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A Qualitative Assessment of Mothers' Perceptions and Behaviors in Response to an Intervention Designed to Encourage Safe Child Feces Disposal Practices in Odisha, India

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Abstract

A Qualitative Assessment of Mothers' Perceptions and Behaviors in Response to an Intervention Designed to Encourage Safe Child Feces Disposal Practices in Odisha, India
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Background:
A critical but often neglected aspect of sanitation is the lack of consistent, proper disposal of child feces. When not safely disposed, child feces can become a source of exposure for enteric disease, potentially leading to impaired growth in children. Reasons for not properly handling child feces include the belief that child feces pose low risk, a lack of understanding of the pathogenic risks, a lack of access to diapers, potties and/or cleaning supplies, and a lack of knowledge about safe disposal practices. As most children under the age of five are dependent on mothers and/or caregivers for their defecation practices, they are key for sustained behavior change in this age cohort. However, there is a need to assess how mothers perceive external influences and personal motivations around child feces disposal management (CFM).

A cluster-randomized controlled trial was conducted in Odisha, India to evaluate the effectiveness of a multi-level intervention that aimed to increase latrine use among latrine-owning households. An aspect of the multi-level intervention was a Mothers Group, targeting mothers of children under age five to increase knowledge safe child feces disposal behaviors and provide safe disposal tools (potties/scoops). This study aimed to qualitatively assess mothers and caregivers attitudes and perceptions of child feces disposal management after attending the Mothers Group.

Methods: Qualitative data collection was carried out in six villages. Twenty-four in-depth interviews (IDIs) were conducted in three villages that received the Mother's Group intervention to assess their opinions of the intervention activities, including the messages and hardware delivered. Four focus group discussions (FGDs) were conducted in three villages that did not receive the intervention to understand feces disposal practices broadly and potential spillover of information from neighboring intervention villages. Inductive coding was used to guide the development of codes and thematic analysis was used to explore the dimensions of emerging patterns and variations.

Results: Results found that women's narratives provide a deeper understanding of the sociocultural context of child feces management, especially in regards to perceptions of family networks and perspectives of risk. Findings indicated that women's household responsibilities and restrictions in their movements outside the home were barriers that prevented them directly experiencing the sanitation intervention. Mothers-in-laws and grandmothers commonly attended the intervention instead of mothers with children under the age of five, the target demographic. Among women that did experience the Mother's Group there was variation in how they implemented the safe disposal tools related to child comfort using of the tool, perceptions of the training process, and access to a functional latrine.

Conclusions: These findings demonstrate that future interventions should be purposive in building trust with elder female gatekeepers, in order to accommodate the movement restrictions of younger mothers. These findings also indicate that the design of the tool may need to shift to better meet the needs of both mother (ease of cleaning) and child (comfort during use). We intend that these findings encourage further research and discourse on CFM solutions that benefit the well-being of both mother and child.

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Chapter 1: Introduction

Introduction and Rationale

Open defecation is used to describe the practice of defecation in outdoor, open spaces instead of a toilet [1]. India's Prime Minister, Shri Narendra Modi, implemented *Swachh Bharat Mission (SBM)* (Clean India Mission) on October 2, 2014 with the primary goal of a 'open defecation free' (ODF) India by October 2019 [2]. Completing this task throughout all of India will require a combination of sustainable latrine construction and interventions targeting attitudes and behaviors towards open defection practices [3–6]. The recently released India National Family Health Survey (NFHS) (2015-2016), reported that 48% of households in the nation are using an improved sanitation facility [7]. Throughout rural India, despite access in some areas, latrine usage remains low. In the state of Odisha, SBM reports only 41% of ODF coverage and 80% of households with toilet construction [2]. In Puri, a rural district of Odisha, only 36.8% of households report using an improved sanitation facility [8].

A critical but often neglected aspect of open defection is the lack of consistent, proper disposal of child feces [3,9–11]. When not disposed or improperly disposed, child feces can become a source of exposure for enteric disease, a source of impaired growth in children, and promoter of environmental enteropathy [12–16]. The NFHS (2015-2016) reports that only 36% of children under the age of five have their feces safely disposed nationwide [7]. Additionally, in the state of Odisha, only 13% of children's feces are safely disposed, the worst reported rate in the nation [7]. Globally, mothers and caregivers reasons for not properly handling child feces include a lack of knowledge of the pathogenic risks, a lack of access to diapers, potties and/or cleaning supplies, and a lack of knowledge about safe disposal practices [3,4,11,17]. However, momentum is building for addressing this aspect of sanitation as the 2017 WHO Guidelines on Sanitation and Health

recommends that sanitation interventions incorporate aspects on the safe disposal of child feces in order to see systematic benefits [18].

