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Rapid Assessment of Indirect Effect of Handwashing Campaign during COVID 19 Risk Communication and Community Engagement on Diarrhoea and Respiratory Illness among Children under Five in Jijiga Town of Somali Region of Ethiopia

Olusola Oladeji[1*], Abdifatah Elmi Farah[1], Asli Hassan[1], Mohamed Ayanle[2] and Yusuf Mohammed Ali[2]

[1]UNICEF Somali Field Office, Jigjiga, Ethiopia.
[2]Somali Regional Health Bureau, Jigjiga, Ethiopia.

Authors' contributions

This work was carried out in collaboration among all authors. Author OO conceived the documentation, analyzed the data, drafted and finalized the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Aims: Diarrhoea and pneumonia are serious global public health problems affecting child survival especially in the developing countries. The study aimed to assess the indirect effect of hand washing campaign during COVID risk communication and community engagement on diarrhoea and respiratory infection among children under five.
Study Design: This was both cross sectional survey and retrospective chart review.
Place and Duration of Study: Jijiga Town of Somali Region, Ethiopia between November 2019 and 30th June 2020.

**Corresponding author: E-mail: ooladeji@unicef.org, olusolaoladeji70@yahoo.com;*

Methodology: Handwashing practices among the households and the reported number of diarrhoea and acute respiratory infection in the District Health Information System (DHIS) database 4 months before and 4 months during COVID 19 risk communication handwashing campaign was assessed and paired t test used to determine the effect of the campaign on diarrhoea and respiratory illness at a significant level of 5%.
Results: 255(44%) of the 580 households had basic hand washing facilities, however 171 (67.1%) of the 255 households with hand washing facilities demonstrated appropriate hand washing techniques. The percentage mean reduction in the number of children under five treated for acute respiratory infection and diarrhoea before and during the campaign was 6.49% and 11.5% though not statistically significant with p value = 0.778 and 0.3952 respectively.
Conclusion: The study reaffirmed the effect of proper hand washing practices on the reduction of episodes of diarrhoea and acute respiratory infection among children which ultimately will contribute to reducing child mortality and shows that COVID interventions and investment could be used to support and strengthen non COVID routine health services.

Keywords: Handwashing; COVID 19; diarrhoea; acute respiratory infection; risk communication.

1. INTRODUCTION

Diarrhoea and acute respiratory infection are serious global public health problems affecting child survival especially in the developing countries. Every year, millions of children under 5 years of age die, mostly from preventable causes such as pneumonia, diarrhoea and malaria with unsafe water, poor sanitation and hygiene being significant contributing factors [1].

In 2016, the United Nations Children's Fund (UNICEF) estimated that 1.4 million children die from pneumonia and diarrhoea every year and these conditions account for 15% and 9% of under-5 deaths, respectively with the majority occurring in low-resource settings [2].

Diarrhoeal disease and acute respiratory infections (ARIs) are strongly linked with poor hand washing practices among other factors and there is an important link between poor hand washing practices of mothers and the morbidity of children less than 5 years of age especially those living in rural communities [3,4]. A number of strategies to control diarrhoea which include improvement of water supply at the household or community level as well as hygiene promotion interventions especially hand washing has been identified [5,6].

In Somali Region, the commonest causes of morbidity among children under five years of age are acute respiratory infections (ARIs), diarrhoea disease, and malaria and the under 5 mortality rates of 94/1,000 live birth compared to the national average of 67/1,000 live birth [7].

With the confirmation of COVID 19 pandemic on 13th March 2020 in the Ethiopia, risk communication and community engagement activities were initiated in the region as preventive measures against the pandemic. This involved mass campaign on promotion of regular hand washing with soap or use of alcohol based hand sanitizers, physical distancing, respiratory etiquette and use of face mask through mass media, social media, mobile phones calls and text messages. Similarly ,information education and communication (IEC) materials like posters, banners and house to house campaign and community sensitization using various community platforms were also intensified.

