ASSESSMENT OF FACTORS INFLUENCING WOMEN'S BEHAVIOUR TOWARDS MATERNAL, INFANT AND YOUNG CHILD FEEDING IN HOMA BAY COUNTY, KENYA

BY

JANET MWENDE MUTISO

A56/76799/2014

A thesis submitted in partial fulfilment of the requirements for the award of the degree

of Master of Science in Agricultural and Applied Economics

Department of Agricultural Economics

UNIVERSITY OF NAIROBI

December 2017

DECLARATION

I declare this thesis is my original work and has not been presented for a degree in any other university.

Janet Mwende Mutiso

 Reg: A56/76799/2014

Sign……………………..   Date………………………

This thesis has been submitted with our approval as university supervisors:

1. **Prof. Willis Oluoch Kosura** (University of Nairobi)

   Signed……………………   Date……………………………

2. **Dr. Julius Okello Juma** (University of Nairobi/International Potato Center)

   Signed……………………   Date……………………………

3. **Prof. Carl-Johan Lagerkvist** (Sweden University of Agricultural sciences)

   Signed……………………   Date……………………………

DEDICATION

This thesis is dedicated to my family.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACKNOWLEDGEMENT

ABBREVIATIONS AND ACRONYMS

FAO   Food and Agriculture Organization

IYCF   Infant and young child feeding

MIYCF   Maternal, infant and young child feeding

OFSP   Orange-fleshed sweetpotato

SSA   Sub-Saharan Africa

TPB   Theory of Planned Behaviour

UKaid   United Kingdom Agency for International Development

VAD   Vitamin A deficiency

SCT   Social Cognitive Theory

SUSTAIN   Scaling-up Sweetpotato through Agriculture and Nutrition

WHO   World Health Organisation

ABSTRACT

Inadequate dietary intake as a result of poor maternal, infant and young child feeding (MIYCF) practices is the foremost cause of vitamin A deficiency (VAD) in Kenya. Women and children's diets characteristically consist of starchy cereals necessitating nutrition interventions to improve consumption behaviour. Such interventions target intended beneficiaries using behavioural change methods aimed at transforming MIYCF practices. Accordingly, based on a goal-augmented model, this study investigated factors influencing women's behaviour towards MIYCF and the factors determining their use. Specific objectives addressed were (i) To analyse the effect of goals towards exclusive breastfeeding on behavioural intention; (ii) To analyse the effect of goals towards proper complementary feeding with foods that include OFSP on behavioural intention (iii) To analyse the effect of nutrition messaging on the intensity of using recommended infant and young child feeding practices; (iv) To examine the effect of income on mother's consumption of diverse diets. The study focused on women in Homa Bay County due to high incidence of VAD in the county. This study used a cross-sectional research design. Data was collected by administering a well-structured questionnaire to 764 respondents stratified into four categories, namely: pregnant mothers, mothers of 0-5 month old children, mothers with 6-23 month old children and potential mothers (i.e., 16-49-year old women not belonging to the first 3 categories at the time of the study). The study involved a field experiment in which the women were randomly assigned into control and treatment groups. The control group (n=377) was given verbal information on baby foods incorporating OFSP only, whereas the treatment group (n=387) received the information and were shown pre-prepared food samples. Data was analyzed using Partial Least Squares Path Modelling (PLS-PM) and Poisson Regression techniques. Results of the PLS-PM technique show that goals construct was the most significant determinant of intention to practice exclusive breastfeeding and use

of OFSP in proper complementary feeding. For pregnant mothers and mothers with young children (i.e., 6-23-month olds), the most important determinant of goal-setting towards incorporating OFSP in complementary feeding was perceived behaviour control. For potential mothers, on the other hand, subjective norms were the most important influencer of goals to include OFSP in baby foods. Further, multi-group tests showed important difference in knowledge in favour of the treatment group. The results of the estimated Poisson Regression models show that nutrition messaging, counseling, mother-to-mother club health talks and cooking demonstrations positively influenced the intensity of using recommended IYCF practices. They also show that mothers' consumption of diverse diets is positively influenced by membership to a mother-to-mother clubs and off-farm income. Based on these findings, the study concludes that goals, perceived behaviour control and subjective norms are important determinants of intention to use recommended IYCF practices. Further based on Poisson Regression model, results of different nutrition education approaches are essential in adoption of recommended IYCF practices while membership to a mother-to-mother club as well as off-farm income are significant for a woman to consume diverse foods. Improvement of these factors thus could aid improving use of recommended MIYCF practices as well as adoption of OFSP as part of proper young child feeding. The study therefore, recommends that nutrition education interventions should equip mothers with planning and self-efficacy strategies. One strategy could involve use of small planning cards which explain the steps which women take towards implementing their intention. Additionally, nutrition education activities should also seek to influence a woman's social environment. The findings with respect to subjective norms point the need for also targeting women's social and economic environment by involving spouses and mother-in-laws in the nutrition promotions efforts. Moreover, results of the Poisson regression suggest the need to utilize mixed nutrition education methods in influencing behavior change.

x

CHAPTER ONE

INTRODUCTION

1.1 Background

Despite efforts to improve nutrition globally, undernourishment continues to be a major predicament. Globally, 805 million people of whom 28 percent are in Sub-Saharan Africa (SSA) are undernourished (FAO, 2015). Kenya is among the SSA countries with the highest numbers (20 million) of undernourished people (FAO, 2015). Vitamin A deficiency (VAD) is one of the leading micronutrient deficiencies in the country, overly affecting young children and women (WHO, 2015). Notwithstanding other factors, inadequate dietary intake, as a result of insufficient maternal, infant and young child feeding (MIYCF) practices, is the foremost cause of VAD. The Kenya Nutrition and Action Plan (2012-2017) reports that children and women's diets mainly consist of staple cereals that lack ideal diversity to meet nutrient needs (Ministry of Health, 2011). Additionally, only one-third of children less than six months are exclusively breastfed, less than one-quarter of children 6-23 months receive minimum acceptable diet and just 22 percent of pre-school children are properly fed (Kenya National Bureau of Statistics et al., 2015).

To improve consumption behaviour, and to combat VAD, various interventions have been undertaken. Scaling-up Sweetpotato through Agriculture and Nutrition (SUSTAIN) project is one such venture implemented in Western Kenya by the International Potato Center. This agriculture-nutrition intervention undertakes to improve food security by reducing the incidence of VAD through promoting use of recommended MIYCF practices, production and consumption of pro-vitamin A rich biofortified orange-fleshed sweetpotato (OFSP) (SUSTAIN, 2015).

The intervention employs behaviour change nutrition education endeavoring to transform and encourage use of recommended MIYCF practices. Nutrition education, in this context, entails utilization of nutrition messaging (group health talks), cooking demonstrations, mother-to-mother club health talks and nutrition counseling accompanied by provision of OFSP planting materials. On the other hand, recommended MIYCF practices broadly comprise the consumption of diverse foods for women, exclusive breastfeeding for the first six months, and proper complementary feeding after the age of six months with foods that incorporate OSFP. Optimistically, it is anticipated that provision of knowledge will motivate beneficiaries to voluntarily adopt recommended practices. Nevertheless, the intensity of adopting advocated practices prospectively varies as do women's socio-economic factors such as income, nutrition education strategies and psychosocial factors (Jonesa et al., 2012).

Women also tend to differ in their intention to use the practices. Intention precedes behaviour and is the perceived likelihood that a person will engage in a given practice (Ajzen, 2002). Intention to use recommended feeding practices is moderated by psychosocial factors, knowledge, goals, recovery efficacy and habits. Even so, in assessing factors influencing women's decision to take up these desired feeding practices, socio-economic aspects have been given more prominence at the expense of psychosocial factors. At the same time, it is not clear whether this reliance on socioeconomic factors to explain the uptake of desired feeding practices provide sufficient insights to fully understand the behaviour of the mothers. It is therefore essential to comprehensively understand factors that determine women's intention and behaviour to help facilitate the reach of the interventions, besides support targeting of behaviour change messages. This study, for that reason, assessed the determinants of maternal, infant and young child feeding behaviour from a psychosocial perspective while taking into view the socio-economic factors that are also likely to influence these practices.

1.2 Statement of the Problem

Nutrition education has been supported as one suitable way to create awareness on proper nutrition practices in attempts to deal with VAD. Literature on nutrition education, both as a stand-alone intervention and a complement to other interventions, is vast (e.g. (Bhutta et al., 2013; Ruel, 2013; Liu et al., 2009). Most of this evidence suggests that provision of appropriate nutrition information could lead to improved nutrition status and knowledge. Nonetheless, limited attention has been given to behaviour change factors (Darnton-hill, 2014; Masset et al., 2011). Information is scanty about the relationship between psychosocial constructs known to influence behaviour and the behaviour intention towards using recommended infant and young child feeding (IYCF) practices among mothers in developing countries. Indeed, the few existing studies on this area have all been conducted in developed countries (Thomas et al., 2015; Marshall, 2013; Hamilton et al., 2010). Outcomes of nutrition interventions, constructive or modest, are entrenched on social and cognitive influences. Hence, lack of understanding of how these elements/influences affect IYCF in a developing country context is an important gap in the literature that this study sought to fill.

Determinants of the use of recommended IYCF practices and mother's consumption of varied diets vital elements of food security and consumption behaviour have also been overlooked (Thompson, 2014). In addition, nutrition education strategies used in interventions are often mixed, thus calling for the understanding of the effect of different nutrition information dissemination channels and psychosocial factors on the use of MIYCF. This study therefore also contributes to the literature by identifying the psychosocial and socio-economic drivers of MIYCF behavior among mothers.

1.3 Overall Objective of the Study

The overall objective was to assess factors influencing women's behaviour towards maternal, infant and young child feeding in Homa Bay County

1.4 Specific Objectives

1. To analyse the effect of goals towards exclusive breastfeeding on behavioural intention

2. To analyse the effect of goals towards proper complementary feeding with foods that include OFSP on behavioural intention

3. To analyse the effect of nutrition messaging on the intensity of using recommended infant and young child feeding practices

4. To examine the effect of income on mother's consumption of diverse diet

1.5 Hypotheses

1. Formulation of goals towards exclusive breastfeeding does not influence behavioural intention

2. Formulation of goals towards proper complementary feeding with foods that include OFSP does not influence behavioural intention

3. Provision of nutrition messages to mothers has no effect the intensity of using recommended infant and young child feeding practices

4. Income has no effect on mother's consumption of diverse diet

1.6 Justification of the Study

This study focused on groups vulnerable to VAD in line with scaling–up nutrition (SUN) framework and UKaid's nutrition strategy. More broadly, this study is in line with global agenda of promoting nutrition-sensitive agricultural interventions targeting poor developing country households. It particularly aligns with sustainable development goal (SDG) number two and three which advocate for zero hunger and good health and well-being respectively.

This study will contribute to literature by identifying behavioral factors influencing infant and young child feeding behaviour. Such information can be used to develop more effective nutrition education campaigns. Therefore support the targeting and integrating of information

channels in promotional campaigns aimed at encouraging the adoption of the recommended MIYCF practices. Knowledge of mother's demand for food diversity as well as identifying the factors that affect demand for dietary diversity gives a better understanding of the consumption patterns that can assist in advocacy for healthy diets. Further, stakeholders advocating for healthy consumption behaviours will use the findings of this study in planning, implementing, improving and strengthening nutrition-sensitive agricultural interventions aimed at realizing the sustainable development goals that target the reduction of maternal and infant mortality rates from all preventable courses.

1.7 Study Area

Homa Bay county is one of the five counties where SUSTAIN project is being implemented in Western Kenya. The county borders Kisumu and Siaya counties to the North, Kisii and Nyamira counties to the East, Migori County to the South and Lake Victoria and the Republic of Uganda to the West (see Appendix 3) (Kenya National Bureau of Statistics, 2013). It is estimated that 41.9 percent of the total population are women of reproductive age (19-49 years). Poor infant feeding practices are a major challenge in the county. Early breastfeeding initiation is estimated to be 41 percent of infants, only 35 percent of children 0-5 months old are exclusively breastfed, and 50 percent of children, aged less than 2 years, are given minimum acceptable diet (Kenya National Bureau of Statistics, 2013). Of the under-five children population, 15 per cent were under weight, 26.3 per cent are stunted and about 4.2 percent wasted (Kenya National Bureau of Statistics, 2015). Moreover, a baseline study conducted by CIP (Okello et al, 2015) found that dietary diversity of mothers of child-bearing age was just above the recommended level of five food groups.

<div align="center">**CHAPTER TWO**</div>

<div align="center">**LITERATURE REVIEW**</div>

2.1 Psychosocial factors that influence behaviour intention towards infant and young child feeding practices

Several studies have sought to evaluate psychosocial factors predicting two main infant and young child feeding practices exclusively breastfeeding and complementary feeding. These studies have focused on mothers' knowledge, attitudes and norms as the main predictors of behaviour intention. Thomas et al (2015) investigated knowledge, attitudes and self-efficacy in relation to intention to breastfeed exclusively among pregnant women in rural Bangladesh. Using a standardized questionnaire, factors associated with exclusive breastfeeding was assessed among pregnant women. Results indicated that knowledge, attitudes and self-efficacy were independently associated with intention. Counseling during pregnancy and literacy were each associated with knowledge and intention. The authors observed that results reinforced the importance of counseling to increase exclusive breastfeeding. This current study assessed the relationship between these factors and proper complementary feeding including OFSP.

Marshall (2013) examined the influence parents' attitudes, subjective norms, perceived behavioral control, and intentions have on the timing and introduction of complementary foods. Data was obtained from 131 first-time parents with children between six and twelve months. Path analysis results indicated that parents' attitudes influenced infant feeding behavior at six months old. This current study adopted the same quantitative methods, but with a different sample design. The current study specifically targeted all women in the reproductive age of 19-49 years.

Adopting theory of planned behaviour incorporating additional normative and demographic influences Hamilton et al (2010) assessed mothers' complementary feeding intentions and behaviour. The study questionnaire was based on the theory of planned behaviour constructs and a follow-up questionnaire assessed the age in months at which the infant was first introduced to solids. Results highlighted the importance of attitudes, normative influences, and individual characteristics on decision-making relating to complementary feeding interventions aimed at improving adherence to maternal feeding guidelines.

2.2 Factors influencing intensity of using recommended infant and young child feeding practices

In the assessment of factors influencing use of recommended infant feeding practices most studies (Patel et al., 2015; Westbrooks, 2015; Hendreş et al., 2014) have tended to focus on assessing just one practice . However, two studies assessed factors determining the intensity of using a number of stated practices. First, Hotz and Gibson (2005) conducted a quasiexperimental pilot study in southern Malawi to evaluate adoption of nutrition education by mothers of children aged 6 to 23 months. The aim was to assess adoption of practices for improving complementary feeding and association with improved dietary intakes. They targeted three intervention communities and one control community before and after the intervention. Results indicated that adoption rates for the four practices targeted ranged from 25% for the preparation of enriched porridges, to 10% for preparing soaked, pounded maize. They concluded that the three intervention practices were well-accepted and were associated with improved adequacy of energy and nutrient intakes from the complementary diet. In this study, adoption was assessed using a regression technique and data from a cross section study. Moreover, the practices evaluated where based on those commended by world health organisation as well as use of OFSP for young child feeding.

Lohia and Udipi (2014), on the other hand, created an index based on five aspects namely, breastfeeding, use of feeding bottle, dietary diversity score, food group requency score and feeding frequency scores and assessed associated factors. They noted that the index of feeding practices was positively associated with mothers age. In creating the index used as the dependent variable this study focused on nine feeding practices and the adoption of bottle feeding was not considered.

2.3 Factors affecting consumption of diverse diet

Consumption of diverse foods has been studied as demand for diverse diet at different levels. Lee (1987) used a negative binomial model to study households' demand for a varied diet. The relationship between food expenditures, household characteristics, and the demand for different food items was assessed. Results indicated that increases in food expenditure increased the number of food items consumed at home. The number of food items consumed at home was, in turn, positively related to increases in the number of household members. Unlike Lee (ibid) this current study focused on assessing only the effect of household characteristics on mothers' demand for varied diets.

Zakaria and Laribick (2014) argue that age, marital status, household membership structure, participation in household decision making, ethnicity and literacy are the key socio-economic factors that affect mothers' dietary choices. Using data obtained from Northern Ghana, they found a low dietary diversity (five food groups) among mothers, hence a comparable score as obtained from a sample of mothers in the study area during the baseline survey conducted by CIP. Rashid, Smith, and Rahman (2006) used data from a household expenditure survey conducted in Bangladesh in 2000 on the food acquisition behavior of 7,440 households over a two-week period to assess determinants of diet quality. Two indicators of dietary quality were employed: household protein availability and household diet diversity. Using two-stage least squares regression to correct for the endogeneity of income, education, the gender of

8

household head, and prices of key foods were found to have significant influence. Male education played a positive role, female education was found to have substantially stronger influence. Unlike his study we used one indicator of women diet diversity based on a 24-hour recall. A different empirical method poisson regression method was used instead of two-stage least squares regression.

Misker, Misker and Ayele (2016) used multivariate logistic regression model in assessing household dietary diversity and associated factors in Mirab Abaya Wereda Southern Ethiopia. Results of the fitted model indicated sex of household head; marital status, monthly expenditure and dependency ration were associated with dietary diversity. Tankari and Badiane (2015) assessed the household food diversity among households in Uganda using a latent class model. They found that the structure of the household and area of residence affect food diversity demand. This study focused only on mothers' demand for diverse diets rather than the household food diversity.

CHAPTER THREE

METHODOLOGY

3.1 Conceptual Framework

From literature, age, income and status of the mother may influence behaviour regarding MIYCF (Beyene, Worku and Wassie, 2015; Laterra et al., 2014; Radwan, 2013). Household income is a determinant of household food security and affects feeding and diet diversity (Misker, Misker and Ayele, 2016). Different forms of nutrition education, such as counseling and nutrition messaging may have different and separate effects. Mother-to-mother club nutrition education is an important factor as it further provides a social environment for sharing opinions on MIYCF practices. Psychosocial factors determine the direction and strength of behavioural intention to use recommended MIYCF (Thomas, et al., 2015). Psychosocial variables include attitudes toward the behaviour, subjective norms, knowledge and the perceived behavioural control. Individuals with high nutritional knowledge, perceived behaviour control, and positive attitudes are more likely to intend to use recommended infant and child feeding practices compared with those with low nutritional knowledge and negative attitudes. Use of recommended MIYCF practices can also differ as a function of distance to a community health worker and mothers' visits to ante-natal and postnatal clinic.

Figure 3.1: The Conceptual Framework
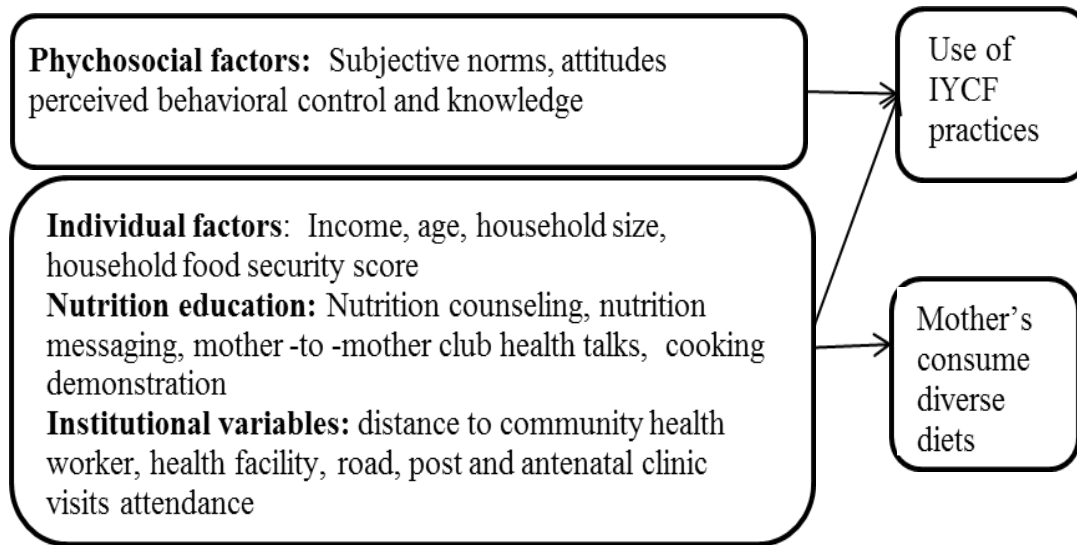
Source: Author's Own Conceptualization (2016).

3.1.1 Data Sources

Primary and secondary data were used in this study. Primary data was obtained from selected respondents using pre-tested structured questionnaires administered by trained enumerators through interviews. Data on socio-economic characteristics, feeding practices used and information on respondents' attitudes, knowledge, motivational factors, subjective norms, descriptive norms, self-efficacy, goals, emotions, habits and perceived behavioural control was collected on a seven-point scales. Secondary data was obtained from a review of existing literature (published or unpublished journals, NGO'S and government reports) on the general area in which the problem falls. This data provided information for literature review and drawing conclusions on some of the findings of this study.

3.1.2 Research Instrument

A questionnaire was developed, based on a review of relevant literature. The variables included in the questionnaire were operationalized as recommended by Ajzen (2005). It was

pre-tested and adjusted accordingly before the final data collection. First, the pilot-test was conducted on 60 respondents to assess the reliability of the knowledge questions, self-efficacy scale, and PBC scale. The data were analyzed, and results indicated the self-efficacy scale items were appropriate. The final pilot-test of all constructs in the questionnaire was conducted on 25 respondents.