Purpose Statement

A cluster randomized trial (CRT), led by researchers at Emory aims to understand if a multi-level intervention improves child feces disposal behaviors and latrine use. Local community partner, Rural Welfare Institute (RWI), implemented the intervention in May and June of 2018. The primary activity to promote safe child feces disposal, and focus of this qualitative sub-study, was a meeting for mothers and caregivers with children under age five. At the meeting, facilitators provided mothers with sanitation education and equipment (potty and scoops) to enable proper child feces disposal. As a part of this study, there is a need to understand how mothers and caregivers perceived the activity. There is also a need to understand if mothers and caregivers in neighboring villages heard or learned about the intervention. These insights are critical to understanding and interpreting trial findings, and to determine if there is any potential for spillover effects in non-intervention villages.

Formal Problem Statement and Research Question

The goal of this research is to understand how the Mother's Group child feces disposal activity embedded within the *Sundara Grama* intervention is perceived by mothers and caregivers. This research has two primary objectives:

(1) To assess the attitudes and perceptions of mothers in Puri District, Odisha, India of the intervention activity designed to encourage safe child feces disposal practices after participating.

(2) To determine 'spillover effects' of the mother's group activity by assessing if mothers and/or caregivers in neighboring, non-intervention communities heard about the intervention and, if they did, what they heard and thought about the information.

Theoretical Framework

To meet the unique challenges of this field of study, the broader intervention was informed by an array of theories including, Behavior Centered Design (BCD) [19], the Behavior Change Wheel (COM-B)[20], and the RANAS model [21]. The unison of these models presented the appropriate constructs for the intervention, but this sub-study will specifically utilize the RANAS model. The RANAS model is a WASH specific model to approach systemic behavior change [21]. The RANAS model is derived from a variety of theories, including the Theory of Planned Behavior, and is composed of behavioral factors, behavioral outcomes, and contextual factors [21]. As this study qualitatively analyzes an under-researched sector of WASH it is imperative to assess the behavioral determinants that guide individuals' intentions and habits for current behaviors. Understanding the social, physical, and personal contexts that establish the environment these behaviors are exercised provides greater nuance about the behavior of interest. Understanding these aspects of behavior will better guide targeted interventions for safe child feces disposal. The framework addresses the historical and lived context of the environment the individual resides in and also provides additional richness to the data by the developing and assessing the beliefs, attitudes, and normative beliefs that guide the intentions for their current behavior [21,22]. The RANAS model guided both the development of the semi-structured interview guide and the deductive analysis.

Chapter 2: Literature Review

Section 2.1 - The State of Sanitation in India

A History of Sanitation Interventions in India

The World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) define open defecation as the "disposal of human feces in fields, forests, bushes, open bodies of water, beaches or other open spaces, or with solid waste" [1]. As of 2017, WHO and UNICEF report that 892 million people, 12% of the global population, practice open defecation[1]. The National Family Health Survey (NFHS) (2015-2016) states that 39% of the Indian population practices open defecation with the rural population accounting for 54% of these individuals [7]. The NFHS also reports that nationwide, only 36% of children under the age of five practiced safe feces disposal [7]. Coffey and colleagues describe this combination of factors, 1) wide-spread open defection, 2) high population density, and 3) low demand for latrine use, as Rural India's Triple Challenge [17]. Their work, in agreement with other studies, suggests large-scale interventions to promote latrine use and encourage changes in sanitation decision-making need to occur to see sustained progress in sanitation [17].

