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Factors influencing Stunting persistence among children under five in Kicukiro District Health Centers

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Abstract

Poor child growth among under five children remains a public health concern in Rwanda. It increases the risk of illness, irreversible body damage and mortality. An estimated 53,843 annual cases of child mortality are associated with child undernutrition. Some factors are behind this poor nutrition. Several studies on child nutritional status among children under the age of 5 years have been well documented at national level and investigated the magnitude among regions, localities and residence but not yet the associated factors within the districts. This article aims to determine factors influencing stunting persistence in children under five years in Kicukiro District. A cross-sectional survey with both quantitative and qualitative was employed. The study consisted of children under the age 6-59 months admitted in nutrition promotion program in three health centers of Gahanga, Masaka and Busanza. Simple random sampling was used to collect quantitative data to 75 children and correspondent caregivers; health care providers were purposively sampled for qualitative data. The quantitative method was conducted via use of self-administered questionnaire with close ended questions to describe variables and examine the association among variables. A key informant interview was accessed for qualitative data. Enthropometric measurements of a child was taken to assess the nutrition status and interviews were conducted among health care providers to improve the validity of the findings. Research clearance was

provided by the Institutional Research Review Committee of the Mount Kenya University in Rwanda, and Ministry of Health as well as Kicukiro district offices. Confidentiality was considered during the research process and data were analyzed by using SPSS statistical package. The findings of this study revealed that the nutrition status among children in Kicukiro district health centers occurred with 38.6% stunted children and 6.7% severe stunting. Children aged 6-24 months were more affected of stunting with 93.3%. Quantitatively bivariate analysis revealed clear significant association with socioeconomic characteristics and environmental health-related conditions associated with stunting persistence; still, low family planning usage, wealth index and low family monthly income as well as poor hygiene practices and household sanitation were qualitatively identified factors influencing in the area. It was concluded that poor nutrition status among children remains a public health challenge in the study setting and related factors have been identified. It was recommended to promote community awareness about perfection of health services and expansion of interventions especially poverty alleviation activities with focus on advance of wealth index and family monthly income and improve sanitation at household level.

Key words: Stunting persistence, child undernutrition, Kicukiro District.

Introduction

Stunting stays a major public health problem in many developing countries; an estimate of 162 million under-five year old were globally stunted in 2011. 90 % of them live in Africa and Asia with prevalence levels of stunting of 36% and Asia 27% respectively (1). Contributing factors are influenced by socio-economic and political settings like poor diet and frequent illness due to home food insecurity, maternal/ child caring practices; low access to health services and unsain surroundings (2).

In Rwanda like in many counties in Africa, underfeeding in children remains a serious concern, the prevalence among children below the age of five was 37.4% in 2014 (3). The causes and childhood undernutrition factors are complex counting inadequate quantity and quality of food, child caring practices, poor hygiene and sanitation; low inaccessibility of effective health care (4).

Diverse initiatives made good progress to improve the nutrition and health status of the population by improving child survival reducing poverty levels, increasing agricultural production, and improving environmental health has been done between 2000 and 2015. The progress done made reduction of national stunting rate from 48 % to 38 % in 2015 compared to 23% at the city of Kigali. Despite these improvements significant gaps persist. While childhood stunting has declined at an accelerated rate, the country could not attain the 18 % stunting target for 2018 (5).

The difference in child nutritional status by region and residence is relatively evident but not yet the associated

factors within the districts. Therefore, the research wanted to determine factors that influence stunting persistence among under five in Kicukiro District.

Materials and Methods

Study design and setting

This is a cross-sectional study Descriptive research design using quantitative and quantitative approaches. The study was conducted in three health centers (nutrition promotion departments) of Gahanga, Masaka, and Busanza catchment areas located in Gahanga, Masaka, and Kanombe sectors in Kicukiro District located in City of Kigali, Rwanda**.**

Study population and procedures of the study

The study targeted children aged 6 to59 months admitted in nutrition promotion services; their mothers or caretakers of the above children and health care providers of targeted area. Data were collected in a period of 1 month of November 2020

The systematic random sampling was used to obtain the sample, key informants were purposively selected from health care providers for quantitative research; A total number of 75 mothers and 75 caregivers and 9 health care providers participated in the study after obtaining an informed written consent.