This study aimed to assess the effect of handwashing campaign conducted as part of the preventive campaign for COVID 19 on diarrhoea and acute respiratory infection among children under five.

2. MATERIALS AND METHODS

2.1 Design

This was a combination of a cross sectional survey and a retrospective chart review of monthly District Health Information System (DHIS) database. The cross-sectional survey involved a rapid assessment of the practice of hand washing practice among households between 12th- 17th April 2020.

The chart reviewed was for children under five years of age treated for diarrhoea and acute respiratory infection reported between November 2019 and June 2020 in the health facilities in Jijiga town in Somali Region of Ethiopia accessed through the DHIS database.

2.2 Study Population and Setting

The study was conducted in Jijiga Town of Somali Region of Ethiopia which is the capital of the region and the epic centre of the COVID 19 pandemic in the region. It has 29 kebeles (lowest administrative units); 20 urban and 9 peri-urban, estimated population of 158,037 and 24,313households. During the crossectional study, a multistage sampling was used in the selection of the households. In the first stage, five urban and two peri-urban woredas were selected in proportion to the number of households in the urban and peri urban kebeles, using simple balloting.

In the second stage, household listing was conducted in each of the seven kebeles (wards) which was used as a sampling frame for the selection of households from which 20 households were selected randomly in each kebele using simple balloting by a team of trained evaluators.

In each of the selected households, a woman or caregiver per household met during the visit in each of the households with hand washing facilities following verbal consent were asked to demonstrate hand washing practices which was evaluated against the standard technique checklist which was previously pretested in other locations by the team of trained evaluators.

2.3 Data Collection and Statistical Analysis

The data were extracted from the information collected from the checklist /questionnaire during the rapid assessment on availability of hand washing facilities and observed hand washing practices while the number of children under five treated for diarrhoea and acute respiratory infection in the health facilities from November 2019 – June 2020 were obtained from the DHIS database. The data were entered into a Micros Excel spreadsheet and analyzed using SPSS version 21. Descriptive data was presented with qualitative variables presented as proportions and univariate analysis was done by generating frequencies of the variables. Test of association was done using chi-square test to compare the hand washing practices among the respondents in the urban and the peri urban kebeles and paired t test used to compare the mean reduction in number of children treated at the health facilities for acute respiratory illness and diarrhoea four months before the COVID 19 risk communication and awareness campaign (November 2019 – February 2020) and four month during the campaign (March 2020 to June 2020) and p value was set at significant level of 5%. The outcome measure was the number of children under five treated for acute respiratory infection and diarrhoea accessed 4 months before and during the campaign.

3. RESULTS

3.1 Review of Household Assessment

Table 1 shows that among the 580 households were visited, 400(69%) in urban setting and 180(31%) in peri urban only 255(44%) of them had basic hand washing facilities, 192(48%) of the 400 urban households and 63(35%) of the 180 peri urban households.

On observation for appropriate hand washing techniques by mothers or care givers in the households visited, 171(67.1%) of the total 255 households with hand washing facilities were reported to demonstrate appropriate hand washing techniques; 134(69.8%) of the 192 urban households and 37(58.7%) of the peri urban households. It shows households in urban area were 1.62 times more likely to wash their hand appropriately than those in the peri urban households though the difference was found not to be statistically significant; chi-square was 2.15 and p value of 0.072.

3.2 Review of the Health Facility Database

Fig. 1 shows the number of children under 5 years of age who were treated for diarrhoea and acute respiratory infection (ARI) in the health facilities between November 2019 and June 2020. It shows progressive decline in the number of cases treated from March 2020 when the risk communication messages on COVID 19 including hand washing campaign started.

Fig. 2 shows that proportion of children under 5 years of age consultation in the health facilities due to diarrhoea from November 2019 and June 2020. The figure shows from March 2020 there has been a decline in the under 5 consultations due to diarrhoea from 13.8 in March 2020 to 8.3 in June 2020. This is compared to progressive increase in the proportion of children due to diarrhoea reported between November 2019 and March 2020 apart from the decline in February 2020.

