Exploring the risk factors of Child malnutrition in Sub-Sahara Africa: A scoping review

Abstract

Background. Malnutrition prevents children from reaching their full physical and mental potential. Health and physical consequences of prolonged states of malnourishment among children are: delay in their physical growth and motor development; lower intellectual quotient (IQ), greater behavioural problems and deficient social skills; susceptibility to contracting diseases. According to the 2015 Millennium development goal (MDG) report, sub-Saharan Africa (SSA) accounts for one third of all undernourished children globally, highlighting that malnutrition still remains a major health concern for children under 5 years in the sub-region, thus buttressing the need for urgent intervention.

Methods. The scoping review was conducted using the following specific subject databases: EBSCOhost, google scholar, Pub med, demographic research and research gate. Attention was paid to keywords during navigation to ensure consistency of searches in each database. Two limiters were applied in all five databases. These included the use of the English language and articles published on child malnutrition in sub Saharan Africa.

Results. The researchers identified eight themes for inclusion in the findings. The themes fell into four major categories being maternal related, family related, child related as well as context related factors. These themes reflect factors associated with child malnutrition.

Conclusion. This scoping review revealed that there are quite a number of risk factors that lead to child malnutrition. Therefore, there is an urgency for strategic interventions aimed at improving child nutrition through female education if the 2030 end malnutrition SDG 2.2 are to be achieved.

Keyword; malnutrition, undernutrition, stunting, wasting, underweight

INTRODUCTION

Malnutrition is the consumption of dietary nutrient either insufficiently or exclusively (Etim et al., 2017).Health and physical consequences of prolonged states of malnourishment among children are delay in their physical growth and motor development; lower intellectual quotient (IQ), greater behavioural problems and deficient social skills; susceptibility to contracting diseases (Madhusudhan and pallavi, 2019).

Malnutrition is a subacute or chronic state of nutrition, in which a combination of varying degrees of under or over nutrition and inflammatory activity has led to changes in body composition and diminished function (Soeters et al., 2016). It can also be a state of nutrition in which a deficiency or excess (or imbalance) of energy, protein and other nutrients causes measurable adverse effects on tissue/body form (body shape, size, composition), body function and clinical outcome (Maria Rita Poggiano et al. 2017).The normal height-for-age z-score (HAZ) is said to be 2 SD or greater, normal weight-for-height z-score (WHZ) is said to be 2 SD or greater, and normal weight-for-age z-score (WAZ) is also said to be 2 SD or greater (Wang Y, 2017).

Globally 6.3 million children under five years of age die every year. Nearly half of these deaths are attributable to undernutrition (Léonie et al. 2019). Sub-Saharan Africa bears one of the highest burdens of undernutrition (Agho, K.E., Akombi et al. 2019). An estimated 160 million children are affected by stunting in Africa, particularly in West, Central and Eastern Africa (UNICEF, WHO, World Bank Group, 2015). Severe acute malnutrition with oedema (kwashiorkor) has the highest prevalence followed by severe acute malnutrition without oedema (marasmus) and marasmic– kwashiorkor (Munthali T, et al. 2015).

It is important to note that malnutrition is not concerned only with the sufficiency of food but extends to having the appropriate micronutrients (Meenakshi, 2016). Moreover, evidence suggests that malnutrition coexists with other health conditions (Kulkarni et al., 2017, Mondal, 2015). The coexistence of undernutrition along with overweight or obesity within individuals, households, and populations and across the life course is what has been referred to as the double burden of malnutrition (DBM) (Davis et al., 2020). However, in recent times, there have been concerns about the

coexistence of over nutrition, under nutrition and micronutrient deficiencies, which is compositely referred to as the triple burden of malnutrition (TBM) (Meenakshi, 2016).

Various forms of malnutrition contribute to the double and triple burden of malnutrition. The double burden of malnutrition (DBM) is defined by the coexistence of maternal overweight and obesity along with child undernutrition within the same household level (WHO 2016, Emdadul S et al. 2018). Triple burden of malnutrition (TBM) refers to the coexistence of overnutrition, undernutrition and micronutrient deficiencies (Meenakshi JV, 2016).

