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Approval Sheet

Integration of WASH and nutrition through the care group approach: A qualitative study of behavior change approaches in rural Western Kenya

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Abstract Cover Sheet

Integration of WASH and nutrition through the care group approach: A qualitative study of behavior change approaches in rural Western Kenya

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An abstract of
a thesis submitted to the Faculty of
the Rollins School of Public Health of Emory University
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Master of Public Health
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Abstract

Integration of WASH and nutrition through the care group approach: A qualitative study of behavior change approaches in rural Western Kenya
By Kathryn Micek

Chronic environmental enteropathy is associated with poor growth and stunting, and in Kenya, stunting affects more than one-quarter of children. Researchers at Emory University developed *Chakruok Makare*, an integrated WASH and nutrition intervention utilizing an existing care group-based approach to address missed opportunities in the traditional Care Group Model. We conducted qualitative research with beneficiaries in two counties in Western Kenya to determine the facilitators and barriers to the uptake of targeted behaviors within areas of high intervention fidelity. We found the following key results**:**

Facilitators	***Barriers***
• Strengthening CHV and CGV facilitation skills	• Caregivers receiving contradictory messages to traditional child rearing practices
• Reducing number of messages per package, simplifying message structure, reviewing previous messaging	• Belief that CGVs were benefiting on behalf of caregivers
• Supervisors providing immediate feedback to CGVs improving message fidelity	• Caregivers not disseminating messages to family members
• Creating pledges, keeping IEC materials in the household	• Home visits too lengthy
• Engaging family members in home visits and household goals	• Family members away from home during home visits
• Encouraging caregivers to designate household tasks to family members	• Learning new behaviors is a lower priority to competing responsibilities
• Encouraging income-generating activities during NWGs	
• Providing hardware made from local materials or demonstrating how to make hardware using local materials	
• Learning the "why" behind a behavior, focusing on benefits of a behavior	

Consider the following key recommendations in interventions utilizing care groups:

- incorporate income-generating activities in NWGs
- employ case managers to improve project monitoring
- train CGVs on facilitation skills
- keep IEC materials in the households
- design specific, succinct messages, and limit to four per session, and focus on benefits of behaviors
- form neighbor groups for family members to engage in intervention messaging
- employ more CGVs to reduce the number of households per CGV
- consider incentivizing CGVs to increase motivation
- continue peer-selection of CGVs and ensure that roles are well understood by all
- integrate care groups into MOH; create case manager position with decreasing supervision of CGVs
- conduct formative research to understand regionally specific contextual factors

Cover Page

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I would like to acknowledge Catholic Relief Services for all work they've done across communities around the world to improve health outcomes. Thank you to the CRS team who welcomed me into this project and took the time to meet me.

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TABLE OF CONTENTS

LIST OF ACRONYMS

BCW	Behavior Change Wheel
CGV	Care Group Volunteer
CHV	Community Health Volunteer
COM-B	Capability, motivation, opportunity – behavior
CRS	Catholic Relief Services
CU2	Children under 2
FGD	Focus group discussion
IEC	Information, education, communication
IYCF	Infant and young child feeding
KII	Key informant interview
MOH	Ministry of Health
NWG	Neighbor women group
PLW	Pregnant and lactating women
WASH	Water, sanitation, and hygiene

INTRODUCTION

Rationale

Exposure to fecal pathogens has significant implications for morbidity and mortality in children globally. Stunting, or impaired linear growth, affects about 26% of children in Kenya. The child's first 1,000 days are critical to development and undernutrition, and acute diarrhea during this time may have long-term negative effects. Impaired growth may also predict poorer educational and economic outcomes. The Care Group Model offers a low-cost and community-driven strategy employed widely across many different maternal and child nutrition interventions. This approach utilizes local caregivers as peer-leaders to communicate and disseminate health messaging, and has greater health promotion coverage compared to other child health intervention modalities. However, few rigorous evaluations of this model have been published to address its weaknesses and limitations.

Problem Statement

Interventions to reduce fecal pathogen exposure in children often focus on diet diversity and sanitation practices but may not address key risk behaviors related to maternal behaviors such as child feeding practices, and potentially contaminated and unsafe play environments. Educational and knowledge-based interventions can improve child feeding practices but there are variable effects on child weight gain and linear growth. Despite many different intervention approaches, barriers to reduce environmental enteropathy remain. A better understanding of critical maternal and child behaviors

associated with poor child growth is needed as well as an integrated intervention approach that addresses multiple components of child development.

Purpose Statement

The purpose of this paper is to qualify facilitators and barriers to the uptake of targeted behaviors within areas of high intervention fidelity. The objectives are as follows:

Objective 1: Describe the heterogeneity of caregivers who practice positive deviant behaviors and those who did not

Objective 2: Identify specific processes underlying the uptake of targeted behaviors

Objective 3: Determine essential components of the intervention to scale up

Significance Statement

This study will describe specific processes underlying the uptake of water, sanitation, hygiene (WASH) and nutrition behaviors in an integrated intervention in Western Kenya. Using the care group approach, we will determine the effectiveness of alternative or additional project modalities to address missed opportunities to behavior change in the traditional Care Group Model. This study will provide evidence on the importance of multi-pronged and integrated approaches to achieve behavior change, and a framework for qualitative process evaluation using well-established behavioral theory. Our results will point to important design and implementation lessons to inform future interventions utilizing the care group approach.

REVIEW OF THE LITERATURE

Overview

The sequelae of exposure to fecal bacteria are associated with substantial morbidity and mortality. Globally, acute diarrhea is the leading cause of death in children under 5 years (UNICEF, 2018), and chronic environmental enteropathy is associated with poor growth and stunting among children in low and middle-income countries (Ngure et al., 2013). Stunting, or impaired linear growth, affects about 162 million children worldwide, and has long-term and irreversible effects on cognitive and physical development (Akombi et al., 2017, WHO, 2014). Additionally, 2.1 billion people worldwide lack access to improve sanitation (UNICEF, n.d.). WASH-related diseases, while complex due to numerous routes of transmission, are largely preventable (Ngure et al., 2013). Interventions targeting behaviors to mitigate or reduce both acute and chronic enteric diseases are critical to global efforts to reduce stunting (Mbuya & Humphrey, 2016).

In Kenya, 26% of children are stunted (KNBS, 2014), due in part to poor maternal nutrition and inadequate infant and young child feeding (IYCF) practices during the child's first 1,000 days which are critical to child development. Undernutrition and repeated episodes of acute diarrhea increase the risk of other infections and predict poorer educational and economic outcomes (WHO, 2014). During this time, growth is the most sensitive to modifiable factors in which environmental, nutrition, and WASH interventions could positively alter (Onis et al., 2013). Western Kenya has the highest prevalence of HIV in the country with about 15% of its population infected (National AIDS and STI Control Programme MoH, Kenya, 2016), and children born to HIV-infected mothers are more likely

to have lower birth weight and length thus placing them at an increased risk for stunting (Arpadi, 2000).

Interventions to reduce fecal pathogen exposure in children focus on dietary circumstances and hygienic practices but often fail to address other risk factors including maternal behaviors, childcare, social conditions, and the environment (Phuka et al., 2008; Engle, 2002). Educational and knowledge-based interventions can improve child feeding practices but the effects on child weight gain and linear growth vary by setting and may be minimal (Frongillo et al., 1997; Bhandari et al., 2004; Remans et al., 2011). Despite programmatic efforts, policy initiatives, and a myriad of intervention approaches, persistent barriers to improve child growth remain (Avula et al., 2013; Engle, 2002; Nankumbi & Mulijra, 2015; Rasheed et al., 2011; Tawiah-Agyemang et al., 2008). To reduce and prevent stunting, an integrated approach that addresses multiple aspects of child development is essential, as well as a better understanding of the critical behaviors associated with child health outcomes (Remans et al., 2011; Bhutta et al., 2008).

Impactful behavior change interventions must include a theoretical basis, multiple behavior change techniques, and effective mode for delivery (Webb et al., 2010) recognizing that the uptake of behavior is also influenced by an individual's social and economic factors (Frongillo et al., 1997). Behavior change interventions should use theory as a design and implementation "roadmap" to avoid mistakes from previous interventions and develop an effective methodology to modify the underlying determinants for action (Moller et al., 2017). Some of the key agents who have been researching the theoretical processes of behavior change, Michie et al. (2011), state that the influence of internal contrivances (physical and psychological) and the external environment are critical to

understand as a working system. They describe behavior change as an interaction between key behavioral domains of capability, opportunity, and motivation, known as COM-B, which drive the practice of behaviors. Intervention activities to reduce environmental enteropathy and improve child nutrition should be designed to amplify or reduce the behavioral domains in order for an individual to regulate own behavior, engage in desired behavior, or discontinue with undesired behavior.

One widely applied approach to maternal and child health interventions in low-income settings, the Care Group Model, offer a low-cost and community-driven strategy to communicate health messaging by mobilizing local caregivers as peer-leaders (Perry et al., 2015; USAID, 2015). There is wide variation in interventions applying this model, and for the purposes of this paper, we will refer to the criteria developed by World Relief and Food for the Hungry in 2009 as the "traditional Care Group Model" (Davis et al., 2010). While this model may have increased coverage compared to other child survival programs (George et al., 2015), behavior change communication alone may only be minimally effective (Ruel, 2017; Aboud & Singla, 2012).

Justification for selected the studies

As described above, the three main issues explored in this literature review are 1) the need for a better understanding of the critical behaviors associated with child health outcomes; and 2) the need for an integrated approach that addresses multiple aspects of child development utilizing a well-established theory of behavior change; and 3) the strengths and limitations of the Care Group Model as an intervention approach to improve child growth.

Selected studies

A variety of research studies have investigated critical behaviors associated with child growth outcomes linking poor sanitation, and poor diet diversity and feeding practices with acute and chronic enteric diseases. An important developmental behavior in infants, mouthing is likely the primary route for young children indicating a fecal-oral transmission route of pathogenic bacteria. One study in rural Zimbabwe conducted structured observations of 23 caregiver and infant pairs for 130 hours and recorded WASH-related behaviors to determine fecal-oral pathways for transmission of pathogenic bacteria. The researchers found that infants were frequently exposed to large amounts of *E. coli* bacteria through the ingestion of chicken feces and soil (4,700,000–23,000,000 and 440–4,240 respectively) in domestic environments. Researchers recommended protecting infants from repeated exploratory ingestion of fecal pathogens and contaminated surfaces to reduce poor growth outcomes (Ngure et al., 2013).