For the quantitative, data were collected using individual structured interview, the questionnaire was developed and administered to the sampled child mother or caregiver and completed on behalf their children. MUAC tape and height board were used to take children anthropometric measurements. For qualitative dialogue; interviews were conducted among mothers and health care providers to assess same aspects of the study objectives to improve the validity of the findings.

Quantitative data and anthropometric measurement were taken, checked and recorded; the magnitude of child undernutrition was calculated. Demographic and socio economic factors were measured by asking questions on age, sex, mother educational status, marital status, employment status, family size, immunization, types of birth, place of delivery, breastfeeding status were measured by response given by respondents. Environmental health condition related variables like sanitation, water supply and housing condition were recorded from responses given.

Sample population

In this study, for quantitative data sample size was calculated using the Yamane's formula where by the confidence level is 95% with the precision level (e) of 5% (6) as follows:

$n = N/1+N (e) 2$

Where n = Sample size

N = Total target population

e = margin of error

$n = 94/1+94(0.05)^2$

$= 94/1+94(0.0025)$

$= 94/1.235 = 76$ Therefore, the sample size is 76

Basing on the nature of our study which is focusing only on malnourished children, the sample size also is relatively low.

For qualitative data, nine key informants were purposely targeted and selected among the health care providers which include the SSA, Nutritionists, and CHWs in Charge from each health center.

Data collection method

For the quantitative data, the questionnaire was designed to capture information related to child nutrition status and factors associate with it. The questionnaires were distributed to the sampled mothers/caregivers of the targeted children and completed on their behalf.

For qualitative dialogue; interviews were conducted among health care providers to assess same aspects of the study objectives to improve the validity of the findings.

Data analysis

All the data were cleaned, coded entered and analyzed by using the Statistical Package for Social Sciences (SPSS) for analysis using descriptive statistics to generate frequency tables. Different frequency tables, graphs and descriptive summaries were used to describe the study variables. Binary Logistic regression was performed to assess the strength of association between each major independent variable and the outcome variables. Results of the analysis were presented in tables

For qualitative data, information was recorded, similar responses were grouped and summarized based on the key study variables.

Results

Demographic and socioeconomic characteristics of the respondents

Table 1 indicates that the most of participated children were aged 6-24 months (93.3%), most of them were female (52.0%). More than half of participated children (70.7%) born with normal weight and a minority of them 29.3% born underweight, 24% were twins, 16% premature and 10.7% were born with disability. In this study 45.3% were children exclusively breastfed up to six months and 34.7% received complementary feed 3 times a day while 14.7% of participated children took the meal less than once per day.

Table 1: Characteristics of children aged 6-59 months at Kicukiro District targeted health centers.

Variables	Frequency	Percentage
Child age in Months		
6-24	70	93.3
25 and above	5	6.7
Child sex		
Male	36	48.0
Female	39	52.0
Child weight at Birth		
Underweight	22	29.3
Normal weight	53	70.7
Health Problems at Birth		
Disability	8	10.7
Twins	18	24.0
Premature	12	16.0
Breastfeeding problem	6	8.0
None	31	41.3
Complementary feeding practices		
2 times per day	16	21.3
3 times per day	26	34.7
4 times per day	22	29.3
Less than once per day	11	14.7

Source: Primary data

Table 2 indicates that a majority of participated mothers 88.0% were aged above 21 years. Nearly a half of them 46.7% lived in cohabiting status. A half of participated respondent 50.7% live among family with 5 people and above; When it comes to antenatal consultations 46.7 % attended less than 3 visits during pregnancy and 53.3% found not using family planning method. It was noted that 50.7% of study participated mothers had attended only primary school. A good number of 54.7% informed to be in the second wealth category while nearly a half (49.3%) of the mothers were unemployed.

