ajfand SCHOLARLY, PEER REVIEWED AFRICAN JOURNAL OF FOOD, AGRICULTURE, NUTRITION AND DEVELOPMENT
Volume 23 No. 9 September 2023
PUBLISHED BY AFRICAN SCHOLARLY SCIENCE COMMUNICATIONS TRUST
ISSN 1684 5374

Afr. J. Food Agric. Nutr. Dev. 2023; 23(9): 24584-24625 https://doi.org/10.18697/ajfand.124.21540

ASSESSMENT OF THE VITAMIN A SUPPLEMENTATION PROTOCOL IN PRIMARY HEALTH CARE SETTINGS: A CASE STUDY OF MOOKGOPHONG SUB-DISTRICT IN SOUTH AFRICA

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Volume 23 No. 9
September 2023
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ABSTRACT

The Integrated Nutrition Programme in South Africa provides Vitamin A supplementation to targeted children. It began in 1994 when marginal vitamin A deficiency was 33 %. Since that time, malnutrition remains a serious problem in South Africa as one of the greatest contributors to childhood illness and death. It is estimated that about 27% of South African children are stunted from a lack of adequate nutrition in the early years of their lives. A poor intake of vitamin A is one of the cofactors in sight and contribute to blindness amongst children. In addition, it is required for cellular integrity. Furthermore, children with poor intake of vitamin A are underweight, fail to grow properly and are more likely to get infections and to die from them. The main purpose of this study was to assess the implementation process of the vitamin A supplementation protocol in primary health care institutions in the Mookgophong sub-district of Limpopo Province. The study design was descriptive and qualitative. All seven facilities, the clinics and the district hospital in the sub-district were purposefully selected. Data were collected from the seven health care facilities and 16 health care workers provided information on the implementation process of the Vitamin A programme, using a self-administered structured questionnaire. An observation questionnaire was also used by the researcher to validate some of the information and to check compliance with the protocol. The findings revealed poor availability of blue (100 000 IU), white (500 000 IU) and yellow (200 000 IU) capsules in stock (56.3%). Approximately half of the health care workers reported to know the preventative schedule, while most of them did not know the treatment schedule. There was generally good adherence to the implementation of preventative protocol. The health care workers complied with the Vitamin A protocol despite the lack of stock or resources in this low resource setting.

Key words: Vitamin A supplementation protocol, health care workers, South Africa

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INTRODUCTION

Vitamin A (VitA) deficiency is a major public health problem affecting approximately 190 million preschool children, mostly from Africa and South Asia [1]. Improving the VitA status of these children through supplementation is one of the recommended strategies to support rapid growth and assist in combatting infections. Tam *et al.* [2] reported efficacy of vitamin A in their study. They compared placebo/no intervention and vitamin A supplementation and found VitA supplementation to reduce the risk of all-cause mortality by 10% when cumulative incidence data was combined, although the upper confidence interval just crossed the line of no effect [2]. Inadequate intake of VitA at school going age might lead to VitA deficiency (VAD) and consequently visual impairment or might be associated with a prevalence of infectious diseases such as measles, diarrhoea, and respiratory tract infections [3]. Currently, more than 88 countries globally, have already incorporated VitA supplementation into their Extended Program on Immunisation (EPI) through semi-annual national preventative and health promotion campaigns [4]. In addition, many have adopted policies calling for the therapeutic administration of VitA as part of the treatment of several childhood illnesses, especially in countries introducing Integrated Management of Childhood Illness (IMCI) for children from five to six years of age.

