Health care seeking behavior for common childhood morbidities in Ethiopia: The effects of maternal behavior and access to key health services

Cindy Xin Feng

University of Saskatchewan

Nigatu R Geda (✉ negyon@yahoo.com)

Addis Ababa University

Susan J Whiting

University of Saskatchewan

Rein Lepnum

University of Saskatchewan Western College of Veterinary Medicine

Carol J Henry

University of Saskatchewan

Bonnie Janzen

University of Saskatchewan

Research

Keywords: Acute Respiratory Illness, Diarrhea, Determinants, Health Services, Morbidity, Ethiopia.

Posted Date: July 21st, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-44306/v1>

License: © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

Background: Childhood morbidities such as diarrhea and pneumonia are the leading causes of death in Ethiopia. Appropriate healthcare-seeking behavior of mothers for common childhood illnesses could prevent a significant number of these early deaths; however, little nation-wide research has been conducted in Ethiopia to assess mothers' healthcare-seeking behavior for their children.

Method: The study used the Ethiopian Demographic and Health Surveys (EDHS) conducted in 2016 on a nationally representative sample of 10641 children under the age of five. The main determinants of care-seeking during diarrhea and Acute Respiratory Infection (ARI) episodes were assessed using multiple logistic regression analyses while adjusting for complex survey design.

Results: Only 43% and 35% of households sought medical attention for their children in episodes of diarrhea and ARI, respectively, during a reference period of two weeks before the survey. The odds of seeking care for diarrhea are lower for non-working mothers versus working mothers. The likelihood of seeking care for diarrhea or ARI is higher for fathers who had education versus no education. The place of delivery for the child, receiving postnatal checkup and getting at least one immunization in the past determined the likelihood of seeking care for ARI, but not for diarrhea. The odds of seeking care are higher for both diarrhea and ARI among households that are headed by females and where mothers experienced domestic violence. Religion and types of family structure are also significant factors of seeking care for diarrhea episodes, but not for ARI.

Conclusion: Given the high morbidity and mortality rates for children in Ethiopia, a deeper understanding of the health-seeking behaviour of mothers may provide insights for identifying the potential gaps and developing improvement of mothers' awareness and perception towards childhood problems

1. Introduction

Reducing preventable deaths of newborns and children under-5 years of age is one of the priority areas of sustainable development (1). The direct causes of most early age mortality are diseases that are preventable and treatable, namely pneumonia, diarrhea, malaria, and measles (in descending order) (2–4). Despite efforts in ensuring universal access to health care through the national Health Sector Development Program (5), Ethiopia is still experiencing one of the highest prevalence of poor health outcomes for children, especially regarding under-5 mortality (6). For children under-5 years old, mortality is 114 deaths per 1,000 live births in rural areas and 83 deaths per 1,000 live births in urban areas. Common childhood illnesses and nutritional deficiencies have been the underlying cause for a significant proportion (at least 28%) of all child deaths in Ethiopia (7). Most of these lives could be saved through affordable treatment measures like antibiotics for acute respiratory infections, oral rehydration for diarrheal diseases, and the use of appropriate drugs for malaria(1,8). Poor healthcare-seeking behavior of parents has been shown to contribute to ineffective prevention and control of morbidity and mortality related to health conditions (9)

In this regard, research-based evidence on care-seeking behavior on common morbidities is required in order to design appropriate child survival strategies in countries like Ethiopia, where the early mortality rate is high (10). In Ethiopia, only a small proportion of children with common childhood illnesses receive appropriate health care(8,10). While care-seeking behavior is generally influenced by availability, quality of services, and personal choices, the roles played by maternal and behavioral variables are crucial. Low care-seeking behavior is particularly pronounced among households in the poorest quintile, in rural areas, with poor parental education, and those who are non-users of basic maternal and child health services(8,10–12). Other contributing factors could be: accessibility to service; severity of illness; trust in healthcare providers; and prior beliefs concerning treatment of the illness(13).