To address the gap in sanitation, India has implemented multiple large-scale, multi-level interventions aimed at increasing coverage, but with limited focus on usage. Through a progression of programs including the Total Sanitation Campaign (TSC) [23], later renamed and repackaged into the *Nirmal Bharat Abhiyan* (NBA) [24], and currently the *Swachh Bharat Mission* (SBM) (Clean India Mission) [2] the government of India has worked to construct millions of toilets throughout the country. Only SBM has included a behavioral goal, specifically to be being open defecation free (ODF) by October 2, 2019, a celebration of Mahatma Gandhi's 150th birthday. The TSC campaign primarily offered subsidies to below the poverty line (BPL)

households to increase motivation for individual household latrine (IHHL) construction by rural households [23]. Evaluations of the TSC suggest a failure to see significant increases in latrine coverage and latrine adoption due to "sub-optimal" implementation of social mobilizing, education, and communication targeting the cultural aspects of open defection [4,25,26]. Improving upon the TSC, the NBA expanded to provide IHHLs to BPLs as well as households that identified above the poverty line (APL) [24]. The NBA was reconstructed into SBM by Prime Minister Narendra Modi in 2014 with a central focus on an ODF India by 2019 through household and community toilet construction [24]. The SBM shares many of the previous guidelines as TSC and NBA but cites that their primary difference is a focus and incorporation of Behavior Change Communication (BCC) into their methodology [2]. It is unclear however, as to what extent BCC has been implemented and what strategies it will utilize within the framework of SBM [2]. A working paper by Gupta and colleagues on the results of the SBM find that open defecation is still widely practiced, but this percentage has decreased from 70% to 44% in rural Bihar, Madhya Pradesh, Rajasthan, and Uttar Pradesh [27]. These findings contrast with government claims that these states are currently ODF [27]. SBM officials focused primarily on latrine coverage, not usage, and villages were marked ODF when about 80% of households owned latrines. This also included individuals who previously had latrines and did not use them [27]. Gupta's findings indicates that despite an increase in latrine coverage, progress for consistent latrine use has remained stagnant [27].

The Struggle for Latrine Adoption in India

Providing physical access to latrines without designing a program to implicitly and explicitly consider gender, religion, age, and caste, creates a false assumption that all people will change their behavior. Studies are consistent in concluding that latrine access does not equate to

latrine usage [5,6,28,29]. Cultural preference for open defection includes a lack of stigma and beliefs that open defecation keeps the household compound clean [4,17,28]. For young married women in low and middle castes, open defection provides opportunities to socialize and a rare opportunity to leave the household [4]. A commonly cited barrier to latrine use are reports of incomplete construction of government-sponsored latrines [28]. Even with functional latrines, however, households still report low or no usage, citing reasons such as smell, water stagnation during the rainy season, and the additional task of water collection for anal cleansing and purification [4,17]. A study in Bhopal, India evaluated communal latrines in urban areas and found that construction systemically excluded women, children, and the poorest, through access, cost, and cleanliness [5]. This is consistent with findings from rural Odisha, India that found women were excluded from sanitation decision-making in their households, finding that the family networks and cultural power dimensions, play a much stronger role in sanitation outcomes than interventions have previously considered [30]. In contrast however, in an intervention conducted in rural Kerala, India the male population found the behavior change education to be a women's issue since much of the intervention was targeted towards them [31]. These conclusions highlight an oversight of the importance of the cultural practices and norms by which populations in both urban and rural India function.

Recent studies have made strides to better understand the defection practices and latrine usage patterns in India after TSC, which has guided the development of sanitation interventions, but there is a need for qualitative research on behaviors and practices on latrine adoption after the efforts of SBM. A systematic review of sanitation intervention in India by Garn and colleagues found only 10 studies assessing household latrine usage [32]. They found an average increase of 13% in usage across these studies, however the researchers categorized the quality of the

evidence as 'low' [32]. Additionally, a 2017 quantitative study using survey responses in Odisha, India, found latrine usage to be poor and inconsistent with a strong preference for open defection [33]. Recent qualitative studies have helped address this gap, providing rich data on the norms, attitudes, behaviors that contribute to this practice in the wake of TSC. For example, an exploratory qualitive study in Odisha, India found that despite the efforts of TSC, many government latrines remained incomplete or lacked a proper water source for cleansing, and as a result individuals chose to practice open defecation [4]. Qualitative work also agrees on the importance of the cultural aspects of open defecation, finding that open defecation does not carry stigma, the practice is customary and traditional, keeps the dwelling area pure from human feces, and for women, especially, provides a rare social opportunity [26,28]. Using data from the India Household and District Survey (IHDS), Hathi and colleagues concluded that in rural villages the natural definitions of community do not align with simplified versions of Western imagination [34]. Instead, the identities of rural populations align more around religion, caste, gender, and age rather than physical geography [34]. Their work suggests that these practiced cultural identities have been overlooked in interventions seeking to eliminate open defection. All of these qualitative findings have been important to understanding the consequences of and existing patterns of practice following TSC. They have also informed the design of sanitation interventions, including this sub-study's parent project, that seek to understand the perceptions, attitudes, and practices around defecation and latrine usage in communities which received latrines through SBM. Following the example of research efforts post-TSC, it is important that these SBM-era interventions and programs also utilize qualitative methodology as a tool to help assess the social acceptability of their program aims from the perspective of the intended community.