According to the United Nations Children fund (UNICEF), South Africa was one of the countries that still required significant assistance and motivation regarding the implementation since VAD was still a public health problem and/or high under-five mortality existed in the 1999 ranking [5]. In 2002, South Africa (SA) introduced a national routine vitamin A supplementation programme, which provides 6-monthly high dose (200 000 IU) vitamin A (retinyl palmitate) capsules to children aged 12 - 59 months and 100 000 IU to children aged 6 - 11 months at all public health facilities [6]. Furthermore, the 2005 national food consumption survey conducted shortly after the implementation of the VitA programme showed that significant progress had been made regarding folate and iodine status, while other micronutrient deficiencies among women and children still persisted and nutritional status was deteriorating [6, 7]. Statistics from the Department of Health (DoH) South Africa revealed that VAD among children was 63.6% and it is consistent among the age groups one to three years, four to six years and seven to nine years [7, 8]. The South African National Health and Nutrition Examination Survey in 2012 (SANHANES-1) study found that VAD in children was still high (43.6%) [9]. No recent data is available at National level as the South African Demographic Health Survey of 2016 did not measure micronutrient status.

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Witten [10] did an assessment of the VitA supplementation programme in the Eastern Cape province and concluded that the VitA protocol was not implemented properly because, more than a third of the children received wrong doses for their age. It was recommended that on-site training, support, and supervision of the VitA supplementation protocol should be implemented. The problem of many children after their nine months immunization is not receiving prophylactic VitA twice yearly. This was also seen in the district health information system (DHIS) data in South Africa [7]. Since 17 years have passed since Witten's study was published, there is a need to investigate whether the VitA supplementation guidelines for infants and children 6 to 59 months of age [1] are being implemented according to the World Health Organization (WHO) protocol. Thus, the main goal of this study was to assess the implementation process of the VitA supplementation protocol in health care facilities in the Waterberg district, Limpopo Province.

MATERIALS AND METHODS

Study design and area

The study design was descriptive and qualitative, conducted in the Waterberg district of the Limpopo Province. One sub-district was purposefully selected because it had all levels of health care facilities that implemented the VitA protocol. The levels of care in the sub-district included five primary health care clinics including mobile units, a health care centre, and the hospital, and all were selected.

All the primary health care clinics and health centres were serviced by the Voortrekker hospital in Mokopane, which is about 45 km from Mookgophong town, the seat of the municipality. Health care workers were the informants that provided information on the implementation process of the VitA programme.

Sampling

All the clinics (five), including mobile clinics, health care centre, and the one hospital (Voortrekker) in the sub-district were included in this study. A purposive sampling was used to select the participants. Categories of the participants were professional nurses, enrolled nurses, medical practitioners, and pharmacists. These health care workers are responsible for the implementation of the protocol. The health care workers were sixteen in total: thirteen nurses, one medical practitioner, and two pharmacists.

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Data collection

The VitA protocol

The WHO VitA supplementation protocol specifies that there are two specific VitA schedules in the programme, the preventative and the therapeutic schedules [1]. The preventative schedule is supposed to be given routinely when children are taken for immunisation at primary health care (PHC) level. The therapeutic schedule is given with treatment of diseases such as measles and malnutrition. VitA supplementation to the mother is given within six weeks postpartum, at a dose of 200 000 IU, irrespective of mode of feeding. Children who are not breastfed should be given 50 000 IU at six weeks of age. The breastfed children will only be given 100 000 IU at six months and will continue receiving dosages according to the prescribed schedule. The researcher, therefore, made the following assumptions: That the health-care facilities are implementing the protocol as prescribed, and that the mother of the child has been advised on the importance of the VitA supplementation.

The instruments

Implementation of the VitA protocol at the health care facilities was measured using observation and self-reported questionnaire. The researcher was at the facility observing when they were completing the questionnaire. The questionnaire had both closed-ended and open-ended questions. Demographic data on participants was also included in the questionnaire. Most demographic factors are required to explain observations and describe the sample characteristics [9]. English was used as the language for collecting data since the sample comprised of professional individuals who understood it.

An observation-based questionnaire was used by the researcher to record facilities, storage, and the availability of VitA capsules. This questionnaire was designed to check compliance with the protocol. Reliability was assessed by checking the availability of capsules, by inspecting the stock, and physically counting which dosage capsules were in stock. The protocol posters and the Road to Health Charts for recording the doses given to children at the clinic during growth monitoring visits were also checked.

Data collection procedures

Each of the clinics was visited twice, the first time was for introduction and requesting permission for data collection and the second time was for data collection. The participants completed the questionnaires. The researcher conducted observations of how the protocol was implemented using the observation checklist.