3.1.3 Sampling Design and Procedure

The study used a cross-sectional design and systematic sampling method. First, Homa Bay County was purposively selected owing to the fact that it is one of the counties that received SUSTAIN intervention the earliest. Nine community units Miriu, Kakangutu East, Rongopala, Sino, Kamioro, Kakangutu West, Got Kamondi, Kakelo Dudi A and B where SUSTAIN project had worked since 2014 were also selected purposefully. In each selected community unit, villages were listed and a sample drawn randomly using probability proportionate to size sampling technique. For the sampled villages, with the help of community health volunteers, eligible households were listed and stratified by the categories of women: pregnant mothers; mothers of infants; mothers of young children and potential mothers. From the list generated a random sample was systematically drawn from each of the four categories of women. The sample size for each category was determined using the formula by (Magnani, 1997):

$$n = D \left[\left(Z_\alpha + Z_\beta \right)^2 * \frac{\left(P_1(1 - P_1) + P_2(1 - P_2) \right)}{(P_2 - P_1)^2} \right]$$

P_1 = the estimated level of an indicator measured as a proportion at the time of the first survey or for the control area

P_2 =   the expected level of the indicator either at some future date such that the quantity

$(P_2 - P_1)$ is the size of the magnitude of change it is desired to be able to detect

Z_α =   the Z-score corresponding to the degree of confidence with which it is desired to be

able to conclude that an observed change of size $(P_2 - P_1)$ would not have occurred by

chance (α - the level of statistical significance), and Z_β =   the z-score corresponding to the

degree of confidence with which it is desired to be certain of detecting a change of size

$(P_2 - P_1)$ if one actually occurred (β - statistical power). Assuming an increase of 20

percentage points in the proportion of women using recommended infant and young child

feeding practices was assumed to be measured. Using standard parameters of 95 percent level

of significance (α) and 90 percent statistical power (β). Inserting these values in the above

formula yields the following result:

$$= \ 2\,[(3.42693/.04] = 2\,(85.67329) = 171.34658 \sim 172\,res.\,per\,category.$$

After adjusting for non –response the total sample size was what 764.

3.2 Predicting Behaviour Intention

3.2.1 Theoretical method: Model of Goal-Directed Behaviour

This study used the Model of Goal-Directed Behaviour (MGB), formulated by Perugini and

Bagozzi (2001), to address Objective 1 and 2 that focused on assessing the intention to use

recommended IYCF practices. The model framework is presented in Figure 3.2 below. MGB

broadened the Theory of Planned Behaviour (TPB) by adding goals as the immediate

predictor of behavioral intentions and embracing anticipated emotions as predictors of the

construct. TPB posits that the most important determinant of a person's behaviour is the intention (Ajzen, 2002). Behaviour intention in the form of readiness to perform a certain behaviour/practice is predicted by three factors, namely: attitudes towards behaviour, subjective norms, and perceived behaviour control (Ajzen, 2005). In this study, intention signifies a person's willingness or reluctance to adopt behaviour, which is in turn determined by goals, habits, knowledge, and recovery and coping efficacy.

According to goal setting theory (Kruglanski et al., 2002), goals are the desired end-states and represent cognitive constructs having distinct motivational meaning. In the MGB, the goal construct was introduced as the most proximal motivational determinant of intentions (Perugini and Bagozzi, 2001). Goal setting involves outlining when, where and how intentions will be translated into action or, in our case, observed behavior/practice (Gollwitzer and Sheeran, 2006). Habits are then related to the goal-directed pursuit and are defined as "the automaticity and the effectiveness of behavior" (Verplanken, 2006). In constant circumstances, goal-setting can be expected to be more automatic. Strong habits shape future behaviour (Sommer, 2011; Ouellette and Wood, 1998).

Knowledge refers to the level of awareness, which in our context relates to awareness of infant and young child feeding practices. It helps in the comprehension of the best way to follow in realizing behavioural intention (Pellegrini, 2007). Recovery and coping efficacy is defined as the ability to maintain a plan, develop routines, and cope with unexpected barriers (Sniehotta, Scholz and Schwarzer, 2005). Behaviour intention might be hard to adhere to, but with recovery and coping efficacy, one can put more effort and persist in overcoming obstacles (Schwarzer and Renner, 2000).

Figure 3.2: Research Model for Psychosocial Variables Hypothesized to Predict Behaviour Intention
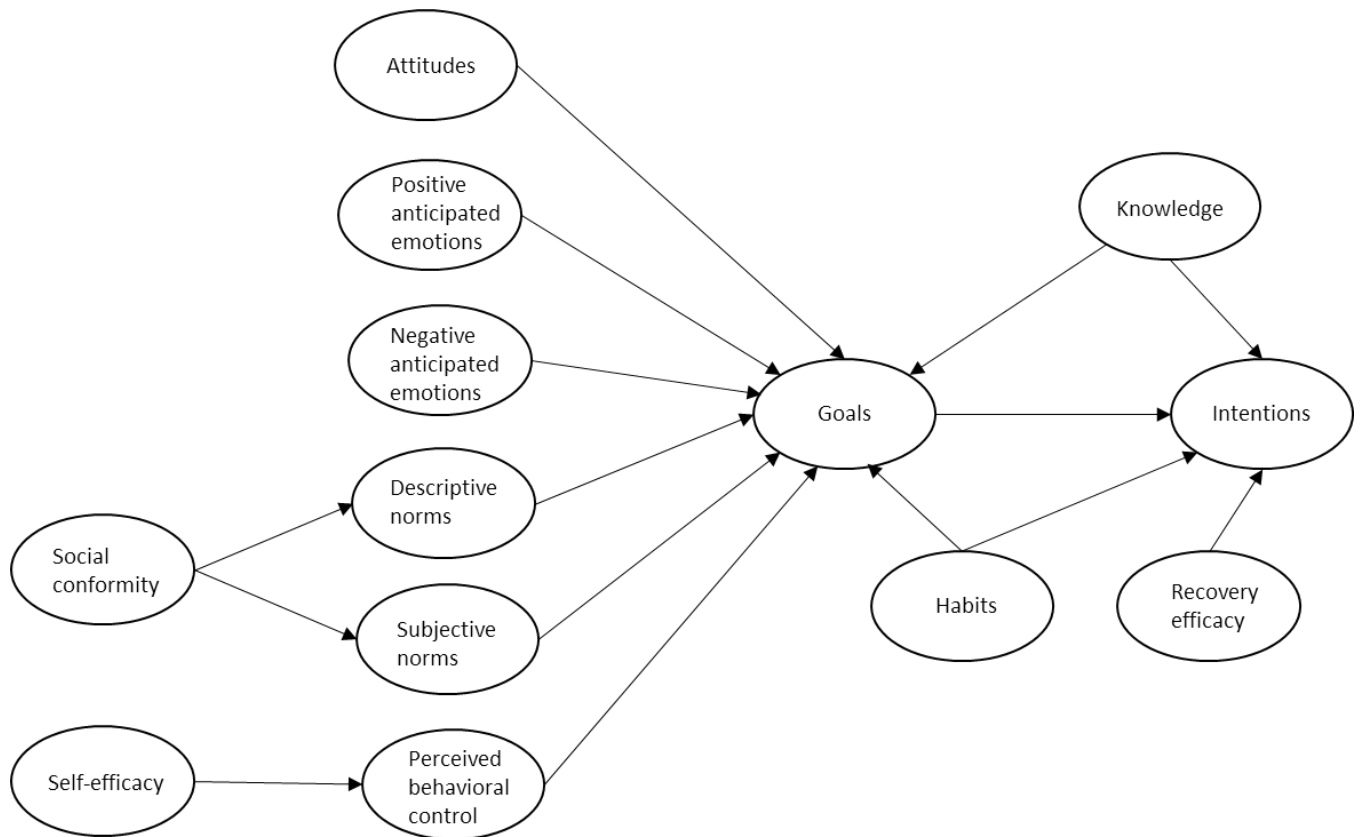
Source: Author's Own Conceptualization (2016).

3.2.2 Determinants of goals

Attitudes - refers to the positive and negative evaluations of a behavior (Ajzen, 2005). Attitudes can be acquired from experience and comprise of cognitive and affective components (Ajzen, 2005). Cognitive aspect deals with thoughts associated with the practices and affective attitude is the feelings about the behaviour and relates to whether a person finds the behaviour enjoyable or otherwise to perform. Positive attitudes are likely to drive a person to plan and set goals while to the contrary, negative attitudes elicit undesirable outcome expectancies hence people will less likely set explicit plans (Bandura, 2004).

Emotions - based on the MGB, goals are influenced by both positive and negative anticipated emotions. Emotions refer to positive or negative sentiments and feelings deriving from undertaking a behavior. A behavior such as exclusive breastfeeding can thus either elicit positive or negative emotions, which in turn influences goals.

Subjective norms - Subjective norms relate to how a person estimates the effect of social pressure on the person's likelihood to undertake behaviour (Ajzen, 2002). According to Ajzen and Fishbein (1975), subjective norms refer to one's belief about and tendency to behave in accordance with other people's expectations. That is, doing what others think one should do. This construct, therefore, deals with one's perception or judgment of the approval or disapproval by other important people and/other societal norms

Descriptive norms - Refers to the need to identify with others in relation to the community standards (doing what others do). Descriptive norms are determined by the strength of the belief and motivation to comply (Ajzen, 2002).

Ajzen (2002) further argues that social conformity influences not only the descriptive norms but also subjective norms. It affects the strength and direction of both descriptive and subjective norms.

Perceived behaviour control (PBC) - refers to the perception of the control one has over performing behaviour. The TPB posits that PBC influences both behaviour intention and, subsequently, the behaviour directly (Ajzen, 2005).

Self-efficacy - is a determinant of the strength and direction of perceived behaviour control and can, therefore, be expected to indirectly influence goal-directed pursuit. In this study, following Bandura (1977), self-efficacy was defined as a person's belief that he/she will be able to perform a behavior even when confronted with specific barriers. Self-efficacy may be

acquired through (Bandura, 1989): (i) vicarious experiences–a person is influenced by observing others; (ii) verbal persuasion– bolsters belief to succeed; (iii) planning –detailed plan of steps to create behaviour change.

3.2.3 Empirical Method: Partial Least Squares-Path Modeling

In order to empirically assess the relationship between psychosocial constructs and behaviour intention towards exclusive breastfeeding and complementary feeding incorporating OFSP, the Partial Least Squares-Path Modeling (PLS-PM) technique was employed. PLS-PM, also known as Partial Least Squares-Structural Equation Modelling (PLS-SEM), is a variance-based technique which involves estimation of a measurement model (inner model) and structural model (outer model) (Hair et al., 2014). The measurement model shows the relationship between manifest variables while the structural model shows the relationship between latent variables. The linear function of the measurement model used in this study was adapted from (Henseler Ringle and Sinkovics, 2009) and is specified as:

$$X_x = \Lambda_x \xi + \varepsilon_x \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where Λ represents the loading coefficients, ξ is the vector of latent variables, x is the manifest variable and ϵ is the residual. Since the measurement model is predictor specific the equation (1) can be reduced to:

$$(X_x | \xi) = \Lambda_\chi \xi \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

The structural model can be specified as shown below:

$$\xi = B\xi + \zeta \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

Where ξ the vector of latent variables, B denotes the matrix of coefficients of their relationships, and ζ represents the structural equation residuals.

The implicit functional forms of the structural model equations can be represented as below:

$$Descriptive\ norms = \ f(Social\ conformity) + \zeta \ \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\text{(4)}$$

$$Subjective\ norms = \ f(Social\ conformity) + \zeta \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\text{(5)}$$

$$Perceived\ behaviour\ control = f(self - efficacy) + \zeta \dots\dots\dots\dots\dots\dots\dots\dots\text{(6)}$$

$$Goals$$
$$= f\ (Positive\ emotions, negative\ emotions, Descriptive\ norms, Subjective\ norms,$$

$$Attitude, PBC, habits, Knowledge) + \zeta$$
$$\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\text{(7)}$$

$$Intention =$$
$$f(Goal - directed\ pursuit, Habits\ , Knowledge\ , Recovery\ and\ coping\ efficacy) + \zeta$$
$$\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\text{(8)}$$

3.2.4 Measurement of Variables Used in PLS-PM Model

i) Defining the Behaviour

Behaviour was defined at the same level of specificity regarding context, action, target, and time, in line with the recommendations of TPB (Ajzen, 2002). Exclusive breastfeeding was defined as feeding infant child aged 0-5 months on mother's breast milk only by putting the infant to the breast or on expressed breast milk. Data on complementary feeding including OFSP was collected as part of a field experiment; respondents were randomly assigned to a treatment or control group. The control group was provided with only the verbal information about baby foods incorporating OFSP while the treatment group was shown prepared baby foods incorporating OFSP in addition to the verbal information. Enumerators first provided a

participant assigned to them with a definition of behaviour under study, namely, proper complementary feeding after the age of six months with foods that include OFSP of about 125g at least three times a week. A sample of OFSP root weighing approximately 125g was shown to the participant as part of defining the behaviour under study. Proper complementary feeding incorporating OFSP was described in detail as entailing:

(i)   Giving a young child foods of the right amount and density at the right frequency depending on a child's age [Feeding frequency: 6-8 months>> 2-3 meals>>2-3 table spoons; 9-11 months >>3-4 meals>>1/2 250ml bowl/cup; 12-23 months >> 3-4 meals>>3/4 250ml bowl/cup]

(ii)   Giving a young child diverse foods (at least four types of foods)

(iii)   Continued breastfeeding up to 2 years

(iv)   Incorporating OFSP of about 125g at least three times a week

After this definition, the participant was asked whether she had any questions or needed clarifications concerning what proper complementary feeding incorporating 125g of OFSP at least three times per week meant. If the answer was negative, they were asked to briefly mention the requirements of complementary feeding. This procedure was to ensure that the participants clearly understood the meaning of complementary feeding incorporating OFSP.

Next, the participant was informed that OFSP is a new variety of sweetpotato that is appropriate for inclusion in a young child's complementary food because it can supply adequate amounts of vitamin A which the body needs to prevent blindness and fight common childhood diseases such as diarrhea. They were also informed that OFSP also contains energy which the child needs to remain active.

The third step involved giving the respondent verbal information about the ways OFSP can be incorporated in young child's complementary food. Specifically, four ways of

incorporating boiled OFSP root young child's food were described. These foods described were:

1.   Mashed OFSP (125g)

2.   Mix/mash: boiled OFSP root + eggs + pumpkin leaves + boiled water into a fine/uniform mix/blend and then feed to the child

3.   Mix/mash: boiled OFSP root +avocado +milk into a fine/uniform mix/blend and then feed to child

4.   Mix/mash: boiled OFSP root + beans (de-hulled) + pumpkin leaves + boiled water into a fine/uniform mix/blend and then feed to the child

Lastly, and for the treatment group only, samples of the above foods were shown to the respondents. The respondents were expected to taste the samples. The respondents were again asked at this stage if they had any questions or needed any clarification on the four complementary foods incorporating OFSP. Any questions and needed clarifications were addressed by the enumerator before proceding to the questions. The interviews were conducted in the respondents respective homes hence no cross-influence.

ii) Model Constructs

Attitudes were assessed using eight items modified from Fishbein and Ajzen (2010) for example, 'for me to perform behaviour is…' bad /good, expensive/inexpensive, foolish/wise, harmful/beneficial, pleasant/unpleasant and healthy/unhealthy. An example of the indicator item used to evaluate attitude was: 'For me, complementary feeding with OFSP after the age of six months is…' (Bad/ Good).

Positive emotions were measured using sixteen statements on a five-point scale from "not at all" to "extremely" to the questions assessed whether using the specified feeding practice made them: feel relaxed, anti-stress, amused, energetic, merry, happy, tender, cuddled, sensual, secure, happy memory, generous, surprised, and curious.

Negative emotions in this case, seven statements were measured on a five-point scale from ''not at all" to ''extremely" with items assessing whether using the practice made one feel: annoyed, guilty, disappointed, sad, neglected, bored or indifferent. The emotions items were disaggregated based on (Spinelli et al., 2014).

Social conformity factors were measured using four items assessed on a seven-point scale (agree/disagree); 'when it comes to performing the behaviour I want to do what…' my mother-in-law, partner, doctor and friends think I should do' (Fishbein and Ajzen, 2010).

Subjective norms- four items on seven-point scales, in accordance with Ajzen's (2002), were used. 'Most people who are important to me think that I should perform the behaviour' (false/true); an example of one item is: 'Most people who are important to me think that I should exclusively breastfeed an infant for the first six months' (false/true).

Descriptive norms- five items (for each behaviour) were used to assess descriptive norms: 'Most people who are important to me think I (should/should not) perform behaviour; 'Most people who are important to me think it (would be a good idea/would not be a good idea) to perform behaviour '; 'Most people who are important to me (want/do not want) me to perform behaviour'; and 'I feel under social pressure to perform behaviour' (disagree/agree). All items were measured on seven-points scales and mean score calculated for the variable (Fishbein and Ajzen, 2010).

Goals- were assessed using five items to all on the seven -point scale (Not at all/exactly true) (Sniehotta, Scholz and Schwarzer, 2005; 2006). The items measured the likelihood of planning implementation by assessing if the respondent had made an explicit plan about when, how and whom to perform the behaviour and also plans to cope with eventualities (i.e., coping planning). Example of the item used was: I will have to continue exclusively breastfeeding for the first six months even if I have to make a lot of preparations initially.

Perceived behavioral control (PBC) - was measured using four items all measured using seven-point scales. These items measured feeling about control and the confidence of the respondent to successfully perform a practice: 'If I really wanted to, I could perform behaviour' (likely/unlikely); 'I am confident that I can perform behaviour' (true/false); 'For me to perform behaviour is under my control' (not at all / total control) and 'performing behaviour is completely up to me' (agree/disagree). The seven-point scale was pilot-tested before the actual study on 60 respondents and adjusted accordingly as earlier discussed.

Self–efficacy - seventeen-item self-efficacy scale that assessed situation-specific barriers with regard to performing behaviour in under different conditions was used. The conditions/situation included: when I feel depressed, bored, or tense, under lots of stress, there is no one to encourage you, eating with friends or co-workers, I have no spouse/partner, my mother dislikes it, my mother-in-law dislikes it, etc. Participants responded to each item on a seven-point scale (I am sure I can /I am sure I can't (Schwarzer and Renner, 2008). This scale was also pilot-tested before the actual study on 60 respondents and analysis conducted suggested that it was satisfactory to have the scale with a uni-dimensional factor structure.

Intention was measured using four items measured on seven-point scales: 'I expect to perform behaviour (definitively do/definitively don't)'; 'I'm willing to perform behaviour

(likely/unlikely)'; 'I will perform behaviour (True/false)'and 'I plan to perform behaviour (agree/disagree)'.

Knowledge awareness of nutrition factors related to maternal infant and young child feeding were measured on a three point scale (true/false/don't know).

Habits were measured on a five-point scale agree/disagree with eleven items checking whether performing behaviour was something they frequently do, automatically, without having to think consciously, makes one feel weird if one were not to do, do without thinking much about it, that would require effort not to do, that belongs to routine, I would find hard not to do, have no need to think about doing, that is typically them and have done for a long time (Verplanken, 2006).

Recovery and coping efficacy were measured with eight items that asked how confident the one was that one could stick to performing the behaviour. …even if one had to; make a detailed, take a long time to get used to it, done did not receive a great deal of support from others when making my first attempts, one had worries and problem, one was tired and busy (Sniehotta, Scholz and Schwarzer, 2005).

3.3 Determinants of Using MIYCF Practices

3.3.2 Theoretical method: Lancaster's consumer theory

To assess mothers' consumption of diverse diets the Lancaster's consumer theory was applied. The theory has been used to assess factors that affect numerous behaviors in demand for diet diversity and healthy food (e.g. (Lee, 1987; Zakaria and Laribick, 2014; Tankari and Badiane, 2015). In this study a woman is assumed to be consuming from a particular food group that will generate nutrients valued. It is from the nutritional value of items consumed that a woman will derive utility. The characteristic of the model which posits that not the good but the characteristics contained in it generate utility was applied (Lancaster, 1971).

Women preferences are based on the characteristics that the food groups possess. Utility is generated by the attributes possessed by the food groups. Women behaviour is a result of utility maximization in terms of a bundle attribute and based on this approach the utility function for a woman can be defined as:

$$U=U(X1, X_2...X_M)..(9)$$

Where 1, 2,….M are different food groups and the total quantity will be derived by a woman from consuming all specified food groups as the characteristics model allows for linear combination. Since, it is postulated that the utilities are a function of a set of independent variables X, which describe a woman n and the food group consumed. The resulting utility equation can be written as (Long, 1997):

$$u_{in} = V(X_{in}; \beta) + \varepsilon_{in} .... (10)$$

Where U_{in} is the utility of consuming from a food group i where i is $[1, . . . ,J]$ for a woman n; X_{in} is a vector of independent variables, β is the coefficient to be estimated, V is the function of the independent variables and the coefficient and ε_{in} random disturbance for i& n. The choice of consuming from a food group can be characterized as show in the equation below (Gujarati and Porter, 2009):

$$y_i= f(x_i), ... (11)$$

Where $y>0$ when a woman consumes from a food group and $y<0$ with no consumption from a food group, the indicator variable $y_i=1$ when $y_i > 0$ and there is consumption, with $y_i=0$ if a woman does not consume from any of the food groups. The function represents unobservable behaviour, which is a function of a set of explanatory factors x_i and a linear sum of Equation (11) has the form (Gujarati and Porter, 2009);

$$Y_i^* = \beta_i x_i + \varepsilon_i .... (12)$$

Where $Y_i^* = 1$ if $Y_i^* > 0$ and $Y_i^* = 0$ otherwise, β_i is a vector of unknown coefficients controlling the relationship between explanatory variables, x_i and consumption from a group,

and ε_i is a random error. Since Y_i* was measured as a count value and positive integer greater than zero a count regression model was applied.