Section 2.2: Safe Disposal of Child Feces – Perspectives from Low and High-Income Countries

An under-researched aspect of sanitation are the practices around child feces disposal. The Joint Monitoring Program (JMP) defines unsafe feces disposal as feces put and/or rinsed into a drain or ditch, feces thrown into the garbage, and feces left or buried in the open [35]. They define safe disposal as a child using toilet/latrine or feces put/rinsed into a toilet or latrine [35]. However, an expert review suggests that burial is not a safe disposal mechanism because burial sites could be located near the home and children play sites and that the same standards for disposal of adult feces should be held for children [36]. Research suggests that previous large-scale sanitation interventions have overlooked the aspect of safe child feces disposal [3,12,37–42]. The Water and Sanitation Program (WSP) suggests that despite recorded improvements in household sanitation facilities in the 2014 JMP *Progress on Drinking Water and Sanitation 2014* report, the estimates rely on coverage and usage around sanitation facilities used by adults and as a result, may exclude children [38]. In India, even in homes with improved sanitation facilities, the unsafe disposal of child feces is still a common practice, suggesting that latrine access is not correlated to safe disposal of child feces [43]. The risk pathways focused on by most sanitation interventions [15,41], exclude the fecal-oral transmission pathways common in the behaviors among children including, touching and/or consuming animal or human feces from the household soil [41]. A 2014 meta-analysis of 10 observations studies from 1987 to 2001, by Gil and colleagues, found limited studies that reported child defection behaviors, but from a small sample of existing studies in low-income countries they describe that key determinants to unsafe child feces management include a lack of tools and access to safe water disposal facilities [42]. To address these behaviors and outcomes, Ngure (2014) and colleagues suggested the addition of a sub-sector termed Baby

Water, Sanitation, and Hygiene, or Baby WASH, to emphasize focus on hand-to-mouth behaviors of young children as they relate to fecal pathogens[41].

The unsafe disposal of child feces presents high exposure opportunities for adverse health outcomes to the direct child, other susceptible children, and adults. Children spend much of their time on the ground crawling and playing, and during this time their fingers are in close proximity to their mouths presenting high exposure to enteric infections from feces left in the open or contaminated soil [3,13,44]. Poor handwashing in combination with unsafe disposal also increases the opportunity for fecal-oral contamination through mother/caregiver hands, child hands, and water disposal sites near and in the household [42]. Susceptible children, including siblings in the household, are at high risk for fecal-oral microbial transmission with unsafe disposal as they are frequently the playmates and/or caregivers of younger children [15]. Unsafe disposal near the household compound also provides increased opportunity for diarrheal pathogen transmission by attracting flies, that can transport feces and contaminate food and utensils to any member of the household [3,42]. Unsafe child feces disposal practices have been linked to diarrheal disease [12,16], stunting, and soil transmitted helminths [14,15,39], while improvements in the management of child feces suggest a lower risk of diarrheal disease and a reduction in helminthiasis in children under the age of two [14,42].

Mothers' and caregivers' reasons for not properly handling child feces include lack of knowledge about safe disposal practices, lack of knowledge of the pathogenic risks, and a lack of access to diapers, potties and/or cleaning supplies [3,5,11,17,28,38,42]. In studies in Burkina Faso and Kyrgystan, children's feces were not considered to be dangerous, making disposal near the household compound acceptable [5]. Findings in Peru are similar to beliefs in India, suggesting that the feces of young children are considered as harmless, or at least less harmful than those of

adults because they are smaller, the odor is not as strong, and less food residue is visible [42]. In India, in a rural region in the state of Tamilnadu, a study found no stigma between open defecation of adults as well as low perceived risk between diarrhea and feces [28]. Another study in northern India found that 43% participants found no difference between using a latrine or open defecation for a child [17]. While it is known there is a common perception in India that child feces pose a low risk, further research is needed to understand the origin, motivations and cultural aspects of this belief [38].