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Ethical considerations

The University of Venda's ethics committee approved the study proposal. Approval was also obtained from the DoH and Social Development to conduct research at the health care facilities. The district manager, manager of primary health care, and the manager for Mother Child Women and Nutrition in the Waterberg district also gave permission. Their co-operation was needed before going to the clinics for data collection. Written consent was obtained from all participants after detailed explanation of the study aim and confidentiality was maintained by using coding.

Data analysis

The VitA supplementation schedule was used as a standard to determine adherence by comparing the practices of the health care facilities to the prescribed protocol. The data from self-reported questionnaire was entered in Microsoft Excel and exported to SPSS version 18.0 for analysis. Descriptive statistics in the form of percentages and frequencies were used to report results. Thematic analysis was used to analyse the observation checklist responses which were compared with expected protocol procedures for adherence. The information from observing different health care facilities was arranged into themes and categorisation was applied.

RESULTS AND DISCUSSION

The results and responses are presented in Table 1 and 2 and discussed in the narrative below under different sub-headings.

Participants and facility competencies

Seven health care facilities (five clinics, one health center and one hospital) and sixteen health care professionals participated in the study. Thirteen participants were professional nurses, followed by two pharmacists, and one medical practitioner. Most of the participants were nursing professionals since the preventative VitA supplementation programme is done mainly at primary health care level, implemented by the nurses in the clinics. Work experience of participants ranged between 3 to 26 years with the average work experience being three years. Detailed analysis revealed that nine (56.25%) had worked in the same institution for less than five years, three (18.75%) had worked for five to nine years, while four (25.0%) worked for 10 years or more. Thirteen (81.25 %) of the participants were females, while three (18.75%) were males. The participants had a variety of qualifications but most of them (31.25%) had a diploma in general nursing and midwifery.

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The study revealed that participants were trained at the different South African universities and nursing schools. Similar studies conducted by du Plessis *et al.* [11] and Hendricks *et al.* [12] evaluated the implementation of the VitA supplementation programme using the health care workers at the primary care clinics, rather than the hospitals.

Availability of the dosage capsules at the health care facilities

The 200 000 IU capsules were regularly available, but the 50 000 IU and the 100 000 IU capsules were unavailable at most of the clinics. Signaling that availability of the capsules was poor at most of the facilities. In all the facilities, the 200 000 IU were available. In the maternity ward of the hospital, they mainly issued supplements to the women postnatal, explaining the reason why they were readily available. When participants were asked if all types of capsules were available, seven (43.75%) reported that they were not available while nine (56.25 %) said that they were available. In contrast, the researcher observed that all capsules were only available at two (31.25%) facilities. See Table 1.

The 50 000 IU capsules were reported to be mostly unavailable, and only one facility reported non-availability of all dosages. The reason for the non-availability of capsules included the demand for the regular use of 200 000 IU, for lactating women and the infants who receive formula who get their VitA (50 000 IU) supplementation at six weeks at the clinics. In addition, Amalgamated (the main supplier of the vaccines at the time) in South Africa did not supply capsules, and facilities did not have a supplier that was approved. When participants were asked what they did to substitute for the unavailable capsules, six (37.25 %) said they divided the 200 000 IU dose to suit the required dose and one reported that they never had to substitute. They open and give half the dose. The problem with dividing the capsule is that it is uncertain if one drop is equivalent to 50 000 IU, which can lead to giving the children too little or too much. Regarding the shortage of capsules, five (31.25%) participants said they never ran out of capsules, while eleven (68.75%) said that at one time or other capsules are unavailable. The nurses oversee ordering the vaccine from the pharmacist and the supplier. In Limpopo Province during data collection period, 50 000 IU and 100 00 IU capsules were not on the order list used by the clinics, implying that the problem was systemic.