Previous studies conducted on the health of children in Ethiopia have focused on small/ local areas (8,10) micro-level data or have addressed only one population category (such as rural areas)(14). The present study addresses these limitations by using nationally representative data and considers a wide range of variables. Drawing from the existing literature, it is hypothesized that care-seeking from public/private health facilities during episodes of the two most common childhood illnesses, namely diarrhea and Acute Respiratory Infection (ARI) would be lower among those who did not have access to key health services for children (Antenatal care/ANC, institutional delivery service, postnatal care, and basic immunization services). It is also posited that poor care-seeking would be more a function of maternal factors such as the living context, knowledge, and resources of these women.

Therefore, this study aims to assess the socioeconomic disparities in healthcare-seeking behavior among mothers during their child's illness.

2. Materials And Methods

2.1 Conceptual Framework

The conceptual framework (Fig. 1) of for factors of health seeking behaviors for mothers of children with diarrhea and ARI conditions is based on Anderson's behavioral model(15). The model assumes that health-seeking behavior is a function of three sets of characteristics: predisposing, enabling, and need. The actual seeking of health services is assumed to be a sequential and conditional function of the individual's predisposition to use health services, their perceived need to use them, and their ability to obtain the services (5).

2.2 Data and study population

The present study was conducted using a nationally representative cross-sectional data of the most recent Ethiopian Demographic and Health Survey (EDHS, 2016). The data were collected from 10,641 ever-married (15–49 years) drawn from the nine regions. The EDHS employed a two-stage stratified cluster sampling(6). Well trained and experienced interviewers conducted the surveys. For the present analysis, only those who reported episodes of acute respiratory and diarrhea illness during the two weeks

preceding the survey date are considered. The detailed description of methods, design, instruments, participants, and sampling frame had previously been published by the Central Statistics Authority of Ethiopia and Macro International (6). Permission to use the data for the purposes of the present study was granted by ORC Macro International and Central Statistics Authority. Ethical approval for this study was obtained from the University of Saskatchewan.

2.3 Measures

Two dichotomous outcome variables were considered in the current analysis: appropriate seeking of treatment for diarrhea and ARI, respectively, constructed based on mothers' responses to questions on recent episodes of various forms of morbidities. Appropriate healthcare-seeking behavior was defined as situations when mothers visited any health facility/institution during episodes of childhood illnesses for diarrhea or ARI. Information on the diarrhea episode during the reference period of two weeks was used. Diarrhea is described as an abnormal increase in the frequency, volume, or liquidity of stools, lasting from a few hours to several days(16,17). ARI is derived based on mothers' responses to questions if their child had a fever, cough, chest congestion, or short rapid breaths in the two weeks preceding the survey(6). The WHO referred these symptoms as "suspected pneumonia" (6). The EDHS survey considered them as a proxy measure of pneumonia(16). In a follow-up question, mothers who reported the occurrence of these symptoms were asked if the child required medical attention. Health care seeking behavior was coded as "1" if mothers sought care during such episodes and "0" if no care was sought.

The choice of potential explanatory variables was guided by literature reviews and model fitting procedures. To capture the key determinants of care-seeking, a wide range of explanatory variables were included. For the purpose of this analysis, the explanatory variables were divided into three major categories: 1) Predisposing factors (Sex of household head, birth order, parity, religion, paternal education, maternal education, IPV); 2) enabling factors (wealth at household level, work status, community-level wealth, overall community literacy and residence); and 3) need factors which includes behavioral variables (utilization of ANC, delivery care, postnatal care, and immunization). Most of the background variables such as child's sex, age, parental education, type of family structure, parity were used the way they were coded in the original data. The remaining variables were constructed by combining certain items. Of importance are those measured using indices such as intimate partner violence (IPV), wealth index, community-level wealth, and community-level maternal education. IPV was constructed from mother's binary response for five sets of questions about her experiences of violence by her partner (beating, insulting, causing physical assault, chasing from home, and slapping). The variable was dichotomized into no/ low IPV and high IPV based on the average value. Household wealth was estimated in the DHS with an asset-based index that combined information about ownership of consumer goods, housing quality, and water and sanitation facilities (6). This is a combined measure of the cumulative living standard. Community-level wealth was measured based on the mean of the wealth index of each household in a cluster. Similarly, mean maternal education at the community level was measured based on information on the highest education achieved by each individual woman. These two variables were used in the analysis as continuous variables.

