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VITAMIN A SUPPLEMENTATION AWARENESS, ATTITUDES AND BELIEFS AMONG CAREGIVERS OF CHILDREN AGED 6-59 MONTHS OLD IN HARARE CITY, 2022

BY

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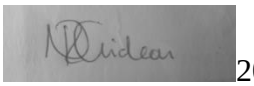
Abstract

Vitamin A deficiency is one of the leading micro-nutrient deficiencies of public health importance in Harare City. Provision of vitamin A supplements every six months is an inexpensive, safe, quick and effective way to improve vitamin A status and save children's lives. Many countries globally have successfully combated the effects of VAD with coverages above 80%. Harare City VAS coverage has been stagnant for the past five years. An analytical cross-sectional survey was conducted in December 2022 to determine vitamin A supplementation awareness, attitudes and beliefs among mothers of children under five years' old attending Harare City health department polyclinics. Data collection was qualitative and quantitative using interviewer-based structured questionnaires. A systematic random sampling technique was used where every third caregiver seated on the waiting benches at every health facility was recruited. Factors associated with the awareness of VAS were computed using Chi-square and logistic regression. Twenty-eight key informants comprising of health care workers were conveniently selected upon availability at the health facility. 339 participants were enrolled; (97%) female and (3%) male; 88.9% were in the reproductive age of 18-37years. Ninety-three percent reported having heard about vitamin A; 79% were able to identify a vitamin A capsule; 80% could correctly name the schedule, route of administration and the recipients of VAS. Health care workers were the major source of VAS information (94%). Knowledge of foods rich in vitamin A was found to be associated with knowledge on vitamin A deficiency symptoms at p=0. Most of the caregivers were positive and supportive of VAS citing usefulness (98.5%), advising others on VAS (97%), willing to attend VAS services (99.1%) though 56.3% mentioned they would not discuss it with others. Caregivers noted that VAS information was not enough (86.5%) with the main hindrances being unawareness of the schedule (35%), forgetfulness (27.2%) and lack of family support (15.7%). Caregiver gender (p=0.010), education level (p=0.000), VAS status coverage (p=0.003) were found to be significantly associated with awareness of VAS. Multivariate regression found that attitudes and beliefs were significantly associated with awareness of VAS at $p<0.01$. The study concluded a lack of awareness on vitamin A and VAS among caregivers and health care workers. The main tasks recommended include education of both stakeholders involved on vitamin A and VAS, training of health care workers on VAS and community advocacy and mobilization to improve VAS awareness on all members of the community.

Keywords: attitudes; awareness; beliefs; coverage; supplementation; vitamin A

Declaration

I declare that this dissertation is my original work except where sources have been cited and acknowledged. The work has never been submitted, nor will it ever be submitted to another university for the award of a degree.

Nyasha Rachel Gideon	 20/04/2023
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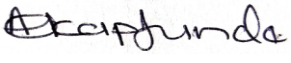
Dr. Abigail Kapfunde	 20/04/23
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Dedication

To my dear husband, Mr. Tafadzwa Evans Gideon and my lovely children Leila-Rose and Enoch-Jonathan

List of Acronyms and Abbreviations

CHW	community health worker
EPI	expanded programme for immunization
GAVA	Global Alliance for Vitamin A
GMP	growth monitoring and promotion
HCW	health care worker
IU	international units
KDHS	Kenya Demographic Health Survey
MDHS	Mozambique Demographic Health Survey
MNP	micronutrient powder
MOH	Ministry of Health
PEC	post-event coverage
SDG	sustainable development goal
TDHS	Tanzania Demographic Health Survey
UNICEF	United Nations Children's Fund
U5MR	under 5 mortality rate
VA	vitamin A
VAD	vitamin A deficiency
VAS	vitamin A supplementation
WHO	World Health Organisation
ZDHS	Zimbabwe Demographic Health Survey
ZimStat	Zimbabwe Statistics Agency

Definition of key terms

Awareness: having information of familiarity of vitamin A food rich sources and vitamin A supplementation. In this study it is also used interchangeably with knowledge.

Supplementation: provision of a specified dose of nutrient preparation which may be in form of a tablet, capsule, oil solution or modified food; for either treating an identified deficiency or prevention of the occurrence of such deficiency in an individual or a community.

Vitamin A supplementation (VAS) coverage: the proportion of children of a given age in a particular location receiving vitamin A supplementation

Vitamin A deficiency (VAD): this is a lack of sufficient vitamin A in the body which is exhibited by symptoms such as night blindness, dry skin and frequent infections.

Vitamin A supplementation (VAS) uptake/ utilization: the process by which caregivers allow their children to receive vitamin A supplementation from health facilities.

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CHAPTER 1 INTRODUCTION

1.1 Introduction

Vitamin A deficiency remains a public health problem in developing countries, particularly in the African and Asian continents. It mainly affects young children, often associated with protein-energy malnutrition, and pregnant women. Vitamin A supplementation is recommended in infants and children aged 6-59 months as a public health intervention to reduce child morbidity and mortality. In accordance with this guideline, Zimbabwe adopted the Vitamin A supplementation programme as a nutrition intervention strategy during routine immunization activities and mass campaigns since 2002.

However, despite all the support affiliated with the programme, there has been a consistent stagnation and poor vitamin A supplementation coverage over the years in Harare City as noted all over sub-Saharan Africa. Current literature has not elucidated reasons affecting this low output in VAS. Bearing this in mind, this descriptive cross-sectional study aimed to determine the awareness, attitudes and beliefs of vitamin A supplementation among caregivers as an influencer of low Vitamin A supplementation coverage rate among children 6-59 months of age in Harare City. In probing into caregivers' awareness and their attitudes and beliefs, implementers of the VAS programme can map the way forward that can at least upscale efforts in ensuring VAS reaches every child less than 5 years of age in Harare City.

This immediate section will introduce as well as provide a background of the subject matter under investigation. It will cover the background of the study, statement of the problem, purpose of the study, research questions, and justification of the study, delimitations and limitations of the study as well as definitions of key terms.

1.2 Background to the study

Vitamin A is an important fat-soluble micro-nutrient which includes retinol, retinal, retinoic acid and retinyl esters. It is found as retinol in animal sources, for example, dairy products and as pro-vitamin A precursors in plant sources, for example, vegetables (dark green leafy) and fruits (mango, carrots), Adamu & Muhammad (2016). It is vital in small amounts for physiological processes of the human body such as vision, immune response, cell differentiation and proliferation, inter-cellular communication, and reproduction (Debelo, Novotny & Ferruzzi, 2017).

Consumption of inadequate vitamin A can lead to its deficiency. Vitamin A deficiency (VAD) is a common public health problem in the world, affecting up to 50% of the countries (World Health Organisation (WHO), 2019), particularly developing countries. Vitamin A deficiency is often worsened by other health conditions such as diarrhoea and measles, and is one of the leading nutritional disorders in the world along with protein malnutrition (Cabezuelo, Zaragozá, Barber, & Viña, 2019).

Low intake of Vitamin A during nutritionally demanding periods in life, such as infancy, childhood, pregnancy and lactation, greatly raises the risk of health consequences on VAD disorders (WHO, 2009). VAD has been noted to be a major contributor of under-five mortality. The provision of adequate Vitamin A supplementation prevents many deaths (Kupka *et al.*., 2016).

Vitamin A deficiency can be treated with a variety of strategies, including dietary changes, food fortification, and vitamin A supplementation (Goudet, Bogin, Madise, & Griffiths, 2019). Through dietary variety, dietary modifications attempt to boost vitamin A availability as well as intake. Another type of dietary improvement is fortification, which includes adding vitamin A to regularly consumed foods to boost their nutritional value (Hombali et. al., 2020). Fortified foods such as bread, mealie meal, flour, cooking oil, and milk are available in Zimbabwe. Food fortification is thought to be a safe and cost-effective strategy to boost vitamin A consumption and avoid deficiency.

Another intervention which is used to remedy VAD is vitamin A supplementation. It is considered to be the first intervention whilst all others are alternatives in areas with high vitamin A deficiency and it is widely adopted across the globe (Imdad et. al., 2017). Vitamin A supplementation involves the periodic delivery of high-potency supplements containing 200 000IU of VA to children between 12 and 59 months and a half dose (100 000 IU) to children between 6 and 11 months (UNICEF, 2019). Dietary improvements and vitamin A supplementation need to be combined in order to minimize vitamin A deficiency (Abdulmalek & Benkhaial, 2018).

Zimbabwe integrates its routine VAS programmes with routine Growth Monitoring and Promotion programs as well as yearly Vitamin A supplementation campaigns. National Child Health Day celebrations held once a year, also contribute to VAS coverage.

Despite these routine vitamin A supplementation programmes, coverage of VAS in Zimbabwe is stagnant and poor. The VAS coverage of Harare City falls far short of the national target of 80%. There are numerous factors which contribute to the stagnation of the coverage of vitamin A supplementation but caregivers play an important role in influencing uptake and thus coverage of VAS. Awareness of caregivers on issues to do with vitamin A supplementation is an important factor in influencing coverage of VAS. Despite being limited by resources, this study sought to evaluate awareness of caregivers for children under the age of five years on vitamin A supplementation and its influence on VAS coverage in the city of Harare, Zimbabwe.

1.3 Statement of the problem

Harare City has various modalities in place, like the National Nutrition Strategy 2018 which was crafted to support vitamin A supplementation activities. Various stakeholders like the Nutritional International and Hellen Keller Institute play a role in ensuring adequate vitamin A capsule supply and administration. The Government of Canada and the Zimbabwe Ministry of Health together with other mandated implementers support vitamin A supplementation.

Harare City vitamin A supplementation coverage has been performing below average against an expected target of 80% (United Nations Children's Fund, 2021). Vitamin A supplementation (VAS) is administered free of charge in Harare City and nationally through the expanded programme for immunization. VAS service coverage for the past 5 years (Table 1) has been lower compared to the immunization service coverage despite the two using the same delivery strategies and structures.

Table 1.1: Comparison of vitamin A supplementation coverage against expected target of 80%

Year	Zimbabwe	City of Harare	Zimbabwe urban areas
2017	43	70	47
2018	40	61	43
2019	44	54	35
2020	29	30	41
2021	-	18	47
Sources: (UNICEF, 2021);		(Annual Report, 2021);	(ZIMVac, 2021)

Factors that affect the utilisation of VAS services by the caregivers have not been fully and widely elucidated. It is unclear why the implementation of VAS services has been poorer than immunization services yet the two are used by the same population. The level of awareness of caregivers for children below the age of 5 years on vitamin A supplementation in the city of Harare has not been established.

In addition, the attitudes and beliefs of caregivers for children below the age of 5 years towards VAS have not been assessed and their association on vitamin A supplementation coverage is not known.

1.4 Purpose of the study

1.4.1 Broad objective

To determine vitamin A supplementation awareness, attitudes and beliefs among caregivers of children aged 6-59 months attending Harare City Clinics in, 2022

1.4.2 Specific objectives

- To assess awareness of vitamin A supplementation among caregivers of children aged 6-59 months attending Harare City Clinics in 2022
- To evaluate the attitudes and beliefs of caregivers of children aged 6-59 months attending Harare City Clinics, towards vitamin A supplementation
- To determine the association between awareness, attitudes and beliefs of vitamin A supplementation among caregivers of children aged 6-59 months attending Harare City Clinics in 2022

1.5 Research questions

- What is the level of awareness of vitamin A supplementation among caregivers of children aged 6-59 months attending Harare City Clinics in 2022?

- What are the attitudes and beliefs of caregivers of children aged 6-59 months attending Harare City Clinics in 2022 towards vitamin A supplementation?
- What is the association between awareness and attitudes and beliefs of vitamin A supplementation among caregivers of children aged 6-59 months attending Harare City Clinics in 2022?

1.6 Significance of the study

Macroeconomic conditions remain poor in Zimbabwe with the double burden of the impact of Covid-19 pandemic and high inflation. Humanitarian food assistance is expected to be low, and the continuing food prices will limit food access and choices (FEWS NET 2021). This study sought to investigate the extent to which Vitamin A supplementation is being provided given the imminent threat of increased Vitamin A deficiency in children and caregivers. The study also provided an insight on vitamin A supplementation for children under the age of 5 years in Harare City. The observations made will be a step towards the country's attainment of the Sustainable Development Goals (SDGs): "end poverty in all its forms" and "end hunger, achieve food security and improved nutrition and promote sustainable agriculture".

1.7 Delimitations of the study

The study only focused on children aged between 6 and 59 months within Harare City. The study focused on Harare City Health facilities where low vitamin A supplementation coverage has been observed.

1.8 Limitations of the study

The study was conducted on the caregivers attending the main polyclinics under Harare City Health department. Therefore, the results may not be readily generalized to the caregivers in all of Zimbabwe. The measles campaign that occurred 3 months before data collection may have influenced responses from the caregivers and may have made the coverage rate higher.

1.9 Chapter Summary

In summary, the VAS coverage of Harare City has been low for a number of years now, as not expected nationally and globally from the WHO. Usually lack of structural elements like vitamin A capsule shortage, lack of distribution models and other resources limits VAS accessibility. This is however not the case; all modalities are in place. To note, the awareness of VAS among caregivers in Harare has not been explored hence this study will assess the awareness, attitudes and beliefs of VAS among caregivers of children 6-59 months in Harare City.

CHAPTER 2 REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter presents literature on related studies on vitamin A supplementation awareness in various settings. The chapter includes an overview of vitamin A supplementation, the awareness of vitamin A supplementation among caregivers, their attitudes and beliefs with regards to it and the association between awareness and the beliefs that affect vitamin A supplementation uptake. Various sources from journals, articles and publications were explored. The contributions exhibited will highlight the current situation in Harare City and possibly shed more light on vitamin A supplementation.

2.2 Conceptual Framework

Figure 2.1 shows the relationship of independent variables and dependent variables. It shows how the independent variables influence the outcome of the dependent variable. The dependent variable is the vitamin A supplementation awareness. Adequate vitamin A supplementation awareness is dependent on the independent variables. The independent variables that influence vitamin A supplementation awareness include attitudes and beliefs of vitamin A and vitamin A supplementation; socio-demographic factors; vitamin A supplementation schedule; adequate vitamin A information and barriers or hindrances to vitamin A knowledge and vitamin A supplementation awareness.

These independent variables all constitute in determining the level of vitamin A supplementation awareness and ultimately the vitamin A supplementation coverage of Harare City.

