Journal of Nutrition & Food Sciences
ISSN: 2155-9600

Mofu et al., J Nutr Food Sci 2013, 3:3
DOI: 10.4172/2155-9600.1000202

Research Article Open Access

Determinant Behavioural Factors for Cassava Consumption among Adults in Southern Zambia

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Abstract

Objective: To evaluate behavioral factors those significantly determine intentions to consume cassava among adults in southern Zambia.

Design: A cross-sectional study with a multistage design based on the theory of planned behavior and health belief models. Data was collected using a structured questionnaire targeting heads of households between February and April, 2008.

Setting: The study was performed in three fragile food-deficit prone districts of Kalomo, Siavonga, and Namwala located in southern Zambia.

Participants: A total of 298 (150 males and 148 females) heads of households aged between 15 and 49 years were interviewed from the initially 304 that were selected proportional to district population sizes.

Main outcome measures: Same variables explained cassava consumption behavior intention in all three districts and among both male and female respondents. Possessing knowledge and an understanding of the health value of cassava were the best predictors for intention to consume cassava.

Conclusion: To effectively promote cassava consumption, nutrition education should focus on increasing the knowledge levels of the adult population. This knowledge should be on the health values of cassava.

Keywords: Cassava; Consumption and utilization; Intention; Theory of planned behavior; Health belief model; Adults; Zambia

Introduction

It is well recognized that the perpetual droughts that continued to ravage the Southern African region over the years had brought substantial crop failures resulting in hunger and malnutrition among poor agriculture dependent communities [1]. Arising from crop failures is household food insecurity which is an important underlying cause of malnutrition [2]. According to the World Food Programme-hunger is defined as a condition in which people are deprived of the basic food intake for a healthy life [3]. In the Southern African region, this deprivation had affected many parts of the region. As a result, more than 8.3 million people needed food aid during the 2002/2003 period. In Zambia, an estimated 1.2 million people mainly from the Southern parts of the country needed food assistance in 2002 [4,5] which was a major source of food for many people [6].

As a sustainable approach to this problem, the Zambian government introduced cassava in the southern parts of the country [7]. Cassava is drought resistant and therefore a good candidate for food security when compared to maize which is the commonly grown crop in the region [1,8]. The promotion and takeoff of cassava as a security food crop in this region faced a number of challenges [7]. These challenges stemmed from local farmer's perception of the crop; inadequate cassava production by farmers who received the cuttings; inadequate dissemination of cassava processing technologies by agriculture extension officers, and poor market facilities. Other investigators have postulated that reasons for inadequate cassava consumption and utilization could be related to perceptions which go beyond attitudes and culture. Still others have suggested that the failure to consume cassava even by farmers who received the cuttings and grew the crop can be due to anthropological challenges [9,10].

Decision-making regarding whether or not to grow and/or utilize cassava as a food security crop is however complicated when perceptions and anthropological factors interact to influence utilization and consumption. There is information gap and questions regarding the behavioral factors associated with the consumption and utilization of cassava as a food. Such questions include the following: What are the factors for instance which led to those people who received the materials, grew the cassava, but did not harvest to consume the cassava tubers? What are the characteristics of farmers who are the first to test plant the crop and utilize it and accept it as a food? In what way(s) are they different from farmers who do not? What implications do these differences have for the selection of appropriate methods to disseminate information on cassava to reach the highest number of potential beneficiaries and ensure appreciable impact in the communities? This study was therefore designed to respond to some of the challenges by focusing mainly on the determinant behavioral factors for consumption of cassava among adults in Southern Zambia. The study used the theories of planned behavior and healthy belief models.

Theory of Planned Behavior and Health Belief Models

As there are no evidence-based nutritional models available to determine behavioral factors affecting food intake, a combination of the

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Received December 21, 2012; **Accepted** March 20, 2013; **Published** March 22, 2013

Citation: Mofu MJ (2013) Determinant Behavioural Factors for Cassava Consumption among Adults in Southern Zambia. J Nutr Food Sci 3: 202. doi:10.4172/2155-9600.1000202

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Theory of Planned Behavior (TPB) [11] and the Health Belief Model (HBM) [12] from the social sciences were used for the investigation. This model is illustrated in figure 1.

