ORIGINAL RESEARCH

CURRENT DEVELOPMENTS IN NUTRITION

Implementation Science

Development and Testing of Responsive Feeding Counseling Cards to Strengthen the UNICEF Infant and Young Child Feeding Counseling Package

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ABSTRACT

Background: The UNICEF Community-based Infant and Young Child Feeding Counseling Package (C-IYCFCP) currently has limited responsive feeding (RF) content, thus limiting dissemination of RF messages within infant and young child feeding (IYCF) counseling.

Objectives: This project *1*) developed counseling cards based on existing evidence-based RF guidelines and *2*) tested their feasibility in Ghana.

Methods: Five RF counseling cards were developed focusing on eating with family; introducing new foods; hunger/satiety cues; food texture; and calming a child. Four focus group discussions (FGDs) were conducted with adult mothers and fathers of children younger than 3 y of age to assess the cultural appropriateness of the cards and accompanying key messages. The feasibility of including cards as part of IYCF counseling was tested via *1*) systematic observation of 8 group education sessions utilizing the cards with the same target audience and *2*) in-depth interviews with health care providers involved in IYCF training and/or counseling.

Results: FGD findings guided changes to all cards to ensure comprehension and cultural appropriateness. The group education sessions suggested that the counseling cards provided important RF messages that are specific, clear, and feasible to implement. Health care providers strongly endorsed the need for and utility of the RF counseling cards and felt they were feasible and important to integrate into the C-IYCFCP currently being used to deliver IYCF training and counseling in Ghana.

Conclusions: The counseling cards have a strong potential to add key RF dimensions to IYCF training and counseling in Ghana. *Curr Dev Nutr* 2020;4:nzaa117.

Keywords: infant feeding, counseling, Ghana, child, responsive feeding, card, cues

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The data underlying this article will be shared on reasonable request to the corresponding author.

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Abbreviations used: C-IYCFCP, community-based Infant and Young Child Feeding Counseling Package; FGD, focus group discussion; IYCF, infant and young child feeding; NutriDash, Nutrition Dashboard; PI, Principal Investigator; RF, responsive feeding; SPRING, Strengthening Partnerships, Results, and Innovations in Nutrition Globally.

Introduction

The first 1000 d of life is a highly sensitive period for early childhood development. An infant's early-life environment affects her immediate and long-term cognitive, physical, and emotional development, leading to lifelong deficits in the absence of nurturing care (1).

Responsive feeding (RF), defined as "feeding practices that encourage the child to eat autonomously and in response to physiological and developmental needs, which may encourage self-regulation in eating and support cognitive, emotional, and social development" (2), is an aspect of responsive parenting that contributes to a nurturing and caring environment for children (3). RF guides caregivers on how to feed their young children, which complements existing global guidance on what to feed young children (2, 3). Caregivers who practice RF identify and respond to their infants' and young children's hunger and satiety cues in a nurturing manner, fostering healthy eating habits and reducing excessive weight gain risk (4). The nurturing environment created by RF has immense potential for optimal child growth and development outcomes (5, 6), especially where poverty and malnutrition in all its forms (including stunting, overweight/obesity, and micronutrient deficiencies) coexist (7).

Use of current global infant nutrition counseling materials, such as the UNICEF generic community-based Infant and Young Child Feeding Counseling Package (C-IYCFCP), has led to improvements in infant feeding practices (8) and subsequently better infant and young child growth and development outcomes, which are crucial for long-term well-being (1). Given that nurturing care can help prevent or mitigate the negative cognitive and physical effects of malnutrition and poverty in early life (9, 10), it can be argued that incorporating early childhood RF education into existing maternal–child nutrition services can empower caregivers to use their limited resources better to positively influence infant and young child feeding (IYCF) practices. Thus, integrating early childhood RF counseling tools within existing IYCF provider training and parent education is a critical step toward providing comprehensive IYCF training and counseling.

Unfortunately, global infant nutrition counseling materials, including UNICEF's C-IYCFCP, lack specific RF counseling guidelines and curriculum for provider training. With the development of the first evidence-informed RF guidelines in 2017 in the United States (4), there is tremendous potential to integrate RF into current global infant nutrition education materials using established key messages. The RF guidelines take a comprehensive, multipronged approach to strengthen responsive IYCF practices by empowering caregivers to respond to hunger and satiety cues with healthy food/beverage options in a nurturing manner and addressing behaviors that influence hunger and satiety, including physical activity, sleep, television use, and meal times (4). Given that UNICEF's C-IYCFCP has been used by >80 countries since 2010 [UNICEF 2019 Nutrition Dashboard (NutriDash)], there is a tremendous benefit to testing the feasibility of including RF as a component to strengthen nurturing care practices associated with IYCF.

The 4 primary study aims were to *1*) develop RF counseling cards that complement UNICEF's generic C-IYCFCP; *2*) assess provider and caregiver perceptions of the utility of the cards; *3*) test caregivers' ability to practice RF messages; and *4*) assess the feasibility of integrating the RF cards into the existing IYCF training and counseling delivery system in Ghana.