2.4 Statistical Analysis

Data were analyzed using SPSS, version 20 (18). Percentage and frequency were used to describe the distribution of child morbidity status and care-seeking by selected socio-demographic characteristics. Bivariate logistic regression was conducted to select the variables with p -values < 0.2 . Multiple logistic regression analyses were then conducted to examine the association between selected explanatory variables and the two-health care seeking variables. Both crude odds ratio (COR) and adjusted odds ratio (AOR) with 95% confidence interval (CI) were computed. A backward model selection method was employed. We used a p -value ≤ 0.05 to ascertain statistical significance(19). All analyses were weighted per DHS guideline (6).

3. Results

The analysis was conducted on the reported cases of 1227 diarrhea and 1280 ARI. The proportion of households representing urban and rural residents is was 11% and 89%, respectively (Table 1). Many of the respondents (50.7%) reported household sizes of 4–6 followed by households of 7 or more (38.8%). The average household size for the reported cases was 6.02 ± 2.28 . The distribution of respondents by asset-based wealth status showed a difference of about 9.5% between the top and bottom quantiles. About 11% of the respondents were engaged in polygamous marriages; they were in their prime reproductive ages (20–34) with a median age of 19.2 years. Overall educational attainment by both men and women was very low, with 66% of mothers and 51% of fathers having no education during the survey. A total of 1227 (11.8%) mothers reported at least one under-5 child with a diarrhea episode in the two weeks preceding the survey, and a total of 1280 (11.3%) mothers reported at least one under-5 child with an ARI episode.

Tables 2 and 3 present the results of the bivariate (unadjusted effects) and multivariable (adjusted effects) analysis of care-seeking for diarrhea episodes and ARI, respectively. The odds of diarrheal care-seeking decrease by 33% for non-working mothers compared to those working outside the home (AOR = 0.672, 95% CI: 0.453–0.996). Fathers' literacy was significant in both models, where the likelihood of care-seeking increases when fathers have some education. Child's place of delivery, receiving postnatal checkup and getting at least one immunization services in the past determined the likelihood of care-seeking for ARI episodes, but not for diarrhea. For instance, mothers who delivered their child at home have a lower chance of taking their ill child to medical attention in case of ARI episodes compared to those who were born in health facilities (AOR = 0.551, 95% CI: 0.392–0.773). The odds of care-seeking for ARI episodes decrease by about 44% for those who never had postnatal checkup (AOR = 0.548, 95%CI: 0.358–0.839) compared to those mothers who had a postnatal checkup. Mothers whose children did not receive immunization in the past are also less likely to seek care for children's ARI episodes compared to mothers whose children who had at least one immunization (AOR = 0.475, 95%CI: 0.285–0.792).

Table 1

Descriptive statistics of mothers' care-seeking for their children's diarrhea and ARI episodes during the two weeks preceding the survey date in Ethiopia, 2016.

		Diarrhea (n = 1227)	ARI (n = 1280)
Characteristics	n(%)	Yes (%)	Yes (%)
Sex of the household head			
Male	9494(86.1)	449(41.3)	283(24.8)
Female	1529(13.9)	75(52.8)	66(47.1)
Residence			
Urban	1216(11.0)	74(58.7)	50(53.8)
Rural	9807(89.0)	450(40.9)	299(25.2)
Family structure			
Monogamous	9243(83.9)	451(43.5)	283(26.4)
Polygamous	1219(11.1)	42(35.3)	40(25.6)
Place of delivery			
Institution	1216(11.0)	200(52.2)	155(42.9)
Home	9807(89.0)	324(38.3)	194(21.1)
Religion			
Orthodox Christians	3772(34.2)	203(45.0)	138(29.2)
Other	7251(65.8)	321(41.3)	210(26.0)
Mothers work status			
Working	2988(27.1)	181(48.4)	135(34.7)
Not working	8035(72.9)	343(40.2)	214(24.0)
Postnatal check			
No postnatal check for most recent birth	9706(88.1)	98(50.0)	79(42.9)
Had post-natal check for most recent birth	1316(11.9)	426(41.3)	270(24.6)
Intimate partners violence			
No	2763(25.1)	112(38.6)	65(19.1)
Yes, low to high	8259(74.9)	412(44.0)	284(30.2)
Children ever born			

