Effect of Routine Vitamin a Supplementation on Nutritional Status of Children Aged 6-59 Months in Wajir County, Kenya

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Abstract

Malnutrition remains an important public health problem in Wajir County with stunted growths in the county reported to be 26.4%, which is similar to the national average of 26.0% as per the Kenya Demographic Health Survey of 2014. The high burden of malnutrition in the county is not only a risk to achieving Vision 2030 but is also likely to obstruct our progress to realise Sustainable Development Goals. Vitamin A deficiency is a key public health issue that contributes to illness and death among young children universally. Vitamin A supplementation is essential for growth, development, and survival of children, especially in resource poor areas of Sub-Saharan Africa and the South East. In circumstances where the deficiency of vitamin A is a community health matter, supplementation is recommended in children under five years. The outcome of Vitamin A routine supplementation on nutrition status of young children aged between 6 to 59 months in Wajir County was investigated. The routine coverage for under-fives was found to be 51.2%. Study findings also revealed the prevalence of stunting to be high at 63.4% among children who did not receive vitamin A supplementation as compared to those who were supplemented (36.6%). Further analysis indicated that there was substantial (0.036) association between the supplement and nutritional status of the target group. Therefore, there is need for creation of awareness to the care givers on the benefits of routine supplementation and likewise improve access to the supplement to all children aged 6-59 months.

Key Words*: Vitamin A supplementation, Stunting, Vitamin A deficiency, Nutritional status, Children*

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1.0 Introduction

Supplementation of vitamin A (VAS) remains a universal wellbeing approach to eradicate nutritional deficiency, including the catastrophic concerns (Imdad et al., 2017). Subsequently, the supplement can be retained in the body for a few calendar months. Supplementing twice a year with a high dose is best recommended for under-fives (Gawronski & Gawronski, 2016). Children should receive their first dose as soon as they turn six months old (Sareen, 2016).

Vitamin A Deficiency (VAD) is a main public health problem that contributes to illness and death among under-fives globally (Kupka et al., 2016). Worldwide and in Africa, VAD affects 33.3% and 41.6% of children below five years respectively (Imdad et al., 2016). Similarly, some studies have indicated that VAD affects about 29% of pre-school children (Kupka et al., 2016) and 190 million children below five years in low and intermediate income nations (Imdad et al., 2017). Inadequate intake of vitamin A in infancy and childhood poses a threat to well-being, including poor growth and immune functions, night blindness and mortality (Neves et al., 2015).

Vitamin A supplementation is essential for growth, development and survival of children especially in resource poor areas of South East Asia and Sub Saharan Africa (Hakim, 2016). In the first six months of life, breastmilk alone is enough to provide the required nutrients but after six months it contains inadequate nutrients to support the rapid growth of the infant (Darlow et al., 2016) hence the need for supplementation (Dror & Allen, 2018). During infancy, breast milk protects the infant against xerophthalmia because of the high amounts of vitamin A. However after six months, this protection can only be sustained in an infant through optimal complementary feeds that are rich in vitamin A (Kapil & Gupta, 2016) and as well as routine supplementation.

In Kenya, routine VAS is currently undertaken among children under five to avert vision impairment due to vitamin deficiency as well as decrease cases of mortality (Imdad et al., 2017). The county implements high impact nutrition interventions, including routine VAS supported by UNICEF and the county governments as a free programme through child health clinic expanded programme on immunization. However, malnutrition, including stunting, remains an important public health problem in Wajir County with a prevalence of 26.4% as per findings of the 2014 Kenya Demographic Health Survey. This rate is as high as the national prevalence of 26.0%.

This high burden of malnutrition in the county is not only a risk to achieving Vision 2030 but is also likely to obstruct the progress towards realising Sustainable Development Goals (SDGs) [Tucker, 2016]. The county is characterised by cyclic droughts which are a major predisposing factor to the high burden of malnutrition among children under five years. Studies also show that there are high levels under-nutrition in children below five years in drought affected areas and in low middle income countries (Belesova et al., 2019). However, there are limited studies documenting the same in Kenya. Further, in Wajir County, there is limited data on VAS in relation to nutritional status.Therefore, this study aimed at assessing the effect of routine supplementation of vitamin A on nutrition status in under-fives in Wajir County.

2.0 Methodology

The study employed the following methods and approaches to data collection and analysis. The study implored across-sectional study design where all the data was collected at one point. The study was conducted in Wajir County, Kenya. Wajir County is among the 47 Counties and is situated in the North Eastern Kenya. The county covers an area of 56,685.9 Km^2. It borders Ethiopia to the North and Somalia to the East. The Kenya 2019 Population and Housing Census indicated that the county had a total population of 781,214. Males comprise 53% of the population whereas female account for 47% of the population.