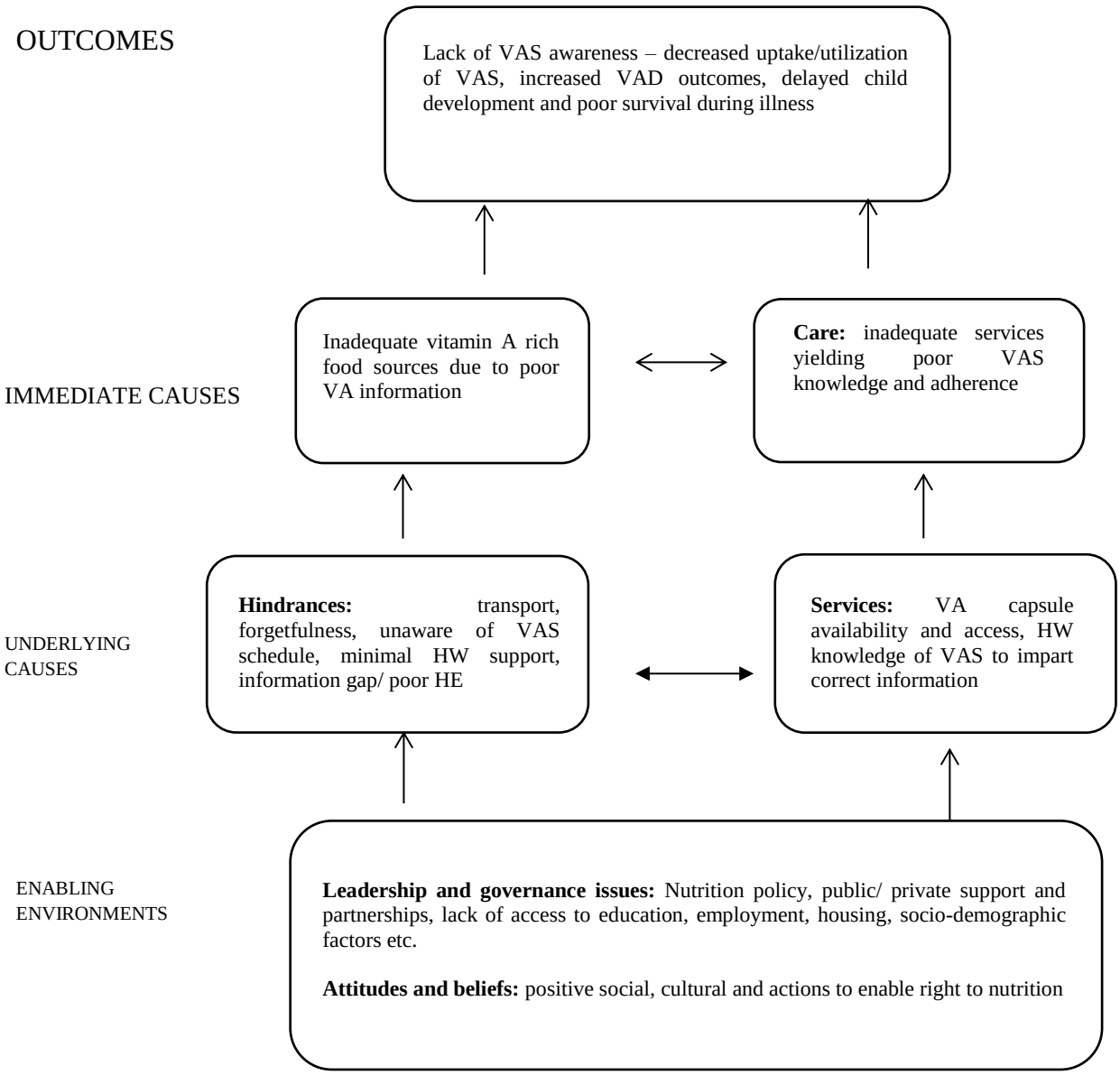

Figure 2.1: Conceptual framework for factors associated with VAS awareness, attitudes and beliefs among caregivers (*adapted from UNICEF conceptual framework on the determinants of maternal and child nutrition 2020*)

2.3 Relevance of the conceptual framework to the study

The conceptual framework in figure 2.1 adapted from the UNICEF conceptual framework for the determinants of maternal and child nutrition (2020) guides this study. The causes of vitamin A supplementation awareness, attitudes and beliefs among caregivers as cited in other studies include sociodemographic factors, attitudes and beliefs (enabling determinants), hindrances or barriers that inhibit access to VAS as well as the VAS services being offered to the caregivers including accessibility and availability of VAS and health worker knowledge on vitamin A and VAS translating to the type of health education shared to the caregiver (underlying determinants). The vitamin A diet intake offered to children by their caregivers shows the level of knowledge and/ or awareness they have on VAS as well as their VAS schedule adherence (immediate causes). All these factors are interlinked to influence the presence or lack thereof of VAS awareness among caregivers. The framework is relevant in guiding the understanding on the various causes of VAS awareness as they are multifaceted. When the actions on each cause are turned about one can visualise the appropriate interventions necessary to achieve VAS awareness at each stage and from the various stakeholders.

2.4 Overview of Vitamin A supplementation as a public health intervention

Vitamin A deficiency (among other micronutrient deficiencies) affects about 19 million pregnant women and 190 million preschool-age children, mostly from the World Health Organisation (WHO) regions of Africa and Asia (WHO, 2011). Vitamin

A is a micronutrient that is important in small amounts for child health and survival. The combination of childhood underweight, micronutrient deficiencies (iron, vitamin A and zinc) and suboptimal breastfeeding is responsible for 7% of deaths and 10% of the total disease burden (WHO, 2009). The burden of deficiency is highest in low-resource settings where poor-quality diets provide inadequate intakes of vitamin A and high rates of infection and illness perpetuate chronic undernutrition.

A meta-analysis of 16 published trials (Mayo-Wilson, Imdad, Herzer *et al.*, 1993) showed that there was a 24% reduction in risk of all mortality in children aged 6 months to 5 years in response to vitamin A supplementation. The same analysis also reported that there was a 28% reduction in cause specific mortality associated with diarrhoea, and a significant reduction in the incidence of diarrhoea by 15% and measles by 50%. It was also noted that vitamin A supplementation produced a 15% reduction in the incidence and prevalence of night blindness and a further 68% reduction in the prevalence of blinding xerophthalmia. In 2013, the prevalence of vitamin A deficiency was highest in sub-Saharan Africa (48%) and has remained stagnant for more than 20 years (Stevens, Bennett, Hennocq, *et al..*, 2015). Further, in 2013, vitamin A deficiency accounted for 2% of all deaths in children under-5 years of age in the region (Stevens, Bennett, Hennocq, *et al..*, 2015).

Strategies to curb vitamin A deficiency are promotion of home gardening, health education, food diversification and fortification, and vitamin A supplementation (Lartey & Armah, 2019).

Wagstaff & Cleason, (2004) elaborated that of all strategies vitamin A supplementation is the most cost effective. Under this recommendation, this key component was adopted in the Millennium Development Goals of reducing under-5 mortality. The mechanism by which vitamin A reduces mortality are not fully understood, and it is unclear whether its action is mediated through the correction of underlying deficiencies or through adjuvant therapeutic effects. The role of vitamin A in innate and adaptive immunity may also include reducing susceptibility to and/ or severity of other infections (WHO, 2011).

Semi-annual high-dose vitamin A supplementation (VAS) is recommended by the WHO for children aged 6–59 months in countries where vitamin A deficiency and child mortality are public-health problems (WHO, 2011). Provision of high doses of vitamin A every 6 months until the age of 5 years was based on the principle that a single, large dose of vitamin A is well absorbed and stored in the liver, and then mobilized, as needed, over an extended period of time (WHO, 2011). A dose of 100 000 International Units (IU) in infants 6-11 months of age and 200 000 IU in children 12-59 months of age is considered to provide adequate protection for 4-6 months, with the exact interval depending on the vitamin A content of the diet and the rate of utilization by the body (WHO, 2011). The doses are given twice a year from 6 months to 5 years. Most side-effects are transient with the large majority starting and disappearing within 24 hours of dosing. There are no known deaths attributed solely to vitamin A toxicity due to overconsumption of vitamin A (WHO, 2011).

The global coverage of the recommended twice-yearly dose is ~70 % among targeted children as stated by UNICEF, (2016). In efforts to meet this target, many countries including Zimbabwe have integrated strategies to deliver vitamin A supplements to infants and children in their national health policies. In Zimbabwe, the delivery has been integrated into routine health services, for example through the special days when vitamin A supplementation is combined with other child survival interventions such as deworming. The supplements are also distributed as part of the Expanded Programme on Immunization (especially at 9 months alongside measles vaccination). The caregivers bring their children for EPI-related activities inclusive of vitamin A supplementation. It is imperative to understand the awareness levels that caregivers have regarding vitamin A and supplementation as well as their attitudes and beliefs to it. This notion can clarify why VAS coverage is still not meeting the recommended UNICEF target.

2.5 Influences of vitamin A supplementation awareness

2.5.1 Sociodemographic factors

Vitamin A supplementation awareness is hinged on sociodemographic factors which is the door of societal interventions. It would be futile to seek clarification and bring lasting solutions without an attempt of understanding these factors. In the context of health services access and consequentially VAS awareness, a number of factors have been found to be significantly associated with VAS uptake including maternal education and age, socio-economic status, religion, health services utilization and

exposure to the media (Mukungwa, 2015). Wealth indices and birth order are known to be associated with utilization of child health services in low-resource settings, (Agrawal & Agrawal, 2013; Mukungwa, (2015). Literature reports that mother and father's education and living in rural areas are important determinants of coverage (Lartey & Armah, 2019). It was also observed that greater maternal formal education, higher household wealth status and high social development status of their area of residence appears to be an important determinant for receipt of vitamin A supplementation by preschool children in India (Agrawal & Agrawal, 2015).

Although few data exists for VAS, maternal education has been shown to be an important determinant of childhood immunization coverage. In a meta-analysis involving data from 96 low- and middle-income countries, Bosch-Capblanch, Banerjee & Burton, (2012) (as cited by Janmohamed, Klemm & Doledec, 2017) showed low caregiver educational status was a major barrier to childhood vaccination. This is thought to be due to little or no education being an obstacle to accessing and understanding information about the importance of health services and because low health service utilization tends to be rooted in the poorer living conditions of uneducated populations.

Lack of information due to low educational status is usually connected to poor supplementation of vitamin A. In a study by Gilano, Hailegebreal & Seboka, 2021, 66.38% of respondents were not educated, while those who had primary education and above showed association with supplementing their children with vitamin A.

It was not only mothers' education, but husband education had also a paramount value in reducing vitamin A supplementation. Here half of the husbands had no education, and the rest were also limited to primary level education; although, it was not evidenced in statistical analyses. There is enough evidence supporting the relationship between maternal education or family education and vitamin A supplementation (Gilano, Hailegebreal & Seboka, 2021).

In past times caregivers especially mothers, would use traditional medicines not as widely used now. This various concoctions brewed came from their predecessors with no reservations. They were taught the need to bring survival to their little ones through these herbs. It is expedient to note that education is not found only by sitting on a desk in the classroom, but rather from various unconventional sources. Education thus can delay or prompt the hunger for a caregiver to seek health care. In this same vein, a community-based descriptive study in Senegal observed that father's lack of education and maternal age over 25 years were among factors associated with delayed supplementation (Diouf & Sougou, 2021). Kamau *et al.*. (2012) extrapolated this same notion in a cross-sectional study in Kenya citing that mother's health education and literacy status has been found to play a major role in improving the health of the child.

Educational level of the mother showed a significant negative association with stunting among under-five children in a study by Assefa, Belachew, Tegegn & Deribew, (2008). This finding is similar with previous reports that maternal education has a positive outcome in reducing the child stunting.

One possible explanation is that knowledge that mothers get from their formal education could capacitate them to practice nutritional and other related behaviours that prevent chronic malnutrition/stunting. In addition to this, educated mothers have better health seeking behaviour for childhood illnesses as compared to uneducated mothers (Assefa *et al.*., 2008). A higher maternal education leads to better health care practice, acceptance of modern health practices and higher female autonomy, which affects health-related decisions, again increasing positive nutritional effects. Further, education is one of an important tool for improvement of income which helps them to satisfy nutritional requirements. Furthermore, education increases skills and is highly linked with different socio-economic factors including life style, income, and fertility at individual and community level, (Muche, Gezie, Baraki & Amsalu, 2021).

Although vitamin A supplements are offered at no cost in national government programmes, household wealth and size may influence access in terms of indirect opportunity costs related to time and transport to the distribution site. Employed caregivers (with better household wealth) have been consistently noted to increase their utilization of VAS services in various literatures due to the increased probability of higher levels of education (Kamau *et al.*, 2002; Kamau *et al.*, 2012). However, one can argue that there are some inequalities among employed caregivers associated with VAS utilization. Various work-related activities can decrease their opportunities of VAS access especially if there are deadlines to be met and pressures relating to their career growth.

Mobile outreaches can also be missed since they normally work during work days and in some cases child health cards may not be easily accessible to those who would have stayed behind with the children. A mixed-modelling approach study found that children from the middle-wealth quintiles had higher odds of receiving a vitamin A capsule in comparison to children from the poorest wealth quintile (Lucha, Engida & Mengistu, 2022). This can be attributed to better health seeking intentions and more affordability when the wealth index is higher. In terms of household size, the same study concluded that older children had higher odds of receiving vitamin A capsules than the youngest ones. This is two-sided, on one end the caregiver has become so used to the immunization activities that he/she knows or believes how some vaccines/ activities are more important than others hence they miss VAS. Another note is the succumbing pressure of increasing number of children and hence, work and household commitments that become a barrier in VAS access especially if a negative qualm has not been observed in the older children.

Religion, caregivers' age and sex and marital status are some factors also associated with VAS awareness. However, caregiver religion seems to affect VAS uptake in children 6 to 12 months more significantly than the other factors. Islam and Christianity are the most supported religions in the world (Chouraqui *et al..,* 2021). In Zimbabwe, the Christian religion is predominant with various sects making up the religion. The Apostolic sect is stringent in its rules regarding child immunization activities. They do not believe in Western medicine and would rather adhere to home delivery than health care facility delivery.

With this in mind VAS activities are shunned as well and in most instances their children do not receive most if not all vitamin A doses. Hopefully, with 21st century socialization, the younger population can be taught on the importance of immunization and in turn VAS while adhering to their apostolic faith. A study more close to home observed that missed opportunities of VAS administration were due to inadequate promotion and lack of awareness of the VAS programme by mothers/ caregivers among other problems (Hendricks, Beardsley, Bourne, Mzamo & Golden, 2007). Marjan, Rahman, Rois & Rahman (2021), recommend that the Bangladesh government and community programs focus on creating awareness among the children's mothers (or caregivers) in local communities, so they can be conscious about morbidity, mortality and blindness due to VAD. It is a suggestion worth capturing as this ensures their active involvement in VAS. When one understands the gravity of a health condition he/ she are more likely to take positive steps in alleviating any symptoms.

2.5.2 The level of knowledge of Vitamin A and Vitamin A supplementation

Nutrition has been recognised globally as a major lifestyle factor in health promotion and is important in the prevention and management of chronic diseases. Lack of knowledge among caregivers has been reported as the most important contributing factor to poor quality care (Masia, Mushaphi, Mabapa & Mbhenyane, 2020). Infants and young children are completely dependent on others, primarily their mothers, for nutrition, safe housing, and preventive and curative health care; indeed, the UNICEF framework on malnutrition highlights "nurturing care" as a critical requirement for

healthy child growth and development. To provide good child care, a mother/ caregiver must have access to resources (money, food, health care, knowledge, and skills, some of which are acquired through education). However, resources alone are not enough: money must be prioritized for child needs, available food must be appropriately prepared and fed to young children, and knowledge and skills must be practiced (Matare *et al*., 2021).