Table 2: Maternal characteristics of participated mothers/ caregivers from Kicukiro District Rwanda, targeted health centers

Variables	**Frequency**	**Percentage**
Maternal age at birth of the child		
Less than 21	9	12.0
21 and above	66	88.0
Marital status		
Single	9	12.0
Married	13	17.3
Widow/separated/Divorced	18	24.0
Cohabiting	35	46.7
Education level		
No formal Education	11	14.7
Primary	38	50.7
Secondary and above	26	34.6
Family Size		
Less than 5 persons	37	49.3
Above 5 persons	38	50.7
Current use of family planning		
Yes	35	46.7
No	40	53.3
ANC Visits during pregnancy of current child		
3 and more	40	53.3
Less than 3	35	46.7

Household head employment status		
Unemployed	21	28.0
Casual jobs	37	49.3
Self employed	6	8.0
Formal employment	11	14.7

Source: Primary data

Table 3 indicates that majority of families (60%) live in traditional mud houses. When it comes to water source 62.7% families use public tap, while 56.0% confirmed not to boil or use chemicals for drinking water. Concerning toilet facilities, a good number of households (92.0%) have and use pit latrine and a majority of them 88.0% sometimes wash hands at critical times while 69.3% declared not having home kitchen garden.

Table 3: Environmental health-related characteristics from Kicukiro District Rwanda, targeted health centers.

Variables	**Frequency**	**Percentage**
Type of house		
Brick concrete	20	26.7
Traditional mud	45	60.0
Plank wood	10	13.3
Water source		
Piped into dwelling	11	14.7
Public tap	47	62.7
Protected spring/well	13	17.3
Unprotected spring water	4	5.3
Drinking water status		
Boiling or use of chemical for treating water	33	44.0
Not boiled and not chemical used	42	56.0
Latrine Availability		
Flush	6	8.0
Pit latrine	69	92.0
Hand washing practice		

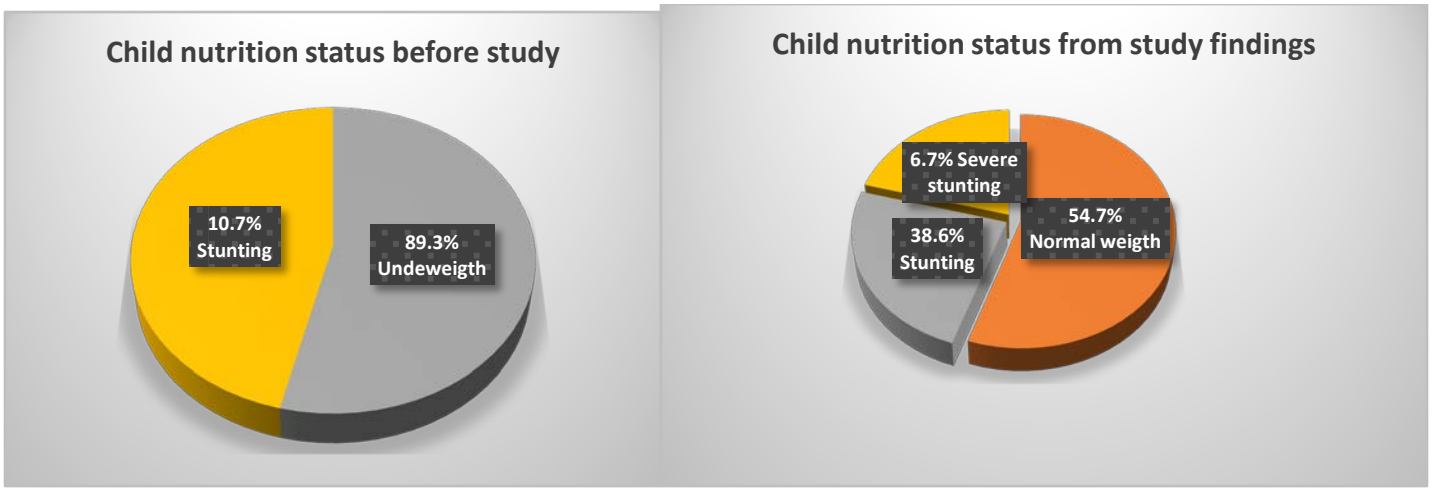
Yes at critical times	9	12.0
Sometimes	66	88.0
Waste management		
Burned their garbage	10	13.3
Disposed in a pit (compost)	49	65.3
Collected by public cleaning company	16	21.3
Having home kitchen garden		
Yes	23	30.7
No	52	69.3

Source: Primary data

Nutrition status of children under five years in Kicukiro district health centers

The figure 1 indicates that 38.6% and 6.7% of participated children from Gahanga, Masaka and Busanza health centers were stunted and severe stunted. The highest occurrence was among children aged 6-24 months. The findings revealed that children form this area has poor nutrition status compared to WHO growth reference standards where 30-39%-mark high prevalence (7).