		Diarrhea (n = 1227)	ARI (n = 1280)
1–3	4836(43.9)	292(48.8)	172(30.8)
4–6	3732(33.9)	155(36.6)	107(24.7)
6+	2454(22.2)	77(37.4)	70(24.3)
Birth order			
First	2058(18.7)	110(44.0)	93(36.0)
Other	8965(81.3)	413(42.3)	255(25.0)
Household wealth			
Poorer and poorest	5156(46.8)	200(37.2)	129(23.1)
Medium	2280(20.7)	103(38.4)	75(24.0)
Richer and richest	3587(32.5)	221(52.4)	144(35.2)
Immunization			
Had at least one vaccination	9616(87.2)	477(43.4)	326(29.1)
Never had vaccination	1407(12.8)	47(36.4)	22(13.8)
Mothers' literacy status			
Literate	3739(33.9)	352(38.8)	247(24.7)
Illiterate	7284(66.1)	172(53.9)	102(36.4)
Fathers literacy status			
Literate	5385(48.9)	290(44.0)	209(30.8)
Illiterate	5637(51.1)	234(41.1)	140(23.3)

Table 2

Unadjusted and adjusted odds ratio for determinants of mothers' treatment-seeking behavior for diarrhea episode in Ethiopia, 2016 (n = 1227).

Characteristics	Unadjusted		Adjusted (Backward elimination)	
	COR (95% CI)	p-value	AOR (95% CI)	p-value
Sex of the household head				
Male				
Female	0.726(1.081–2.758)	0.022	2.182(1.143–4.164)	0.018
Family structure				
Monogamous				
Polygamous	0.447(.243-.824)	0.010	0.381(0.188–0.770)	0.007
Religion				
Orthodox				
Other	0.616(.440-.864)	0.005	0.545(0.367–0.808)	0.003
Women work status				
Working				
Not working	0.642(.454-.909)	0.012	0.672(0.453–0.996)	0.048
Intimate partners violence				
No				
Yes, low to high	2.086(1.378–3.157)	0.001	1.826(1.152–2.893)	0.010
Father's literacy status				
Literate				
Illiterate	0.679(0.486–0.949)	0.023	0.629(0.417–0.949)	0.027
Household wealth				
Poorer and poorest				
Medium	1.785(1.161–2.743)	0.008		

<i>Characteristics</i>	Unadjusted	Adjusted (Backward elimination)
Richer and richest	1.562(1.072–2.277)	0.020
Place of delivery		
Institution		
Home	0.604(0.429–0.851)	0.004
Postnatal check		
Yes		
No	0.570(0.369–0.881)	0.011
Children ever born		
1–3		
4–6	0.574(0.393–0.839)	0.004
6+	0.678(0.431–1.065)	0.092
Birth order		
First		
Other	0.773(1.527–1.133)	0.187
Immunization		
Had at least one vaccination		
Never had vaccination	0.359(0.196–0.660)	0.001
Mothers' literacy status		
Literate		
Illiterate	0.562(0.403–0.784)	0.001
Residence		
Urban		
Rural	0.566(0.337–0.949)	0.031

<i>Characteristics</i>	Unadjusted	Adjusted (Backward elimination)		
Wealth at community level (%)	1.285(1.075–1.536)	0.006		
Women education at the community level (mean years completed)	1.224(1.100–1.363)	0.000	1.192(1.055–1.347)	0.005

Table 3

Unadjusted and adjusted odds ratio for determinants of mothers' treatment-seeking behavior for ARI episode in Ethiopia, 2016 (n = 1280).

Characteristics	Unadjusted		Adjusted	
	COR (95% CI)	p-value	AOR (95% CI)	p-value
Sex of the household head				
Male				
Female	2.286(1.569–3.331)	0.000	1.861(1.233–2.808)	0.003
Place of delivery				
Institution				
Home	0.341(0.258–0.452)	0.000	0.551(0.392–0.773)	0.001
Postnatal check-up				
Yes				
No	0.332(0.230–0.480)	0.000	0.548(0.358–0.839)	0.006
Intimate partners violence				
No				
Yes, low to high	1.998(1.457–2.740)	0.000	1.556(1.106–2.190)	0.011
Birth order				
First				
Other	0.522(0.381–0.716)	0.000	0.641(0.450–0.911)	0.013
Immunization				
Had at least one vaccination				
Never had vaccination	0.457(0.281–0.742)	0.000	0.475(0.285–0.792)	0.004
Father's literacy status				
Literate				
Illiterate	1.537(1.167–2.024)	0.002	0.672(0.504–0.896)	0.007