Methods

Study setting

Ghana served as an ideal site given its national use of UNICEF's generic C-IYCFCP, relatively high country rates of acute and chronic malnutrition among children <5 y of age (per 2014 data) (11), and existence of nonresponsive RF practices (12) which contribute to suboptimal child growth (13). Given that there is a need for RF education and skills among Ghanaian caregivers of young children (14), this study focused on 2 Central Region districts (Awutu Senya and Gomoa East), where infant growth and IYCF feeding indicators reflect national estimates (**Supplemental Material 1**) (11).

Study design

Five cards were developed and tested in 4 phases implemented from March to August 2018. Human subjects research ethics approvals were obtained from the Ghana Health Service and Yale University. Regional and district-level officials, plus community leaders, provided permission to engage the targeted communities.

Phase 1. Initial development of RF counseling cards.

During this phase, 2 staff from the Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project (SPRING was a USAID-funded implementing agency providing technical support to scale up nutrition practices and policies globally), who were evaluating the UNICEF C-IYCFCP in Nigeria, were consulted (15). Based on their feedback, 5 RF topics were identified as high priority: eating with family, hunger and satiety, introducing new foods, appropriate food texture, and soothing.

Key messages for the 5 topics were extracted from the only set of comprehensive RF guidelines (4) and adapted to the local Ghanaian context (**Supplemental Material 2**). Messages were translated into the local dialect, Twi, then back-translated into English.

Five cards were developed between March and May 2018 by a public health professional with graphic design experience (GJC). To ensure the style of images was consistent with UNICEF's generic C-IYCFCP (16), the SPRING/UNICEF IYCF Digital Image Bank was used, which contains high-quality digital images that can be adapted for use in printable materials (17). The layout and design of the cards were done in Adobe InDesign and images from the UNICEF IYCF Digital Image Bank were modified using Adobe Photoshop. If specific images needed to convey key RF messages were unavailable in the UNICEF IYCF Digital Image Bank, a Photo-to-Illustration technique was used to develop new images (17).

Phase 2. Revision of RF counseling cards.

After the development of the counseling cards, a total of 4 focus group discussions (FGDs) ($n = 27$) were conducted to assess the cultural appropriateness of the cards and revise the cards as needed. First, 2 FGDs were held in a peri-urban town in the Gomoa East District with mothers ($n = 7$) and fathers ($n = 6$) separately so each group would feel comfortable speaking freely among their peers. Mothers and fathers were eligible if they were aged 18 y and older, with a child younger than 36 mo of age, and were involved with feeding the child. Eligible participants were identified by health care providers from the local Community Welfare Clinic as well as through door-to-door recruitment.

Each FGD was held in Twi by a trained moderator (a nutrition officer with years of delivering IYCF education). The cards developed in phase 1 were presented in each FGD 1 at a time. The moderator followed a FGD guide that had been developed by the Principal Investigator (PI) to assist him with how to present the images within each card and what questions to ask related to each of the images. The process followed was that the first card, *Enjoy Eating with Family*, was presented with 1 image revealed. Participants described the image and what they thought it meant. The image was covered up and the next image exposed with the same discussion. Once all images on the card had been discussed individually, the full card was displayed and participants described what they thought it taught. The card messages were then explained and participants recommended design changes. After the fifth card, participants were asked what information was new and if the cards would help caregivers. The FGDs lasted ∼1.5 h. Participants received soap (equivalent $2) for participating.

The moderator, the notetaker, the project coordinator, and the study PI (AJH-F) debriefed together immediately after each FGD to identify recommended card revisions. Then, the cards were revised based on recommendations from both FGDs.

After the card revisions, 2 more FGDs [i.e., mothers (n = 10) and fathers (n = 4), separately] were held in a rural village in Gomoa East District with the same target population using the same FGD methodology to ensure the cards were culturally appropriate across both rural and peri-urban populations. These FGDs lasted ~2 h. Participants also received soap (equivalent $2) for participating.

After these 2 FGDs, the cards were revised again. The revised cards and key messages were submitted in early July to the Ghana Food and Drugs Authority for approval before conducting the group education sessions.

Phase 3. Group education sessions.

Eight sessions were conducted from July to August 2018 to assess parents' perceptions of the utility of the RF cards and test their ability to practice RF messages. Mothers and fathers fitting the same inclusion criteria as in the FGDs were identified by health care providers from the local Community Welfare Clinic as well as through door-to-door recruitment. Separate group sessions were held with mothers and fathers living in 2 peri-urban towns and 2 rural villages within the Gomoa East and Awutu Senya districts to ensure the cards and messages were tested across both rural and peri-urban populations. A total of 4 group education sessions with mothers (n = 20) and 4 sessions with fathers (n = 18) were conducted.

The same FGD moderator conducted the group sessions in Twi. Before the sessions, a detailed training protocol was developed and ~10 h of moderator training were conducted to standardize message delivery across the sessions.

At each group session, the RF counseling cards and messages were taught. The moderator began each session by showing the first RF card and asking participants to explain that card's meaning. The moderator then taught the RF messages for the first card and discussed them with participants to ensure the card and messages were understood. Participants were then asked to share what they had learned from that card, what was new, who had taught them the information they already knew, and if the messages would be easy for caregivers to practice. This process was repeated for all 5 cards.

