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Prevalence of Malnutrition among Under-Five aged Children and Methods Used to prevent and Control Unmated Nutrition Needs in Population Health of Kicukiro District, Rwanda

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Abstract

Globally, malnutrition remained a significant issue, especially in low- and middle-income countries like Rwanda. Though progress has been made, millions of people, particularly children, still suffer from malnutrition, however malnutrition information and methods o used to prevent and control in Kicukiro District remains unclear. These reasons led to Specifically to determine the prevalence of malnutrition among Under-Five aged Children, Methods Used to Prevent and Control Unmated Nutrition Needs in Population Health , and evaluate how knowledge, attitudes, and practices of KAP are associated with the increased malnutrition among under-five children attending Kicukiro Health Center. Despite global efforts to combat malnutrition, it remained a significant public health challenge. In Rwanda, malnutrition is associated with mass wasting, distended abdomen of under 5s, stunting growth, poor cognitive and physical development, with increased morbidity and mortalities. Study was mixed-methods of descriptive, cross-sectional, cohort, and triangulation designs of both surveys and Interviews. Structured questionnaires for primary data and rapid retrospective forms for secondary data for the last 5 years data collection using, a 235 sample sizes, in survey, and KIIs and FGDs guides used interviews to get value data numbers. The study opined, that only female next of kin/guardians participated in the stated healthcare of the under children to seek health care in the study area, (102) 43.4%, aged 25 to 35 with zero male community participation. The occupation profile of the respondents, majority lacked employment (126) 53.6 %, and only a few, (45) 19.1%, were employed guardians / next of under 5s with RR (0.2, 0.3) and OD (1.0) income. Most under 5s sex affected by malnutrition was female (123), 52.3%, followed closely by, (112), 47.7% male gender. The prevalence of malnutrition among under 5s was only 12. 8 % (30) in the population health, with RR (0.34. 0.43) due Global partnership supply of fortified food and increased health education on under 5s nutrition by MOH. Food insecurity at the household level is associated with the main supply of inadequate nutrition with RR (0.56., 2.1) and (OD 3.04) signifying the need to improve food security at the household level to mediate a quality long-lasting intervention malnutrition in society. The study concludes that malnutrition among under-five children remains a public health challenge due to limited household access to adequate dietary food. The study recommends diversifying and increasing the supply of fortified foods through global partnerships and coordinated efforts by the Ministries of Health and Agriculture to address food insecurity and support nutrition programs for under-five children.

Keywords: *malnutrition under 5yrs children, stunting under nutrition global partnership, community participation*.

1.0 Introduction

Globally, malnutrition remained a significant issue, especially in low- and middle-income countries. While progress has been made, millions of people, particularly children, still suffer from malnutrition (Wicaksana & Rachman, 2018). Global targets to lower malnutrition have been established by international organizations such as the World Health Organization and the United Nations. By 2030, the second Sustainable Development Goal (SDG) sought to eradicate hunger and attain food security, enhance nutrition, and advance sustainable agriculture (UNICEF, 2022).

In sub-Saharan Africa and south Asia, the most frequent diagnoses were related to children malnourished. It frequently resulted from a poor diet. In addition to inhibiting physical and intellectual growth, childhood malnutrition raised the chance of mortality or disability from common childhood illnesses such pneumonia and diarrheal diseases. This had an impact on long-term health (Mulenga et al., 2018), (Wicaksana & Rachman, 2018). According to UNICEF, malnutrition has become a serious public health issue in many East African communities, including Rwanda (Agho et al., 2019). In Rwanda, malnutrition has become a major public health concern, especially among children under the age of five (USAID, 2019). In 2010, 44% of Rwanda's under-5-year-olds were stunted due to chronic malnutrition; this had a severe detrimental effect on the children's physical and cognitive development, as well as their health and productivity (Jean De Dieu Nsabimana, 2019).

