CONCEPTUAL FRAMEWORK OF UNDERLYING FACTORS LIMITING ERADICATION OF HIDDEN HUNGER IN DEVELOPING COUNTRIES

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ABSTRACT

Background: Hidden hunger (HH) is a global public health problem. There is an interplay of several underlying factors limiting HH in developing countries**.**
Objective: This paper aims at conceptualising the interplay of these underlying factors limiting HH in developing countries.
Methodology: Explanatory sequential mixed method was used. A goggle search was done to collect qualitative data on underlying factors of HH using the following terms "corruption," "nutrition knowledge," "war," " agricultural food production," "food choices and handling," "caring practices," "refugees," "food scarcity," "prevalence of micronutrient deficiencies", "malnutrition", and "country populations" (2000-2019) to construct a conceptual framework. Probability sampling technique was used to select 17 out of 34 Low Income (LI) and 23 from 47 Lower Middle Income (LMI) countries from World Bank Country Classification. Secondary quantitative data were collected from Global Hunger Index (GHI), Food Insecurity Experience Scale (FIES), Corruption Perceptions Index (CPI) and World Population Review. Data was analysed at p<0.05.
Result: Regional mean GHI was World (11.6%), Africa (19.5%), Asia (13.1%). Mean CPI, GHI and population for developing countries were 29.1, 25.9 and 40.7 million. Mean FIES was World (9.1%), Africa (24.9%) & Asia (6.8%). Conceptualised framework showed that the major underlying causes of HH were poor nutritional knowledge, war, corruption, low agricultural productivity and over population culminating in HH. Statistically significant correlation existed between CPI and GHI (p<0.05).
Conclusion: Policies discouraging corrupt practices and that promoting adequate micronutrients supply for vulnerable groups to eradicate hidden hunger in developing countries are very important.

Key words: hidden hunger, micronutrient deficiencies, underlying factors, developing countries

Word count: 245

1.0 INTRODUCTION

Hidden hunger also called micronutrient deficiency is a global public health problem in developing countries especially Sub-Saharan Africa (SSA) and Asia (Sight and Life, 2013; UNHCR, 2013)). Hidden hunger includes vitamin A deficiency (VAD) which is responsible for night blindness in preschool children; iron deficiency anaemia (IDA) which causes delayed mental and motor development in infants and young children as well as high morbidity among young pregnant women and infants; folate deficiency associated with abnormal pregnancy outcomes (premature births) and neural birth defects (spina bifida, club foot, cleft palate and anencephaly); zinc deficiency also responsible for loss appetite, growth retardation, impaired immune function and iodine deficiency which causes low intelligent quotient in school-aged children. Micronutrient malnutrition causes birth defects, mental retardation, learning difficulties, compromised immune systems, low work capacity, blindness and death (Uchendu, 2011). Globally, about 2 billion people lack key micronutrients like iron and vitamin A (Development Initiatives, 2017). One in three people in the world suffer from hidden hunger (Sight and Life, 2013). Nigeria, South Sudan and Somalia are countries cited as experiencing food insecurity and malnutrition from famine and droughts. In these countries, it is estimated that about 38 million people are severely food insecured, approximately 2 million children under five have severe acute malnutrition and 5 million people have moderate acute malnutrition (Development Initiatives, 2017).

Hunger is the pain, discomfort and stress associated with lack of food or food insufficiency. The Food and Agriculture Organization (FAO) defines hunger as food deprivation or undernourishment resulting from the consumption of less than 1800 kilocalories per day which is the minimal requirement for an average individual to live a healthy and reproductive life (Welthungerhilfe/International Food Policy Research Institute/Concern Worldwide, 2015). Global hunger index is an index used to measure

hunger across the world. Hunger is multidimensional and so has four component indicators used in describing the different aspects of it. The four indicators of hunger are undernourishment, child wasting, child stunting and child mortality (Welthungerhilfe/International Food Policy Research Institute/Concern Worldwide, 2015). Food-based intervention strategies to eradicate hidden hunger include introduction of agricultural programmes such as green revolution, operation feed the nation, home gardening, biofortification, nutrition education, diet diversification, exclusive breastfeeding, adequate complimentary feeding, good caring practices, food supplementation, food fortification, new foods and food preparations, novel foods and proper school feeding programmes (Uchendu and Atinmo, 2011).