Target population

The target group included children aged 6 to 59 months who were used to capture information on the outcome of routine supplement and nutrition status. A sample of 207 children aged 6 to 59 months were selected from households in Wajir County and included in the study. The women (care givers) were selected as the respondents because in Somali community women are responsible for feeding and childcare practices. Wajir East Sub-County in Wajir County was purposively selected out of six sub-counties. This is because the sub-county accommodates and represents the entire five livelihoods of the county such as formal employment, agropastoral, pastoral cattle, pastoral camel and pastoral all species, thus being representative of the county as a whole. The list of the villages was generated from the four wards of Wajir East, namely Barwaqo, Township, Khorof Harar, and Wagberi, using projected 2009 census results. Four villages were excluded (Handaki, Gerille, Bojigaras and Konton) due to insecurity issues. Using the probability proportion to size derived from Emergency Nutrition Assessment version 2015, 23 out 36 villages were selected. A random sampling technique was adopted in the selection of the households. The sample size was designed using this formula $n = Z^2pq/d^2$ (Saeed et al., 2006) which translated to 205 children with 0.967% non-response rate.

Data collection

Data was collected by the researcher together with five assistants who were trained on the study objectives, methodology, interviewing techniques, anthropometric measurement, and maintenance of ethics during and after data collection. The assistants were nutritionists who were conversant with the local dialect in Wajir County. Data was collected during normal working days. An individual visit was scheduled with mothers or care takers for interviews and data collection. To test the validity of the instruments, a pretest was conducted in one of the villages which was not part of the selected villages. Semi-structured questionnaires and anthropometric equipment were used in data collection. The equipment used was a portable height/length board with movable headpiece/foot piece/cursor tested at the beginning of the exercises. For children two years and above and/or those greater than 87cm, their height was measured while standing. For those below two years of age and/or less than 87cm, their length was measured while lying down. The participants were assured of their confidentiality that the information collected would be used for academic purposes only.

Data analysis

Collected data was cleaned to identify and eliminate errors. Coding was done to translate responses into specific categories. The coded items were entered and examined using Statistical Package for Social Sciences (SPSS) package version 20.For anthropometrics, ENA for smart was used to compute the children's Z-cores that were

used for inferences. Descriptive analyses were computed for background characteristics of the study population. The Chi-square test was used for deriving associations.

Ethical approval

Authorisation to collect data was acquired from the relevant authorities including Kenya Methodist University and National Commission for Science, Technology, and Innovation (NACOSTI/P/17/51506/16715). Approval was also obtained from the Ministry of Education, the Ministry of Health at Wajir County, and the national government

3.0 Results and Discussions

The results on the effect of routine VAS on nutritional status of children aged 6-59 months in Wajir county are presented below.

Demographic characteristic

The demographic characteristics of the respondents are presented in Table 1.

Table 1

Demographic characteristics of the respondents

Characteristic	% (N =205)
Age of the Respondents	
20 Years and Below	12 (26)
21-30 Years	50 (101)
31-40 Years	34 (70)
41-50 Years	4 (8)

A response rate of 86% was achieved. All the respondent were women because in Somali community men are hardly found at home during the day while women are more involved in care giving roles for infants. Majority of the respondents were aged between 21-30 years (50%), followed by 34% who were aged between 31-40 years. Only 12% were aged 20 years and below but were within the 18 years age bracket while 4% of the respondents were aged above 40 years.

Table 2

Age distribution of the target children

Childs age in months	Frequency	Percent
6-12	54	26.3
13-24	60	29.3
25-36	40	19.5
37-48	33	16.1
49-59	18	8.8
Total	**205**	**100.0**

A larger number of the children who participated in the study were aged 13-24 months (29.3%). These were followed by 26.3% who were aged between 6-12 months, 19.5% aged between 25-36 months, 16.1%

aged between 37-48 months while only 8.8% were aged between 49-59 months.

Vitamin A routine supplementation

Of the children sampled, 51.2% received their VAS while 48.8% did not receive the supplementation. Further, analysis showed that a higher proportion of children aged 6-12 months (31.0%) and 13-24 months (33.0%) received vitamin A supplementation (Table 3).

Table 3

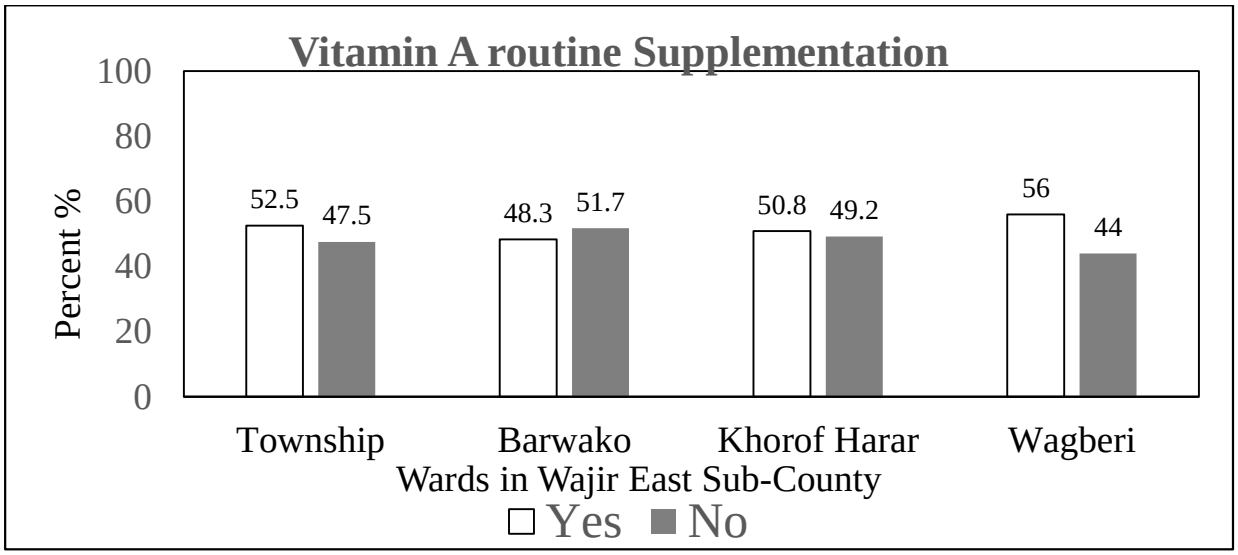
Vitamin A routine supplementation across age groups in children 6-59 months

