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Research paper

Dietary utilization of vitamin A evaluation by pre-school students in Southern Ethiopia- a cross-Sectional analysis

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A R T I C I E I N F O

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A B S T R A C T

Shortage of vitamin A is a public health issue in Ethiopia. Investigations demonstrated that especially pre-school students are so influenced by this issue. There are numerous reasons, which cause vitamin A shortage while the insufficient dietary information is the main reason in developed countries. This study's aim is assessing dietary vitamin A utilization by pre-school students aged group 2 to 5 years in Sodo Zuria community, South Ethiopia. A cross-sectional study has been performed utilizing 2 step group sample method has been utilized for selecting the usual samplings of 576 pre-school children from 3 rural kebeles of the investigation site. An adjusted 7-day HKI food frequency questionnaire and 24 hours FANTA food variety score have been utilized for estimating the dietary in taking of Vitamin A. This study's outcome determines that 99.5 percent of pre-school children had used Vitamin A rich foods from animal sources ≤ four times and 98 percent of pre-school children have been using animal and plant resources of Vitamin A rich foods ≤ six times every week. The average frequency of animal utilization resources of Vitamin A has been 1.42 times and the average utilization of whole animal plus plant resources of Vitamin A has been 3.01 times for the last one week. The results demonstrated that the utilization frequency of Vitamin A rich foods have been lower than the threshold amount of HKI and PAHO/WHO recommendations. By considering the FAO standards dietary utilization of Vitamin A by a lot of pre-school children has been insufficient and they have been in danger of VAD issue. Therefore mother or caregivers of the kids must enable their pre-school children for eating Vitamin-A rich foods per day minimum a food items which are animal foods, yellow, orange fruits, and green vegetables.

Introduction

Shortage of vitamin A is a general health issue in Ethiopia. National Nutrition Program, (2008) notes that in the country, VAD influences 61 percent of kids six to fifty-nine months that is extensively high and it is the number one reason for preventable blindness. Similarly, the country-level side view reveals which 298,000 kid deaths in Ethiopia over 6 years (2000- 2005) could be assigned to VAD (Ethiopian Profiles Team & AED/ Linkages, 2005). The major reason for VAD in develop countries is the insufficient dietary intake of Vitamin A. The vitamin A rich foods utilization is influenced by numerous elements such as insufficient generation of vitamin A rich foods, Vitamin A rich foods unavailability in the market, populated family, highly mother equality levels, and land size, which are supposed to give to insufficient utilization of Vitamin A rich foods in develop countries (Demissie et al., 2009). Investigations

connecting to zone detailed about the vitamin A rich food utilization and reasons for VAD for pre-school kids in Ethiopia are rare; therefore, true details concerning elements contributing to VAD are shortage in Ethiopia containing the investigation site. This investigation's aim is assessing dietary utilization of vitamin A with pre-school kids 2 to 5 years in Sodo Zuria Woreda, South Ethiopia.