Sustainable development Goals (SDGs) Targets 1 and 2 aim at no poverty and zero hunger and these are some of the risk factors of hidden hunger. Hunger has been reported to influence life expectancy in war-torn Sub-Saharan African countries (Uchendu, 2018). There are about 1 million Rohingya refugees from Myanmar many of whom are suffering from acute food insecurity, poor health, and injuries caused by violence (Hammond, 2018). Nigeria has approximately 7 million internally displaced persons (IDPs) (Lenshie and Yenda, 2016) while about 200, 000 Nigerians are refugees in Chad, Niger and Cameroun (WFP, 2018). Chad has 1 million IDPs, Niger 1.2 milion, Cameroon 50, 000 and Ghana, 150, 000 (Lenshie and Yenda, 2016). Food shortage in Nigerian IDP camps has resulted in chronic hunger, and acute malnutrition (Adedibu, 2017). SDG Target 2.1 says "By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round." (FAO/IFAD/UNICEF/WFP/WHO, 2018). It has been suggested that hunger and displacement must be understood and treated as political problems (Hammond, 2018). It has been reported that food shortage in Nigerian IDP camps has resulted in chronic hunger, and acute malnutrition (Adedibu, 2017).

Micronutrient deficiency is a silent epidemics of vitamin and mineral deficiencies affecting people of all genders and ages, as well as certain risk groups (Tulchinsky, 2010). The most vulnerable are pre-school children, pregnant and lactating mothers and adolescents. In Nigeria, hidden hunger is a serious problem, with 29.5 % of children under-five estimated to be vitamin A deficient (HarvestPlus, 2012). Hidden hunger is a chronic lack of vitamins and minerals that often has no visible warning signs, so that people who suffer from it may not even be aware of it. It is as a result of inadequate intake of micronutrient dense staples and low food diversity. Other studies have also shown that micronutrient deficiency and worm infections are intertwined and co-exist among low-income populations (Al-Mekhlafi et al. 2008; Khor and Zalilah, 2008). An association has been found between nutrition knowledge and food intake indicating that knowledge is an important factor in explaining variations in food choices (Wardle et al. 2000).

According to World Health Organization, food security has been defined as when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life (Menhas et al., 2016). Poverty combined with other socio-economic and political problems create the bulk of food insecurity around the world (FAO, 2011). Income poverty (due to unemployment, low wages, or lack of education) can lead to household food insecurity, inadequate care, "unhealthy household environment, and lack of health services (Black et al. 2008). People of low socioeconomic status are most vulnerable to food insecurity since purchasing power serves as a main determinant of the ability-to-afford nutritional food sources. Households that cannot attain nutritious foods due to income poverty are most associated with inadequate diet and disease that leads to malnutrition (Wieser et al. 2013). Poverty, hunger, and gross food insecurity are ravaging the masses not because of lack of resources in some cases, but due to the absence of a 'messiah' or a true patriot or selfless advisors and managers of national resources and tax payers' money (Uchendu, 2013). Corrupt practices have been reported to be negatively influencing food security and life expectancy in developing countries

(Uchendu and Abolarin, 2015). This is an indication that if positive effort is not made to stop this trend, SDG target 2.1 which aims at eradicating hunger by 2030 might not be achieved especially in developing countries (FAO/IFAD/UNICEF/WFP/WHO, 2018).

The prevalence of undernourishment is one of the indicators used to monitor hunger while the prevalence of severe food insecurity is measured using the Food Insecurity Experience Scale (FIES) which was introduced in 2017. FIES provides an estimate of the proportion of the population experiencing serious challenges of obtaining safe, nutritious and sufficient food (FAO/IFAD/ UNICEF/WFP/WHO, 2018). The aim of this study therefore is to describe the underlying risk factors responsible for persistent increase in hidden hunger in developing countries.

2.0 MATERIALS AND METHODS

Inclusion criteria

Only developing countries that had complete data on CPI, FIES, POP, GHI and a population of at least 1 million were included in the study resulting in 40 countries selected.