The moderator, notetaker, and project coordinator debriefed together after each group education session to discuss participants' responses.

Phase 4. In-depth interviews.

In-depth interviews were conducted during the same time period in English with 14 health care providers who delivered IYCF training to other providers and/or delivered IYCF counseling to caregivers of infants and young children. The aims and methodology have been described in detail elsewhere (14), but the feasibility of the cards and their integration into IYCF training and education are described here. Briefly, providers were shown each of the 5 cards and corresponding key messages. For each card, providers described the RF messages already taught, as well as the acceptability, importance, and ease of practice for caregivers. Lastly, providers shared thoughts on integrating the cards and messages into the current Ghana IYCF training and education delivery system.

All FGDs, group education sessions, and in-depth interviews were audio-recorded.

Analyses

FGDs.

The moderator audio translated audio recordings into English which were then transcribed. Transcriptions were checked for accuracy (AJH-F). Each transcript was independently read (AJH-F, GJC, RP-E), then meetings were held to reach consensus on participants' level of understanding of each card plus additional card changes. Level of understanding was assessed as follows: *1*) participants understood the card well and participants did not suggest modifications to understand it better; *2*) participants understood the card well but participants suggested minor modifications to increase the understanding; *3*) participants understood the card slightly and suggested major modifications to increase understanding; and *4*) participants did not understand what the images on the card were explaining and full revisions to the card were required to maximize understanding.

Group education sessions.

The moderator audio translated audio recordings into English translations, which were thoroughly reviewed (AJH-F) and responses recorded to document if participants *1*) could describe key card messages; *2*) learned something new and, if so, what; *3*) felt messages would be easy for caregivers to practice and, if so, what would be easy.

In-depth interviews.

Audio recordings were transcribed and transcriptions checked for accuracy (MRT). Half the transcripts were independently read and coded (AJH-F, MRT, RP-E) and saturation was reached. Meetings were held to reach consensus on domains, themes, and subthemes for a final codebook, which was applied to the data of the remaining 7 transcripts pertaining to the feasibility of the RF counseling cards and messages.

Results

Development and revision of the RF counseling cards

FGD participant characteristics.

The mean age of peri-urban and rural FGD mothers was similar (30.7 and 29.5 y, respectively), as was the mean age of peri-urban FGD fathers (32.8 y). Rural FGD fathers were older (mean: 38.2 y). Eighty percent of rural FGD mothers had only a primary education or less, whereas other FGD mothers and fathers had higher levels of education. Across all 4 FGDs, most participants were employed and married (**Table 1**).

FGD findings.

Analysis of the qualitative data by our team indicated that participants understood 4 of the 5 cards well. Only minor revisions were needed to improve their understanding of these 4 RF cards and ensure the cards were *1*) compatible with the key messages from the 2017 RF guidelines and *2*) culturally appropriate (**Table 2**). However, the images depicting the introduction of new food were not well understood as being illustrative of that topic. Extensive revisions were recommended to this card within all FGDs and major revisions were made to ensure it described and relayed the key messages well.

TABLE 1 Characteristics of Ghanaian mothers and fathers with young children in Central Region, Ghana participating in focus group discussions (phase 1)[1]

	Peri-urban		Rural	
	FGD1 Mothers ($n = 7$)	FGD2 Fathers ($n = 6$)	FGD3 Mothers ($n = 10$)	FGD4 Fathers ($n = 4$)
Age, y	30.7 ± 5.5	32.8 ± 8.6	29.5 ± 5.8	38.2 ± 12.8
Children, *n*	3.0 ± 0.8	2.5 ± 1.0	3.2 ± 1.1	4.2 ± 1.5
Employed	71	100	70	100
Highest education				
None/primary	14.3	16.7	80.0	0
Junior high school	71.4	33.3	20.0	100
Senior high school	14.3	50.0	0	0
Married	85.7	83.3	80.0	100

[1] $n = 27$. Values are means ± SDs or percentages. FGD, focus group discussion.

Table 3 describes the iterative development process taken to reach the final set of cards. FGD feedback and analysis led to multiple revisions across all counseling cards, with major revisions across 2 cards: *Enjoy Eating with Family* and *Introducing New Foods.* The card *Enjoy Eating with Family* was revised to include the father across all 3 images and 2 final cards were created to reflect diverse eating characteristics within Ghana, particularly eating on the ground (reflecting Northern Ghana) and eating at a table (reflecting the Central Region). *Introducing New Foods* card changes were dramatic after the first 2 focus groups, whereby the number of images was reduced to 3, musical notes were introduced to reflect singing, and a variety of foods were included.

Revisions were also made to the card titles. "Satiety" was not deemed a commonly used word and was replaced with "satisfaction." Similarly, "soothing" was not easily translatable to Twi and was replaced with "calming the baby." Key messages were simplified to ensure they would be easily translatable to Twi.

Testing

Group education sessions.