Section 2.3: The Role of Mothers and Caregivers

Research has encouraged the importance of exploring the role of the mother/caregiver as an access point to improve child feces management in low-income countries as their behaviors have observationally been correlated to the prevention or lack thereof of child contact with fecal pathogens [5,12,39,45]. For example, Miller-Petrie's work in Cambodia found correlations between the age, experience, and habits of the caregiver and their child feces disposal [12]. Azage's work in Ethiopia suggest a positive relationship between a mother's increased level of education and the practice of safe child feces disposal [46]. A recent study analyzing data from the 2005-06 NHHS in India found that sociodemographic characteristics of the mother including: non-literacy, lower exposure to media, belonging to lower castes, a lower wealth quintile, having access to unimproved toilet facility, and residing in a rural environment were all associated with unsafe child feces disposal [43]. Research suggests that the mother is exemplary model for the child as a study in rural north India found that young children followed their mother to open defecate [28]. In higher income countries, similar importance of the role of the mother and/or caregiver has been assessed in feces management of children, including attitudes parents have during the process of toilet training of autistic children in Texas [47] and Belgium [48] and the knowledge and awareness of

constipation in infants by mothers in Michigan [49]. This range in physical geography and cultures is representative of the importance of this role as an access point to promoting behavior change.

Another important research aspect of safe child feces management focuses on the tools (potties and latrines) mothers and caregivers in both low-income and high-income countries utilize when teaching young children defecation practices. Studies on the use of child potties in low-income regions of Bangladesh and Cambodia found support with mothers and caregivers as they saved time, they were cheap, and made the process of feces disposal easier [12,50]. However, in studies conducted in Peru, mothers disliked the use of latrines for young children because of a fear that children may fall in and adult feces may be contaminating [51,52]. Another study in Bangladesh, suggested that despite wide coverage of child potties in the study area, only in households with overall better sanitation practices did researchers find more likely instances of safe child feces disposal [37]. This suggests the importance of household-level sanitation changes, including adult latrine adoption, as a factor in the promotion of safe child feces management.

In high-income countries, studies on the toilet training of both children with and without developmental disorders is met with conflicting advice on the best timing and training techniques [48,53,54]. Physicians have encouraged both adolescent mothers and adult parents to seek out health education to boost their self-efficacy in making a decision about an appropriate start time, as it unique to each child [55–57]. From this work, it is important to note the indeterminate, customary course this process takes, where suggesting a new standardized method of toilet training may not be initially welcomed or understood. A similar understanding of cultural norms and shifts in practice should be incorporated into the development of health promotion interventions in lower-income countries as well, to give reflexivity to the project design. However, in these studies, on the role of mothers and the tools they use, there is a need for more qualitative work on the

narratives and personal insights rural mothers in India have about their experience and the social norms and other factors that affect their choices.

Section 2.4 Sanitation Challenges in Odisha, India

In India, the state of Odisha has been the focus of multiple sanitation studies where findings suggest report poor latrine uptake despite progress in latrine coverage [4,26,58]. A study by Barnard and colleagues in the Puri District of Odisha, found that 72% of households had latrines following TSC [26]. However, 39% reported that no member of the household used the latrine and most members of the community still practiced open defecation [26]. This study was completed three years after the implementation of TSC, reiterating the program gap in emphasizing educational behavior components [26]. In another study in Odisha, Majorin and colleagues assess the impact of TSC specifically on the practices around child feces disposal and found that among the 79% of houses that had latrines, only 23% used them for child feces disposal [3]. This strongly suggests a need for qualitative research to better understand the reasons for low use for child feces disposal specifically despite increased coverage in this region.

Unsafe child feces disposal practices in Odisha mirror practices in other rural, low-income regions. Unsafe practices in these countries include disposal in open spaces (including the yard of the household) or an open 'garbage' pits [12,37,42]. In an exploratory study in Odisha, Routray and colleagues found that infants and young child defecate in the household on a paper, cloth or directly on the ground [4]. Feces is then disposed in a pit near the home or an open plot of land [4]. Children are taught to squat with a mother's assistance before progressing to squat on their own[4]. Some mothers mentioned the use of a potty for the child and then disposing the feces outside the home on the ground [4]. Since child feces management is highly under-researched, researchers also suggest the frequency with which these practices occur are highly

underestimated [42].