Exclusion criteria

Countries were excluded if they do not have complete relevant data (CPI, FIES, POP, GHI) available. Global Hunger Index (GHI) 2015 and Corruption Perceptions Index 2018 had records for 104 and 180 countries, respectively.

Sample collection

An explanatory sequential mixed method was used in collecting the data. Qualitative data was obtained from a systematic review of relevant databases searched from 2010 to November 2019. Comprehensive search terms included: global prevalence of micronutrient deficiency, malnutrition, country populations, corrupt practices, refugees, social amenities, food security, food scarcity, food availability, war incidences in Sub-Sahara Africa (SSA), agricultural productivity in developing

countries and nutritional knowledge among women. A conceptualised framework was constructed using the qualitative data from the search. List of developing countries were collected from World Bank Country Classification (World Population Review, 2019). Developing countries were randomly selected from Low Income (LI) ($995 or less) and Lower Middle Income (LMI) ($996 to $3,895) Economies (World Bank Group, 2019). Probability proportionate to size (PPS) was used to select 17 out of 34 Low Income and 23 from 47 Lower Middle Income countries from World Bank Country Classification (making 40 countries) as a representative sample. Secondary quantitative data were also collected from 2015 Global Hunger Index (Welthungerhilfe/International Food Policy Research Institute/Concern Worldwide, 2015); Food Insecurity Experience Scale (FIES) (FAO/IFAD/UNICEF/WFP/WHO, 2018); Corruption Perceptions Index (CPI) (Transparency International, 2018) and World Population (World Population Review, 2019). Countries were arranged according to their CPIs in chronological order. The qualitative data was used to explain the quantitative data.

Statistical analyses

Data was analysed using T-test and Pearson correlation analysis at p<0.05. Data was presented in tables as means, standard deviation and percentages.

3.0 RESULTS

Figure 1 shows the conceptual framework of the major underlying factors limiting hidden hunger in developing countries. It reveals the major underlying factors as low agricultural food production, war, corruption, and over population and poor nutrition education/knowledge among women and children. The underlying factors had either direct or indirect influences on hidden hunger but the overall effect was micronutrient insecurity. This conceptual framework will guide the discussion.
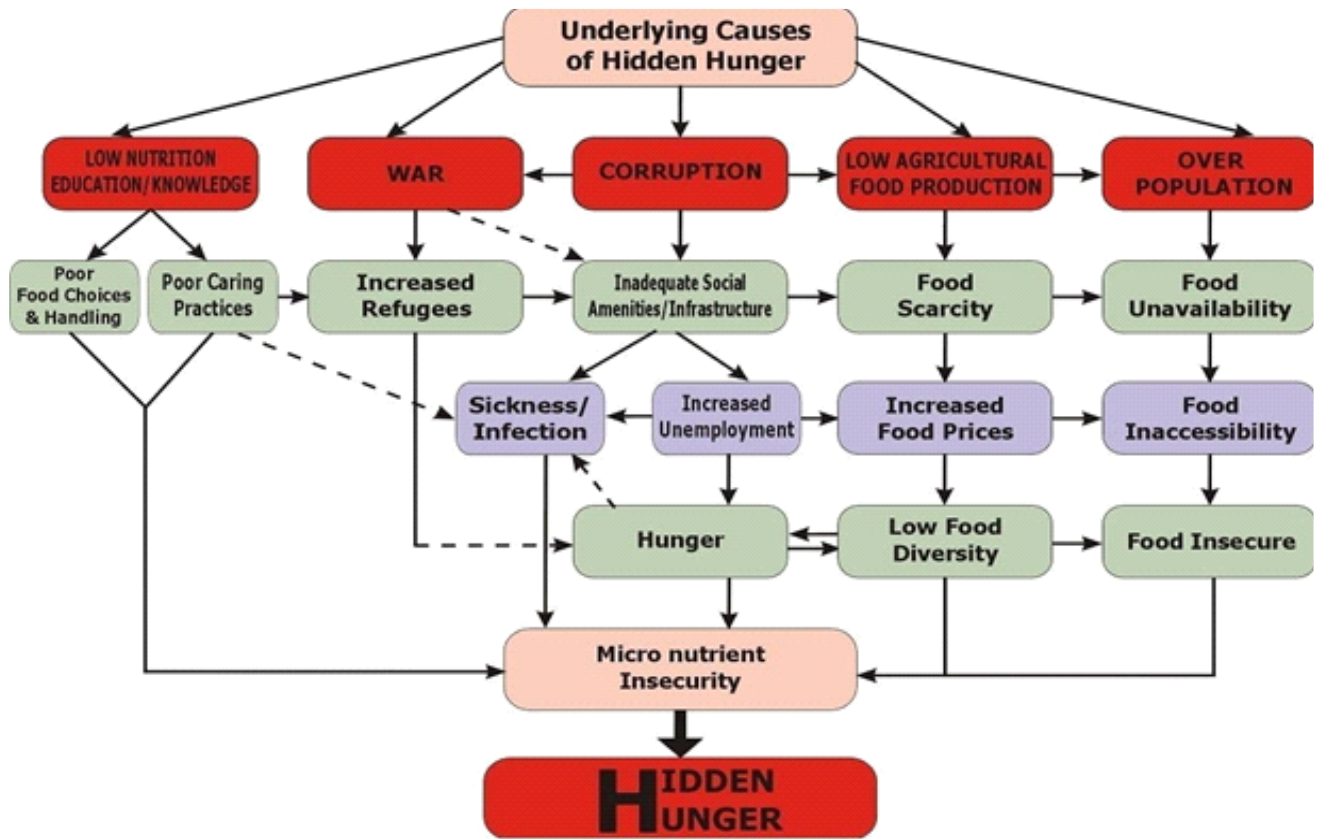
Figure 1: Conceptual framework of risk factors limiting the eradication of hidden hunger in developing countries

