

Coping Strategies and Household Dietary Diversity in a Low Income Neighborhood in South Africa

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ABSTRACT: Several recent studies define food insecurity as a situation where the availability of nutritionally adequate and safe foods or the ability to acquire acceptable foods in socially acceptable ways is limited or uncertain. To overcome the challenges of food insecurity household's employ certain Coping Strategies to mitigate food shortages. A quantitative research method was deployed and a stratified random sample of 600 households in two low income neighborhoods was included during a study conducted in 2015, to measure food insecurity, coping strategies and dietary diversity. The study found that households employed coping strategies to mitigate food shortage, but this leads to low dietary diversity. The study found that the Coping Strategy to "Buy only necessities", "skip meals" and "purchase food on credit" is employed by a significant number of households. The study found that these coping strategies are associated with lower dietary diversity. This study aimed to increase the general understanding of food insecurity in low-income areas, and how coping strategies impact on dietary diversity in the context of food insecure households. The study concluded that although households may use coping strategies to mitigate the impact of food shortages it will directly impact on low dietary diversity with health consequences. In this context, there may be desperate need in low income neighborhoods to amend policy to include a more comprehensive approach that includes adequate information to households on health consequences of low dietary diversity.

KEYWORDS: Food Insecurity, Coping Strategies, Economic Development

Introduction

The Food and Agricultural Organisation of the United Nations defines food security as a situation where "all people, at all times, have physical, social, and economic access to sufficient, safe and nutritious food which meet their dietary needs and food preferences for an active and healthy life" (FAO 1996). Several studies in the context of food insecurity refer to **malnutrition** as a consequence of food insecurity (Hampton 2007; Mello et al. 2010; Nord and Parker 2010). In this regard, food insecurity is defined as a situation where the availability of **nutritionally** adequate and safe foods or the ability to acquire acceptable foods in socially acceptable ways is limited or uncertain (Anderson 1990). Rashid et al. (2006) highlighted the fact that most measurements/studies focused only on food intake and not on the quality of the food intake. To overcome the challenges of food shortages at the household level households employ coping strategies to mitigate the food shortages. The question however arises: To what extent do these coping strategies employed by food insecure households lead to lower dietary diversity at the household level? Several studies in this context indicated that higher dietary diversity in developing countries is linked with improved nutritional intake (Savy et al. 2005; Steyn et al. 2006). Thorne-Lyman et al (2010) indicated that higher food security is associated with dietary diversity. In this context, it can be assumed that food secure household's status does not always implicate dietary diversity status. Several studies showed that lower quality food intake can be associated with increased health risks (Bronte-Tinew et al. 2007; Hampton 2007).

The aim of this study is to analyse the coping strategies employed by households and the dietary diversity status associated with the coping strategies. The question can thus be asked: Can lower dietary diversity be associated with coping strategies used to mitigate food shortages? In this context households may use the strategy of "Buying only necessities", but that may lead to lower dietary diversity. This study aimed to increase the general understanding of food insecurity in low-income areas, and how coping strategies impact on dietary diversity in the context of food insecure households. The study concluded that although households may use coping strategies to mitigate the impact of food shortages it will directly impact on low dietary diversity with health consequences. In this context, there may be desperate need in low income neighborhoods to amend

policy to include a more comprehensive approach that includes adequate information to households on health consequences of low dietary diversity.

Section 2 of the study analyses the literature with regards to food insecurity, coping strategies and dietary diversity. Section 3 discusses the methodology and measuring instruments while section 4 discusses the findings, while section 5 draws a conclusion.

Literature Review

The literature review in this study focus on coping strategies used by households to mitigate food shortages and on dietary diversity at the household level. In the 1980's Lenhart and Read (1989) defined food insecurity in the context of nutrition as "a condition resulting from chronic under-consumption of food and/or nutritious food products. Other researchers (Steyn et al. 2006; Hilbruner and Egar 2008; Ajani 2010) indicated that dietary diversity is the result of adequate access, availability and utilisation of food. In this context, Ruel (2002) defined dietary diversity as "the number of different foods or food groups consumed over a given reference period. Dietary diversity can be seen as the number of food groups consumed over a given period (Vakili et al. 2013).