The clinic outlet audits in the Eastern Cape in South Africa revealed that 87% had insufficient stock of 100 000 IU [10]. An observation sprouting from this study was that those who did not always have stock, reported that they devised strategies

such as requesting from other health care facilities, or divided a dose of 200 000 IU to give 2x 100 000 IU, or dividing the 200 000 IU into drops, where one drop equals 50 000 IU, or giving 2 x 100 000 IU for 200 000 IU. This practice has also been described in a report by Department of Health on distribution of VitA during national immunisation days [8].

The participants reported that the government distributor was supplying them with 200 000 IU and 100 000 IU, not the 50 000 IU capsules. Other information provided was that the hospital was not supplying doses other than the 200 000 IU, which is used in the maternity ward for the postpartum women. The nursing staff in the pediatric ward should have stock of other dosage capsules too because ill children are treated by them, and they should be able to give the correct VitA dosage of 200 000 IU for every unique case [8].

All three dosage capsules were only available at one health care facility, as observed by the researcher on site on the day of the visit. It should be noted that the researcher visited the facilities once only and observed what was available on that day. However, five health care workers reported to have all the dosages available. Which means when needed there is no dosage. The South African government has been implementing the VitA protocol since 2006. The poor availability of capsules at the health care facilities observed in this study was not because of the budgets but may be due to the lack of proper ordering systems and a lack of knowledge.

Health professionals' knowledge of the VitA supplementation protocol

Regarding health care workers' knowledge of the VitA protocol, most (93.75%) of the participants knew about the protocol. Ten (62.50%) of the 16 participants were never trained on the VitA protocol. Of the six participants trained, four said that they were trained by other nurses while two mentioned nutrition departments. The six who were trained had at least one year of service since the training. The self-reporting results revealed that fifteen (93.75%) of the 16 participants said that their health care facilities adhered to the protocol.

All sixteen participants had knowledge of the VitA protocol. However, the six who were trained reported general knowledge and not knowledge acquired through training. At least eight of the participants knew the preventative schedule, but thirteen of them did not know about the treatment schedule. The importance of administering VitA capsules was assessed, and all the participants mentioned at least one reason for administering VitA capsules. All sixteen mentioned its role in the prevention of blindness. However, eight participants reported prevention of

xerophthalmia, severe under nutrition, prevention of infant morbidity and mortality, while five mentioned: to improve sight, reduce the risk of measles, assisted the development and maintenance of epithelial tissue. Thirteen of the 16 participants mentioned that the mothers at their facility were taught about the importance of VitA, but three were not sure and this could be those who are not in contact with mothers. Furthermore, they were asked if they taught mothers about VitA. Eleven of the 16 participants said they taught mothers about the dangers of VitA deficiency, while five said they did not teach mothers anything. The eleven participants who said they taught mothers were asked if they had a programme for lessons. Majority (9 of 11) said they did not have any programme for teaching the mothers who came to their facility, they just gave information impromptu, while the other two had structured programmes.

The participants described the preventative schedule, but only three of them could do so in full.

The others could only describe parts of the schedule. The participants described the curative schedule in short, but none could fully describe it; they only described parts of the schedule.

Fifteen of the participants knew about the VitA protocol but only five were adequately trained. The high percentage (68, 75%, 11 out of 16) of untrained personnel on VitA protocol is problematic because competent health care workers are crucial for the protocol implementation. Almost all reported the implementation of the VitA protocol in their health care facilities; one can therefore assume that even without proper training, they still issued the supplement. This contrasts with a study conducted in the Western Cape Province where training was done well because all health care facility managers were trained on VitA supplementation [11].

During observations, the researcher noticed that at most of the health care facilities, the preventative schedule was displayed on notice boards. According to the protocol, health care staff at all levels of the health care system, as well as others involved in the control of VitA deficiency and its consequences, should be adequately trained on the treatment and prevention schedules. These findings contradict the results of a study conducted by du Plessis *et al.* [11] who concluded that the protocol was reasonably implemented successfully in Western Cape, mainly because the staff was trained, and the mothers were aware of it. In this study mothers were not interviewed.