Figure 1: Nutrition status of under-five children in nutrition program from Kicukiro district targeted health centers



Source: Primary data

Associated demographic and socioeconomic characteristics with stunting persistence

Table 4.3. and Table 4.4. indicates that maternal and child related characteristics are not significantly associated with persistence of stunting among under five children p-value is significant more than 0.005.

However qualitative analysis identified low use of health services in terms of family planning practice and ANC visists; family wealth index and educational revel as follows:

Limited knowledge, resources and ignorance on the use of health services including poor adherence to nutrition promotion program and this contributed to their children to develop undernutrition

Many families under program whose children born with disability, some of them came from socially vulnerable families with inadequate means to buy enough food and food with nutrients; most of them live in illegal marriage; often undernourished children came among families with conflict and from families that practice short birth spacing

Some mothers with under five children do not attend regulary cooking demonstration and growth monitoring sessions; children with chronic illness/diseases and lack of appetite to some children often during the weaning period and variation in complementary feeding then care to maintain adequate nutrition for growth are the causes.

Almost a half of unrolled mothers don't use birth spacing methods after their previous births. Others are less educated one and remain with their limited skills and knowledge about nutrition and health in general, others visited less health facilities for ANC during pregnancy of study subjects which turned them not to be able gain and to implement instructions given by health providers on caring practices on them, teir children and their whole family which hinder the risk of child undernutrition

Most of remarks from participants encountered financial challenges which resulted in the development of undernutrition in their children:

Being single to take care of children and having limited income, make difficult to buy food and suitable food especialy for underfive children.

Mots of unrolled child mother/caregiver do not have job and stays with limited income for the family to acces to family basic needs which later return children more vulnerable to poor nutrition. This impacts household food availability and security, child feeding practices, ability to prevent infections as well as safe quality of water to use.

Associated environmental health-related conditions

Table 4.5. indicates that related characteristics are not meaningfully allied with stunting persistence among children under five. However qualitative analysis from this study identified poor hygiene and sanitation at household level. This was explained as follows:

Majority of children came from households that don't treat water to make it safe to drink. Concerning about toilet facilities, a greater number of families had latrine but do not disposed or practice handwashing; also they dispose garbage in a pit and open field.
The ownership of livestock and home garden are not practiced at household and this also resulted in the development of undernutrition in their children due to poor cleanliness and personal hygiene.

Unclean water for drinking and none clean household environs such as unimproved sanitation facilities and poor hand washing practices were found to effect on nutritional outcomes our area.

Discussion of findings

The finding of this study indicate that poor nutrition status among under-five in Kicukiro District remains a serious public health concern at 38.6% stunted and 6.7% severe stunted children. The rate is high compared to WHO growth reference standards where 30-39%-mark high prevalence (7). Study results are consistent with findings of other research. Mengistu K. (8) in Ethiopia found that 41.4% of under the age of five children were stunted and 35% found in Kenya (9). In India stunting among children under two years found at 35.5% (10) whereas 59.8% found among children from Kibagabaga District Hospital (11).

The child nutritional status is partially allied to the level and sustainability of investment of parents and caregivers of a child that in turn, play essential role during the design of parental allocation of resources. Even though parents invested in their children, several constraints and home characteristics could result in varying nutritional status.

It was noted that, risk of stunting was increased as age increased. Child age (6-24 months) was more associated with stunting growth. The result is allied with factors found in Hidabu (8). The reason is that a child is at a critical stage where weaning period start with variation in complementary feeding and care to maintain adequate nutrition for growth. Other possible explanation for increased risk of persistent may be due to poor preparation of complementary foods which exposes children to recurrent infections as confirmed by qualitative research findings.

The current study revealed that short birth interval was reported to be associated with child stunting growth. It is consistent with studies that have found that number of siblings affects nutritional status in Bangladesh (12). The reason is that increase in numbers of children within a family puts strain on food and household resources, it

impacts the level of care then likelihood of children's poorer nutrition and health outcomes. The study findings reveled the ignorance of the importance of family planning and reproductive health services usage that enable the couple to control their births. Such shorter births interval results in biological depletion of mothers and inadequate capacity of caring which in turn affects the nutritional status of a child (13).