Section 2.5: Intervention Design & Theoretical Framework

Parent Intervention Design

This research is embedded within a larger research project evaluating a multi-level, theoretically informed behavior change intervention designed by researchers in the Environmental Health department at Emory University. The parent project involves 72 total villages in Odisha state, with 66 engaged in a cluster-randomized trial (CRT) to assess intervention impact on latrine use and six not engaged in trial activities but designated for further learning through qualitative research. The setting of this sub-study was the six supplemental villages, those not included in the CRT, engaged in qualitative research, three of which received the intervention.

Theoretical Framework

To meet the unique challenges of this field of study, the parent intervention was informed by an array of theories including, Behavior Centered Design (BCD) [19], the Behavior Change Wheel (COM-B) [20], and the RANAS model [21]. The unison of these models presented the appropriate constructs for the intervention, but this sub-study will specifically utilize the RANAS model. The Risk, Attitude, Norms, Ability, Self-regulation (RANAS) model was designed by Hans Mosler and intended to understand WASH practices [21]. The RANAS model is intended to measure and assess behavioral factors and their influencers, aid in the designing of interventions to address behavior change, and then finally measure the effect of interventions on the behavior change [21]. The model integrates elements from the Theory of Planned Behavior, Health Action Process Approach, Protection Motivation Theory, Social Cognitive Theory, and the Health Belief Model, selected for their proven ability to measure and describe changes and

discrepancies and health behaviors [21]. From these various theories Mosler developed five primary factor blocks to establish the framework of the model [22]. *Figure 1* provides a concise overview of the five factors, their definitions, and sub-categories.

The factor blocks are comprised of risk factors, attitude factors, norm factors, ability factors, and self- regulation factors. The risk factor block represents an individual's ability and awareness of the health risk from the behavior [21]. It is comprised of the sub-categories of health knowledge, perceived vulnerability, and perceived severity [22]. The attitude factor block represents an individual's appraisal of the behavior and/or health risk. It is comprised of two sub-categories, beliefs about cost and benefits and feelings both in context of the health risk [22]. The norm factor block represents the individual's perceived social pressure regarding the behavior [21]. It is comprised of the following sub-categories: descriptive norms (perceptions of the behaviors of others), injunctive norms (perceptions of the opinions of others regarding the behavior), and personal norms (an individual's beliefs about their behavior) [21,22]. The ability factor block represents an individual's confidence in their ability to practice a behavior. It is comprised of action knowledge (knowledge on how to execute the behavior), confidence in performance, confidence in continuation, and confidence in recovering after disruptions in the behavior [21,22]. Finally, the self-regulation factor block represents an individual's attempts to plan and self-monitor a behavior while planning for disruptions or possible barriers. It is comprised of action planning (planning the logistics of the behavior), action control (a self-monitoring strategy where the practiced behavior is continually evaluated to the intended standard), barrier planning, remembering, and commitment to the behavior [21,22]. Each of these factor blocks are influenced by external elements, defined by social context, physical context, and personal context (socio-

demographic factors, physical health, and mental health) [21,22]. *Figure 1* provides a concise overview of the five factors, their definitions, and sub-categories.