Another study in a peri-urban setting in Western Kenya also conducted structured observations of 25 infants and households for oral contact and caregiver handwashing behaviors. Infants were observed to most commonly have oral contact with objects in the following order: mother's breast, a range of physical objects, infant's own hands, food, liquids. Additionally, caregivers were observed to hand wash with soap only 5 out of 101 observed times before or after appropriate events (i.e. before breastfeeding; after toilet use) which indicates possible caregiver contamination of objects that infants frequently have oral contact with. Researchers suggest that interventions targeting caregiver hand

hygiene should be prioritized in efforts to reduce acute diarrhea in children (Davis et al., 2018).

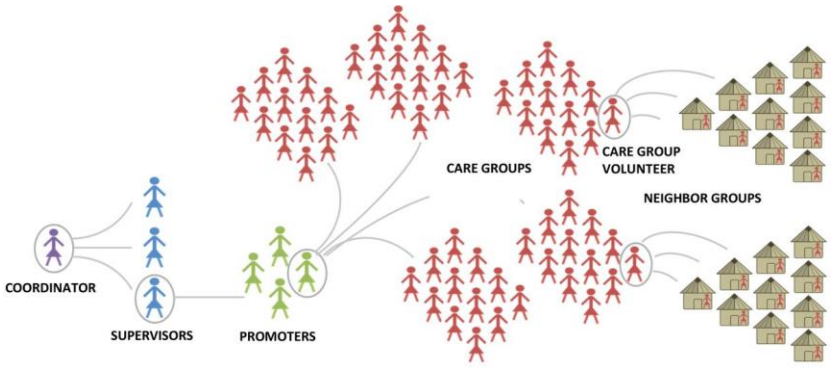
In Malawi, researchers developed fortified spread to improve child growth and compared to traditionally-used complementary feeding to prevent undernutrition. This study was a single-blind, randomized controlled trial in which infants were provided with daily rations of traditional porridge or the fortified spread. After one year, modest weight gain indicated that infants consuming the fortified spread were not noticeably better in their mean weight gain or length. These results are in line with other diet diversity interventions in similar settings indicating a need for integrated approaches to reduce stunting (Phuka et al., 2008).

A program which utilized Michie's Behavior Change Wheel (BCW) as a framework to identify targeted intervention behaviors was STAR MAMA. This intervention was implemented in the United States among Latina women as a means to decrease gestational diabetes risk behaviors. Researchers identified a number of behavior change techniques based on the COM-B such as persuasion to overcome specific barriers which led to a tailored approach for women to adopt preventive health behaviors. They recommended the BCW as a framework to develop intervention activities (Handley et al., 2015).

The Care Group Model has been used in many settings and is considered a cost-effective method that achieves increased population coverage and reduced mortality for children under 5 (Perry et al., 2015a). It leverages the power of social support networks from neighborhood-appointed volunteer caregivers (CGVs) to lead neighbor women's groups and home visits to disseminate messages and demonstrate healthy practices. The CGVs meet with a paid facilitator to learn the messaging in order to conduct the peer-to-

peer health promotion. The care group approach also relies on regular supervision of the volunteers to ensure fidelity to messaging and the performance of project activities. Perry et al (2015) described the care group approach as a "promising alternative to current strategies for delivering key health interventions to remote and underserved communities." However, limitations exist of this model and of education-only interventions. Figure 1 displays the typical structure of the Care Group Model.

Figure 1. *Typical structure of the Care Group Model. Adapted from Perry et al. (2015a)*



A cluster randomized controlled trial in rural India assessed the effectiveness of education-only to promote complementary feeding to reduce stunting by employing a care group approach. The results indicated that there was no effect on weight gain and small effect on length gain between the intervention and control groups (difference in means 0.32 cm, 95% CI, 0.03, 0.61). Researchers concluded that there was high intervention coverage and improvements in infant and young child feeding practices but little effect on child weight and length gains (Bhandari et al., 2004). Results from this study indicate that the acceptability and effectiveness of interventions increase with the use of practical components as opposed to education only. This study described contextual factors that

may have pointed to decreased effectiveness of the intervention, but did not discuss the potential effects of the modality of message delivery, i.e. the care group approach.

Perry et al (2015a) describe the recent trends in interventions utilizing the care group approach. Authors state that in 2015, 25 non-governmental organizations, in collaboration with Ministry of Health programs, had implemented care group interventions in 28 different countries reaching about 1.3 million households and training over 100,000 CGVs. Clearly, there is growing enthusiasm for the Care Group Model as its implementation in a variety of settings continues to grow. However, weaknesses of the traditional Care Group Model exist and few rigorous evaluations of this model have been published (Linabarger et al., *in process).* Limitations include, but are not limited to 1) failure to involve fathers and other influential family members in care groups; 2) insufficient training materials; 3) few, if any materials given to caregivers for household reference; 4) too few trainings and refresher trainings for care group volunteers; 5) lack reasonable explanations in messaging; 6) poor facilitation skills of the care group volunteers; and 7) low fidelity to intervention messaging (Gregg, 2015; Linabarger et al. *in process).* There is a need for future interventions to address the weaknesses of this approach to more effectively deliver behavior change strategies to child and caregiver populations in low-income settings.

Summary and conclusion

Chronic environmental enteropathy is associated with poor growth and stunting among children in low and middle-income countries, and has long-term and irreversible effects on cognitive and physical development (Ngure et al., 2013). WASH-related diseases are likely due to infant mouthing and maternal WASH behaviors which interventions often

fail to address (Engle, 2002). Studies show that educational and knowledge-based interventions can improve child feeding practices but the effects on child weight gain and linear growth vary by setting and may be minimal. There needs to be a better understanding of the critical behaviors related to internal contrivances and the external environment associated with poor child health outcome to design and implement effective intervention strategies. Additionally, siloed approaches to addressing maternal and child health have been shown to have little effect on the reduction of stunting indicating a need for more integrated interventions to address multiple targeted behaviors. The Care Group Model offers a promising, low-cost approach to health promotion messaging in low-income settings; however, few rigorous evaluations of this approach highlight its limitations. These missed opportunities need to be addressed in order to more effectively deliver behavior change strategies to children and caregiver populations. Essential components of the care group approach need to be determined in order to scale up global efforts to reduce chronic environmental enteric diseases and childhood stunting.

MANUSCRIPT

Introduction

The sequelae associated with exposure to fecal pathogens have significant implications for morbidity and mortality in children. Globally, acute diarrhea is the leading cause of death in children under 5 years (UNICEF, 2018), and chronic environmental enteropathy is associated with poor growth and stunting among children in low and middle-income countries (Ngure et al., 2013). Stunting, or impaired linear growth, affects about 162 million children worldwide (Akombi et al., 2017), and in Kenya, more than one-quarter of children are stunted (KNBS, 2015). Undernutrition and repeated episodes of acute diarrhea during the child's critical first 1,000 days have long-term and irreversible effects on cognitive and physical development and predict poorer educational and economic outcomes (Ngure et al., 2013; WHO, 2014).

Acute and chronic fecal pathogens are linked to poor sanitation and unhygienic living conditions. While the transmission of pathogenic bacteria is complex, the primary route for young children is likely fecal-oral due to the active developmental phase of mouthing. In Western Kenya, infants were observed to have an average of 1.8 oral contact behaviors per hour with objects such as the mother's breast, toys, clothing items, dirt, and the infant's own hands. Infant mouthing behavior with contaminated objects exposes children to fecal-orally transmitted pathogens which is associated with environmental enteropathy and poor growth (Davis et al., 2018; Ngure et al., 2013). Interventions targeting behaviors to mitigate or reduce both acute and chronic enteric diseases are critical to global efforts to reduce stunting (Mbuya & Humphrey, 2016).

Interventions to reduce fecal pathogen exposure in children focus on dietary circumstances and hygienic practices but often fail to address other risk factors including maternal behaviors, childcare, social conditions, and the environment (Phuka et al., 2008; Engle, 2002). Educational and knowledge-based interventions can improve child feeding practices but the effects on child weight gain and linear growth vary by setting and may be minimal (Frongillo et al., 1997; Bhandari et al., 2004; Remans et al., 2011). Despite programmatic efforts, policy initiatives, and a myriad of intervention approaches, persistent barriers to improve child growth remain (Avula et al., 2013; Engle, 2002; Nankumbi & Mulijra, 2015; Rasheed et al., 2011; Tawiah-Agyemang et al., 2008). To reduce and prevent stunting, an integrated approach that addresses multiple aspects of child development is essential, as well as a better understanding of the critical behaviors associated with child health outcomes (Remans et al., 2011; Bhutta et al., 2008).

One widely applied approach to maternal and child health interventions in low-income settings, the Care Group Model, offers a low-cost and community-driven strategy to communicate health messaging by mobilizing local caregivers as peer-leaders with increased coverage compared to other child survival programs (George et al., 2015; Perry et al., 2015; USAID, 2015). There is wide variation in interventions applying this model, and for the purposes of this paper, we will refer to the criteria developed by World Relief and Food for the Hungry in 2009 as the "traditional Care Group Model" (Davis et al., 2010). Weaknesses of the traditional Care Group Model exist; however, few rigorous evaluations of this model have been published (Linabarger et al., *in process).* Limitations include, but are not limited to 1) failure to involve fathers and other influential family members in care groups; 2) insufficient training materials; 3) few, if any materials given to caregivers for

household reference; 4) too few trainings and refresher trainings for care group volunteers; 5) lack reasonable explanations in messaging; 6) poor facilitation skills of the care group volunteers; and 7) low fidelity to intervention messaging (Gregg, 2015; Linabarger et al. *in process).*

Researchers at Emory University developed a theory-informed intervention, *Chakruok Makare* ("Better Beginnings"), which utilized an existing care group-based message delivery approach, but introduced modified trainings, materials, and supportive supervision, and incorporated additional practical elements. This intervention integrated messages on water, sanitation, and hygiene (WASH) and nutrition focused on the lived experiences of caregivers to address missed opportunities in the traditional Care Group Model (Arriola *in review*). *Chakruok Makare* was grounded in Michie's COM-B theoretical framework to frame context-specific behavior change processes; we utilized the Behavior Change Wheel to guide intervention development and implementation (Michie et al., 2011).

The purpose of this study was to qualify facilitators and barriers to the uptake of targeted behaviors within areas of high intervention fidelity. Our study was conducted within the broader context of an endline evaluation of *Chakruok Makare*, which employed a cluster randomized trial among household members from 42 care groups, each of which simultaneously participated in THRIVE II, a related intervention using the traditional Care Group Model. Within this context, qualitative data will be used to explore the heterogeneity of caregivers who practiced positive deviant behaviors and those who did not, identify the specific processes underlying the uptake of targeted behaviors, and determine essential components of the project to scale up. This study provides evidence on the importance of

multi-pronged and integrated approaches to achieve behavior change, but also a framework for qualitative process evaluation using well-established behavioral theory.