This condition was caused by a number of causes, including the number of infants and young children living in the same household, improper nutrition and care practices, the safety of food and water, and food instability in the home (UNICEF Rwanda, 2023). Malnutrition and household food insecurity persist despite Rwanda's remarkable economic success. More than 38% of Rwandan children are malnourished, in part because of the country's low agricultural production (UNICEF Rwanda, 2019); Sylvestre, 2021).

2.0 Literature Review

2.1. Prevalence of Malnutrition among Under-Five aged Children and Methods Used to prevent and Control Unmated Nutrition Needs in the Population health

Globally, malnutrition remains a significant public health challenge, especially among under-five children. According to the World Health Organization (WHO, 2021), approximately 149 million children under the age of five were stunted, and 45 million were wasted worldwide. Regions such as Sub-Saharan Africa and South Asia bear the highest burden. Studies in South Asia (UNICEF, 2020) indicate that malnutrition prevalence was influenced by poverty, inadequate dietary intake, and poor sanitation. For instance, in India, Pasricha et al. (2020) found that 37% of under-five children were stunted, highlighting widespread chronic malnutrition.

Sub-Saharan Africa experiences one of the highest malnutrition rates globally, with stunting affecting 32% of children under five (UNICEF, 2021). Factors such as food insecurity, infectious diseases, and inadequate healthcare contribute to this prevalence. In Ethiopia, a study by Abate et al. (2021) reported that 38% of under-five children were stunted, with higher rates in rural areas due to limited access to healthcare services and poor maternal education. Similarly, in Nigeria, Olatunbosun et al. (2020) found that 29% of children under five were stunted, with wasting rates of 10%, linked to poverty and cultural feeding practices.

Rwanda faced a significant burden of malnutrition among under-five children despite progress in reducing its prevalence. According to the Rwanda Demographic and Health Survey (RDHS, 2020),

33% of children under five were stunted, while 7% were wasted. The prevalence was more pronounced in rural areas, where food insecurity and limited maternal education were prevalent. A study by (Nsereko et al. 2019) in Rwanda's Eastern Province reported that stunting affected 35% of children under five, with contributing factors including low household income and poor feeding practices. The stunting rate in Rwanda decreased from 38% in 2015 to 33% in 2020, but progress had been slow. The Rwanda DHS conducted in 2014-2015 found that the stunting rate was 38%, the wasting rate was 2%, and the underweight rate was 9%. A study conducted in Ngoma District found that the prevalence of malnutrition was 33.7%, with stunting being the most prevalent form of malnutrition (World Health Organization, 2021).

2.1.1 Methods Used Prevent and Control Unmated Nutrition Needs in the under Five aged Children

According to the World Health Organization caregivers' awareness of proper feeding practices, nutritional needs, and hygiene was a critical determinant of child health outcomes which may achieved through males and community participation to resolve unmated malnutrition need among the under five children mainly through Nutrition and dietary uptake of quality Health education to promote and improve celebration of fifth birth day of children below five years in low income countries like Rwanda (WHO, 2021). A study conducted in Southeast Asia by Nguyen et al. (2020) demonstrated that caregivers with inadequate knowledge about complementary feeding were more likely to have malnourished children if not involved in health education as intervention strategy at community households.

Furthermore, negative attitudes, such as undervaluing the importance of exclusive breastfeeding or perceiving child malnutrition as unavoidable, exacerbate poor nutritional outcomes result to long lasting unmated nutrient need of the under-fives year children (Black et al., 2020). In contrast, positive practices, including proper hygiene via hazards analysis critical points during fortified food preparation and packaged to accessible facilities in hygiene transportation, and adherence to dietary guidelines via capacity building of gurdisn and next of kin , were closely associated with lower signs and symptoms of malnutrition rates such stunting, undernutrition and wasting in children.

The studies emphasize the significance of sustainable capacity building in balanced diet uptake in addressing malnutrition. For instance, in Ethiopia, there were variations in knowledge levels between genders, with females being more adept at identifying malnutrition symptoms, while males had better knowledge about specific nutrient deficiencies like vitamin A and iodine (Gebre et al., 2023), In Lesotho, maternal schooling positively influenced child weight-for-age through improved nutrition knowledge, especially in wealthier households.