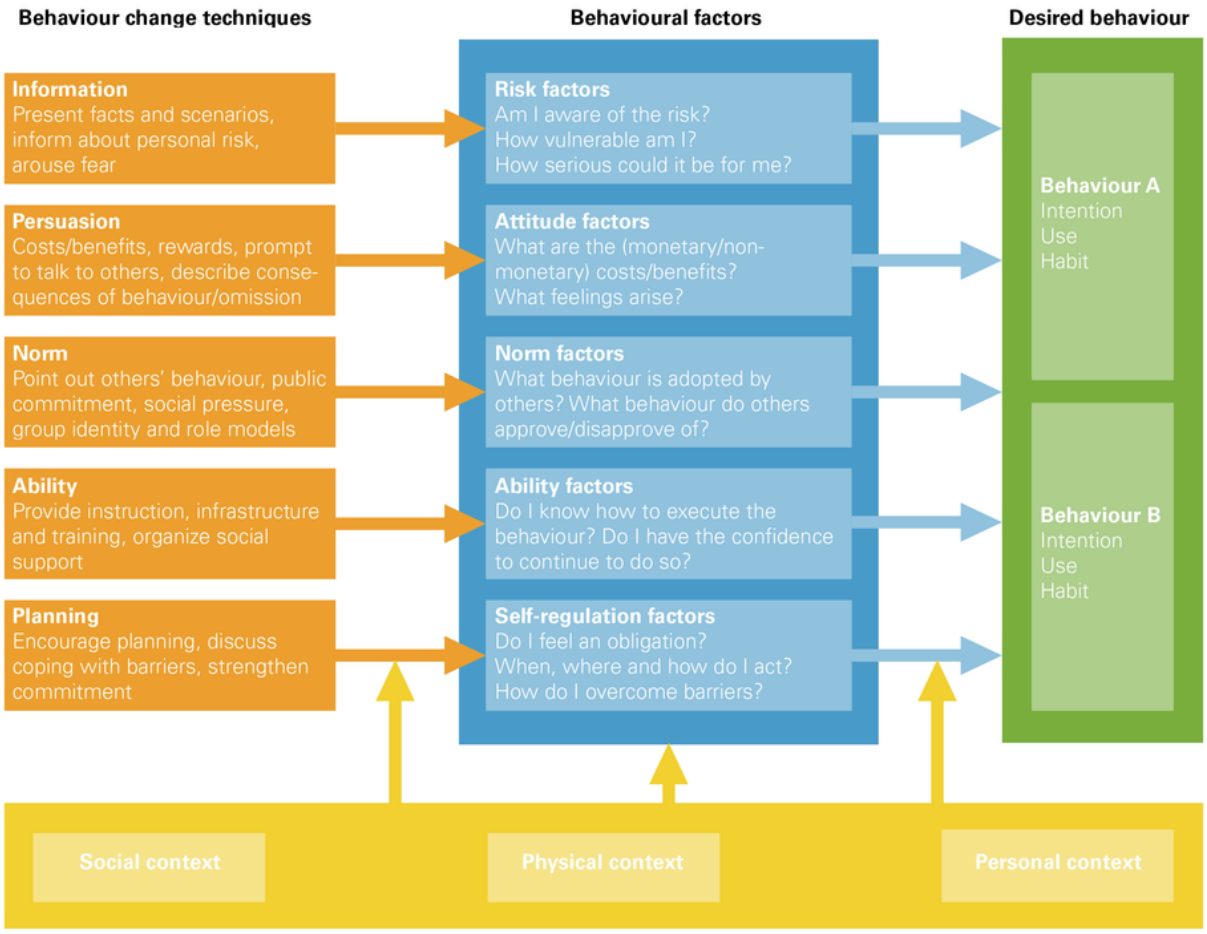

Figure 1: The RANAS Model [59]

The RANAS model was originally designed to focus on changing WASH health behaviors in low-income countries and has become a proven useful resource in health-promotion work. The model has been applied successfully by Mosler on solar water disinfection projects in Bolivia [60] and Zimbabwe [61], household drinking water disinfection in Chad [62], and handwashing in Haiti and Ethiopia [63]. In 2010 [64] and 2014 [65] Mosler conducted studies using the model to identify factors related to the use of arsenic-safe wells in Bangladesh. Mosler also incorporated the RANAS model in a 2013 study to determine the psychological factors that influence the consumption of safe water in rural Ethiopia, and of these factors, which could potentially be

changed [66]. The 2013 study especially, shares similar design components and intended outcomes with the present research project. As this study aims to also understand the psychological factors, attitudes, and perceptions that mother's and caregivers have regarding a behavior (safe child feces management), the application of the RANAS model with this population and in this setting is appropriate and useful.

Sub-Study Purpose

A group-level element of the multi-level parent intervention was a targeted meeting open to all mothers and caregivers of children under age five to provide them with action knowledge and hardware (scoops, potties) for safe child feces disposal. Facilitators from the local implementing partner, Rural Welfare Institute (RWI), provided instruction on the use and importance of the hardware. The group setting intended to promote discussion among women to share views, knowledge and questions on safe disposal. This qualitative sub-study will focus on the Mothers Group to further investigate the under-researched area of child feces management by evaluating the perceptions and attitudes of mothers and caregivers following the intervention.

Chapter 3: Student Contribution

Section 3.1 - Introduction

I worked with a research team at Emory University to carry out qualitative research to understand how child feces disposal is perceived by mothers and caregivers following a sanitation intervention from June 2018 to July 2018 in rural, Odisha, India. My key contributions included tool development, piloting, management of research assistants, participant recruitment, data collection, data management and storage, thematic data analysis, and report writing.