Table 1. Association between household characteristics and appropriate handwashing techniques

Variable	Total N= 580 n(%)	Handwashing facilities N=255 n(%)	Appropriate Handwashing technique N=171 n(%)	Test statistic
Urban Households	400 (69)	192(48)	134(69.8)	OR =1.62; 95% CI[0.901- 2.92] Chi- square = 2.15, P value=0.072
Peri Urban Households	180(31)	63(35)	37(58.7)	

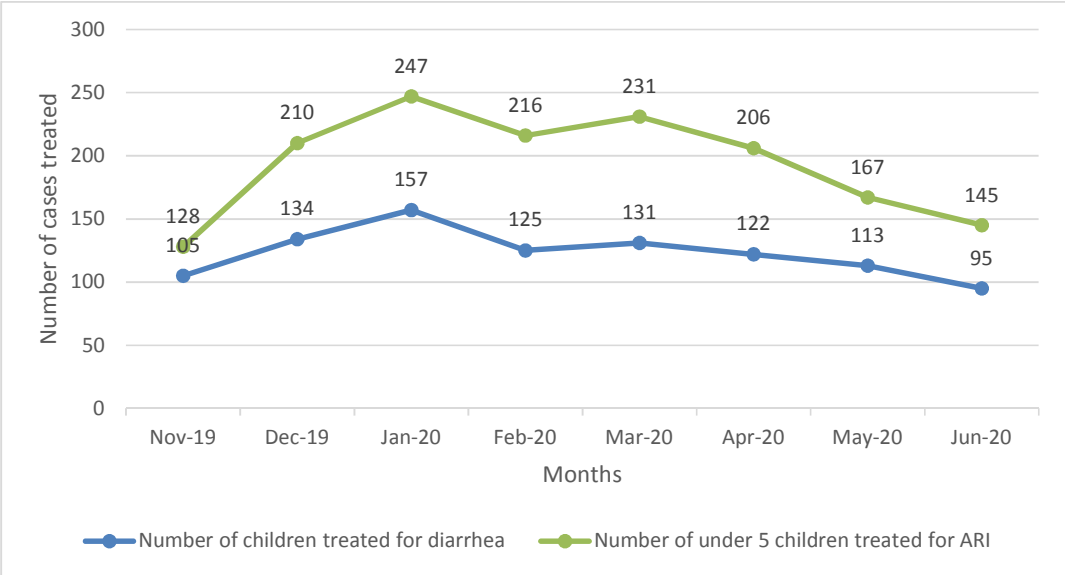

Fig. 1. Number of children under 5 years of age treated at the health facilities between November 2019 and June 2020

