubMed | Google Scholar

16. Woldemicael G. Diarrhoeal morbidity among young children in Eritrea: environmental and socioeconomic determinants. J Heal Popul Nutr. 2001 Jun;19(2): 83-90. PubMed | Google Scholar

17. Kawakatsu Y, Tanaka J, Ogawa K, Ogendo K, Honda S. Community unit performance: factors associated with childhood diarrhea and appropriate treatment in Nyanza Province, Kenya. BMC Public Health. 2017 Feb 16;17(1): 202. PubMed | Google Scholar

18. Samwel M, Eddison M, Faith N, Richard S, Elizabeth KM, Douglas N. Determinants of diarrhea among young children under the age of five in Kenya, evidence from kdfs 2008-09. Etude la Popul Africaine. 2014;28(2): 1046-56. PubMed | Google Scholar

19. DHS programs. The impact of maternal education on child nutrition: evidence from Malawi, Tanzania, and Zimbabwe. 2013. Accessed January 30 2020.

20. Adeyimika D, Mojisola O, Yetunde JA, Opeyemi O, Ayo AS. Maternal education and childhood diarrhea. African Journal of Reproductive Health. 2017 Feb 16;37: 2329. PubMed | Google Scholar

21. Godana W, Mengiste B. Environmental factors associated with acute diarrhea among children under five years of age in derrashe district Southern Ethiopia. Rural Remote Health. 2013;13(3): 2329. PubMed | Google Scholar

22. Kalid M, Omar E, Ibrahim AA, Said SA, Farah DA. Factors related to the occurrence of diarrheal disease in under-five children of IDP’s in Bosaso. Puntland-Somalia. 2016;13(1): 54-9. Google Scholar

23. Gebrehiwot EM, Berhetto TM, Worku A, Darebo TD, Sibamo EL. Childhood diarrhea in Central Ethiopia: determining factors for mothers in seeking modern health treatments. Sci J Clin Med. 2015;4: 4-9. Google Scholar

24. Aremu O, Lawoko S, Moradi T, Dalal K. Socio-economic determinants in selecting childhood diarrhoea treatment options in Sub-Saharan Africa: a multilevel model. Ital J Pediatr. 2011 Mar 23;37: 13. PubMed | Google Scholar
Table 1: socio-demographic characteristics of the caregivers

| Variables                             | Frequency | Percentage |
|---------------------------------------|-----------|------------|
| Are you the household head            |           |            |
| Yes                                   | 88        | 35.8       |
| No                                    | 158       | 64.2       |
| Who is the household head             |           |            |
| Husband                               | 165       | 67.2       |
| Mother in law                         | 15        | 6          |
| Father in law                         | 11        | 4.5        |
| Marital status                        |           |            |
| Single                                | 15        | 6.0        |
| Divorced                              | 33        | 13.4       |
| Married                               | 187       | 76.1       |
| Widowed                               | 11        | 4.5        |
| Number of children below 5 years      |           |            |
| One                                   | 40        | 16.4       |
| Two to three                          | 151       | 61.2       |
| Three and above                       | 55        | 22.4       |
| Gender of children below 5 years      |           |            |
| Male                                  | 132       | 53.5       |
| Female                                | 114       | 46.5       |
| Highest level of education            |           |            |
| No formal education                   | 99        | 40.3       |
| Primary                               | 63        | 25.4       |
| Secondary                             | 62        | 25.4       |
| Tertiary                              | 22        | 9.0        |
| Primary occupation                    |           |            |
| Livestock keeping                     | 158       | 64.2       |
| Salaried employee                     | 20        | 8.1        |
| Formal business owner                 | 22        | 8.9        |
| Informal business owner               | 39        | 15.9       |
| Crop farming                          | 7         | 2.9        |

Table 2: regression analysis model summary

| Step | -2 Log likelihood | Cox & Snell R Square | Nagelkerke R Square |
|------|-------------------|----------------------|---------------------|
| 1    | 18.968*           | 0.303                | 0.566               |

a. Estimation terminated at iteration number 6 because parameter estimates changed by less than 0.001.
### Table 3: regression analysis Omnibus tests of model coefficients

|   | Chi-square | df | Sig. |
|---|------------|----|------|
| Step 1 Step | 16.932 | 6 | 0.010 |
| Block | 16.932 | 6 | 0.010 |
| Model | 16.932 | 6 | 0.010 |

### Table 4: regression analysis of socio-demographic factors influencing diarrhea

| Step 1° | B       | S.E.  | Wald | df | Sig. | Exp(B) | 95% CI for EXP(B) |
|---------|---------|-------|------|----|------|--------|--------------------|
|         |         |       |      |    |      |        | Lower             | Upper             |
| Household head | -6.303 | 3137.653 | 0.000 | 1  | 0.998 | 0.002 | 0.000             | 1.4351            |
| Marital status  | 0.819  | 8.110 | 0.010 | 1  | 0.920 | 2.267 | 0.000             | 8.910             |
| Number of children < 5 yrs | -3.219 | 1.770 | 3.309 | 1  | 0.049 | 1.040 | 1.001             | 2.284             |
| Level of education | 1.503 | 0.719 | 4.366 | 1  | 0.037 | 4.494 | 1.098             | 18.401            |
| Occupation | 0.709 | 0.603 | 1.383 | 1  | 0.240 | 2.032 | 0.623             | 6.625             |
| Monthly income | 0.668 | 0.366 | 3.326 | 1  | 0.068 | 1.950 | 0.951             | 3.998             |
| Constant | -2.263 | 3137.738 | 0.000 | 1  | 0.999 | 1.950 | 0.951             | 3.998             |

Variable(s) entered on step 1: household head, marital status, children < 5yrs, level of education, occupation, monthly income

---

*Mahad Dahir Turyare et al.* PAMJ - 38(391). 21 Apr 2021. - Page numbers not for citation purposes.