According to the 2015 Millennium development goal (MDG) report, sub-Saharan Africa (SSA) accounts for one third of all undernourished children globally, highlighting that malnutrition remains a major health concern for children under 5 years in the sub-region, thus buttressing the need for urgent intervention (United Nations, 2015). Undernutrition in developing countries has been an internationally important issue, as exemplified by the launch of the Scaling up Nutrition (SUN) (Mitsunaga A, et al. 2020).

Previous research (WHO, 2017) described that sub-Saharan Africa has an undernutrition problem. In Zambia, located in sub-Saharan Africa, the rates of stunting and under-weight for children under 5 years were 45% and 15%, respectively, according to the national investigation (Central Statistical Office, 2018). This means that in Zambia, child undernutrition is a problem, as in other sub-Saharan countries. Undernutrition is most often measured by anthropometry and evaluated in terms of stunting, wasting and underweight. These conditions are based on World Health Organization (WHO) classification using child growth standards medians in terms of standard deviations (SD).

Stunting is defined as a height-for-age z-score (HAZ) below 2 SD, wasting defined as a weight-for-height z-score (WHZ) below 2 SD, and underweight as a weight-for-age z-score (WAZ) below 2 SD (Centre Disease Control, World Food Programme, 2017). Undernutrition can also be evaluated using mid upper arm circumference (MUAC-for-age z-score below -2SD), which provides more accurate results in dehydrated children (Modi et al., 2015). Few studies have examined the prevalence and associated factors of triple burden malnutrition (Sunuwar, 2020). Therefore, this study set out to explore the risk factors of child malnutrition in sub–Saharan Africa through a scoping review.

METHODOLOGY

We used Arksey and O'Malley five stages framework to guide our scoping review (Arksey et al., 2005). The five stages followed are as follows:

1. Identification of the research question.

2. Identification of relevant studies.

3. Selection of studies.

4. Data abstraction (charting of the data)

5. Data analysis and reporting of results.

The scoping review was conducted in July 2021 using the following specific subject databases: EBSCOhost, google scholar, Pub med, demographic research, and research gate. Attention was paid to keywords during navigation to ensure consistency of searches in each database. Two limiters were applied in all five databases. These included the use of the English language and articles published on child malnutrition in sub–Saharan Africa. The countries in sub-saharan Africa include all countries in central Africa eg Angola, all countries in eastern Africa eg Ethopia, all countries in southern Africa eg Zambia and all countries in Western Africa eg Nigeria. The sub Saharan Africa region has 48 countries altogether.

Inclusion Criteria

Articles were considered if they met at least one of the outlined inclusion criteria:

- Articles exploring child malnutrition in both male and female children in sub–Saharan African countries were included.
- Articles exploring under nutrition in both male and female children in sub–Saharan African countries were included.
- Articles exploring malnutrition as stunting, wasting, overweight or underweight in the sub-Saharan African countries were included.
- Articles exploring child malnutrition between 2003 – 2021 were included.
- Articles exploring genetic disorders such as anaemia in relation to child malnutrition were included.

Exclusion Criteria

Articles were excluded from this scoping review based on the following criteria.