Childs Age in months	Yes (n=105)	No (n=100)
6-12	21.9%	31.0%
13-24	25.7%	33.0%
25-36	23.8%	15.0%
37-48	20.0%	12.0%
49-59	8.6%	9.0%

Vitamin A supplementation across the four wards included in the study indicated that 56%, 52.5%, 50.8%, and 48.3% of the children in Wagberi, Township, Khorof Harar, and Barwaqo wards respectively received the supplement showing uneven coverage across the wards.

Figure 1

Vitamin A routine supplementation across Wajir East Sub-County



Effect of Vitamin A supplementation on nutrition status.

A higher proportion of children (63.4%) who did not receive VAS were stunted as compared to 36.6% of the children who received VAS. A chi- square test was used to establish the association between routine VAS and nutrition status of children in the study. The results indicated that there was a significant (0.036) association (Table 4) between VAS in children (6-59 months) in Wajir County and their nutritional status

Table 4

***Vitamin A routine supplementation on nutrition status of children aged 6 to 59 months*.**

		Proportion of stunted children.			
Vitamin A routine supplementation		Normal	Stunted	Total % (n)	*P* value
	Yes	54.9% (90)	36.6% (15)	51.2% (105)	0.036
	No	45.1% (74)	63.4% (26)	48.8% (100)	
Total (n)		164	41	205	

χ^2 test significant at $\alpha<0.05$

4.0 Conclusions

The study sought to determine the consequences of vitamin A routine supplementation on the nutrition status of children aged 6-59 months in Wajir County. Findings from the study revealed that 51.2% of the children under five years in Wajir County received their routine vitamin A supplement. However, a large number (48.8%) are still not supplemented despite the supplements being given freely at government health facilities.

These results were within the range reported in Wajir County as per the Kenya Health Information Survey 2015, which showed that 53% of the children in the county received their supplements. However, this is below the national target of above 80% in Kenya. The problems associated with VAS deficiencies are a notable public health problem internationally, especially in less industrialised and poor nations (Hakim, 2016). This study showed that prevalence of stunting was high among the children who were not supplemented (63.4%) and less in children supplemented (36.6%) with routine vitamin A as shown in Table 4. Further, the association between vitamin A supplementation and nutrition status of the children was significant (0.036). This, therefore, confirms that there is a positive substantial association between vitamin A supplementation and nutrition status of the children in the study. Other studies indicated that there is a significant association of vitamin A deficiency with stunting in children (Nutrition, 2006).

Therefore, supplementation is recommended in infants and children aged 6–59 months VAD is a public health concern (Imdad et al., 2016). Vitamin A deficiency is a common nutrition problem in most of the developing countries mainly affecting the health and survival of pre-schoolers and young children (Imdad et al., 2016). Therefore, vitamin A routine supplementation can help prevent these effects and improve the nutritional status of these vulnerable groups (Smith et al., 2016).

5.0 Values and Implications

The likelihood of becoming stunted due to inadequate nutrients and frequent infections often leads to a short body physique, structural, and functional harm to the brain. If not controlled, this often interrupts the development of intellectual functions and can lead to permanent cognitive damage (Dewey & Begum, 2011). Therefore, efforts to avert stunting are likely to be of advantage for numerous results, as well as intellectual progress, academic attainment and economic growths (Leroy et al., 2014).

To reduce stunting among infants adequate and relevant policy interventions are required. Precisely, nutrition interventions that cover the first 1000 days 'window of opportunity' commencing from the pre-conception period and up to 23 months should be put in place and promoted widely (Nutrition, 2006). Specifically, for Kenya, county governments need to provide health services such as nutrition education to parents on the use and benefits of Vitamin A in growth and development of their children. The County needs to strategize and put more effort to accelerate and create platforms that enhance service delivery at the hospital and community level so as to increase vitamin A intake across the wards and among individual children in Wajir County.

Last but not least, achieving all these efforts geared towards raising awareness, improving availability of the vitamin A stocks and promoting health/nutrition positive practices requires combined efforts of all stakeholders, starting with the individuals, community, leaders, health care providers, partners, policy makers and academia. It is this synergy that will enhance the survival, dignity, and economic productivity of local communities.

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