Table 1 shows the mean corruption perceptions index 2018 of selected developing countries to be 29.0, GHI 2015 (26.7) and population (41.0 million).

Table 1: Developing countries' Corruption Perceptions Index, Global Hunger Index and their population

S/N	Country	CPI Score[a] 2018/100	GHI 2015[b]	Population (≈million)[c]
1	Lesotho	41	23.5	2.3
2	Burkina Faso	41	31.8	20.3
3	Ghana	41	15.5	30.1
4	Benin	40	21.8	11.8
5	Gambia	37	21.5	2.2
6	Mongolia	37	14.7	3.2
7	Philippines	36	20.1	108.1
8	Tanzania	36	28.7	60.9
9	Côte d´Ivoire	35	26.3	21.1
10	Zambia	35	41.1	18.1
11	Ethiopia	34	33.9	110.1
12	Niger	34	34.5	23.1
13	Pakistan	33	33.9	204.8
14	Vietnam	33	14.7	97.4
15	Liberia	32	30.8	4.9
16	Mali	32	29.6	19.7
17	Sierra-Leone	30	38.9	7.9
18	Togo	30	23.0	8.2
19	Bolivia	29	16.9	11.4
20	Honduras	29	13.4	8.6
21	Myanmar	29	23.5	54.3
22	Paraguay	29	10.5	6.8
23	Equatorial Guinea	28	28.8	1.4
24	Kenya	27	24.0	52.2
25	Nigeria	27	32.8	200.9
26	Bangladesh	26	27.3	168.1
27	Uganda	26	27.6	45.7
28	Cameroon	25	24.2	25.3
29	Madagascar	25	36.3	26.9
30	Nicaragua	25	13.6	6.0
31	Mozambique	23	32.5	31.4
32	Uzbekistan	23	13.3	32.8
33	Zimbabwe	22	30.8	17.2
34	Cambodia	20	22.6	16.3
35	Democratic Republic of Congo	20	26.6	86.7
36	Haiti	20	37.3	11.2
37	Angola	19	32.6	31.8
38	Chad	19	46.4	15.8
39	Congo, Rep.	19	26.6	5.5
40	Yemen	14	34.2	29.6
	Mean[d]	**29.0±7.01**	**26.7±8.49**	**41.0±52.00**

\[a]Transparency International Corruption Perceptions Index, 2018: Score 0 -100; The high the cleaner
[b]2015 Global Hunger Index (Welthungerhilfe/International Food Policy Research Institute/Concern Worldwide, 2015);

[c]World Population Review, 2019

[d]Developing countries without complete data and population <1 million were excluded.