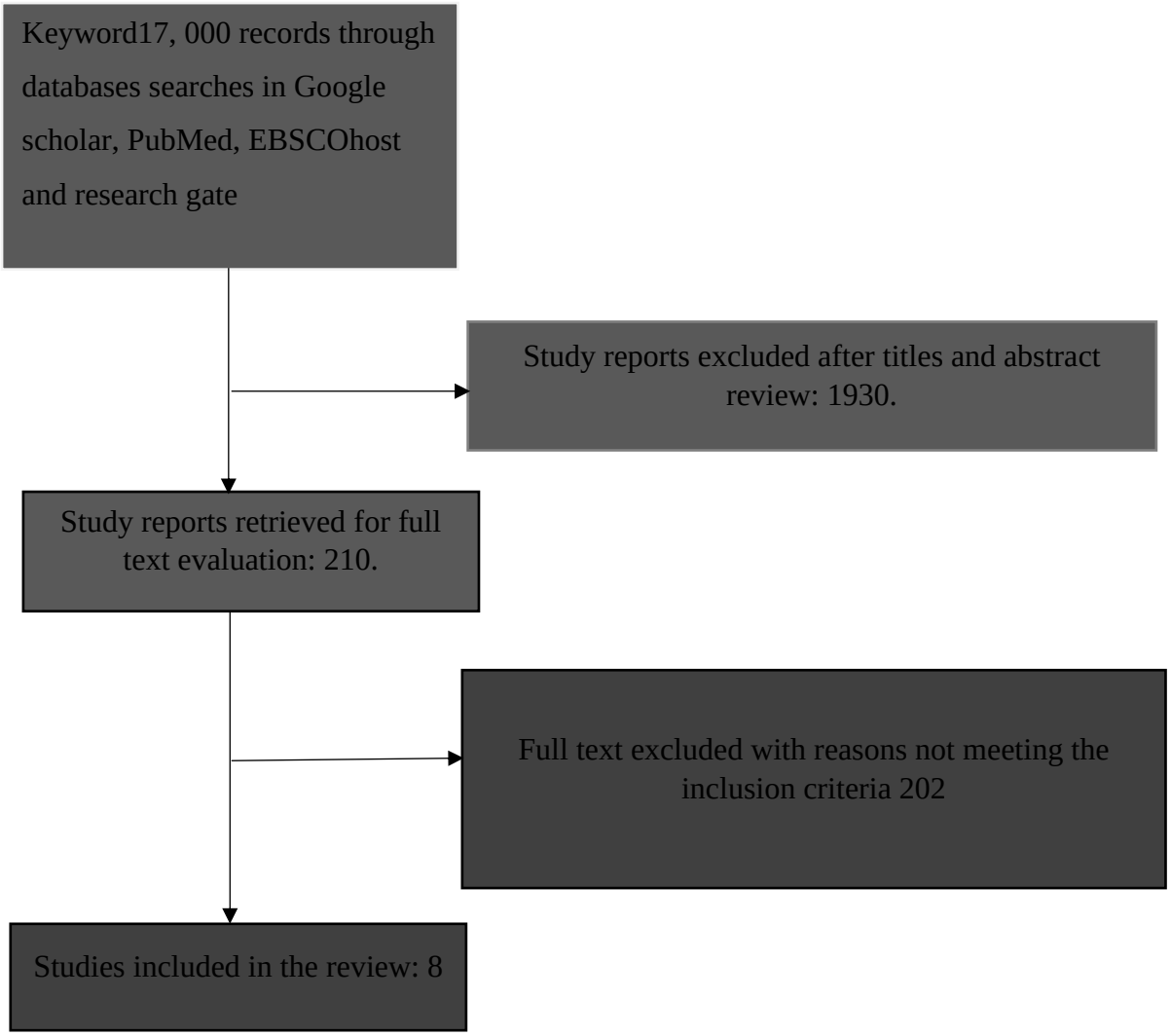
- Articles exploring child malnutrition in children more than 19 years old were not included.
- Articles exploring child malnutrition published outside 2003-2021 were not included.
- Articles exploring child malnutrition outside the Sub-Saharan Africa region were not included.

STUDY SELECTION AND DATA ABSTRACTION

We identified a total of 1140 literature from the database search. Following the removal of duplicates, we were left with 926 which were considered for our scoping review. All the abstracts of the considered articles were screened, which resulted in the exclusion of 214 articles. We then identified 206 articles as relevant for use in the scoping review and were matched against the inclusion and exclusion criteria. A total of 8 articles were judged to meet the prescribed criteria after screening the full articles. The PRISMA diagram in Figure 1 outlines the searches undertaken and the subsequent results obtained.