3.3.3 Empirical method: Poisson Regression model

In order to examine factors associated with the intensity of using recommended IYCF practices and women demand for diet diversity, this study used Poisson regression technique. Intensity of using IYCF was measured as the number of recommended IYCF practices used and diet diversity as the number of food groups consumed by a woman, respectively. The two dependent variables relate to Objective 3 and Objective 4, respectively. They are count variables which take the values 0, 1, 2, 3…n hence the use of Poisson regression models. The Poisson model can be specified as shown below (Gujarati and Porter, 2009):

$$\text{Prob}(Y_i = y_i | x_i) = P(y_i) = \frac{\lambda_i^{y_i} e^{-\lambda_i}}{y_i!} \quad \text{...(13)}$$

Where y_i is the number of IYCF practices used/ number of food groups consumed respectively for Objective 3 and Objective 4, x_i is the vector of independent variables, $P(y_i)$ is the probability of using a practice, λ_i and is the mean value of the practices used/ number of food groups consumed. The log-linear function derived from Equation 13 can be specified as: $\ln \lambda_i = x_i' \beta$…………………………………………………………………..… (14)

Where, x_i' is the transpose of covariates and β the coefficients to be estimated. The expected number of recommended IYCF practices used/ number of food groups consumed can be expressed as:

$$\lambda_i = \varepsilon[(y_i|x_i)] = \exp(x_i'\beta) \ for \ i \ = \ 1,2,\dots,n \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \ (15)$$

From the function above, the implicit functional form of the model used to estimate the expected number of recommended IYCF practices used can be specified as:

$$\begin{aligned} Expected \ number \ of \ IYCF \ practices \ used \\ = f(Individual \ factors, Nutrition \ education, Psychosocial \ factors, \\ Institutional \ factors) + \varepsilon \end{aligned}$$

(16)

Also from the function in (11), the implicit functional form of the model to be used to estimate factors affecting diet diversity score can be specified as:

$$\begin{aligned} Diet \ diversity \ score = f(\ Individal \ factors, \ Nutrition \ education, institutional \ factors) + \\ e \end{aligned}$$

(17)

3.3.4 Measurement of Variables Used in Poisson Regression Model for MIYCF

a) Dependent variables

The number of IYCF practices used was assessed for a mother who at the time of data collection had received some form of nutrition education. A dichotomous scale (yes/no) was used to record the responses for each of the practices described in Table 3.1. That is, the practice was assigned a 1 if the woman practiced it and 0 otherwise. A total count for each respondent was then obtained and used as proxy for intensity of using recommended IYCF practices. The total count for a woman who followed all the practices was 9. Hence the number of practices ranged from 0 to 9.

Table 3.1: Description of infant and young child feeding (IYCF) practices

	Practice	Description
1.	Breastfeeding initiation	Early breastfeeding within the first hour
2.	Exclusively breastfeeding	Giving only breast milk for the first six months
3.	Continued breastfeeding at 1 year	Breastfeeding between12-15 months
4.	Meal frequency	6-8 months, 2 meals; 9-23, 3 meals; 6-23, 4 meals
5.	Child diet diversity	Feeding different foods
6.	Texture	Feeding acceptable texture and consistency
7.	Minimum diet diversity (child)	Feeding of at least 4 groups of food
8.	Feeding OFSP roots	Incorporating OFSP into a child's food
9.	Feeding OFSP leaves	Incorporating OFSP leaves into a child's food

Source: Author's Own Conceptualization (2016).

Table 3.2 describes food groups used to assess maternal diet diversity. Food groups consumed were assessed using the FAO scale of nine food groups. A 24-hour dietary recall was conducted to obtain the information. Consumption of any amount from a food group was considered to be sufficient.

Table 3.2: Description food groups

Food Group	Description
Starchy	Any Cereals foods, white tubers and roots e.g. maize, rice
Legumes nut and seeds	Any beans or peas, including soybeans
	Any nuts or cashews or seeds like pumpkins or sunflower
Milk and milk products	Any dairy products like milk, or other milk products
Flesh food	Any organ meat, Any beef, Any other kind of fish,
Eggs	Any eggs
Dark green leafy vegetables	Any dark green / leafy vegetables, including wild ones
Other vegetables	Any other vegetables (e.g. tomato, onion), including wild vegetables
Vitamin A rich vegetables	Any pumpkin, carrots, squash
Vitamin A rich fruits	Any ripe mangoes, cantaloupe, ripe papaya
Other fruits	Any other kind of fruits including wild fruits, such as ochwa

Source: FAO (2015).

b) Independent variables

1. **Individual characteristics:** *Lnag*e= natural log of the age of the respondent in years. Previous studies have found contrasting results with regard to age and use of recommended feeding practices (Zakaria and Laribick, 2014; Radwan, 2013). In a Nepalese study, age did not influence the initiation of breastfeeding (Subedi et al., 2012). However, a comparative study in four Asian countries found age to be significantly associated with complementary feeding practices (Rana et al., 2016). In the case of a Nigerian study (Onah et al, 2014), there was a significant association between age and exclusive breastfeeding but no effect on the initiation of breastfeeding. Age is expected to

have a positive sign in this study because senior mothers are more experienced, hence likely to use more of the recommended IYCF practices.

Lnofarminc = natural log of total household income earned in 2015 in Kenya shillings from self-employment, casual work, and permanent employment. Access and control of income influence consumption patterns (Tankari and Badiane, 2015). It is therefore hypothesized in this study that off-farm income is negatively related to use of recommended IYCF practices, for instance working mothers may not be able to breastfeed exclusively in addition it may be hard to monitor their child's complementary feeding practices.

Birthparity=dummy variable equal to 1 if the respondent is a first-time mother, 0 otherwise. This variable is expected to have a negative relationship with the number of IYCF practices used. *hhsize*= total number of people living in the household. Increase in the number of household members is hypothesied to decrease the number of practices. Women category dummies were used to account for differences that may arise due to the respective status of the women. Three dummy variables for the women categories targeted during the survey were included. The pregnant women category was used as the reference category. The mother of infants (0-5months) (*infant*), mothers with young children (6-23 months) (*Ychild*) and potential mothers (*potential*) are included to control for effect of the different status. Each dummy takes the value of 1 if Yes (i.e., mother has *infant*) and 0 otherwise.

2. **Nutrition Education Variables:** *Nutcouns*= dummy variable equal to 1 if the respondent was counseled one-to-one in the health facility where she attended pre- or post- natal clinics, 0 otherwise. Mekuria and Edris (2015) show that prenatal and antenatal counseling has a significant influence on feeding practices. Nutmsg= dummy equal to 1 if the respondent was trained on nutrition or received health talk at the health facility where

she attended pre- or post- natal clinics, 0 otherwise; *Nedugrp* dummy equal to 1 if the respondent was trained and/or received health talk on nutrition in mother to mother club, 0 otherwise; *cookdemo*= dummy variable equal to 1 if the respondent attended a cooking demonstration, 0 otherwise. All the nutrition education variables are expected to have a positive effect on the number of practices used.

3. **Psychosocial Factors:** *Knowledge*= Respondent's total score of knowledge of maternal and child feeding practices. Knowledge and child feeding practices from literature have a positive relationship and is therefore expected to have a positive sign; *Att*= Average index of the respondent's attitudes towards IYCF. The mean score was computed for attitudes towards exclusive breastfeeding and complementary feeding; *PBC* =Average index of the respondent's perceived behaviour control. The index was the mean of perceived behaviour control towards exclusive breastfeeding and complementary feeding; *subnorms*= average index of the respondent's subjective norms estimated as a mean score. A higher score of knowledge, attitudes, and PBC are associated with higher number of practices used. Following the theory of planned behaviour, these variables were expected to positively influence the number of practices used positively (Ajzen, 1991; Ajzen, 2005).

4. **Institutional Factors:** *Pclinic*= dummy equal to 1 if the respondent attended antenatal clinic (ANC) and postnatal clinic (PNC), 0 otherwise. Use of ANC and PNC services is hypothesised in this study to be positively associated with an increase in utilization of proper IYCF practices; *lndstchv*= natural log of distance to community health volunteer in minutes. Short distance to a community health volunteer means less time is spent by women to looking for information on IYCF information. This variable is therefore expected to be inversely related to the number of practices used, hence has a negative sign. *Lndstroad*= natural log of distance to the nearest main road in minutes. It was

hypothesised that increase in distance to the nearest main road decreases demand for diet diversity because it is a proxy for market access; *Lndstfacility*= natural log of distance to the nearest health facility in minutes. It is hypothesised that increase in distance to the health facility will decrease the number of food groups demanded by a woman; *M_club*= dummy equal to 1 if the respondent is a member of mother-to-mother club, 0 otherwise. Membership to a mother-to-mother club is expected to increase the variety of food groups demanded. Sika-Bright (2010) observed that interaction with friends could influence practices. Adoption of a practice is more likely to occur when there is support from a relevant individuals and/or groups endorsing the practice as a good thing to do.

c) Estimation Problems and Tests

i) Equi-dispersion

Poisson regression model has one limiting assumption equidispersion that requires the variance to equal the mean. This was tested using the Pearson chi-square ratio and the model was found to be a good fit.

ii) Multicollinearity

Multicollinearity occurs when a linear relationship exists between some of or all the explanatory variables. This causes the inflation of the variance of the model and coefficients hence the confidence interval becomes wide and inferences made are unreliable. To test for multicollinearity, variance inflation factor (VIF) was employed. VIF values that exceed 10 are generally viewed as evidence of the existence of multicollinearity (Gujarati and Porter, 2009). There was no evidence of multicollinearity (see Appendix 2).

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Characteristics of the Respondents

Results show that 18% of women interviewed were pregnant, 26% were mothers of infants (0-5 months), 28% had young children (6-23 months) and 28% were potential mothers. The results indicate that 65% of the women were married and living with their spouses. This finding implies that in nutrition promotion messaging involving men is of the essence as they form part of the immediate social environment and influence food purchase, hence consumption practices. The average age of the interviewed women was 27 years which is within the mean age bracket of 25-29 years (The World Factbook, 2014). The mean number of years of formal schooling was 9 years, thus most women had attained basic education.

Results also indicate that 78% were aware of the SUSTAIN project suggesting that majority of the respondent should be aware of OSFP and the role it plays in young child feeding. Further, 85% had utilized antenatal/postnatal services and about 68% had received nutrition messaging from a local health facility. The findings also show 34% of the respondent had attended a cooking demonstration. About 16% of the respondents indicated they were members of a mother-to-mother club and 30% had specifically received nutrition messaging from SUSTAIN/PATH. Results further show that 31% of the women had received a coupon for subsidized OFSP planting materials. Notably, only 18% of the respondents had utilized OFSP root for infant feeding, while only 10% reported to have used OFSP leaves for infant feeding. Summary statistics of variables used in the Poisson regression models are presented in Table 4.1 below.

Table 4.1: Summary statistics and characteristics of respondents (N=665)

Variables	Description	Mean	Std.	Min	Max
Practices	Number of IYCF practices used (count)	3.18	2.19	0.00	9.00
Diet diversity score	Number of food groups consumed (count)	5.63	1.32	0.00	10.00
Lnage	Natural log of age of respondent (in years)	3.28	0.27	2.64	4.09
Birthparity	First-time mother; 1 if yes and 0 otherwise	0.17	0.37	0.00	1.00
Lnofarminc	Natural logarithm of off-farm income (1USD= 110 KES)	11.40	0.99	6.91	14.14
Hhsize	Total number of people in the household	5.74	1.98	2.00	13.00
Hfias	Household food insecurity	6.95	5.12	0.00	24.00
Nedugrp	Mother club nutrition messaging; 1=Yes& 0=No	0.17	0.38	0.00	1.00
Nutcouns	Received nutrition counseling; 1=Yes& 0=No	0.33	0.47	0.00	1.00
Nutmsg	Received nutrition messaging; 1=Yes& 0=No	0.78	0.41	0.00	1.00
Cookdemo	Attended cooking demonstration; 1=Yes& 0=No	0.39	0.49	0.00	1.00
Knowledge	Respondent knowledge (Score)	11.09	3.56	0.00	21.00
Att	Attitudes average index (Score)	5.89	0.57	3.69	7.00
Pbc	Average index for PBC (Score)	5.58	0.76	2.50	7.00
Sub_norms	Average index for subjective norms (Score)	5.22	0.86	2.25	7.00
Pclinic	Ever attended clinics since 2014; 1=Yes& 0=No	0.90	0.30	0.00	1.00
M_club	Member mother to mother club; 1=Yes& 0=No	0.18	0.39	0.00	1.00
Lndstchv	Natural log of distance to the nearest CHV in minutes	2.54	0.82	0.00	4.50
Lndstroad	Natural log of distance to the nearest road in minutes	2.06	0.77	0.00	4.09
Lndstfac	Natural log of distance to the nearest facility in minutes	3.40	0.74	0.69	5.19
Infant	Respondent is mother of infant; 1=Yes& 0=No	0.28	0.45	0.00	1.00
Ychild	Mother with a young child; 1=Yes& 0=No	0.30	0.46	0.00	1.00
Potential	Respondent is a potential mother; 1=Yes& 0=No	0.23	0.42	0.00	1.00

Source: Survey data (2016).

Table 4.2 shows that a higher number of practices were used by women who had received nutrition messaging with a mean of three practices. Mean differences between those women

33

who did not receive messaging and those who did were significant (F=23.32; p=0.001). Specifically, those who had received health talks at the health facilities had used one more practice relative to those who had not received health talks.

Table 4.2: Number of practices used by nutrition messaging

Nutrition messaging	No	Yes	Total
Mean	2.42	3.40	3.18
N	145	520	665
Std. Deviation	2.14	2.15	2.19

Source: Survey data (2016).

Results in Table 4.3 indicate that the mean number of practices used by pregnant women, women with infants, mothers of young child and potential mothers are 2, 3, 4 and 3 respectively. Results show that the mean difference was significant (F=38.813; p=0.000). The results show a variation among the four categories in the level of using IYCF practices among sampled women and are in line with a priori expectations. This finding underlines the need to consider the status of the women being targeted with nutrition education activities.

Table 4.3: Number of Practices Used by Women Category

Category of mother	Pregnant	Infant	Young child	Potential	Total
Mean	2.37	2.84	4.07	3.07	3.18
N	122	187	202	154	665
Std. Deviation	2.34	1.78	2.03	2.34	2.19

Source: Survey data (2016).

4.2 Psychosocial Factors Influencing Exclusive Breastfeeding Intention

i.   Measurement model

All the indicators in the measurement model were estimated as reflective measures. Composite reliability measures presented in Table 4.4 range between 0.7-0.9, indicating that the level to which constructs are measured is statistically satisfactory. The low Cronbach's alpha value for knowledge may be attributed to the inability of the respondents to distinguish between some questions because of the standard references used in the questionnaire.

Table 4.4: Construct Reliability for the Measurement Model

Construct	Cronbach's alpha	Composite reliability	**Average Variance extracted**
Attitudes	0.779	0.858	0.601
Positive anticipated emotions	0.939	0.946	0.535
Negative anticipated emotions	0.877	0.896	0.565
Social conformity	0.693	0.822	0.608
Descriptive norms	0.821	0.893	0.736
Subjective norms	0.731	0.823	0.542
Self-efficacy	0.921	0.933	0.560
Perceived behavioral control	0.738	0.832	0.555
Knowledge	0.507	0.796	0.663
Habits	0.968	0.972	0.759
Recovery and Coping efficacy	0.939	0.950	0.702
Goals	0.910	0.933	0.735
Exclusive breastfeeding Intention	0.864	0.908	0.714

Source: Survey data (2016).

The goodness of fit index was 0.983 and 0.811 for the measurement and structural model respectively. Thus, the performance of the PLS-PM model was good as the values are higher than 0.7 (Sanchez, 2013). The Fornell-Larcker criterion was estimated to measure discriminant validity. This measure compared the square root of each construct's average variance extracted with its correlations with all other constructs. The results (Appendix) indicated that there is adequate discriminant validity: that is, the diagonal elements were greater than the off-diagonal elements in the corresponding rows and columns (Fornell and Larcker, 1981).

ii.   Structural Model

Figure 4.1 below shows that the R^2 is 66% for behaviour intention construct, hence more than 19%, the acceptance level recommended by (Chin, 2010). The model also met the Falk and Miller's criteria for the level of explained variance which requires an R-squared ≥ 0.10 (Falk et al., 1992). Consequently, the structural model predicting intention is adequate. The mean values of Average Variance Extracted (AVE) (see Table 4.4 above), is higher than the threshold value of 0.5 Chin (1998) and, therefore, that requirements of convergent validity have been satisfied.

Results from the structural model in figure 4.1 below indicate that perceived behaviour control, subjective norms, attitudes and emotions had significant influence on goals. Further, the path from goals to intention was significant at one percent, and therefore the first hypothesis is rejected, goals had very strong positive influence on intention to practice exclusive breastfeeding. The results show that one standard deviation increase in goals increases behaviour intention by 0.653 standard deviations.This implies that women who plan and set goals are more likely to practice exclusive breastfeeding than those who do not plan nor set their goals.

Figure 4.1: Estimated Structural Model Predicting Exclusive Breastfeeding Intention
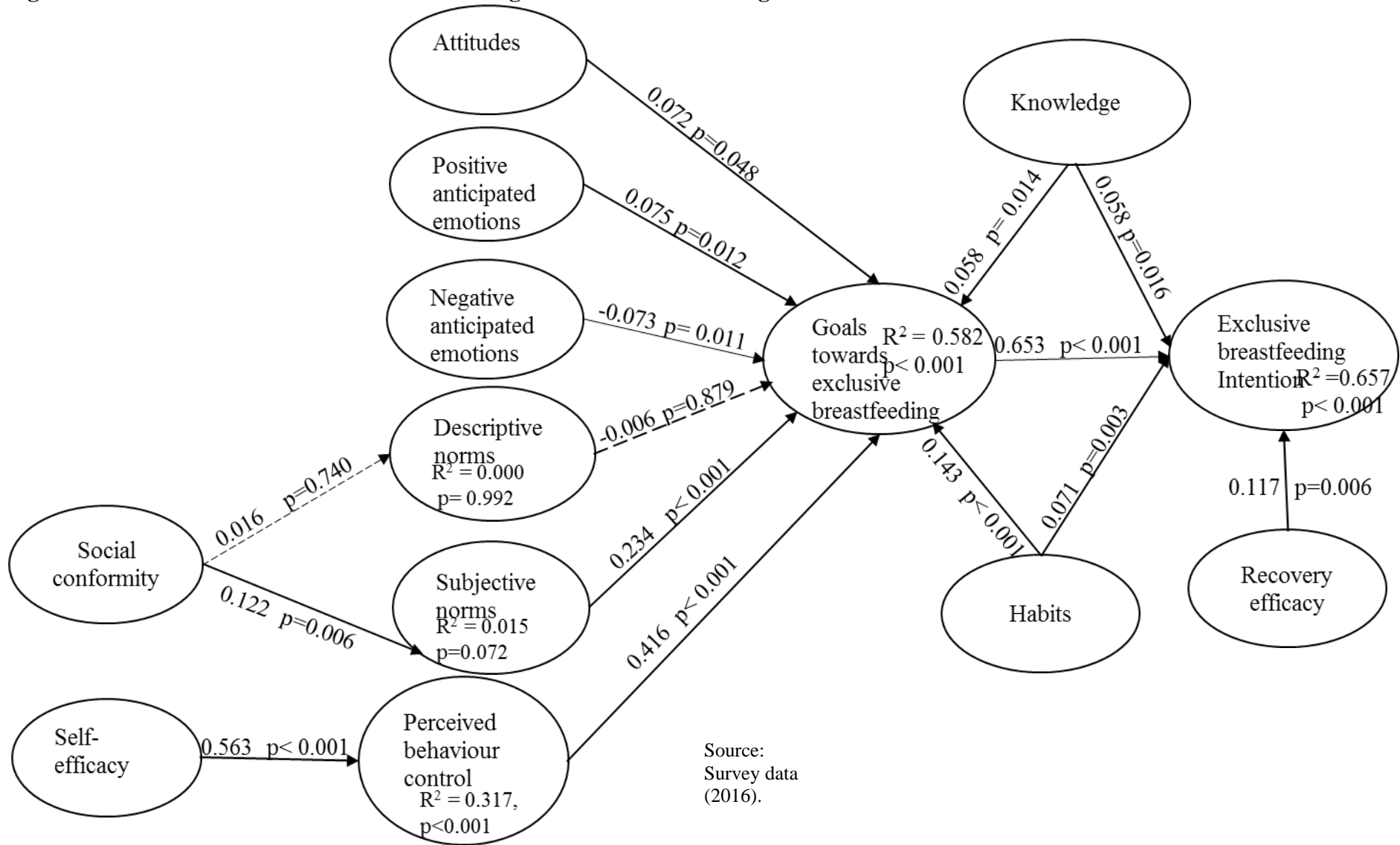
Habits as well as recovery and coping efficacy also significantly predicted intention, albeit weakly, indicating that coping mechanisms may be required by some mothers to be able to fulfill intention to exclusively breastfeed.

As expected, both subjective norms and descriptive norms were positively influenced by social conformity. This indicates that women's motivation to comply with exclusive breastfeeding is likely to influence their social environment. This finding is in line with those of Teklehaymanot, Hailu, and Wossen, (2013) in a study conducted in Ethiopia observed that the expectations of husbands and mother-in-laws were considered highly in making the decision to exclusively breastfeed. These findings are also consistent with those from a research in Western Kenya that suggested women felt their infant feeding decisions were more influenced by their mother-in -laws and husbands (Nduati, Arum and Kageha, 2011). Subjective norms had a positive but moderate (0.234) influence on goals. This finding implies that a woman whose cultural norms embraces exclusive breastfeeding will more likely plan to practice exclusively breastfeeding, and vice versa.

Perceived behaviour control, as expected, positively and strongly influenced goal setting.This implies that the respondents strongly felt that if they had control over the practice exclusive breastfeeding they could plan to breastfeed exclusively. An increase in PBC by one standard deviation increases goals by 0.416 standard deviations, holding other factors constant. Indeed, Behera and Kumar (2015) found that perceived behaviour control is a major factor influencing intention to practice exclusive breastfeeding.

Perceived behaviour control was predicted positively by self-efficacy. Specifically, results show that one standard deviation increase in self-efficacy increases perceived behaviour control towards exclusive breastfeeding by 0.563 standard deviations. Blyth et al (2004) also found that breastfeeding confidence was strongly determined by self-efficacy.

4.3 Psychosocial Factors Influencing Proper Complementary Feeding Incorporating OFSP Intention

(i)   Measurement model

The results of model diagnostic tests showed that goodness of fit index for the measurement and structural model was 0.993 and 0.861, showing that the performance of PLS-PM model was good as the values are higher than 0.7 (Sanchez, 2013). The mean value of Average Variance Extracted (AVE) was 57%, indicating that more than 50% of the indicator variance is accounted for and that the data meets convergent validity. Measures estimated to evaluate the composite reliability of the measurement model gave satisfactory results (Table 4.5). Specifically, the constructs composite reliability is higher than the recommended threshold of 0.7 in all cases. Lastly, the Fornell-Larcker criterion was used to assess discriminant validity. The results showed values in the diagonal elements were greater than those in the off-diagonal elements in the corresponding rows and columns, demonstrating adequate discriminant validity for the estimated model (Fornell & Larcker, 1981). Overall, the findings of these diagnostic tests show that the data support the reliability of the indicators.