In the context of poverty, studies found a positive correlation between household income and dietary diversity (Ruel 2002; Rashid et al. 2006; Taruvinga et al, 2013). In this regard limited income normally leads to spending on lower quality food with lower nutritional value (Bloem et al. 2005; Dachner et al. 2010). The outcome of lower quality food leads to health related risks and chronic diseases (Alaimo et al. 2001; Bronte-Tinkew et al. 2007; Hampton 2007).

Considering the level of education studies (Smith et al. 2003; UNICEF 2011; Lucheo et al. 2013) found that lower education of women can be associated with malnutrition and food insecurity. In the context of this study a lack of education may lead to lower dietary diversity as households mitigate the consequences of food shortages. One single food group does not contain all nutrients and therefore it is important to realise that dietary diversity leads to meeting nutrient requirements (Labadarios et al. 2011).

To mitigate the risk associated with food shortages households may opt for different coping strategies. In this regard Maxwell and Caldwell (2008) identified a number of coping strategies to mitigate the impact of food shortages at the household level. In a study by Devereux (2002) it is revealed that a lack of food availability or affordability leads to "coping strategies". This study however aims to analyses whether coping strategies leads to lower dietary diversity at the household level.

Sample and Data Collection

This study is based on a survey conducted in 2015 in two low income neighborhoods in Gauteng Province, South Africa namely Sharpeville and Bophelong. A total of 600 household heads, both male and female were interviewed by trained fieldworker. A stratified random sample was drawn and every second household in a street was included in the survey. After cleaning of the data only 580 questionnaires were used in the analyses.

Methodology

To measure the Coping Strategies used by households the Coping Strategies Index used by Maxwell and Caldwell (2008) is used. The Coping Strategies considers the frequency and importance of different coping strategies used by households in order to mitigate some of the consequences of food insecurity at the household level. This Coping Strategy index considers 12-items to measures the frequency of coping strategies used by a household. In this regard, for example, a respondent can indicate whether they "buy only necessities" to mitigate the consequences of food shortages. Table 1 shows the Coping Strategies used by households.

Table 1. Strategies of households to cope with food shortages

Coping Strategy	
Dietary Change	<ul style="list-style-type: none"> • Rely on less preferred and less expensive food
Increase Short-term Household Food Availability	<ul style="list-style-type: none"> • Borrow food from a friend or relative • Purchase food on credit • Gather wild food, hunt, or harvest immature crops • Consume seed stock held for next season
Decrease Number of People	<ul style="list-style-type: none"> • Send children to eat with neighbors • Send household members to beg
Rationing Strategies	<ul style="list-style-type: none"> • Limit portion size at mealtimes • Restrict consumption by adults in order for children to eat • Feed working members at the expense of non-working members • Reduce number of meals in a day • Skip entire days without eating

Source: Maxwell and Caldwell (2008)

To measure the Household Dietary Diversity of households in this paper the 24-hour dietary recall scale of the Food and Agricultural Organization (FAO 2007) was used. This scale includes 12 different food groups as indicated in Table 2. Respondents must then indicate what they can recall from the previous 24 hours what food groups were included in the diet of household. To determine the Household Dietary Diversity Score (HDDS) of households, one point per food group is recorded adding up to a maximum of 12 food groups.

Table 2. Food Groups

	Food Group	Point allocation
1	Any bread, rice, noodles, biscuits or food made from millet, sorghum, maize, rice, wheat or any other locally available grain	1
2	Any potatoes, yams, manioc, cassava or any food made from roots or tubers	1
3	Any vegetables	1
4	Any fruits	1
5	Any beef, pork, lamb, goat, rabbit, wild game, chicken, duck, other birds, liver kidney, heart or other organ meats	1
6	Any eggs	1
7	Any fresh, dried fish or shellfish	1
8	Any foods made from beans, peas, lentils or nuts	1
9	Any cheese, yoghurt, milk or other milk products	1
10	Any foods made with oil, fat or butter	1
11	Any sugar or honey	1
12	Any other foods such as condiments, coffee or tea	1
		12

