Trends of severe acute malnutrition morbidity and mortality (2014-2017), Bale Zone, Oromia Region, Ethiopia, 2018

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Abstract

Background Malnutrition is a serious disease and remains an important public health problem in many developing countries including Ethiopia. Malnutrition is one of the diseases under the surveillance system which is reported weekly and monthly. In the Bale zone, malnutrition is one of the major public health problems. Therefore, this trend analysis of severe acute malnutrition was to describe the magnitude, trends, disease outcome and geographical distribution of the severe acute malnutrition in Bale Zone from 2014-2017.

Methods A descriptive cross-sectional study was conducted on April 2018. Data was extracted from Bale zone monthly malnutrition report database and checked for completeness and consistency then four years’ trends of severe acute malnutrition were analyzed. The prevalence and trend of severe acute malnutrition by Woreda, year and age were analyzed using Microsoft office excel and SPSS version 20 then summarized using text, table, and figure.

Result A total of 37,678 severe acute malnutrition cases registered over four years (2014-2017). Of these, 31,642(84%) cured, 52(0.14%) died, 641(1.7%) defaulters, 66(0.18%) non-respondents. Among registered cases, 98.2% are 6-59months age groups. The average annual prevalence of severe acute malnutrition high among under-five children was 3.3%. Prevalence rate per 1000 population of severe acute malnutrition in 2014, 2015,2016 and 2017 are 3.6, 4.5, 7.5 and 4.7 respectively and death rate are 0.21%, 0.26%, 0.1% and 0.08% respectively. Among the Woreda, the highest prevalence at Delomena (2.45%) and lowest at Sinana woreda (0.1%). The death rate is high among 6-59months age groups (0.13%) and followed by less than 6months age group (0.008%).

Conclusion Cases of severe acute malnutrition increased during the year 2014 to 2016 then decreased during 2017. The prevalence of severe acute malnutrition high in under-
five age groups children at Bale zone during the study period and Delomena Woreda has the highest average annual prevalence of severe acute malnutrition. We recommend further research on why some district has a high prevalence of severe acute malnutrition.

Background

Malnutrition is a general term for a medical condition caused by an inappropriate or inadequate diet. The term usually refers to generally faulty nutrition and is most often related to under nutrition [1]. The number of children aged under five who are chronically or acutely undernourished (wasted) may have fallen in many countries, but the data tracking shows that global progress to scale back these varieties of nutrition deficiency disease is not fast enough to fulfil internationally united nutrition targets, including Sustainable Development Goal (SDG), target 2.2 to end all forms of malnutrition by 2030.

Hunger statistics are stepping into the incorrect direction: currently 815 million folks are aiming to bed hungry, up from 777 million in 2015. The reality of famines within the world these days means that achieving these targets, especially for wasting, will become even more challenging. Indeed, an estimated 38 million people are facing severe food insecurity in Nigeria, Somalia, South Sudan, and Yemen while Ethiopia and Kenya are experiencing significant droughts [2].

According to the global burden of diseases study, malnutrition attributes to 11.7% death and 15.9% DALY globally and also the most significant contributors to the risk factors of the global burden of the diseases [3].

According to the 2016 Ethiopia demographic health survey (EDHS), 38% of children under 5 age are stunted or too short for their age, and 18% severely stunted. Ten percent are wasted or too thin for their height, including 3% who are severely wasted. Twenty-four percent of children under age 5 are underweight or too thin for their age, with 7% severely underweight. The prevalence of overweight children remained low at 1% [4].
Different problems are responsible for child to be undernutrition especially in developing countries. Of these problems some basic issues are; political instability, slow economic growth, and lack of education. Others are underlying causes such as food insecurity and lack of maternal and childcare services. The third groups include the highly specific risk factors like frequent infections and inadequate dietary intake [5].

Conducting trend analysis of a data is a key operate for monitoring illness trends, and evaluating the effectiveness of disease management programs and policies. Results from trends of severe acute malnutrition can trigger public health action when the prevalence of diseases increasing and to describe the epidemiology of severe acute malnutrition. Even though malnutrition is one of the major public health problems in the Bale zone, trends of severe acute malnutrition have not been analyzed. Therefore, this study aimed to assess trends of severe acute malnutrition morbidity and mortality from 2014–2017 in Bale Zone, Oromia Region.

