

Magnitude and Determinants of Stunting Among Children in Africa: A Systematic Review

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<http://dx.doi.org/10.12944/CRNFSJ.2.2.05>

(Received: August 07, 2014; Accepted: August 21, 2014)

ABSTRACT

Globally it is estimated that 162 million under-five year old children are stunted. Africa is known with one of the highest prevalence of stunting in the world. Even though studies suggested various determinants for stunting in Africa; there is lack of agreement about the relative importance of factors affecting the nutritional status of children. We reviewed all literatures, including: observational studies, and prospective randomized controlled trials (RCTs) evaluating the prevalence and determinants of stunting in children under the age of five years in Africa to identify systematically, appraise and synthesize the best available evidence on the magnitude and epidemiological factors for stunting among children under the age of five years in Africa by conducting electronic search of Medline, Pub Med, Health Inter-network access to Research Initiative (HINARI), and Google Scholar databases. After exclusion of irrelevant ones, 21 out of 55 articles were considered for the final analysis. On the basis of this review, majority of the articles reported highest prevalence of stunting in Africa and its progress is found unsatisfactory. Inappropriate complementary feeding practice, maternal under nutrition, household food insecurity, economic growth and maternal education, are identified as the principal determinants of stunting. Some studies confer the determinants of stunting is multidimensional and intertwined. The remaining articles reviewed, noted the synergistic interaction between inadequate dietary intake and disease as the main determinant of stunting. The magnitude of stunting in Africa is found as one of the highest in the world and the trend shows stagnating rather than progress. It is confirmed that the determinants of stunting in the continent are varied and intertwined; showing variations from region to region. It is recommended that; African countries should give more emphasis to fight stunting; further research on target implementation sites is needed before creating health policies. They should also consider the cultural beliefs and socio cultural realities of their population. We therefore encourage policy makers to use facts from this review on creating policies to reverse the situation.

Key words: Stunting, Determinants, Magnitude, Africa.

INTRODUCTION

Globally it is estimated that 162 million under-five year old were stunted¹. Studies confirmed that 90% of the global burden of stunting occurs in 36 African and Asian countries. Eastern and middle Africa is known with a highest prevalence of estimates in the UN sub regions with 50% and 42%, respectively².

The progress of stunting has been highly uneven, and the rates in the most affected world

regions have largely remained static^{3, 4}. The most recent studies shows that in Africa the percentage of children who are stunted (below -2 SD) ranges from 46%-18.8%⁵⁻⁸. Growth stunting in early life continues to be a critical public health concern and it is highly associated with impaired cognition and educational performance⁹. Stunting have long-term consequences on adult health and human capital¹⁰⁻¹¹; since WHO adopted a resolution on maternal, infant and young child nutrition which included a global target to reduce the number of stunted children under 5 years of age by 40% in 2025¹².

Several studies examining the prevalence and determinants of stunting in Africa have been conducted (12-14) but; they have had limitations. Even though several studies determined that stunting in early life continues to be a critical public health concern in this continent; most of the previous studies and review articles have not adequately addressed the issue and not examined exhaustively the determinants of stunting in Africa. Studies that address and bring together the broader picture of determinants of stunting are lacking [11a]. It is also noted a lack of agreement about the relative importance of factors affecting the nutritional status of children in this continent⁵⁻¹⁹.

Literatures shows that many developing countries are focusing on creating policies in line with addressing maternal and child issues, implementing programmes and placing systems to reverse the situation²⁰. In line with this an updated systematic review is essential to help identify regions needing effective interventions and provide the basis for future research and for a discussion of policy implications. Hence, this manuscript examines the magnitude and determinants of stunting in Africa by reviewing recent high quality literatures and published articles.

Methods

The published results from high-quality human observational and experimental studies which analyzed the magnitude and associated factors with stunting were all included to this literature based analysis. Electronic search of Medline, Pub Med, Health Internetwork Access to Research Initiative (HINARI), and Google Scholar databases up to the end of 2013 was conducted. Search was done in keywords: (“stunting” OR “under five children” OR “malnutrition OR stunting”) AND (“determinants” OR “factors associated” OR prevalence) AND (Observational studies OR Randomized control trials in Africa).

A function extracting related articles as well as reference lists from research and reviews was used during the search process. The full version of the English-language analyzed articles and abstracts of most found papers were available during the selection process. All literatures, including: observational studies, and prospective randomized controlled trials (RCTs) evaluating the prevalence

and determinants of stunting in children under the age of five years in Africa, published in English language, were included.