2.2 Knowledge, Attitudes, and Practices (KAP) Associated with Malnutrition among Under-Five Children

Caregivers' knowledge, attitudes, and practices (KAP) significantly influenced the prevalence and management of malnutrition among under-five children. In India, inadequate knowledge among mothers of under-five children regarding Protein Energy Malnutrition was identified as a concern, with 80% having inadequate knowledge (Sharma et al., 2020). The research also delves into the importance of attitudes towards nutrition. In Ethiopia, the study found that while females had better knowledge of malnutrition symptoms, males had a relatively better understanding of fortified foods, indicating variations in attitudes towards nutrition (Gebre et al., 2023). In Lesotho, the intervention significantly improved the nutritional attitude of mothers, highlighting the impact of

targeted interventions on attitudes towards nutrition (Sukandar et al., 2015). Similarly, in India, a significant percentage of mothers had a favorable attitude towards nutrition, but there were still gaps in practice (Sharma et al., 2020). The studies underscore the need for translating knowledge and positive attitudes into actionable practices.

The relevance of practice in improving nutritional outcomes was highlighted by the discovery that nutrition education for mothers in Lesotho improved children's growth, especially in homes with access to resources (Gebre et al., 2023). In India, the study revealed that while mothers had a positive attitude towards nutrition, there were variations in practices, with only 10% following good practices regarding the prevention of Protein Energy Malnutrition (Sharma et al., 2020).
Abel Karamari and Joseline (2023) conducted a study in the Kicukiro District of Rwanda to evaluate the knowledge, attitudes, and practices of mothers of under-five malnourished children. According to the study, moms were deemed to have sufficient knowledge if they could list the different food kinds, provide samples of each type of food, and describe how a balanced diet was put together.
Studies reveal a critical knowledge gap in maternal and healthcare provider understanding of child nutrition. In Rwanda, only 42.5% of mothers had sufficient nutrition knowledge, with low rates of exclusive breastfeeding and proper feeding frequency (Hakizimana et al., 2023). Similarly, nurses showed good knowledge but only moderate practice, indicating that improved knowledge could enhance malnutrition management (Monique, 2022).