Adult participants were on average 33 y old with 3.5 children on average. The median age of their youngest child was 18.0 mo (range: 0–36 mo). All participants were employed and most (94.6%) had a senior high

TABLE 2 Level of understanding of the responsive feeding counseling card images across all 4 focus group discussions in Ghana's Central Region[1]

		Level of understanding of card images			
Card	FGD[2]	Understood very well; no modifications	Understood well; required minor modifications	Understood slightly; required major modifications	Limited understanding; required full consideration
Enjoy Eating with Family	1		X		
	2		X		
	3		X		
	4	X			
Hunger and Satisfaction Cues[3]	1	X			
	2		X		
	3		X		
	4		X		
Introducing New Foods	1				X
	2				X
	3				X
	4				X
Texture	1	X			
	2		X		
	3		X		
	4	X			
Calming Your Baby[4]	1		X		
	2		X		
	3		X		
	4	X			

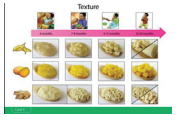
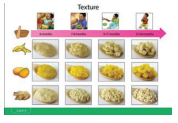
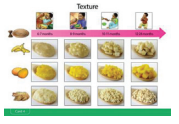
[1] FGD, focus group discussion.
[2] FGDs 1 and 2 were conducted among mothers and fathers, respectively, in a peri-urban area, whereas FGDs 3 and 4 were conducted among mothers and fathers, respectively, in a rural area.
[3] Title was originally "Hunger and Satiety Cues" but was changed based on FGD feedback.
[4] Title was originally "Soothing" but was changed based on FGD feedback.

TABLE 3 Development of final, culturally appropriate responsive feeding cards in Ghana[1]

	Original card	Revised card	Final card[2]	Recommended revisions for original card[3]	First revisions	Recommended revisions to revised card[4]	Final revisions
Card 1: Enjoy Eating with Family				FGD1: Older son (Image 2) was thought to be the father.	Image 2: Father replaced the boy feeding the child.	FGD3: Child was too young and should be on the lap of the mother or father. Food should not be on the floor.	Image 2: Child was placed on mother's lap off the floor. Child's bowl moved from floor to mother's hand.
				FGD2: Remove bowl in front of father (Image 3). Provide a "feeding bottle with water."	Image 3: Father's bowl replaced with a child's cup of water in final card.	Analyses: Child's bowl in Image 2 was believed to have water. Child believed to be 3 mo rather than 6 mo in Image 2. Determined child's glass was more appropriate than adult glass (Image 3).	Image 3: Replaced adult's glass with child's glass of water.
					Change not made: No fruit added because deemed challenging to identify varieties in bowl.		Second card: A second card was made to include eating from a table.
Card 2: Hunger and Satisfaction Cues				FGD1: No changes were recommended.	Title: "Satiety" was changed to "Satisfaction" because moderator and staff at FGDs deemed "satiety" was not understood well.	FGD3: Felt mother was forcing child to eat (Image set 2).	Image set 1: Reduced the size of the infant to reflect age of <6 mo. Reduced mother's breast size to show the child has eaten. Modified position of infant to make positioning and latch accurate.
				FGD2: Add a bib to neck of the infant/child to keep them clean. Mother in the last 2 images was feeding the child with her hands, which they felt might not be clean.	Image set 2: Rounded child's cheeks so he did not look sick.	FGD4: Felt mother was forcing child to eat (Image set 2).	
					Changes not made: Bib not added because not common in Ghana.	Analysis: Discussion in both groups that mother's breast in Image set 1 was still full even though we explained child had already eaten. Positioning and latch of the first image in Image set 1 were noted to be inaccurate.	

(*Continued*)

TABLE 3 (*Continued*)

	Original card	Revised card	Final card[2]	Recommended revisions for original card[3]	First revisions	Recommended revisions to revised card[4]	Final revisions
Card 3: Introducing New Foods				FGD1: Add specific times to match the sun images. Add specific foods to reflect different times of day. Not sure what food was given. FGD2: Reduce images to 4 to show progression from breastfeeding to complementary feeding. Include images of texture.	Removed sun images. Ten images were reduced to 3. Altered food color in bowl to make it clear it is 1 food. Added variety of foods to show food diversity.	FGD3: Child's hands and legs should be straightened to avoid child looking disabled. Child should be held closer to the mom with the face toward it to show nurturing. FGD4: No changes were recommended. Analyses: Red, orange, and green colors were understood as reflecting stop, slow, and go without relating it to the child's behavior (refusing, slowly accepting, accepting food).	Child's hand was straightened. Red and yellow circles outside images were changed to shades of green (to avoid traffic light association).
Card 4: Texture				FGD1: No changes were recommended. FGD2: Put an asanka and a blender on the card to show tools used to blend foods to get the right texture for the children.	Added an asanka to show a culturally appropriate tool used to blend. Changes not made: A blender was not added because it may not be accessible to many.	FGD3: Image of the blending tool we added was identified as a mortar and pestle, not an asanka. FGD4: No changes were recommended.	Blending tool image changed to an asanka.
Card 5: Calming your baby				FGD1: Add arrows linking to soothing strategy. Add image of mother ignoring child with saggy diaper.	Image 1: Drew arrow linking child crying to soothing strategies. Lightened child's face and added more tears.	FGD3: Image 2: Thought block in father's hand was food, not a toy. Participants had difficulty seeing that the mother was pointing at the child.	Title: "*Soothing*" was changed to *Calming Your Baby*.