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None of the participants in this study could describe the curative schedule in full. The staff in the hospital, especially those in the pediatric ward, should be able to describe the curative schedule in full because they come in regular contact with children with conditions that require VitA as part of their treatment. Semba *et al.* [13] reported that supplementation decreases the mortality rate in HIV infected children, even though it did not have any significant effect on modified point prevalence of fever, ear discharge, bloody stools, and hospitalization. Benn *et al.* [14] reported similar findings in Guinea-Bissau. This means that if the medical practitioners and nurses are also capacitated, they will be able to prescribe the VitA correctly to those who visit the hospital with different conditions such as HIV, measles, pneumonia, and other conditions, thereby reducing morbidity and mortality rate.

All the participants could state at least one importance of administering VitA, but the information was general knowledge. Eight participants said that VitA is given to prevent xerophthalmia, for severe under nutrition, and to prevent infant morbidity and mortality. Darlow *et al.* [15] conducted a meta-analysis on VitA supplementation to prevent mortality and concluded that supplementing very low birth weight infants with VitA was associated with a reduction in death or oxygen requirement at one month of age. In Nepal, Fiedler [16] found that the strategy of empowering Female Community Health Volunteers improved coverage of VitA. Gupta and Indrayan [17] found evidence of a direct result of VitA supplementation in reducing morbidity and mortality in India.

Eleven participants reported that they were teaching the mothers about the dangers of VitA deficiency, but they did not have any formal programme of teaching mothers at the clinic; they just gave education individually during consultation. The caregivers should be taught about the benefits of VitA supplementation to the children. This will improve their knowledge and they will be motivated to take their children for other immunisations. Frigg *et al.* [18] found that the VitA supplementation programme in Ghana, needed to be sustained by continuous communication, monitoring, and community mobilisations. Du Plessis *et al.* [11] found that mothers who were aware of the programme made a difference in the successful implementation.

Constraints encountered and recommendations reported by health care professionals

Concerning constraints encountered by participants in the implementation of the VitA protocol, they reported the non-availability of some of the capsule doses, lack of training of staff, health education sometimes not given to mothers about the

importance of VitA, and some parents not bringing children to the clinic for their VitA supplements.

The participants reported unavailability of the capsules as a constraint, and this was also observed during data collection by the researchers. Hendricks *et al.* [12] also reported it as a challenge in the Western Cape province. The budgets are available for purchasing the capsules, and the health care facilities should prioritise orders from the government distributors. Lack of training on the VitA protocol was also reported as a constraint. Ten of the participants were never trained, hence they listed training as a constraint for them. Thus, training should be prioritised so that the implementation will be uniform and correct. Training should include all stakeholders, including those at hospitals. Lack of training impacts negatively on the implementation process [11, 12]. In South Africa, the IMCI training package, compulsory for all Primary Health Care nurses, includes content on VitA [8].

Parents not bringing their children to the clinics for the preventative schedule was also reported as a constraint. Children should be brought to the health care facilities to receive VitA during national immunisation days. In Nepal, Fiedler [16] found that the strategy of empowering Female Community Health Volunteers has improved coverage of VitA. In Bangladesh, they improved coverage by having a national VitA week and the national immunisation days whereby the 12 to 59-month-old children were targeted for supplementation [17, 18]. The same strategy was launched in South Africa in 2008 and has improved the coverage for children 12 to 59 months in the country [19]. Furthermore, in 2016, Community Health Workers were recognised by the post-apartheid government as partners in the health system, and many are incorporated as government employees, paid directly by the State and managed by government health facility managers and/or nurses [20].

In this study, another challenge was that capsules were given, but not always recorded on the Road to Health charts. According to the protocol, the dosages given to children should be recorded in the Road to Health charts so that the next person can see when the child last received VitA and at what dosages. Failure to record the administered dosages in the Road to Health charts impacts negatively on the implementation and can put a child in danger, as VitA should not be administered more than once a month. The constraints encountered by the health care workers are genuine and could negatively impact on the implementation of the protocol.