Figure 1: Flow Chat Illustrating Articles Screening Process

Fig. 1. A PRISMA flowchart outlining the literature search



Data Abstraction

Data abstraction was undertaken by the first author and verified by the second author. Discrepancies in the results were resolved by the third author**.** Most of the articles were from cross sectional studies among 32 sub-Saharan countries (n=3), two from Zambia (n=2), one from Cameroon (n=1), one from Congo DR (n=1) and one article from Ethiopia (n=1). The majority (n=7) of the articles were quantitative in nature, while 1 was mixed methods. Despite the methodological differences and geographical locations of the studies analysed, a common thread was noted and confirmed

throughout the themes. Table 1 below shows the characteristics of the studies while table 2 shows the findings and limitations of the stud

Table 1. Characteristics of studies in the scoping review (n = 8)

Authors	Country	Methods	Settings
Asare B.Y.S et al, 2019	Ghana	unmatched case-control study (n=6933)	Ghana
Gwido V. and Fekadu M. A, 2015	Sudan	descriptive cross-sectional study (n=50)	Juba-Sudan
Mchunu G et al, 2012	South Africa	Cross sectional study (n=3123)	South Africa
Mothiba, T.M. & Maputle, MS., 2012	South Africa	Quantitative descriptive study (n=100)	Capricorn district (SA)
Ngonidzashe M. et al, 2015	Zimbabwe	Qualitative study (n=23)	Hurungwe District-Zimbabwe
Josephine N. et al, 2020	Uganda	Qualitative study (n=101)	Rural eastern Uganda
Clifford O. et al, 2016	SSA	Quantitative multi-country cross section study	Sub Saharan Africa
Haymanot M. et al, 2021	Ethiopia	cross-sectional study (n=2258)	Eastern Ethiopia

able 2: Data Extraction Table

Authors	Method	Findings	Limitation
Dapi Ntefa et al. (2019).	Cross sectional study ($n = 388$)	The prevalence of wasting, stunting and underweight was 3.2%, 16.4% and 5.2%, respectively.	An in-built limitation of cross-sectional data is their snapshot nature that makes establishing a temporal sequence of events and drawing causal inferences difficult as this pertains to the period and season the survey was undertaken
Mzumara et al. (2018)	Cross sectional study ($n = 12,328$)	The prevalence of stunting among under five children in Zambia is 40%.	A few key variables could not be included because of difference in classifications, as data was collected and classified by ZDHS team. For instance, the ZDHS only classifies urban residence as urban even though it includes peri-urban areas thus the definition was not precise. Although the study excluded other key variables from the analysis, our model did reflect all those variables linked to childhood stunting.
Mitsunaga and Yamauchi (2020)	Cross sectional study ($n = 1135$)	The 50th percentile curve of height and weight in the growth chart of the target population was equivalent to the 5–25th percentile curve of the US reference, and the children of Zambia were both small and of low weight.	A major limitation of the study was the small number of girls aged 19 years. As girls of this generation often entered the pregnancy and lactation period, there were many cases in which an anthropometric survey could not be conducted. Another limitation of the study was the lack of information of peak height velocity (PHV).
Akombi et al. (2017)	Cross sectional study ($n = 32$ countries)	Stunting was highest in Burundi (57.7%) and Malawi (47.1%) in East Africa; Niger (43.9%), Mali (38.3%), Sierra Leone (37.9%) and Nigeria (36.8%) in West Africa	The study was limited as some SSA countries were not included because they had no recent DHS data (2006–2016) or had no comprehensive data on the malnutrition indicators.
Abimbola et al. (2021)	Cross sectional study ($n = 169,394$)	Out of the 169,394 children, 734 (1%) suffered from Triple burden of malnutrition (TBM).	Our study has some noteworthy limitations; we cannot establish causality between the various factors (i.e. child-related, maternal, household and contextual factors) and TBM. The pooling of the data may be affected by heterogeneity across regions.
Adeyemi et al. (2019)	Cross sectional study ($n = 17,307$)	Out of the children in this study, 31.8% were found to be stunted, 15.5% wasted and 30.9% had anaemia among Burkina Faso children, while 42.5% of Mozambican children were stunted, 5.9% wasted and 30.9% suffered from iron-deficiency anaemia. The multivariate analysis revealed that the spatial prevalence existed across regions in Burkina Faso with geographical variations in stunting estimated as: 0.7549, CI (0.4693, 1.2264); wasting 0.9197; (95%CI: 0.535, 1.591) and anaemia : 0.734; (0.4606, 1.214).	The data were obtained from Demographic and Health Surveys (DHS) as domiciled in the Bureau of Statistics of respective countries and as such some data took a bit of time to be obtained.
Kandala et al. (2011)	Cross sectional study ($n = 8992$)	Although childhood malnutrition was more pronounced in all provinces of the DRC, after accounting for the location's effects, geographic differences were significant: malnutrition was significantly higher in rural areas compared to urban centres and this difference persisted after multiple adjustments	Attempts to include such small-area information using province-specific dummy-variables would in our case entail more than 50 dummy-variables and using this approach we would not assess spatial inter-dependence.
Endris et al. (2017)	Mixed method ($n = 3095$)	The prevalence of malnutrition among rural children in Ethiopia was 48.5%.	This study was limited in that it does not consider some important variables that affect the nutritional status of children such as dietary aspects.