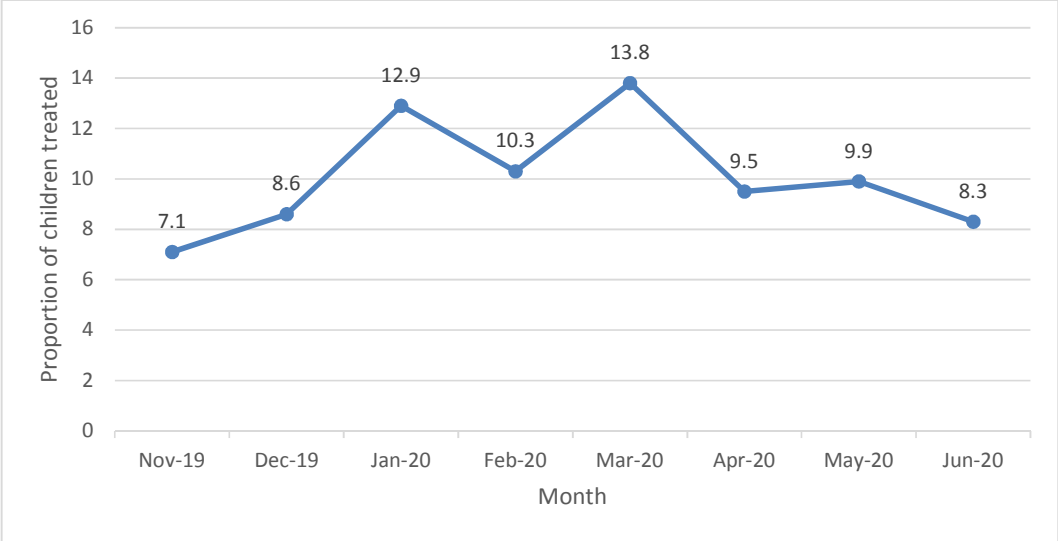

Fig. 2. Proportion of under 5-year children treated for diarrhoea

Table 2 shows the changes in the number of children under 5 years of age treated for acute respiratory infection and diarrhoea in the health facilities 4 months before (November 2019 – February 2020) and 4 months during the COVID risk communication campaigns (March 2020-June 2020).

The mean difference in the number of children under five treated for acute respiratory infection (ARI) was 13.00 which shows a 6.49% mean reduction in number of cases before and after the campaign started however the difference is not statistically significant, t=0.3079, p-value of 0.7788 while a difference in the number of 15.00 was found among children under five treated for diarrhoea which shows a 11.5% mean reduction in number of cases before and after the campaign started though not statistically significant, t=0.9895, p-value of 0.3952.

Fig. 3 shows the comparison in the proportion of children under 5 years of age seen at the health facilities treated for diarrhoea between January -June 2019 and the same period in 2020. It shows sharp drop in the proportion of children treated for diarrhoea monthly between March and June from 16.2, 20.6, 18.7, 27.4 in 2019 to 13.8, 9.5, 9.9 and 8.3 respectively in 2020.

Table 2. Test of association on mean number of children under 5years of age treated for Acute Respiratory Infection (ARI) and diarrhoea during the study

Variables	Children under with treated for Acute Respiratory Infection(ARI)		Test statistic	Children under with treated for diarrhoea		Test statistic
	4months before campaign	4 months during campaign	Paired t - test	4months before campaign	4months during campaign	Paired t - test
Mean	200.25	187.25	t = 0.3079 [95% CI: -121.36 to 147.36] P=0.7788	130.25	115.25	t = 0.9895 [95% CI: -33.23 to 63.23] p=0.3952
SEM	25.41	19.28		10.78	7.69	

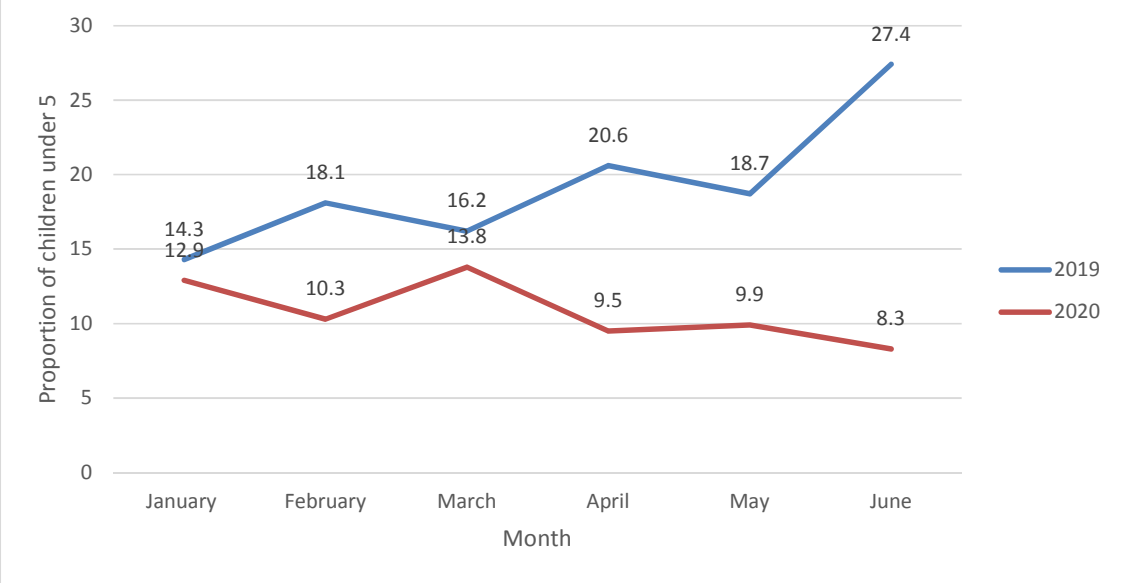

Fig. 3. Proportion of children under 5 years of age treated for diarrhoea in 2019 vs 2020