Malnutrition is prevalent, especially so related to vitamin A deficiency in sub-Saharan Africa. The VAS program has been proven to be a cost-effective intervention to combat vitamin A deficiency. Other countries in the world have used this intervention and studies have observed how level of knowledge is attributed to provision of vitamin A supplementation coverage in infants and young children. Nigusse & Gebretsadik, (2021) elaborated that taking health education regarding VAS from different sources in the last six months preceding the supplementation was significantly associated with VAS coverage. This can be simply put as the more knowledge one acquires in the context of vitamin A and vitamin A supplementation, the more awareness they have and the ease of uptake of VAS services.

Knowledge of caregivers was incentivized in Tanzania where only 49% of caregivers knew the benefits of VA and 45% knew about its sources. Sinha *et al.* (2018) in a cross-sectional observational study in Ghana revealed that 67.7% did not know about any natural sources of Vitamin A while 62.7% did not know about any medical effect of vitamin A deficiency.

These observations show that though the majority of caregivers have some knowledge of VAS, it needs to be reinforced and it is insufficient to make them self-reliant with regards to the full context of VAD.

2.5.3 Adequate vitamin A and vitamin A supplementation information

Nutrition information acquisition comes in many forms including formal education, social media, radio, posters, flyers, nutrition talks etc. Health facility staff and radio messages are also important communication channels for VAS campaigns and, therefore, should be utilized more effectively to sensitize populations and make them more aware about the importance of vitamin A supplements for young children and for broader nutrition messaging. Posters often constitute large proportions of programme budgets for VAS and other services. Nutrition awareness is usually shared via posters. Posters are a low-cost method of health education, providing a visual and coherent portrayal of information.

Despite posters frequently being used in African health promotion campaigns, there have been few studies evaluating their effectiveness or acceptability. Furthermore, there have been no studies in a rural African setting assessing the efficacy of educational posters to aid the use of interventions within clinical trials (Harrison *et al.*, 2019). Not to say that posters are not an effective means of improving awareness but they need to be supported by other promotional activities and counselling in health facilities. For example, when annual immunization days are advertised, it is also needful to share of vitamin A supplementation schedules as well.

Bearing in mind the routes of communication channels for VAS awareness, social media seems to be underutilized. The 'now' generation exhibits a high level of smartphone and social media usage despite their educational level, employment status, age or religion. The usual socio-demographic factors are not hindrances when it comes to social media usage. Looking further, this is a great option to improve VAS awareness and diminish any negative attitudes and beliefs regarding the service. A systematic study (Chau, Burgemaster & Mamykina, 2018) on 16 articles that included social media components in their nutrition-related intervention observed that 11 out of the 16 studies had at least one significant nutrition-related clinical or behavioural outcome. This is a compelling analysis especially since VAS awareness is mainly a change in nutrition behaviours.

The Zimbabwe National Nutrition Survey (2018) revealed that 12% of households had heard about fortified foods, 7% had heard of micronutrient powders and 6% of bio-fortification. These revelations therefore mean that a lot needs to be done to address micronutrient deficiency among the vulnerable groups. When individuals understand how various nutrition interventions benefit them, they are more likely to use them since they will be more aware. Awareness about vitamin A supplementation should be created among caregivers and health workers so as to increase utilisation. Missed opportunities should be reduced by screening for vitamin A status of all children at every contact with health facility as also cited by Kamau & Makokha, (2012). In light of this, a knowledge gap currently exists on vitamin A supplementation services in Zimbabwe.

This study aims to be a stepping stone in addressing vitamin A supplementation service uptake especially after caregivers take their children for the 18-month measles-rubella vaccination. It is to pave way in determining why caregivers seem unconcerned with taking their children for VAS up to 5 years of age.

2.5.4 Attitudes and beliefs of vitamin A and vitamin A supplementation

The terms attitude and belief co-exist, some even use them interchangeably. However, to separate them a belief is a state or habit of mind in which trust or confidence is placed in some person or thing, (Merriam-Webster, 2022). Oxford Languages (2022), further states that an attitude is a settled way of thinking or feeling about something. For example, an individual can have a belief that vaccinating is against tenets set by their religious leader. This simply means they develop a negative attitude towards vaccinations. The converse is also true. Bear in mind that tenets can come from any source, a person, media, scientific studies etc.

In the context of this study, a cross-sectional descriptive study conducted in Libya noted that the interviewed parents revealed a high positive attitude toward re-giving Vitamin A supplements to their children in the next campaign (88%), and in advising other parents to give their children Vitamin A supplements (76%). Their only limitation was the overall low level of knowledge on vitamin A among the caregivers, (Abdulmalek & Benkhaial, 2018).

They had been made more aware of what vitamin A and VAS was about that their beliefs and consequently their attitude towards it had shifted making them more willing to allow their children to receive future doses.

In another cross-sectional study which utilized the multivariable model, it was found that mothers who were aware of the benefit of VAS had 1.5 times increased odds of receiving the supplement, (Kassa, 2020). It can be argued that these women already had a positive belief with regards to vitamin A supplementation hence the increased odds of their children receiving the supplement. It can be deduced that awareness of a condition or a situation stimulates positive or even negative attitudes and beliefs with regards to any notion affiliated with that condition or situation. For example, in a study by Kassa (2020) 75% of the local women were aware of the benefit of VAS, had positive knowledge and attitude towards the supplement and were willing to have their children administrated. In the same light, if any negative information had been associated with VAS, their attitudes would have changed in like manner.

The high level of respondent awareness (99%) about VAS campaigns and the >90% coverage achieved in the two surveys conducted in Sierra Leone (Janmohamed, 2017) support the importance of effective awareness-raising in target communities. Further, the very low coverage achieved in Kenya, based on two surveys conducted in 2012 and 2013, highlights the negative consequences of programming in under-informed communities. Kamau, Makokha, Mutai & Mugoya (2012) attributed low VAS coverage of 50% in Kenya to a lack of knowledge among health workers and mothers of eligible children.

Interestingly, >90 % of informed respondents in the study expressed positive attitudes towards VAS and reported no challenges or obstacles in obtaining supplements for their children. This brings another shade of positive attitudes to VAS; one might have the right attitude but lack adequate information relating to its access and hence fail to have their child supplemented.

Community health workers have been noted to be key sources of information about VAS campaigns in several countries. This is not surprising as this cadre of health personnel has been shown to be effective in improving maternal and child health in many countries through their role in informing and mobilizing communities for health promotion, (Lewin, Munabi-Babigumira, Glenton *et al.*, 2010; Perez, Ba, Dastagire & Altmann, 2009). These studies also showed that a rather high level of community acceptance for VAS and suggests higher coverage can be achieved with effective distribution in well-informed communities. The issues of supply-driven barriers to compliance (lack of awareness, no distribution) outweighed constraints on women's ability to bring their children to a fixed site (family refusal, too busy, long distance, long waiting time) were thus unexpected.

2.5.6 Hindrances to vitamin A access and vitamin A supplementation uptake

There are various barriers to vitamin A supplementation access and uptake and ultimately affect the overall coverage. The mode of supplementation delivery is important as it is what determines if a child receives vitamin A or not.

In Zimbabwe, caregivers' visit the health facility during routine immunization visits and it is through this structure that vitamin A supplementation is given. Annual health days are also held to cover for the ones who would have missed their vaccinations. A study by Janmohamed, Klemm & Doledec (2017) found that the door-to-door distribution of VAS resulted in 30% higher coverage than the fixed-site plus outreach delivery model, for which 75% of surveys estimated coverage below 80%. This can be explained by the fact that in the fixed-site plus outreach model caregivers first need to be aware of the campaign and then make the appropriate arrangements to attend the closest health facility or outreach site with their eligible children, whereas the door-to-door delivery model places the effort on health personnel and requires only that caregivers and children are present at the time of distribution.

It can also explain why there are variations in VAS coverages between the rural and urban set ups. It is easier for health workers to maintain a record and follow on children in their respective areas in rural areas than in urban settings. This notion is not aligned with findings by Berde, Bester & Kruger (2019) who noted that children in rural areas are less likely to receive VAS than those in urban areas due to differences in accessibility to health information and health services, infrastructures and technological advancements.

Janmohamed *et al.*, (2017) interestingly discovered that VAS was more likely among children of caregivers with some formal schooling in the fixed-site strategy and among those with no formal schooling in the door-to-door model.

This is suggestive that caregiver education may not be a major contributor to coverage in areas where health workers provide supplements directly at the household, but may be more important for programmes that require active participation in a community health event. Door to door approaches may require less prior awareness, but in conservative communities it is still needful to advertise beforehand. Despite the delivery strategy employed, there is need to inform caregivers prior about VAS campaigns.

Registered nurses are the main administrators of vitamin A capsules at Harare City health facilities. Other health care workers like the community health care workers and nutritionists also support in administration especially during VAS campaigns and measles campaigns. However, with the high staff attrition some facilities do not have a high number of nurses and nutritionists resulting in work overload. Community health workers '*mbuya utano'* assist nurses in identifying missed opportunities or any other ailments affecting the community. The question comes when the CHWs are few in number and aged since their recruitment was last done years ago. This puts a damper on interventions that should be moving swiftly.

Another limitation is lack of funding for transport for CHWs to move around communities especially in their catchment areas which might have bigger yards with large distances between them. Periodic breaks in the supply chain sometimes but rarely occur as vitamin A capsules are financed by Canada through UNICEF.

Other barriers are affiliated with the lack of VAS are on the caregivers' end including distance to health facility and caregivers' commitment to vitamin A supplementation. In Harare most residential areas are close to their health facilities with average distances less than 5km. This is important for ease of access to health care ensuring quick service delivery. However, there are new per-urban areas that do not have health facilities built as yet and mobile clinics are not available as they are costly to deploy.

2.5.7 Association between vitamin A supplementation awareness and attitudes and beliefs

According to the knowledge, attitude and practice (KAP) model, acquiring knowledge is a key first step to promoting belief and changing undesirable behaviours (Ul Haq *et al.*, 2018). When an individual is made aware of nutrition interventions the odds are higher that they will be motivated and competent enough to access, process and understand nutrition information to make nutrition-related decisions (Ong *et al*., 2021).

Findings from a cross-sectional study in Kenya (Kigaru *et al*., 2015) showed that children had moderate nutrition knowledge and poor dietary practices, associated with negative dietary attitude. The study further recommended raising awareness on dietary practices and related health risks. Nutrition knowledge or awareness and positive attitude can be seen to influence dietary practices and positive health seeking beliefs and behaviours.

The same applies to growth monitoring and promotion (GMP) activities, good knowledge is important for the HCWs to have a favourable attitude to educate the caregivers on childhood vaccination (Mukhtar *et al..,* 2022). Attitudes influence behaviour change, including attendance of GMP, and negative attitudes are linked to non-attendance.

A qualitative exploratory study in South Africa found that inconsistent availability of GMP services and the behaviour of health workers affected participants' attitude but the caregivers still felt good about GMP and this boosted their attitude towards it and aided in adherence despite the challenges they faced (Mphasha *et al.*, 2023). They were made more aware of the benefits of GMP and they adjusted their attitudes accordingly as long as it benefited their children. An earlier study in Kenya also showed that mothers were positive and supportive about VAS but there was a general lack of information and awareness among both health workers and mothers (Kamau & Makokha, 2010).

It is classically believed that good knowledge should be associated with good attitude and proper nutritional behaviours to interventions available, however in some situations good knowledge and attitude do not necessarily translate into good health seeking behaviours (Nassanga, Okello-Uma & Ongeng, 2018). This does still reiterate the fact that even if one decides not to seek appropriate care; health awareness should still be accorded such that their decision is more informed. It is the first step in eliminating and combating micronutrient deficiencies.

2.6 Vitamin A supplementation controversy

WHO recommends vitamin A supplementation programmes for children 6-59 months in areas where vitamin A deficiency is still a public health problem (WHO, 2011). Coverage for VAS programmes has slipped dramatically since 2016 especially in regions where child morbidity and mortality remain high. Resources for adequate provision of VAS programming are also falling short as global commitment is waning with shifts in SIA funding and general campaign fatigue; and a couple of countries have actually succeeded in reducing VAD and under5 mortality. This has created controversy on drawing attention to scale back on VAS.

Evidence-based decision making on the status of vitamin A in various settings has been difficult to make as there is not enough data and oftentimes the data is unreliable to make informed decisions on scaling back VAS. The Global Burden of Disease study shows that there is a general decline in global vitamin A deficiency, (Zhao *et al.*, 2022). However, there have been comebacks with regards to this criticism in programming with GAVA mentioning that when the population has sufficient vitamin A intake and when VAD is present in less than 10% of the population can scaling back on VAS be considered.

WHO also cites that scaling back on VAS can be considered when countries have developed interventions that increase availability and consumption of nutrient-rich foods and improve overall public health conditions to eliminate vitamin A deficiency.

Meeting populations' dietary requirements through available and affordable nutritious food prevents the need for vitamin A supplementation. Citing all the issues raised, one can even conclude that the perceived risk for vitamin A deficiency is low and hence VAS can be scaled back.

What happens then to settings where child mortality and morbidity is still high? Is it not expedient in the interest of public health and the SDG focus on eliminating preventable child mortality to ensure those areas remain supported despite the supposed progress on VAD made by others? Some authors have expressed concern in more data being availed in terms of dietary intake surveys, coverage data of interventions that increase vitamin A intake in children (like fortification and MNPs) and periodic micronutrient status surveys. This is noble but the countries most affected do not have adequate financing to carry out laboratory-intensive analysis as expected.

A study by McLean *et al.* (2020) approved that proxy indicators (in this case using U5MR as proxy for VAD) are needed in the interim when VAD data are not available. The proxy for VAD has been placed at U5MR of less than 25 deaths per 1000 live births. According to the ZimStat Preliminary Report 2022, the U5MR of Harare is 32.7 deaths per 1000 live births and overall Zimbabwe is at 39.8. Using the proxy results to inform decision making, there is definite need to continue with VAS. However, strategies deployed to reach the target population might need to be reassessed in order to maximise coverage. McLean *et al.* (2020) suggests narrowing the age range as mortality data from the GBD study suggests.

Mortality rate in the older children (4-5 years) has declined. Delivery approaches also need to be addressed to target the most vulnerable. Given this discussion, VAS awareness becomes more important to maximise on the delivery mechanisms offered now or in the future. It is also a means to identify the most vulnerable in terms of vitamin A nutrition and thus afford intervention with VAS more appropriately.

2.7 Chapter Summary

This chapter showed that vitamin A supplementation is a necessary public health intervention especially in our context where caregivers are mostly unaware of appropriate vitamin A-rich foods. It is also worth noting that implementers should plan according to the dynamic local context bearing in mind technological advancements, new peri-urban settlements and above acceptability of the programme as a whole to caregivers with the target population. It also creates a need to understand the prevalence of vitamin A deficiency and extrapolate means for equitable access. This chapter sourced information from various authors regionally and internationally in relation to VAS.

CHAPTER 3 METHODOLOGY

3.1 Introduction

This chapter described the materials and methods adopted in this study. The materials and methods will be discussed under study site, research philosophy, research design, and population under study, inclusion/ exclusion criteria, and sampling procedure. It will also address the data collection techniques, the pretesting of the tools and the means for ethical consideration.

3.2 The Research Design

The study adopted an analytical cross-sectional study design. This design was appropriate in determining association between the independent and dependent variables. This type of research design allowed the researcher to collect data from different individuals at a single point in time. It was a cross-sectional study as it is not costly to perform and did not require plenty of time to be carried out. This design also allows establishing preliminary evidence in planning for a future advanced study. The analytical design allows assessment of associations between parameters in this case VAS awareness and attitudes and beliefs.