QUALITATIVE ANALYSIS

Following data extraction, the findings were exported into Microsoft Excel for analysis. Instead, all the eight articles contributed to the final analysis of the results presented in this article. Thematic analysis was utilized to reflect the new combined findings of the eight articles considered (Braun and Clarke, 2006). Articles were colour coded on Microsoft Excel according to the related themes they contributed (Aveyard et al., 2013). The colour coding used helped to visualize the contribution of each article, including its contribution to the themes. The data coding was reviewed over 1 month, leading to various changes and refinement of themes, which subsequently made the final themes of the article.

RESULTS

The researchers identified eight themes for inclusion in the findings. The themes fell into four major categories being maternal related, family related, child related as well as context related factors. Table 3 below shows themes by author.

Table 3 Themes by author

Table 2 **Themes by Author**								
Theme	Mchunu et al. (2012)	Gwindo & Pekadu (2016)	Mothiba & Maputle (2012)	Mutanana & Mutara (2015)	Asare et al. (2019)	Nabugoomu et al. (2020)	Odimegwu & Mkwananzi (2016)	Mezmur et al. (2021)
Individual Related Factors								
Use of condoms & contraceptive	V	v	v	v		v		
Personal Values & Choices	V	v						
Family Related Factors								
Education of Parents								
Economic Factors	V	v		v	v	v	v	V
Family Setup	V	v			v		v	V
Religious & Cultural Beliefs		v		v		v		
External Factors								
Lack of Knowledge	v	v	V	v		v		V
Early Exposure &				v		v		

Peer Pressure								

Maternal Related Factors:

Education

Maternal education is one of the factors that determine child malnutrition (Endris et al., 2017; Ahinkorah et al., 2021; Mzumara et al., 2018). In the study of malnutrition among children under the age of five in the Democratic Republic of Congo (DRC), it was determined that children with more educated mothers were less likely to suffer from malnutrition than children with less educated mothers (Kandala et al., 2011). In rural Ethiopia, the risk of being malnourished among children whose mothers did not attend education was 1.32 times higher than children whose mothers attended primary education (Endris et al., 2017).

Additionally, children whose mothers attended antenatal sessions were at a lesser risk of malnutrition as compared to those whose mothers did not attend (Adeyemi et al., 2019; Ahinkorah et al., 2021). Thus, it is supposed that education has the potential to improve nutritional practices (Kandala et al., 2011; Endris et al., 2017).

Short Birth Interval

Birth intervals of less than 18 months is a risk factor for stunting (Adeyemi et al., 2019; Neima, et al., 2015) found an inverse relationship between length of the preceding birth interval and the fraction of malnourished children.

Family Related Factors

Nutritional Patterns and Lack of Safe Drinking Water

The type of nutrition offered to children affects their likelihood to suffer nutrition. In Congo, it was observed that groups of people who lacked food security and those that denied their children certain foods due to cultural beliefs recorded high cases of malnutrition (Kandala et al., 2011). It was also observed that lack of safe drinking water was a risk factor for malnutrition (Ahinkorah et al., 2021; Kandala et al., 2011; Mzumara et al., 2018). For example, in the DRC malnutrition was prevalent where

more than two thirds of the population had no access to drinking water (Kandala, et al, (2011).