(*Continued*)

TABLE 3 (*Continued*)

Original card	Revised card	Final card[2]	Recommended revisions for original card[3]	First revisions	Recommended revisions to revised card[4]	Final revisions
			Image 3: Change candies/soda bottle. FGD2: Add child with mother pointing finger at child. Change candies/soda bottle to represent those in Ghana.	Image 4: Child added in front of mother and hand raised higher to indicate yelling. Image 5: Lightened child's face and added more tears. Changes not made: Image of mother ignoring child with wet diaper was deemed difficult to portray and felt image of the mother changing the child's diaper supported the practice of attending to the child when the diaper was wet.	Analysis: "Soothing" isn't used much by Ghanaians; however, they recognize "calming" better.	Image 2: Changed color of block in father's hand to look less like food.

[1] FGD, focus group discussion. Numbers in cards reflect images to enable the association of changes with particular images.
[2] Per the UNICEF/SPRING Image bank website (iycf.spring-nutrition.org), "USAID/SPRING, the United Nations Children's Fund (UNICEF) and University Research Co., LLC-Center for Human Services (URC-CHS) contributed a significant number of illustrations to the Image Bank, and continue to own and retain the copyrights to these images. All images found in the Image Bank credit the specific organization responsible for developing the image." Yale University, University of Ghana, and Point Hope Yale accessed, modified, and used images from the USAID/SPRING-UNICEF IYCF Image Bank (iycf.spring-nutrition.org) as part of this research. Commercial use, redistribution, or selling of these images and materials is prohibited.
[3] Cards shown to peri-urban FGDs 1 and 2.
[4] Cards shown to rural FGDs 3 and 4.

school education or less. Over 80% of participants were married (data not shown).

All participants could accurately describe ≥1 key messages relayed during the sessions (**Table 4**). For the first card, *Enjoy Eating with Family,* participants in 4 sessions reported learning new information. Mothers reported learning what they already knew about this topic primarily from their mothers, whereas fathers mostly expressed learning from both their parents. Within all sessions, participants felt practicing the messages would be easy for caregivers. However, they acknowledged that fathers may work late or may not be around the home a lot, making it difficult for the entire family to eat all together. One group of peri-urban fathers expressed that it may be difficult to eat as a family owing to financial hardships where the father needs to continually work.

For the second card, *Hunger and Satisfaction Cues*, participants in 4 sessions reported learning new information. Mothers, parents, and observing their own children had taught them what they knew about this topic. Within most sessions, participants felt messages would be easy for caregivers to practice. Peri-urban fathers felt messages would be difficult for those who haven't been taught how to observe hunger and satiety cues, especially first-time mothers.

For the *Introducing New Foods* card, participants in 5 sessions reported learning new information. Parents were the primary source of information already known about this topic. Participants across most sessions felt messages could be easily practiced by caregivers. Within 1 peri-urban maternal FGD session, participants felt some mothers may not have time to cook or calm a child to eat. One group of peri-urban fathers expressed the difficulty of introducing new foods if there was not money to purchase diverse foods.

Almost all participants (7 of 8 sessions) learned new information from the *Texture* card: primarily that foods, especially meats, can be mashed into soft textures using tools like an asanka (i.e., a Ghanaian clay grinding pot with a pestle) or blender. Mothers, parents, and health care providers had taught them what they already knew. Most participants felt the messages would be easy for caregivers to practice, with both groups of peri-urban fathers expressing concern that it may be difficult if there was not money to purchase the tools.

For the fifth card, *Calming Your Baby*, participants within 5 sessions reported learning new information, especially not to feed sweets to children to calm them as well as not to shout or hit crying children. What they already knew came primarily from their mothers or both parents. Almost all participants felt the messages would be easy for caregivers to practice. Some acknowledged that it is cultural to yell at and hit children so it may be a specific mindset that may be hard to change. Peri-urban fathers also shared that financial hardship may increase frustration, leading to hitting young children.

In-depth interviews.

Participant characteristics have been described elsewhere (14). Health care providers reported teaching most key messages primarily during 1-on-1 counseling as needed rather than group education sessions. However, messages were not relayed consistently to caregivers because *1*) messages were only relayed to those who exhibited problems and required individual counseling and *2*) of a lack of RF training and not

TABLE 4 Parent feedback from group education sessions (ES) on perceptions of the utility of the RF cards and ability to practice RF messages[1]