Methods

We employed qualitative research methods to answer the primary question for this study: what factors enabled or hindered the uptake of key behaviors by caregivers? These key behaviors (outcomes of interest) included 1) households with hygienic food preparation area; 2) households hygienically store previously prepared food; 3) caregivers know the key times that they should wash their and their child's hands throughout the day (before food preparation, before eating, before feeding the child under two, after defecating, after cleaning child feces, and after cleaning animal feces); 4) households provide a safe play environment to children under 2; 5) pregnant and lactating women (PLW) receive sufficient diet diversity in their diets; 6) children 6-24 months of age receive sufficient diet diversity in their diets; and 7) caregivers prepare thickened porridge to improve energy density for a child under 2 years (CU2) to thrive. The study was conducted within the context of the endline evaluation of the *Chakruok Makare* intervention, and was nested within THRIVE II, a project in Kenya led by Catholic Relief Services (CRS) designed to support children under two years and their caregivers in areas of high HIV prevalence.

Background

In January 2016, CRS began to implement the THRIVE II project to support care givers and CU2 affected by HIV. THRIVE II used a modified care group approach in Homa Bay and Migori counties, which have some of the highest HIV rates in the country, 26% and

14% respectively (KNBS, 2014). The project focused on positive parenting, early stimulation, maternal mental well-being, WASH, and nutrition for PLW and women with children under 2. THRIVE II relied on a hierarchy of health communication in which local implementing partner organizations educated community health volunteers (CHVs) who each led care groups made up of 10-15 neighborhood-appointed care group volunteers (CGVs). The CGVs then each disseminated messages to a neighbor women group (NWG) of 6-15 caregivers following a specialized flipbook. CGVs also conducted home visits to each of the neighbor women to review messaging and follow-up after the group setting.

CRS partnered with Emory University and Uzima University to develop *Chakruok Makare*, an integrated WASH and nutrition intervention nested within THRIVE II, to support efforts to reduce stunting in Homa Bay and Migori counties. This intervention's formative research and design cycle were grounded in Michie's COM-B framework. This framework guided the development of an intervention approach as linked to behavior change mechanisms. Michie et al (2011) describe behavior change as an interaction between key behavioral domains of capability, opportunity, and motivation, known as COM-B, which drive the practice of behaviors. Capability is defined as "the individual's psychological and physical capacity to engage in the activity concerned," which includes having the knowledge and skillset to practice a behavior. Opportunity is defined as "all the factors that lie outside the individual that make the behavior possible or prompt it," and may be divided into physical opportunity and social opportunity. Motivation is defined as "brain processes that energize and direct behavior," and includes reflective motivation and automatic motivation (Michie, van Stralen, & West, 2011). Intervention activities were

designed to amplify or reduce the behavioral domains in order for an individual to regulate own behavior, engage in desired behavior, or discontinue with undesired behavior.

Chakruok Makare was comprised of three incremental packages (food hygiene, mealtime, clean compound) through which key messaging about WASH, infant and young child feeding (IYCF), and healthy environment were delivered. The main outcomes of interest were identified to track behaviors at the end of the five month intervention (see Appendix A). Compared to the THRIVE II intervention, *Chakruok Makare* delivered fewer messages at one time; reviewed messaging to encourage retention; provided information, education, and communication (IEC) materials such as home visit manuals and pledge cards to caregivers; and provided hardware: an apportioned bowl and spoon for PLW and CU2, cloth food covers, and handwashing station consisting of a basin, pitcher, soapy water bottle, and powder soap. This intervention encouraged caregivers to make small, achievable pledges to improve healthy behavior practice. We expanded capacity-building trainings of all implementation levels to include group facilitation and household counseling skills in addition to health messaging and demonstrations. We also increased the level of supportive supervision of the CHVs and CGVS with accompaniment by case managers during care group, NWG meetings, and home visits, and provided feedback on the delivery and accuracy of messages. Case managers conducted random spotchecks to observe the progress of household behavior change and provide additional support to the caregivers. Finally, influential family members (fathers and grandparents to the index child) were also encouraged to participate in pledge-setting and home visits.

Data Collection

Primary qualitative data were collected through key informant interviews (KIIs) (N=13) and focus group discussions (FGDs) (N=10) during May-June, 2018 in Homa Bay and Migori counties. Participants described program successes and challenges, acceptability, and recommendations for project improvement. This data also explored the drivers and barriers to the uptake of targeted behaviors, and complemented household endline survey data collection which assessed household conditions and caregiver behavioral determinants related to the WASH and nutrition outcomes of interest for the THRIVE II project. Qualitative data collection was conducted by trained researchers in English and Dholuo, the local language. Table 1 below describes the method of research activity, population, and number of events and participants.

Key Informant Interviews (KIIs)

Purposive sampling was used to identify five CHVs overseeing "active" neighbor women groups, identified as practicing targeted behaviors at the household verified through random spotchecks. We also interviewed four social workers from local organizations which CRS partnered with for project implementation; three program case managers employed by *Chakruok Makare* to assist with project activities and supervision of CHVs and CGVs; and one CRS employee based on the role in implementation for a total of thirteen (N=13) key informants (see Appendix B). Participants were recruited to partake in a two-hour maximum confidential interview. Some participants had follow-up interviews conducted in-person or via mobile phone. Handwritten notes were taken in both English and Dholuo throughout the discussions.

Focus Group Discussions (FGDs)

FGD participants were recruited from intervention communities. We sampled four (N=4) neighbor women groups who met at least twice per month, had at least six caregivers, and had members 18 years or older. We conducted two (N=2) FGDs with fathers and two (N=2) FGDs with grandmothers who were family members of a caregiver in the sample neighbor women groups. We also facilitated two FGDs (N=2) with care group volunteers from selected study sites (see Appendix C). FGDs were conducted in Dholuo and lasted on average two and a half hours. Participants were not compensated for their time but were provided transport reimbursement, beverages, and snacks.

Table 1*. Research activities and population, May-June 2018*

Method	***Population***	***Number of events***	***Number of participants***
Key Informant Interviews	CRS staff	1	1
	Case Managers	3	3
	Social Workers	4	4
	Community Health Volunteers	5	5
Focus Group Discussions	Care Group Volunteers	2	15
	Mothers	4	32
	Fathers	2	14
	Grandmothers	2	15
TOTAL		23	89

Data Management and Analysis

Debriefs involving the research team and research assistants were conducted following each research activity. Debrief notes were recorded and included strategies of interview conduct, emerging themes, and any issues with the interview tools. Detailed

notes were taken on all research activities following a template and guide for labels. Motivational probes were not recorded in the detailed notes; however, verbatim questions and responses were typed into the templates. If the interview was conducted in Dholuo, research assistants translated the interviews into English as they typed the detailed notes. The field manager, a native Dholuo speaker, listened to all recordings of the activities conducted by research assistants and filled in gaps to ensure fidelity to the recordings. Detailed notes were analyzed thematically using MaxQDA 12. These themes informed the codebook which was adjusted throughout analysis to account for additional emerging themes. Codes were both data and theory-driven, informed by Michie's behavior change framework (Michie et al., 2011).

No identifying data were collected from participants. All participants were consented prior to the start of each research activity. KIIs and FGDs were recorded on handheld voice recorders following the verbal and written consent of participants and signed copies of the consents obtained. Interviews were conducted in private spaces to ensure confidentiality. Computer files were password protected on a HIPPA-approved webserver. Names and locations were de-identified prior to analysis. All files were uploaded onto staff computers and password protected. Recorders were kept in a locked area only accessible to the field research team.

Ethical Approval

This study was approved by the Emory University Institutional Review Board (Atlanta, GA, USA #IRB00090057), and the National Commission for Science, Technology

and Innovation (NACOSTI) Ethical Review Board on the Kenyan national level and the Great Lakes University of Kenya (GLUK) Ethical Review Boards on the Kenyan local level.

Results

KIIs were conducted with 10 females (77%) and 3 males (23%) from 10 communities. Table 2 below shows the demographic characteristics reported by FGD participants from 10 communities (excluding one CGV FGD). Aside from the CGV FGDs, all participants were related to an intervention index child who was under the age of 5. Almost half of the participants were ages 25-34 (49%), the majority of participants had 3-6 children (70%), and had low levels of education (76%).

Table 2. *Demographic characteristics of FGD participants*

Characteristics	***Category***	***n (%)***
Age n=69	18-24 25-34 35-44 45+	8 (12) 34 (49) 14 (20) 13 (19)
Number of children n=69	1-2 3-4 5-6 7+	10 (15) 28 (40) 21 (30) 10 (15)
Occupation n=68	Farmer Fishing or fish mongering Casual labor (fetching firewood, collecting seeds, etc.) Seller Other	14 (21) 11 (16) 8 (12) 16 (23) 19 (28)
Education n=70	None Primary school or some primary school Secondary school or some secondary school Tertiary college or university	4 (6) 49 (70) 13 (18) 4 (6)

The results are presented in three sections pertaining to the COM-B domains (capability, opportunity, and motivation) which guided the *Chakruok Makare* intervention approach. Michie's theory of behavior change states that the influence of internal contrivances (physical and psychological) and the external environment are critical to understand as a working system (Michie et al., 2011). *Chakruok Makare* was adapted from the THRIVE II intervention and was designed to modify specific internal and external mechanisms that may be involved in behavior change. Each section describes the facilitators and barriers to the uptake of intervention targeted behaviors related to *Chakruok Makare* or the traditional Care Group Model. Data are drawn from all research events and participants, focusing on the perceptions of intervention activities and behavior change.

Capability

Capability is defined as "the individual's psychological and physical capacity to engage in the activity concerned," (Michie et al., 2011). The *Chakruok Makare* intervention design focused more on psychological capability, which refers to the knowledge and skillset necessary to practice a behavior. Physical capability refers to the physical ability of an individual which *Chakruok Makare* did not focus on.

Psychological Capability

Chakruok Makare used education, demonstrations, and IEC materials during NWGs to teach caregivers the desired behaviors. Then CGVs and supervisors (case managers or social workers, and CHVs) conducted home visits to observe desired behaviors and give feedback to enable behaviors. The facilitators and barriers relating to participants' psychological capability are reported below.