Social-Economic Factors

Family economic status was another factor determining the occurrence of malnutrition in children (Endris et al., 2017; Mzumara et al., 2018). Economically stable communities had the potential to afford good nutrition for their children and effectively prevent occurrences of malnutrition (Kandala, et al., 2011; Adeyemi et al., 2019). On the other hand, poor communities were characterized by the resurgence of kwashiorkor due to increasing poverty among parents who could not afford proteins for their children (Kandala et al., 2011).

Child Related Factors

Age of Child

Age of child is a significant factor of child malnutrition (Endris et al., 2017; Mzumara et al., 2018). Younger children are less likely to suffer from malnutrition than older ones because they are breastfed. This was likely to be so because the problem of lack of food in the home did not directly affect them. Additionally, older children also face the risk of eating contaminated food is reduced (Kandala et al., 2011). In the contrarily, Dapi Nzefa et al. (2019). (2019) found that children who were still breastfeeding had a higher risk of being underweight than those who had been weaned. In rural Ethiopia, children aged 12-23 months were more prone to malnutrition than those who were below six months of age (Endris et al., 2017).

Sex of Child, Birth Order, and Birth Size

A study of the prevalence and factors associated with the over nutrition, under nutrition and micronutrient deficiencies among mother-child pairs in Sub-Saharan Africa indicated that sex of the child, birth order and birth size were significant factors in child malnutrition (Ahinkorah et al., 2021). Nutrition related problems were more associated with children with above average birth weight than average (Ahinkorah, et al., 2021).

In Zambia, Léonie, (2019) reported that children born as first or second in order were more likely to be stunted compared with those born third in line or later. Additionally, male children were more disposed to malnutrition than female children (Kandala et al., 2011; Léonie, 2019). For example, a higher prevalence of stunting was reported among male children as compared to female children in Zambia (Mzumara et al., 2018). Similarly, in the DRC, the prevalence of stunting was greater among boys than girls (Kandala et al., 2011), and the prevalence was higher in children born outside the hospital.

Context Related Factors

Demographic Factors

Geographic location is one of the factors of child malnutrition (Endris et al., 2017; Mzumara et al., 2018). For example, in the DRC, stunting was lower in Kinshasa, Orientale and Equateur provinces as compared to the Northeastern part of the nation that were affected by conflict and the provinces that heavily relied on local mineral mining (Kandala et al., 2011). Children living in rural areas were found to be more stunted than their counterpart in urban areas (Kandala et al., 2011; Ahinkorah et al., 2021).

Pollution

Pollution affects the prevalence of malnutrition. For example, [24] found that children whose mothers used unclean cooking fuel were more likely to experience nutrition related problems than other children (Ahinkorah et al., 2021).

DISCUSSION

Maternal education was found to be a factor in child malnutrition in that children with more educated mothers had a lower propensity to suffer from malnutrition as compared to other children (Kandala et al., 2011, Endris et al., 2017). Maternal education included formal academic as well as antenatal education (Endris et al., 2017; Adeyemi et al., 2019; Ahinkorah et al., 2021). In other studies, Makoka, D. 2013 and Abuya, B. A. et al. 2012 found that maternal education was inversely related to child malnutrition. However, Makoka (2013) indicated that this outcome was only

statistically significant at high levels of education i.e., secondary school and above. Furthermore, Shyam et al. (2020) found that none of the antenatal care indicators had any statistically significant effect on underweight status.

However, it suffices to say that maternal education is critical in the alleviation of child malnutrition. To achieve maternal education, the education for all (EFA) agenda, for the provision of provide quality basic education for all children, youth, and adults, needs to be a top priority throughout SSA. However, United Nations Educational, Scientific and Cultural Organization (UNESCO), (2015) reported that poor girls continued to face extreme obstacles accessing primary school and that two-thirds of adults lacking basic literacy skills were women. This was attributed to issues of early marriage, early motherhood, gender-based violence, traditional seclusion practices and unequal allocation of house chores UNESCO, 2015.

Borrowing from the Dakar goals and strategies for Education Funding Agency (EFA), there is need for political will and commitment towards EFA, leading to the development of national action plans, significant implementation in basic education as well as the development of informal strategies to reach disadvantaged people and those excluded from formal education (Education Forum, 2002). Additionally, maternal health education and engagement of traditional leaders and families to raise awareness about maternal education and the importance of antenatal education can help remedy the situation (Ikechukwu et al., 2020).

