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Determinants of dietary Diversity in Namibian Children: Evidence from 2013 DHS

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ABSTRACT

This study aimed at establishing levels and factors influencing dietary diversity in Namibian children as a proxy of food security. The study made use of secondary data from the Namibia 2013 Demographic and Health Survey, from a cross-sectional representative women in the reproductive age group (15-49) from all 14 provinces. Dietary data was used to come up with a dietary diversity score (DDS) that was calculated by counting each of 11 food groups. A DDS ↓5 was regarded as reflecting poor dietary diversity and poor food security. A generalized linear regression model was fitted to model dietary diversity with independent variables such as socio-economic status, region, mother's level of education, religion, ethnicity, marital status and place of residence. Results indicated that dietary diversity was low in rural areas. There were significant differential in dietary diversity with socio-economic status, marital status, place of residence and ethnicity. Generally the majority of Namibian children consumed a diet which varied less.

Keywords: Dietary diversity, Food security, Children, Namibia

PAPER

1. Introduction

The three major components underlying food security are food availability, accessibility and utilization. Critical to ensuring adequate intake of essential nutrients that promotes good health and well-being is the intake of a variety of foods and food groups (Ruel, 2002). Dietary diversity is not only viewed as a proxy measure of food security (Hoddinott and Yohannes, 2002), but has become an important measure of the diverse diet and by implication an indicator of nutritional adequacy and quality (Foote, et al., 2004). Consumption of a higher number of food items and food groups is associated with positive health outcomes such as birth weight, child anthropometric status (Hoddinott and Yohannes, 2002); improved nutritional adequacy (Hatloy, et al., 1998) it also highly correlated with caloric and protein adequacy. Among adults, diversified diet is associated with reduced complications of diabetes (Wahlqvist, et al., 1989), reduced incidence of cancers (Fernadez, et al., 1996; Lucenteforte, et al., 2008). A number of studies have shown, using Dietary diversity score (DDS) which counts the number of food groups consumed over a specified reference period to assess dietary diversity, that DDS is positively associated with overall dietary quality (Steyn, et al., 2006; Kennedy et al., 2007).

In developing countries, deficiencies of selected micronutrients prevalent among young children and women of childbearing age were found to be associated with birth defects, growth restriction, impaired cognition and increased morbidity and mortality (Black, et al., 2008). A limited or lack of dietary diversity is primarily responsible these deficiencies particularly among population groups of concerns in developing countries. Understanding dietary intakes among children is important in order to develop evidence-based strategies. The purpose of the present study was to assess dietary diversity among children under five in Namibia as a proxy of food security. In addition, we examined the relationships between dietary diversity and socio-demographic variables.

2. Methods

Secondary data from the Namibia Demographic and Health Survey NDHS (2013), from a cross-sectional sample of representative mothers from all the regions was used. The woman responded to dietary questions regarding the feeding of their children. The responses were used to compute a dietary diversity score (DDS) given by the total number of food groups consumed by the children out of the recommended 12 (Bread, noodles, other made from grains; Potatoes, cassava, or other tubers; Eggs; Meat (beef, pork, lamb, chicken, etc); Pumpkins, carrots, squash (yellow or orange inside); Dark green leafy vegetables; Mangoes, papayas, other vitamin A fruits; Any other Fruits.

Liver and heart organs; Fish or shell fish; Food made from beans, peas, and lentils; and Cheese, yorghut, and other milk products). A DDS of ↓5 was regarded as reflecting poor dietary diversity and poor food security. A binary logistic regression model was fitted to model DDS (1=DDS of at least 5, 0=DDS↓5) with independent variables such as wealth index, region, mother's highest educational level, religion, ethnicity, marital status and place or residence, to establish the determinants of dietary diversity in