Characteristics	Unadjusted	Adjusted
Household wealth		
Poorer and poorest		
Medium	0.951(0.678–1.334)	0.772
Richer and richest	1.970(1.456–2.665)	0.000
Type of family structure		
Monogamous		
Polygamous	1.141(0.839–1.550)	0.401
Mother's literacy status		
Literate		
Illiterate	1.537(1.167–2.024)	0.000
Women work status		
Working		
Not working	0.644(0.490–0.847)	0.002
Children ever born		
1–3		
4–6	0.739(0.549–0.995)	0.046
6+	0.787(0.558–1.109)	0.171
Residence		
Urban		
Rural	0.246(0.150–0.404)	0.000
Wealth at community level (%)	1.478(1.283–0.703)	0.000
Women education at the community level (mean years completed)	1.191(1.098–0.292)	0.000

Among the household and community variables, the odds of care-seeking increases in both diarrhea and ARI for female-headed households compared to male-headed households (AOR = 2.182, 95% CI:1.143–4.164 and AOR = 1.861, 95%CI: 1.233–2.808, respectively). The likelihood of care-seeking for diarrhea episodes decreases by about 62% in women living in polygamous households compared to those living in monogamous ones (AOR = 0.38, 95% CI:0.0188-0.770). Mothers who experienced low to high domestic violence have increased likelihood of care-seeking behavior by 1.83 and 1.56 times for their children's diarrhea and ARI episodes, respectively. Compared to followers of Orthodox Christianity, women from other religious faiths (Muslim, Catholic Christians, and others) have lower odds of care-seeking in case of diarrhea episodes (AOR = 0.545, 95% CI: 0.367–0.808).

4. Discussion

The study shows that less than half (43%) of households sought medical care for diarrhea and barely over a third (35%) of households sought medical care for symptoms of ARI. Though the low reporting of care-seeking behavior is partly attributed to poor health infrastructure and poverty at the national scale, this study argued that the likelihood of seeking care for diarrhea and ARI is heavily determined by a set of predisposing and enabling factors at the individual level.

Among the predisposing characteristics of children, birth order is the only predictor significant for ARI only. There is an inverse relationship between the birth order of the child and care-seeking during the ARI episode, suggesting that care-seeking declined for the second and subsequent births. The increased confidence mothers develop during subsequent births partly explains why many mothers did not seek medical attention for symptoms of diarrhea and ARI(20). Interestingly, the analysis indicated more effects of fathers' education than mothers' education. The effect of fathers' education may stem from the fact that they usually have better jobs and/or that higher income to the families. As educated fathers can better-recognizing danger signs of childhood illnesses, there is no doubt it motivates the household to seek medical help. It is usually the mother's responsibility to take the child to health facilities. The historical mortality-education researchers of the twentieth century (21,22) reported the effect of successful completion of primary schooling or functional literacy as enough to promote child health and survival. A study in India found that even after controlling for assets owned by the household, the probability of seeking care increases with the educational qualification of the father (23). Although the bivariate analysis showed a significant association between mother's education and the two outcomes, it turns out insignificant once other variables were included in the models. Previous studies documented that literate mothers have several advantages over illiterate ones with regards to the quality of childcare(24–26) as they generally tend to make aggressive use of health care services (26).

The effect of religion on care-seeking behavior agreed with earlier studies. A study in rural Ethiopia reported that Orthodox Christian households are more likely to seek modern health care and seek care earlier compared to Muslim-headed households (14). Similarly, another local study on maternal health-seeking behavior based on the Ethiopian DHS found that Muslim women are less likely to seek postnatal

care compared to Orthodox Christian women(27). In the present study, which is nation-wide, mothers from Orthodox Christianity were more likely to seek treatment for diarrhea episodes.