There were no limits on the age if stunting occurs under the age of five years. In the primary search 112 records were found. After exclusion of studies/reviews which did not examine the magnitude and determinants of stunting among children under the age of five in Africa duplicated and outdated (published before 2000) data, 55 articles were selected. During the second selection we evaluated 21 of them as potentially relevant articles considering the prevalence and determinants of stunting in children under the age of five in Africa. Studies that failed to meet our criteria were not taken into consideration (Figure 1). We defined a “determinant of stunting” as any factor that is associated with stunting among children under the age of five in Africa.

RESULT AND DISCUSSION

We identified 112 potentially relevant articles for thorough review (Figure 1). We excluded 57 articles during initial screening because they were not directly referring the prevalence and determinants of stunting in Africa. The remaining 55 articles were again analyzed for their internal consistency with the research objectives and some 34 of them were found not relevant and/or incomplete, hence excluded for the second time. The remaining 21 of were considered for final review and analysis. From these finally accommodated articles, eleven of them were related to the determinants of stunting, 7 of them were both about magnitude and determinants of stunting in Africa, and the remaining 3 articles reviewed were about the trends of stunting in Africa and worldwide scale.

Though some variations are observed from region to region; the results on the final analysis of the most articles reviewed, shows more of similar findings on the prevalence and determinants of stunting in Africa. A study conducted by Afework. M et.al from Ethiopia, demonstrate that chronic malnutrition is a public health problem in the study communities; the rate of stunting becomes more apparent as children grow older. The same study confirmed poor complementary feeding practice

is the main determinant of stunting in the study area [13a]. Another systematic review conducted by Lindsay H. Allen, reveals that in addition to poor complementary feeding practice, many children in developing countries are already nutritionally depleted by the end of the first year of life associated with maternal under nutrition²¹. Similarly a community based cross-sectional survey by Beka T.et al, determined inappropriate feeding practice as the principal risk factor which brought about nutritional deprivation among under-five children; showing the importance of appropriate feeding during infancy and childhood cannot be overstated even in food surplus areas²².

Analysis of 109 Demographic and Health Surveys by Emre Özaltın et.al in 54 countries conducted between 1991 and 2008; revealed maternal stature inversely associated with offspring mortality, underweight, and stunting in infancy and childhood ²³. In contrast Alemu M. et.al study;

reported that no association was observed between gender and nutritional status [15a].

Several studies have demonstrated the connection between stunting and household income²⁴⁻²⁶. In line with this Smith LC and Haddad L estimated that the effect of economic growth on changes in under nutrition and economic growth leads to a small but significant reduction in stunting ²⁷. Conversely a systematic review by Sebastian V et.al revealed very small to null association between increases in per-head GDP and reductions in early childhood under nutrition [16a].

A review by Luchuo .E et.al also noted that despite extensive global economic growth in recent decades, including in some of the poorest countries in Africa, millions of people remain locked in a vicious cycle of hunger and poverty and this leads to irreversibly stunted development and less productive lives. A low level of education especially