Table 4.5: Composite Reliability for the Pooled Model (N=764)

Model constructs	Cronbach's alpha	Composite reliability	Average Variance extracted
Intention	0.754	0.846	0.649
Attitudes	0.608	0.781	0.544
Descriptive norms	0.731	0.832	0.553
Habits	0.973	0.975	0.778
Motivation factors	0.791	0.855	0.663
Negative emotions	0.806	0.852	0.454
PBC	0.726	0.826	0.545
Positive emotions	0.907	0.924	0.455
Recovery and coping efficacy	0.857	0.883	0.558
Self-efficacy	0.920	0.926	0.510
Subjective norms	0.803	0.882	0.713
Exclusive breastfeeding intention	0.906	0.908	0.712
Knowledge	0.311	0.680	0.543
Goals	0.801	0.858	0.549

Source: Survey data (2016)

ii) Structural Model

To assess the structural model the R^2, which shows the total variance of the endogenous variables was estimated. From the results in Figure 4.2 below, variance explained for behaviour intention is 37%, which is greater than the recommended acceptance level of 19% Chin (2010), therefore the model is satisfactory.

Figure 4.2: Estimated Structural Model Illustrating Factors Predicting Complementary Feeding with OFSP Behaviour Intention

Source: Survey data   (2016)
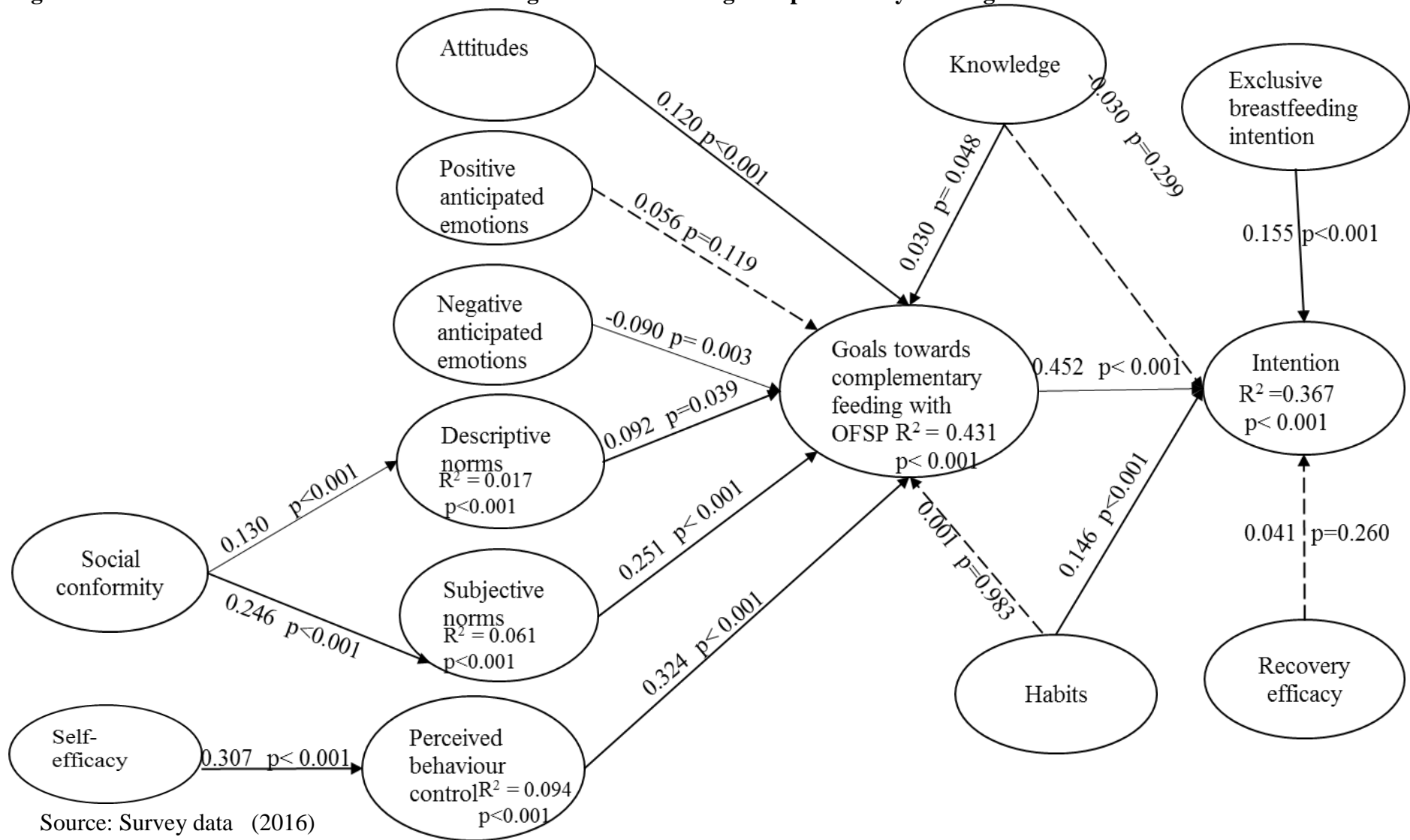
Results of the estimated model are presented in Figure 4.2 above, they indicate that goals towards proper complementary feeding incorporating OFSP significantly influence intention at one percent level. Specifically, results show that intention is positively influenced by goals. Based on this finding, therefore, the first hypothesis is rejected. An increase in goals by one standard deviation increases intention by 0.452 standard deviations, showing that mothers who set goals and plan to provide their young children with complementary foods incorporating OFSP are more likely to have greater intentions toward doing so.

The effects of habits on intention were negative and much weaker. The other predictor of intention was the plan to do exclusive breastfeeding. It had a positive but weak effect on behavioral intention. This finding implies that mothers who are willing to exclusively breastfeed their children for the first six months are also more likely be willing to provide proper complementary feeding incorporating OFSP.

As anticipated, positive anticipated emotions had a positive effect on goals. Results show that social conformity had a weak influence on descriptive norms, but a moderate effect on subjective norms. In the context of this study, the finding indicates that strategies that aim at promoting proper complementary feeding incorporating OFSP should not overlook mothers-in-law and spouses. This finding supports those of GINA (2013) who noted that nutrition priorities and needs vary between men and women, but that men are influential in terms of behaviour. Further, FAO (2015) notes that involving men in nutrition interventions is critical in reducing women's resource constraints hence have influence beyond behaviour realms.

Further, an increase in self-efficacy by one standard deviation leads to an increase in perceived behaviour control by 0.307 standard deviations, ceteris paribus. This finding demonstrates the value of motivational factors in one's intention to incorporate OFSP in proper complementary feeding. It implies that women who feel that they can overcome

obstacles that arise from work commitments, dislike of the practice by influential people, and resource limitations will most likely be more confident towards performing the behaviour.

Results reveal that subjective norms and perceived behaviour control affect goal-directed pursuit positively. Specifically, a unit increase standard deviation in perceived behaviour control leads to a 0.324 standard deviation increase in goal-directed pursuit, other things constant. This suggests that if a woman feels they have control over the practice, they will most likely plan to incorporate OSFP for young child feeding. It highlights the importance of non-motivational factors in one's implementation of the intention to use/incorporate OFSP in proper complementary feeding. Increase in perceived availability and control of resources relevant to a woman could make it possible to execute the plans to incorporate OFSP in baby foods. This finding is in line with studies advocating for closing the gender gap that have shown that women's control over income and land has great influence on improving child's nutrition (Margolies & Buckingham, 2013). Hamilton et al (2011) found perceived behaviour control to be a key driver in complementary feeding. Perceived behaviour control was also an important factor in determination goal-directed pursuit to exclusively breastfeeding.

Results further show that increase in subjective norms by one standard deviation leads to an increase in goal-directed pursuit towards proper complementary feeding incorporating OFSP by 0.251 standard deviation, other things constant. Thus, the respondents were concerned about how they would be perceived by others. This finding indicates that incorporating OFSP in proper complementary feeding will be much easier for women whose friends, family members and important neighbours practice and/or support this behaviour. The results corroborate Horodynski et al (2007) who found that subjective norms were an important factor in making the decision to commence complementary feeding among low-income mothers.

Turning to the model for the control and treatment groups (see Table 4.6), results indicate that subjective norms, attitudes and perceived behaviour control all have a positive and significant effect on goals. Overall, the results of the treatment group model are very similar to those of the control group model. They show that goal-directed pursuit is driven by subjective norms and perceived behaviour control. However, the effect of self-efficacy on perceived behaviour control for this treatment group was higher. As a result, the contribution of perceived behaviour control on goals was enhanced compared to that in the control model. It may also mean that the experimental group felt confident that they could surmount any challenges encountered in the process of adopting this behavior change.

Results also show that goals had a greater influence (with a value of 0.503) on the intention to practice proper complementary feeding incorporating OFSP. Whereas habits had a weak effect, the influence was same for both. The effect of habits for the treatment group may be due to the fact that the respondents' past behaviour was no longer relevant after seeing the actual samples of complementary foods incorporating OFSP.

Results further show significant differences between treatment and control groups with respect to the effect of knowledge towards incorporating OFSP in young child feeding. Awareness of complementary feeding and use of OFSP for young child feeding was a significant factor to the control group in setting goals.

Table 4.6: Estimated Coefficients of Factors Predicting Intention to Incorporate OFSP in Complementary Feeding (Field Experiment)

	Control (N=377)		Treatment (n=387)	
	Coeff.	P-value	Coeff.	P-value
Positive Anticipated Emotions -> Goals	0.107	0.093*	0.029	0.537
Negative Anticipated Emotions -> Goals	-0.087	0.122	-0.133	0.001***
Attitudes -> Goals	0.122	0.024**	0.107	0.021**
Self-Efficacy -> PBC	0.273	0.000***	0.346	0.000***
Social Conformity -> Descriptive Norms	0.172	0.000***	0.099	0.116
Social Conformity -> Subjective Norms	0.270	0.000***	0.224	0.000***
Descriptive Norms -> Goals	0.075	0.236	0.109	0.062*
Subjective Norms -> Goals	0.245	0.001***	0.264	0.000***
PBC -> Goals	0.275	0.000***	0.350	0.000***
Habits -> Goals	0.016	0.694	0.005	0.896
Knowledge -> Goals	0.055	0.315	0.066	0.237
Exclusive Breastfeeding Intention -> Intention	0.183	0.000***	0.128	0.009***
Habits -> Intention	0.173	0.000***	0.117	0.003***
Knowledge -> Intention	0.099	0.038**	-0.039	0.418
Recovery Efficacy -> Intention	0.007	0.893	0.072	0.166
Goal -> Intention	0.385	0.000***	0.503	0.000***

Note: ***, **, * = significant at 1%, 5% and 10% respectively ; Source: Survey data (2016).

They show that self-efficacy has a much stronger effect for treatment group than the control group. This suggests that respondents in the treatment group had a higher feeling of ability to prepare foods incorporating OFSP after seeing the actual samples of complementary foods incorporating OFSP. In other words, the treatment group may have realized that it was easy to include OFSP in baby/complementary foods and that they could overcome any perceived obstacles to doing so, after seeing the samples. This finding, therefore, highlights the

importance of cooking demonstrations as part of nutrition education aimed at behavior change. Cooking demonstrations, based on the results of this study, can increase mothers' self-efficacy towards using OFSP as part of baby/complementary foods.

The results of multi –group analysis among the women categories are presented in Table 4.7 They show that there are two paths with significant group differences. These are i) exclusive breastfeeding intention→ behavioral intention and ii) habits→ behavioral intention. The latter actually showed significant differences between pregnant mothers and mothers of infants and also between pregnant mothers and mothers with young children. Hence, women categories have moderating effect on determinants of behavioral intention.

Multi-group analysis shows, for all categories of women, that subjective norms and perceived behaviour control affect goal-directed pursuit of proper complementary feeding incorporating OFSP. Nonetheless, there are divergences in the strength of these factors on goal-directed pursuit in between the various models.

Social conformity had a stronger influence among those with young child and was weakest for potential mothers. Additionally, key group differences were noted for mothers with young children and potential mothers. These findings underscore the importance of motivation factors for mothers with young children.

Table 4.7: Multi-group Analysis of Factors Predicting Intention for the Women Categories

	Pregnant (N=141)		Infant (N=197)		Young child (N=212)		Potential (N=214)	
	Coeff.	p-Values	Coeff.	p-Values	Coeff.	p-Values	Coeff.	p-Values
Positive Anticipated Emotions ->Goals	0.222	0.108	-0.041	0.592	0.154	0.016**	0.032	0.765
Negative Anticipated Emotions -> Goals	-0.136	0.218	-0.167	0.015**	-0.036	0.616	-0.112	0.027**
Attitudes -> Goals	0.106	0.213	0.046	0.615	0.216	0.000***	0.186	0.001***
Self-Efficacy -> PBC	0.324	0.000***	0.304	0.000***	0.292	0.000***	0.395	0.000***
Social Conformity -> Descriptive Norms	0.246	0.003***	0.132	0.288	0.135	0.088*	0.105	0.299
Social Conformity -> Subjective Norms	0.299	0.000***	0.232	0.004***	0.331	0.000***	0.158	0.040**
Descriptive Norms -> Goals	0.086	0.349	0.064	0.461	-0.007	0.933	0.107	0.208
Subjective Norms -> Goals	0.240	0.023**	0.210	0.045**	0.293	0.000***	0.236	0.019**
PBC -> Goals	0.309	0.022**	0.347	0.000***	0.361	0.000***	0.214	0.006***
Habits -> Goals	0.043	0.418	0.026	0.581	0.016	0.777	0.136	0.023**
Knowledge -> Goals	-0.012	0.885	0.210	0.026**	0.106	0.146	0.101	0.277
Exclusive Breastfeeding Intention -> Intention	0.104	0.212	0.131	0.052*	0.068	0.201	0.258	0.000***
Habits -> Intention	0.025	0.708	0.212	0.000***	0.169	0.005***	0.137	0.005***
Knowledge -> Intention	0.090	0.383	0.082	0.206	0.091	0.095*	0.053	0.605
Recovery Efficacy -> Intention	0.147	0.094*	-0.025	0.758	0.033	0.590	0.082	0.316
Goal -> Intention	0.449	0.000***	0.512	0.000***	0.481	0.000***	0.280	0.012**

Note: ***, **, * = significant at 1%, 5% and 10% respectively; Source: Survey data (2016)

For pregnant mothers, mothers with infants and mothers with young children, the main determinant of goal-directed pursuit was perceived behaviour control. On the other hand, subjective norms were the strongest driver of goal setting towards incorporating OFSP in proper complementary feeding among potential mothers. These findings can be interpreted to mean that if pregnant mothers and mothers of young children had assurance and control over key resources that facilitate incorporation of OFSP in proper complementary feeding, they would more likely practice complementary feeding incorporating OFSP. Similarly, if potential mothers find proper complementary feeding with foods that include OFSP to be common among their social circle, they most likely adopt the behaviour.

Intention to provide proper complementary feeding incorporating OFSP is also significantly influenced by goals for all categories of women. Nevertheless, effect of goal-directed pursuit on intention was strongest for mothers of infants. Justifiably, they were preparing to begin providing complementary feeding at the time of interviews. Multi-group t-test results further confirmed that intention varied significantly between mothers of infant vs. potential mothers and mothers of young child vs. potential mothers. On other factors predicting intention results show that habits are an important determinant of behavioural intention except for pregnant mothers. Its effect for mothers with infants and mothers of young children was moderate, there were substantial differences for pregnant mothers vs. mothers with infants, pregnant vs. mother with young children and pregnant mothers vs. potential mothers with regard to habits. Then, for the path from planning to exclusively breastfeed to behaviour intention, there was noteworthy difference for mothers with young children vs. potential mothers' showing that potential mothers who are willing to exclusively breastfeed will most likely be more willing to use OFSP for young child feeding.

4.4 Factors Affecting the Intensity of Using Recommended IYCF Practices

The results of the Poisson model estimated to assess the factors affecting the intensity of using recommended IYCF practices are presented Table 4.8. The model was checked for the equidispersion property and the results indicate the Poisson regression model was robust with good fit (Wald chi2 (17) =249.9, p-value= 0.000). A major hypothesis of this study was that nutrition messaging has no effect on the intensity of using recommended IYCF practices. The results, however, indicate that the hypothesis is rejected at five percent level of significant. Several individual factors (namely, age, birth parity, off-farm income, and women categories) also significantly influenced the expected number of IYCF practices used.

A unit increase in the natural log of age of the respondent increases the expected number of practices used by about 48%, other things equal. This finding suggests that older mothers tend to use more practices, probably due to experience in infant and child feeding over the years. Further, this finding is in line with past study (Lohia and Udipi, 2014) which found a positive association between age of mothers and index of recommended practices used. Results also show that income affects the expected number of IYCF practices used. Other things constant, an increase natural log of off-farm income by one Kenya Shilling decreases the expected number of practices used by more than 19% (1USD=110KES). This finding suggests that mothers who participate in off-farm employment activities used fewer recommended IYCF practices, probably because they are not always available to feed their infant and/or young children as and when needed. Onah et al (2014) found similar results among working-class mothers. They specifically found lower child dietary diversity among such mothers. Ogunba (2015) has also argued that occupations that require mothers to work away affect child nutrition.

49

For first-time mothers, compared to a mother with more than one child, the expected number of feeding practices was lower by about 39%. Radwan (2013) noted that mothers who had more than one child were more likely to breastfeed exclusively. This could be because first-time mothers are less experienced in, and have had no or little exposure to knowledge about, IYCF, especially if their attendance of pre-natal clinics was poor. Results, however, show that being a mother with a young child and a potential mother increases the expected number of IYCF practices used, *ceteris paribus*.

As expected, nutrition education, participation in mother-to-mother group health talks, nutrition counseling, nutrition messaging and cooking demonstrations all positively affect the expected number of IYCF practices used. This finding thus suggests that women who received these forms of nutritional education used more IYCF practices. The marginal effects show that participation in mother-to-mother club health talks increases the expected number of practices a woman uses by more than 79%. This is because such health talks occur within group settings which also acts as source of social support (collective action) and reduces information asymmetry (Beyene, Worku and Wassie, 2015).

Results further indicate, as expected, that respondents who received nutrition counseling used a higher number of practices than their counterparts. Specifically, nutrition counseling increased the expected number of IYCF used by about 40%, all things equal. This finding corroborates those of Kimani-Murage et al (2013) and Laterra et al (2014) who found that personalized counseling and nutrition support at health facility level is very effective in increasing use of recommended IYCF practices.

Table 4.8: Factors Affecting the Intensity of Using Recommended IYCF Practices: Poisson Regression Results (N=665)

	Regression coefficients			Marginal effects		
	Coeff.	Std. Error	P.value	dy/dx	Std. Error	P.value
Lnage	0.162	0.089	0.069*	0.483	0.266	0.069*
Birthparity	-0.138	0.068	0.044**	-0.393	0.186	0.035**
Lnoffarminc	-0.066	0.023	0.005***	-0.197	0.070	0.005***
Hhsize	-0.014	0.012	0.252	-0.042	0.037	0.252
Nedugrp	0.245	0.064	0.000***	0.795	0.223	0.000***
Nutcouns	0.132	0.052	0.011**	0.404	0.163	0.013**
Nutmsg	0.184	0.074	0.012**	0.523	0.198	0.008***
Cookdemo	0.131	0.052	0.012**	0.395	0.160	0.014**
Knowledge	0.037	0.007	0.000***	0.109	0.021	0.000***
Att	-0.047	0.040	0.236	-0.141	0.119	0.237
Subnorms	-0.066	0.034	0.053*	-0.196	0.100	0.052*
Pbc	0.112	0.042	0.009***	0.333	0.126	0.008***
Pclinic	0.634	0.146	0.000***	1.492	0.260	0.000***
Lndstchv	-0.067	0.030	0.027**	-0.200	0.090	0.027**
Infant	0.175	0.089	0.050**	0.545	0.285	0.056*
Ychild	0.473	0.088	0.000***	1.563	0.313	0.000***
Potential	0.375	0.098	0.000***	1.244	0.356	0.000***
_cons	0.051	0.474	0.914			

Wald chi2(17) =249.9, p-value= 0.000, Log pseudolikelihood=-1344.096

Note: ***, **, * = significant at 1%, 5% and 10% respectively; Source: Survey data (2016).

Receiving nutrition messaging also increases the expected number of IYCF practices used. It increased the expected number of IYCF practices used by about 52%, other things constant. This finding may be because nutrition messaging increases self-efficacy, hence the use recommended practices. Mothers who have received health talks are more exposed in terms of information, skills and knowledge concerning the importance of using recommended feeding incorporating OFSP. Having attended a cooking demonstration also increases the expected number of IYCF practices used by a moderately large proportion (39%), holding other factors constant.

Wald multiple exclusion test of the hypothesis that all the nutrition education variables have no joint effect on the intensity of using recommended practices is rejected (Wald chi2 (4) = 45.96, Prob> chi2= 0.000). The test results indicate that nutrition messaging, nutrition counseling, mother-to-mother club health talks and cooking demonstrations jointly increase the expected number of IYCF practices used. These are the nutrition education approaches being applied by SUSTAIN project to improve IYCF practices and promote incorporation of OFSP in complementary diets. These findings thus indicate that SUSTAIN nutrition education activities have an influence on the adoption of recommended IYCF practices.

Among the psychosocial control variables included in the model, knowledge, subjective norms and perceived behavioral control (PBC) had a positive and significant effect on the expected number of IYCF used. A unit increase in the knowledge score results in 11% increment in the expected number of IYCF practices used, other factors constant. Further, a unit increase in the PBC index increases the expected number of IYCF practices used by 33%, other things constant. The results of the effect PBC corroborate those of Bai, Wunderlich and Fly (2011) who also found that PBC affects infant feeding practices. PBC is however directly related to the socio-economic status of an individual (Swanson and Power, 2005). Thus, mothers who are better-off

(i.e., well-endowed financially) are more likely to use a higher number of practices. Results also show that a unit increase in subjective norms index is associated with 20% decreases in the expected number of practices used, other things constant. This finding suggests that the higher the influence from the social environment, the lower the number of recommended practices a woman is likely to use.