Facilitators. Participant responses in KIIs and FGDs revealed several intervention components that can be attributed to strengthening participants' psychological capability. This includes capacity-building trainings to strengthen CHV and CGV facilitation skills, message structure, supportive supervision, and use of IEC materials. *Chakruok Makare* included additional (compared to THRIVE II) capacity-building trainings in which case managers, CHVs, and CGVs each attended. One aspect of the training focused on improving CHV and CGV facilitation skills to deliver messaging in an engaging manner. When participants in KIIs were asked what factors contributed to the most active neighbor women group, the facilitation skills of the CGV were most commonly cited. A CRS employee attributed active neighbor women groups to their "more confident" CGV:

> *"the [neighbor women] groups that have better attendance, chances are their lead mother is usually good in facilitation." Mothers described improved facilitation during NWGs as enabling for comprehension: "at times you may learn the same message [as you had previously], but the way it's facilitated comes with new learning," (CRS employee).*

Most participants found intervention messages to be "unique," "to the point," and described messages as "broken down to specific points." Review of previous messaging, IEC materials, and demonstrations were stated as more practical for the caregivers when compared to the traditional Care Group Model. A social worker stated:

> *"through the interactive sessions you are able to see, to hear words like 'I committed this and this is what I did.' You would be able to see a change," (social worker).*

Supportive supervision was a vital component of project delivery in ensuring correct dissemination of messages and knowledge transfer. Supervisors consisted of CHVs, case managers and social workers who provided oversight and mentorship to the CGVs. Supervisors perceived this supportive supervision as an "added advantage" because immediate feedback improved fidelity to messaging:

> *"What contributed to the quality, we were working hand-in-hand together with them [CGVs]... You as a social worker or you as a CHV, you are there to help her be on track, to deliver the right full message," (social worker).*

IEC materials were cited as a common facilitator to behavior change by supervisors, CGVs, and caregivers. They were used in each of the three packages and included food hygiene counseling cards, mealtime food wheel, clean compound sanitation story book, and pledge materials. IEC materials remained in the households after each home visit which mothers described as "encouraging" and served as reminders to practice behaviors.

Caregivers made pledges relating to each of the packages which encouraged incremental changes towards behavior change and were tracked through the duration of the program. In FGDs, mothers recalled their pledges with ease and often stated intent to continue practice (discussed further in physical opportunity):

> *"I pledged that even during such rainy seasons, it may be difficult to keep the compound clean, but I pledged that I can pick and collect all the rubbish then I can burn them," (mother).*

Barriers. We limited the number of messages delivered in one session to seven in *Chakruok Makare*. The mealtime package included seven messages and the food hygiene and clean compound packages included a maximum of three messages. Supervisors took notice of the increased number of messages in the mealtime package and indicated this was a barrier to enhancing psychological capability of caregivers. A case manager stated that the mealtime package was "bulky" and "cumbersome" compared to the food hygiene and clean compound packages which were described as "short and precise."

Opportunity

Opportunity is defined as "all the factors that lie outside the individual that make the behavior possible or prompt it," and is divided into physical opportunity (contextual resources) and social opportunity (social influences). *Chakruok Makare* focused on leveraging social support and providing minimal hardware and IEC materials to encourage targeted behaviors.

Social Opportunity

Chakruok Makare trained CGVs to involve family members in home visits and demonstrations. Messaging also encouraged caregivers to share household roles and responsibilities with husbands to ease caregiver burden. In keeping with the traditional Care Group Model, *Chakruok Makare* fostered NWGs to discuss everyday challenges and solutions for adopting targeted behaviors and providing social support.

Facilitators. *Chakruok Makare* trained CGVs to engage influential household members in home visits and household goals. Evidence shows that male involvement in intervention messaging may increase the likelihood that both caregivers will engage in behavior change activities to improve maternal and child health (Kraft et al., 2014). One husband remarked on the influence he had on family decision-making:

> *"When the [intervention] first came, I told my wife to accept because it would help improve our lives. I allowed her to participate in the program," (father).*

Additionally, mothers were encouraged to designate household tasks to family members to ease the burden of household responsibilities. Fathers and grandmothers in FGDs expressed admissibility of role sharing:

> *"We share roles and have a healthy family. Before I could not do that because I felt that a woman's role was a woman's role. But since we were taught and told that there*

is a way that roles can be shared, we are assisting one another and leading a better life," (father).

The traditional Care Group Model leverages social support by developing NWGs with mothers who live near each other. Mothers indicated these NWGs were "supportive" and "change[d] behaviors through teaching each other." These groups discussed challenges with practicing new behaviors and possible solutions which improved social acceptability of targeted behaviors. A mother stated:

"There are times you might not be using soap for handwashing, and when we meet you are reminded about it and you will not forget again," (mother).

The most active neighbor women groups included income-generating activities in addition to intervention messaging. Women participated in merry-go-round financial activities, or contributed to a food pool for one person per month:

"If we don't have a business there is no way that we can get money in a pool as group members. It would be good for us to have a group like this one such that whenever we meet we can collect some money which we can use," (mother).

Barriers. Participants described challenges associated with caregivers receiving messages that may be contradictory to what their mothers (grandmothers to the index child) believed. Caregivers learned childrearing practices from their own mothers and some

found it difficult to initiate a change in behaviors. A grandmother described the difference in her knowledge of breastfeeding practices compared to what her daughter learned from *Chakruok Makare* messaging:

> *"she [daughter] later told me that when they [caregivers] go for teachings, they are told that it is good to breastfeed the child up to six months without giving any other thing. Then after six months you can introduce milk or porridge. For me, I knew that once a child turned 3 months then it could be given milk or porridge or even water then fed. So, the challenge was that it was like we had a small disagreement," (grandmother).*

A CRS employee remarked on the influence family members on caregiver behavior:

> *"Most of our mothers live in a neighborhood where they are under huge influence from their husbands and their mothers-in-law who really call the shots in most of these homes. So if the [grand]mothers and the fathers really buy into this, the mothers will just follow through…So those are huge influences in our community. We really cannot go in there ignoring those people. They're the decision-makers in the homes," (CRS employee).*

Lack of monetary incentives negatively influenced the attitudes of some caregivers. A CGV discussed the negative attitude of a family member related to the lack of physical incentives provide, thus not viewing the IEC materials with value:

"You find a mother and the husband. The husband says that they are tired of seeing papers every now and again but receive nothing in return," (CGV).

Physical Opportunity

Chakruok Makare provided IEC materials and hardware as part of each intervention package to leverage environmental context and available resources, and enable behavior practice. In addition, the intervention was designed to include influential family members to learn the messages and participate towards household goals.

Facilitators. Participants in KIIs and FGDs commonly cited facilitators related to physical opportunity to include varying forms of reminders to practice behaviors (i.e. cues to action). Caregivers were able to keep *Chakruok Makare* IEC materials in their homes to refer to as often as needed. Caregivers described the IEC materials as reminders to practice behaviors: "They [pledges] remind me every time I looked at the wall," (mother). In addition, mothers also indicated that supportive supervision from CGVs that occurred during home visits was also a cue to practice new behaviors:

"I had forgotten about something but when I see her [CGV] I remember that thing and do it. That made me sweep the compound in the morning and in the evening too because I keep doing what she teaches," (mother).

When KII and FGD participants were asked how this intervention differed from previous health programs in the area, almost all described the provided hardware which included handwashing station (jug, basin and soap), food covers, and a bowl and slotted spoon for feeding PLW and CU2. The handwashing station and food covers used locally available materials so that caregivers could make more hardware to fit their needs. A social worker observed this:

> *"There was a household I went to do spotchecks on and I was happy to find out she was given two food mesh covers and she had six! She had added four more of her own, and she said, 'I wanted bigger ones for my bigger sufria [cooking pot]. So I had to add some more, it is helping me. I'm a person who has many visitors,'" (social worker).*

CGVs also demonstrated to caregivers how to make a feces scooper using locally available materials. This item was not provided directly but caregivers still felt encouraged to make and utilize the item for a cleaner play environment:

> *"I saw it elsewhere; I did not have it as a grandmother. I asked more about it and was told that it is used for scooping rubbish and taking it to designated place, a hole where rubbish is disposed of... So, the scooper helps in collecting rubbish and even collects feces and go dispose in the latrine," (grandmother).*

Barriers. *Chakruok Makare* messaging encouraged family members to participate in intervention activities; however, CGVs discussed the difficulty in finding family members

home during the day as they were most often away from the home working. To mitigate this challenge, CGVs encouraged mothers to disseminate messages to other family members; however, CGVs did not believe this was always done:

> *"A household has a number of different people but during our visits we would mostly find the mothers… The messages therefore did not reach the fathers or even other children. Sometimes the child would see some changes but no explanation was done as to why the changes are there… Most of the messages that we passed reached the mothers but sometimes they did not share with the family members," (CGV).*

While *Chakruok Makare* included fewer messages per package, CGVs were trained to review previously delivered messages for caregiver comprehension and retention, discuss challenges and solutions to adopting new behaviors, and demonstrate optimal practices. Due to these additional elements, CGVs found the home visits to be too lengthy. They described the difficulty in conducting multiple home visits in one day with other competing responsibilities. One CGV stated:

> *"When I went to visit them, it was time consuming and frustrating because the visits would consume the whole day and yet I had other roles to attend to," (CGV).*

Another barrier to caregivers' uptake of behaviors was the availability and accessibility of resources, especially during times of drought and flood. Mothers cited challenges they faced in achieving behavior pledges such as "lack of firewood during the

rains to thoroughly cook food was a heavy task for me," "Sweeping the compound during the rains was hard I was forced to hand pick instead then wash my hands later," and "Water source is far away and we have to walk for a long distance. We would cope by begging from the neighbor." To account for limited resources, intervention messages offered alternative solutions when possible and hardware consisted of locally available materials.

Motivation

Motivation is defined as "brain processes that energize and direct behavior," and includes reflective motivation and automatic motivation. Reflective motivation involved planning and decision-making whereas automatic motivation involves habitual practices and emotional impulses (Michie et al., 2011). *Chakruok Makare* designed messages to aid in the reflective motivation decision-making processes to practice a targeted behavior. This intervention could not focus on automatic motivation as emotions and impulses are internal mechanisms that take time to manifest in behaviors.

Reflective Motivation

Chakruok Makare focused on teaching the positive or negative consequences to practicing behaviors to better inform caregivers' decision-making or reflective motivation, to adopt a new behavior.

Facilitators. Participants most commonly cited learning the "why" behind practicing targeted behaviors and focusing on the benefits these behaviors produce as motivators to behavior change. A mother described the positive attributes of reheating food:

"Nowadays I don't go so much to the hospital since we don't eat cold ugali and porridge anymore. Even the stomach upset I used to get is no longer there," (mother).

Participants discussed the importance of finding value in the messages. A case manager noted that when sessions "were meaningful, a mother even without any form of motivation is looking forward to the next session." Additionally, participants indicated they felt a sense of responsibility in practicing the behaviors to act as role models to other caregivers. One CGV exemplified this when she stated:

"After receiving the teachings, I said that I would try to practice. It helped me to improve and even breastfed my child exclusively up to 6 months before I introduced him to food. I realized that the child was healthy and many diseases were now not there. So when I go to teach others I give an example by saying that I have also tried to do it and it is something that can help," (CGV).