3.3 Population and Sampling

3.3.1 Study site

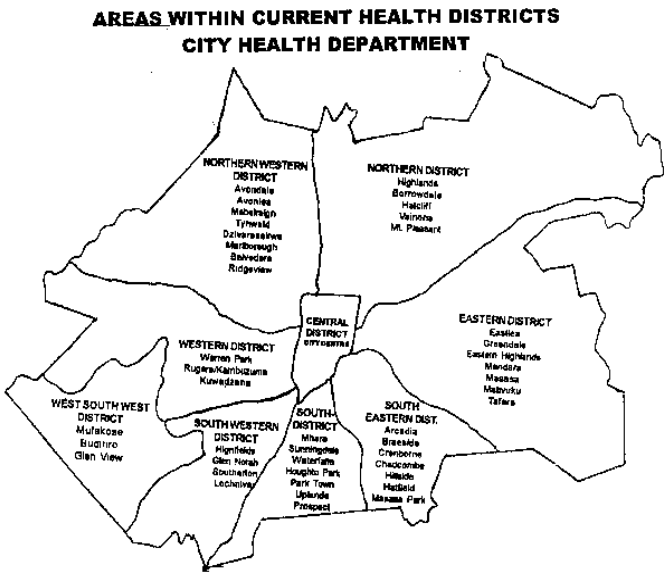

Figure 3.1: Map showing the health facilities Harare City

The study was conducted in Harare City, at Harare City poly clinics in the four districts of Harare City, Southern, Eastern, Western and Northern. The study focused on twelve polyclinics which are run by Harare City Council. These were Glen View Polyclinic, Highfield Polyclinic, Kambuzuma, Mabvuku, Mbare Polyclinic, Rujeko Polyclinic in Dzivarasekwa, Warren Park Polyclinic, Rutsanana Polyclinic in Glen Norah, Kuwadzana Polyclinic, Hatcliffe Polyclinic and Budiriro polyclinic. The polyclinics offer family health services inclusive of routine immunization activities where vitamin A supplementation services are provided.

3.3.2 Study Population

Population is the total number of objects or individuals understudy from which observations and data collection is made. The population of this study comprised of caregivers of the children aged between 6 and 59 months from the twelve polyclinics. The 2020 Harare City Health Annual Report, estimated the total population of Harare to be at 1 873 284. The city of Harare was estimated to have attended to 428 580 children under the age of 5 old in the year 2020 for growth monitoring and vaccinations.

3.3.3 Inclusion/ Exclusion Criteria

The research involved the caregivers of the children aged between 6-59 months who would have utilized health services for their children at those clinics within the last 12 months. The research also included health care workers for Harare City clinics who participate and administer vitamin A to children 6-59 months. The research excluded those caregivers who were not willing to take part in the study. It also excluded caregivers who did not have their child's health card/ book which indicates their vitamin A supplementation schedule. The research also excluded caregivers of children below 6 months and above 59 months.

3.3.4 Sample size determination

A sample size was calculated using Snedecor, G., and Cochran (1989) sample size formula: $n = (Z\alpha/_2)^2 P (1-P)/e^2$; with known proportion at 95% confidence interval, 5% margin of error, 10% non-response rate (Hadzi *et al.*., 2016):

Where: Z = 1.96; e = 0.05; p = 0.30 (Harare City VAS coverage percentage of 30% in 2021); q = 1-p

This yielded an estimated sample size of 322.6944 which was further increased by 5% to account for incomplete responses and missing data. Thus, the required sample size was 322.6944 + 16.1 = 339.

3.3.5 Sampling techniques

There are four districts under Harare City which house the polyclinics. Purposive sampling was used to include all the districts and the 12 poly clinics under the districts into the study. Systematic random sampling was used to recruit the study participants. Every third caregiver seated on the waiting benches at every health facility was recruited and interviewer-based questionnaires administered to them. At every poly clinic, two health workers were conveniently selected depending on their availability at the time of the visit.

3.4 Data Collection Instruments

Data was collected by use of interviewer-administered questionnaires to caregivers with children under 5 years old attending Harare City health facilities. The researcher noted that caregivers were pre-occupied with looking after their children and hence could not be able to fill in a questionnaire on their own. The questionnaires had four sections, section one collected demographic data whilst section two collected data on caregivers' awareness on vitamin A. Section three of the questionnaires collected data on vitamin A supplementation coverage among children The child health card was also observed to determine whether a child had received a Vitamin A supplement in the last 6 months. Section four of the questionnaire collected data on attitudes and beliefs. Data from the health care workers was collected using self-administered structured questionnaires with questions relating to their nature of work at the health facility, their knowledge levels on vitamin A-rich foods and VAS as well as their observations on the level of knowledge of VA and VAS of caregivers and possible hindrances they have in accessing the services.

Pretesting of Instruments

A pre-test was done using 10% of the caregiver sample size (approximately 33 participants). It involved caregivers of children aged 6 to 59 months at Waterfalls' clinic under Harare City. This assisted in determining the reliability of the data collection instruments.

Content validity was used to ensure that instruments collected what they were intended. The researcher engaged the supervisors' advice on the instruments' validity.

3.5 Data Collection Procedure

The author ascribed two research assistants to assist in data collection, including the author the data collection was carried by three people. Each person was accorded four health facilities, and 28 questionnaires were given for 9 health facilities and 29 for 3 health facilities totalling 339 questionnaires as per the sample size of 339. HCWs filled in their forms during interviewing of the participants and the forms were collected after interviews were done for the day or when as many participants were interviewed. The participants were interviewed based on the questionnaire.

Selected health workers including nurses and nutritionists were given a separate self-administering questionnaire in order to deduce their awareness levels on vitamin A supplementation as well as their attitudes regarding the services. The sister-in-charge was asked to randomly select any two health workers to fill in the questionnaires at each health facility visited. This avoided bias as the researcher did not know any health workers at any of the facilities and the sister-in-charge knew which health workers were on duty that particular day. The health worker questionnaires were returned on that day after the researcher had interviewed caregivers at the particular health facility.

3.6 Analysis and organisation of Data

Primary data collected using questionnaires was cleaned, coded and then keyed into STATA statistical package version 14.0. Mean, variance, standard deviation and percentages and descriptive statistics were computed to analyse quantitative primary data collected using questionnaires. Analysed data was organized and summarized using tables and charts. The influence of independent variables on Vitamin A supplementation awareness was tested using Chi-square. Regression analysis was used to measure the association between vitamin A supplementation awareness and attitudes and beliefs.

3.7 Dissemination of results

The results obtained from this study will be disseminated through presentations and papers to relevant personnel. It will also be shared through books, journal articles, reports as and when the opportunity arises. Printed copies of the final study will be distributed to Harare City personnel too. The researcher will also share with a wide range of audiences such as peer researchers, students, professional practitioners, policy makers and the general community.

3.8 Ethical Considerations

The researcher sought clearance from the Ethics Committee at Harare City and Africa University Research Ethics Committee (AUREC) in order to conduct the research.

The study took into consideration research ethics of confidentiality, voluntary participation, plagiarism and publication of results. The researcher requested permission at every polyclinic from the sister in charge before carrying out the study. The researcher then requested permission from the participants who took part.

Participants' names and other identifying information were not captured onto the questionnaire in order not to link specific responses to specific participants. The questionnaires from both the health workers and caregivers were kept in envelopes and stored in cabinets with locks which only the researcher had control over. The researcher explained to each participant of the study and its intent.

Only after the participant understood and was willing to participate were they requested to sign informed consent forms before the interview began. No participant was forced to take part in the study without their full consent. They were also notified that no benefits would be accorded to them in order to eliminate bias. Each interview was done separately without other caregivers prying or listening to avoid feelings of shame if one failed to answer any of the questions. If at any moment of the interview they decided to terminate it, they were allowed to do so with no malice or negative feedback from the researcher.

3.8 Chapter Summary

This chapter explained the methodology used in conducting the research. Various aspects like the study area, population under study, sample size, data collection procedure and instruments were cited. It also covered how the results of the study will be disseminated to relevant personnel as well as the ethical considerations to be noted before and during the study.

CHAPTER 4 RESULTS

4.1 Introduction

This chapter discusses the results of the study which include socio-demographic information, assessment of caregiver awareness on vitamin A and vitamin A supplementation, their attitudes and beliefs with regards to vitamin A and vitamin A supplementation as well as health worker knowledge on vitamin A and supplementation. The overall objective of the study was to determine vitamin A supplementation awareness, attitudes and beliefs among caregivers of children aged 6 to 59 months in Harare City.

4.2 Response Rate

The study earmarked to administer 339 questionnaires and all the participants were willing to participate as highlighted in Table 4.1.

Table 4.1: Response rate

Questionnaires earmarked to be administered	**Questionnaires administered**	**Questionnaires valid for analysis**	**% response rate**
339	339	339	100

According to Mugenda & Mugenda (2003) a 50% response rate is adequate, 60% good and above 70% is rated very well. Based on this assertion, the response rate of 100% was excellent and was therefore the data was valid for analysis.

The high response rate was attributed to the use of research assistants and adequate mobilization.

4.3 Socio-demographic characteristics of the participants

The participants were asked to indicate their age. This was important in order to establish the age distribution of caregiver ages. Among the 339 caregivers interviewed, the majority were in the age group 27 – 32 years (36.83%) followed by 23 – 26 years (25.15%) and the least below 18 years (0.6%) as indicated in figure 4.1. The findings show that the majority (88.9%) of the caregivers were in the reproductive age of 18-37 years. Generally, there were a higher proportion of females (97%) amongst the caregivers in comparison with the males at 3%.

More than three quarters (89.5%) of the caregivers were married, 5.4% separated and 0.3% was single parents. The majority of caregivers cited they completed secondary level education (71.60), 8.4% completed primary education and only 3.5% had higher level education. Above fifty percent of the respondents (52.7%) were unemployed, 31.7% self-employed and 2.4% were casual labourers sometimes. The common religion amongst caregivers was Christianity under the Pentecostal sect followed by the apostolic sect (36.2%) and lastly the traditional religion at 1.5%.

Table 4.2: Frequency distribution of caregivers by age, sex, marital status, educational level, employment status and religion, N=339

Characteristic	Frequency (n)	Percentage (%)
Age		
<18	2	0.6
18-22	42	12.6
23-26	84	25.2
27-32	122	36.8
33-37	48	14.4
38-42	22	6.6
>43	13	3.9
Sex		
Male	10	3.0
Female	323	96.9
Marital status		
Divorced	7	2.1
Married	299	89.5
Single	1	0.3
Separated	18	5.4
Widowed	9	2.7
Educational level		
Primary completed	28	8.4
Primary not completed	6	1.8
Secondary completed	239	71.6
Secondary not completed	49	14.7
Tertiary	12	3.5
Employment status		
Casual labour at times	8	2.4
Formally employed	44	13.2
Not employed	176	52.7
Self-employed	106	31.7
Religion		
Apostolic	121	36.2
No religion	14	4.2
Pentecostal	194	58.1
Traditional	5	1.5
Relationship of caregiver to child		
Aunt/ uncle	6	1.8
Father	11	3.3
Grandparent	13	3.9
Mother	304	91.3
Caregiver household size		
2-3 members	80	24.0

4-5 members	196	58.9
6-8 members	53	15.9
>9 members	3	0.9

The highest proportion of caregivers who were interviewed are the mothers (91%) of the children whilst 3.90% were grandparents and 1.80% either aunt or uncle. More than fifty percent of respondents (59%) cited their households have 4 – 5 members, 26% have 2-3 members and 1% had more than 9 members.

Distribution of the children by sex and age

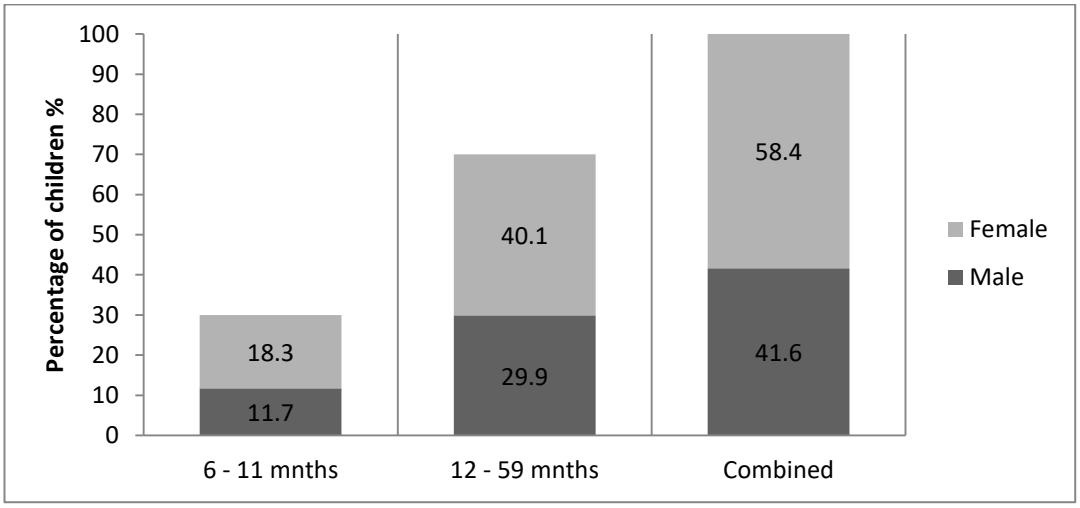

Figure 4.1 Distribution of children by age and sex

Overall, majority of caregivers had female children (58.4%) and those with male children (41.6%). Among the two age groups, the majority of caregivers had children in the age group 12-59 months (70%).

4.4 Vitamin A supplementation awareness

Table 4.3: Frequency distribution of awareness characteristics, N=339

Characteristics	Frequency (n)	Percentage (%)
Caregivers that have heard about VAS		
Yes	309	92.9
No	24	7.2
Ability to identify vitamin A capsule		
Yes	263	78.9
No	70	21.0
Knowledge on recipients of VAS		
Mothers and children	2	0.6
Mothers	6	1.85
Children under 5 years	219	65.85
All children	106	31.7
Knowledge of VAS schedule		
Yes	264	79.3
No	69	20.7
States correct schedule		
To be given once a year	15	5.7
Every 6 months from birth (twice per year)	63	23.8
Every 6 months from birth (twice per year up to 5 years)	170	64.4
To be given only with measles vaccine	16	6.1
Route of administration		
Injection	12	3.6
Oral	11	3.3
Both	310	93.1
Source of VAS information		
Health workers	312	93.7
Friends	3	0.9
Mother	10	3.0
Mother in law	5	1.5
My family	1	0.3
Other relatives	1	0.3
Media	1	0.3

The largest proportion of participants (92.8%) had heard about Vitamin A supplementation and only 7.2% had not. The majority of the caregivers (79%) could identify the vitamin A capsules as either blue or red. The majority of the caregivers correctly noted that children under 5 years are the recipients of VAS (65.9%). However, 31.7% mentioned that all children regardless of age can receive VAS. Only a few cited mothers as recipients. Most of the caregivers (310/333) cited that the capsule is given orally, while a few noted that it can be given by injection (6/333) and others by both routes (5/333) as shown in the table. Health workers were identified as the major source of information (93.7%) on vitamin A supplementation. The mother (caregiver) was next in line at 3% while friends, mother in law, family, other relatives and media have minor roles as sources of information.