Table 2 shows that there was a correlation between corruption and hunger among developing countries. Statistically significant correlation existed between CPI and GHI (p<0.05).

Table 2: Pearson correlation between corruption index, global hunger index and population in developing countries

		Correlations		
		CPI	GHI	POP
CPI	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	40		
GHI	Pearson Correlation	**-.334***	**1**	
	Sig. (2-tailed)	.035		
	N	40	40	
POP	Pearson Correlation	-.003	.123	1
	Sig. (2-tailed)	.987	.451	
	N	40	40	40

*. Correlation is significant at the 0.05 level (2-tailed).

Table 3 reveals the mean regional corruption scores of countries of the world. The average CPI scores for the regions were Asia Pacific (44 %), Eastern Europe & Central Asia (35 %), Middle East & North Africa (39 %) and Sub-Saharan Africa (32 %). The higher the score, the more clean and less corrupt the country is.

Table 3: Mean regional corruption index (CPI) scores of the world

S/N	Region	CPI Scores 2018/100*				
		Average	Top	Score	Bottom	score
1	Asia Pacific	44	New Zealand	87	North Korea	14
2	Eastern Europe & Central Asia	35	Georgia	58	Turkmenistan	20
3	Middle East & North Africa	39	United Arab Emirates	70	North Korea	14
4	Sub-Saharan Africa	32	Seychelles	66	Somalia	10

*Scale of zero (highly corrupt) to 100 (very clean); Mean CPI Africa (35.3); Asia (39.5)

Source: Transparency International 2019

Table 4 shows the prevalence of severe food insecurity from 2014–2017 in developing countries. Mean global prevalence of food insecurity was (9.1 %), Africa (24.9 %), Asia (6.8 %), Latin America (7.8) and Northern America and Europe (1.4).

Table 4: Global prevalence of severe food insecurity, measured with the food insecurity experience scale, 2014–2017

S/N	Region	Food Insecurity Experience Scale (FIES) by year				
		2014	2015	2016	2017	Mean
1	World	8.9	8.4	8.9	10.2	9.1±0.77
2	Africa	22.3	22.4	25.4	29.8	24.9±3.52
3	Asia	7.3	6.6	6.5	6.9	6.8±0.35
4	Latin America	7.6	6.3	7.6	9.8	7.8±1.45
5	Northern America and Europe	1.5	1.5	1.2	1.4	1.4±0.14

Source: FAO/IFAD/UNICEF/WFP/WHO, (2018)

Table 5 shows the regional prevalence of hunger (GHI) in the world from 2005 - 2017. The mean prevalence of hunger indices were world (11.6), Africa (19.5), Asia (13.1), Latin America and the Caribbean (6.7), Oceania (5.9) and Northern America and Europe (< 2.5).

Table 5: Global prevalence of undernourished people (GHI) in regions of the world 2005 - 2017

		Undernourishment (years)[a]						
S/N	Region	2005	2010	2012	2014	2016	2017	Mean
1	World	14.5	11.8	11.3	10.7	10.8	10.9	11.6±1.44
2	Africa	21.2	19.1	18.6	18.3	19.7	20.4	19.5±1.10
3	Asia	17.3	13.6	12.9	12.0	11.5	11.4	13.1±2.21
4	Latin America and the Caribbean	9.1	6.8	6.4	6.2	6.1	6.1	6.7±1.16
5	Oceania	5.5	5.2	5.4	5.9	6.6	7.0	5.9±0.72
6	Northern America and Europe	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5

Source: [a]FAO/IFAD/UNICEF/WFP/WHO, (2018)

Figure 2 shows the relationship between the average Corruption index, Global hunger index and Prevalence of food insecurity among the regions in developing countries. African region ranked highest in corruption, severe food insecurity and hunger followed by Asian region. It implies that the two regions must take deliberate drastic measures to increase food production to minimize hunger in the regions.