Positive consequences (or reduced negative consequences) of a targeted behavior, finding value in the messages, and feeling social responsibility as a role model contribute to an individual's decision and planning to continue practicing a behavior.

Barriers. Some mothers indicated intervention activities were a lower priority to competing household responsibilities:

"It is time wastage when the mothers are busy, she may wish to go and look for food but feel that the meeting would delay her," (mother).

Thus caregiver's attendance and punctuality to NWGs was a challenge. Members either did not attend meetings or the meetings started later than planned which frustrated the women who arrived on time:

"People come late and sometimes the number in attendance is also few...When the time is set for 10:00 o'clock, some come at 12:00 o'clock. So people arrive at different times making it a challenge," (mother).

A problem uncovered during one FGD with mothers was that they believed the CGVs were compensated for their time commitment to intervention activities. Mothers felt the CGVs were benefitting on behalf of the caregivers and felt both groups should be compensated equally. Additionally, mothers believed that the CGVs were not distributing all available hardware. One mother stated:

"It has troubled us a lot because we feel that they get something behind [our back]...because once they go there [to trainings], they will say 'my group wants this and that.' Then once they get it, their group members will not see it because it is them that benefit largely. They come from the seminars with thousands of shillings," (mother).

However, CGVs were not compensated but received travel reimbursement for trainings and phone credit for community mobilization efforts. Nevertheless, mothers in this community indicated that they were less likely to attend NWGs or practice targeted behaviors because they wanted compensation for their time. This example is an overlap of reflective motivation due to a lower prioritization of *Chakruok Makare* activities as well as physical opportunity due to time and lack of monetary incentives for caregivers. Table 3 below provides a visual presentation of perceived facilitators and barriers to targeted behaviors as described by KII and FGD participants.

Table 3. *Comparison of facilitators and barriers by COM-B domains*

Com-B Domain	***COM-B Definition***	***Reported Activity***	***Facilitator/Barrier***
Capability: psychological capability	Knowledge and skillset to engage in the activity concerned	Strengthen CHV and CGV facilitation skills through capacity-building trainings	Facilitator
		Reducing number of messages per package, simplifying message structure, reviewing previous messaging	Facilitator
		Providing immediate feedback to improve fidelity to messaging though supportive supervision	Facilitator
		Using IEC materials as visual aids, creating pledges, keeping IEC materials in the household as a reminder	Facilitator
		Disseminating too many messages in mealtime package	Barrier
Opportunity: social opportunity	Social factors that lie outside the	Engaging influential household members in home visits and household goals	Facilitator

	individual that prompt or hinder a behavior	Encouraging caregivers to designate household tasks to family members to ease the burden of household responsibilities	Facilitator
		Leveraging social support by developing NWGs with mothers who live near each other	Facilitator
		Encouraging income-generating activities during NWGs	Facilitator
		Caregivers receiving messages that may be contradictory to traditional childrearing practices	Barrier
		Negative attitude of caregiver and family members, especially related to lack of provided physical incentives	Barrier
Opportunity: physical opportunity	Physical or contextual factors that lie outside the individual that prompt or hinder a behavior	Keeping IEC materials in the household and CGVs conducting home visits as cues to action	Facilitator
		Providing hardware that are made from locally available materials (with the exception of the bowl and slotted spoon), and demonstrating how to make hardware using locally available materials	Facilitator
		Difficulty including family members in home visits because many were away from home during the day	Barrier
		Caregivers may not be disseminating messages to other family members	Barrier
		Home visits too lengthy, CGVs having difficulty conducting multiple home visits in one day	Barrier
		Limited availability and accessibility of resources to carry out behaviors	Barrier

Motivation: reflective motivation	Planning and decision-making to energize and direct behavior	Learning the "why" behind practicing a behavior, focusing on the benefits of practicing a behavior	Facilitator
		Finding value in learning the messages	Facilitator
		Being a role model to others, feeling a sense of social responsibility and intent to practice	Facilitator
		Learning new behaviors is a lower priority to competing responsibilities	Barrier
		Some mothers believing that CGVs were benefitting on behalf of the caregivers, believing that CGVs were not distributing all available hardware	Barrier

Discussion

This study identified specific processes underlying the uptake of targeted behaviors within an integrated WASH and nutrition intervention in rural Western Kenya. Using a well-established behavioral theory, Michie's COM-B framework, we designed *Chakruok Makare*, a multi-pronged and integrated approach targeting behaviors related to food hygiene, mealtime, and clean compound. *Chakruok Makare* was nested within THRIVE II, and focused on the lived experiences of caregivers to address missed opportunities in the traditional Care Group Model and determine the effectiveness of alternative or additional program modalities to behavior change. Overall, participants in the project evaluation reported that the additional components of *Chakruok Makare* such as supplementary capacity-building trainings, intervention messaging structure, and encouragement of IEC materials and minimal hardware to remain in caregivers' households strengthened

beneficiary capability, opportunity, and motivation needed to engage in targeted behaviors. Elements of the traditional Care Group Model such as visual teaching aids, supportive supervision, and NWGs were recounted with acceptability and enthusiasm. Barriers to the uptake of behaviors included length of home visits, number of messages in the mealtime package, and contradictory messaging to traditional childrearing practices. Additional contextual factors such as limited availability and accessibility of resources, and prioritization of competing domestic responsibilities were also discussed as barriers. Our results point to important design and implementation lessons that should be considered in future interventions utilizing the care group approach.

The traditional Care Group Model is considered a cost-effective method that achieves increased population coverage and reduced mortality for children under 5 (Perry et al., 2015a). It leverages the power of social support networks from neighborhood-appointed CGVs who lead women's groups and home visits to disseminate messages and demonstrate healthy practices. KII and FGD participants in our study expressed enthusiasm for the NWGs comparable to accounts reported in similar studies (Perry et al., 2015a; Perry et al., 2015b). Additionally, we found that the most active NWGs incorporated income-generating activities such as merry-go-round financial activities or social support activities such as food pools. These activities built on existing social capital and neighbor networks, and motivated women to participate in the groups due to perceived multiple benefits. Supportive supervision is an essential component of the care group approach to monitor the CGVs' contact with her assigned caregivers (Perry et al., 2015b). In comparison to THRIVE II, *Chakruok Makare* improved monitoring activities by employing case managers in addition to social workers, who oversaw project activities. While project supervisors,

CGVs, and caregivers viewed this as a motivator and an added advantage, the increased supervision did require further personnel costs which may be difficult to incorporate in potential Ministry of Health country initiatives (Linabarger et al., *in process).*

THRIVE II process evaluation data indicated the need for increased capacity of CGVs to effectively deliver messages, and reduce the number of messages delivered at one time (Linabarger et al., *in process*). A separate process evaluation of a community health worker program also conducted in Western Kenya showed that community health workers may have varied performances due to insufficient training in soft skills (Aridi et al., 2014). Perry et al., suggest that the success of care group interventions is largely contingent on having well-trained, well-supported, and motivated field workers (2015). Given that CGVs are neighborhood-appointed volunteers with minimal leadership experience, capacity-training focused on facilitation skills was imperative to the effectiveness of this intervention.

The messaging structure employed by *Chakruok Makare* was widely accepted by project participants. Supervisors described most of the messages as specific and succinct; however, our results also suggest that the number of messages delivered in one session should be limited to four to avoid cumbersome message delivery. CGVs and caregivers remarked that the messages focused on the reasons for practicing targeted behaviors evidenced by positive consequences as opposed to fixating on the penalties of not practicing a behavior. This contributed to caregivers finding value in the messages by experiencing or observing direct benefits such as reduced incidences of diarrhea in children. Within this context, caregivers who described benefits of a behavior appeared more likely to practice positive deviant behaviors indicating a shift from knowledge to practice. This finding is consistent with a previous study of the behavioral determinants of

caregivers of young children in Viet Nam which found that caregivers who identified benefits of positive deviant behaviors were consistently more likely to practice those behaviors (Dearden et al., 2002). Finding value in the messaging will likely increase the prioritization of engaging in project activities. The utilization of visual teaching aids is an essential component of the care group approach. While many studies report the use of intervention IEC materials, *Chakruok Makare* materials uniquely remained in the households after use which few other similar studies indicate doing so (Bhandari et al., 2004; Bhutta et al., 2008; Davis et al., 2010; George et al., 2015; Gregg, 2015). These materials, coupled with minimal hardware and supportive supervision, served as cues to action reminding caregivers of the messaging and encouraged initial action towards applying changes within the household.

CGVs expressed that the time commitment to conduct project activities was too great for their volunteer role, in which no monetary benefit was provided. They described home visits as time-consuming as well as the difficulty in finding family members at home to engage in messaging. *Chakruok Makare* messaging encouraged the involvement of family members in learning and practicing behaviors to increase the likelihood that both caregivers will engage in behavior change. However, the context of rural fishing communities in Western Kenya increases the likelihood of long hours away from the household. We attempted to account for this challenge by encouraging mothers to disseminate messages to other family members; however, CGVs did not believe this was consistently done. Furthermore, caregivers and family members expressed disaccord in practicing behaviors that were contradictory to community childrearing practices, such as exclusive breastfeeding for six months. Involving family members as decision-making

partners has long been recognized as ideal in child development (Craig et al., 2015). Though *Chakruok Makare* attempted to involve influential persons in home visits, scheduling proved difficult as these family members are often out of the household during the day. Future interventions should explore additional ways in which fathers and grandmothers can be more involved in learning contemporary maternal and child health messaging; perhaps through their own neighbor groups to foster support.

This study identifies important conditions that should be considered when developing targeted behavior change programs to systematically reach PLW or CU2 using a care group approach. Through extensive formative research and a process evaluation of THRIVE II, we identified and accounted for elements related to limited resources, seasonality, gender dynamics and other social conditions that were likely to affect the rollout of the intervention. For broader application, donors should prioritize funding formative research for a comprehensive understanding of regionally specific contextual factors. Participant acceptability of *Chakruok* Makare appears to be consistent with other care group interventions which have been implemented across a range of contexts and points to the potential to scale up the care group approach. Integrating the care group approach with Ministry of Health (MOH) services is a potentially effective and sustainable way to package multiple interventions and reduce the silo effect of disease-specific programs. Rather than increasing the responsibilities of existing position, MOHs should consider creating formal positions of case managers to extend supportive supervision to CHVs and CGVs (Perry et al., 2015a). While our program required extensive oversight by the case managers, MOH efforts could potentially decrease the amount of supervision over time as the capacity of CHVs and CGVs increase (Freeman et al, 2018). Additionally, more

CGVs may be needed to reduce the number of households each CGV is required to oversee allowing more time for competing domestic responsibilities. Incentivizing CGVs with small household needs such as sugar (context-depending) may increase motivation of CGVs and reduce drop-out rates, though compensation should be further explored for volunteer roles to consider all potential benefits and detriments to this role. Given the time commitment as well as potential benefits of becoming a CGV, we recommend continuing selection of CGVs by mothers ensuring that advantages and disadvantages are well understood by all. Further research identifying methods to incorporate care group implementation into Ministries of Health as well as the financial sustainability of government-run care groups is needed.