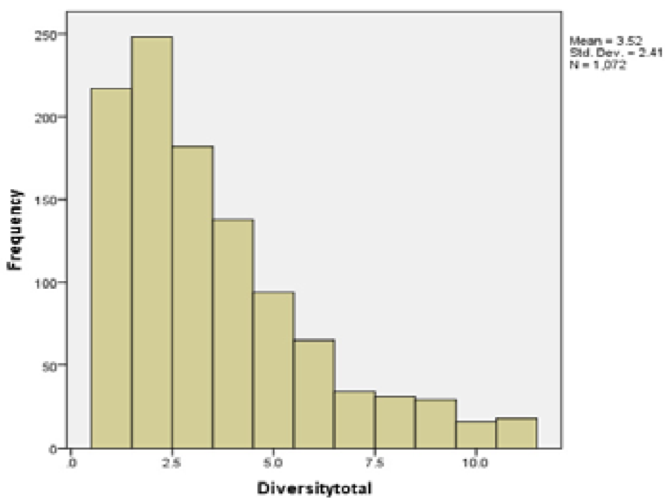
3.Results

Background characteristics of the sample

The composition of respondents by age-group was 15-19 (4.4%), 20-24 (16.4%), 25-29 (19.6%), 30-34 (17.8%), 35-39 (16.9%), 40-44 (13.7%) and 45-49 (11.1%). Their distribution by region was Zambezi (7.5%), Erongo (9.0%), Hardap (6.7%), !Karas (9.0%), Kavango (8.9%), Khomas (9.4%), Kunene (7.4%), Ohangwena (7.3%), Omaheke (6.5%), Omusati (7.1%), Oshana (6.4%), Oshikoto (6.6%) and Otjozonjupa (8.1%). Most of the respondents resided in urban areas (51.6%). With regard to their highest educational level, 7.6% of the respondents had had no formal education, 22.9% had primary education, 63.4% secondary education, and only 6.1% had higher education. Their religious affiliations ranged from Roman Catholic (21.1%), Protestant/ Anglican (23.2%), ELCIN (40.2%), Seventh Day Adventist (5.8%), no religion (1.4%), and others (8.3%). Most of the households were female headed (54.0%). The socio-economic status of the respondents (measured by the wealth index) ranged from poorest (17.2%), poorer (19.5%), middle (21.8%), richer (23.5%) to the richest (18.1%). Their distribution with regard to marital status was as follows: never in union (42.3%), married (25.9%), living with partner (22.5%), widowed (2.9%), divorced (1.3%), no longer living together / separated (4.9%). Their cultural diversity (measured by the main language spoken at home) ranged from Afrikaans (9.8%), Damara/Nama (16.2%), English (1.3%), Herero (10.3%), Kwangali (9.4%), Lozi (7.1%), Oshiwambo (41.5%), San (1.3%) and others (3.1%).

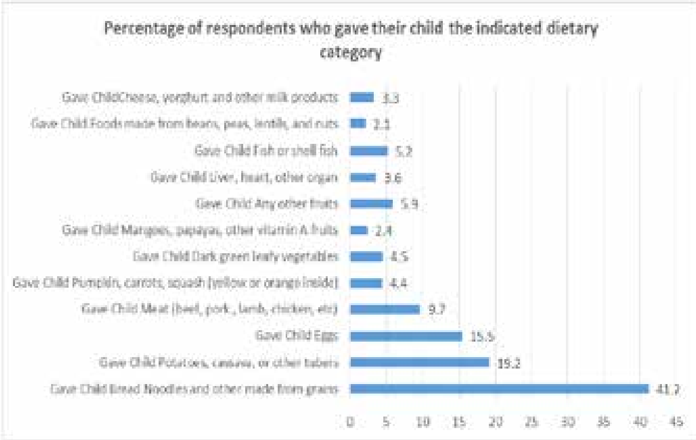
From the food groups proposed by FANTA (Swindale and Bilinsky, 2006), the dietary diversity score, which is the sum of the different food groups consumed by each child, ranged from 1 to 11 with a mean of 3.52 with a standard deviation of 2.41 [95% CI: 3.38 – 3.67]. The histogram of the dietary diversity scores are presented in Figure 1. The dietary diversity scores were skewed towards very few food groups.

Figure 1 - Histogram of Dietary diversity scores for children



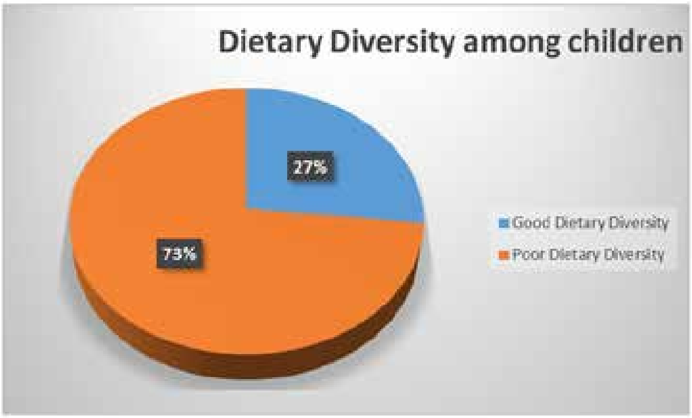
The proportion of children consuming foods from the various groups are presented in Figure 2. It was worrying to note that there was very little consumption of foods all other groups except for the Bread, Noodles and … group (41.2%); and Potatoes, cassava, or ….(19.2%); and to a lesser extend eggs (15.5%).

Figure 2 - Percentage of respondents who gave their child food from the indicated dietary food group



A dietary diversity score of less than 5 was considered poor. The pie chart in Figure 3 shows that only 27% of the children had a good dietary diversity. The rest of the children had a poor dietary diversity (73%).