Theory of planned behavior

The theory of planned behavior states that a person's intention is the best predictor for performing or assimilating certain behavior. This intention is as a result of three basic determinants which may act singly or interactively: (1) attitude towards behavior; (2) subjective norm; and (3) perceived control. Attitudes towards behaviour are a function of beliefs. Beliefs are the held notions of the consequences of performing the behaviour, and the evaluations of those consequences. The summed product of the beliefs and evaluations constitutes the attitude towards behaviour [13].

Health belief model

The health belief model gives a view that health behaviour is determined by belief in personal health threats and belief in the effectiveness of health behaviour. The personal health threats are affected by perceived susceptibility to a disease and by perceived severity of a disease. Together they invoke a general motivation for action; persons who feel threatened will look for ways to reduce the threats. The belief in effectiveness of health behaviour is a function of perceived benefits, and perceived barriers. The perceived benefit is perceived degree to which preventive behaviour will reduce the threat of particular health risk. The perceived barriers are negative aspects of a particular preventive behaviour. Belief in effectiveness measure of reduces risk, and this guides to choices for a particular behaviour. Furthermore there is a cue to action, a precipitating force that makes the person feel the need to take action. This can be an internal or an external factor [14].

Analysis

These models are comparable and combining them leads to more variance of outcome variables being explained. This combined model has also been used and validated in a study to investigate factors affecting consumption of iron-fortified soy sauce among women in China. By using path analysis, the investigators showed that 35% to 55% in the variance of behavioral intention could be explained by the model [15,16].

Methodology

Design

This is a cross sectional study with a multistage design. A stratified random sampling procedure was used independently in each of the three districts. In the first stage, 3 districts were selected as these districts participated in the cassava promotion programme. In the second stage, agricultural camps were selected for the study; an agricultural camp is a small unit in the agricultural sector ware farmers are grouped around agricultural extension service provision with an extension officer. In the final stage, households were selected.

Sample selection

The following formula was used to compute the required sample size for the study [17,18].

$$n=\frac{\left(Z^2\right)(N)\left(P_y\right)\left(1-P_y\right)}{\left(Z^2\right)\left(P_y\right)\left(1-P_y\right)+(N-1)\left(\varepsilon^2\right)\left(P_y\right)}$$