	Mothers				Fathers			
	Rural		Peri-urban		Rural		Peri-urban	
Questions	**ES 1 ($n = 5$)**	**ES 2 ($n = 5$)**	**ES 3 ($n = 5$)**	**ES 4 ($n = 5$)**	**ES 5 ($n = 4$)**	**ES 6 ($n = 5$)**	**ES 7 ($n = 5$)**	**ES 8 ($n = 4$)**
Card 1: Enjoy Eating with Family								
Did all participants describe key messages?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Did participants learn something new?	No	Eat together around 1 bowl and include young children. Have a happy face before giving the child food. Have young child sit on lap and offer them food.	Having the child sitting and eating with adults.	No	Breastfeeding child should be at the table. Father should be at table when mother breastfeeding child. Give child own bowl, serve separately.	No	Mother holding the child and the father feeding the child.	No
Where did participants learn what they knew?	Mother Grandmother	Mother Observing own child	Mother Father	Mother Health care providers	Parents Health care providers (CWC)	Parents	Parents Observing own child	Parents Scriptures Televi-sion/movies School
Will messages be easy for Ghanaian caretakers to practice?	Yes, if they are taught.	Yes, because it is taught by their mothers.	Yes, because it happens already. May be hard for some women if the father is not around.	Yes, because it is already being done in households. Others thought it might be difficult because some like to eat on their own, some are very busy, and some fathers don't come home from work early enough to eat together.	Yes, if they are taught.	Yes, if they are taught and they observe how it is done.	Yes, but 1 expressed it may be difficult if there isn't much money in the household.	No, because: fathers aren't home for dinner because of work; some fathers do not live with their children.

(*Continued*)

TABLE 4 (*Continued*)

	Mothers				Fathers			
	Rural		Peri-urban		Rural		Peri-urban	
Questions	**ES 1 (*n* = 5)**	**ES 2 (*n* = 5)**	**ES 3 (*n* = 5)**	**ES 4 (*n* = 5)**	**ES 5 (*n* = 4)**	**ES 6 (*n* = 5)**	**ES 7 (*n* = 5)**	**ES 8 (*n* = 4)**
Card 2: Hunger and Satisfaction Cues								
Did all participants describe key messages?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Did participants learn something new?	A young, hungry child will cry and can throw tantrums, so need patience and time to feed them.	Children will give a sign to let you know they are hungry.	No	No	When a child is satisfied they become happy/smiling.	No	Didn't know when the child is hungry they can request food or breast milk. Every stage has different behaviors to express hunger.	No
Where did participants learn what they knew?	Mother Parents Observing own child	Mother Parents	Mother Observing own children	Observing own children	Mother Parents Health care providers Observing own children	Mother Parents Wives Observing own children	Mother Parents Older siblings Observing own children	Mother Parents Female siblings Observing own children Health care providers Wives
Will messages be easy for Ghanaian caretakers to practice?	Yes, can be taught and child will let you know.	Yes, because learned from mother already.	Yes, child's actions will tell you s/he needs. But not everyone will be able to do it.	Yes, child's actions will tell you s/he needs.	Yes, can be taught and child will let you know.	Yes, because learned from mother/parents already.	No, if haven't been taught, such as first-time mothers.	No, if haven't been taught, such as first-time mothers.

(*Continued*)

TABLE 4 (*Continued*)

	Mothers				Fathers			
	Rural		Peri-urban		Rural		Peri-urban	
Questions	**ES 1 (*n* = 5)**	**ES 2 (*n* = 5)**	**ES 3 (*n* = 5)**	**ES 4 (*n* = 5)**	**ES 5 (*n* = 4)**	**ES 6 (*n* = 5)**	**ES 7 (*n* = 5)**	**ES 8 (*n* = 4)**
Card 3: Introducing New Foods (including messages on food variety)								
Did all participants describe key messages?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Did participants learn something new?	No	Can express breastmilk and mix with new food. Not supposed to give young children evaporated milk.	No	Should continue to try to offer a new food. Don't be discouraged when child doesn't eat new food, continue to offer it. Don't offer sweet drinks to a young child.	Can express breast milk and mix with new food. Certain milks shouldn't be offered at early stages. Shouldn't offer toffees and sugar drinks. Can sing when introducing new food to a child.	No	Can offer young children fruits.	Can express breast milk and mix with new food. Smile, sing, and calm children when offering food. Don't use sugar when introducing new foods.
Where did participants learn what they knew?	Mother Parents Grandparents	Mother Parents Health care providers (CWC)	Mother	Parents Health care providers	Mother Parents Health care providers (CWC)	Parents Observe own child	Parents Observe own child Health care providers	Mother Parents Antenatal book Television
Will messages be easy for Ghanaian caretakers to practice?	Yes, because the messages can be taught to them. Some messages are taught at the hospital and in the antenatal book.	Yes, because they have done it for a long time and some messages about diet variety are taught during CWC.	Yes, because can learn to calm the child. Also have to be sure to check whether the child is not eating because s/he is sick.	No, some don't have time to cook food for child and don't have time to calm child down to help them eat. As well, some may already have given foods that are not good for child and, because nothing went wrong, will not change practice.	Yes, because they observe other parents and learn to be patient when doing it. Messages can also be taught to them.	Yes, because messages may have already been taught by parents and they know it. May be difficult for first-time parents.	Yes, because messages can be taught to them. But may be difficult for women who won't have time, who aren't willing, or who may have a first child.	Yes, because the messages can be taught. But may be hard for those who have financial hardships because they can't serve the child a variety of foods.