Figure 3 - Pie chart showing percentage distribution of dietary diversity in children



Bivariate analysis results

Chi-square tests of association between the dietary diversity score and potential predictor variables are given in Table 1.

Table 1 - Results of Chi-Square Tests of Association between the dietary diversity score and potential predictor variables.

Independent Variable	Pearson Chi-Square Statistic	P-value
Respondent Age-group	7.972	0.240
Region	95.077	P<0.001***
Place of residence	49.716	P<0.001***
Highest educational level	53.322	P<0.001***
Religion	4.315	0.505
Sex of Household Head	2.848	0.091
Wealth Index	72.753	P<0.001***
Marital Status	19.083	0.002
Main Language spoken at home	30.326	P<0.001***

The results of Chi-square tests of association at 5% level of significance indicated that dietary diversity in children was significantly associated with region (Chi-square=95.077, p<0.001); place of residence (Chi-square=49.716, p<0.001); highest educational level (Chi-square=53.322, p<0.001); wealth index (Chi-square=72.753, p<0.001); marital status (Chi-square=19.083, p=0.002); and main language spoken at home (Chi-square=30.326, p<0.001). There was no significant association between dietary diversity in children with the mother's age-group (Chi-square=7.972, p=0.240); religion (Chi-square=4.315, p=0.505) and the sex of the head of that household (Chi-square=2.848, p=0.0.091). Those potential indicator variables with significant associations were input into the binary logistic regression model to establish the extent of their effects on dietary diversity in children.

Results of logistic regression are presented Table 2. The regression results showed significant differentials in dietary diversity with respect to region. Children from Erongo (OR=2.073 ,CI:1.010-4.253, p=0.047); !Karas (OR=2.286 ,CI:1.120-4.665, p=0.023); and Khomas (OR=2.360 ,CI:1.158-4.811, p=0.018) regions were about twice more likely to have a good dietary diversity compared to their counterparts in the Otjozonjupa region. With regard to the highest educational level, children of mothers with no formal education (OR=0.150 ,CI:0.043-0.516, p=0.003); and those whose mothers had primary education (OR=0.337,CI:0.143-0.794, p=0.013) were less likely to have a good dietary diversity compared to those of mothers with higher education. Results also revealed that children from the poorest households (OR=0.387 ,CI:0.183-0.817, p=0.013) were less likely to have a good dietary diversity compared to those from the richest households.

Table 2 - Logistic regression results

Predictor variables	Odds Ratio	95% Confidence Interval		P-value
		Lower	Upper	
Region				
Zambezi	1.276	.297	5.479	.743
Erongo	2.073*	1.010	4.253	.047
Hardap	.625	.272	1.436	.268
!Karas	2.286*	1.120	4.665	.023
Kavango	2.298	.877	6.022	.090
Khomas	2.360*	1.158	4.811	.018
Kunene	1.099	.476	2.539	.825
Ohangwena	.695	.284	1.702	.426
Omaheke	.676	.294	1.551	.355
Omusati	.372	.136	1.018	.054
Oshana	.701	.276	1.779	.454
Oshikoto	.962	.420	2.206	.927
Otjozonjupa (Ref)	1.00	1.00	1.00	1.00
Place of Residence				
Urban	1.223	.819	1.826	.326
Rural (Ref)	1.00	1.00	1.00	1.00
Highest Educational Level				.012
No Formal Education	.150**	.043	.516	.003
Primary	.337*	.143	.794	.013
Secondary	.480	.224	1.029	.059
Higher	1.00	1.00	1.00	1.00
Wealth Index				
Poorest	.387*	.183	.817	.013
Poorer	.552	.301	1.012	.055
Middle	.715	.408	1.255	.243
Richer	.967	.588	1.590	.895
Richest	1.00	1.00	1.00	1.00
Marital Status				
Never in Unioin	.883	.417	1.869	.744
Married	1.429	.653	3.127	.371
Living with Partner	.809	.374	1.752	.592
Widowed	.446	.042	4.706	.502
Divorced	7.314	.991	53.963	.051
No longer living together/ separated	1.00	1.00	1.00	1.00
Main Language Spoken at home				
Afrikaans	.274*	.101	.743	.011
Damara / Nama	.270**	.104	.704	.007
English	.225	.049	1.036	.056
Herero	.334*	.116	.961	.042
Kwangali	.217**	.087	.541	.001
Lozi	.251	.058	1.085	.064
Oshiwambo	.368*	.146	.924	.033
San	.414	.068	2.519	.338
Other Languages	1.00	1.00	1.00	1.00

***p<0.05, **p<0.01, ***p<0.001**

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