Methodology

The A community-based cross-sectional investigation has been embarked assessing the utilization of vitamin A rich foods with pre-school kid in Sodo Zuria district, Wolyita Zone, SNNPR, which is 380 km south of the capital Addis Ababa and 160 km from the regional capital Hawassa. The investigation time has been from February- March 2011. The resource people of this investigation have been pre-school kids of 2 to 5 years, which have been existing in Sodo Zuria community. The investigation participants have been accidentally chosen pre-school kids of 2 to 5 years, which have been living in chosen 3 kebele. The information resources have been mothers or caregivers of 2 to 5 years old kid which understand the kid's food habits. The population size has been chosen by the formulation $N = Z^2_{1-\frac{\alpha}{2}}\, pq/d^2$ (by utilizing standard normal amount at 95 percent confidence level (1.96), population proportion of utilization of vitamin rich food of fifty percent, error Margin of five percent, and designing influence account to be 1.5), the whole model size has been as 576 pre-school kid. Two-phase group sampling has been utilized. The first phase concerns the choice of 3 kebele. Out of 31 rural kebeles of the region, 3 kebeles have been chosen by chance proportionate to the population size (PPS) sample method. with utilizing accidental number table causing a number of 1 to sample range to choose the first kebele after getting sampling range. The sample range is estimated by separating the accumulative number of pre-school kids in the Woreda to kebeles numbers assumed for examinations, next, add the sample range to the number, which was acquired in randomization for identifying the other three kebeles. The second phase has been chosen of homes in chosen kebeles;- The householders in the chosen kebeles by 2 to 5 years kids have been recognized with immunization card from the nearby health post or center also home to home recording for those who aren't recorded on immunization card. The population size has been equally set for the chosen 3 kebeles. The sample structure has been designed by recording all suitable kids aged 2 to 5 years old in every 3 kebeles. The plain accidental sample has been utilized for selecting the needed number of kids in chosen kebeles. Whole pre-school kids and constant habitats in the Sodo Zuria area have been contained, whereas those who haven't been a constant habitant and aren't pleasing to take part have been deprived. By obtaining approval from Hawassa University, ethical study committee and verbal approval from every relevant, information such as home socio-demographic and economic factors and food preparation of 2 to 5 years have been assembled by utilizing a structured questionnaire. While dietary utilization of vitamin A rich foods by 2 to 5 years-old kid has been evaluated by utilizing a limited Helene Keller International qualitative food frequency questionnaire and Food diversity and Nutrition Technical Assistance Project (FANTA) (HKI, 1992; FANTA, 2006).

Pretested and an adjusted questionnaire have been utilized for collecting the data by considering this study's aim. SPSS windows version sixteen has been utilized for analyzing the data. Descriptive summaries utilizing frequencies, proportions, and figures have been utilized for presenting this investigation outcome.

Outcomes

576 families have been incorporated via a response rate of about 100 percent. Out of the whole investigation matter, pre-school kids 282 have been man and 294 have been woman in sex with the average age of 43.4 ± 1.09 months. The mean household population of the investigation participant family has been 5.96 people. Majority 549 of the investigation take part families have been headed by fathers and the main work of the head of the families has been farmer (Table. 1).

Frequency of vitamin A rich foods utilization with pre-school kids in the last one week

In accordance with this study, half subjects of investigation cases were utilized DGLV such kale, cabbage less or equivalent to one times in the last one-week previous of the study. None of them have been using both carrot and pumpkin each day in past one week. Probably this result notes that little above half (54.3 %) of pre-school kids have been using avocado less or equivalent to 1 time every week and just two percent of pre-school kids have been using avocado each day for the last one week. The standard frequency of utilization per of avocado and mango in the last one week before the study has been lower than 2 times. Slightly above one-fifth (21.9 %) of pre-school kid have been using papaya at least 1 time every week (table. 2).

In this investigation site, the investigation issues' utilization frequency of chilies and sweet potato leaves has been very low, for example, eighty-five percent and nighty-nine percent of pre-school kids were never utilized both foods in the last one week.

Table. 1. Socio-demographic and economic features of the investigation taken apart families in Sodo Zuria Woreda from February-March, 2011.

Factors	No.	%
Ethnicity		
Wolyt	563	97.7
Amhira	7	1.2
Gurage	6	1.1
Religion		
Protestant	350	60.8
Orthodox	180	31.3
Catholic	23	4
Muslim	21	3.6
Other	2	0.3
Head of the household		
Father	549	95.3
Mother	25	4.4
Other	2	0.3
Occupation of the head of the household		
Farmer	533	92.5
Petty trader	28	4.9
Civil servant	11	1.9
None	2	0.3
Other	2	0.3
Respondent		
Mother	496	86.2
other	80	13.8
Educational level of the respondent		
None	270	46.9
Read/write	104	64.9
Elementary (grade 1-6)	167	29
Junior high school (grade 7-8)	24	4.2
High school (grade 9-12)	11	1.9
Marital status of the respondent		
Married	477	82.8
Single	86	14.9
Divorced	7	1.2
Widowed	6	1
Mean± SD		
Mean family size	5.96 ± 1.88	
Average age of children in month	43.4 ± 1.09 months	

Table. 2. Utilization Frequency of plant resource of vitamin A rich foods by pre-school kids in the last one week in Sodo Zuria Woreda from February-March, 2011.