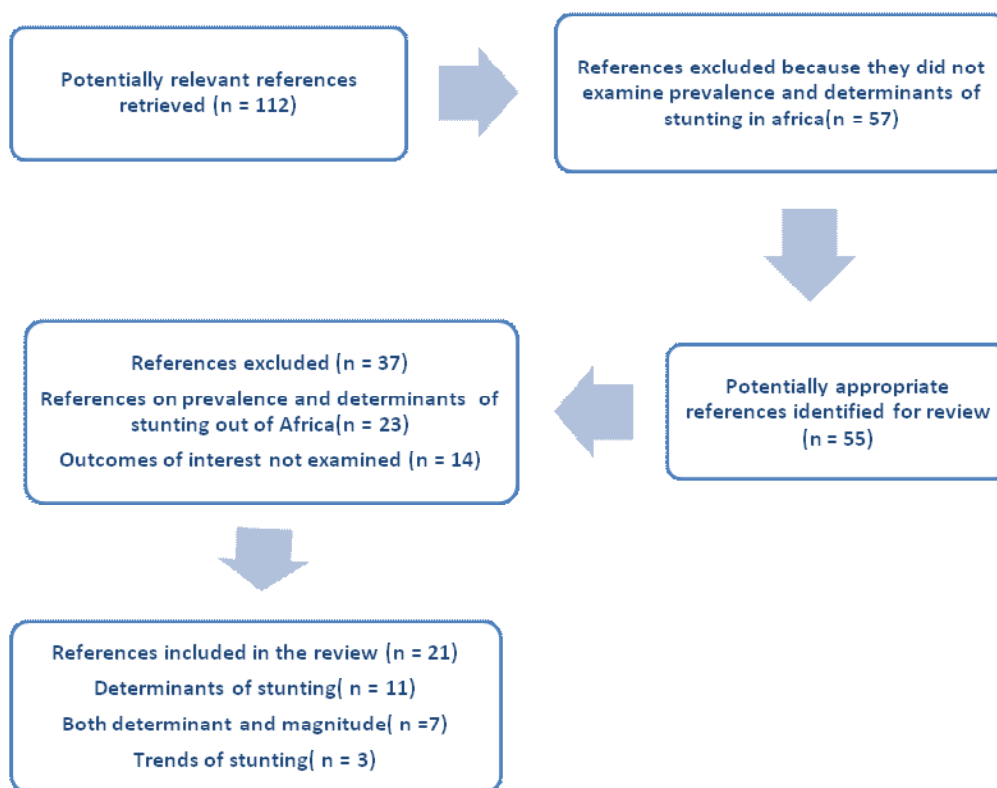


Fig. 1: Selection of studies included in systematic review of randomized controlled trials and observational studies on prevalence and determinants of stunting in Africa

in women is also reported as key perpetrators of poor nutrition practices in this Region of the World. The same study confer that government policy has not been very successful most of the time, because most governments fail to consider this as a serious issue, and rescue projects from the western world are vertical and do not consider socio cultural realities of target implementation sites²⁸.

A meta-analysis by Henry W. et al reported that male children below five years of age are more likely to become stunted than their female counterparts [18a]. Similarly systematic review by R. Elena. et al provide similar evidence that male gender as negatively associated with Height for Age z-score, as previously reported by others^{29,30}. Other studies proposed this may be resulted by the fact that biological, behavioral, and socio-cultural mechanisms of gender differences. They justify that biologically, female subjects have an advantage for better health and longer survival because of the role of sex hormones in modulating lipid levels and increasing immune response. [26a, 31]

Selected micronutrient deficiencies are also suggested as a determinant factor for stunting in developing countries. Prospective randomized controlled trial by Aamer. I et.al, suggests the positive effect of zinc supplementation on linear growth of children [17a]. On the other hand observational studies reviewed from various parts of Africa viewed the determinants of stunting as multidimensional and intertwined. Additionally public health services such as having antenatal care and vaccinations also considered as variables that influence stunting^{32, 33}.

The analysis of Gretchen A Stevens' et.al reported the macroeconomic shocks, structural adjustment, and trade policy reforms in the 1980s and 1990s might have been responsible for worsening of child nutritional status in sub-Saharan Africa [34]. UNICEF-WHO-and the World Bank in 2012 estimates of the trend of stunting in Africa shows almost stagnant prevalence over the past two decades; even though, some countries made substantial progress [1a].

Therefore, it is clear to see that the determinant of stunting in Africa are various and

multidimensional; and its trend shows stagnation rather than progress in most of the region.

CONCLUSION

In summary, the results of our study revealed that current magnitude of stunting in Africa is one of the highest in the world and it is confirmed that the trend is stagnating in most of the region; showing that more effort is required to improve the situation in the continent. We systematically identified the determinants of stunting in African continent are varied and intertwined showing variation from region to region.

To be successful governments must consider stunting as a serious issue and must put special emphasis on creating policies in line with research findings conducted by considering the cultural beliefs and socio cultural realities of target implementation sites . They should also be committed to combat stunting, implementing programmes and placing systems by considering it as the main agenda on the fight against poverty and a fundamental driver of a wide range of developmental goal. We therefore encourage policy makers to use facts from this review on creating policies to reverse the situation. It is also recommended that further larger quantitative and qualitative studies, in order to identify other important socio-demographic factors and cultural perceptions that have an impact on the situation of stunting in Africa.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

ZT developed the review parameters and made detailed and extensive literature search and involved in extraction, analysis, write up and synthesis of the findings. He also drafted the manuscript for intellectual content.

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ACKNOWLEDGMENTS

We want to extend our heartfelt thanks to Mr. Afework Kebebu who is Lecturer and research assistant at Hawassa university school of nutrition

and food science for his valuable input in reviewing this manuscript. We are also grateful to all individuals who never failed to encourage us in every aspect from the beginning until the end of this study.

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