There are few studies conducted to assess the effects of polygamous family structure on health-seeking for childhood morbidities. After controlling for household wealth and maternal education, our result suggests significant adverse effects of mothers in polygamous marriages on care-seeking during diarrhea episodes. One pioneer study on polygamy in Africa reported that being in a polygamous household has little impact on the likelihood of children receiving medical treatment for fever or diarrhea(28). On the contrary, Arthi and Fenske (2018) reported that polygyny is negatively associated with a range of indicators of early life care in the Nigerian DHS (29). They also pointed out that competition between wives with the same husband leads to relative inefficiency in resource production and consumption compared to hypothetically more harmonious monogamous unions, in turn reducing child health (29). In 2012, Henrich, Boyd, and Richerson (30) further reiterated that polygamous men usually prefer to divert their resources into accumulating additional wives rather than into raising existing offspring.

Another striking finding of the present study is the positive association between mothers' experiences of Intimate Partner Violence and treatment-seeking for both diarrhea and ARI. Consistent with this finding, a recent study in Bangladesh (31) reported that infants of mothers exposed to different forms of family violence had 26–37% higher incidence of diarrhea. In another study in India, treatment-seeking was most prevalent in women who had been exposed to a combination of physical, sexual, and emotional abuse (48.8%) (32). Given the fact that most Ethiopian women have poor education and low autonomy, it aggravates the likelihood of women experiencing different forms of domestic violence.

The study clearly reiterated that the use of basic maternal and child services (institutional delivery, postnatal care, and basic immunization) makes significant differences in the likelihood of developing care-seeking behavior for ARI but not for diarrhea. Studies in other developing countries reported that fever and ARI were more frequently treated at a facility, while diarrhea was usually treated at first at home (33,34). The use of the simple and standard treatment for diarrhea treatment (ORS or HRS) remains sub-optimal in many countries including Ethiopia. In a recent study in Tanzania, for instance, almost all children (99%) treated at home received ORS or RS(33). Some previous studies have indicated the continuum effects of attending ANC and delivery on subsequent use of health facilities. They claimed that these basic health services are commonly used as an opportunity for health promotion (35). Thus, women who attended ANC/delivery/ postnatal care services can easily acclimatize to the health facility environment (36). This may help them avoid unnecessary fear and stress related to the utilization of childcare and related services. In Ethiopia, the eight basic vaccination services are provided at both the conventional health facilities and through occasional village campaigns. Such campaigns are also usually used to counsel and educate women about signs and symptoms of common childhood illnesses and the risks associated with them.

Strength and limitations

As the study was conducted based on nationally representative data, the generalizability of the current study to a wider population group is a major strength. Further, the factors analyzed in this study have not been addressed much in previous studies, and hence, sheds light on possible interventions to improve child health and survival in Ethiopia. However, certain limitations warrant careful interpretation of the results of the study. First, care-seeking was examined for only two common childhood morbidities (diarrhea and ARI) due to data limitations. Second, childhood morbidity is season dependent. A longitudinal study may be more suitable to provide data covering different seasons. Third, the DHS system generated the morbidity data based on mothers' reports of their children's health in the past two weeks preceding the survey. The responses could be biased as they depend on mothers' perceptions of reality than on clinical examination, and hence, might have introduced some reporting bias and recall bias, creating either under-reporting or over-reporting of childhood illnesses. Due to a lack of data, the present study did not address some of the factors that significantly affect health-seeking behavior such as socio-cultural taboos and prevalence of traditional healthcare in the environment, accessibility to service, the trust in healthcare providers, and prior beliefs concerning the treatment of the illness, and perception of the severity of illness.

5. Conclusion

Our study indicated that a substantial proportion of Ethiopian women did not seek health care for their children's diarrheal and AIR conditions. More coordinated efforts should be made to ensure equitable access to health care services focusing on low-income households and mothers of poor education. Strengthening partnerships with public facilities, private health care practitioners, and community-based organizations would help further improve access to the services. Promoting continuous community-level health education should be more crucial areas of concern for rural health extension workers and program administrators in Ethiopia.