The gap observed on stunting prevalence between children from uneducated mothers or those whose mothers have a primary school level of education compared with those from mothers with secondary or high level of education remains high (Kandala et al, 2011). The strong evidence of statistically significant difference of malnutrition between socio economic groups mainly between poorest, poorer, middle, and richer groups compared to the richest group confirms the reality that in the DRC affording food for most of the population is still a challenge (FAO, 2008).

A study in Rwanda had elucidated those children from lower socio-economic class (measured by education status, occupation) were found to be associated with higher risk of anaemia, malaria infection and under nutrition (Yimer, 2000). Therefore, looking at the impact of the discussed factors, it will be very important to reduce female

illiteracy by providing extensive training and policies in both local languages and official languages of the nation regarding child nutrition.

The mother's characteristics such as short birth interval (less 18 months) influenced high risk of stunting and wasting (Adeyemi et al., 2019). Preceding birth interval is the other important variable which is associated with nutritional status of children. There is an inverse relationship between the length of the preceding birth interval and the proportion of children who are malnourished (Endris et al., 2017). For the newborn, the larger birth interval results into better care and more time allocation for the nutrition and wellbeing (Khan and Raza, 2016). Therefore, it is cardinal to set policies that provide extensive trainings to expecting mothers and those taking their children for under 5 clinic visits regarding the importance of child spacing. Also increasing the number of antenatal centres especially in rural areas.

Regarding birth order, studies reveal that it can affect the child's wellbeing from birth, as first babies are normally lighter than subsequent births [38]. Studies also show that babies born underweight are 3 times more likely to be stunted than children of the same age group with normal or higher birth weight (Myles, 2013). It is thus relevant to improve early detection of intra-uterine growth restriction in pregnant women to provide preventive and efficacious interventions during the pre-conceptual and antenatal period. This study is useful for public health planning and identification of underlying factors to child malnutrition, this would help the central government in proper allocation of health resources, developing and implementation of appropriate nutrition programmes aimed at improving maternal and child nutrition both at individual and community level.

Water and sanitation also have a significant impact on child nutritional status as lack of water in households makes basic hygiene somewhat unattainable (Mzumara et al., 2018). Children whose source of drinking water was non-improved were likely to be stunted compared to children whose source of water was improved. This may be attributed to the fact that non-improved water sources may be contaminated and thus may increase risk of infection such as diarrhoea.

These findings are consistent with other studies (Tiwari, 2011; Monteiro et al., 2017; Willey et al., 2009; Yasmin, 2014). In relation to number of children in the household, smaller families are generally socio-economically advantaged accompanied by

improved quality of life. It is thus very important for rural set ups to have boreholes in place of wells and pit latrines be dug as far away from boreholes as possible.

This scoping review found that some studies reported nutritional patterns and lack of safe drinking water as important risk factors of child malnutrition (Modi et al., 2015, Ahinkorah et al. 2021, Mzumara et al. 2018). Nutritional patterns are varied; some involving offering children's adequate quantities of the same type of food day in day out but not containing a mixed proportion from the basic food groups; others may just be inadequate quantities due to several reasons such as food shortages and inability to afford them. In either case the child will lack some necessary nutrients that the body requires to develop properly or will receive them in insignificant quantities (Ahinkorah et al., 2021). Also, unsafe drinking water poses a significant risk in that it is associated with a whole range of diarrheal diseases that compromise the child's absorption of necessary nutrients from foods eaten.

It is assumed that lack of water in households makes basic hygiene somewhat unattainable. A non-improved water sources may be contaminated and thus may increase risk of infection such as stated above (Mzumara et al., 2018). This simply means even if the child ate a nutritious diet if they are suffering from a diarrheal disease, uptake of nutrients is likely going to be compromised (Modi et al., 2015). Therefore, the impact of the two above mentioned factors on child malnutrition is enormous hence the need to address all the complementary factors using an integrated approach. Part of the strategy should involve educating mothers on progressive nutrition patterns and ways of making water safe to drink. Equally, policies and programs should also focus on improving social-economic status of mothers, sensitization in and improve water sources, sanitation, and hygienic practices.