2.3. Conceptual framework

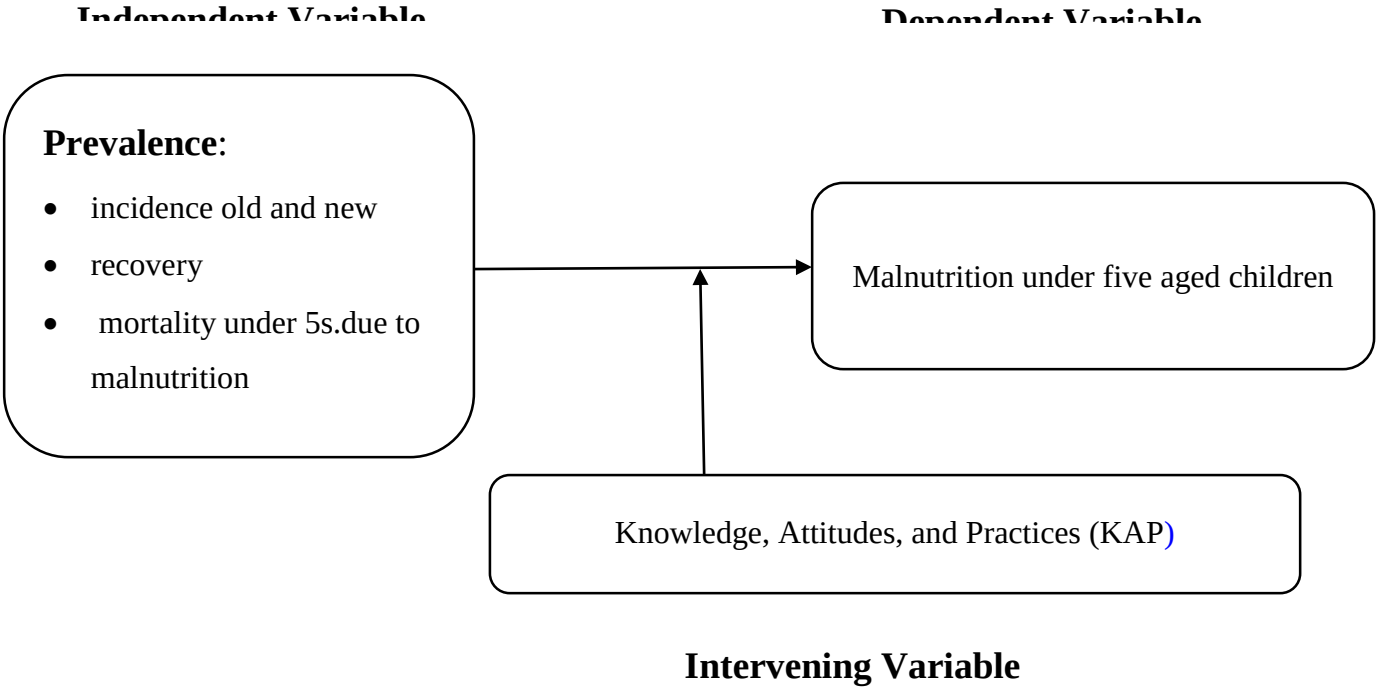

Figure 1*: *Conceptual framework

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3.0 Research Methodology

3.1 Methods

This study used a mixed-methods approach combining descriptive cross-sectional and triangulation designs. Quantitative data from surveys and chart reviews were complemented by qualitative insights from interviews and focus groups at Kicukiro Health Center. Structured tools assessed malnutrition prevalence and contributing factors among under-five children. Fisher's formula was applied to determine a representative sample from the 600 malnourished children, aiming to capture current and future health risks.

Fisher's formula states:

$$n = \frac{N \times Z^2 \times p \times (1-p)}{(E^2 \times (N-1)) + (Z^2 \times p \times (1-p))}$$

Where: n = the required sample size
N= the total population (600 participants)
Z = Z-value (1.96 for a 95% confidence level)
p = estimated proportion of the population (use 0.5 for maximum variability)

q = proportion of the acceptance proportion significance of respondents estimated to be traced. (0 .50)

e = margin of error (usually 0.05 for 5% margin of error)

$$n = \frac{600 \cdot 1.96^2 \cdot 0.5 \cdot (1-0.5)}{(0.05^2 \cdot (600-1)) + (1.96^2 \cdot 0.5 \cdot (1-0.5))}$$

.

$$n = \frac{576.24}{2.4579} \approx 234.44$$

The required sample size was approximately 235 participants to achieve a 95% confidence level with a 5% margin of error. Data was managed by SPSS Version 27, analysis by cross-tabulating descriptive and inferential statistics; data was presented using pie charts and bar graphs. Ethical clearance sought at Mount Kenya School of Postgraduate and its ethical clearance in Nyamata level II Teaching Hospital.

4.0 Findings

This study investigated the prevalence and management of malnutrition among under-five children in Kicukiro District, Rwanda, highlighting persistent public health concerns despite global and national interventions. Using a mixed-methods design, it assessed nutritional status, socioeconomic drivers, and caregiver practices. Data were collected through surveys, interviews,

and retrospective reviews from 235 participants. Key focus areas included KAP levels, food insecurity, and the effectiveness of health education and fortified food programs.