Maternal and paternal educational status is other determinant of chronically undernutrition in Indonesia (14); the same as our study finding, parent's education level was strongly appointed to persistence of stunting. The same results from study done among public health facilities of Pastoralist Community in Ethiopia demonstrated the positive correlation of parent's education and child nutrition (15). The reason might be due to the lack of knowledge and skills of caregivers for baby feeding and caring practices that help to improve nutritional status of their children. However, family income was likely to be behind the non-education of parent. Quite a lot of studies reported that the educated mother utilized health care facilities and followed the instructions given by health providers on child feeding and caring practices and this is likely to decrease the risk of child undernutrition.

Study results revealed that stunting is more among children whose mother has done few ANC visits as recommended. The result is in line with the result from Ethiopian study that indicated antenatal care was the most consistent predictors of child stunting growth (16). Almost a half of the respondents did not or was not sure to have attended antenatal consultation as recommended; not attending antenatal consultation means not to be assessed for some infections and not to get health talk on nutritional foods, early and exclusive breast feeding which if not followed might lead to early malnutrition of children. Child care practice starts early from the pregnancy. Mothers who obtain ANC visit during their pregnancies had more access awareness and needed information about child care practices.

Poor wealth status has found to contribute to the child undernutrition in our study. Households belonging to category 1&2 were likely to have children suffer from child poor growth. This was supported by a study done in Pakistan where child poor nutrition was associated with the socially vulnerable groups of people (17). And it is in line with the results from factors for stunting among children under five years where wealth index, early childbearing and mother's education level found to contributed factors of child malnutrition in Rwanda (18).

Household's income status and unemployment of the family partner were among the factors to influence undernutrition among under five children in our study area; confirmed also in Nepal (19) and (20) in Holeta Town. Economic element in terms of household income is leading factor contributing to poor nutrition of children. In Indonesia unemployed parents were likely to have the under-five suffering from stunting growth. The reason may be that being unemployed or having irregular job for one partner cause the family to earn few money which make difficult to them to nourish their children and to have ability to fulfil the basic necessities

which later make children more vulnerable to poor nutrition. This in turn directly impacts household food availability and security, child feeding practices, ability to prevent infections as well as safe water usage and sanitation practices.

Contributing factors of child stunting growth in Tanzania found that unsafe drinking water sources and poor sanitation were among the major predictors (21). It is supported by our results that unclean water for drinking at household level together with poor person hygiene in terms of handwashing practices were highly attributed to poor nutrition among children. More stunting children were found among families used untreated water for drinking and those with low attitude of hand washing at critical times. The explanation is that poor hygiene and sanitation practices have immediate impact on child nutritional status as they increase the risk of infectious diseases which later once persisted lead to enteric dysfunction and reduce nutrient absorption then delay child development. Culture to wash hand with soap at critical times can reduce diarrhea rates by more than 40% (22). However, this study found that practice of hand washing at critical times including after using the toilet was very low.

Improved water hygiene and sanitation facilities at family level is defined as access to safe water for drinking, a proper toilet facility together with a hand washing facility with soap. (21).

Treating water for drinking for instance by boiling to make it safe, is related with hygiene and health seeking character. The study results indicated that those who do not boil water for drinking were more likely to have poor stature children compared to those who did it (Table 4.5.). All children from families that use pit latrines and sometimes wash their hand at critical time found to have more stunded children. Unclean water usage is the second most common cause of child death worldwide. Several studies have indicated the role of water, sanitation and hygiene facilities to child undernutrition. (23). These two public health interventions are likely to reduce diarrheal diseases transmission, which are both associated with reduced linear growth (24). Having the above attitude would help to reduce incidence of diarrhea among children under five.

Conclusion

Childhood nutrition is key mechanisms of adequate child growth; it regulates the current child situation as well as their future lifelong growth processes. Undernutrition among young children can contribute to poor cognitive and social behavior, resulting in nonproductive society.

The current study concluded that stunting among under-five children in Gahanga, Busanza and Masaka health facilities in Kicukiro District remains high. Factors identified to contribute to stunting included poor family planning usage, poor wealth index then poor household sanitation and hygiene practices. It was recommended to increase awareness about health and nutrition with emphasis on perfection of health services and expansion of interventions especially poverty alleviation activities with focus on advance of wealth index and

improvement on sanitation in the area.

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