Wald multiple exclusion test of the hypothesis that all the psychosocial factors have no joint effect on the intensity of using recommended IYCF practices generated Wald chi2 (4) = 38.84, Prob> chi2= 0.000. The test results indicate that even though attitudes was insignificant in results presented in Table 4.8, all psychosocial variables jointly increase the expected number of IYCF practices used.

Attending PNC/ANC clinic also affects the expected number of IYCF practices used. Specifically, results indicate that attending these clinics increases the expected number of IYCF practices used by more than one practice. The results are in line with those of Rana et al (2016) who recently found that attending ANC and PNC clinics improved breastfeeding practices. Distance to the nearest community health Volunteer (CHV), used in this study as a proxy for access to health information, affects the usage of IYCF. Community health volunteers reinforce the messages mothers receive from the health clinics. Thus, an increase in distance to the nearest CHV was expected to negatively affect usage of IYCF practices. The results indicate that this is indeed the case. An increase in distance by one walking minute reduced the expected number of IYCF practices used by 20%, other factors equal.

4.5 Assessment of Factors Affecting Mothers' Consumption of Diverse Diets

The fourth hypothesis of this study was that off-farm income has no effect on mothers' consumption of diverse diet. The results of the Poisson model estimated to assess the drivers of factors affecting mothers' consumption of diverse diets, and test of this hypothesis, are shown in Table 4.9. The results, however, indicate that the hypothesis is rejected at five percent level of significant. Household food insecurity score, natural log of off-farm income, natural log of distance to the community health volunteer, natural log of distance to the main road and membership to a mother to mother club significantly influences the expected number of food groups demanded.

The marginal effects show that an increase in the natural log of off-farm income by 1% increases the expected number of food groups consumed by more than 13%, other factors constant. This implies that employment income increases maternal diet diversity. Other factors constant, membership to a mother-to-mother club increases the expected number of food groups consumed by 72%. This huge influence of such clubs is likely due to the encouragement (i.e., social support) to consume diverse diets mothers give each other in these clubs.

Results also show that an increase in the natural log of distance to a community heath volunteer (CHV) by an additional unit decreases the expected number of food groups demanded by 11%, holding other factors constant. This inverse relationship between distance to a CHV and dietary diversity was expected. Community health volunteers are advocates of healthy eating and usually encourage mothers to diversify their diets. Hence, the further a woman is from the CHV the less nutrition information they are likely to get, which in turn translates into fewer food groups they consume from.

Table 4.9: Factors Affecting Women's Dietary Diversity: Poisson Regression Results

(N=665)

	Regression coefficients			Marginal effects		
	Coeff.	Std. Error	p-value	dy/dx	Std. Error	p-value
Lnage	-0.008	0.036	0.829	-0.044	0.205	0.829
Lnofarminc	0.024	0.009	0.011	0.135	0.053	0.011**
Hhsize	0.007	0.005	0.145	0.039	0.027	0.145
HFIAS	-0.005	0.002	0.006	-0.027	0.010	0.006***
Nedugrp	-0.069	0.070	0.325	-0.378	0.375	0.314
M_Club	0.124	0.067	0.067	0.724	0.411	0.078*
Cookdemo	0.009	0.020	0.641	0.052	0.113	0.642
Pclinic	0.034	0.040	0.393	0.187	0.216	0.387
Lndstchv	-0.021	0.011	0.061	-0.118	0.063	0.061*
Lndstroad	0.023	0.012	0.055	0.127	0.066	0.056*
Lndstfacility	0.016	0.012	0.179	0.089	0.066	0.180
Potential	0.008	0.030	0.799	0.043	0.167	0.799
Infant	0.012	0.025	0.624	0.069	0.140	0.625
Ychild	-0.002	0.026	0.932	-0.012	0.145	0.932
Birthparity	-0.015	0.028	0.589	-0.086	0.159	0.587
Constant	1.380	0.166	0.000			

Wald chi2 (15) =40.40 , Prob>chi2= 0.000, Log pseudolikelihood= -1291.3982, N=665

Note: ***, **, * = significant at 1%, 5% and 10% respectively; Source: Survey data (2016).

The increase in the natural log of distance to the main road by one unit increases the expected number of food groups demanded by more than 12%, other things constant. The probable reason for this could be as markets distance increases mothers buy a lot

Increase in household food insecurity score decreases the expected number of food groups by more than 3%, other factors constant. This finding is also in line with *a prori* expectation. Households that are food insecure are likely to focus on consuming foods they can find most easily, usually the starchy staples.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

The rationale behind this study was to assess determinants of women behaviour towards maternal, infant and young child feeding practices, in Homa Bay County, Kenya, using a cross-sectional study. The effectiveness of nutrition education for behaviour change, to an extent, is contingent on knowing which factors need to be targeted and how modifiable they are. The study tested four hypotheses relating to MIYCF practices, namely i) Goals towards exclusive breastfeeding have no effect on behavioural intention; ii) Goals towards proper complementary feeding with foods that include OFSP have no effect on behavioural intention iii) Provision of nutrition messages to mothers does not affect the intensity of using recommended infant and young child feeding practices iv) Income has no effect on mother's consumption of diverse diet. Hypotheses i) and ii) were tested using PLS-PM regression model while Hypotheses iii) and iv) was tested using Poisson regression model. The study found that several psychosocial factors mediate behaviour intention towards exclusive breastfeeding and proper complementary feeding incorporating OFSP. The findings are in line with the MGB model because perceived behaviour control and subjective norms positively predicted goal, with goals, in turn, predicting mothers' intention to practice exclusive breastfeeding and complementary feeding at by 65% and 44%, respectively.

The finding, relating to subjective norms, implies that women whose social environment supports exclusive breastfeeding and use of OFSP for young child feeding have higher chances

of having intention towards undertaking these practices. For instance, if social referents have firmer positive views towards incorporating OFSP in young children's diets, there will be more social pressure to perform the behaviour in accordance with the referents' beliefs. The finding implies that a woman is likely to consider what is socially acceptable and the relevant cultural norms in deciding to practice exclusive breastfeeding. Subjective norms were positively predicted by social conformity, indicating that mothers feel compelled to comply by friends, mother-in-laws and spouses when deciding to exclusively breastfeed or use OFSP for young child feeding.

Perceived behaviour control also moderately positively predicted goals in both exclusive breastfeeding model and complementary feeding with foods that include OFSP, hence the intention. This is a reflection of the confidence women had in their actual ability and control over the decision to practice the behaviours individually.

Evaluation of the constructs among treatment and control groups showed that presenting women with verbal information as well as samples of actual baby foods incorporating OFSP improves self–efficacy. This shows the importance of cooking demonstrations which enables mothers to see the actual samples of OFSP-based foods and the preparations procedures. Cooking demonstrations is therefore a good strategy for creating behavior change relating to the use of OFSP for complementary feeding.

The relative importance of each construct toward goal-directed pursuit to include OFSP in complementary feeding of young child differed for women categories targeted. For example, subjective norm was important for potential mothers while perceived behaviour control was most influential for mothers with young children. Additionally, multi-group analysis also highlighted

important category differences. For instance, the path from planning to exclusively breastfeed to intention (mothers with young children vs. potential mothers) was significantly different. These results suggest that if potential mothers are willing to exclusively breastfeed they will be more willing to adopt complementary feeding with foods that include OFSP. This implies generally, involving mothers in nutrition education activities from a formative stage could be beneficial.

The results also suggest that majority of women have utilized very few infant and young child feeding practices, as the mean number of practices taken up was three. As expected, women who had received nutrition messaging had adopted more practices than those who had not. Concerning the women categories targeted, the findings suggest those with young children had adopted the highest number of practices. Results from the Poisson model indicated that nutrition education variables and psychosocial factors had a significant influence on the expected number of practices used.

Further, mothers' consumption of diverse diets is influenced by household food insecurity status and membership to a mother to mother club. Results also indicate that majority of the mothers have attained the recommended maternal diet diversity.

5.2 Conclusions and Recommendations

This study concludes that adopting exclusive breastfeeding and complementary feeding with foods that incorporate OFSP behaviour intention to adopt recommended practices is affected by psychosocial factors. It especially concludes that intentions towards exclusive breastfeeding and complementary feeding with OFSP are strongly affected by goal pursuit, self-efficacy, subjective norms and perceived behaviour control. This study also concludes that intensity of using recommended IYCF practices is significantly influenced by nutrition education, attitudes,

perceived behaviour control, subjective norms and knowledge. The adoption of practices differs across women categories, with mothers of 0-5-month-old child, 6-23-month-old child, and potential mothers adopting more of the IYCF practices than pregnant mothers. Further, mothers' consumption of diverse food is strongly influenced by off-farm income and membership to a mother to mother club.

Several implications arise.

1) This study found that goals are a key factor towards utilization of OFSP for complementary feeding and exclusive breastfeeding. Therefore awareness-creation is needed to equip women with various planning strategies on how they can incorporate OFSP in infant feeding. Planning goals can involve helping women develop manageable subtasks that are clearly specified and viewed as challenging but attainable. The use of small planning cards which detail out steps women should take towards implementing their intention can be introduced. These cards can have small boxes were women can tick and track their progress on IYCF practices. Use of such cards can also be one way of creating and strengthening collective action in the mother-to-mother clubs and facilitating the incorporation of OFSP in complementary foods.

2) The findings with respect to subjective norms point to the need for targeting women's social environment by involving other key household members in the nutrition promotions efforts. These results imply that spouses and mothers-in-law cannot be ignored in the efforts to promote proper complementary feeding including OFSP and exclusive breastfeeding and therefore the need to be made aware of the benefits of these practices. By extension, these findings imply that spouses and in-laws need to be targeted in the efforts to promote the

adoption of recommended IYCF practices among pregnant women and mothers of infants and young children.

3) Self-efficacy can be improved by employing peer-modelling[1]. Peer-modelling can be integrated into mother-to-mother clubs to assist in developing skills and raising self-efficacy of participating women. Most of community health volunteers who lead health talks in these groups are normally not engaged in young child feeding themselves. Additionally, most of them are perceived to be 'superior' because of their knowledge in health and dietary matters, hence not seen as peers and role models that the beneficiaries can relate to and associate with freely. Identification of a peer model that mothers can identify with in terms of underlying abilities from within the group/club to lead or co-lead in the training on exclusive breastfeeding and proper complementary feeding incorporating OFSP can be greatly influential. Such peers can tell of how they overcome the difficulties they encounter in following the recommended IYCF practices.

4) The finding on effect of women category on the intensity of using recommended practices, showed that different strategies should be employed for the women to promote widespread diffusion of the practices. With respect to use of IYCF practices, each of the different nutrition education channels separately had an effect on the intensity of adoption implying that mothers also need consistent nutrition messages that are to be reinforced through multiple channels. Therefore, healthcare providers' engagement, community involvement, and mother-to-mother club nutrition education support are all essential to maximise the effectiveness of the IYCF programs.

---

[1] Peer modelling is an arrangement where one learns to perform behaviour and skills associated

5.3 Suggestion for future Research

The study revealed that women's behaviour intention towards both exclusive breastfeeding and complementary feeding incorporating OFSP and exclusive breastfeeding is predicted strongly by goal-directed pursuit. The study recommends that more research should be carried out to assess if behaviour intention translates into actual behaviour. In assessing consumption of diverse diet among women, this study did not collect information on the actual quantities of food consumed from each food group as well as the respective price indexes due to time limitations. Future studies should investigate the influence of these factors on women's consumption behaviour.

REFERENCES

Ajzen, I. (1991). The Theory of Planned Behavior. *Organisational Behavior and Human Decision Processes, 50*, 179 - 221.

Ajzen, I. (2002). Perceived behavioural control, locus of control and the theory of planned behavior. *Journal of Social Psychology, 32*, 665-683.

Ajzen, I. (2005). *Attitudes, personality, and behavior.* New York: Open University.

Ajzen, I., & Fishbein, M. (1975). Attitude-behaviour relations: a theoretical analysis and review of empirical research. *Psychological Bulletin, 84*, 888-918.

Bai, Y., Wunderlich, M., & Fly, D. (2011). Predicting intentions to continue exclusive breastfeeding for 6 months: A comparison among racial/ethnic groups. *Maternal and Child Health Journal*, *65*, 1257-1264.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*, 191-215.

Bandura, A. (1989). A social cognitive theory of action. In J. P. Forgas, & M. Innes, *Recent Advances in Social Psychology: An International Perspective* (pp. 127-138). North Holland: Elsevier.

Bandura, A. (2004). Health promotion by social cognitive theory. *Health Education & Behaviour, 31*, 143-164.

Behera, D., & Kumar, K. A. (2015). Predictors of exclusive breastfeeding intention among rural pregnant women in India: a study using theory of planned behaviour. *Rural and Remote Health*, *15*, 3405.

Bernie, K. (2014). The factors influencing young mothers' infant feeding decisions: The views of health care professionals and voluntary workers on the role of the baby's maternal grandmother. *Breastfeeding Medicine*, 9, 161-165.

Beyene, M., Worku, A. G., & Wassie, M. M. (2015). Dietary diversity, meal frequency and in Northwest Ethiopia: a cross- sectional study associated factors among infant and young children. *BMC Public Health, 15,* 1007-1016.

Blyth, R. C., Dennis, C. L., Moyle, W., Pratt, J., & De Vries, S. M. (2004). Effect of Maternal Confidence on Breastfeeding Duration: An Application of Breastfeeding Self-Efficacy theory. *Birth, 29*, 278-284.

Bhutta, Z., Jai, D., Arjumand, R., Gaffey, M. F., Walker, N., Horton, S., et al. (2013). Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost? *Lancet series,2, http://dx.doi.org/10.1016/S0140-6736(13)60996-4.*

Chin, W. (1998). The partial least squares approach to structural equation modelling . In I. G. Marcoulides (Ed.), *Modern methods for business research* (pp. 296-358). Mahwah, NJ: Lawrence Erlbaum.

Chin, W. (2010). How to write up and report PLS analyses. In V. E. Vinzi, W. Chin, J. Henseler, & H. Wang, *Handbook of partial least squares: Concepts, methods and applications in marketing and related fields* (pp. 655-690). Berlin: Springer.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences.* Mahwah, NJ: Lawrence Erlbaum.

Darnton-hill, I. (2014). The underestimated impact of food interventions. In B. Thomson, & L. Amoroso, *Improving diets and nutrition -Food-based approaches* (pp. 74-88). Rome,Italy: CAB International and FAO.

Falk, R. F., & Miller, N. B. (1992). *A primer for soft modeling.* Akron, OH: University of Akron Press.

FAO. (2015). *Food and Nutrition in Numbers.* Rome, Italy: FAO.

Fishbein.M., & Ajzen, I. (2010). *Predicting and Changing behavior.* New York, NY: Taylor & Francis .

Fornell, C., & Larcker, D. (1981). Evaluating structural equation models with unobservable variables and measurement error. *18*, 39-50.

GAIN. (2014). *Championing gender equality to end malnutrition.* Global Alliance For Improved Nutrition, Geneva, Switzerland.

Gollwitzer, P. M., Brandstatter, V., & Lengfelder, A. (2001). Implementation intentions and efficient action initiation. *Journal of Personality and Social Psychology, 81*, 946-960.

Gujarati, D. N., & Porter, D. C. (2009). *Basic Econometrics.* New York: McgGraw -Hill Education.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing Theory and Practice, 19*, 139-151.

Hair, J. F., Sarstedt, M., Ringle, C. M., & Mena, J. A. (2012). An assessment of the use of partial least squares structural equation modeling in marketing research. *Journal of the Academy of Marketing Science, 40*, 414-433.

Hair, J., Hult, G. M., Ringle, C. M., & Sarstedt, M. S. (2014). *A Primer on partial least squares structural equation modeling (PLS-SEM) 2nd ed.* Thousand Oaks, CA Sage.

Hamilton, K., Daniels, L., White, K. M., & Walsh, N. M. (2010). *Predicting mothers' decisions to introduce complementary feeding at 6 months. An investigation using an extended*

theory of planned behaviour. Queensland University of Technology, Victoria Park Road, Queensland, 4059, Australia.

Hendreş, D. M., Gherman, M.-A., Arhiri, L., Diac, G., & Curelaru, V. (2014). Exploring the socio-cognitive correlates of breastfeeding in a group of Romanian mothers. *Sociologie şi Asistenţă Socială, 7*.

Henseler, J. R., Ringle C.M., & Sinkovics, R. (2009). The use of partial least squares path modelling in international marketing. *20*, 277-319.

Henseler, J., & Sarstedt, M. (2013). Goodness-of-fit indices for partial least squares path modeling. *Computation Statistics, 28*, 565–580.

Hotz, C., & Gibson, R. (2005). Participatory nutrition education and adoption of new feeding practices are associated with improved adequacy of complementary diets among rural Malawian children: a pilot study. *European Journal of Clinical Nutrition*, *14*, 226–237.

Jonesa, A. D., Agudob, Y. C., Galwayc, L., Bentley, J., & Pinstrup-Andersen, P. (2012). Heavy agricultural workload and low crop diversity are strong barriers to improving chils feeding practices in the Bolivian Andes. *Social Science& Medicine, 10.1016/j.socscimed.2012.06.025*.

Kimani-Murage, E. W., Kyobutungi, C., Ezeh, A. C., Wekesah, F., Wanjohi, M., Muriuki, P. (2013). Effectiveness of personalized, home-based nutritional counseling on infant feeding practices, morbidity and nutritional outcomes among infants in Nairobi slums: study protocol for a cluster randomized controlled trial. *Trials, 14*, 445.

Kenya National Bureau of Statistics. (2010). *2008–09 Kenya Demographic and Health Survey*. Nairobi, Kenya: Kenya National Bureau of Statistics and ICF Macro.

Kenya National Bureau of Statistics. (2013). *Nyanza Province Multiple Indicator Cluster Survey 2011, Final Report.* Nairobi, Kenya: Kenya National Bureau of Statistics.

Kenya National Bureau of Statistics, Ministry of Health, National AIDS Control Council, Kenya Medical Research Institute, National Council for Population and Development.(2015). Kenya Demographic and Health Survey 2014. Nairobi, Kenya.

Kumar, D. B. (2015). Predictors of exclusive breastfeeding intention among rural pregnant women in India: a study using theory of planned behaviour. *Rural and Remote Health, 15*, 3405.

Kruglanski, A.W., Shah, J.Y., Fishbach, A., Friedman, R., Chun, W., & Sleeth-Keppler, D. (2002). A theory of goal systems. In M.P. Zanna (Ed.). *Advances in Experimental Social Psychology*. Vol. 34. pp. 331-378. San Diego. CA: Academic Press.

Laterra, A., Ayoya, M. A., Beaulière, J.-M., Bienfait, M., & Pachón, H. (2014). Infant and young child feeding in four departments in Haiti: mixed-method study on prevalence of recommended practices and related attitudes, beliefs, and other determinants. *Rev Panam Salud Publica, 36*, 306-313.

Lee, J.-Y. (1987, Aug). The demand for varied diet with Econometric Models for count data. *American Journal of Agricultural Economics, 69*, 687-692.

Liu, N., Mao, L., Liu, L., Yao, P., & Chen, B. (2009). The effect of health and nutrition education intervention on women's postpartum beliefs and practices: a randomized controlled trial. *BMC Pubic Health, 9,* 124-139.

Lohia, N., & Udipi, S. A. (2014). Infant and child feeding index reflects feeding practices, nutritional status of urban slum children. *BMC Pediatrics, 14*, 290. *Doi:10.1186/s12887-014-0290-7*.

Long, J. S. (1997). *Regression Models for Categorical and Limited Dependent Variables.* Thousand Oaks: Sage Publications.

Magnani, R. (1997). *Sampling Guide.* Washington, D.C.: Food and Nutrition Technical Assistance Project (FANTA).

Margolies, A., & Buckingham, E. (2013). *The Importance of Gender in Linking Agriculture to Sustained Nutritional Outcomes.* Guatemala City, Guatemala: USAID.

Marshall, L. E. (2013). *The influence parents' atitudes, subjective norms, perceived behavioural control, and intentions have on the timing and introduction of complementary foods: An application of theory of planned behaviour.* Thesis, The University of Georgia, Athens, Georgia.

Masset, E., Haddad, L., Cornelius, A., & Isaza-Castro, J. (2011). *A systematic review of agricultural interventions that aim to improve nutritional status of children.* University of London, EPPI Center, Social Science Research Unit, Institute of Education, London.

Mekuria, G., & Edris, M. (2015). Exclusive breastfeeding and associated factors among mothers in Debre Markos, Northwest Ethiopia: a cross-sectional study. *International Breastfeeding Journal, 10,*1-18.

Ministry of Health. (2011). *Engaging grandmothers and men in infant and young Feeding, and maternal nutrition.* Nairobi: Ministry of Health Kenya.

Misker, D., Misker, B., & Ayele, G. (2016). House hold dietary diversity and associated factors in Mirab Abaya wereda Southern Ethiopia2016; community based cross sectional study. *Diversity and Equality in Health and Care, 13*, 293-296.

Nduati, R., Arum, S., & Kageha, E. (2011). *Beliefs and attitudes around infant and young child feeding in Kenya.* Nairobi: Network of AIDS Researchers of East and Southern Africa (NARESA).

Ogunba, B. O. (2015). Effect of Maternal Employment on Infant Feeding Practices in Southwestern Nigeria. *Food and Nutrition Sciences, 6*, 597-604.

Okello, J.J., Lagerkvist, C.J., Kwikiriza, N. Muoki, P. and Ackatia-Armah, R. (2015).

SUSTAIN-Kenya Baseline Survey Report. Unpublished.