Abbreviations

ANC
Antenatal Care
ARI
Acute Respiratory Infection
CSA
Central Statistics Authority
DHS
Demographic and Health Surveys (DHS).
EDHS
Ethiopian Demographic and Health Surveys
GDP
Gross Domestic Product

IPV
Intimate Partners Violence
SDGs
Sustainable Development Goals
SES
Socio-Economic Status
US
United States
WHO
World Health Organization

Declarations

Ethics approval and consent to participate

Ethical clearance was obtained from the Institutional Review Board of the University of Saskatchewan. The DHS took informed consent from respondents prior to the administration of the questionnaire.

Consent for publication

Consent to publish the data was taken from ICF International/ DHS.

Availability of data and material

The datasets used for this study are made available from ICF international upon request.

Competing interests

The authors declare no competing interest.

Funding

There was no financial support taken from any organization.

Author Contributions:

NR, CF, and SW were involved in the study conception and design. NR was responsible for the data analysis; CF and SW contributed to the discussion, interpreted the findings. JB, RL and CH critically reviewed/edited the manuscript for intellectual content. All authors read and approved the final manuscript.

Acknowledgments:

The authors would like to gratefully acknowledge the Macro International Inc. (USA) and the Central Statistics Authority (Ethiopia) for their kind permission to use the data.

References

1. UN. The Sustainable Development Goals Report 2017 [Internet]. 2017. Available from: <https://unstats.un.org/sdgs/files/report/2017/thesustainabledevelopmentgoalsreport2017.pdf>.
2. Black R. Global, regional, and national causes of child mortality in 2008: a systematic analysis. *Lancet*. 2010;375(9730):1969–87.
3. Bryce J, Boschi-Pinto C, Shibuya KBR. WHO Child Health Epidemiology Reference Group WHO estimates of the causes of death in children. *Lancet*. 2005;365:1147–52.
4. Mulholland K. Magnitude of the problem of childhood pneumonia. *Lancet*. 1999;354:590–2.
5. Federal Democratic Republic of Ethiopia. Country profile of Federal Democratic Republic of Ethiopia, IMF Country Report No. 13/308. Addis Ababa, Ethiopia; 2013.
6. CSA and ICF International. Central Statistical Agency [Ethiopia] and Macro International. Ethiopian Demographic Health Survey, 2016. Calvrton,USA; 2016.
7. African Union Commission
UN Economic Commission for Africa & UNWFP
African Union Commission. Planning NEPAD, Agency C. UN Economic Commission for Africa & UNWFP. The cost of hunger in Africa: Social and economic impact of child undernutrition in Egypt, Ethiopia, Swaziland and Uganda. Addis Ababa, Ethiopia; 2014.
8. Kolola T, Gezahegn TAM. Health Care Seeking Behavior for Common Childhood Illnesses in Jeldu District, Oromia Regional State, Ethiopia. *PLoS One*. 2012;11(10):e0164534.
9. Ellis AA, Traore S, Doumbia S, Dalglish SLWP. Treatment actions and treatment failure: Case studies in response to severe childhood febrile illness in Mali. *BMC Public Health*. 2012;12(946).
10. Simieneh MM, Mengistu MY. Abebaw Addis Gelagay and MTG. Mothers' health care seeking behavior and associated factors for common childhood illnesses, Northwest Ethiopia: community-based cross-sectional study. *BMC Heal Serv Res*. 2019;19(59).
11. Deressa W, Ali A, Berhane Y. Maternal responses to childhood febrile illnesses in an area of seasonal malaria transmission in rural Ethiopia. *Acta Trop*. 2007;102(1):1–9.
12. Tsion A, Tefera B, Ayalew T, Amare D. Mothers' Health Care Seeking Behavior For Childhood Illnesses In Derra District, Northshoa Zone, Oromia Regional State, Ethiopia. *Ethiop J Heal Dev*. 2008;18(3):87–94.
13. Samer Abuzerr S, Nasser M, Yunesian M, Hadi AH, Mahvi R, Nabizadeh AAM. Prevalence of diarrheal illness and healthcare-seeking behavior by age-group and sex among the population of Gaza strip: a community-based cross-sectional study. *BMC Public Health*. 2019;19(704).
14. Anagaw Mebratie E, Van de Poel Z, Yilma D, Abebaw G, Alemu, Arjun SB. Healthcare-seeking behaviour in rural Ethiopia: evidence from clinical vignettes. *Health Econ*. 4(2).
15. Andersen RM. Revisiting the behavioral model and access to medical care: does it matter? *J Health Soc Behav*. 1995;36:1–10.