Strengths and limitations

The evaluation of *Chakruok* Makare was a cross-sectional, mixed-methods design. The results discussed in this paper focus primarily on the qualitative data collected at endline. This study used a rigorous approach grounded in theory which has value for public health program planning and implementation. As a qualitative study, we presented context-specific results which may not be representative of the whole project or other areas of Kenya. Due to relying on interviews with key informants and focus groups, potential bias exists from lack of triangulating structured or semi-structured observation data. It is also possible that bias may have resulted from errors translating from Dholuo to English. Finally, the timing of the interviews was within one month from concluding the intervention, thus sustainability of behaviors is difficult to determine.

Conclusion

The qualitative results of the *Chakruok Makare* endline evaluation assessed the effectiveness of an integrated WASH and nutrition care group intervention under routine field conditions in rural Western Kenya. Our results contribute to a strong evidence base for community-based public heath programming channeling the support of women's groups and peer mentorship to improve maternal and child health outcomes. Intervention participants expressed overall acceptability of critical behaviors related to IYCF practices, dietary diversity, and safe play environment for young children learned within a context of mutual problem-solving to improve child growth. Lessons learned from this intervention determine critical implementation components to consider in future projects using a care group approach in other contexts as well as integration into Ministries of Health.

CONCLUSION AND RECOMMENDATIONS

Participants in the project evaluation of *Chakruok Makare* reported that the additional components of *Chakruok Makare* such as supplementary capacity-building trainings, intervention messaging structure, and encouragement of IEC materials and minimal hardware to remain in caregivers' households strengthened beneficiary capability, opportunity, and motivation needed to engage in targeted behaviors. Elements of the traditional Care Group Model such as visual teaching aids, supportive supervision, and NWGs were recounted with acceptability and enthusiasm. Barriers to the uptake of behaviors included length of home visits, number of messages in the mealtime package, and contradictory messaging to traditional childrearing practices. Additional contextual factors such as limited availability and accessibility of resources, and competing domestic responsibilities were also discussed as barriers.

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prioritization of engaging in project activities. The utilization of visual teaching aids is an essential component of the care group approach. While many studies report the use of intervention IEC materials, *Chakruok Makare* materials uniquely remained in the households after use which few other similar studies indicate doing so (Bhandari et al., 2004; Bhutta et al., 2008; Davis et al., 2010; George et al., 2015; Gregg, 2015). These materials, coupled with minimal hardware and supportive supervision, served as cues to action reminding caregivers of the messaging and encouraged initial action towards applying changes within the household.

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the day. Future interventions should explore additional ways in which fathers and grandmothers can be more involved in learning contemporary maternal and child health messaging; perhaps through their own neighbor groups to foster support.

This study identifies important conditions that should be considered when developing targeted behavior change programs to systematically reach PLW or CU2 using a care group approach. Through extensive formative research and a process evaluation of THRIVE II, we identified and accounted for elements related to limited resources, seasonality, gender dynamics and other social conditions that were likely to affect the rollout of the intervention. For broader application, donors should prioritize funding formative research for a comprehensive understanding of regionally specific contextual factors. Participant acceptability of *Chakruok* Makare appears to be consistent with other care group interventions which have been implemented across a range of contexts and points to the potential to scale up the care group approach.

Integrating the care group approach with Ministry of Health services is a potentially effective and sustainable way to package multiple interventions and reduce the silo effect of disease-specific programs. Supportive supervision is an essential component of the care group approach and project supervisors, CGVs, and caregivers viewed this as a motivator and an added advantage. However, increased supervision does require further personnel costs which may be difficult to incorporate in potential Ministry of Health country initiatives (Linabarger et al., *in process).* Rather than increasing the responsibilities of existing position, MOHs should consider creating formal positions of case managers to extend supportive supervision to CHVs and CGVs (Perry et al., 2015a). While our program required extensive oversight by the case managers, MOH efforts could potentially decrease

the amount of supervision over time as the capacity of CHVs and CGVs increase (Freeman et al, 2018). Additionally, more CGVs may be needed to reduce the number of households each CGV is required to oversee allowing more time for competing domestic responsibilities. Incentivizing CGVs with small household needs such as sugar (context-depending) may increase motivation of CGVs and reduce drop-out rates, though compensation should be further explored for volunteer roles to consider all potential benefits and detriments to this role. Given the time commitment as well as potential benefits of becoming a CGV, we recommend continuing selection of CGVs by mothers ensuring that advantages and disadvantages are well understood by all. Further research identifying methods to incorporate care group implementation into Ministries of Health as well as the financial sustainability of government-run care groups is needed.

This study identified specific processes underlying the uptake of targeted behaviors within an integrated WASH and nutrition intervention in rural Western Kenya. Using a well-established behavioral theory, Michie's COM-B framework, we designed *Chakruok Makare*, a multi-pronged and integrated approach targeting behaviors related to food hygiene, mealtime, and clean compound. *Chakruok Makare* was nested within THRIVE II, and focused on the lived experiences of caregivers to address missed opportunities in the traditional Care Group Model and determine the effectiveness of alternative or additional program modalities to behavior change. Our results point to important design and implementation lessons that should be considered in future interventions utilizing the care group approach.

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APPENDIX A: Summary of outcomes of interest

Outcome of Interest	*Operational Definition*	*Means of Verification*	*Package*
Households with hygienic food prep area	Hygienic food preparation space will have at least 4 of the 5 following features: 1) a cleanable/wipeable food preparation surface 2) a space visibly free of dirt/debris 3) a space that is inaccessible to animals 4) clean utensils: stored in a place that is not accessible by animals, stored dry and visible free of dirt/debris 5) has a handwashing station within 10m.	Direct observation	Food Hygiene
Households hygienically store previously prepared food	Hygienically stored food will have the following features: 1) food inaccessible to animals 2) food inaccessible to young children 3) food covered 4) food free of flies.	Direct observation	Food Hygiene
Caregivers know the key times that they should wash their hands and their child's hands throughout the day	Caregivers are able to list at least 5 of the 6 key times, unprompted by a research assistant: 1) before food preparation 2) before eating 3) before feeding the child under two 4) after defecating 5) after cleaning child feces 6) after cleaning animal feces.	Participant self-report	Food Hygiene

Pregnant and lactating women receive sufficient diversity in their diets	Using the Women's Diet Diversity Score (WDDS), which measures micronutrient intake for the respondent, 16 food groups total were grouped according to the WDDS format into 9 micronutrient-based groups	24 hour food intake recall	Mealtime
Children 6-24 months of age receive sufficient diversity in their diets	Using the WHO standards for minimum dietary diversity, the analysis categorized CU2 by those who consumed 4 or more WHO categories of foods, and those who consumed 3 or fewer categories of foods.	24 hour food intake recall of the caregiver	Mealtime
Caregivers prepare porridge that has sufficient energy density for children under 2 to thrive	Porridge of sufficient energy density is defined as any which has a minimum of 0.8kcal/g	Porridge thickness picture-based methods	Mealtime
Households provide a safe play environment for children under 2	Safe play environments will have the following features: 1) presence or absence of animals in the compound especially chicken/duck, whether they were kept in a pen and if they could go in and out of the house 2) presence or absence of animal feces including chicken/duck 3) method of disposing animal/human feces including ownership of latrine, access to latrines and functionality of latrines 4) tool for disposing of animal/ child feces 5) compound swept which included compound swept every day, household swept every day and compound looking swept	Direct observation	Clean Compound

APPENDIX B: Key informant interview guides

ENGLISH VERSION

KII Guide for Case Managers, Social Workers, CHVs

Objectives:

1. Qualify the barriers to uptake of the Chakruok Makare intervention within areas of high intervention fidelity.
2. Describe the heterogeneity of uptake between households and communities.
3. Collect information from selected CHVs to provide insight into the successes and limitations to behavior change.

A01. Researcher name:		
A03. Community name:		
A04. Date (dd/mm/yyyy) ____/____/_____	**A05.** Start time: ____ : ____ am/pm (circle one) **A06.** End time: ____ : ____ am/pm (circle one)	
NO.	**QUESTION**	**PROBES**
Warm-up Questions		
1	Tell me about your role in the Chakruok Makare program.	• Responsibilities in the program • Responsibilities in other programs other than Thrive II • Main activities • Targets for Thrive II, other programs • Supportive supervision for HH visits, NWG or CGV meetings
2	Please tell me about any neighbor women meetings you attended in relation to the Chakruok Makare program.	• What was the focus of the meeting? (FH, MT, CC) • How was information received? • How was the presentation of information? • Who else (if anyone) was providing supportive

		supervision? • What were some of the challenges experienced? • How was the attendance
3	Please tell me about any household visits you attended in relation to the Chakruok Makare program.	• How was the supportive supervision? • How were CGVs received in the home? • Who else was present at home • Any challenges experienced by CGV • How was the message delivery
Behavior Change		
4	What kinds of behavior change did you see in the communities?	• Related to which intervention package? • FH • Mealtime • Clean compound
5	Which behaviors have been difficult for households to adopt?	• FH • Mealtime • Clean compound • Time • Understanding • Support
6	What pledges were commonly set among the households?	• Food hygiene • Clean compound • Mealtime • Were they achieved? • What made them successful
7	Were households able to maintain initial pledges while adding other pledges?	• How were pledges maintained? • What facilitated adding other pledges • What was challenging?
Intervention Functions		
8	What influenced behavior change practices the most in food hygiene?	• Knowledge • Demonstrations • Food cards (and placement) • Time • Neighbor women groups • Counseling • Family support • Social support • Food cover