4.1 Demographic Profile

The study opined that the majority of the respondents who participated in the study were (102) 43.4% guardian / next of kin aged 25 to 35, and the least cohort above 45 years and all were female respondents showing No participation of male gender in under five children health care,

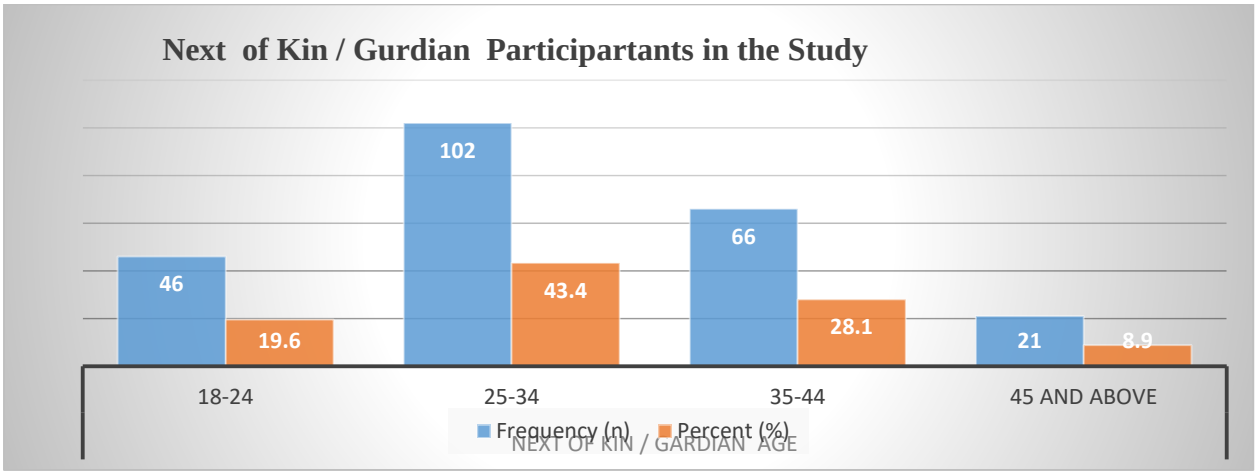

Figure 2 *Distribution of Next Of Kin / Guardian in Managing Malnutrition among the Under Children in the Study Area*

The result demonstrated among children below five years attending the health most of the gender were female (123), 52.3% and a few were male gender, (112), 47.7%. With marked symptoms of stunting, body mass wasting and descended abdomen keeping features of marasmus and kwashiorkor respectively.