Source: FAO 2007

Results and Discussion

The descriptive statistics of the sample of 580 households is shown in Table 3. The mean household size of the sample is 4.16 members per household with a standard deviation of 1.662. The mean age of the head of the household is 49.47 years with a standard deviation of 13.803. The number of years schooling of the head of the household is 9.49 years of schooling with a standard deviation of 3.630. The mean income of the households in the sample is R 7254.50 with a standard deviation of R 5916.49. The mean household food expenditure of the sample is R 1203.8 with a standard deviation of R 672.76. When the Household Dietary Diversity Score of the households are considered it shows a mean score of 8.57 groups of food with a standard deviation of 2.699. With the aim of the study to analyse the dietary diversity of the households that indicated that they use coping strategies to overcome food shortages, the descriptive statistics of the households indicating coping strategies are analysed further.

Table 3. Descriptive Statistics

Socio Economic Variable	Number of respondents	Min	Max	Mean	Standard Deviation
Household Size	580	1.0	11.0	4.16	1.662
Age of the Head of the Household	580	22.0	83.0	49.47	13.803
Number of Years Schooling of Head of Household	580	0.0	15.0	9.49	3.630
Household Income	580	350.0	35000.0	7254.5	5916.49
Household Food Expenditure	580	95.0	5870.0	1203.8	672.76
Household Dietary Diversity Score	580	2.0	12.0	8.57	2.699

For the purpose of this paper coping strategies used by households for more than 5 days in a week were considered for the analyses. Table 4 shows the descriptive statistics of the households that indicated that they “buy only necessities” as a coping strategy for more than 5 days in a week. A total of 331 households indicated that they use “buy only necessities” as a coping strategy. In this regard the mean household size is 4.25 compared to 4.16 for the whole sample, indicating larger household sizes of those households using this coping strategy. The number of years schooling of the head of the household in households using the strategy “buying only necessities” is lower at 8.86 compared to 9.49 for the whole sample. When income is considered the households using the strategy “buy only necessities” have a mean income of R 4826.16 compared to a mean income for the whole sample of R 7254.50. Table 4 shows that the dietary diversity mean score of households using the strategy “buying only necessities” is 7.72 compared to a slightly higher mean score of 8.57 for the whole sample.

Table 4. Descriptive Statistics of Households who buy only necessities as coping strategy

Socio Economic Variable	Number of respondents	Min	Max	Mean	Standard Deviation
Household Size	331	1.0	11.0	4.25	1.621
Age of the Head of the Household	331	22.0	83.0	49.44	13.576
Number of Years Schooling	331	0.0	14.0	8.86	3.496
Household Income	331	600.0	16.000.0	4826.16	3017.42
Household Food Expenditure	331	250.0	3000.0	1055.49	542.544
Household Dietary Diversity Score	331	2.0	12.0	7.72	2.799

When the households using “skip meals” as a strategy is considered it shows that 343 households use this strategy for more than 5 days in a week to mitigate the consequences of food shortages. The mean household size is larger for this group at 4.22 compared to 4.16 for the whole sample. Similar to table 4, the mean household income is lower at R 5185.62 compared to R 7254.50 for the whole sample. The

households using the strategy “skip meals” spend less on food than the sample with a mean food expenditure of R 1142.98 compared to 1203.80 for the whole sample. The mean dietary diversity score for this group is 7.68 compared to 8.57 for the whole sample.

Table 5. Descriptive Statistics of Households who skip meals as coping strategy

Socio Economic Variable	Number of respondents	Min	Max	Mean	Standard Deviation
Household Size	343	1.0	11.0	4.22	1.749
Age of the Head of the Household	343	22.0	82.0	49.36	13.803
Number of Years Schooling of Head of Household	343	0.0	14.0	9.60	3.420
Household Income	343	320.0	16000.0	5185.62	3365.679
Household Food Expenditure	343	200.0	3500.0	1142.98	625.06
Household Dietary Diversity Score	343	2.0	12.0	7.68	2.884

A total of 322 households indicated that they use “purchase food on credit” as coping strategy for more than 5 days in a week to cope with food shortages. Table 6 shows the descriptive statistics of this group of households. The number of years schooling of this group is higher at a mean number of years schooling of 9.66 years compared to 9.49 for the whole sample. The mean income at R 5553.41 is lower than the mean income for the whole sample, and the expenditure on food higher at R 1258.73 compared to a mean expenditure on food of R 1203.80 for the whole sample. In this context the dietary diversity score of this group is also higher at 7.95 compared to 8.57 for the whole sample.