(*Continued*)

TABLE 4 (*Continued*)

	Mothers				Fathers			
	Rural		Peri-urban		Rural		Peri-urban	
Questions	**ES 1 (*n* = 5)**	**ES 2 (*n* = 5)**	**ES 3 (*n* = 5)**	**ES 4 (*n* = 5)**	**ES 5 (*n* = 4)**	**ES 6 (*n* = 5)**	**ES 7 (*n* = 5)**	**ES 8 (*n* = 4)**
Card 4: Texture								
Did all participants describe key messages?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Did participants learn something new?	Can mash chicken and pound it into a powder. All information is new (1 participant).	Have to mash food completely for young child. Understand now how to mash food before giving to child.	Can mash meat and feed to a young child (6–7 mo).	How to change texture of foods as child grows.	Can mash meats and fruits and feed to a young child (6–7 mo).	No	How to blend meat for a child. All information is new (1 participant).	Can use an asanka or blender to mash foods.
Where did participants learn what they knew?	Mother Parents Health care provider (CWC)	Parents Health care providers (CWC)	Mother Grandmother Stepmother Brother	Parents Health care providers	Mother Parents Grandparents Health care providers (CWC, hospital)	Parents Observe own child	Mother Parents Observe own child	Mother Health care providers Television School
Will messages be easy for Ghanaian caretakers to practice?	Yes, because the messages can be taught to them.	Yes, because the messages can be taught to them and mashing is easy to do.	Yes, because the messages can be taught to them and mashing is easy to do.	Yes, mashing is easy to do and want to do it for the child. May be difficult if someone is not interested/committed to doing it.	Yes, because the messages can be taught to them.	Yes, because the messages can be taught to them if they haven't learned already from parents.	Yes, because blending is not difficult. But some may not have the asanka or blender to mash food. If they do, it may be hard to wash all the pepper out from the asanka to make sure there isn't hot pepper when mashing food.	No, if they don't have the money to buy an asanka or blender. If they have money for an asanka, it will be easy to mash food.

(*Continued*)

TABLE 4 (*Continued*)

	Mothers				Fathers			
	Rural		Peri-urban		Rural		Peri-urban	
Questions	**ES 1 (*n* = 5)**	**ES 2 (*n* = 5)**	**ES 3 (*n* = 5)**	**ES 4 (*n* = 5)**	**ES 5 (*n* = 4)**	**ES 6 (*n* = 5)**	**ES 7 (*n* = 5)**	**ES 8 (*n* = 4)**
Card 5: Calming Your Baby								
Did all participants describe key messages?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Did participants learn something new?	Don't give toffee or biscuit when child cries to stop them from crying.	Don't give toffee, sweets, or sweet drinks when child cries to stop them from crying. Don't hit/beat child to get them to stop crying. Don't neglect a crying child.	No	Don't shout at the child who is crying. Don't hit/beat the child to get them to stop crying.	Don't give toffee, sweets, or sweet drinks when child cries to stop them from crying. Don't shout at the child who is crying.	No	Don't give toffee, sweets, or sweet drinks when child cries to stop them from crying. Don't hit/beat child to get them to stop crying.	No
Where did participants learn what they knew?	Mother	Mother Health care providers (CWC)	Mother	Parents Health care providers	Parents Wives	Parents	Mother Parents Neighbors	Sister Television Observe own child Books
Will messages be easy for Ghanaian caretakers to practice?	Yes, because the messages can be taught to them.	Yes, because the messages were taught to them by their mothers.	Yes, because the messages can be taught to them and solutions are easy (i.e., put child on back to calm). It can be difficult in situations where there isn't support to help parents.	No, because difficult to change someone's mindset and habits (i.e., it will be difficult to stop beating or shouting at a child when s/he is doing something wrong).	Yes, because the messages can be taught to them.	Yes, because the messages can be taught to them.	Yes, because the messages can be taught to them. It can be difficult for some caregivers who may have financial hardships or who become easily frustrated.	Yes, because the messages can be taught to them. It may be difficult for some people who already have the habit of hitting their child.

[1] *n* = 38. CWC, Child Welfare Clinic; ES, education session; RF, responsive feeding.

having access to a specific curriculum (14). Health care providers overwhelmingly felt that all the messages were applicable and important (**Table 5**). Almost all providers felt that the caregivers would understand all messages in each card and most felt they would be easy for caregivers to practice. Providers felt some hunger and satiety cues (i.e., fast breathing) would be difficult for participants to observe, resulting in the removal of this cue in the messages. Lastly, overall, providers liked the cards, felt they could help reinforce important RF messages, and proposed integrating the cards into existing counseling tools and utilizing them within IYCF counseling sessions. Hence the final set of ready-to-use RF counseling cards and corresponding messages are presented in **Supplemental Material 3**.