Methods

Study area

Bale is one of the zones in the Oromia region, Ethiopia, which administratively divided into 18 Woreda and two towns. Bale zone is 430km from Addis Ababa located at South-east direction, with an estimated 1,858,639 total populations in 2017 and a total area of 67,329.59km² and also 14% are highland, and 64% are lowland. Amon total Woreda, nine are pastoralist and other nine were agro-pastoralists. The Zone shares the boundaries with Somale region, West Arsi, Guji zone, West Hararge, Arsi on East, West, South, Northwest, North respectively. In 2017 there are four Hospitals, 82 health centers and 381 health posts in the Bale Zone. All health facilities give severe acute malnutrition treatment services.
Study design and period

We reviewed four years (2014–2017) of severe acute malnutrition secondary data at Bale zone health office in April 2018. All severe acute malnutrition data was available in the Bale zone, Nutrition department.

Case definition

Severe acute malnutrition

Infants less than six months or less than 3 Kg: Weight –for- Length (WFL) less than 70% or < -3Z score or Presence of pitting Edema of both feet or Visible Severe Wasting if it is difficult to determine WFL

Children 6 months to 18 years: Weight –for- Length (WFL) / WFH less than 70 % or < -3Z score OR Presence of pitting Edema of both feet or MUAC <11cm for child length greater than 65 cm

Adults: MUAC <180mm with a recent loss or underlying chronic illness or MUAC<170mm OR BMI <16

Source of data and collection procedure

Secondary data of severe acute malnutrition from routine PHEM (Public Health Emergency Management) surveillance system and nutrition department were reviewed from Bale zonal databases. Data was stored computerized at the Bale Zone Health office in PHEM (Public Health Emergency Management) surveillance system and malnutrition department. In the study area, severe acute malnutrition patients were treated at Health post, Health Center and Hospital according to the Ethiopian malnutrition national guideline [6]. All relevant data like a month, year, Woreda, age, treatment outcomes. Accordingly, four years’ severe acute malnutrition secondary data (2014–2017) was extracted from Bale zonal health office malnutrition report database using a prepared data extraction format.
Data analysis procedure

All data were checked for completeness and consistency. Data were analyzed by place, person and time using Microsoft Office excel 2016 and Epi Info 7. The retrospective data of severe acute malnutrition was summarized using figure, table and line graph and bar chart.

Ethical

Permission to use secondary data of malnutrition was obtained from Bale Zone Health Department.

Results

Severe acute malnutrition by time

A total of 37,678 severe acute malnutrition (SAM) cases were registered over four years’ period (2014–2017). Of these 33,540 (89%) of SAM cases were treated at the Outpatient Therapeutic Program (OTP) and 4,138 (11%) of the cases were treated at Stabilization Center (SC) programs. Prevalence of severe acute malnutrition in 2014, 2015, 2016 and 2017 are 3.6, 4.5, 7.5 and 4.7 per 1000 population respectively (Figure 1) and death rate also 0.21%, 0.26%, 0.1% and 0.08% respectively. Prevalence of SAM by average increasing with 0.11% per year at the Bale zone. Cases of SAM admitted to OTP increased by 26.1% from 2014 to 2015 and increased by 70% in 2015 to 2016 and decreased by 36.2% in 2016 to 2017 and similarly, cases of malnutrition admitted to SC increased by 55.6% from 2014 to 2015 and increased by 71.3% from 2015 to 2016 and decreased by 27.2% in 2016 to 2017. (Figure 2).

Severe acute malnutrition by place

From the total registered cases of severe acute malnutrition, the majority of the cases 4,646(12.3%) were reported from Delomena Woreda followed by Berbere woreda.
3636(9.7%) and Goro woreda 3389(8.99%). The lowest cases of severe acute malnutrition during this period were reported from Goba rural which is 228(0.6%) cases (Figure 3).

Severe acute malnutrition by person

From total registered of severe acute malnutrition 37,027(98.2%) cases were 6-59 months old children followed by 293(0.8%) cases were less than 6 months’ children and 194(0.5%) cases are 5-10 years’ children (Table 1). The prevalence of severe acute malnutrition in 6-59 months age group in 2014, 2015, 2016, 2017 are 2.61%, 3.06%, 4.66%, and 3.10% respectively and the average annual prevalence was 3.3%.

Among total admission of severe acute malnutrition cases, 23,530(62.5%) were cured and 48(0.13%) death were 6-59 months children followed by less than 6 months infants 236(0.63%) cured and 3(0.008%) death. The death rate in 2014, 2015, 2016 and 2017 were 0.21%, 0.26%, 0.1% and 0.08% respectively.