Figure 2: Corruption index, Global hunger index and Prevalence of food insecurity in developing countries
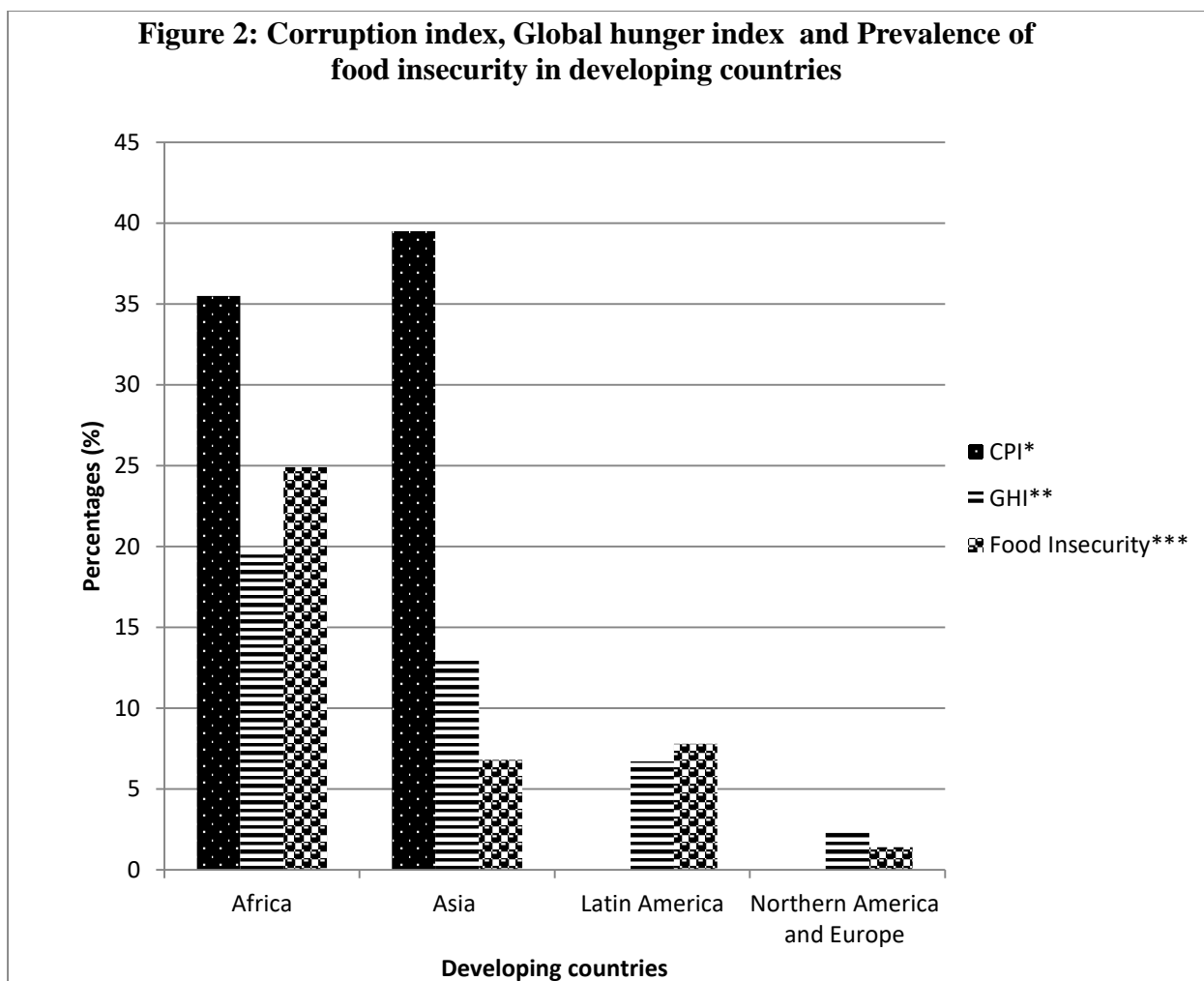
*CPI: Scale of zero (highly corrupt) to 100 (very clean)

**GHI/Food Insecurity: Scale of zero (low prevalence) to 100 (high prevalence)

4.0 DISCUSSION

Corruption, incessant war, over population, low nutrition education/knowledge and low agricultural food production might be underlying risk factors limiting the eradication of hidden hunger in developing countries (Figure 1). Developing countries are densely populated (41.0 million), have the highest mean corrupt practices tendencies below 30 % and very high hungry people (26.7 %). African region has the highest mean corrupt perceptions index (35.5.0 %) and undernourished people (19.5 %) followed by Asia CPI (39.5 %) and GHI (13.1 %) when compared with the rest of the regions. Again the highest most food insecure people live in Africa (24.9 %). The prevalence of food insecurity in