Onah, S., Osuorah, D. I., Ebenebe, J., & Ezechukwu, C. (2014). Infant feeding practices and maternal socio-demographic factors that influence practice of exclusive breastfeeding among mothers in Nnewi South-East Nigeria: a cross-sectional and analytical study. *International Breastfeeding Journal, 9, https:/doi.org/10.1186/1746-4358-9-6.*

Ouellette, J.A., and Wood, W. (1998). Habit and intention in everday life: The multiple processes by which past behavior predicts future behavior. *Psychological Bulletin, 124,* 54-74.

Patel, A., Bucher, S., Pusdekar, Y., Esama, F., & Krebs, N. F. (2015). Rates and determinants of early initiation of breastfeeding and exclusive breast feeding at 42 days postnatal in six low and middle-income countries: A prospective cohort study. *Reproductive Health, 12*, 1-18.

Pellegrini, M. G. (2007). The carbon-saving behaviour of residential households. *Futures of Cities - 51st IFHP World Congress, 23-26 September 2007.* Copenhagen.

Perugini, M., & Bagozzi, R.P. (2001). The role of desires and anticipated emotions in goal-directed behaviors: Broadening and deepening the theory of planned behavior. *British Journal of Social Psychology, 40*, 79-98.

Radwan, H. (2013). Patterns and determinants of breastfeeding and complementary feeding practices of Emirati mothers in the United Arab Emirates. *BMC Public Health, 13*, 171-192.

Rana, B.M., Chandwani, H., Sonaliya, K.N., & Prajapati, A. (2016). A descriptive study to assess factors affecting core indicators of infant and young child feeding practices in urban area of Gujarat State, India. *International Journal of Community Medicine Public Health, 3*, 1101-1106.

Rashid, D. A., Smith, L., & Rahman, T. (2006). Determinants of dietary quality: Evidence from Bangladesh. *Selected Paper prepared for presentation at the American Agricultural EconomicsAssociation Annual Meeting, Long Beach, California, July 23-26, 2006.*

Ruel, T. (2013). Nutrition-sensitive interventions and programmes: how canthey help to accelerate progress in improving maternal andchild nutrition? . *www.thelancet.com Published online June 6, 2013 http://dx.doi.org/10.1016/S0140-6736(13)60843-0.*

Sika-Bright, S. (2010). *Infant feeding practices in Cape Coast: A sociological approach.* Department of Sociology & anthropology, UCC.

Sanchez, G. (2013). *PLS Path modelling with R.* Berkeley : Trowchez Editions.

Schwarzer, R., & Renner, B. (2008). *Health-specific self-efficacy scales* : Ralf Schwarzer.

Schwarzer, R., & Renner, B. (2000). Social-cognitive predictors of health behavior: action self-efficacy and coping self-efficacy. *Health Psychology*, *19*, 487-495.

Sniehotta, F. F., Scholz, U., & Schwarzer, R. (2005). Bridging the intention–behaviour gap: Planning, self-efficacy, and action control in the adoption and maintenance of physical exercise. *Psychology & Health, 20*, 143-160.

Sniehotta, F., Scholz, U., & Schwarzer, R. (2006). Action plans and coping plans for physical exercise: A longitudinal intervention study in cardiac rehabilitation. *British Journal of Health Psychology, 11*, 23-37.

Spinelli, S., Masi, C., Dinella, C., Zabolini, G.P., & Monteleone, E. (2014). How does it make you feel? A new approach to measuring emotions in food product experience. *Food Quality and Preference*, 37, 109-122.

Sommer, L. (2011). The theory of planned behaviour and the impact of past behaviour. *International Business & Economics Research Journal, 10*.

Subedi, N., Paudel, S., Rana, T., & Poudyal, A.K. (2012). Infant and Young Child feeding practices in Chepang Communities. *Journal of Nepal Health Research Council, 10,* 141-145.

Sukandar, D., Khomsan, A., F. A., Riyadi, H., & Mudjajanto, E. S. (2015). Nutrition Knowledge, Attitude, and Practice of Mothers and Children Nutritional Status Improved after Five Months Nutrition Education Intervention. *International Journal of Sciences : Basic and Applied Research, 23*, 424-444.

SUSTAIN. (2015). *Scaling -up swetpotato though agriculture and nutrition.* Lima: CIP.

Swanson, V., & Power, K. G. (2005). Initiation and continuation of breastfeeding: Theory of planned behaviour. *Journal of Advanced Nursing, 50*, 272-282.

Tankari, M. R., & Badiane, O. (2015). Determinants of households' food diversity demand in Uganda. Milan , Italy: International Conference of Agricultural Ecoomist.

Teklehaymanot, A. N., Hailu, A. G., & Wossen, B. A. (2013). Intention of exclusive breast feeding among pregnant women using theory of planed behavior in Medebay Zana District, Tigray Region, North Ethiopia. *Public Health Research*, *20,* 162-168.

The World Factbook. (2014). Retrieved 03 25, 2017, from Central Intelligence Agency: https://www.cia.gov/library/publications/the-world-factbook/field/2256.html

Thomas, J. S., Yu, E. A., Tirmizi, N., Owais, A., Das, S. K., Rahman, S. (2015). Maternal knowledge, attitudes and self-efficacy in relation to intention to exclusively breastfeed among pregnant women in rural Bangladesh. *Maternal and Child health, 19*, 49-57.

Thompson, B. (2014). Towards long-term nutrition security: The role of agriculture in dietary diversity. In B. Thompson, & L. Amoroso, *Improving diets and nutriton -Food based approaches* (pp. 246-267). Rome, Italy: CAB International and FAO.

UKaid. (2014). *Can agriculture intervention promote nutrition?* London, England: Department for international Development.

Verplanken, B. (2006). Beyond frequency: Habit as a mental construct. *British Journal of Social Psychology*, 45, 639-656.

Westbrooks, M. (2015). Variables Influencing Breastfeeding among First Time Mothers. *Nursing Theses and Capstone Projects, 201*.

https://digitalcommons.gardner-webb.edu/nursing_etd/201

WHO. (2015, August 01). Retrieved 08 01, 2015, from World Health Organization: www.who.int/nutrition/topics/infantfeeding/en/

WHO. (2015, July 30). *Media center*. Retrieved July 30, 2015, from World Health Organisation: www.who.int/mediacenter/factsheet/fs342/en/

Worldbank. (2015, Jun 20). *Nutrition*. Retrieved from Worldbank: http:www.worldbank.org/nutrition/

Zakaria, H., & Laribick, D. B. (2014). Socio-economic determinants of dietary diversity among women of child bearing ages in Northern Ghana. *Food Science and Quality Management, 34, ISSN 2225-0557*.

Zimmerman, B. J., Bandura, A., & Martinez-Pons, M. (1992). Self-motivation for academic attainment: The role of self efficacy beliefs and personal goal setting. *American Educational Research Journal*, *15*, 663-676.

Appendix 1: Diagnostics from PLS-PM model

Table A1.1: Pooled Model Statistics for Exclusive breastfeeding Feeding PLS-PM Model

Latent variable	Q^2	D.G. rho	MIN	MAX
Attitudes		0.877	-4.902	1.236
Positive emotions			-2.390	1.544
Social conformity		0.589	-5.358	1.705
Subjective norms	0.008	0.832	-3.225	1.671
Descriptive norms	0.015	0.859	-3.609	1.403
Self-efficacy		0.941	-4.215	1.497
Perceived behaviour control	0.188	0.831	-3.720	1.464
Knowledge		0.654	-4.898	1.618
Habits		0.972	-1.248	2.031
Negative emotions			-0.497	9.090
Goals	0.421	0.933	-3.422	1.229
Recovery efficacy		0.950	-3.374	1.325
Intention	0.467	0.908	-3.677	1.248

Source: Survey data (2016)

Table A1.2. Summary Statistics for the Exclusive Breastfeeding Measurement Model

Construct		Mean	Std. dev	Std. loadings
Attitudes: *For me exclusively breastfeeding an infant for the first six months is…*				
A1	Bad_Good	5.92	1.14	0.74
A2	Healthy_Unhealthy	6.08	1.20	0.81
A3	Wise_Foolish	5.81	1.11	0.75
A4	Beneficial_Harmful	5.91	1.19	0.79
Positive emotions: *please describe how you feel right now considering exclusively breastfeeding for the first six months*				
PE1	It is an anti-stress: it calms me, it reassures me	3.14	1.44	0.77
PE2	It relaxes me and make me feel carefree	3.29	1.32	0.80
PE3	I associate it with amusement and fun	3.06	1.51	0.78
PE4	It makes me feel full of energy and reinvigorated	3.09	1.51	0.79
PE5	It makes me merry	3.24	1.48	0.82
PE6	It makes me happy	3.84	1.19	0.82
PE7	It satisfies me	3.48	1.36	0.74
PE8	It makes me feel tender and affectionate	3.66	1.22	0.74
PE9	It gratifies me, reward me	3.33	1.35	0.75
PE10	It makes me feel cuddled and loved	3.71	1.26	0.80
PE11	It communicates sensuality, it charms me	3.34	1.38	0.80
PE12	It communicates security	3.18	1.50	0.77
PE13	I associate it to happy memories of childhood	3.51	1.38	0.74
PE14	It makes me feel good and generous	3.74	1.29	0.70
PE15	It surprises me	4.16	1.26	0.28
		Mean	Std. dev	Std. loadings
PE16	It makes me curious	3.97	1.35	0.33
Negative emotions				
NE1	It makes me feel indifferent	1.69	1.10	0.36

		Mean	Std.dev	Std. loadings
NE2	It bores me	1.23	0.56	0.76
NE3	It makes me feel neglected, without any care for me	1.33	0.74	0.64
NE4	It makes me feel sad	1.16	0.50	0.82
NE5	It disappoints me	1.15	0.46	0.86
NE6	It makes me feel guilty	1.15	0.47	0.84
NE7	It annoys me, it makes me nervous	1.13	0.44	0.85

Social conformity: *We are now interested in how certain people or groups motivate/influence you when it comes to exclusive breastfeeding*

		Mean	Std.dev	Std. loadings
SC1	I want to do what my mother-in-law thinks I should do	3.40	1.90	0.81
SC2	I want to do what my partner thinks I should do	4.18	1.83	0.68
SC3	I want to do what my friends and peers think I should d	2.65	1.65	0.84

Descriptive norms: What is your perception on *where the following people/groups stand when it comes to exclusively breastfeeding*

		Mean	Std.dev	Std. loadings
DN1	Most people who are important to me think I Shouldn't -Should	5.47	1.32	0.88
DN2	Most people who are important to me think it Would not -Would be a good idea	5.55	1.35	0.83
DN3	Most people who are important to me Do not Want - want	5.31	1.39	0.86

Subjective norms: *Now think about what ought to be, in the sense of whether exclusive breastfeeding for the first six months would be approved or disapproved:*

		Mean	Std.dev	Std. loadings
SN1	Most people who are important to me think that I should	5.51	1.29	0.77
SN2	Most people whose opinion I value would approve of	5.59	1.33	0.70
SN3	Most people I respect and admire	4.98	1.45	0.76
SN4	Most people like me exclusively breastfeed	4.59	1.78	0.74

Self-efficacy: *please rate how confident you are that you could really motivate yourself to do these things consistently, for at least six months*

		Mean	Std dev	Std. loadings
SE1	eating with friends or co-workers	5.86	1.33	0.70
SE2	someone makes fun of me	5.78	1.42	0.72
SE3	I have no spouse/partner	5.52	1.57	0.77
SE4	my mother dislike it	5.56	1.44	0.81
SE5	my mother-in-law dislikes it	5.62	1.52	0.78
SE6	my husband dislikes it	5.20	1.67	0.75
SE7	my best friend dislikes it	5.90	1.35	0.74
SE8	I am exhausted	5.15	1.54	0.72
SE9	I have a lot of farmwork	5.20	1.53	0.73
SE10	someone visit at home	5.89	1.26	0.74
SE11	I am busy with house work	5.60	1.35	0.76

Perceived behaviour control: *Now think about yourself, i.e., the power you personally hold regarding exclusively breastfeeding for the first six months. To what degree do you agree with the following statements*

		Mean	Std dev	Std. loadings
PBC1	I am confident	5.41	1.56	0.84
PBC2	Is completely up to me	5.49	1.25	0.69
PBC3	If I really wanted to, I could	5.54	1.27	0.78
PBC4	is under my control	5.67	1.18	0.66

Knowledge		Mean	Std. dev	Std. Loadings
KN1	It is okay to give a 4 month old child porridge	5.18	0.81	0.77
KN2	It is okay to give drinking water to a child aged 2-month	3.80	0.90	0.66

Habits *Breastfeeding for the first six months is something that*

H1	I do frequently	2.36	1.43	0.90
H2	I do automatically	2.56	1.37	0.91
H3	I do without having to think consciously	2.59	1.38	0.88
H4	Makes me feel weird if I would not do	2.77	1.43	0.80
H5	I do without thinking much about it	2.51	1.36	0.88
H6	That would require effort not to do	2.52	1.34	0.84
H7	That belongs to my routine	2.41	1.38	0.91
H8	I would find hard not to do	2.51	1.36	0.84
H9	I have no need to think about doing	2.63	1.38	0.84
H10	That is typically me	2.45	1.43	0.91
H11	I have been doing for a long time	2.54	1.47	0.87

Recovery and coping efficacy *can stick to exclusively breastfeeding for the first six months*

RCE1	even if I have to make a detailed plan	5.32	1.48	0.83

		Mean	Std. dev	Std. loadings
RCE2	even if I have to take a long time to get used to it	5.39	1.52	0.86
RCE3	even if I have to start all over again several times until I succeed	5.36	1.46	0.86
RCE4	even if need a long time to develop the necessary routines	5.36	1.48	0.86
RCE5	even if I do not receive a great deal of support from others when making my first attempts.	5.35	1.53	0.84
RCE6	even when I have worries and problems	4.99	1.63	0.8
RCE7	even when I am tired	5.26	1.54	0.84
RCE8	even when I am busy	5.39	1.58	0.81

Exclusive breastfeeding intention		Mean	Std. dev	Std. loadings
BI1	I expect to do	5.54	1.43	0.89
BI2	I will do	5.31	1.46	0.90
BI3	I am willing to do	5.69	1.25	0.71
BI4	I plan to do	5.42	1.55	0.86
Goals				
G1	I desire to commit myself to exclusively breastfeed for the first six months	5.23	1.57	0.87
G2	It is important to me to commit myself as to how I will exclusively breastfeed for the first six months	5.44	1.46	0.86
G3	I want to commit myself to exclusively breastfeed my infant for the first six months	5.43	1.60	0.87
G4	I want to stick to exclusive breastfeeding for the first six months even if I have to learn much about nutrition	5.46	1.45	0.84
G5	I want to stick to exclusive breastfeeding for the first six months even if I have to make a lot of preparations initially	5.51	1.45	0.84

Source: Survey data (2016).

Table A1.3: Discriminant Validity Exclusive Breastfeeding PLS-PM Model

Discriminant validity

	IN	AT	DN	HB	KN	SC	NE	PBC	PE	RC	SE	SN	G
Intention (IN)	0.845												
Attitudes (AT)	0.408	0.738											
Descriptive norms (DN)	0.504	0.537	0.781										
Habits (HB)	-0.459	-0.289	-0.326	0.871									
Knowledge (KN)	0.148	0.075	0.136	-0.253	0.634								
Social conformity (SC)	0.178	0.195	0.157	-0.094	-0.004	0.554							
Negative emotions (NE)	-0.227	-0.242	-0.275	0.082	-0.089	-0.049	0.764						
Perceived behavior control	0.707	0.404	0.535	-0.463	0.196	0.168	-0.281	0.742					
Positive emotions (PE)	0.357	0.17	0.115	-0.394	0.214	0.141	-0.127	0.354	0.643				
Recovery efficacy (RC)	0.708	0.395	0.436	-0.428	0.194	0.13	-0.286	0.645	0.297	0.838			
Self-efficacy (SE)	0.588	0.388	0.387	-0.351	0.159	0.117	-0.335	0.583	0.254	0.741	0.698		
Subjective norms (SN)	0.546	0.435	0.684	-0.378	0.213	0.119	-0.165	0.541	0.184	0.517	0.414	0.743	
Goal (G)	0.802	0.388	0.476	-0.495	0.21	0.152	-0.243	0.702	0.33	0.834	0.682	0.568	0.857

Source: Survey data (2016)

Table A1.4: Pooled Model Statistics Complementary Feeding PLS-PM Model

Model assessment:

Latent Variable	Q^2	D.G. rho	Min.	Max.
Positive emotions			-2.384	1.714
Negative emotions		0.852	-0.517	9.724
Social conformity		0.855	-1.682	2.395
Attitudes	0.053	0.781	-4.838	1.171
Descriptive norms	0.009	0.832	-4.342	1.676
Subjective norms	0.043	0.882	-3.248	1.502
Perceived behaviour control		0.826	-3.838	1.611
Self-efficacy		0.926	-4.525	1.419
Goals	0.234	0.858	-5.019	1.579
Knowledge		0.680	-4.742	1.562
Recovery efficacy		0.872	-4.822	1.581
Habits		0.975	-1.695	1.698
Exclusive breastfeeding intention		0.908	-3.688	1.240
Intention	0.229	0.847	-4.671	1.511

Source: Survey data (2016).

Table A1.5: Results for the complementary feeding incorporating OFSP measurement model

Construct		Mean	Std. dev	Std. loadings

Attitudes: For me providing proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week is…

A1	Bad_Good	6.14	0.89	0.68
A2	unPleasant_pleasant*	6.04	0.95	0.62
A3	Foolish_Wise*	5.99	0.93	0.61
A4	Harmful_Beneficial*	6.21	0.93	0.71
A5	Tiresome_Tireless	5.58	1.35	0.67

*Wordings were presented in reverse order.

Emotions: Below you will find sentences which describe different kinds of moods and feelings. Using the scale below and sentences listed; please describe how you feel right now regarding proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week

PE1	It is an anti-stress: it calms me, it reassures me	3.19	1.33	0.77
PE2	It relaxes me and make me feel carefree	3.32	1.25	0.81
PE3	I associate it with amusement and fun	3.09	1.38	0.75
PE4	It makes me feel full of energy and reinvigorated	3.24	1.43	0.79
PE5	It makes me merry	3.27	1.43	0.83
PE6	It makes me happy	3.93	1.05	0.80
PE7	It satisfies me	3.66	1.19	0.50
PE8	It makes me feel tender and affectionate	3.51	1.33	0.78
PE9	It gratifies me, reward me	3.30	1.28	0.57
PE10	It makes me feel cuddled and loved	3.35	1.50	0.82
PE11	It communicates sensuality, it charms me	3.20	1.41	0.57
PE12	It communicates security	3.37	1.35	0.45
PE13	I associate it to happy memories of childhood	3.59	1.26	0.75
PE14	It makes me feel good and generous	3.85	1.12	0.66
PE15	It surprises me	1.94	1.25	0.33
		Mean	Std.dev	Std. loadings

PE16	It makes me curious	2.25	1.39	0.13
NE1	It makes me feel indifferent	1.59	1.05	0.62
NE2	It bores me	1.14	0.46	0.63
NE3	It makes me feel neglected, without any care for me	1.29	0.65	0.67
NE4	It makes me feel sad	1.09	0.34	0.62
NE5	It disappoints me	1.10	0.35	0.65
NE6	It makes me feel guilty	1.09	0.32	0.76
NE7	It annoys me, it makes me nervous	1.10	0.33	0.74

Construct		Mean	Std. dev	Std. loadings
Social conformity: We are now interested in how certain people or groups motivate /influence you when it comes to matters of complementary feeding that incorporates orange-fleshed sweetpotato				
SC1	I want to do what my mother-in-law thinks I should do	3.38	1.93	0.76
SC2	I want to do what my partner thinks I should do	4.25	1.84	0.82
SC3	I want to do what my friends and peers think I should do	2.98	1.68	0.86
Descriptive norms: What is your perception on where the following people/groups stand when it comes to matters of complementary feeding that incorporates orange-fleshed sweetpotato				
DN1	Most people who are important to me think I Shouldn't -Should	5.55	1.03	0.77
DN2	Most people who are important to me think it Would not -Would be a good idea	5.72	1.10	0.74
DN3	Most people who are important to me Do not Want - want	5.45	1.20	0.76
DN4	It is expected of me Disagree - Agree	5.76	1.13	0.71
Subjective norms: Now think about what ought to be, in the sense of whether proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week would be approved or disapproved:				
SN1	Most people who are important to me think that I should	5.29	1.31	0.77
SN2	Most people whose opinion I value would approve of	5.22	1.47	0.70
SN3	Most people I respect and admire	4.74	1.73	0.76
SN4	Most people like me exclusively breastfeed	4.59	1.78	0.74
Self-efficacy: please rate how confident you are that you could really motivate yourself to do these things consistently, proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g				
SE1	I feel depressed, bored, or tense	5.41	1.56	0.72
SE2	Under lots of stress	5.22	1.67	0.77
SE3	There is no one to encourage you	5.65	1.42	0.70
		Mean	Std.dev	Std. loadings
SE4	My mother dislike it	5.81	1.22	0.74

SE5	My mother in law dislike it	5.77	1.35	0.70
SE6	My husband dislike it	5.59	1.45	0.74
SE7	My best friend dislike it	5.98	1.25	0.64
SE8	I am sick	4.96	1.59	0.69
SE9	I am exhausted	5.35	1.44	0.77
SE10	I have lots of farmwork	5.45	1.41	0.75
SE11	Someone visits at home	5.98	1.20	0.63
SE12	Busy with house work	5.76	1.29	0.69

Perceived behaviour control: Now think about yourself i.e., the power you personally hold regarding providing proper complementary feeding. Please tell me your position on the following statements.

PBC1	I am confident providing proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week (False_True*)	5.63	1.12	0.73
PBC2	Is completely up to me to provide proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week (Disagree_Agree*)	5.50	1.21	0.78
PBC3	If I really wanted to, I could provide proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week (Unlikely_Likely*)	5.66	1.11	0.65
PBC4	Providing proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week (Not at all_Total control*)	5.61	1.27	0.79

*Wordings were presented in reverse order.