Table 6. Descriptive Statistics of Households who purchase food on credit as coping

Socio Economic Variable	Number of respondents	Min	Max	Mean	Standard Deviation
Household Size	322	1.0	11.0	4.17	1.699
Age of the Head of the Household	322	22.0	82.0	49.19	13.539
Number of Years Schooling of Head of Household	322	0.0	15.0	9.66	3.414
Household Income	322	320.0	16500	5553.41	3660.13
Household Food Expenditure	322	200.0	3800.0	1258.73	691.639
Household Dietary Diversity Score	322	2.0	12.0	7.95	2.867

In table 7 the households using coping strategies are analysed, in terms of the number of food groups they consume daily based on what they could recall in last 24 hours. The correlation between dietary diversity and the coping strategy used is shown and the mean dietary diversity score of the group using the coping strategy.

Table 7. Household Coping Strategies and Dietary Diversity

	N	Number of Food Groups				R ²	Sig.	Mean	Std Dev.
		1-3	4-6	7-9	10-12				
Buy necessities	331	10	127	62	132	-0.27	0.000	7.54	2.78
Rely on less	30	4	15	3	6	-0.35	0.000	6.10	3.57

expensive food									
Stick to the budget	35	3	21	7	4	-0.34	0.000	6.75	2.59
Limit portions at meal times	94	8	47	16	23	-0.37	0.000	6.78	3.02
Skip meals	343	13	133	63	134	-0.32	0.000	7.42	2.62
Purchase food on credit	322	8	118	54	142	-0.17	0.000	7.89	2.85
Maintain a food garden	91	3	44	16	27	-0.20	0.000	7.40	2.77
Borrow food from friends	24	2	9	10	2	-0.29	0.000	6.70	1.70
Restrict consumption of adults in order for children to eat	19	1	8	8	2	-0.23	0.000	6.55	2.06
Gather wild vegetables	19	1	7	8	3	-0.24	0.000	7.00	1.73
Sent household members to eat elsewhere	21	1	10	8	2	-0.17	0.000	6.84	2.45

The coping strategies mostly used by households in the sample are “buy necessities”, “skip meals”, and “purchase food on credit”. A total of 137 households who indicated that they “buy only necessities” consume 6 or less food groups, or 41.38 % of the households who use the “buy only necessities” coping strategy. A statistical significant negative correlation ($R^2=-0.27$, $P<0.000$) exist between households using the strategy “buy only necessities” and dietary diversity. This means that as households use the coping strategy the dietary diversity decreases. A total of 343 households indicated that they “skip meals” to mitigate the consequences of food shortages. A total of 146 of these households however consume 6 or less food groups, or 42.56% of the households using this strategy. A statistical negative correlation ($R^2=-0.32$, $P<0.000$) exist between the households using the strategy and dietary diversity, meaning that using the strategy decreases the dietary diversity of the household.

A total of 322 households indicated that they “purchase food on credit” as a coping strategy. However, 126 of these households consume 6 or less food groups. A statistical significant but weak correlation ($R^2=-0.17$, $P<0.000$) exist between this strategy and dietary diversity. The dietary diversity however of the households who use this strategy is the highest of all strategies at 7.89 food groups, indicating that credit may enable some households to increase household dietary diversity.

Conclusion

This study aimed to increase the general understanding of food insecurity in low-income areas, and how coping strategies impact on dietary diversity in the context of food insecure households. It is evident that households may use coping strategies to mitigate the consequences of food shortages but in the process of for example “buy only necessities” many households decrease dietary diversity. In the short run households mitigate the immediate negative consequences of food shortages but in the medium to long run decrease dietary diversity. This may lead to negative health consequences. Households may use coping strategies to mitigate the impact of food shortages but it will directly impact on low dietary diversity, and in this context there may be a desperate need in low income neighborhoods to amend policy to include a more comprehensive approach that includes adequate information to households on health consequences of low dietary diversity.

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