		• Handwashing stations • Pledges setting • Availability of resources (Money, firewood, water) • Motivation/Attitude
9	What influenced behavior change practices the most in mealtime?	• Demonstrations of feeding or porridge preparation • Knowledge • Motivation/Attitude • Bowl and spoon • Counseling card • Dietary diversity card • Neighbor women groups • Counseling • Affordability of foods • Availability of foods • Accessibility of foods • Prioritization • Trusted sources of information • Pledge setting • Family/social support
10	What most influenced behavior change practices in clean compound?	• Knowledge • Affordability of resources • Accessibility of resources • Availability of resources • Counseling • Trusted sources of information • Neighbor women groups • Family support • Institutional support
11	When the program was delivered as planned, which behaviors were still difficult to change?	• Resources • Cultural factors • Environmental factors • Religious factors
12	Why do you think some households had better uptake?	• Attitude • Resources (time, money, cost) • Family support • Ease in using the interventions • Personal factors (education)
Contributing Factors		
13	When you think of the most successful neighbor women group, what contributed to its success?	• Local capacity building • Community ownership • Use of local resource

		persons • Partnerships with Emory • Refresher sessions • Home visits • Uptake of interventions • Active participation • Time keeping • Attendance • Accountability • Relationships • CGV
14	What factors outside of Chakruok Makare helped households reach their targets?	• SES • Food or resource security • Religion • Relationship with the community • Former programming • Individual leadership
15	What challenges outside of Chakruok Makare did the households face in the last 5 months?	• Time • Religion • Availability of resources • Trusted sources of information • Work • Money • Relationships
Additional Programming		
16	What have been the strengths of the Chakruok Makare program?	• Local capacity building • Community ownership (reception) • Use of local resource persons • • CGV trainings • NWG meetings • Home visits • Refresher training • **Partnership between Emory and CRS**
17	What do you see as the main differences between Chakruok Makare and THRIVE II?	• Strengths • Weaknesses • Successes • Challenges
18	If you could make changes to the Chakruok Makare program, what would they be?	• Should anything be excluded? • Anything that should be included but wasn't?
19	Did you participate in THRIVE I? How did it	• Experience gained

	influence your decision to participate in Chakruok Makare?	• Refresher trainings • Knowledge and skills in ongoing activities
20	Have there been any other programs in this area in the last 5 years that addressed WASH and nutrition?	• How do you think Chakruok Makare project differs from these other programs? • What was Chakruok Makare more successful at? • What was Chakruok Makare less successful at?
Sustainability		
21	Which activities of Chakruok Makare do you think households will continue to do once Chakruok Makare is over?	• Demonstrations • Community mobilization • Neighbor women groups • Supportive supervision • Counseling • Household support for changes • Food cover • Handwashing stations • Pledges setting • Tracking calendar • Prioritization • Pledge setting
22	What would help households sustain positive outcomes?	• Food hygiene • Mealtime • Clean compound • Continued supportive supervision • Refresher trainings
Closing Questions		
23	What was your overall impression of Chakruok Makare?	• Staff • Materials • Trainings/refreshers • Planning activities • Communication
24	Do you have any other thoughts you would like to share about Chakruok Makare in general?	• Areas they did well in • Areas of improvement

ENGLISH VERSION

KII Guide for CRS staff

Objectives:

1. Qualify the barriers to uptake of the Chakruok Makare intervention within areas of high intervention fidelity.
2. Describe the heterogeneity of uptake between households and communities.
3. Collect information from selected CHVs to provide insight into the successes and limitations to behavior change.

A01. Researcher name:	
A02. Interviewee name:	
A03. Date (dd/mm/yyyy) ____/____/_____	**A04.** Start time: ____ : ____ am/pm (circle one)
	A05. End time: ____ : ____ am/pm (circle one)

NO.	QUESTION	PROBES
Warm-up		
1	Tell me about your role in the Chakruok Makare program.	• Responsibilities in the program • Main activities (day to day) • What activities do you oversee? • Targets for Thrive II, other programs • Field work • Who do you supervise?
2	Please tell me about your general view of the neighbor women meetings.	• How was the message delivery? • How was the presentation of information? • Who was providing supportive supervision? • What were some of the challenges experienced? • How was the attendance
Behavior Change		
3	Overall, what do you think influenced behavior change practices?	• Knowledge • Demonstrations (community

		mobilization) • Time • Neighbor women groups • Supportive supervision (of whom)? • Counseling • Household support for changes • Pledges setting • Availability of other resources (water, firewood, money) • Religion • Affordability of foods • Availability of foods • Accessibility of foods • Family support (husband providing resources for obtaining diverse foods)
4	Which activities do you think best helped the neighbor women to reach their targets?	• Why this activity over others? • How useful was this activity?
5	When the program was delivered as planned, which behaviors were still difficult to change?	• Why? • Resources • Cultural factors • Environmental factors • Religious factors
6	Why do you think some households had better uptake?	• Attitude • Resources (time, money, cost) • Family support • Ease in using the interventions • Personal factors (education)
High Intervention Fidelity		
7	When you think of the most successful neighbor women group, what contributed to its success?	• Local capacity building • Community ownership • Use of local resource persons • Partnerships with Emory • Refresher sessions • CGV trainings • NWG meetings • Home visits
8	What made other groups less successful?	• Attitude • Resources (time, money,

		cost) • Family support • Ease in using the interventions • Personal factors (education)
9	What factors outside of Chakruok Makare helped households reach their targets?	• SES • Food or resource security • Religion • Strong relationship with the community • Former programming • Individual leadership
10	What challenges outside of Chakruok Makare did the households face in the last 5 months?	• Time • Religion • Availability of resources • Trusted sources of information • Work • Money
Saturation of Programs		
11	What have been the strengths of the Chakruok Makare program?	• Local capacity building • Community ownership (reception) • Use of local resource persons • Partnership with other programs • Home visits
12	If you could make changes to the Chakruok Makare program, what would they be?	• What should be excluded?
13	How do you think Chakruok Makare project differs from these other programs	• What did Chakruok Makare do better? • In what ways was Chakruok Makare less successful?
Sustainability		
14	What would ensure that positive outcomes from activities would continue?	• Food hygiene • Mealtime • Clean compound • Continued supportive supervision • Refresher trainings
Closing Questions		
15	Do you have any other thoughts you would like to share about Chakruok Makare in general?	• Areas they did well in • Areas of improvement

APPENDIX C: Focus group discussion guides

ENGLISH VERSION

FGD Guide for mothers

Objectives:

1. Qualify the barriers to uptake of the Chakruok Makare intervention within areas of high intervention fidelity.
2. Understand what influenced participant behavior change in
    a. Food hygiene
    b. Mealtime
    c. Clean compound
3. Assess participant acceptability of Chakruok Makare, including of intervention materials
4. Gather recommendations from participants for future programming.

A01. Researcher name:	
A02. Community name:	
A03. Date (dd/mm/yyyy) ____/____/_____	**A04.** Start time: ____ : ____ am/pm (circle one)
	A05. End time: ____ : ____ am/pm (circle one)

NO.	QUESTION	PROBES
Opening Questions		
1	What is your main role in the household?	• Work • Financial • Children • Animals
Behavior Change		
2	Please describe in your own words, what Chakruok Makare was?	• What topics were covered? • What activities did you partake in? • What was the intention of the project? • Do you feel the project achieved its goal? • How do you view Chakruok Makare in relation to THRIVE
3	Which pledges were most commonly chosen in your neighbor women group as part of Chakruok Makare?	• Related to • Why were these pledges chosen? • What motivated people to work towards achieving those pledges? • If the program started over, do you think different pledges would be chosen? • Do you think people will still work on

<table>
<tr><td></td><td></td><td>these pledges after Chakruok Makare ends? Why or why not?
• Among selected pledges, which behaviors were previously practiced?</td></tr>
<tr><td>4</td><td>How do you think behaviors changed related to any of the Chakruok Makare activities?

[As these are being listed by women, the facilitator should take notes so that the next part of the activity would be easier]</td><td>• What challenges have you/your family experienced in achieving these goals/ fulfilling the pledges?
• Which goals/pledges do you think people are still working on?
• How were people able to maintain pledges related to food hygiene while adding other pledges related to mealtime or clean compound?
• What was challenging about this?</td></tr>
<tr><td colspan="3">Activity:
1. On flipchart provided, ask participants to list behavior changes specifically related to food hygiene, mealtime, and clean compound experienced by women in the NWG.
2. Then ask the women to list factors <u>within</u> Chakruok Makare that contributed to success.
3. Next ask women to list factors <u>outside</u> of Chakruok Makare that contributed to success.
4. Tell participants they have 20 minutes to list their ideas. Once complete, ask participants to read their flipchart. Ask questions listed below.
Ex.
Behaviors changed
• Handwashing before preparing food
• Sweeping compound every morning
• Exclusive breastfeeding

<u>FH</u>
Internal factors
- pledge cards

External factors:
-family support

MT
- food wheel
- pledge cards

CC
- scooper

-religion</td></tr>
<tr><td>5</td><td>How many of you think this behavior was changed by the majority of mothers?
[Tally the number of mothers who raise their hand next to each listed behavior practice}</td><td>• Why did you choose these behaviors?
• Why were some behaviors adopted more than others?</td></tr>
<tr><td>6</td><td>What challenges did women experience in changing these behaviors related to food hygiene?</td><td>• Related to Chakruok Makare?
• How were these addressed?
• What could have been done to mitigate the challenges?</td></tr>
<tr><td>7</td><td>What challenges did women experience in changing these behaviors related to mealtime?</td><td>• Related to Chakruok Makare?
• How were these addressed?
• What could have been done to mitigate the challenges?</td></tr>
<tr><td>8</td><td>What challenges did women experience in changing these</td><td>• Related to Chakruok Makare?
• How were these addressed?</td></tr>
</table>

	behaviors related to clean compound?	• What could have been done to mitigate the challenges?
Intervention Activities		
9	How do you think the neighbor women group meetings were helpful in achieving behavior change?	• What did you value about them most? Least? • Which meeting do you remember best? • Will you continue to meet after Chakruok Makare ends? • What were the challenges of the NWG?
10	How do you think the household visits helped to achieve behavior change?	• What did you value about them most? Least? • Which ones do you remember best?
Sustainability		
11	How has the health of your youngest child changed as a result of Chakruok Makare?	• Number of visits to the hospital • Child's growth • Diarrheal illness • Family's health
12	How will behaviors be maintained?	• Which activities will you continue to do? • What support will you receive? • Family • Community
Acceptability		
13	Which aspects of the Chakruok Makare program were most liked?	• NWG meetings • Home visits • Demonstrations • Intervention materials (handwashing station, food cover, feeding bowl, soapy water, counseling card, diet diversity calendar, food hygiene card, etc.)
14	Which aspects of the Chakruok Makare program were most disliked?	• NWG meetings • Home visits • Intervention materials (handwashing station, food cover, feeding bowl, soapy water, counseling card, diet diversity calendar, food hygiene card, etc.) • How could we improve these aspects?
15	Have you ever participated in other programs?	• Which programs? • What was the focus of these programs? • Did you participate in THRIVE I? • How did it influence your decision to participate in Chakruok Makare? • How does Chakruok Makare compare to these other programs?
Closing Questions		
16	What recommendations do you have for any kind of future programming?	•

ENGLISH VERSION

FGD Guide for grandmothers

Objectives:

1. Qualify the barriers to uptake of the Chakruok Makare intervention within areas of high intervention fidelity.
2. Understand what influenced participant behavior change in
    a. Food hygiene
    b. Mealtime
    c. Clean compound
3. Assess participant acceptability of Chakruok Makare, including of intervention materials
4. Gather recommendations from participants for future programming.