Africa is about four times that of Asia and thrice that of Latin America and the world prevalence. Even though the level of undernourishment in Asia has reduced and remained stable, that of Africa started increasing again from 2016. This is an emergency trend and needs critical action to check met it. A recent study reported that hunger influenced life expectancy in war-torn Sub-Saharan African Countries (Uchendu, 2018). Hidden hunger is precipitated by underlying factors such as corruption, war, over population, low agricultural food production and low nutrition education or poor nutritional knowledge. These underlying risk factors either have direct or indirect influence on hidden hunger and they are also interrelated. This high prevalence of hunger in Africa and Asia implies that young children in these endemic regions might be experiencing severe undernourishment, wasting, stunting and high mortality. Undernourishment, child wasting, child stunting and child mortality have been reported as the indicators of hunger (Welthungerhilfe/International Food Policy Research Institute/Concern Worldwide, 2015).

The most food insecure people live in Africa followed by Latin America and then Asia. The health implication is that people in these regions are experiencing serious challenges in accessing safe, nutritious and sufficient foods. Food insecurity is associated with lack of safe, nutritious and sufficient foods (FAO/IFAD/UNICEF/WFP/WHO, 2018). African countries must invest in mechanized agricultural food production and reduce over dependence on importation of foods. Africa had the highest number of hungry people followed by Asia. Apart from the influence of corruption, this can also be explained by the fact that the two regions had the highest prevalence of food insecurity. Food insecurity is directly related to low agricultural food production and over population and is one of the causative agents for prolonged hunger resulting in micronutrient insecurity which is hidden hunger. Developing countries should invest in mechanised agriculture to produce sufficient foods for their teeming population.

Corruption is described as the dishonest and fraudulent practices by officials in power or position of authority. It is an abuse of entrusted power for personal gain (Transparency International, 2018). The statistically significant correlation which existed between CPI and GHI indicated that high corruption in developing countries was one of the factors that precipitated hunger among the developing nations. As corruption increased, hunger increased. From the conceptual framework, corruption leads to unavailability of adequate social amenities/infrastructures. Absence of social amenities/infrastructures in turn precipitates sickness, infection and increased unemployment. For example, lack of portable water will lead to infection and sickness and if there is no money to pay for hospital bills due to unemployment, this might result to increased morbidity and mortality. Corrupt practices have been reported to negatively influence food security and life expectancy in developing countries (Uchendu and Abolarin, 2015). Unemployment in the presence of increased food prices results in hunger and low food diversity. Prolonged hunger and low food diversity give rise to micronutrient insecurity via hidden hunger among the vulnerable groups. Deliberate and concenscious effort must be made to minimise corruption in developing nations. Policies to block all forms of corruption and leakages should be made by the Legislators.

Many African countries are over-populated with a mean population of 41.5 million. The three most populous countries were Bangladesh (156.6 million), Nigeria (173.6 million), and Pakistan (190.7 million). Developing countries are highly populated but with very high mean CPI index less than 30 %. Poverty, hunger, and gross food insecurity are ravaging the masses not because of lack of resources in some cases, but due to the absence of a 'messiah' or a true patriot or selfless advisors and managers of national resources and tax payers' money (Uchendu, 2013).

There is an increasing incidences of war, conflicts, arm banditry, killings, kidnapping and unrest in many developing countries especially Sub-Sahara Africa. War and conflicts forcefully displaces people from their residences or homes and makes them refugees incapable of helping themselves.