Table 4.4: Frequency of knowledge on vitamin A food sources and deficiency symptoms, N=339

Characteristics	Frequency (n)	Percentage (%)
Knowledge of color of foods rich in vitamin A		
Wrong color	131	39.3
1 color	97	29.1
2 colors	83	25
3 colors	22	6.6
Knowledge on three vitamin A-rich food sources		
Wrong food	173	52
1 correct	110	33
2 correct	26	7.8
3 correct	24	7.2
Knowledge on symptoms of vitamin A deficiency		
Wrong symptom	201	60.2
1 correct	114	34.1
2 correct	18	5.4
3 correct	1	0.3

The majority of the participants (39.6%) as highlighted in Table 4.4 could not name at least one correct colour of foods rich in vitamin A while only 6.6% (22/333) could name three. The majority of the participants (52%) did not know the correct food sources of vitamin A. The least number of participants (24/333) could cite 3 correct vitamin A-rich foods with the most commonly mentioned foods being milk followed by fish, eggs and butternuts. Out of the 333 participants 201 (60.2%) did not have knowledge on symptoms of Vitamin A deficiency citing wrong symptoms, 5.4% could cite 2 correct symptoms and less than 1% could cite more than 3 correct symptoms as shown in Table 4.4.

Table 4.5: Association of knowledge of foods rich in vitamin A and symptoms of VAD, N=339

Variable	**Symptoms of Vitamin A deficiency**				
Foods rich in Vitamin A	Wrong symptoms (%)	1 symptom (%)	2 symptoms (%)	3 or more symptoms (%)	Statistical test
Wrong food	32.3	9.9	7.2	2.4	$X^2 = 54.3$
1 food	6.0	13.8	11.4	2.1	p = 0.000
2 foods	0.3	3.3	3.3	0.9	(12df)
3 or more foods	0.9	2.1	3.0	1.2	

The majority of the participants (32.3%) who could not name 1 correct food rich in Vitamin A and could also not correctly identify at least 1 symptom of VAD whilst a minimal 1.2% of participants could correctly name 3 or more foods rich in Vitamin A as well as identify 3 or more symptoms of VAD. Commons foods named included butternuts, dark green vegetables and eggs.

Symptoms identified by participants included prolonged illness, night blindness and rough skin. Knowledge of foods rich in Vitamin A was associated with knowledge on symptoms of VAD p=0.000.

4.5 Vitamin A supplementation attitudes and beliefs

Table 4.6: Attitudes and beliefs about VAS, N=339

Characteristic	Attitudes and beliefs	
	Agree n (%)	**Dis-agree n (%)**
Discuss about VAS with others	145 (48.7)	188 (56.3)
Advise others about VAS	323 (97)	10 (3.0)
Usefulness of VAS	328 (98.5)	5 (1.5)
Willingness to go for next dose	330 (99.1)	3 (0.9)

*VAS-vitamin A supplementation

Most of the caregivers were in support of Vitamin A supplementation; (98.5%) agreed that VAS is useful, 97% were in agreement to advise their colleagues to send their children for VAS, 99.1% were willing to again for VAS. More than half (56.3%) indicated they would not discuss about VAS with others.

Table 4.7: Frequency distribution of characteristics associated with attitudes and beliefs, N=339

Characteristic	Frequency (n)	Percentage (%)
Decision to attend VAS		
Health worker	166	49.7
Myself (mother)	160	48.0
In laws	3	0.9
My husband	1	0.3
My wife	2	0.7
Myself (father)	1	0.3
Adequacy of VAS information		
Enough	22	6.6
Just enough	8	2.4
Not enough	288	86.5
Not sure	15	4.5
Children who received VAS in the preceding 12 months of the study		
Yes	280	84.1
No	53	15.9
Doses of VAS received		
Zero	5	1.5
Once	253	76.0
Twice	75	22.5
Hindrances to accessing VAS		
Forgetfulness	91	27.2
Transport	30	9.0
Not aware of schedule	117	35.1
No support	43	13.1
No challenge	52	15.7

*VAS – vitamin A supplementation

There was a slight difference in decision making between the health worker (49.7%) and the mothers (48%) as mentioned by the caregivers. In laws, the husband, the wife, friends have very little contribution in the decision making to attend VAS. The highest proportion of respondents cited that they did not have enough information on VAS (86.5%), 6.6% had enough information and 2.4% had just enough information. The

majority of caregivers (84%) had children who had been given Vitamin A supplement whilst 16% had not been given VAS in the last 12 months prior the study. More than fifty percent of the respondents mentioned their children had been given Vitamin A supplement once (76.2%), 22.7 % twice and 1.1% had never been given vitamin A supplement in the previous 12 months. Several challenges for failing to access Vitamin A supplementation were mentioned by the interviewed caregivers. The main challenges mentioned included not being aware of schedule, forgetfulness and lack of support from family.

4.6 Proportion of various outcomes among various exposure variables

Awareness was assessed based on scale designed by the author. Questions relating to awareness were used which were:

- *Caregivers that have heard about VAS*
- *Ability to identify a vitamin A capsule*
- *Knowledge of recipients of VAS*
- *Knowledge of VAS schedule*
- *Stating the correct VAS schedule*

These were placed on a scale which was numbered out of 5; where if a caregiver knew 3 or more answers he/ she was said to be aware of VAS, if they had 2 or less answers they were categorized as unaware.

Table 4.8: Association of awareness to socio-demographic characteristics

Characteristic	Awareness (%)		Statistical test
	Not aware	Aware	
Age of caregiver			
<18 years	0.9	11.7	x^2=7.5 (6df)
18-22	3.0	22.2	p=0.270
23-26	5.4	31.4	
27-32	3.0	11.4	
33-37	1.8	4.8	
38-42	0	0.6	
>43 years	0.9	3.0	
Age of child			
Under 1	3.3	26.7	x^2=1.8 (1df)
Above 1	11.7	58.3	p=0.184
Sex of caregiver			
Female	13.8	83.5	x^2=6.3 (1df)
Male	1.5	1.5	p=0.012*
Relationship to child			
Aunt/ uncle	0.3	1.5	x^2=15.8 (3df)
Father	1.2	2.1	p=0.359
Grandparent	0.9	3.0	
Mother	12.6	78.4	
Religion			
Apostolic	4.2	32.0	x^2=2.0 (3df)
No religion	0.9	3.3	p=0.570
Pentecostal	9.6	48.5	
Traditional	0.3	1.2	
Marital status			
Divorced	0.3	1.8	x^2=3.1 (4df)
Married	12.6	77.0	p=0.540
Separated	1.5	3.9	
Widowed	0.6	2.1	
Single	0	0.3	
Educational level			
Primary completed	2.7	5.7	x^2=23.4
Primary not completed	1.2	0.6	p=0.000*
Secondary complete	9.9	61.7	
Secondary not completed	1.2	13.5	
Tertiary	0	3.6	
Employment status			
Casual labour	0.3	2.1	x^2=0.5
Formally	2.4	10.8	p=0.928
Unemployed	7.8	45.0	
Self-employed	4.5	27.3	
Household size			

2-3 members	2.7	21.3	x^2=5.5 (3df)
4-5 members	8.1	51.1	p=0.138
6-8 members	3.9	12.0	
>9 members	0	0.9	
VAS status			
Yes	10.5	73.7	x^2=8.8
No	4.5	11.3	p=0.003*

***indicate significance p<0.05*
VAS-vitamin A supplementation
d.f.-degrees of freedom

The socio-demographic characteristics were associated with awareness of caregivers on vitamin A supplementation. Gender of the caregiver (p=0.010) and education level (p=0.000) were found to be significantly associated with caregiver awareness on Vitamin A as indicated in the Table above. There was no significant association of awareness and age of caregiver, employment status, marital status and household size (p-value >0.050). 73.7% of participants who had children with an up to date VAS status are aware of vitamin A supplementation whilst 4.50% are not aware and their children do not have an up to date VAS status. Vitamin A status (coverage) was associated with awareness p=0.003.

Table 4.9: Multivariate regression analysis of VAS awareness

Equation	Observations	Parms	RMSE	"r-SQ"	F	P
Awareness	339	7	0.3325908	0.1514	9.690338	0.0000
	Coefficient	**Standard error**	**t**	**P>|t|**	**95% confidence interval**	
Usefulness of VAS	0.57896	0.1581099	3.66	0.000	0.2679155	0.8900044
Would discuss with others	0.0958244	0.0370875	2.58	0.010	0.0228635	0.1687854
Willingness to take child for next dose	-0.3468923	0.2000326	-1.73	0.084	-0.74041	0.0466254
VAS status of child	0.1488503	0.0502192	2.96	0.003	0.0500557	0.2476449
Caregivers' sex	-0.3135327	0.1149998	-2.73	0.007	-0.539768	-0.0872973
Education status of caregiver	0.0626827	0.0166737	3.76	0.000	0.0298812	0.0954843
_cons	0.0996523	0.4644234	0.21	0.830	-0.8139928	1.013297

*VAS-vitamin A supplementation

Regression analysis was conducted to determine the association between awareness, and attitudes and beliefs of vitamin A supplementation. All the variables that showed significant association on univariate analysis namely education level of caregiver, VAS status of children and caregiver sex were entered into the regression model to determine association with attitudes and beliefs categorized as usefulness of VAS, willingness to discuss about VAS, willingness to take child for next VAS dose and advising others about VAS. The p-values for usefulness of information, discuss with others, willingness to go again were below 0.100 at 90% confidence limit, excluding advising others about VAS. This indicated that these were significantly associated with VAS awareness amongst caregivers.

A caregiver who was more aware of VAS was more likely to have their child's VAS status up to date, most likely female and had positive attitudes and beliefs about supplementation than one who was unaware.

4.7 Health worker assessment on caregivers' awareness of vitamin A supplementation

Twenty-four health workers participated in the study. Two from each health facility visited were enrolled depending on their availability. All the health workers cited that vitamin A supplementation is done at health facilities especially local clinics, and is administered by health workers and community health workers to children aged 6-59 months.

Table 4.10: Health worker characteristics, N=24

Characteristic	Frequency (n)	Percentage (%)
Designation at facility		
RGN	12	50.0
Nutritionist	4	16.7
Primary counsellors	2	8.3
Length of stay at facility		
<1 year	6	25.0
1-5 years	9	37.5
>5 years	9	37.5
Duties involved in at facility		
Immunization	12	50.0
Growth monitoring	8	33.3
Health education and nutrition assessment	16	66.7
Covid-19 vaccination	2	8.3
OI ART management	10	41.7
Patient treatment and counselling	10	41.7
Participation in vitamin A sensitization campaigns		
Yes	16	66.7
No	8	33.3

*RGN-registered nurse
*OI ART-opportunistic infection/ antiretroviral therapy

Most of the health workers who participated in the study were registered nurses, primary counsellors and nutritionists with an average length of stay at the particular facility between 1 and over 5 years. Most of the duties they are involved in include immunization activities, growth monitoring, health education and nutrition assessment, OI ART management and patient treatment and counselling. Most of the health workers (66.7%) have participated in vitamin A sensitization campaigns like the measles/rubella campaign held in August/September 2022.

4.7.1 Sources of vitamin A rich foods

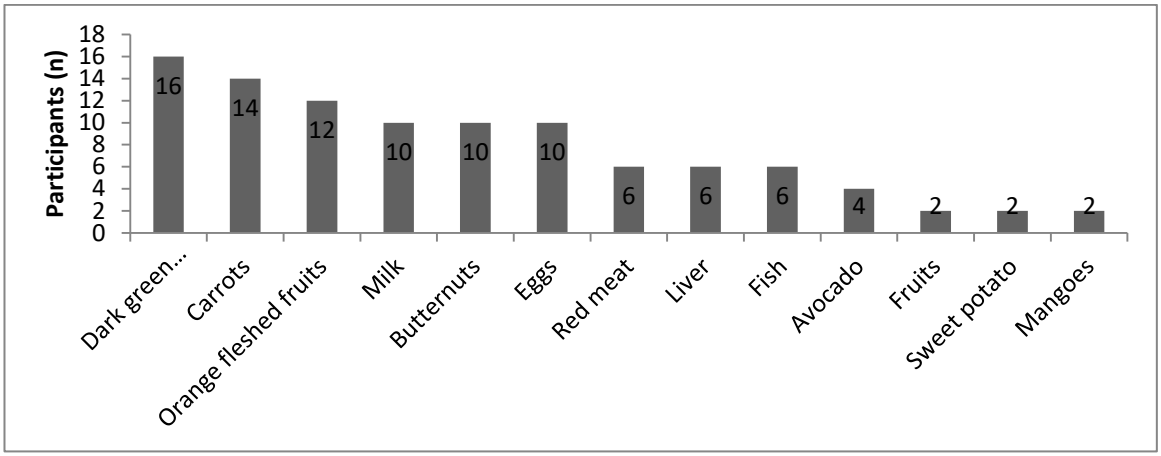

Figure 4.2 Health workers' sources of vitamin A rich foods

The majority of the participants cited dark green vegetables (16/24), carrots (14/24) and orange-fleshed fruits (12/24) as the major sources of vitamin A rich foods. A small number mentioned fruits in general, mangoes, sweet potato and avocado as sources.

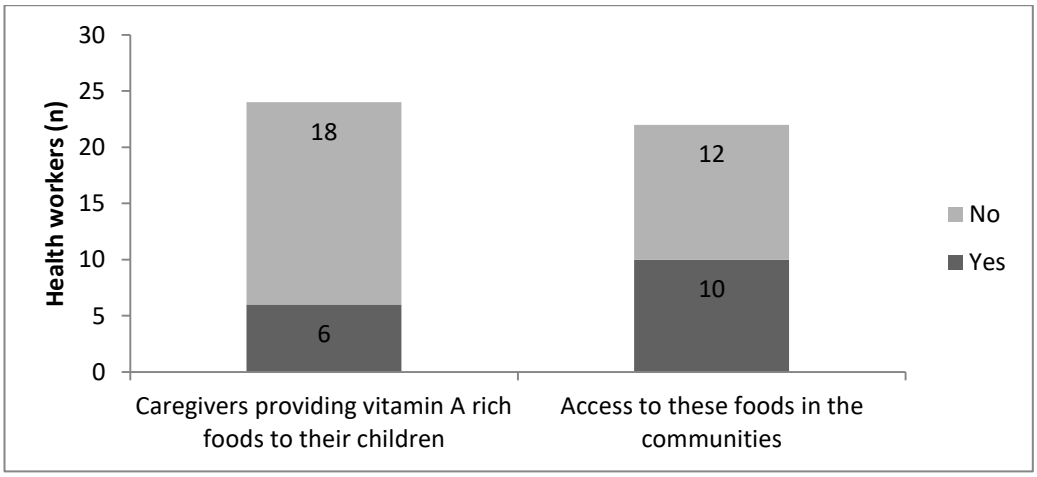

Figure 4.3 Accessibility of vitamin A rich foods by caregivers

Most of the health workers (18/24) cited that caregivers are not providing vitamin A rich foods to their children and they also noted that (12/24) caregivers have no access to these foods within the communities they live in.