Goals

G1	I desire to commit myself to as to when I will start providing proper complementary feeding with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week	5.17	1.46	0.78

		Mean	Std.dev	Std. loadings
G2	It is important to me to commit myself as to how I will providing proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week	5.55	1.16	0.69
G3	I want to commit myself to providing proper complementary feeding after the age of six months with foods that include orange-fleshed	5.51	1.30	0.80

	sweetpotato of about 125g at least 3 times a week			
G4	I want to stick to providing proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week even if I have to learn much about nutrition,	5.76	1.10	0.70
G5	I want to stick to providing proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week even if I have to make a lot of preparations initially	5.77	1.12	0.72

Exclusive breastfeeding intention: Exclusive breastfeeding intention for the first six months is something that…

EBI1	I expect to do	5.54	1.43	0.90
EBI2	I will do	5.31	1.46	0.89
EBI3	I am willing to do	5.69	1.25	0.71
EBI4	I plan to do	5.42	1.55	0.86

Knowledge: *Using the alternatives True, False or Do not know, please respond to the following claims*

KN	Mean of total score over thirteen statements	0.696	0.11	N/A
	**Formative construct			

Habits: Complementary feeding with foods that include orange-fleshed sweetpotato of about 125g, at least 3 times a week is something ......

		Mean	Std.dev	Std. loadings
H1	I do frequently	2.94	1.37	0.92
H2	I do automatically	3.04	1.34	0.90
H3	I do without having to think consciously	3.05	1.34	0.89
H4	Makes me feel weird if I would not do	3.12	1.33	0.86
H5	I do without thinking much about it	2.96	1.34	0.89
H6	That would require effort not to do	2.84	1.25	0.82
H7	That belongs to my routine	2.98	1.36	0.90
H8	I would find hard not to do	2.92	1.26	0.83
H9	I have no need to think about doing	3.00	1.29	0.87

H10	That is typically me	3.00	1.40	0.91
H11	I have been doing for a long time	3.16	1.44	0.89

Recovery and coping efficacy: I can stick providing proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g   at least 3 times a week

RCE1	even if I have to make a detailed plan	5.53	1.16	0.69
RCE2	even if need a long time to develop the necessary routines	5.36	1.48	0.79
RCE3	even if I do not receive a great deal of support from others when making my first attempts.	5.53	1.20	0.80
RCE4	even when I have worries and problems	5.38	1.35	0.78
RCE5	even when I am tired	5.54	1.27	0.74
RCE6	even when I am busy	5.61	1.29	0.67

Behaviour intention: Proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g   at least 3 times a week is something

BI1	I expect to do	5.62	1.19	0.86
BI2	I will do	5.45	1.11	0.83
BI3	I plan to do	5.52	1.34	0.72

Source: Survey data (2016).

Table A1.6: Discriminant Validity Complementary feeding PLS-PM Model

	In	Att	DN	HB	SC	NE	PBC	PE	RC	SE	SN	EB	KN	G
Intention (IN)	0.806													
Attitudes (Att)	0.052	0.738												
Descriptive norms (DN)	0.459	0.141	0.744											
Habits (HB)	-0.299	-0.107	-0.331	0.882										
Social conformity (SC)	0.121	-0.187	0.130	-0.125	0.814									
Negative emotions (NE)	-0.073	-0.273	-0.087	0.066	0.162	0.673								
PBC	0.564	0.117	0.514	-0.326	0.087	-0.162	0.738							
Positive emotions (PE)	0.288	-0.236	0.277	-0.286	0.329	0.342	0.249	0.674						
Recovery efficacy (RC)	0.372	0.231	0.314	-0.197	-0.073	-0.254	0.435	-0.068	0.747					
Self-efficacy (SE)	0.168	0.448	0.208	-0.156	-0.166	-0.433	0.300	-0.335	0.587	0.714				
Subjective norms (SN)	0.495	-0.095	0.618	-0.362	0.246	-0.033	0.513	0.438	0.260	0.039	0.845			
Breastfeeding (EB)	0.320	0.057	0.329	-0.096	0.030	-0.003	0.283	0.143	0.193	0.113	0.298	0.844		
Knowledge (KN)	0.162	-0.069	0.260	-0.217	0.093	-0.024	0.197	0.213	0.129	0.044	0.283	0.122	0.737	
Goals	0.550	0.135	0.463	-0.262	0.048	-0.176	0.557	0.202	0.625	0.352	0.495	0.310	0.269	0.741

Source: Survey data (2016)

Appendix 2: Results of Variance Inflation Factors

Table A2.1: Inner VIF Values PLS-PM model

	Intention	Attitudes	Descriptive norms	Subjective norms	Goal-directed pursuit
Attitudes					1.311
Descriptive norms					1.859
Habits	1.104				
Motivation factors			1.000	1.000	
Negative emotions		1.132			
PBC					1.608
Positive emotions		1.132			
Recovery and Coping efficacy	1.650				
Self-efficacy					1.371
Subjective norms					1.912
exclusive breastfeeding intention	1.108				
knowledge	1.111				
Goal directed pursuit	1.876				

Table A2.2: VIF Poisson models

Variable	VIF	1/VIF
Potential	2.110	0.475
Pclinic	2.020	0.495
Ychild	1.950	0.513
Infant	1.860	0.538
Subnorms	1.770	0.566
Pbc	1.750	0.570
Nutmsg	1.670	0.599
Nutcouns	1.320	0.756
Cookdemo	1.220	0.819
Hfias	1.200	0.832
Hhsize	1.200	0.835
Lnage	1.180	0.845
Att	1.160	0.866
Nedugrp	1.150	0.866
Lndstfacility	1.130	0.887
Lndstchv	1.120	0.893
Knowledge	1.110	0.898
Lnoffarminc	1.110	0.902
Lnroad	1.100	0.907
Birthparity	1.100	0.911
Mean VIF	1.410	

Source Survey data (2016)

Appendix 3: Map of the study area
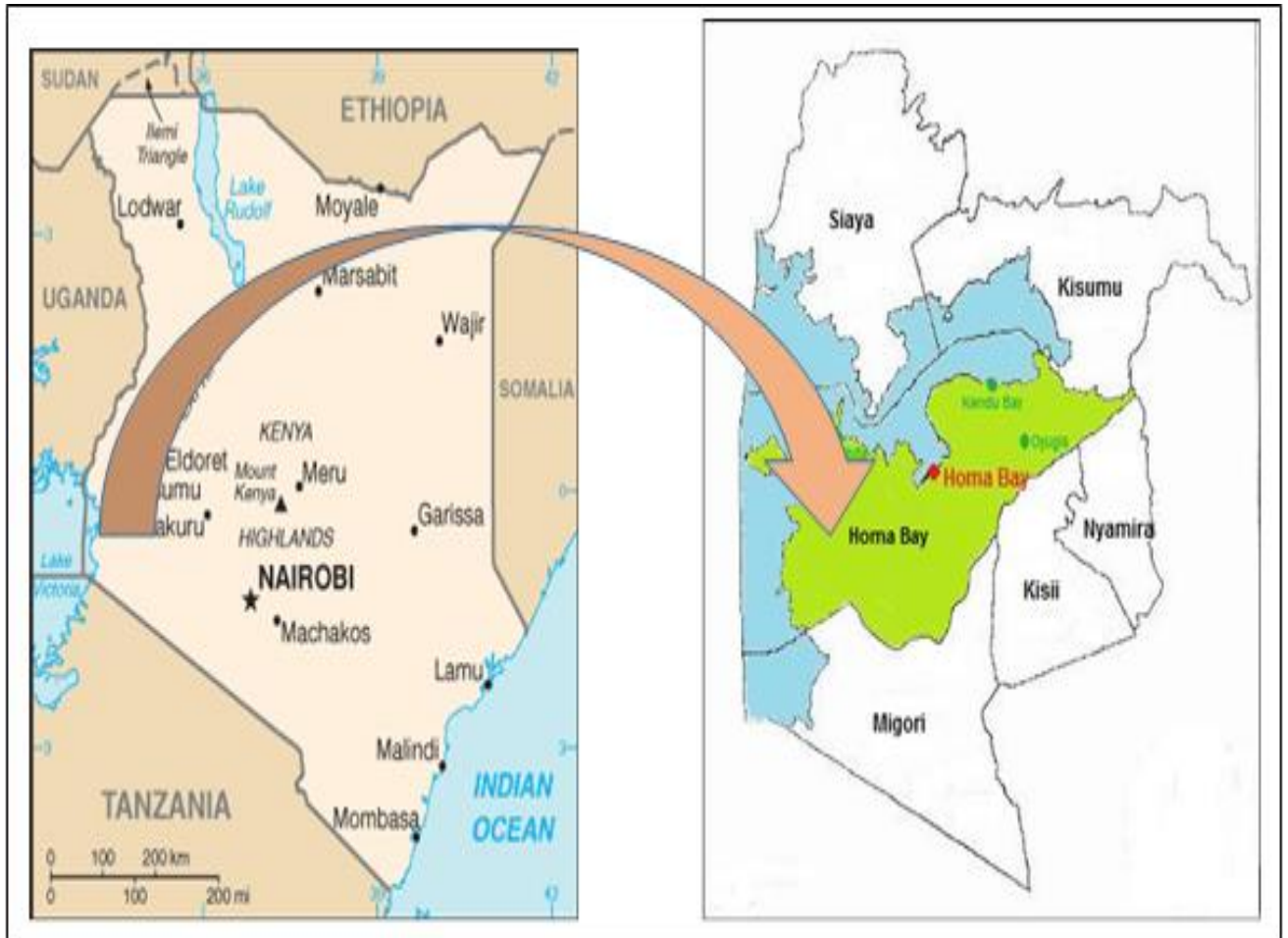
Source: Kenya National Bureau of Statistics (2013)

Appendix 4: The Research Questionnaire

PREDICTING BEHAVIOR TOWARDS OFSP-FOCUSED YOUNG CHILD FEEDING

Date of interview …………………………..   Start time…………   End time…………

Interviewed   by …………………………………………………………………………..

PART A: RESPONDENT AND SITE IDENTIFICATION

1.   Respondent's name (three names)……………………………………….
2.   Phone number (own or of closest neighbour)……………………………………………

3.   County …………………………………………………………………
4.   Community unit …………………………………………………………
5.   Village…………………………………………………….….…
6.   Distance to the nearest health facility (minutes)…………………………………
7.   Distance to the nearest main road (minutes.) …………………………………
8.   Distance to the nearest home of the community health volunteer (CHV) (minutes) ……

9.   a)   Are you currently <u>pregnant</u>? 1=Yes   0=No
          b)   Do you have a child who is <u>0- 6 months</u> now? 1=Yes   0=No
          c)   Do you have a child who is <u>7- 23 months</u> now? 1=Yes   0=No
          d)   Are you currently between is <u>19-49</u> years old? 1=Yes   0=No

      [*If no to all questions above discontinue the interview*]

10   Have you ever heard of SUSTAIN project (or CIP sweetpotato)? 1=Yes   0=No

11   Have you ever received a coupon for OFSP vines <u>since 2014</u>? 1=Yes   0=No
12   Did you receive the coupon at a health facility? 1=Yes   0=No
13.   What is the name of the facility where you received coupon from [*N/A if not applicable*]……………………………………………………………

01: Name of HH member [*Start with respondent followed by <u>husband</u>. Skip row 2 if husband missing. Record all the 3 names*]	02 :Gender 1=Male 0=Female	03: Age (Years)	04: Relation to household head Codes A	05: Marital status Codes B	06: Education (Years) Codes C	07: Employment (salaried or casual) 1=Yes 0=No
1.						
2.						
3.						

PART B: HOUSEHOLD DEMOGRAPHICS

Codes A 1= Household head 2=Spouse 3= Son/daughter 4=Grandchild 5= Sister/brother 6=In-law 7=Other, specify………………

Codes B 1= Single 2=Married, lives with spouse 3=Married, spouse lives away 4= Divorced /Separated 5=Widowed

Codes C 1= No formal education at all. [*For others record year/grade completed : Primary 1 = 1; Primary 2=2; Sec form 1 = 9; form 3 = 11; University/College yr 1= 13; University/College yr. 2 = 14, etc.*]

08. [*Enumerator: Please, ask*] is this (or will this be) your first born child? 1=Yes 0=No 2=N/A

09. Youngest of the children aged <u>0-23 months</u> is called [*name*] [*N/A if none*] ……………

10. Actual date of birth of <u>youngest</u> [*Ask for health booklet*]…dd…………/mm……………/year………

I would like to ask you a few questions about [*name of the child in Q08*]

11. What did you give [*name*] immediately after birth? 1=Colostrum 2=Sugar water /glucose water 3=Honey water 4= milk 5 = Plain water 6=Other specify

12. Are you currently breastfeeding [*name*]? 1=Yes 0=No

13. Was [*name*] given semi-solid / solid foods <u>yesterday</u> during the <u>day or at night</u>? 1=Yes 0=No

14. IF Yes to Q11, how many times did [*name*] eat semi-solid /solid foods yesterday <u>during the day or at night</u>? ....

15. Have you ever fed [*name*] on mashed sweetpotato? 1=Yes 0=No

<u>PART D: KNOWLEDGE</u> : I would now like us to discuss various aspects around feeding of young children especially up to 2 years of age. You may be aware that this is the time when most children become malnourished if proper care is not provided. For this session, respond with the words True, False or do not know.

1. <u>Objective Knowledge: Breastfeeding</u>

a) Breast feeding should be initiated within 1 hour after birth 1=True 0=False 2=Do not know

b) It is okay to give drinking water to a child aged 2-month 1=True 0=False 2=Do not know

c) It is WRONG to continue breastfeeding a child UP TO 2 years.1=True 0=False 2=Do not

d) Breastfeeding mothers should eat more food than non-breastfeeding mothers 1=True 0=False 2=Do not know

e) It is okay to express breast milk for a child 6-8 months 1=True 0=False 2=Do not know

f) Expressed breast milk is okay to feed a baby within 12hours when stored outside refrigeration conditions 1=True 0=False 2=Do not know

2. Objective Knowledge: Complementary feeding

a) It is okay to give a 4 month old child porridge 1=True 0=False 2=Do not know

> Mary, a mother of a 8-month old child provided the following foods to her child:
> ✓ 7am -Uji from maize and sorghum flour
> ✓ 12noon - Ugali and milk
> ✓ 7pm- Ugali and vegetable soup

Please respond to the following questions based on Mary's scenario above:

b) Mary provided a balanced diet to her child during these meals 1=True 0=False 2=Do not know

c) Mary provided food to her 8-month old baby in the required frequency on this day 1=True 0=False 2=Don't know

d) The diversity/number of food types that Mary fed her 8-month old child is okay to ensure her baby grows up healthy.   1=True 0=False 2=Do not know

Now I would like to ask you a few other questions about feeding a young child in general

e) The food of a child 9-12 months should not flow freely from a spoon *[Enumerator to illustrate using sample foods]*   1=True 0=False 2=Do not know

f) It is okay to feed a child on porridge using a feeding bottle. 1=True 0=False 2=Do not know

g) Children 6-23 months should not eat eggs. 1=True 0=False 2=Do not know

h) Children who continue to breastfeed after 1 year do not eat other foods well 1=True 0=False 2=Do not know

i) Utensils for feeding a child aged 6-8 months should only be used for this purpose. 1=True 0=False 2=Do not know

j) Cooking pots/sufuria used for cooking food for a child aged 6-8 months should only be used for this purpose 1=True 0=False 2=Do not know

3. Objective Knowledge: Vitamin A

a) Vitamin A deficiency is common among young children 1=True 0=False 2=Do not know

b) All children under 2 years need to receive a vitamin A capsule periodically from the health facility or during campaigns/outreach. 1=True 0=False 2=Do not know

c) There are foods locally available in our community that provide our body with vitamin A
        1=True 0=False 2=Do not know

d) Pregnant women require more vitamin A that non- pregnant women. 1=True 0=False 2=Do not know

e) Breastfeeding women require more vitamin A as compared to women that are not breastfeeding   1=True 0=False 2=Do not know

f) In your opinion, what causes vitamin A deficiency? *[Enumerator: Please indicate YES or NO below]*   a) Mentions lack of consumption of vitamin A rich foods. 1=Yes   0=No

g) The orange fleshed sweetpotato is a good source of vitamin A *[Enumerators to show the root]* 1=True 0=False 2=Do not know

h) In your opinion, why is this (OFSP) root orange in colour? *[Enumerator: Check for below]*
        1= Mentions contains vitamin A   1=Yes   0=No
        2= Mentions contains beta carotene 1=Yes   0=No

i) The orange colour of OFSP means it is good for baby food 1=True 0=False 2=Do not know

BEHAVIORAL ASPECTS
PART E: EXCLUSIVE BREASTFEEDING
[Enumerator please read] This section focuses on exclusive breastfeeding.   Exclusive breastfeeding means feeding an infant on mother's breast milk only for the first six months by putting the infant to the breast or on expressed breast milk. [*Emphasize No water also*]

   I.   OUTCOME EXPECTANCIES

> Using the scale, please indicate how you would rate each of the following statements
>
> If I exclusively breastfeed for the first six months ……[*Repeat the question before each of the following statements*] 1=I disagree   2 3   4   5   6   7=I agree

a. my child will be healthy	b. my friends will make fun of me
c. it will be expensive	d. it will be time consuming.
e. it will be enjoyable.	f. I will be wise.
g. it will be beneficial.	

II.   ATTITUDES

For me exclusively breastfeeding an infant for the first six months is…[*Repeat the question before each statement]*

Enjoyable	1 : 2 : 3 : 4 : 5 : 6 : 7 Unenjoyable	Bad	1 : 2 : 3 : 4 : 5 : 6 : 7 Good
Expensive	1 : 2 : 3 : 4 : 5 : 6 : 7 Inexpensive	Pleasant	1 : 2 : 3 : 4 : 5 : 6 : 7 Unpleasant
Healthy	1 : 2 : 3 : 4 : 5 : 6 : 7 Unhealthy	Wise	1 : 2 : 3 : 4 : 5 : 6 : 7 Foolish
Beneficial	1 : 2 : 3 : 4 : 5 : 6 : 7 Harmful	Tiresome	1 : 2 : 3 : 4 : 5 : 6 : 7 Tireless

III.   MOTIVATIONAL FACTORS

We are now interested in how certain people or groups motivate /influence you when it comes to matters of exclusive breastfeeding. When it comes to matters of exclusive breastfeeding for the first 6 months…..[*Repeat the question before each of the following statements]*

I want to do what my mother-in-law thinks I should do.	Agree 1 : 2 : 3 : 4 : 5 : 6 : 7 Disagree
I want to do what my partner thinks I should do.	Agree 1 : 2 : 3 : 4 : 5 : 6 : 7 Disagree
I want to do what my doctor and CHV thinks I should do.	Agree 1 : 2 : 3 : 4 : 5 : 6 : 7 Disagree
I want to do what my friends and peers think I should do.	Agree 1 : 2 : 3 : 4 : 5 : 6 : 7 Disagree

IV.   SUBJECTIVE NORMS

Now think about the people who are very important to you and those you respect. Assume also that you have decided to exclusively breastfeed for the first six months.

a.   Most people who are important to me think that I should exclusively breastfeed a baby for the first six months.   False   1 : 2 : 3 : 4 : 5 : 6 : 7 True

b.   Most people whose opinion I value would approve of me exclusively breastfeeding a baby for the first six months. Improbable 1 : 2 : 3 : 4 : 5 : 6 : 7 Probable

c.   Most people I respect and admire exclusively breastfeed for the first six months.   Unlikely   1 : 2 : 3 : 4 : 5 : 6 : 7 Likely

d.   Most people like me exclusively breastfeed for the first six months. Disagree 1 : 2 : 3 : 4 : 5 : 6 : 7 Agree

V.   DESCRIPTIVE NORMS (Model learning)

Please continue thinking about the people who are important to you and those around you, and exclusively breastfeeding….

1. Most people who are important to me think I Should 1 : 2 : 3 : 4 : 5 : 6 : 7 Should not exclusively breastfeed for the first six months.

2. Most people who are important to me think it Would be a good idea 1: 2 : 3 : 4 : 5 : 6 : 7 Would not be a good idea to exclusively breastfeed for the first six months.

3. Most people who are important to me Want 1 : 2 : 3 : 4 : 5 : 6 : 7 Do not want me to exclusively breastfeed for the first six months.