There are about 1 million Rohingya refugees from Myanmar many of whom are suffering from acute food insecurity, poor health, and injuries caused by violence (Hammond, 2018). Nigeria has approximately 7 million persons internally displaced (Lenshie and Yenda, 2016) while about 200, 000 Nigerians are refugees in Chad, Niger and Cameroun (WFP, 2018). Chronic hunger threatens the lives of forcibly displaced persons. The prevalence of undernourished people (PoU) in the world has stabilised except in Africa where the PoU started increasing again from 2016 (19.7 %) to 2017 (20.4 %). This might be attributed to the underlying factors that limit eradication of hidden hunger. War results in forced migration via increased number of refugees and internally displaced persons (IDPs) who live in camps with no shelter, food, portable water and clean environment. Children and women especially pregnant women and lactating mothers in IDP camps face prolonged hunger and malnutrition. Hunger has been reported to influence life expectancy in war-torn Sub-Saharan African countries (Uchendu, 2018). It has been suggested that hunger and displacement must be understood and treated as political problems (Hammond, 2018).

Low agricultural food production leads to inadequate supply of foods which is one of the indicators of hunger and it affects the whole population both adults and children. This in turn causes food scarcity resulting in increased food prices, low food diversity and undernourishment. Food scarcity results in food unavailability, food inaccessibility and eventually food insecurity. Low food diversity affects negatively the quality of food consumed leading to hidden hunger. Most developing countries do not embark on mechanised agriculture to produce enough foods for their population. Food-based intervention strategies aimed at eradicating hidden hunger has been practised in many countries and these includes introduction of agricultural programmes (green revolution (Nigeria), operation feed the nation (Nigeria), home gardening, biofortification), nutrition education, diet diversification, exclusive breastfeeding, adequate complimentary feeding, food supplementation, food fortification, new foods and food preparations, novel foods and proper school feeding programmes (Uchendu and Atinmo, 2011). Low agricultural food production has been worsened by climate change. Climate change refers

to the increasing changes in the measures of climate over a long period of time in relation to precipitation, temperature, and wind patterns. Climate change results in increased demand for soil nutrients, moisture, water availability and consequently affects food production and the welfare of food animals. It leads to low production of fishes, livestock, animals, agricultural produces thus resulting in food scarcity via undernutrition. Prolonged undernutrition results in hidden hunger.

Poor nutritional knowledge gives rise to poor food choices, poor food handling and poor caring practices. Poor food choices would result in low food diversity while poor food handling could lead to degradation and destruction of micronutrients and low food safety during processing. A recent study, reported poor food safety practices and hygiene among women in Lagos State. The study found that about 75 % of women over-cooked their vegetables (5-30 minutes) and another 75 % bought their vegetables and at the same time, cut them in the market before washing at home (Uchendu, 2018). These poor handling processes result in loss of vitamin C, an important antioxidant in the vegetables. Vegetables should be washed, cut at the point of use and should not be cooked for more than one minute. Low food diversity and degradation of micronutrients have a direct relationship with hidden hunger. Adequate nutritional knowledge is required to make the right food choices by mothers and care-givers. In the presence of low agricultural food production, good nutritional knowledge is necessary to be able to combine the available and affordable foods to get quality meal. Good nutritional knowledge will provide the citizens with the information necessary to choose healthy foods which will eventually lead to an improvement in dietary intake. Also, good nutritional knowledge will give accurate information about what the people should be consuming and the implications to their health if they eat the `wrong' foods, and this will lead to positive food behavioural changes. An association has been found between nutritional knowledge and food intake indicating that knowledge is an important factor in explaining variations in food choices (Wardle et al, 2000). Women who had better knowledge of nutrition also exhibited better dietary behaviour, thus underlying the importance of

nutrition education for improving dietary behaviour (De Vriendt et al. 2009). Global nutrition education is very important among children, adolescents, and adults to eradicate hidden hunger.

5.0 CONCLUSION

The underlying primary socio-economic factors for persistent increase in hidden hunger in developing countries include corruption, over population, incessant war, climate change, low agricultural food production, and poor nutritional knowledge among mothers and care-givers. The region of Africa still has the highest corrupt practices, undernourished people and severe food insecurity. Hidden hunger policies face the challenges of political will power, implementation and monitoring. Implementation and monitoring of policies geared at reducing the underlying risk factors of hidden hunger in developing countries is very important.

ETHICS STATEMENT

The datasets used in this study were obtained from (World Population Review, 2019; World Bank Group, 2019; Welthungerhilfe/International Food Policy Research Institute/Concern Worldwide, 2015; Transparency International, 2018; World Population Review, 2019). The datasets for this study are free and available for public use with no identifiable information on the survey participants.

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