Discussion

Severe acute malnutrition is one of the most common causes of morbidity and mortality worldwide [6]. It is also a public health problem in Ethiopia especially at an area affected by drought-like Bale zone in the Oromia region [7]. This study describes the trends of severe acute malnutrition morbidity and mortality at Bale zone from 2014-2017. The prevalence of severe acute malnutrition at the Bale zone increased continuously from 2014 to 2016. This study finding is consistent with the finding reported by the humanitarian situation report. This may be associated with an increased number of outpatient therapeutic feeding program sites and screening services conducted at the community level [7]. The death rate increased by the year 2014 to 2015 but substantially decreased by the year 2015 to 2017 these were due to the intervention program conducted with the expansion of OTP and SC sites [7].
The prevalence of severe acute malnutrition in under-five year children markedly higher than that of above five years old. This finding is consistent with the scientific background which indicated that under-five children are more affected by malnutrition [6][8]. Additionally, our finding might be due to the high participation rate of under-five year children on malnutrition screening as a result of government policy highly focus on these age groups [9]. So this finding implies that under-five children are suffered from severe acute malnutrition. The average annual prevalence of severe acute malnutrition of under-five children from 2014 to 2017 almost equal with that of the Oromia region according to EDHS–2016[4]. The prevalence of severe acute malnutrition of under-five children (3.1%) in 2017 less than that of study the conducted at Shashemene referral hospital (25.2%) [10] and a study conducted at east Hararge Haramaya district (14.43%) [11] these likely due to study population, our study conducted at the zonal level and population of bale zone were our study population, unlike study conducted at Shashamane hospital which is facility-based.

The prevalence of malnutrition higher in the rural area as compared to town at the bale zone this is comparable with the EDHS 2016[4]. Dello mena woreda has the highest average annual prevalence of severe acute malnutrition followed by Meda Welabu and Harena buluk. However, Gasera and Sinana woreda has the lowest average annual prevalence of severe acute malnutrition.

This study has its limitations. First limited by the being retrospective study as we were relying only on already collected secondary data. There was a possibility of some of the records may not correctly be recorded. Second, we were limited to the variable on the reporting format. However, our study revealed important finding such as Woreda with the high prevalence of severe acute malnutrition was identified so these are the priority area for the further researchers.
Conclusions
The prevalence of severe acute malnutrition increasing with 0.11% yearly at the Bale zone. The prevalence was high among under-five children. The prevalence of severe acute malnutrition was varying among Woredas of the zone and high at Delomena Woreda. The case fatality rate and defaulter decreased during the four years of the study period. Bale zonal health office and other stakeholders should strengthen the nutrition program to tackle the increment trends of severe acute malnutrition. Additionally, we recommend further research to investigate the reasons for the high prevalence of severe acute malnutrition in some Woreda of Bale zone

Abbreviations
EDHS: Ethiopia Demographic Health Survey; MUAC: Mid Upper Arm Circumference; OTP: Outpatient Therapeutic Program; SC Stabilization Center; SPSS: Statistical Package for the Social Sciences; WFL: Weight -for- Length

Declarations
Competing of interest
The authors declare that they have no competing of interest

Authors contribution
Mohammed Hasen: He was responsible for the conception of the problem, design, extraction of the data, analysis, and interpretation of the data and drafting the final manuscript.

Henok Asefa: He was responsible for the design, analysis, and interpretation of the data and critical review of the final draft

Naod Birhanu: He was responsible for the interpretation of the data and critical review of the manuscript.
Falaho Sani: He was responsible for the analysis and review of the manuscript.

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Availability of the data

All the data supporting our findings of this study are available from the corresponding author upon request

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Tables

Table 1: Total registered severe acute malnutrition by age from 2014 to 2017 at Bale zone, Oromia region, Ethiopia, April 2018.

| Cases by age | OTP  | SC   | Total (%) |
|--------------|------|------|-----------|
| <6months     | 9    | 284  | 293(0.8)  |
| 6-59months   | 33,315 | 3,712 | 37,027(98.2) |
| 5-10years    | 63   | 131  | 194(0.5)  |
| 11-17years   | 97   | 10   | 107(0.3)  |
| >18 years    | 54   | 3    | 57(0.15)  |

Figures
Prevalence of Severe Acute Malnutrition from 2014 to 2017 at Bale zone, Oromia, Ethiopia, April 2018.

Total new admissions of Severe Acute Malnutrition from 2014 to 2017 at Bale zone, Oromia, Ethiopia, April 2018.
Figure 3

Severe Acute Malnutrition by woreda from 2014 to 2017 at Bale zone, Oromia, Ethiopia, April 2018