4. It is expected of me to exclusively breastfeed for the first six months. Disagree 1 : 2 : 3 : 4 : 5 : 6 : 7 Agree

5. I feel under social pressure to exclusively breastfeed for the first six months. Disagree 1 : 2 : 3 : 4 : 5 : 6 : 7 Agree

VI.   SELF-EFFICACY

[Enumerator please read]: Now let's talk about things/circumstances that might influence people who are trying to exclusively breastfeed. Please use the scale to respond if this was about you: *[Repeat the question before each statement] I am sure I can't 1 2 3 4 5 6 7 I am sure I can*

STATEMENT	
I could really motivate myself to <u>consistently</u> exclusively breastfeed, for the first six months, even when.....	
a. I feel depressed, bored, or tense	b. my mother-in-law dislikes it
c. under lots of stress	d. my husband dislikes it
e. there is no one to encourage you	f. my best friend dislikes it
g. eating with friends or co-workers	h. I am sick
i. I am alone, and there is no one to watch me	j. I am exhausted
k. someone makes fun of me	l. I have a lot of farmwork
m. I have no spouse/partner	n. someone visit at home
o. my mother dislike it	p. I am busy with house work

VII.   PERCEIVED BEHAVIORAL CONTROL

Now think about yourself i.e., the power you personally hold regarding exclusively breastfeeding for the first six months. Please indicate your stand with respect to the following statements.
a) I am <u>confident</u> that I can exclusively breastfeed for the first six months.   True 1 : 2 : 3 : 4 : 5 : 6 : 7 False
b) Exclusively breastfeeding is <u>completely up to me</u> for the first six months.   Agree   1 : 2 : 3 : 4 : 5 : 6 : 7 Disagree
c) If I <u>really wanted to</u>, I could exclusively breastfeed for the first six month.   Likely   1 : 2 : 3 : 4 : 5 : 6 : 7 Unlikely
d) For me exclusively breastfeeding for the first six months is <u>under my control.</u>   Not at all 1 : 2 : 3 : 4 : 5 : 6 : 7 Total control

VIII.   BEHAVIORAL INTENTION

      Let's now focus shift to your <u>intentions</u> when it comes to matters of exclusive breastfeeding.

a) I expect to exclusively breastfeed for the first six months   Definitively do 1 : 2 : 3 : 4 : 5 : 6 : 7 Definitively don't
b) I will exclusively breastfeed for the first six months   Likely 1 : 2 : 3 : 4 : 5 : 6 : 7 Unlikely
c) I am willing to exclusively breastfeed for the first six months   False 1 : 2 : 3 : 4 : 5 : 6 : 7 True
d) I plan to exclusively breastfeed for the first six months   Agree 1 : 2 : 3 : 4 : 5 : 6 : 7 Disagree

   IX.   ADOPTING AND MAINTAINING BEHAVIOR

      Now for the next few questions, I would like us to talk about commitment to exclusive breastfeeding

i. Coping and recovery self-efficacy	
[Enumerator: Repeat the question before each of the following statements]	
I can stick to exclusive breastfeeding for the first six months …… Not at all 1 2 3 4 5 6 7 Exactly true	
a. even if I have to make a detailed plan	b. even when I have worries and problems
c. even if I have to take a long time to get used to it	d. even when I am tired
e. even if I have to start all over again several times until I succeed	f. even when I am busy
g. even if need a long time to develop the necessary routines	
h. even if I do not receive a great deal of support from others when making my first attempts.	

ii.   Planning and goal setting
A) Implementation intentions
a.   I have already committed myself as to <u>when</u> I will <u>start</u> to exclusively breastfeed your baby   Not at all 1 : 2 : 3 : 4 : 5 : 6 : 7 Exactly true
b.   I have already committed myself to <u>how</u> I will exclusively breastfeed   Not at all 1 : 2 : 3 : 4 : 5 : 6 : 7 Exactly true
c.   I have already committed myself to exclusively breastfeed <u>my</u> infant(s) for the first six months   Not at all 1 : 2 : 3 : 4 : 5 : 6 : 7 Exactly true
B) Action and coping planning
<u>I will have to continue</u> exclusively breastfeeding for the first six months …………… *[Enumerator: Repeat the question before each of the following statements]*
Not at all 1 , 2, 3, 4, 5, 6, 7 Exactly true
even if I have to learn much about nutrition,
even if I have to make a lot of preparations initially

PART F: HABITS

[*Enumerator please read*]: Using the scale below and the sentences listed; please describe your habits regarding exclusively breastfeeding for the first six months

Scale: 1=Strongly agree 2=Agree 3=Neither agree nor disagree 4=Disagree 5=Strongly disagree

Exclusive breastfeeding is something that		
1	I do frequently	7. That belongs to my routine
2	I do automatically	8. I would find hard not to do
3	I do without having to think consciously	9. I have no need to think about doing
4	Makes me feel weird if I would not do	10. That is typically me
5	I do without thinking much about it	11. I have been doing for a long time
6	That would require effort not to do	

PART G: EMOTIONS

[*Enumerator please read*]: Below you will find sentences which describe different kinds of moods and feelings. Using the scale below and sentences listed; please describe how you feel right now regarding exclusively breastfeeding for the first six months.
Scale: 1=Not all 2=Slightly 3=Moderately 4=Very 5=Extremely

STATEMENTS	
a. It is an anti-stress: it calms me, it reassures me	b. It communicates security
c. It relaxes me and make me feel carefree	d. I associate it to happy memories of childhood
e. I associate it with amusement and fun	f. It makes me feel good and generous
g. It makes me feel full of energy and reinvigorated	h. It surprises me
i. It makes me merry	j. It makes me curious
k. It makes me happy	l. It makes me feel indifferent
m. It satisfies me	n. It bores me
o. It makes me feel tender and affectionate	p. It makes me feel neglected, without any care for me
q. It gratifies me, reward me	r. It makes me feel sad
s. It makes me feel cuddled and loved	t. It disappoints me

u. It communicates sensuality, it charms me	v. It makes me feel guilty
w.	x. It annoys me, it makes me nervous

PART H: PARTICIPATION IN NUTRITION EDUCATION

1.	Are you a member of a mother-to-mother club/group? 1=Yes 0=No
2.	Has this group ever received nutrition training from SUSTAIN/PATH/AFIA-PLUS? 1=Yes 0=No
3.	Have you ever received nutrition training/messaging from this group? 1=Yes 0=No
4.	Have you ever received nutrition training on infant and young child feeding given by SUSTAIN, PATH or APHIA plus/CIP <u>since 2014</u>? 1=Yes 0=No
5.	Have you attended prenatal and post-natal clinic <u>since 2014</u>? 1=Yes 0=No
6.	Did you receive/get <u>nutrition counselling</u> from the health facility you attended? [*Enum: Counselling is 1to1*] 1=Yes 0=No
7.	If you have ever attended a pre or post-natal clinic, did you get <u>nutrition messaging</u> from the health facility you attended? [*Enumerator: Messaging = general health talk given to the group of pregnant women/mothers attending clinic*] 1=Yes 0=No
8.	Have you ever attended a cooking demonstration or orange-fleshed sweetpotato value addition training (open day) <u>since 2014</u>? 1=Yes 0=No

18. If you have participated in any nutrition education (messaging or counselling) before, please indicate which of the following practices you have started using as a routine (adopted)?
[*Enum: A YES in Q4, Q5, Q6, Q7 or Q8, means respondent has participated. Please probe*]

	Yes	No
a) Early initiation of breastfeeding (breastfed within the first hour)		
b) Exclusive breastfeeding up to 5 months		
c) Continued breastfeeding at 1 year		
d) Dietary diversity (2 to 3 different classes of foods)		
e) Minimum meal frequency (i.e. 6-8 months, 2-3 meals ; 9-11 months, 3-4 meals and 12-23 months 3-4 meals)		
f) Minimum acceptable <u>amount</u> (6-8 months start with 2-3 tablespoons per feed, 9-11 ½ 250ml cup; and 12-23 months ¾ 250ml cup)		
g) <u>Texture</u> (6-8 months start with thick porridge , 9-11 months mashed /finely chopped foods; and 12-23 months family/mashed /finely chopped foods)		
h) Incorporating 125g of orange-fleshed sweetpotato into a child's foods (one small root, 125 grams)		
i) Incorporating orange-fleshed sweetpotato leaves into a child's foods		
j) Other, specify…………		

PART I: COMPLEMENTARY FEEDING

[*Enumerator read*] For the next set of questions, we will be focusing on proper complementary feeding after the age of six months with foods that include <u>orange-fleshed sweetpotato</u> [*show sample of OFSP root*]. Proper complementary feeding entails:

   ✓ Giving a young child <u>foods of the right amount and density</u> at the <u>right frequency</u> depending on a child's age [*Feeding freq: 6-8 months >> 2-3 meals >>>2-3 table spoons; 9-11 months >> 3-4 meals>>>1/2 250ml bowl/cup; 12-23 months >> 3-4 meals>>>3/4 250ml bowl/cup]*.
   ✓ Giving a young child diverse foods.
   ✓ Incorporating orange-fleshed sweetpotato of about 125g [*show OFSP root*] at least 3 times a week.
   ✓ Continued breastfeeding up to 2 years.

[Enumerator: ask: Do you have any questions regarding what is meant by proper complementary feeding incorporating 125g of OSFP at least 3 times per week?
[Enumerator: please ask the respondent to briefly explain the requirements of complementary feeding.
If correct: proceed
If not correctly answered: Go back and explain again. Then repeat the follow-up question. This should go on until you are sure that the respondent understands what the criteria refers to]

Orange-fleshed sweetpotato such as this [*Show sample of OFSP root*] is a new variety of sweetpotato. It is appropriate for inclusion in a <u>young child's complementary food</u> because it <u>contains Vitamin A</u> which <u>prevents blindness</u> and <u>helps the body fight common childhood diseases</u> such as diarrhea. It also <u>contains energy</u> which the child needs.

This sweetpotato [*Show OFSP root*] can be prepared for <u>baby feeding</u> in various ways.

<u>Treatment 0 (Control)</u> [*Talk only – No showing*]: You can:
1. Mashed OFSP (125g)
2. Mix/mash: <u>boiled OFSP root + eggs + pumpkin leaves + boiled water</u> into a fine/uniform mix/blend and then feed to the child.
3. Mix/mash: <u>boiled OFSP root +avocado +milk</u> into a fine/uniform mix/blend and then feed to child
4. Mix/mash: <u>boiled OFSP root + beans (de-hulled) + pumpkin leaves + boiled water</u> into a fine/uniform mix/blend and then feed to the child

<u>Treatment 1</u> [Talk + show]: You can:
1. Mashed OFSP (125g)
2. Mix/mash: <u>boiled OFSP root + eggs + pumpkin leaves + boiled water</u> into a fine/uniform mix/blend and then feed to the child.
3. Mix/mash: <u>boiled OFSP root +avocado +milk</u> into a fine/uniform mix/blend and then feed to child.
4. Mix/mash: <u>boiled OFSP root + beans + pumpkin leaves + boiled water</u> into a fine/uniform mix/blend and then feed to the child

I will now show you some samples of these 3 types of foods that a mother can prepare for a young child.
[Shows samples of OFSP-based baby foods]

I. OUTCOME EXPECTANCIES

Using the scale, please indicate how you would rate how each of the following statements	
Providing proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week will …….[*Repeat the question before each of the following statements*]	
1=I disagree 2 , 3 , 4, 5, 6, 7=I agree	
a. keep my child healthy.	b. make feeding my child enjoyable.
c. make my friends make fun of me.	d. make me wise.
e. be expensive.	f. make feeding my child beneficial.
g. make feeding my child time consuming.	

II. ATTITUDES

For me providing proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week is …? [*Repeat the question before each of the following statements*]			
Enjoyable 1 : 2 : 3 : 4 : 5 : 6 : 7 Unenjoyable	Bad	1 : 2 : 3 : 4 : 5 : 6 : 7 Good	
Expensive 1 : 2 : 3 : 4 : 5 : 6 : 7 Inexpensive	Pleasant	1 : 2 : 3 : 4 : 5 : 6 : 7 Unpleasant	
Healthy 1 : 2 : 3 : 4 : 5 : 6 : 7 Unhealthy	Wise	1 : 2 : 3 : 4 : 5 : 6 : 7 Foolish	
Beneficial 1 : 2 : 3 : 4 : 5 : 6 : 7 Harmful	Tiresome	1 : 2 : 3 : 4 : 5 : 6 : 7 Tireless	

III. MOTIVATIONAL FACTORS

We are now interested in how certain people or groups motivate /influence you when it comes to matters of complementary feeding that incorporates orange-fleshed sweetpotato.
When it comes to matters of proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week …….
I want to do what my mother-in-law thinks I should do.   Agree   1 : 2 : 3 : 4 : 5 : 6 : 7 Disagree
I want to do what my partner   thinks I should do.   Agree   1 : 2 : 3 : 4 : 5 : 6 : 7 Disagree
I want to do what my doctor and CHV   thinks I should do. Agree   1 : 2 : 3 : 4 : 5 : 6 : 7 Disagree
I want to do what my friends and peers think I should do.   Agree   1 : 2 : 3 : 4 : 5 : 6 : 7 Disagree

IV. SUBJECTIVE NORMS

Now think about people who are very important you and those you respect. Assume also that you have decided to provide proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week	
a.	Most people who are important to me think that I should provide proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week. False 1 : 2 : 3 : 4 : 5 : 6 : 7 True
b.	Most people whose opinion I value would approve of me providing proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week. Improbable 1 : 2 : 3 : 4 : 5 : 6 : 7 Probable
c.	Most people I respect and admire provide proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week. Unlikely 1 : 2 : 3 : 4 : 5 : 6 : 7 Likely
d.	Most people like me provide proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week. Disagree 1 : 2 : 3 : 4 : 5 : 6 : 7 Agree

V. DESCRIPTIVE NORMS (Model learning)

Please continue thinking about the people who are important to you and those around you, and providing proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about

125g at least 3 times a week
1. Most people who are important to me think I Should   1 : 2 : 3 : 4 : 5 : 6 : 7 Should not provide proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week
2. Most people who are important to me think it Would be a good idea 1 : 2 : 3 : 4 : 5 : 6 : 7 Would not be a good idea to provide proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week
3. Most people who are important to me   Want   1 : 2 : 3 : 4 : 5 : 6 : 7 Do not want me to provide proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week
4. It is expected of me provide proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week Disagree 1 : 2 : 3 : 4 : 5 : 6 : 7 Agree
5. I feel under social pressure provide proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week. Disagree   1 : 2 : 3 : 4 : 5 : 6 : 7 Agree

VI.   SELF-EFFICACY

Now let's talk about things/circumstances that might influence people who are trying to adopt provide proper complementary feeding under such circumstances. Please use the scale to respond: *[Repeat the question before each of the statements]*
STATEMENT I could really motivate myself to provide proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week,WHEN ..... I am sure I can't 1: 2: 3: 4: 5: 6: 7 am sure I can

a.	I feel depressed, bored, or tense	b.	my mother dislike it
c.	under lots of stress	d.	my mother in law dislike it
e.	there is no one to encourage you	f.	my husband dislike it
g.	dining with friends or co-workers	h.	my best friend dislike it
i.	I am alone, and there is no one to watch you	j.	I am sick
k.	someone makes fun of me	l.	I am exhausted
m.	I have no spouse/partner		
n.	I have lots of farmwork	o.	busy with house work
p.	someone visits at home	q.	I have to find work outside the home

VII.   PERCEIVED BEHAVIORAL CONTROL

	Now think about yourself i.e., the power you personally hold regarding providing proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week. Please tell me your position on the following statements.
a)	I am confident that I can provide proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week. True 1 : 2 : 3 : 4 : 5 : 6 : 7 False
b)	Providing proper complementary after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week is completely up to me. Agree 1 : 2 : 3 : 4 : 5 : 6 : 7 Disagree
c)	If I really wanted to, I could provide proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week. Likely 1 : 2 : 3 : 4 : 5 : 6 : 7 Unlikely
d)	For me providing proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week is under my control. Not at all 1 : 2 : 3 : 4 : 5 : 6 : 7 Complete /total control

VIII.   BEHAVIORAL INTENTION

Let's now shift to your <u>intentions</u> when it comes providing appropriate complementary feeding.

a.	I expect to provide proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week. Definitively do 1 : 2 : 3 : 4 : 5 : 6 : 7 Definitively do not
b.	I will provide proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week Likely 1 : 2 : 3 : 4 : 5 : 6 : 7 Unlikely
c.	I am willing to provide proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week False 1 : 2 : 3 : 4 : 5 : 6 : 7 True
d.	I plan to provide proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato at of about 125g least 3 times a week Agree 1 : 2 : 3 : 4 : 5 : 6 : 7 Disagree

IX.   ADOPTING AND MAINTAINING BEHAVIOR

	i. Coping and recovery self-efficacy
	I can stick providing proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week ………[*Enumerator: Repeat the question before each statement*] Not at all 1: 2: 3: 4: 5: 6: 7:Exactly true

i.	even if I have to make a detailed plan	j.	even if I do not receive a great deal of support from others when making my first attempts.
k.	even if I have to take a long time to get used to it	l.	even when I have worries and problems
m.	even if I have to start all over again several times until I succeed	n.	even when I am tired
o.	even if need a long time to develop the necessary routines	p.	even when I am busy

	ii. Planning and goal setting
	A) Implementation intentions
a.	I <u>have already committed myself</u> as to <u>when</u> I will start after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week. Not at all 1 : 2 : 3 : 4 : 5 : 6 : 7 Exactly true
b.	I have already committed myself to <u>how</u> I will provide proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week Not at all 1 : 2 : 3 : 4 : 5 : 6 : 7 Exactly true
c.	I have already committed myself to provide proper complementary feeding my infant(s) after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week. Not at all 1 : 2 : 3 : 4 : 5 : 6 : 7 Exactly true
	B) Action and coping planning
	<u>I will have to continue</u> providing proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week ……..[*Enumerator: Repeat the question before each of the following statements*]
	Not at all 1:2: 3:4:5 :6:7 Exactly true
	even if I have to learn much about nutrition,
	even if I have to make lots of preparations initially

PART J: HABITS

[*Enumerator please read*]: Using the scale below and the sentences listed; please describe your habits regarding proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week .Scale: 1=Strongly agree 2=Agree 3=Neither agree nor disagree 4=Disagree 5=Strongly disagree

Complementary feeding with foods that include orange-fleshed sweetpotato of about 125g, at least 3 times a week is something	
I do frequently	That would require effort not to do
I do automatically	That belongs to my routine
I do without having to think consciously	I would find hard not to do
Makes me feel weird if I would not do	I have no need to think about doing
I do without thinking much about it	That is typically me
	I have been doing for a long time

PART K: EMOTIONS

[*Enumerator please read*]: Below you will find sentences which describe different kinds of moods and feelings. Using the scale below and sentences listed; please describe how you feel right now regarding proper complementary feeding after the age of six months with foods that include orange-fleshed sweetpotato of about 125g at least 3 times a week .

Scale: 1=Not all 2=Slightly 3=Moderately 4=Very 5=Extremely

STATEMENT	
a. It is an anti-stress: it calms me, it reassures me	b. It communicates sensuality, it charms me
c. It relaxes me and make me feel carefree	d. It communicates security
e. I associate it with amusement and fun	f. I associate it to happy memories of childhood
g. It makes me feel full of energy and reinvigorated	h. It makes me feel good and generous
i. It makes me merry	j. It surprises me
k. It makes me happy	l. It makes me curious
m. It satisfies me	n. It makes me feel indifferent
o. It makes me feel tender and affectionate	p. It bores me
q. It gratifies me, reward me	r. It makes me feel neglected, without any care for me
s. It makes me feel cuddled and loved	t. It makes me feel sad
u. It makes me feel guilty	v. It disappoints me
w. It annoys me, it makes me nervous	x.

PART L: DIETARY DIVERSITY – BASED ON 24-HOUR RECALL

INSTRUCTION: For the sections that follow, please consider

The Reference Child as the youngest child between child 6-23 months and the Reference Woman is the woman selected for interview: i) pregnant woman ii) woman with infant 0-5 months iii) woman with young child 6-23 months or iv) woman of reproductive age (19-49 years). If respondent has no Ref Child as defined, choose youngest child that is 6-23 months in the same household and interview the mother/caregiver of that child.

THE 24-HOUR DIETARY DIVERSITY

Please describe the foods (meals and snacks) that [*name*] and YOU [*ref woman*] ate yesterday during the day and night, including those eaten outside the home. Start with the first food eaten in the morning after [*name*]/you woke up and continue until time of sleep.

[*Enumerator: Use Code 1 if any food in group is mentioned and 0 if not mentioned*].

			Ref Child	Ref Woman

	Food Group	Examples	Ref Child CODE	Ref Woman CODE
01	Cereals	Any starchy foods like bread, noodles, biscuits, cookies or products made from millet, sorghum, maize, rice, wheat + *insert local foods e.g. ugali, porridge (uji) or pastes or other locally available grains* staple,		
02	White tuber and roots	Any white potatoes, white yams, cassava, or foods made from these		
03	Biofortified foods	A type of sweetpotato that is orange inside or orange maize [*show pictures*]		
04	Legumes nut and seeds	Any beans or peas, including soybeans		
05		Any nuts, groundnuts or cashews or seeds like pumpkins or sunflower		
06	Milk and milk products	Any dairy products like milk, yoghurt or cheese or other milk products		
07	Organ meat (iron rich)	Any organ meat like liver or heart or other organ meats or blood based foods. e.g Matumbo, liver, kidney,….		
08	Flesh meats	Any beef, pork, lamb, goat, rabbit, wild game, chicken, duck, or other birds		
09	Eggs	Any eggs		
10	Fish	Any other kind of fish, fresh or dried or shellfish		
11	Dark green leafy vegetables	Any dark green/leafy vegetables, including wild ones + *locally available vitamin-A rich leaves such as cassava leaves, sukumawiki etc.*		
12	Other vegetables	Any other vegetables (e.g. tomato, onion, eggplant) , including wild vegetables		
13	Vitamin A rich vegetables	Any pumpkin, carrots, squash, + *other locally available vitamin-A rich vegetable*		
14	Vitamin A rich fruits	Any ripe mangoes, cantaloupe, ripe papaya + *other locally available vitamin A-rich fruits*		
15	Other fruits	Any other kind of fruits e.g., orange, banana, guava, including wild fruits, such as ochwa		
16	Oils and fats	Any source of fat, lard, like cooking oil, coconut milk, or butter		
17	Sweets	Any sugary foods or drinks like sugar, honey, sweetened soda or sugary foods such as chocolates, cookies, candies		
18	Spices and condiments	Like spices(black pepper, salt), condiments (soy sauce, hot sauce), coffee, tea, alcoholic beverages OR *local examples*		

PART M: FOOD INSECURITY (Household Food Insecurity Access Scale (HFIAS))

Kindly complete the Table below regarding food situation in your household, in the last four weeks (30 days).

	HFIAS Question	Response 1=Yes 0=No	If Yes, how often? Codes A
1	In the past four weeks, did you worry that your household would not have enough food?		

2	In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred due to lack of resources?		
3	In the past four weeks, did you or any household member have to eat a limited variety of foods due to lack of means to buy them?		
4	In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?		
5	In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?		
6	In the past four weeks, did you or any other household member have to eat fewer meals in a day because there was not enough food?		
7	In the past four weeks, was there ever (a day when there was) no food to eat of any kind in your household because of lack of resources to get food?		
8	In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?		
9	In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?		

Codes A: 88=Never 1=Rarely (1-2 time in past four weeks) 2=Sometimes (3-10 times in past four weeks) 3=Often (>10 times in past four weeks)

PART N: HOUSEHOLD INCOME

Please indicate how much income you earned from these sources in 2015 (Jan – Dec)

		Amount (KShs)
1.	Agriculture (crop income)	
2.	Agriculture (livestock income) (milk, eggs, chicken, sheep/goats, cow,….	
3.	Self-employment (e.g., business)	
4.	Casual work (kibarua)	
5.	Permanent employment (farm or non-farm)	

THANK YOU VERY MUCH FOR YOUR TIME!!!