4.7.2 Adequacy of information to caregivers on sources of vitamin A rich foods

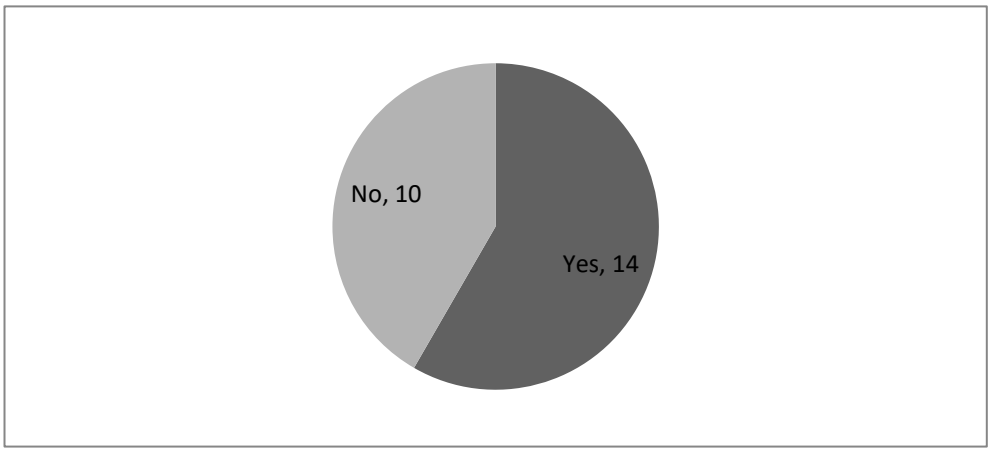

Figure 4.5 Adequacy of information to caregivers on sources of vitamin A rich foods

The majority of the health workers (14/24) suggest that caregivers have the adequate information on sources of vitamin A rich foods.

Reasons for in/adequacy of information

On the majority of the health workers (14/24) who cite that caregivers have enough information on sources of vitamin A rich foods, most contribute this information to their attendance to health education talks (71.4%).

The proportion that mentioned lack of adequate information to the caregivers (10/24) cited caregiver ignorance, not enough information not being shared by the health workers on vitamin A and minimal support from health workers as equally important in contributing to lack of adequate VAS information among caregivers.

Table 4.11: Reasons for in/adequacy of information, N=24

Adequacy of information on sources of vitamin A rich foods	**Reasons for lack or presence of information**	**Frequency (n)**	**Percentage (%)**
Yes (N=14)	Attendance of health education talks	10	71.4
	None	2	14.3
	Presence of posters with foods	2	14.3
No (N=10)	Health workers do not share much information on vitamin A	3	30.0
	Caregiver ignorance	4	40.0
	Minimal support from health workers	3	30.0

4.7.3 Hindrances of vitamin A supplementation

The major hindrances to VAS identified were lack of adequate information on VAS to the caregivers (20/24), distance to health facility (16/24) as well as the caregivers' lack of commitment to VAS (16/24). The least mentioned hindrance was lack of adequate vitamin A capsules (4/24).

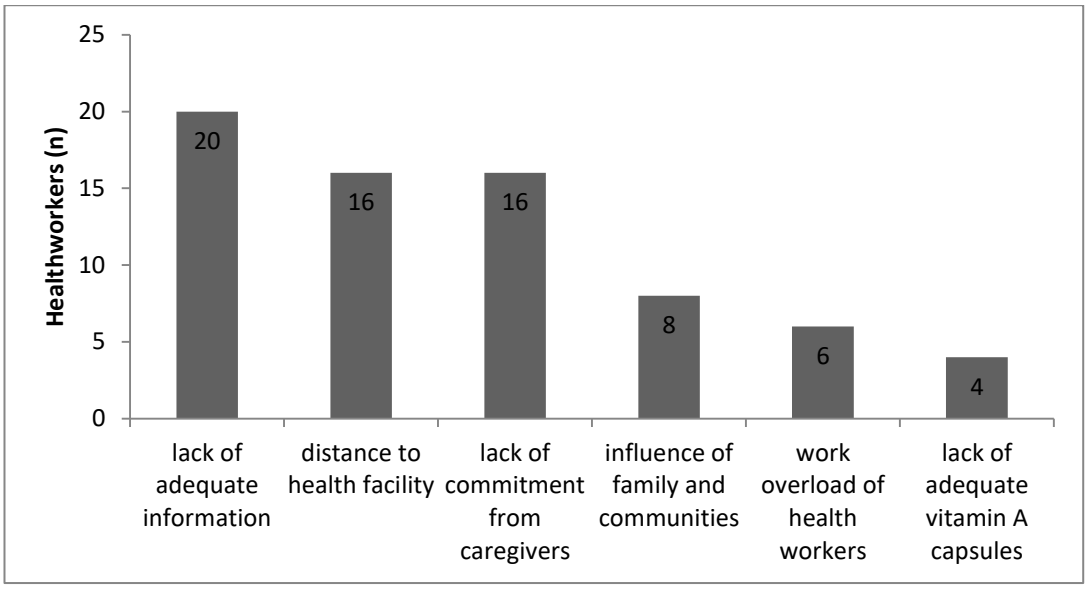

Figure 4.5 Hindrances of vitamin A supplementation

4.8 Chapter Summary

This chapter highlighted on the results observed by the study and they were presented according to the objectives of the study. The findings from this study showed that over 50% of the caregivers had heard about vitamin A supplementation and most of them knew the VAS schedule, target recipients as well correct identification of the capsule. The findings also showed a significant association between VAS awareness and attitudes and beliefs as well as the caregivers' sex, education and VAS status of the child. The health worker assessment showed that there is an overall information gap of vitamin A knowledge. The results were further discussed in the next chapter.

CHAPTER 5 DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the main findings, discussions as well as the conclusions drawn from the assessment of vitamin A supplementation awareness, attitudes and beliefs of caregivers with children aged 6 to 59 months in Harare City. It also presents the recommendations in light of the findings and areas for further research.

5.2 Discussion

Vitamin A supplementation awareness and attitudes and beliefs levels amongst caregivers, is essential in dietary interventions that can help the attainment priority nutrition outcomes. A scarcity of knowledge of vitamin A amongst caregivers especially those with children under 5 may result in a deficiency causing a decrease in immunity, iron movement impairment, delayed growth, xerophthalmia and night blindness which are diseases of public health concern.

5.2.1 Socio-Demographic Characteristics

Questionnaires were used to collect primary data from caregivers and the key informants (health care workers). The key informants included the nurses and nutritionists at the polyclinics. The study results show that the majority of the participants (97%) were women as compared to 3% men.

These results were expected in an African society where women are largely responsible for taking care of children as caregivers. These findings are in agreement with Matare *et al.,* (2022) and Abdulmalek & Benkhaial (2018) who found that infants and young children are completely dependent on others, primarily their mothers, for all their welfare.

Majority of caregivers (88.9%) are aged between 18 and 37 years corresponding to the reproductive ages of 15 – 49 years. The findings that the large proportion (89.5%) of the study participants are married are consistent with the findings from ZDHS 2015 (62%) were married. Most (71.9%) of the caregivers attained secondary level education which is consistent with the findings from the ZDHS 2015 report which showed that 63% of women and 77% of men have attended secondary school or higher. Janmohamed, Klemm & Doledec (2017) acknowledge that maternal education has been shown to be an important determinant of childhood immunization coverage. This is because little or no education has been observed to be an obstacle to accessing and understanding information about the importance of health services. The older caregivers (above 43 years) accounted for 3.9% and comprised mainly of grand-parents a common occurrence in African societies. The majority of respondents are Christians with the highest proportion in the Pentecostal sect. There was no gender bias in supplementation observed in this study.

This is encouraging as it supports findings of Demographic and Health Surveys in other African countries like Kenya (KDHS, 2015), Mozambique (MDHS, 2013) and Tanzania (TDHS, 2011) as well as a post-event coverage survey (PEC) by Janmohamed, Klemm & Doledec (2017) that indicate no significant gender differences in VAS status.

5.2.2 Vitamin A supplementation awareness of caregivers with children aged 6 to 59 months in Harare City

Findings from the study indicate that more than three quarters (92.9%) of the participants were aware of Vitamin A supplementation which is higher than the findings from the Zimbabwe National Micronutrient Survey 2015 report which showed 63% of women had never heard of Vitamin A. The fact that this study focused on the urban population and was facility based could have contributed to the higher level than the provincial level. The results from survey were earlier proposed by Kamau & Makokha (2010) on a similar study in Kenya noting that 94% of the mothers had reported having heard about vitamin A. Abdulmalek & Benkhaial (2018) in their findings slightly contrary to this study found that 61% of mothers were not aware of the vitamin A supplementation campaign and hence their children did not receive it.

The study showed a significant association between the level of education and awareness of caregiver on Vitamin A which was also inferred by Kamau *et al.*, (2012)

and Adamu & Muhammad (2018) who found out that awareness of VAS services consistently rose with the level of education amongst the caregivers of children under 5 in Kenya and Nigeria respectively. It is likely that education may make the parents more aware of the benefits and negatives of VAS and therefore the children are more likely to receive VAS.

Although awareness of VAS and employment status had no significant association, awareness was highest amongst the unemployed caregivers than those who are employed. It could be because they have more time to take their children for growth monitoring activities than employed mothers who are mostly free during weekends or at nights when clinics will be closed. These results do not tally with findings by Kamau & Makokha (2010) and Adamu & Muhammad (2018); that had consistently high levels of awareness among the employed than the unemployed.

The majority of the participants were aware of the recommended VAS schedule (79.3%) and of those 64.4% knew the correct VAS schedule. 23.8% knew it must be given twice a year but were not sure of the age criteria that it starts from 6 months and given until the age of 5. This is relatable with Kamau & Makakho's (2010) study where most of the mothers did not know that VAS should continue up to 5 years of life. This simply means after the 18month measles vaccine most mothers will fail to attend VAS every 6 months until 5 years since they are ignorant of the schedule.

On a positive note, 64.4% of the caregivers knew the correct schedule and 66% mentioned the recipient of VAS correctly which is slightly lower than that observed

by Kassa, Mesfin & Gebremedhin (2020) where 75% (95% CI: 72.1-77.9) of the mothers knew the reference period for VAS. Some caregivers (31.7%) mentioned that all children regardless of age receive VAS. This variation might be attributed to the recent measles outbreak treatment protocol in August-September 2022 where all children despite their age were administered vitamin A as part of the treatment protocol. The majority of the caregivers (79%) seemed to correctly differentiate vitamin A capsules, a result corresponding with Adamu & Muhammad (2016) study which had 459/900 participants correctly identifying a capsule, from other vaccines since 93.1% responded that it was administered orally although a few caregivers would confuse it with oral polio vaccine. It showed an attachment with vaccinations indicating minimal information on VAS. Njue, Makokha & Kamau (2010) coincidentally agree with these findings.

Night blindness is the main attribute of vitamin A deficiency in children less than 5 years and the main goal in VAS distribution. Despite this being the main reason for the intervention, more than half (60.2%) of all caregivers could not cite a symptom of vitamin A deficiency showing a general lack of information on vitamin A with only one caregiver correctly mentioning three symptoms of vitamin A deficiency. Caregivers cited symptoms like fatigue, restlessness and diarrhoea.

This finding coincides with Njue, Makokha & Kamau (2010) who had 17% caregivers who did not know any benefit of vitamin A, a percentage way less than our current

study and Adamu & Muhammad (2016) who had 87% of mothers who could not name any effect of VAD. This could be due to low levels of education and possibly the fact that VAS administration mainly focuses on distribution and less on health education for mothers due to work overload of the health workers, campaigns are mainly for administration as the health workers will be trying to cover long walking distances giving VAS. There is need to educate the public about VAS to avert the consequences of VAD. Though 65% of the health workers mentioned they provide VAS information during routine clinic visits, caregivers had way below average knowledge on symptoms of VAD indicating that maybe the level of information shared by the health workers on those visits should be assessed.

Awareness of vitamin A rich food sources seemed very scarce as 52% of the participants did not correctly mention any vitamin A food sources, 24/333 of the caregivers correctly mentioned all three foods. These findings are compounded by Njue, Makokha & Kamau (2010) and Abdulmalek & Benkhaial (2018) in whose studies less than half of the mothers only mentioned one correct food source while in Adamu & Muhammad's study 85% (722/900) failed to mention any food source. This shows a lack of information on nutritional value of certain foods which is translated to dietary practices based on ignorance in respect to vitamin A.

There are many food sources of vitamin A mostly found under animal (e.g. red meat, liver, milk) or plant sources (e.g. dark green leafy vegetables, carrots, butternuts,

pumpkins). It is also surprising to note that none of the caregivers mentioned breastmilk as a major source of vitamin A. Antenatal classes should be able to address nutritious dietary practices for mothers and their children. Growth monitoring sessions are a platform to cement good dietary practices among caregivers; when they understand and are aware of vitamin A and its benefits inclusive of sources; they are more equipped to make the decision to bring their children for VAS.

Findings from the health workers showed that the majority of them mentioned dark green vegetables (16/24), carrots (14/24) and orange-fleshed fruits (12/24) as major sources of vitamin A-rich foods. It is important to note that only 6/24 mentioned animal food sources. The health workers are the main distributors of information regarding vitamin A and VAS and it is important that they be equipped with the right knowledge, hence it is of no surprise that the majority of the caregivers could not correctly mention vitamin A food sources.

The results from the study show that 93.7% of participants received information on Vitamin A supplementation from health care workers which can be attributed to the health care workers role of educating the community on health matters during growth monitoring visits or during campaigns, as highlighted by 16/28 health workers who mentioned that caregivers have adequate information on VAS from attending clinic health education talks.

Janmohamed, Klemm & Doledec, (2017) elaborated that caregivers being informed prior to campaigns is a strong predictor of VAS in fixed-site set ups. A VAS survey in

Sierra Leone also supported the importance of effective awareness-raising in target communities as they achieved a 90% respondent awareness contributing to more than 90% coverage, (Janmohamed, Klemm & Doledec, 2017). The fact that health care workers were key sources of information about VAS campaigns in several countries as cited by Janmohamed (2017) was not surprising as this cadre of health personnel has been shown to be effective in improving maternal and child health in many countries through their role in informing and mobilizing communities for health promotion.

This same observation was highlighted in a study by Kassa (2020) where 97.5% had received information from health care workers in the preceding 6 months of the study. Abdulmalek & Benkhaial (2018) found that friends and relatives were the main sources of VAS information contrary to this study where they only contributed to 10/334 as a source. It is however also important to note the low involvement of media (radio, television and social media) on providing information on Vitamin A given that we now live in a digital era and social media is the fastest and cheapest platform for sharing information.

As only one caregiver mentioned media as a source of VAS information, it is recommended that posters not be considered as a priority strategy in efforts to sensitize local communities; these results coincide with Kassa (2020) where only one-fifth (20.4%) considered mass media as a source of information.

In this light, Abdulmalek & Benkhaial (2010) noted Facebook as a source of information for VAS camapigns in Libya; a strategy worth adopting.

Emerging from the findings is an observation that most caregivers (86.5%) did not have adequate information on Vitamin A supplementation. This is in agreement with the findings by Kamau *et al.* (2012) who argued that the leading causes resulting in low use of Vitamin A supplementation services was lack of or inadequate information and awareness amongst both the caregivers and the health care workers. One of the leading reasons for inadequate information amongst caregivers is the short period of health education sessions.