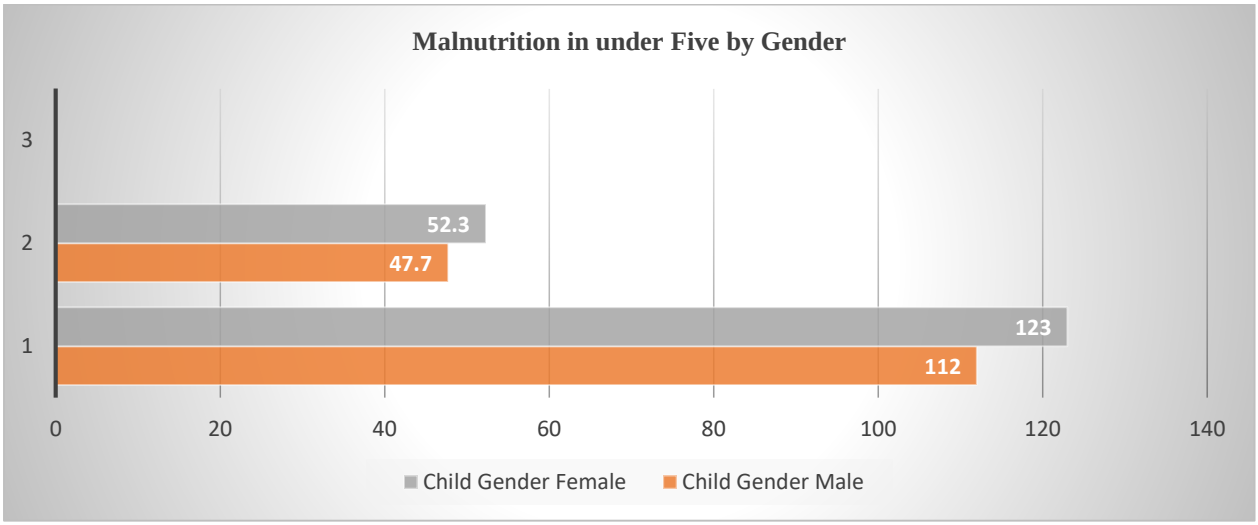

Figure 3: *Distribution of Malnutrition in the study area by gender.*

Also, the study on determinants of of malnutrition among the under 5s opined that, is mainly closely associated with limited occupation chance among the guardians and next of kin as demonstrated in the figure below where the majority were unemployed (126) 53.6 % and only a few (45) 19.1% were employed and have salary income, RR (0.2, 0.3) and OD (1.0). Signifying a protective effect of the relative risk and the no relation between malnutrition conditions with occupation status of the community health. The sincere challenge is associated with limited health education and accessibility of a variety of balanced dietary foods as opined in a focused group discussion:

"We have basic knowledge of nutrition of balanced diet utilization in our locality, but we don't always know which specific foods meet the nutritional needs of children under five for protein carbohydrate vitamins, or minerals may you come and provide us with community health education? For instance, many believe that porridge alone was enough, unaware that protein or fruits were essential" (FGDs discussion held on 18th of February 2025).

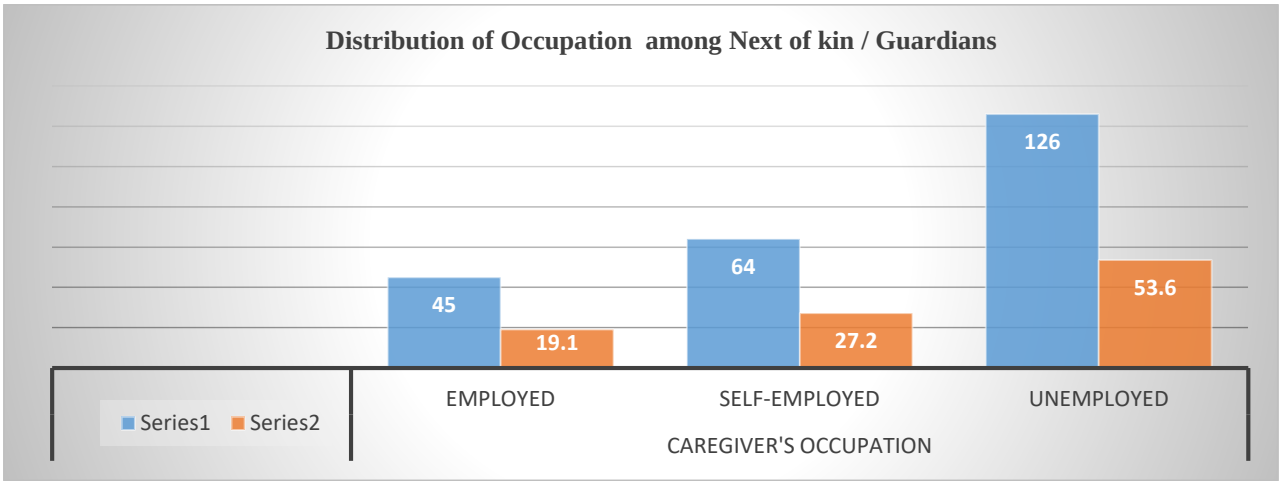

Figure 4 *Distribution of occupation Status among Next of Kin / Guardians of The Under-Five Children Associated with Malnutrition*

4.2.1 Prevalence of Malnutrition among Under-Five Children Attending Kicukiro Health Center

The study opined that the prevalence of malnutrition among children under five attending Kicukiro Health Center was only 12. 8 % (30) next of kin/guardian respondents.