A01. Researcher name:	
A02. Community name:	
A03. Date (dd/mm/yyyy) ____/____/_____	**A04.** Start time: ____ : ____ am/pm (circle one)
	A05. End time: ____ : ____ am/pm (circle one)

NO.	QUESTION	PROBES
Warm-up Questions		
1	Please tell us about your relationship with your daughter or daughter-in-law who was a part of the neighbor women group.	• Tell us about the time you spend in the same compound? • Tell us about the time you spend with your youngest grandchild.
2	Who was present during the community mobilization meetings? Please share what you remember.	• Can you relate this meeting to what you've seen in the community? • How do you support the health of your youngest child?
3	Please describe in your own words, what Chakruok Makare was?	• What topics were covered? • What was the intention of the project? • Do you feel the project achieved its goal?
4	Which activities did you partake in?	• NWG • Food hygiene • Clean compound • Mealtime
Intervention Activities		
Activity: On the flipchart provided, ask participants to list their day-today activities specifically related to the Chakruok Makare intervention. Circle changes in their day that occurred as a result of Chakruok Makare. Next underline changes to occurred due to external factors. See questions listed below.		

5	What behavior changes did households make during the last 5 months that related to food hygiene?	• Food cover • Handwashing station • Pledge card
6	What behavior changes did households make during the last 5 months that related to keeping your compound clean?	• Sweeping tool/feces scooper • Handwashing station • Pledge card
7	What behavior changes did households make during the last 5 months that related to mealtime?	• Feeding • Pledge card • Washing hands before meals
8	Did any of these changes occur due to something other than Chakruok Makare?	• Family • Relationships • Religion • Former programming • CHVs/CGVs
Behavior Change		
9	What in the project (Chakruok Makare), helped to change behaviors?	• Individualized counseling • Demonstrations • NWGs • IEC materials
10	How did you see mothers encourage behavior changes?	• Assigning roles • Resources • Conversations • How was she supported by other family members?
11	What challenges did families experience in changing these behaviors?	• Resources • Religion • Culture • Motivation • Were there any drawbacks of changing behaviors? • How were these addressed?
Sustainability		
12	How will behaviors be maintained?	• Which activities will you continue to do? • What support will you receive?
Acceptability		
13	What aspects of the intervention were well liked?	• Home visits • Intervention materials (handwashing station, food cover, feeding bowl, soapy water, counseling card, diet diversity calendar, food hygiene card, etc.)
14	What aspects of the intervention were disliked?	• Home visits • Intervention materials (handwashing station, food cover, feeding bowl, soapy water, counseling card, diet diversity calendar, food hygiene card, etc.)

15	Have you ever participated in other projects?	• Which programs? • What was the focus of these programs? • Did you participate in THRIVE I? • How did it influence your decision to participate in Chakruok Makare? • How does Chakruok Makare compare to these other programs?
Closing Questions		
16	What recommendations do you have for any kind of future programming?	•

ENGLISH VERSION

FGD Guide for fathers

Objectives:

1. Qualify the barriers to uptake of the Chakruok Makare intervention within areas of high intervention fidelity.
2. Understand what influenced participant behavior change in
    a. Food hygiene
    b. Mealtime
    c. Clean compound
3. Assess participant acceptability of Chakruok Makare, including of intervention materials
4. Gather recommendations from participants for future programming.

A01. Researcher name:	
A02. Community name:	
A03. Date (dd/mm/yyyy) ____/____/_____	**A04.** Start time: ____ : ____ am/pm (circle one)
	A05. End time: ____ : ____ am/pm (circle one)

NO.	QUESTION	PROBES
Opening Questions		
1	Please tell us about your youngest child.	• Names • Ages
2	Who was present during the community mobilization meetings? Please share what you remember.	• Can you relate this meeting to what you've seen in the community? • How do you support the health of your youngest child?
3	Please describe in your own words, what Chakruok Makare was?	What topics were covered? • What activities did you partake in? • What was the intention of the project? • Do you feel the project achieved its goal?
Intervention Activities		
Activity: On the flipchart provided, ask participants to list their day-today activities related to the Chakruok Makare intervention. Next, ask the participants to circle changes in their day that occurred <u>as a result of Chakruok Makare</u>. Underline changes that occurred as a result of external factors. See questions listed below.		
4	What behavior changes did you see your household make during the last 5 months that related to food hygiene?	• Food cover • Handwashing station • Pledge card • Specific pledges? Why were these chosen? • Challenges?

5	What behavior changes did you see your household make during the last 5 months that related to keeping your compound clean?	• Sweeping tool/feces scooper • Handwashing station • Pledge card • Specific pledges? Why were these chosen? • Challenges?
6	What behavior changes did you see your household make during the last 5 months that related to mealtime?	• Feeding • Pledge card • Washing hands before meals • Porridge preparation (thick porridge) • Specific pledges? Why were these chosen? • Challenges?
7	Did any of these changes occur due to something other than Chakruok Makare?	• Family • Relationships • Religion • Former programming • CHVs/CGVs
Behavior Change		
8	What in the project (Chakruok Makare), helped change behaviors?	• Individualized counseling • Demonstrations • Home visits • NWGs • IEC materials
9	How did the mother in your family encourage these behavior changes?	• Assigning roles • Resources • Conversations
10	How did other family members support mothers?	• Role sharing • Resources
11	What challenges have families experienced in changing these behaviors?	• Resources (time, money) • Religion • Culture • Acceptability • Family issues (sharing of roles) • Motivation • How were these challenges addressed? • How were people able to maintain one behavior while working towards other behaviors? • Have there been any drawbacks to changing behaviors?
Sustainability		
12	How will behaviors be maintained?	• Which activities will you continue to do? • What support will you receive?

Acceptability		
13	What aspects of the intervention were well liked?	• Home visits • Intervention materials (handwashing station, food cover, feeding bowl, soapy water, counseling card, diet diversity calendar, food hygiene card, etc.)
14	What aspects of the intervention were disliked?	• Home visits • Intervention materials (handwashing station, food cover, feeding bowl, soapy water, counseling card, diet diversity calendar, food hygiene card, etc.)
15	Have you ever participated in other programs?	• Which programs? • What was the focus of these programs? • Did you participate in THRIVE I? • How did it influence your decision to participate in Chakruok Makare? • How does Chakruok Makare compare to these other programs?
Closing Questions		
16	What recommendations do you have for any kind of future programming?	•

ENGLISH VERSION

FGD Guide for CGVs

Objectives:

4. Qualify the barriers to uptake of the Chakruok Makare intervention within areas of high intervention fidelity.
5. Understand what influenced participant behavior change
6. Understand participant feelings about the Chakruok Makare intervention at endline.
7. Gather recommendations from participants for future programming.

A01. Researcher name:	
A02. Community name:	
A03. Date (dd/mm/yyyy) ___/___/_____	**A04.** Start time: ____ : ____ am/pm (circle one)
	A05. End time: ____ : ____ am/pm (circle one)

NO.	QUESTION	PROBES
Demographic Information		
1	Let's go around and each person tells us about their youngest child/children	• Number of children • Names • Ages
Behavior Change		
2	Please describe Chakruok Makare in your own words	• What topics were covered? • What activities did you partake in? • What was the intention of the project? • Do you feel the project achieved its goal?
3	Tell me about your neighbor women's group.	• How many people? • What has your experience leading the group been like?

4	What changes in your neighbor women's group have you seen related to food hygiene?	• What can you attribute these changes to?
		  ○ Knowledge/skills
		  ○ Availability of resources
		  ○ Accessibility of resources
		  ○ Affordability of resources
		  ○ Motivation (i.e. "being a good mother")
		  ○ Intervention inputs
		  ○ Neighbor women groups
		• What has made some people successful and other people less so?
		• What are some of the barriers to success that you can talk about

5	What changes in your neighbor women's group have you seen related to the mealtime intervention?	• What can you attribute these changes to?
		  ○ Knowledge/skills
		  ○ Availability of resources
		  ○ Accessibility of resources
		  ○ Affordability of resources
		  ○ Motivation (i.e. "being a good mother")
		  ○ Intervention inputs
		  ○ Neighbor women groups
		• What has made some people successful and other people less so?
		• What are some of the barriers to success that you can talk about

6	What changes in your neighbor women's group have you seen related to the clean compound intervention?	• What can you attribute these changes to?
		  ○ Knowledge/skills
		  ○ Availability of resources
		  ○ Accessibility of resources
		  ○ Affordability of resources
		  ○ Motivation (i.e. "being a good mother")
		  ○ Intervention inputs
		  ○ Neighbor women groups
		• What has made some people successful and other people less so?
		• What are some of the barriers to success that you can talk about

Intervention Activities		
7	How do you think the neighbor women group meetings were helpful in achieving behavior change?	• What did you value about them most? Least? • Will you continue to meet after Chakruok Makare ends? • What will you be discussing when you meet? • What were the challenges of the NWG?
8	How do you think the household visits helped to achieve behavior change?	• What did you value about them most? Least? • Messages • Interventions • IEC materials • Pledging process
Program Saturation		
9	What do you think have been the strengths of the Chakruok Makare program?	• Local capacity building • Community ownership • Use of local resource persons • Partnership with Emory Refresher sessions • CGV trainings • NWG meetings • Home visits
10	If you could make changes to the Chakruok Makare	• Message delivery design • Timing of activities

	program, what would they be?	• Staffing
11	Have you ever participated in other programs?	• What was the focus of these programs? • Did you participate in THRIVE I? • How did it influence your decision to participate in Chakruok Makare? • What did Chakruok Makare do better? • What did Chakruok Makare do worse?
12	What differences have you noticed that resulted from Chakruok Makare?	•
Sustainability		
13	What do you think women will do to maintain their pledges and behavior change once Chakruok Makare is over?	• Which activities will continue? • What support will you receive? • What support can you offer?
14	Which functions of Chakruok Makare do you think households will continue to use now?	• Demonstrations (community mobilization) • Food cards (and placement) • Neighbor women groups • Supportive supervision • Counseling • Household support for changes • Food cover • Handwashing stations • Pledges setting • Tracking calendar • Prioritization • Pledge setting
15	What would ensure that positive outcomes from activities would continue?	• Food hygiene • Mealtime • Clean compound • Continued supportive supervision • Refresher trainings
Closing Questions		
16	What recommendations do you have for Chakruok Makare?	•