Where

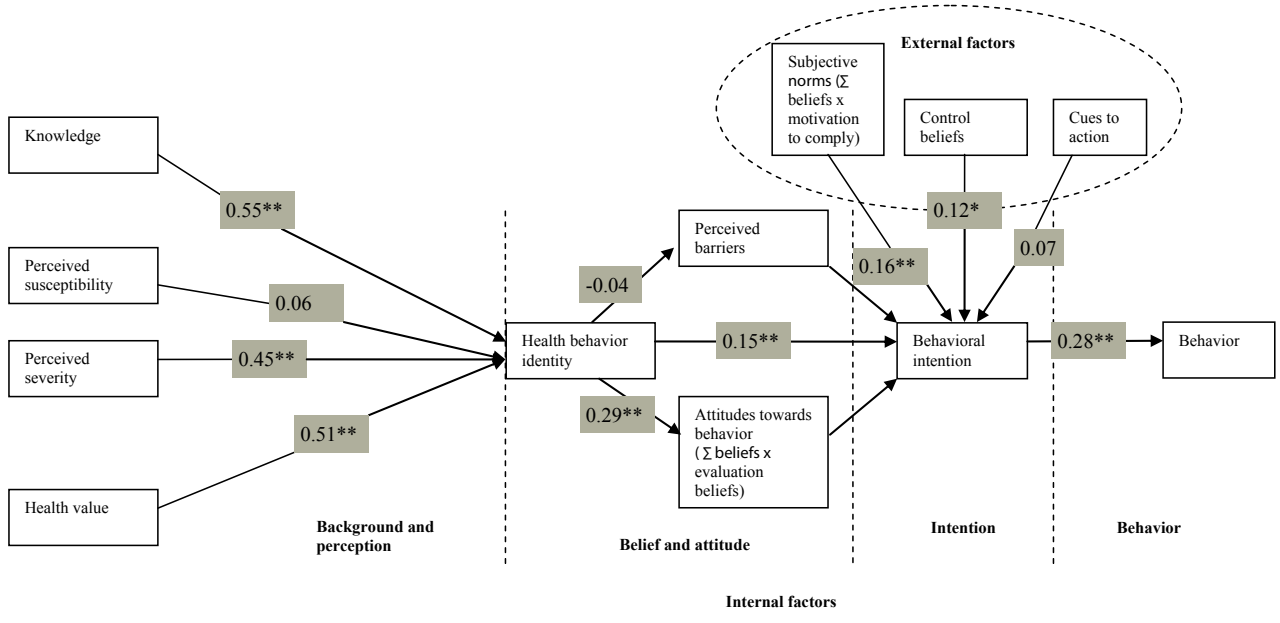
n=sample size

N=size of target population

P_y=expected prevalence of cassava consumption (=estimated at 4%)

Z=z-value for the selected α=0.05

ε=estimated as ε=3 in this study.



*P<0.05, **P<0.01

Figure 1: Combined health belief model and theory of planned behavior with spearman's correlation coefficients between constructs.

A total of 306 participants were randomly selected for the interviews in all of the 3 districts. This selection process took into account a 12 percent non response rate and ultimately only 298 heads of households aged between 15 and 49 respondents' participated in the study due to non response. One hundred fifty eight (158) of these were males and 148 were females.

Data collection tools

A questionnaire developed by the application of the TPB and HBM was used to collect data at individual participants'. The questionnaire covered all the areas of interests associated with perception and decision making as indicated by the constructs in the combined TPB and HBM model indicated in figure 1**.** The questionnaire was structured in topics such as knowledge; hunger and cassava; outcomes of cassava consumption; cassava attributes; perceived barriers to cassava consumption; information source; people and factors that could enhance cassava consumption; and subjective beliefs about cassava. To determine the perceptions of the farmers, the questions were reflected as statements and the farmers were asked to indicate if they agree, disagree, or are neutral. For each question, each response corresponds to a one-point score. All analysis was performed by SPSS version 15.

Results and Discussion

Demographic characteristics

The majority of respondents (82.7%) were engaged in farming activities while a few (7%) were involved in both farming and business activities of trading and marketing nature. About 10.3% of the respondents were no longer involved in farming and were thus excluded from further analysis. For those who were involved in farming, 51.6% were male while 48.4% were female. Average age distribution is indicated in table 1.

Internal consistency

Scale analysis to verify reliability of the questionnaire in measuring factors determining cassava consumption intention revealed that all the questionnaire constructs with the exception of external control beliefs, attitudes toward behavior and perceived barriers (Figure 1) had reliable scales with crombach's α coefficients of more than 0.8 (Table 2). No items with low item total correlation coefficients were deleted in each of the three constructs as removal of these items did not lead to a significant increase in the crombach's α.

Demographic	Male			Female		
	n	Mean age	sd	n	Mean age	sd
Kalomo	79	33.1	7.7	84	32.6	8.8
Namwala	40	34.2	10.0	38	34.3	10.5
Siavonga	39	31.2	8.1	26	29.6	7.4

Table 1: Age and sex distribution by district.

Construct	Crombach's α	Number of items
Knowledge	0.8	7
Perceived susceptibility	0.9	5
Perceived severity	0.9	8
Health value	0.8	4
Health behavior Identity	0.8	2
Perceived barriers	0.4	5
Attitudes towards behavior	0.5	8
External control beliefs	0.1	3
Cues to action	0.8	9
Subjective norms	0.8	8

Table 2: Reliability and construct validity associated with perception factors for the utilization and consumption of cassava in the three selected districts of Southern Province, Zambia.