Child malnutrition is associated with several factors, including child related factors such as: age, sex of the child, birth order and birth size. According to (Endris et al., 2017), age of a child is a significant factor of child malnutrition, this postulation is correct because the foundation for optimum health and development across the lifespan is formed during the first 1000days of life (Cusick et al., 2013). Yet in developing countries like the Sub-Saharan Africa, poverty and its attendant condition, malnutrition weaken this foundation leading to early mortality and morbidity such as poor health and stunted growth.

Furthermore, right nutrition and care during this period influences the chances of survival and growth. According to Rodriguez (2019), 25% of all children will experience feeding difficulties during infancy and early childhood that can affect their overall health and development. Early childhood development is a critical time for growth and development hence it needs attention and appropriate care. On the other hand, sex of the child contributes to stunted growth as shown by the study conducted in Nigeria which revealed that male children had a significantly increased risk of being stunted than females (Svedberg, 1990).

Gender-based health inequality may be because of community specific cultures in Nigeria which renders high value to women's agricultural labour where males are more physically active in the fields expending most of their energy which have been channelled into growth. On the other hand, females are culturally expected to be less active and stay at home with their mothers near food preparation. This finding is in line with results from cross-sectional studies conducted in Kenya, Indonesia, Ghana, and Tanzania (Kavosi et al., 2014; Masibo and Makoka, 2009; Darteh et al., 2014; Shiratori, 2014).

There is association between region of residence and nutritional status. Earlier survey has also shown a very low prevalence of malnutrition in these regions (Sebsibe and Yinges, 2015). The watched distinction may reflect natural imperatives, more awful broad living conditions, harmful sociocultural practices, unequal intra household food distribution, seasonal food insecurity, poor public facilities, and other related factors (Girma and Genebo, 2002).

In addition, under-five children from poor wealth status are at a higher risk of malnutrition compared with children from rich households. This is consistent with other studies done in Ethiopia, Bangladesh, Nigeria, and India (Headey, 2011; Dasgupta, 2014; Sebanjo, 2009, (Shahjada, 2014). Therefore, it is of utmost importance that farming and or gardening including entrepreneurship be very encouraged amongst the rural and poor settlers so that so that their nutritional statuses can improve.

Implications for Practice

It is very cardinal to use multi-purpose ways to alleviate the burden of malnutrition in the Sub-Saharan Africa (SSA) since factors contributing to this problem are dynamic. Various private organisations alongside government efforts should participate in trying

to attain a sustainable food security program, clean water and sanitation environments for all people, as well as highly promoting agriculture and livestock farming. Furthermore, policies that support and promote nutrition and family planning education in both local and official languages will greatly enhance the knowledge of the people and in turn will yield positive results in the SSA. In SSA, there is need for proper allocation of health resources, developing and implementation of appropriate nutrition programmes aimed at improving maternal and child nutrition both at individual and community level.

Limitations of the study.

Articles used in this study were drawn from different countries, this makes it difficult to generalise.

Conclusion

This scoping review revealed that there are quite a number of risk factors that lead to child malnutrition. Therefore, there is an urgency for strategic interventions aimed at improving child nutrition through female education if the 2030 end malnutrition SDG 2.2 are to be achieved. There is also a great need for all SSA countries to greatly strengthen their current policies and programmes on malnutrition to enhance their attainment of the SDGs.

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Availability of data and materials

Since the study was a literature review all the articles used in the study can be accessed online.

Author's contributions

Mrs Catherine M. Mtambo participated in results extraction and one discussion theme

Mr Kalungwe Mwamba participated in one discussion theme

Ms Thamary Karonga participated in one discussion theme

Dr Ekpenyong Mandu participated in reviewing the work

Dr Mathew Nyashanu supervised and reviewed the study

Conflict of interest

The authors declare no potential conflict of interest with respect to the research, authorship and publication of this article.

Consent for publication

We give the Journal the right to publish this work.

Ethical approval

There was no need of ethical approval as this was a literature paper and the data used was already in the public.

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