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The VitA protocol describes how it should be implemented by health care workers. In this study, there was poor compliance due to capsules not always being available, hence impacting implementation. A pilot project in Mozambique concluded that coverage was not consistent and depended on modality of distribution [21]. They further indicated that implementation was variable and possibly influenced by resources. Participants in this study made three recommendations on improving the implementation of the protocol: making all doses available at all clinics all the time, training of health care workers on the VitA protocol and education for caregivers/mothers about the importance of VitA.

Lack of resources affects compliance. In this study shortage of professional nurses at some clinics, especially the enrolled nurses who are implementing the protocol, was also observed. Similarly, du Plessis *et al.* [11] reported shortage of staff in the Western Cape. This shows that for implementation to be good, there are many factors involved such as human and physical resources, training, community involvement, and monitoring. Every programme must have clear monitoring and evaluation tools which should be used continuously and the results communicated to all those who are implementing the protocol. In this study, it was not clear how the Primary Health Care and the hospitals were monitored for adherence to implementation of the VitA protocol.

Community involvement is also important for the implementation of the VitA programme. In the first 18 months, Expanded Programme on Immunisation helps with distributing the VitA, but after that it is a challenge if mothers are not informed to bring children every six months until five years of age. Pangaribuan *et al.* [22] evaluated the effectiveness of a widespread VitA supplementation programme and described indicators of compliance with the programme. They concluded that to increase compliance and coverage of the programme, communication is important. Fieldler [16] recommended the empowerment of female community workers and other representatives from education, agriculture, as well as political representatives, emphasising nutrition-sensitive sectors and collaboration.

Compliance to the protocol is crucial for proper implementation. Health care workers should have interest and advocate for resources. Even though many studies are in conflict on the VitA impact on mortality and morbidity, it is important to implement the protocol correctly. Imdad *et al.* [23] reported that preventive vitamin A supplementation reduces all-cause and diarrhea specific mortality in children 6-59 months of age in community settings in developing countries. Vitamin A supplementation is associated with large reductions in mortality, morbidity, and vision problems in a range of settings [23, 24]. Even though coverage was not

evaluated in this study, according to the district health system, in 2004 the coverage in Limpopo Province was only 33% [25], no new data on coverage were available. However, according to UNICEF, despite the potential benefits of this key child survival intervention, only 42% of targeted children were reached in 2021 in South Africa, with Eastern and Southern Africa achieving the lowest coverage at 59% [26]. The same poor implementation could be happening in other districts due to lack of training, unavailability of the capsules, and lack of community awareness.

The study limitations include the fact that only one municipality health district was studied. The researcher did not establish whether the participants in this study were aware of the National Vitamin A supplementation Policy: Guidelines for South Africa (2012) [27] or WHO report [1]. The mothers were also not interviewed to get their perspective.

CONCLUSION, AND RECOMMENDATIONS FOR DEVELOPMENT

The current findings revealed that VitA supplementation was not implemented as per protocol in the Mookgophong sub-district. The availability of the capsules was poor, varied by facility, and the expected proficiency level among staff was unsatisfactory. The health care workers recommended that training should be enforced, capsules be made available all the time, and education be provided for caregivers. The population should also be informed about the importance of VitA so that they will be compelled to ensure that their children do not fall victim to VitA deficiencies.

ACKNOWLEDGEMENTS

The authors would like to thank the healthcare workers who participated in this study. This work was supported by the National Research Foundation of South Africa and the University of Venda.

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Table 1: Responses to questions about the implementation of vitamin A protocol