16. WHO. Integrated Management of Childhood Illnesses [Internet]. 2019. Available from: <https://apps.who.int/medicinedocs/documents/s18808en/s18808en.pdf>.
17. WHO. Maternal, newborn, child and adolescent health [Internet]. 2018. Available from: https://www.who.int/maternal_child_adolescent/documents/9241593180/en/.
18. Statistical Package for Social Sciences/SPSS. IBM Corp. Released 2011. IBM SPSS Statistics for Windows, Version 20.0. 2011.
19. Greenland S. Commentary Modeling and Variable Selection in Epidemiologic Analysis. *Am J Public Heal*. 1989;79(3):340–9.
20. Ononokpono DNOC. Determinants of maternal health care utilization in Nigeria: a multilevel approach. *Pan Afr Med J*. 2014;17(1).
21. Mosley WH, Chen LC. An Analytical Framework for the Study of Child Survival in Developing Countries. *Popul Dev Rev* [Internet]. 1984;10:25–45. Available from: <http://www.jstor.org/stable/2807954>.
22. Davis K, Blake J. “Social Structure and Fertility”: An analytical framework. *Econ Dev Cult Change*. 1956;4:221–35.
23. Anindita Chakrabarti. Determinants of child morbidity and factors governing utilization of child health care: evidence from rural India. *Appl Econ*. 2012;44(1):27–37.
24. Goldman N. Social Inequalities in Health. Disentangling the Underlying Mechanisms. *Annals of the New York Academy of Sciences*. 2001;(954):118–39.
25. Corman Hope MG. Determinants of neonatal mortality rates in the US: a reduced form model. NBER. 1984.
26. Ermisch J, Francesconi M. Family matters: impacts on family background on educational attainments. *Economica*. 2001;68:137–56.
27. Ethiopian Society of Population Studies. Maternal health care seeking behaviour in Ethiopia: findings from EDHS 2005. ESPS. 2008.
28. Gage A. Familial and socioeconomic influences on children’s well-being: An examination of preschool children in Kenya. *Soc Sci Med*. 1997;45(12):1811–28.
29. Arthi V, Fenske J. Polygamy and child mortality: Historical and modern evidence from Nigeria’s Igbo. *Rev Econ Househ*. 2018;16(1):97–141.
30. Henrich J, Boyd R, Richerson P. The puzzle of monogamous marriage. *Philosophical Transactions of the Royal Society Biol Sci*. 2012;367(1589):657–69.
31. Asling-Monemi K, Naved RT, Persson L. Violence against women and increases in the risk of diarrheal disease and respiratory tract infections in infancy: a prospective cohort study in Bangladesh. *Arch Pediatr Adolesc Med*. 2009;163(10):931–6.
32. Malin Leonardsson M, San S. Prevalence and predictors of help-seeking for women exposed to spousal violence in India – a cross-sectional study. *BMC Womens Health*. 2017;17:99.

33. Almamy M, Kanté HR, Gutierrez AM, Larsen EF, Jackson, Stéphane Helleringer, Amon Exavery, Kassimu Tani JFP. Childhood Illness Prevalence and Health Seeking Behavior Patterns in Rural Tanzania. BMC Public Health. 2015;15(951).
34. Khera R, Jain S, Lodha R, Ramakrishnan S. Gender bias in child care and child health: global patterns. Arch Dis Child. 2014;99:369–74.
35. Lawn J, Kerber K, Ou C, Yang H, Balinandi S, Sawadogo S, et al. Opportunities for Africa's newborns: practical data policy and programmatic support for newborn care in Africa. J Virol Methods. 2007;144(1–2):109–14.
36. Fekadu GA, Kassa GM, Berhe AK, Muche AA, Nuradin AK. The effect of antenatal care on the use of institutional delivery service and postnatal care in Ethiopia: a systematic review and meta-analysis. BMC Heal Serv Res. 2018;18(577).

Figures

Figure 1

Conceptual Framework of the study developed based on Anderson’s behavioral model of health service utilization(15)