This underscores the need to strengthen focused counselling for caregivers attending growth monitoring clinics to improve on Vitamin A supplementation awareness and in turn VAS coverage. This study also showed that 12/28 health workers attributed caregivers' VAS ignorance to not enough information being shared by the health workers as well as their minimal support. It is needful to assess their level of knowledge on nutrition interventions as they are the major sharers of health education.

5.2.3 Vitamin A supplementation attitudes and beliefs of caregivers with children aged 6 to 59 months in Harare City

It is clear from this study that most of the caregivers were very positive and supportive of the entire VAS programme since there were 98.5% who thought VAS was useful

and 97% said they were willing to advise others about it. The majority of the caregivers did not know the consequences of vitamin A deficiency; it is no surprise that most (56.3%) were unwilling to discuss VAS with fellow mothers. Njue, Makokha & Kamau (2010) had 100% of their participants with no negative beliefs and attitudes towards VAS, a finding inconsistent with this study.

Most mothers (99.1%) were willing to take their children for VAS again as also highlighted by Abdulmalek & Benkhaial (2018) who had 88% of the parents willing to go for VAS again. Most of the mothers came for VAS (48%) out of their own initiative despite most of them being supportive of VAS. This shows that information has not been fully disseminated from the health workers to the mothers. These findings are parallel with Njue, Makokha & Kamau (2010).

However, it was observed that health workers are the main initiators (49.7%) in decision making for VAS almost always since the caregivers then decide to go for VAS after the health workers refer them for it. Proper education prior administration means even in the absence of health workers they would actually be able to take their children for VAS up to the recommended five years of age even after the 18 month vaccines. The findings also show that they are willing to take their children but they lack full capacitation to enable them to action.

Empowerment through provision of adequate knowledge and sensitizing them about need for VAS and creating awareness through health education; is key in improving their decision making throughout the recommended stages.

Once they can action VAS by themselves ultimately they will ‘push’/ advise other mothers to do the same.

The fact that the majority of the caregivers have never discussed VAS with other caregivers shows that it is not a commonly discussed topic among caregivers and the general population despite almost all (97%) participants saying they would advise other caregivers to take their children for VAS. These results tally with Njue, Makokha & Kamau (2010) and Abdulmalek & Benkhaial (2018) who had parents with a positive attitude towards VAS and would advise others to give their children. Evidence shows there is not enough adequate information (86.5%) on VAS hence why caregivers rarely share on the subject. There is thus a need to increase advocacy on VAS to make the public aware and invoke discussions among the public which will lead them to seek further information hence creating more awareness. Scaling up nutrition counselling methods at health facilities could have a positive impact in achieving positive public health intervention.

Most of the children had received VAS (84%) in the 12 months prior the study, however only 22.7% had received the recommended two doses given twice a year. The sum who had received one dose only had received it in September 2022 (3 months before data collection commenced) during the measles campaign. This shows that mothers attended the measles campaign boosters afraid of their children contracting measles with no awareness of the benefits of VAS alongside measles vaccines; showing that without measles campaigns, they would have no reason to go for VAS.

Adequate thought provoking sessions on vitamin A deficiency is needful to ensure that whether SIAs are carried out or not, caregivers will still seek for VAS on their own initiative.

Only 15.7% of the caregivers acknowledged they had no hindrance in accessing VAS services. Most of them mentioned that they were unaware of the schedule (35%) as also reiterated in Abdulmalek & Benkhaial's study as the main challenge; and that they forgot they had to take their child for VAS (27.2%). Both these reasons justify minimal awareness of VAS by the caregivers. If they were able to value VAS they would have no reason to forget about it easily and miss schedules just as they attend the regular vaccines. Caregivers know they have to bring their children for the 6, 9 and 18 month vaccinations without fail. The same willingness and awareness has to be invoked for the 24 month VAS administration right up to the 59 month mark. As long as the caregiver prioritizes VAS among their important things, then they will create time to take their children for it. This is only possible only if they realise how critical and important VAS is and this is brought about by increasing advocacy and sensitization among communities to attach a value to VAS.

Health workers assessed in this study mentioned major hindrances to VAS being lack of adequate information on VAS (20/24), distance to health facilities (16/24) and lack of commitment by the caregivers to VAS (16/24). These findings match the caregivers' lack of awareness of the VAS schedule; reinforcing the need for health workers to appropriately and frequently mention these dates during routine immunization to serve as a reminder to caregivers.

Their lack of commitment to VAS could be due to poor reception at health facilities and furthermore the low perception of the importance of the programme to their children. Commitment can be worked on with improved support from health workers as well as improved knowledge on benefits of VAS. Most of the caregivers did not mention distance as a barrier to accessing VAS services; however health workers found it to be another hindrance in VAS uptake. These notions vary greatly as most urban clinics are within 1 to 5km distance from most residential locations; however the peri-urban communities that have emerged in recent years do not have easily accessible clinics or mobile clinics that can support them in VAS services. These could be the caregivers being mentioned who mainly receive VAS services during mass campaigns of door-to-door delivery.

5.2.3 Association of vitamin A supplementation awareness and attitudes and beliefs of caregivers with children aged 6 to 59 months in Harare City

When an individual is aware of a nutrition intervention that can benefit them and/ or their family members, they will have a positive attitude towards it and ultimately seek for its service. These narratives are interlinked. This study's findings showed that most of the caregivers were aware of VAS and they had a positive attitude towards it and were willing to take their children for their next doses. Abdulmalek & Benkhaial (2018) found similar associations with mother's knowledge of vitamin A ($p<0.001$) and the child's coverage status. Sociodemographic characteristics also shape one's awareness and their attitudes and beliefs.

The study found that caregivers' education (p=0.000), sex (p=0.012) and VAS status (p=0.003) were associated with awareness to VAS; this tallies with findings from Abdulmalek & Benkhaial's study where education level was significantly associated with awareness of vitamin A with p<0.001; in the same study though gender of the caregiver was not significant. The more educated one is, the more aware they are of their basic needs and health rights. It also makes parents more concerned of their children's health thereby having a positive attitude towards VAS.

5.3 Conclusions

This section highlights the main conclusions drawn from the research findings per each objective of the study.

The caregivers were positive and supportive of VAS, their major source of information being the health worker but overall knowledge level regarding vitamin A supplementation and its benefits or lack thereof was relatively low among the caregivers and evidently also minimal among health workers.

5.3.1 Awareness of vitamin A supplementation

From the study findings for this objective it is concluded that caregivers' gender and education status influence vitamin A supplementation awareness. Female caregivers are most likely to be aware of VAS than the male counterparts. This is expected as mothers are the main nurturers and caregivers of children especially during the 6 to 59 month age group.

The more one is educated beyond primary level, the more they are likely to understand the importance of nutrition information including VAS. They can easily place a value on it, as they are more aware of its benefits and the need for their child to have it.

From the research outcomes on the sources of information on vitamin A supplementation, health workers contributed the most at 93.7%. However, the available information was not adequate. It can be concluded that due to lack of adequate information on VAS led to the majority of the caregivers having no knowledge of the colours of vitamin A-rich foods, 60.2% had no knowledge of the symptoms of vitamin A deficiency and 52% could not mention any three vitamin A-rich foods. Another conclusion is that caregivers were quite knowledgeable on the recipient of VAS who children below 5 years old and 79.3% were aware of the schedule and 64.4% correctly mentioned the times of the schedule as well as the route of administration of VAS and caregivers knew that the supplement is only obtained at health facilities (69.4%).

This is basic knowledge in terms of child growth monitoring activities especially when they attend during the first 18 months of a child's life. They understand the need to have vaccinations up to that point. However, after the 18 month mark, caregivers fail to attend for VAS up to 5 years; with adequate information with regards to the benefits and effects of deficiency, they will become more aware and easily attend VAS up to 59 month mark.

It also becomes difficult for them to take their children for VAS after 18 months as most children will start attending formal schooling and are only free during the weekends. This further precipitates need for VAS during the school term at the schools though cost of such interventions does become a stumbling block.

5.3.2 Attitudes and beliefs of vitamin A supplementation

From the findings of this study, the attitudes and beliefs of the caregivers were positive regarding VAS with 98.5% finding VAS useful, 97% would advise others about it and 99.1% were willing to take their child for the VAS dose. It can be concluded that 56.3% of the caregivers were unwilling to discuss about VAS with other caregivers since 86.5% mentioned that they did not have adequate information on VAS. The supplementation coverage for the study for one dose was 76.2% and for the twice per year was at 22.7%. These findings were below the WHO recommended target of 80%.

This outcome is also a surprise as 3 months prior the study, there was a measles campaign where VAS was also being carried out. One can conclude that some caregivers attended the campaign for the vaccines but did not have their health cards for documentation hence why there was no record of them having had VAS prior the study or the caregivers did not attend the SIA at all. It can be concluded that health workers and caregivers (mothers) should work together as part of the decision making process for VAS. Health workers should be given adequate information on VAS as they are the main initiator of VAS in the community.

Making the caregivers more aware of the programme enhances the uptake of the service; this is especially possible since they already have a positive attitude towards the programme. This stems from the conclusion of the study that being unaware of the VAS schedule was one of the main challenges cited as well as forgetfulness of the caregivers. It is easy to forget something you never once heard or heard little of. Health workers need full capacitation as they also cited the main hindrance to VAS was lack of adequate information (24/28) on vitamin A, VAD and VAS that they can impart to the caregivers and community. It can be concluded that there is a significant association between VAS awareness and VAS attitudes and beliefs from the regression model where most factors fit at $p<0.100$ 90% confidence limit.

5.4 Implications of the study

The objective of this study was to determine the vitamin A supplementation awareness, attitudes and beliefs among caregivers of children under 5 years of age attending Harare City polyclinics. The first implication noted in the study is that VAS awareness is low among the caregivers and the health workers too and that is a problem clearly contributing to the stagnant and poor VAS coverage of Harare City over the years. This information highlights the need for specific interventions that can be designed tailored to the needs of both groups, the caregivers mostly and the health workers who are responsible for imparting knowledge. Curricular designed to target both groups should be redesigned ensuring that it is context-specific and technologically feasible and acceptable. A second implication is the association between awareness and attitudes and beliefs which was shown to be significant.

A behavioural change approach can therefore be applied when formulating ways to upscale VAS awareness. When the attitudes and ideas and values of caregivers are addressed effectively it becomes easier for them to accept any positive nutrition intervention without cohesion or spending unnecessary expenditure in reaching out to them. They will regard it as equally important as other vaccines and thus adhere and comply to ensure their children receive the supplementation on time.

5.5 Recommendations for the study

Task	Recommendation	Responsible authority	Time frame
Education	Health education is key in improving VAS for both health workers and the public at large.	Head of Nutrition department at Harare City Health – facilitates nutritionists and nurses training	Continuous programme
	Sensitization and advocacy among all would go a long way in improving VAS.	Nursing Manager Harare City Health – assists in ensuring relevant personnel are trained	
	Collaboration with other public health programmes that are known to be supported by women like family planning activities as a way to sensitize caregivers and make them more aware	Collaborations with other public health organisations like PSI during some of their key campaigns	
Training	Pre-service and regular in-service training and updating of all health workers to create awareness of the entire VAS programme should be done more effectively.	Ministry of Health in collaboration with training hospitals to check on the present curriculum and include in-depth study on VAS	Continuous with regular monitoring

		Universities that train nutritionists to further cement VAS awareness. They should work with nurses and the MoH to create a holistic programme Harare City Health Nutrition department to conduct regular training of nurses and nutritionists on VAS and documentation of health books to properly show the next schedule for VAS CHWs to be trained as well so they can also inform the communities	
Mobilization	Awareness can be raised through available means of media (e.g. radio and not just on News) and social network sites like WhatsApp and Facebook. Virtual live discussions can be propagated on social media, radio and TV to raise more awareness especially for mass campaigns. Explain to the public what vitamin A and VAS is.	Harare City Health departments; nutrition department, IT, health promotion MoH to partner with radio stations and communication networks to enable City Health to broadcast their messages	Continuous
Engage private clinics/ hospitals	Coverage data should also include data from the private sector. Also include them in the mass campaigns. Allow for policy change and have them administer VAS at	MoH, Harare City Health nutrition and nursing department	Continuous

	no cost to the public to attract more caregivers to their points		
Strengthen the food-based approach for VAS through home gardens and food fortification	If food manufacturing industries are also held accountable to not producing basic goods fortified with vitamin A they can support the cause. They can also assist in public awareness of vitamin A uptake, giving people a better understanding of it.	Food Manufacturing industries, MoH, Nutrition departments	Continuous

5.6 Recommendations for further research

The following areas may require further research;

1. Establish the factors leading to inadequate information on vitamin A among the caregivers.
2. Establish the determinants of low consumption of vitamin A-rich foods on the nutritional status of children aged 6-59 months

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ZimStat (2022) Population and Housing Census Mortality and Orphanhood Preliminary Results

APPENDICES

Appendix 1: Timeline

Activity	Apr-Nov 2022	Dec	Jan 2023	Feb	March	April	May
Proposal write-up, defence, submission to AUREC, approval letter from AUREC							
Data collection commenced							
Data analysis							
Submission of first draft							
Corrections and submissions							
Dissemination of results							
Corrections and final submission to AU							

Appendix 2: Caregiver Questionnaire

Thank you for your time and valuable contribution

Tick the most appropriate answers applicable to you by the use of options corresponding to your choice where necessary or by writing on the spaces provided.