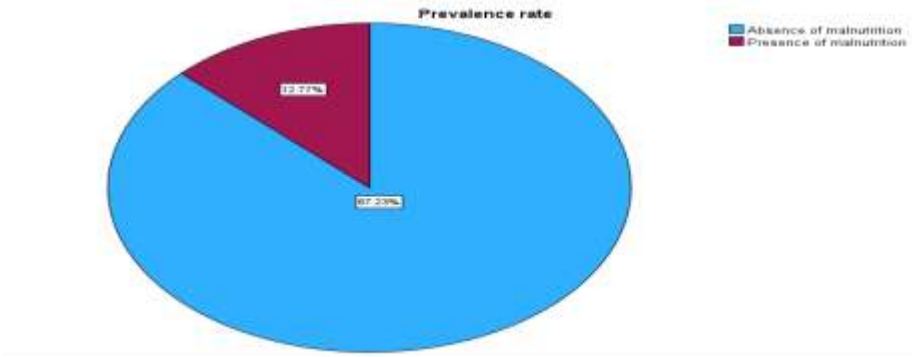

Figure 5: Demonstrate the prevalence of malnutrition among under-five children

4. 3 Knowledge Attitude and Practices KAP Association with Malnutrition among Under-Five Children

The study opened with opined significance in KAP in associated malnutrition among the under-five with RR (0.34, 0.432) and OD (0.332) in 95% CI with a p-value of 0.0321, where most next of kins and guardians had sufficient knowledge on malnutrition with equal perception and experience in prevention and control from the study population achieved via regular capacity building in nutrition health education during antenatal and postnatal care

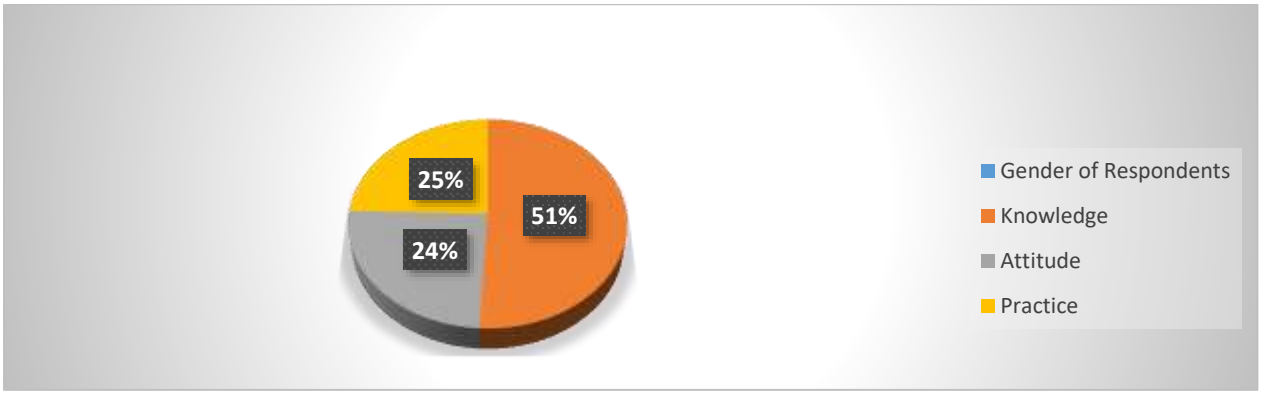

Figure 6 *Demonstrated level of KAP and health education in association with Malnutrition among the under 5 aged children*.

6.0 Conclusions

The study concludes that malnutrition among under-five children at Kicukiro Health Center remains a significant public health concern, primarily driven by inadequate nutrition, poor feeding

practices, and socioeconomic challenges. It emphasizes the urgent need for targeted interventions such as caregiver education, improved access to nutritional resources, and addressing underlying issues like low income and limited access to clean water to reduce the prevalence and impact of malnutrition in the community.

7.0 Recommendation

The study recommends conducting targeted educational campaigns to enhance caregivers' knowledge of child nutrition, emphasizing the importance of balanced diets that include proteins, fruits, and vegetables. These campaigns should involve workshops, health talks, and practical demonstrations within local communities. Additionally, integrating hands-on training on preparing nutritious meals using affordable, locally available foods will empower caregivers to meet their children's nutritional needs despite economic constraints.

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