Item	Percentage	Frequency (n = 16)
Type of capsules available in the facility		
Yellow 200,000 IU	43.75	7
Blue 50,000IU	6.25	1
White 10,000IU	12.5	2
Yellow & Blue	6.25	1
Yellow &White	-	-
Blue & White	-	-
All capsules, yellow, blue, white	31.25	5
Availability of all types of capsules in the facility		
Yes	56.25	9
No	43.75	7
Capsules not available in the facility		
50,000IU and 100,000IU	43.25	7
200,000IU and 50,000IU	6.25	1
50,000IU	6.25	1
N/A	37.5	6
None	6.25	1
Reasons for non-availability		
The capsules available in the ward are only for post-natal women	6.25	1
There's only a demand for 200,000IU	12.5	2
Amalgamated (Supplier) not supplying the capsules.	12.50	2
Not applicable	43.75	7
No answer	25.00	4
Substitutes of unavailable capsule		
They requested from other institutions	18.75	3
They divide the dose of the 200,000IU to give 100,000IU and give 2 x 100,000IU for the 200,000IU	25.00	4
Divide the 200,000IU into drops and give 1 drop for 50,000IU	12.50	2
Not applicable	18.75	3
No answer	12.50	2
None	6.25	1
Never	6.25	1
Frequency of unavailability of capsules		
Sometimes	12.50	2
Many times,	6.25	1

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Long time for blue and white	6.25	1
Always	6.25	1
Not applicable	12.50	2
No answer	18.75	3
None	6.25	1
Never	31.25	5
Responsible person for the availability of the capsules		
Amalgamated (supplier)	31.25	5
Pharmacy	31.25	5
Nurse	18.75	3
Amalgamated and nurse	6.25	1
No answer	12.50	2
Additional information about availability of Vitamin A capsules		
We are only supplied with 200,000IU and 100,000IU	12.50	2
We are never out of stock of the 200,000IU, but the other doses are rarely available	6.25	1
When we are out of stock of others, we substitute by using the 200,000IU	12.50	2
The 50,000IUis available at the clinics but not in the hospital.	18.75	3
No answer	18.75	3
None	31.25	5
Knowledge of vitamin A protocol		
Yes	93.75	15
No	6.25	1
Training on the protocol		
Yes	31.25	5
No	62.50	10
Not sure	6.25	1
Trainer/Facilitator		
Nutrition department	6.25	1
Nurse	18.75	3
Not applicable	68.75	11
No answer	6.25	1
Adherence to the protocol		
Yes	93.75	15
Not sure	6.25	1
Brief description of the protocol		

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Given to all children not breastfed at 6 weeks, breastfed at 6months interval until 5years and to mothers postpartum who breastfeed until /before 8 weeks and for prophylaxis in Gastroenteritis and during deficiency	6.25	1
Given to children at 0-5 months who were breastfed, 0-5 months non breastfed infants single dose at 6weeks, at 6-11 months 100,000IU dose, 12-60 months 200,000IU dose, curative is for the children with severely malnutrition, Gastroenteritis, measles and xerophthalmia	12.50	2
Postnatal women given 200,000IU, 6 weeks infants not breastfed -50,000IU, 6-11 months infants breastfed -100,00IU, 12-60months- ,.	50.00	8
50,000IU given to children before 6 months, 6-11 months infants breastfed -10,000IU, 12-60months- 200,000IU on 6 months interval.	18.75	3
50,000IU given to children with measles, malnutrition, therapeutic protocol depends on the age and clinical signs and	6.25	1
Varies from birth to 11 months, used in cases of measles, malnutrition, Gastroenteritis, TB/HIV/AIDS and eye signs of clinical VAD.	6.25	1
The importance of administering the vitamin A capsules		
To prevent xerophthalmia, for severe under nutrition, to prevent infant morbidity and mortality	50.00	8
To improve sight, to reduce the risk of measles, the development and maintenance of epithelial tissue	31.25	5
To prevent eye problems	6.25	1
For good vision , Boost immune system	6.25	1
Prevent blindness, Importance for bone formation	6.25	1
The dangers of not administering vitamin A capsules		
Risk of contracting serious illness and higher risk of becoming blind	56.25	9
Infant mortality and severe malnutrition, blindness and difficulty in growing	6.25	1
Blindness and general body weakness	6.25	1
Blindness	18.75	3
Mild to moderate vitamin A deficiency is a critical factor in child health survival	6.25	1
Blindness and osteoporosis	6.25	1
Teaching mothers about the importance of vitamin A		
Yes	81.25	13

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Not sure	18.75	3
Teaching mothers about the dangers of vitamin A		
Yes	68.75	11
No	6.25	1
Not sure	25.00	4
Availability of a program for the lessons given to mothers		
Yes	18.75	3
No	56.25	9
Not sure	18.75	3
No answer	6.25	1