SECTION A: SOCIO-DEMOGRAPHIC INFORMATION

1. Please state the sex of your child? Male [ ] Female [ ]

2. Please state his/ her age (in months)

3. What is the birth order of your child among all your children?

4. Please indicate your sex (caregiver) Male [ ] Female [ ]

5. Please select one option to describe your relationship with the child you are taking care of

[ ] Mother [ ] Father [ ] Sibling [ ] Grandparent [ ] Other [ ]

6. Please indicate your faith (caregiver)

i. Pentecostal [ ]
ii. Traditional [ ]
iii. Apostolic [ ]
iv. No religion [ ]

7. Please indicate your age in years (caregiver)

i. Below 18 years [ ]
ii. 18 - 22 years [ ]
iii. 23 - 26 years [ ]
iv. 27 - 32 years [ ]
v. 33 - 37 years [ ]
vi. 38 - 42 years [ ]
vii. Above 43 years [ ]

8. Please indicate the child mother/father marital status

i. Married [ ]
ii. Single [ ]
iii. Separated [ ]
iv. Widowed [ ]
v. Divorced [ ]

9. Please indicate your highest level of education attained by the mother/father of the child you are taking care of. (One option only)

i. No education [ ]
ii. Primary School (Completed) [ ]
iii. Primary School (Not completed) [ ]
iv. Secondary School (Completed) [ ]
v. Secondary School (Not completed) [ ]
vi. Tertiary [ ]

10. Please indicate your occupation (One option only)

i. Not employed (No work at all) [ ]
ii. Casual labour at times [ ]
iii. Formal employment (with monthly pay) [ ]
iv. Self-employment [ ]

11. What is the total number of your house hold members? _____
_

SECTION B: VITAMIN A KNOWLEDGE AMONG CAREGIVERS AGED 6 to 59 MONTHS

12. Please mention three foods that are rich in Vitamin A (1 point for a correct answer out of 3)

i. _____
ii. _____
iii. _____

13. Identify the colours of foods that are rich in Vitamin A (up to 3 colours, 1 point for green, yellow or orange)

i. _____
ii. _____

iii. _____

14. Identify symptoms that may be related to vitamin A deficiency (1 point for a correct symptom out of 3)

SECTION C: VITAMIN A SUPPLEMENTATION AWARENESS AMONG CAREGIVERS

15. Have you ever heard about Vitamin A supplementation? Yes [ ] No [ ]

16. Was what you heard about vitamin A supplement good or bad? Good [ ] Bad [ ]

17. Where did you get information on Vitamin A supplementation? (More than one option applicable)

i.	Health worker	[ ]
ii.	Media	[ ]
iii.	Mother	[ ]
iv.	Husband or wife	[ ]
v.	In-laws	[ ]
vi.	Pastor/ church leader	[ ]
vii.	Friends	[ ]
viii.	Pre-natal and Post-natal visits	[ ]
ix.	Internet	[ ]
x.	Relatives	[ ]

18. Who gets vitamin A supplementation?

i.	Mothers	[ ]
ii.	Children under 5 years	[ ]
iii.	All children	[ ]
iv.	Mothers and children	[ ]

19. What is the route of administration of vitamin A supplement?

i.	Oral	[ ]
ii.	Injection	[ ]
iii.	Both	[ ]

20. a) Are you aware of the recommended schedule? Yes [ ] No [ ]

b) If Yes to a) state the schedule

i. To be given once a year [ ]
ii. To be given once every 6 months from birth (twice per year) [ ]
iii. To be given once every 6 months from birth (twice per year) until 5 years [ ]
iv. To be given only with measles vaccine [ ]

21. Please identify Vitamin A capsule among the following drugs? Yes [ ] No [ ]

SECTION C: SUPPLEMENTATION COVERAGE OF Vitamin A AMONG CHILDREN AGED 6 to 59 MONTHS

22. (a) Has your baby been given Vitamin A supplement in the last one (1) year [ ] Yes [ ] No

(b) If yes, how many times? (Probe number of times in the last 12 months (confirm from the card)

23. At what age was the baby given Vitamin A (One Option)

i. Less than a month [ ]
ii. 1 – 3 months [ ]
iii. 4 - 6 months [ ]
iv. 6 - 12 months [ ]
v. 1 – 3 years [ ]
vi. 4 - 5 years [ ]

24. Who decided that you give your baby Vitamin A?

i. Myself (Mother) [ ]
ii. Myself (Father) [ ]
iii. My husband [ ]
iv. My wife [ ]
v. My mother [ ]
vi. Mother in law [ ]
vii. Health worker [ ]
viii. Friends [ ]
ix. Others [ ]

25. Where did you get Vitamin A supplement from?

i. From the health facility [ ]
ii. From the community health workers who do door to door visits [ ]
iii. From health workers during campaigns [ ]
iv. Other (specify) [ ]

26. Do you think you have adequate information on Vitamin A supplement?

i. More than enough [ ]
ii. Just enough [ ]
iii. Enough [ ]
iv. Not Enough [ ]
v. Not sure [ ]

27. How far is the distance from your home to the nearest health facility where you can get Vitamin A supplements?

i. Less than a km [ ]
ii. 1-5 km [ ]
iii. More than 5 km [ ]

SECTION D: ATTITUDES AND BELIEFS TOWARDS VITAMIN A SUPPLEMENTATION AMONG CAREGIVERS OF CHILDREN AGED 6 to 59 MONTHS

28. Using the table below please indicate by ticking in the appropriate box

	Attitudes and Beliefs	**Agree**	**Disagree**
	Do you think Vitamin A supplement is useful to children?		
	Would you advise other caregivers to take their children for vitamin A supplementation?		
	Have you discussed about vitamin A supplementation with other people/ caregivers?		
	Are you willing to take your child for the next dose of vitamin A supplement?		

29. Do you think vitamin A supplement is as necessary as the other vaccines like measles or rotavirus? Yes [ ] No [ ]

30. Who do you think should initiate vitamin A supplementation?

i. Yourself [ ]
ii. Nurses [ ]
iii. Nutritionists [ ]
iv. Community health workers [ ]
v. Midwives [ ]

31. What challenges are you facing/faced or you may when accessing Vitamin A supplementation?

i. No support from health workers to access vitamin A
ii. No support from family members to access vitamin A
iii. No transport to go to the health facility when due for supplement
iv. Not aware of the supplement schedule
v. Forgetfulness
vi. No challenges

Appendix 3: Key informant questionnaire

1. What is your designation?

2. How long have you worked at Harare City?

3. What is your role at this health facility?

4. Have you ever participated in any Vitamin A sensitization campaigns? Yes_ No_

4a) If yes, when was it conducted?

4b) who were the stakeholders of the campaign?

4c) what was your role in the campaign?

5. What are sources of Vitamin A-rich foods?

6. Do you think caregivers have adequate information on the types of foods rich in vitamin A? Yes_ No_

6a) if no, why do you think so?

7. Do you think caregivers have adequate information on vitamin A supplementation? Yes_ No_

7a) if no, why do you think so?

8. Do you think the caregivers provide variety of Vitamin A-rich foods to children aged 6 to 59 months? Yes_ No_

8a) if no, why do you think so?

9. Knowledge on vitamin A supplementation in Harare City

9a) When is it done?

9b) Where is it done?

9c) who are the target children?

9d) who gives out the supplementation?

10. What are the hindrances of Vitamin A supplementation? Tick any appropriate

a) lack of adequate information
b) distance to the health facility
c) influence of socio-economic factors
d) too much workload to perform supplementation
e) there are no hindrances
f) lack of vitamin a capsules

11. Suggest ways of improving Vitamin A uptake in Harare City

Appendix 4: Informed Consent Form

Hello, my name is Nyasha Rachel Gideon, a final year student at Africa University pursuing Master's degree in Public Health. I am carrying out a study on 'Vitamin A supplementation awareness among caregivers of children aged 6 to 59 months at Harare City health facilities in Harare 2022'. I am kindly asking you to participate in this study by filling in the questionnaire. The purpose of the study is to determine the level of awareness of vitamin A supplementation among children 6 to 59 months as the vitamin A supplementation coverage in Harare City is below average. A total of 358 caregivers have been selected and you have been chosen as you meet the requirements of the study which are caregiver for an under 5 child and holder of child health card/ book. This survey will inform Harare City Health department as well as the Ministry of Health and the different stakeholders who may be willing to partner in improving the nutrition status.

The survey will take between 20 to 30 minutes to complete. All information you provide will be treated with total confidentiality and the person's identity will remain concealed. Participation in this survey is voluntary and no Vitamin A supplement or reward whatsoever will be provided, and if we should come to any question you don't want to answer, just let me know and I will go on to the next question; or you can stop the interview at any time with no penalty. If you do not choose to participate in this study, your decision will not affect your future relationship with Harare City health. However, we hope that you will participate in this survey since your views are

important. Before you sign this form, please ask any questions on any aspect of this study that is unclear to you. You may take as much time as necessary to think it over.

Authorisation

If you have decided to participate in this study please sign this form in the space provide below as an indication that you have read and understood the information provided above and have agreed to participate.

---------- ----------

Name of Research Participant (please print) Date

Signature of Research Participant or legally authorised representative

If you have any questions concerning this study or consent form beyond those answered by the researcher including questions about the research, your rights as a research participant, or if you feel that you have been treated unfairly and would like to talk to someone other than the researcher, please feel free to contact the Africa University Research Ethics Committee on telephone (020) 60075 or 60026 extension 1156 email aurec@africau.edu

Name of Researcher: Nyasha Rachel Gideon

Appendix 5: Shona Consent Form (Caregivers)

Zita rangu ndinonzi Nyasha Gideon ndiri kuita Master of Public Health ne Africa University, parizvino ndiri pa attachment ku Harare City Health Services Department. Ndiri kuita tsvakurudzo kana ongororo pamusoro peruzivo rwekudonhedzerwa kwe vitamin A kuvana vari pakati pemwedzi mitanhatu kusvika pamakumi mashanu nemapfumbamwe kune vanochengeta vana ava muguta re Harare, 2022.

Tsanangudzo yetsvakurudzo:

Tsvakurudzo ino ndeyekutsvaga ruzivo rune vabereki kana avo vanochengeta vana vari pakati pemakore ye mwedzi mitanhatu kusvika pamakumi mashanu nemapfumbamwe maererano nekudonhedzerwa kwevana vemazera aya vitamin A. Mutsvakurudzo dzapfuura zvakaonekwa kuti chiero che vitamin A muguta reHarare chakaderera pane zvinotenderwa nebumbiro remitemo inobva ku Ministry of Health and Child Care. Tsvakurudzo ino inotendera nhengo dzine vana vane makore ari pasi pamashanu uyezve vaine kadhi kana bhuku rekukiriniki. Tsvakurudzo ino tinotenda ichabatsira vekanzuru yeHarare nemamwe mapato anoona nezvehutano kuti vabatsirane kusimudzira hutano hwevana vari pasi pemakore mashanu.

Kodzero yenyu:

Musati mazvipira kuve nhengo mutsvakurudzo ino munofanirwa kunzwisisa chinangwa chetsvakurudzo ino, rubatsiro rwaichakupai, njodzi nekusagadzikana,

zvipundutso zvingangowanikwa uye zvamunotarisirwa kuzoita. Iyi ndiyo inonzi mvumo yetsvakurudzo.

Hwendaenda nenguva ichatorwa:

Kana muchinge mazvipira kupinda mutsvakurudzo iyi muchabvunzwa mibvunzo mishoma inenge ichitsvaga ruzivo rwenyu pamusoro pekudonhedzerwa kwevana ne vitamin A. Mibvunzo iyi ichatora nguva isingadariki maminitsi makumi maviri. Hakuna njodzi kana kusagadzikana kunotarisirwa kuva kuchizokonzereswa netsvakurudzo ino.

Kuva nhengo yetsvakurudzo nokuzvidira:

Hapana munhu achamanikidzwa kuzova nhengo yetsvakurudzo ino uye vanenge varamba kuva nhengo dzetsvakurudzo ino havasikuzoramba kubatsirwa pakiriniki pano. Hapana chimwe chinotarisirwa kubva kunhengo kunze kwekudaira mibvunzo chete. Uyezve nhengo dzichapuhwa ruzivo pamusoro pe vitamin A, kuvabatsira kuti vave neruzivo rwakatesva pamusoro pekukosha kwe vitamin A kuvana. Nhengo dzichabatsira nekutsvakurudzo ino dzinobvumidzwa kuchinja pfungwa chero ipi zvayo nguva yadzinenge dzada pasina anodzirambidza.

Kuvanzika:

Mazita kana ruzivo rwevanhu vachave nhengo dzetsvakurudzo ino hazvisikuzoratidzwa ani naani zvake pasina mvumo kubva kunhengo idzi uye mazita

enyu haasikuzobvunzwa pamibvunzo yamuchabvunzwa mutsvakurudzo ino. Pachashambadzwa zvichabuda muongororo iyi hapashandiswe zita renyu kana rumwe ruzivo rungaita kuti vanhu vazive kuti manga muri muongororo.

Kupindurwa kwemibvunzo:

Musati masaina gwaro rino munobvumidzwa kubvunza mibvunzo yose yamungade kuziva pamusoro petsvakurudzo ino. Munotenderwa kutora chero nguva yamunoda yekufungisisa kuti munoda here kupinda mutsvakurudzo iyi.

Mvumo:

Kana makasarudza kupinda muongororo iyi, tinokukumbirai kuti musaine gwaro iri panzvimbo iri pasi, zvichiratidza izvo kuti maverenga makanzwisisa zvese zvamaudzwa ende mabvuma kupinda mutsvakurudzo iyi.

_____ _____

Zita renhengo (Nyorai) Musi

_____

Siginecha yenhengo kana mumiriririri wenhengo

Kana muine mibvunzo maererano neongororo iyi kana gwaro rechibvumirano iri kusanganisa chinangwa cheongororo iyi, kodzero dzenyu, kupfura zvamunemnge mapindurwa, uye kana makafunga kuti hamuna kubatwa mushe muchida kutaura nemumwewo munhu, makasununguka kubata veAfrica University Research Ethics

Committee parunhare rinoti (020) 60075 or 60026 extension 1156 kana paemail inoti aurec@africau.edu

_____ _____

Siginecha yemutsvakurudzi Musi

Appendix 6: Approval from Harare City Health

City of Harare

DEPARTMENTAL MEMORANDUM

Your ref: …… **Vote: …3702……..** **Date: 02 June 2022**

And Date: …….. **Ref: 3/7**

TO: ALL UNITS **FROM: DIRECTOR OF HEALTH SERVICES**

RE: AUTHORISATION FOR NYASHA GEDION TO COLLECT DATA IN HARARE CITY HEALTH FACILITIES

I refer to the above.

Nyasha Gedion is an MPH Officer attached to Harare City Health Department. She is operating at a senior management level and her duties require her to visit some health facilities for data collection.

May you kindly assist her is every way possible for the success of her research work

Yours Faithfully

CITY OF HARARE
CITY HEALTH DEPARTMENT
RECEPTION

DIRECTOR OF HEALTH SERVICES
acm//

Appendix 7: AUREC Approval letter

AFRICA UNIVERSITY
A United Methodist-Related Institution
Investing in Africa's future

AFRICA UNIVERSITY RESEARCH ETHICS COMMITTEE (AUREC)

P.O. Box 1320 Mutare, Zimbabwe, Off Nyanga Road, Old Mutare-Tel (+263-20) 60075/60026/61611 Fax: (+263 20) 61785 website: www.africau.edu

Ref: AU2382/22 9 November, 2022

Nyasha Rachel Gideon
C/O CHANS
Africa University
Box 1320
MUTARE

RE: VITAMIN A SUPPLEMENTATION AWARENESS, ATTITUDES AND BELIEFS AMONG CAREGIVERS OF CHILDREN AGED 6-59 MONTHS OLD IN HARARE CITY, HARARE 2022

Thank you for the above titled proposal that you submitted to the Africa University Research Ethics Committee for review. Please be advised that AUREC has reviewed and approved your application to conduct the above research.

The approval is based on the following.

a) Research proposal

- **APPROVAL NUMBER** AUREC 2382/22
  This number should be used on all correspondences, consent forms, and appropriate documents.
- **AUREC MEETING DATE** NA
- **APPROVAL DATE** November 9, 2022
- **EXPIRATION DATE** November 9, 2023
- **TYPE OF MEETING** Expedited
  After the expiration date this research may only continue upon renewal. For purposes of renewal, a progress report on a standard AUREC form should be submitted a month before expiration date.
- **SERIOUS ADVERSE EVENTS** All serious problems having to do with subject safety must be reported to AUREC within 3 working days on standard AUREC form.
- **MODIFICATIONS** Prior AUREC approval is required before implementing any changes in the proposal (including changes in the consent documents)
- **TERMINATION OF STUDY** Upon termination of the study a report has to be submitted to AUREC.

AFRICA UNIVERSITY
RESEARCH ETHICS COMMITTEE (AUREC)
APPROVED
P.O. BOX 1320, MUTARE, ZIMBABWE

Yours Faithfully

MARY CHINZOU
ASSISTANT RESEARCH OFFICER: FOR CHAIRPERSON
AFRICA UNIVERSITY RESEARCH ETHICS COMMITTEE