	Standardized β	P	R^2	Adjusted R^2
Model 1 Dependant variable: Health behavior identity			0.31	0.30
X_1=knowledge	0.73	0.00		
X_2=perceived susceptibility	- 0.02	0.54		
X_3=perceived severity	- 0.07	0.55		
X_4=health value	0.27	0.01		
Model 2: Dependant variable: Behavioral intention			0.03	0.02
X_1=Perceived barriers	-0.22	0.10		
X_2=Health behavior identity X_3=Attitudes towards behavior	0.23 0.16	0.08 0.46		
Model 3: Dependant variable: Behavioral intention			0.05	0.04
X_1=Subjective norms	0.31	0.01		
X_2=Control belief	0.33	0.01		
X_3=Cues to action	0.05	0.69		
Model 4 : Dependant variable: Cassava consumption			0.15	0.14
X_1=Age	0.01	0.47		
X_2=Perceived barriers	0.01	0.96		
X_3=Intention to consume cassava	0.78	0.00		
X_4=Perceived barriers×Intention to consume	-0.17	0.03		

Table 3: Factors determining health behavior identity (Model 1), intention to consume cassava (Model 2 and 3) and cassava consumption (Model 4) among the people of southern Zambia.

Factors predicting intention to consume cassava

Same variables explained cassava consumption behavior intention in all three districts and in both male and female respondents. Intention to consume cassava was significantly correlated with consumption in the combined regression model (r=0.28, P=0.00, Figure 1). Possessing knowledge (Standardized β=0.73, P=0.00) and an understanding of the health value of cassava (Standardized β=0.27, P=0.01) were the best predictors for intention to consume cassava (Table 3). Some of the statements describing knowledge on cassava included; cassava is good for my health, cassava can prevent hunger, cassava can prevent malnutrition and when there is no maize at home cassava can be used as food'. While some statements that described health value included; Health is very important for me and my family; and growth is important for me and my family.

The study also found that subjective norms (Standardized β=0.31, P=0.01) and control beliefs (Standardized β=0.33, P=0.01) had significant influence on behavior intention to consume or utilize cassava (Table 3). Some statements that described subjective norms included, "household members encourage me to eat cassava, extension workers from Ministry of Agriculture encourage me to eat cassava and the opinions of my family members are very important for me".

It was also found that the intention to consume cassava was the best predictor for cassava consumption (Standardized β=0.78, P=0.00). This finding is also in line with what others have found [19]. A statement

describing cassava consumption behavior was, 'I will eat cassava next month'. The behavioral factors that were determining intention to consume cassava among the target population were many (Figure 1). However, those with a significant influence were: the knowledge levels on cassava that the study population had; the health value of cassava that the target group held and the perceived severity for not consuming cassava and the subjective norms.

In order to promote cassava consumption and utilization, nutrition education and extension services should first aim at increasing the knowledge levels before, during, and after cassava planting material distribution. This knowledge should be based on the health value of cassava. In order to effectively promote cassava consumption, nutrition education and agriculture extension should focus on increasing the knowledge levels of the adult population. This knowledge should be directed more on the health values and benefits of cassava. It should also focus on enhancing positive attitudes as well as subjective norms that influence perceptions on cassava.

Acknowledgement

The author would like to thank the National Food and Nutrition Commission of Zambia for funding this study. Others appreciated include Wageningen University, the Netherlands and in particular, Dr. Inge D. Brouwer, Associate Professor, for guidance in the conduct of the study, Bianca Van Dam for her contribution to research materials and the Ministry of Agriculture and Cooperatives in Zambia for providing the structure and extension officers to facilitate the data collection exercise. The survey participants are appreciated for accepting to participate in this work.

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