Table 2: Description of the protocol by participants and interpretation by researcher

Verbatim description of the preventative schedule by participants	Interpretation by researcher
Non breastfed infants 1-5months given 50,000IU at 6 weeks(n=1)	The participants described only the dosage for non-breastfed infants, and this cannot indicate that they know the preventative schedule.
All infants 6-11months given 50,000IU at 6-11 months (n=1)	The participants described the dosage for children in the 1st year only.
All children 12-60 months single dose 200,000IU every 6 months until 60 months (n=1)	The participants only described the doses given to children 12-60 months nothing is mentioned of the other ages.
All postpartum women given a single dose at delivery up to 6weeks (n=2)	The participants only described the part about the postpartum women nothing about the children and the dosage is also not mentioned.
Non breastfed infants 1-5months given 50,000IU at 6 weeks, all infants 6-11months given 50,000IU at 6-11 months, (n=1)	Nothing on postpartum women was described only the children under a year old were described.
Non breastfed infants 1-5months given 50,000IU at 6 weeks, All children 12-60 months single dose 200,000IU every 6 months until 60 months (n=1)	Nothing on postpartum women was described only the children were described and how often the children are given what dosages.
Non breastfed infants 1-5months given 50,000IU at 6 weeks, all postpartum women given a single dose at delivery up to 6weeks (n=1)	Nothing on children from 12-60 months was described.
Non breastfed infants 1-5months given 50,000IU at 6 weeks, all infants 6-11months	The participants described the schedule in full.

given 50,000IU at 6-11 months, all postpartum women given a single dose at delivery up to 6weeks, All children 12-60 months single dose 200,000IU every 6 months until 60 months (n=3)	
All infants 6-11months given 50,000IU at 6-11 months, All children 12-60 months single dose 200,000 every 6 months until 60 months (n=2)	Nothing on postpartum women and non-breastfed infants was mentioned.
All infants 6-11months given 50,000IU at 6-11 months, all postpartum women given a single dose at delivery up to 6weeks (n=1)	Nothing on how much dosage to be given and when for children 12-60 months.
Non breastfed infants 1-5months given 50,000IU at 6 weeks, All children 12-60 months single dose 200,000 every 6 months until 60 months, (n=1)	Nothing on postpartum women was described only the children under 5months and non-breastfed and over 12 months were described.
No answer (n=1)	
Description of the curative schedule by participant	Interpretation by researcher
Give 50.000IU at 0-5months immediately on diagnosis	The participants only described the dosages given to children below 5 months.
Give 100,000IU at 6-11 months immediately on diagnosis	The participants only described the dosage for children 6-11 months nothing on children 0-5 months and 12-60 months old.
Give 200,000IU 12-60 months to children	The participants only described the dosage for children 12-60 months and they did not mention when they are given.
No answer (n = 13)	They did not report anything.
Constraints experienced by participants	Interpretation by researcher
Availability of some of the capsule doses	The institutions did not have other dosage capsules
Lack of training of staff	Not all the staff interviewed were trained in Vitamin A protocol.
Health education not given to mothers with regard to the importance	The staff was not giving health education to mothers on why they are giving vitamin A and its importance so that mothers can bring their children continuously to be given vitamin A.
Parents not bringing children to the clinic to get it	Because parents are not told of the importance of bringing their children to receive VitA, they do not bring the children especially after they finish their immunization schedule.

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Doses given not written in the children's cards making it difficult to know if the child was given or not	The staff are not writing it in the children's cards because they were mostly not trained therefore, they do not know the importance of recording it.
No response	Most informants said that they did not have any constraints.
Recommendations made by participants	Interpretation by researcher
Make all doses available in all clinics all the time	All dosages must be there all the time.
Train health care workers	Training is required for proper implementation to take place
Educate caregivers and mothers about vitamin A	Caregivers are the people to bring the children to the institutions so they should be educated about the protocol and the benefits thereof.

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