4. DISCUSSION

This study explored the indirect benefits of hand washing campaigns conducted as part of the ongoing COVID 19 pandemic risk communication and community engagement activities in the region on diarrhoea and acute respiratory infection which is to improve child survival.

Our study found that only 44% of the households visited had handwashing stands this is similar to two studies in Uganda and Bangladesh that reported between 40 and 50% of the households had handwashing facilities at home [8,9]. However, a global report by UNICEF/WHO and global and regional estimated by Wolf et al. reported higher number of households globally with hand washing facilities which is however found to be lower in sub-Saharan Africa in both studies [10,11]. The UNICEF /WHO global report in 2017 shows that 60% of the global population had basic handwashing facilities with soap and water available at home, however only 25% of household in sub Saharan African had basic hand washing facilities at home while Wolf et al in the global and regional estimate studies in 77 countries reported that only approximately one in four persons did not have a designated handwashing facility in 2015 [10,11].

Our study found a high proportion of households visited, 67% practiced good handwashing techniques this is similar to other studies which reported between 60-80% of households observed or reported to practice good handwashing techniques especially in high income countries [12,13]. However, the systematic study reported lower proportion of household practicing effective hand washing standard especially in sub-Saharan Africa which reported rate less than 25% among the study population and found high income countries with data on handwashing frequency show rates varying between 48% and 72%, and low income countries show lower rates varying between 5% and 25%, similar to between 29% and 38% of female care givers with good hand washing practices reported in a study in Bangladesh [13,9].

The high proportion of households with good handwashing practices in our study compared to others could have been due to the house to house community awareness campaign with demonstration of appropriate handwashing technique in homes and other COVID prevention messages just completed few weeks before the assessment was done, which could have reinforced the knowledge and skills of the mothers and caregivers assessed in the households visited.

Our study reported a mean reduction of 11.5% in the cases of diarrhoea during the campaigns which is much less than reduction of between 32% and 47% reported by most studies [14,15,16,17] which evaluated the effect of handwashing practices on episodes of diarrhoea among children under 5. The systematic review looked at mostly randomized controlled trials, where the unit of randomization is an institution (e.g day-care centre), household, or community, that compared interventions to promote hand washing or a hygiene promotion that included hand washing with no intervention to promote hand washing reported one-third reduction (32% to 39%) in diarrhoea morbidity observed [14]. The other community based interventional studies reported estimated reductions of between 44% and 47% [15,16,17]. However, a systematic review reported reduction in the estimate of the effect of handwashing with soap on diarrhoea from a relative risk of 40% to a relative risk of 23%, an estimate that is not significant after correcting for non-binding bias [13].

A previous study in the same Somali region though in the rural settings that assessed effect of handwashing with soap and WASH educational interventions on the incidence of childhood diarrhoea reported a 35% reduction in diarrhoea diseases for households who practiced hand washing with soap and the WASH key messages compared to control households that were given no intervention [18]. However, an intervention study in rural Bangladesh reported a difference of between 4.2% and 8.8% in the prevalence of diarrhoea among children in households where hand washing was implemented and the control without hand washing practices [19].

Our study reported a mean reduction of 6.5% in the cases of acute respiratory infection which is much less than the findings in most studies which was reported a reduction of between 16% and 23%. A systematic review by Rabie and Curtis found a mean reduction in acute respiratory infections of 16% from eight studies in community and institutional settings in high-income countries [4] while another review of studies of various hand hygiene interventions from low-, middle- and high-income countries in both community and institutional settings found

mean reduction in respiratory illness of 21% [20] However a randomized controlled trial in Bangladesh that placed and maintained a handwashing station with soap and water in homes to promote hand washing and a community based studies in Kenya did not find a reduction in the cases of respiratory infection among children in the studied population [21,22].