Food	pre-school kids users percent		Average frequency every week
	≤ four times every week	> four times every week	
Chilly	99	1	0.33
Dark green vegetable	98.30	1.70	1.31
Avocado	90.60	9.40	2
Carrot	99.70	0.30	0.50
Mango	92.20	7.80	1.74
Pumpkin	99.70	0.30	0.28
Papaya	100	-	0.40
WFSP	70.30	29.70	3.02
OFSP	100	-	0.16
YFSP	100	-	0.03
Sweet potato leaves	100	-	0.01

About two third, 68.6 percent of investigation issue had used white fleshed sweet potato (WFSP) at least once each week, whereas 1.4 percent and 6.8 percent of investigation issues had used yellow fleshed sweet potato (YFSP) and orange fleshed sweet potato (OFSP) at least once each week

orderly. A bit less than half, 48.4 percent of pre-school children had utilized WFSP greater than or equivalent to 4 times each week, when 1.9 percent of pre-school children were used OFSP more than or equivalent to 4 times each week (Table. 2). The foods utilization frequency from animal resources by investigation issues has been extremely low in the last one week. Therefore, 34.9 percent of pre-school children had used milk at least one times every week. For eggs, 1.4 percent of pre-school kids have been using at least one day, while the rest 98.6 percent of investigation issues haven't been using egg. Nearly all i.e. 99.1 percent and 99.8 percent of investigation issues hadn't used chicken and fresh or dried fish for the last one week orderly.

16.7 percent of pre-school kids had been used meat at least one time every week (Table. 3). About the utilization frequency of fats and oils in this investigation, 98.3 percent of pre-school kids have been using oil fried food under 4 times every week. About 99 percent of pre-school kids used vitamin A fortified oils under 4 times every week. The average frequency of utilization of oil fried food and vitamin A fortified oils has been under one time for the last 7 days. Also 9 percent of pre-school kids have been using vitamin A fortified cereals at least one time every week (Table. 3).

Table. 3. Utilization Frequency of animal resource of vitamin A rich foods with pre-school kids in the last one week in Sodo Zuria Woreda from February-March, 2011

Food	pre-school kids users percent		Average frequency every week
	≤ four times every week	> four times every week	
Egg with yolk	100	-	0.203
Milk	96.5	3.50	0.75
Fresh/ dried fish	100	-	0.0035
Chicken	100	-	0.013
Meat	100	-	0.23
Better	100	-	0.36
Liver	100	-	0.31
Oils and fortified foods			
Oil fried food	100	-	0.609
Vit-A fortified oil	100	-	0.33
Vit-A fortified cereal	100	-	0.19
Biscuit/ bread	99.3	0.7	0.98
Total mean consumption of			
Plant source of Vit-A (weighted by source)			1.61
Animal source of Vit-A			1.42
Animal +Plant source of Vit-A (weighted by source)			3.03
Percent below threshold			
Total animal source of Vit-A			99.5%
Total Animal+ Plant source of Vit-A(weighted by source)			98%

Dietary variety score of pre-school kids in the last twenty-four hours

This investigation demonstrated that out of listed twelve food clusters the mean dietary variety of the last 24 hours have been 4.15625 ± 1.86 and 4.0677 ± 1.35 food groups at the families and particular level orderly. Also15 percent of pre-school kids had used ≥ six food groups, 39.10 percent of pre-school kids used 4 to 5 food groups and 45.90 percent of pre-school kids used lower than or equivalent to 3 food groups for the last twenty-four hours.