Discussion

Findings from this study demonstrated that the RF counseling cards and messages were wanted and needed within the Ghanaian health care system. The group education sessions demonstrated that caregivers were receiving RF messages primarily from family, with few provided through health care providers. Yet, health care providers reported relaying RF messages to caregivers. Given that providers deliver RF messages primarily through individual rather than group counseling, that they are not consistently trained on IYCF messages, and that current curricula and counseling tools used for provider training lack comprehensive messages on RF (14), RF messages are not delivered in a consistent, systematic manner. To maximize delivery and uptake of RF messages, they must be delivered consistently and repetitively (18), neither of which is currently being done in Ghana. Providing health care providers with culturally appropriate RF counseling cards plus evidence-informed, clear, and simple RF messages specifically designed to complement current IYCF counseling can contribute to enhanced counseling of caregivers throughout the health care system, from the community to the clinic level. Furthermore, providers can use the full set of cards or select a subsample of cards to address specific nonresponsive feeding practices. Indeed, integration of RF cards and messages strongly aligns with the very recent IYCF programming guidance issued by UNICEF, which emphasized the inclusion of RF practices into IYCF education (8). Although this would add to the duration of health care provider training, counseling, and education delivery, providers strongly supported integrating RF into the IYCF system (14).

The systematic process taken to develop and test the feasibility of the 5 cards is consistent with the development and testing of other nutrition education materials (15, 19, 20). Indeed, this study ensured that the RF cards and key messages would be feasible for providers to teach and for caregivers to practice. This innovative approach provides evidence that the cards and messages are simple and clear for health care providers to teach and Ghanaian caregivers to practice. However, it cannot be overlooked that findings suggested a few RF messages may be challenging for all caregivers to practice in the context of food and financial insecurity. In the face of financial and food hardship, emotional distress has been shown to lead to physical and neglectful behavior by caregivers (21–24). Peri-urban fathers specifically highlighted how financial hardship may make it difficult to eat together as a family as well as to introduce new foods owing to the inability to serve a diverse diet or afford a blender or asanka to provide appropriate food texture. As documented within the fathers' sessions, these hardships can lead to caregiver frustration and ultimately lack of adherence to RF messages, such as shouting or hitting a crying child. Therefore, more work is needed to explore approaches for those caregivers experiencing extreme hardships to help improve compliance with RF messages.

This study has a few limitations. First, this study is limited in its generalizability because testing was conducted within the Central Region in Ghana and the only language used was Twi. Although the cards were designed to be applicable across varying demographic, socioeconomic, and religious characteristics, further work within other regions may be needed to ensure the RF cards and messages are applicable and understood throughout Ghana. For example, there are several other local dialects spoken within the Central Region, and RF concepts such as satisfaction or satiety might be represented differently within those languages. Indeed, an RF curriculum for the cards is currently being developed and informed through a counseling pilot study our team is currently conducting, which will contribute additional knowledge in this direction. Second, the cards' utility and acceptability were tested across mothers and fathers, yet other caregivers (i.e., grandmothers, nannies, daycare providers) would also benefit greatly from RF counseling. The cards and messages were not tested among these caregiver subgroups. Because mothers and fathers are the primary recipients of IYCF counseling within hospitals, clinics, and child welfare clinics in Ghana, this study focused on a highly relevant population. More research should be conducted to understand the use and feasibility of RF counseling cards and messages among other caregivers to ensure RF practices are supported. Third, there are additional relevant RF topics (4); however, 5 cards were considered appropriate for this study to add to the existing Ghanaian IYCF training and delivery system. Fourth, the cards were intentionally designed to complement the generic UNICEF C-IYCFCP, therefore card images were restricted to those available within the UNICEF IYCF Image Bank (17). Fifth, the messages accompanying the RF cards were adapted from the 2017 RF guidelines from the United States (4), which drew from evidence from high-income countries. However, as seen in this study, the clear acceptability of and ability to follow RF messages among Ghanaian parents suggest that, when adapted to be culturally appropriate, these messages can be applied to low-income countries. Finally, we acknowledge that it may be difficult to implement a new practice even if caregivers feel they can in the moment they are asked. In the counseling session, mothers and fathers were asked if they felt the messages were possible to practice. In several, participants expressed that there were situations when changing practices might be challenging. This suggests that participants were cognizant of barriers that would need to be addressed to promote RF behavior change, which needs to be considered when counseling on RF.

Despite these limitations, the development of a methodology to design and test culturally appropriate and applicable RF cards and messages that align with the UNICEF C-IYCFCP represents a major contribution to strengthening IYCF counseling to caregivers of infants and young children in Ghana and beyond. Worldwide, >80 countries use the generic UNICEF C-IYCFCP or an adapted version (with some adding RF components) to provide IYCF counseling (UNICEF 2019 NutriDash). Indeed, the RF cards and corresponding messages from this study can be used or adapted by other countries to strengthen their

TABLE 5 Feasibility of responsive feeding guidelines among health care providers that conduct IYCF training and/or deliver IYCF education in Ghana[1]

Card	All messages applicable	All messages important	Understand all messages	All easy to practice
Enjoy Eating with Family	100%	100%	86%	86%
Hunger and Satisfaction Cues	100%	100%	64%[2]	92%
Introducing New Foods	100%	100%	100%	100%
Texture	100%	100%	86%	92%
Calming Your Baby	100%	100%	100%	86%

[1]IYCF, infant and young child feeding.
[2]Some providers thought specific hunger cues, such as fast breathing, might not be recognized as such.

own IYCF counseling systems. Furthermore, additional RF cards and messages can be developed so countries can choose a set of cards for RF messages they feel are most important for their IYCF educational package.

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