In spite of the lower mean reduction in the study on the cases of acute respiratory infection and diarrhoea reported compared to other studies with much larger reduction, these findings in this study are important and reaffirm the effect of hand washing practices in the reduction of these common childhood diseases. In all the referenced studies, information about episodes or diarrhoea and acute respiratory infections were based either on self-reporting from parents or institutions like day care centres through daily telephone call or record of symptoms in homes or by day care centers, or weekly interview by the field workers, unlike our study where the information was from the health facility records. In spite of the limitation associated with the use of secondary health facility data, the reported larger increase in other studies could have been due self-reporting which has been reported to have the tendency of dramatically overestimate rates of response to intervention by participants [23]. In addition another major bias especially in intervention non blinded studies like most of the referenced studies is courtesy bias with tendency of participants who know they are in a study to provide answers to please the investigators or field workers and may lead under reporting of diarrhoea or respiratory infection and thus overestimate the effect of the intervention.

Another critical point is that most of the studies referenced were standalone or specifically focused on handwashing interventions with close monitoring of the participants and some also provided soap and hygiene materials for the intervention households, which is different from this study which only promoted and created awareness on hand washing and hygiene practice as part of the general COVID risk communication messages and no regular house to house visits were routinely conducted or hygiene materials provided. This could have been responsible for the lower reduction in the effect of handwashing reported on cases of diarrhoea and acute respiratory infection reported. This assertion is supported by a systematic review which reported that promotion of handwashing with provision of soap was better associated with greater reduction of diarrhoea than broader hygiene education with a 40% reduction in the risk of diarrhoea from the promotion of handwashing compared to 24% reduction in the risk of diarrhoea for general hygiene education alone [13].

Our study is the first study to our knowledge that has looked at the indirect benefit of hand washing campaign as part of COVID 19 risk communication on diarrhoea and acute respiratory infection among children under 5. There is possibility that the reduction in the number of children treated for diarrhoea or respiratory infection during the campaign may have been due to the reduction in utilization of services, however the proportion of children treated for diarrhoea among all children treated at the health facilities which is one of the key indicators in the DHIS shows decline in the proportion of children who presented in the clinic during the period. This shows that even if there was reduction in the number of children who utilized the health facilities, the proportion of them treated for diarrhoea declined and suggest that the number of children with diarrhoea actually decreased during the campaign and may be due to the improved handwashing practices by mothers and care givers as a preventive measures against COVID 19 transmission. Likewise, the reduction in the cases of acute respiratory infection which is linked to diarrhoea could be due to this also. A community-based assessment of the incidence of diarrhoea and acute respiratory infection among children in households instead of use of health facility data to evaluate the effect of the hand washing campaign for COVID is suggested.

5. CONCLUSION

The study reaffirmed the effect of proper hand washing practices on the reduction of episodes of diarrhoea and acute respiratory infection among children which ultimately contributes to reducing child mortality. Even though the COVID risk communication and community engagement activities implemented were not directly targeted at reducing child morbidity and mortality but these indirect benefits have shown that the COVID interventions, investment and infrastructure could be used to support and strengthen non COVID routine health interventions. However, there is need to sustain all the best practices and interventions like handwashing post COVID so as to ensure improved and sustained child health outcomes.

6. LIMITATION OF THE STUDY

This study is based on clinic records and thus subject to the limitations associated with studies utilizing routine data affected by the quality of the data used. While the DHIS2 data is reported from a large number of facilities, the reliability of the data has not been independently verified, and it is unclear if data was being collected and reported accurately.

CONSENT

It is not applicable.

ETHICAL APPROVAL

Ethical approval to conduct the study was obtained from the Somali Regional Health Bureau Ethical Committee.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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