Discussion

Average family population of this investigation contributed families have been 5.96 ± 1.88 people that is a little higher in comparison with the national data expressed in the 2005 Ethiopian Demographic Health Survey report (CSA, 2005). The average land size has been 0.65 hectare in this investigation site. Demissie et al. (2009) noted that the utilization of vitamin A rich foods is influenced by items such as a large family size and land size, which are supposed for contributing to insufficient utilization of vitamin A in developing countries.

Vitamin A is discovered in plants and animal resources. Foods from animal origin include high bio-available vitamin A. Of plant resources, vegetables and fruits are the major resources of vitamin A. The utilization of these vegetables and fruits are important in design endurable interventions for preventing Vitamin A shortage. While the investigation related to the utilization of vegetables and fruits demonstrated that significantly suboptimum in developing countries (Demissie et al., 2009). Dietary intake of vitamin A rich foods with pre-school kids has been very low. Most, 99. 8 percent of pre-school kids haven't using animal foods every day and 96.3 percent havent using any vitamin A rich foods every. About all, 99.5 percent of pre-school kids have been using animal foods lower or equivalent to 4 times every week and 98 percent of pre-school kids have been using all

animal plus plant resource of vitamin A rich foods lower than or equivalent to 6 times each week.

Their average utilization of animal, all animal plus plant resource of vitamin A rich foods has been 1.42 and 3.03 days orderly (Table. 3). In line the investigation performed in Uganda noted that 75 percent of young kids haven't used animal foods regularly and in Kenya, 70.8 percent of kids had used animal foods lower than 4 times each week (Cornelia et al., 2010; Kipkorir et al, 2006). Nevertheless, the existing kid feeding direction (PAHO/ WHO 2003; WHO 2005) suggests that babes and young kids over 6 months of age must be fed those vitamin A rich foods per day for preventing VAD problems. HKI approach also specifies whether VAD is a public health issue. with the utilization of 2 threshold criteria, first one is the mean frequency of utilization of animal resources of vitamin A is lower or equivalent to 4 days every week and the second one is the mean frequency of all utilization of animal and plant resources of vitamin A is lower than or equivalent to 6 days every week. VAD is probable to be a public health issue if at least seventy percent of observed community don't meet the threshold of vitamin A (Rosen et al., 1993). WHO (1996), furthermore recommends that if lower than 75 percent of pre-school age kids use vitamin A rich foods at least 3 times a week the community or people must be regarded as a risk community/ people.

These investigation site pre-school kids haven't been at risk of vitamin A shortage problems because the dietary intake of vitamin A has been under the threshold level of the HKI and PAHO/WHO suggestions. The dietary variety outcomes demonstrated that most of the investigation subjects' pre-school children's food variety score have been little and middle.

The dietary variety scores were positively associated by improved mean micronutrient density sufficiency of foods in young kids (Ruel et al., 2002; Dewey et al., 2004; FANTA 2006). from all the investigation issue pre-school kids, by FAO food variety score criteria,45.9 percent had lower (used ≤ three food groups), 39.1 percent had an average (used 4 and 5 food groups) and 15 percent had highly dietary variety score (used ≥ six food groups) for the last twenty-four hours (FAO, 2006). In this case, the dietary variety score of pre-school kids has been lower, thus, pre-school kids discovered in this investigation site are in risk of VAD issue.

Conclusion

Dietary utilization of vitamin A with pre-school kids has been insufficient and they have in risk of VAD problems in Sodo Zuria district. Therefore, it is a better mother or caregivers of the child must encourage their pre-school kids for eating vitamin A rich foods every day at least one food factor, which is animal foods, yellow or green vegetables, or orange in colors such OFSP. Encourage mothers or caregivers of the kid for growing vegetables and fruits in the house garden to diversify their pre-school children's food intake in the investigation site.

Conflict of interest

The authors declare that they have no conflict of interest.

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