Section 3.2 – Setting and Project Context

The study was carried out across rural villages in the Puri District a coastal region of the State of Orissa in Eastern India, between June and July 2018.

This project was carried out simultaneously with two other qualitative research projects led by Emory MPH students, which examine other aspects of the intervention. I worked closely with one of these students throughout the tool development and data collection process, as our project goals closely aligned. Working together, our team co-led field team data collection training, provided feedback on tool revisions, and shared key insights from interviews and observations to inform the improvement of the tools.

Section 3.3 - Tool Development and Piloting

I developed four research tools for this project. The first research tool was a semi-structured guide for in-depth interviews (IDIs) to be carried out with mothers in intervention communities to explore their perceptions of the intervention and their practices and perceptions of safe child feces disposal. The second research tool was a semi-structured guide for focus group discussions (FGDs) to be carried out with mothers in control communities to understand norms around child feces disposal practices and gain insight regarding communal perceptions of the intervention. This tool was co-designed with my research colleague to also incorporate their intended research questions about the other elements of the intervention. The third and fourth tools were the demographic forms for the IDIs and FGDs. Again, the FGD demographic form was co-designed with my research colleague. With the support of Dr. Parimita Routray, our India-based principal investigator, our team recruited research assistants who were proficient in English and Oriya, the local language, and had experience in qualitative research methods. We conducted training for the research assistants (RAs), which consisted of lectures, careful question-by-question discussion and review of the tools, and role-playing over three days. We

intended for the training to refresh the research assistant's knowledge of qualitative methods and familiarize them with the goals of the project.

We piloted the IDI and FGD tools in three villages where the local community partner, Rural Welfare Institute (RWI), piloted the intervention. We piloted one FGD and four IDIs. During the piloting, my Emory research colleague and I observed during interviews and discussions. Based on participant response and research assistant feedback during debriefings, we determined that our presence was not a disturbance to the quality of the data and could continue into the data collection stage. We conducted debrief sessions with the research assistants after the pilot IDIs but not the pilot FGD due to time constraints. The debrief sessions were conducted the following day of data collection. We walked through each of the questions with the research assistants to understand the answer the participant gave, if it was appropriate to the intended meaning of the question, and if the question translated well into informal Oriya from English. We reviewed the debrief session notes and received feedback from the research assistants to improve the tools. We also provided feedback on the field team's interviewing and moderating skills.

Section 3.3a - In-Depth Interviews (IDIs) with Mothers in Intervention Villages

I developed the IDI guides based on the process objectives of the education elements of the Mother's Group meeting in the intervention. I revised it iteratively for cultural competency, appropriate language choice, and relevant subject content throughout the tool development, piloting, and data collection stages. I led the data collection of 25 IDIs in Oriya in three intervention villages. My Emory research colleague or myself were present at most interviews to take notes on non-verbal communication during the interview. For the first twelve interviews, I conducted immediate in-depth debriefs after each day of data collection. In some instances, the

debrief took place the following day due to time constraints or poor weather. These in-depth debriefs led to significant improvements for the interview guides. For the remaining interviews, due to time constraints by monsoon rains, I conducted shorter debriefs mainly focusing on covering major themes of the discussions and significant problems with the guide.

Section 3.3b - Focus Group Discussions (FGDs) with Mothers in Control Villages

I led the data collection of four FGDs in in three control villages. My tool development for the non-intervention FGD followed the same iterative processes as the IDI. My Emory colleague and I also took notes on non-verbal communication and the setting of the FGD. When possible, we debriefed immediately after the session. As with the IDIs, in some instances the debrief took place the following day due to time constraints or poor weather.

Section 3.4 - Data Analysis Approach

For the analysis, I used a thematic approach to code and analyze all transcribed interviews, field notes, and debrief sessions. My preliminary analysis consisted of memoing from debrief session notes and field notes to consider what initial themes and patterns were present. I used MAXQDA 2018 [67] for further analysis of the data. I began the coding process by using deductive codes to organize coded segments by how they represent the RANAS Model. I also chose to use an inductive coding approach to maintain the integrity of the intentions and meaning of the quotes that developed each code. With limited discourse on the subject, it was important to establish codes that highlighted the unique perspectives this population had to develop a thick description of the data [68]. My second phase of analysis focused on code-based comparative analysis. After organizing codes in MAXQDA, I used MAXMAPS to sort through related codes rich with data from the transcripts to explore possible relationships and dimensions. I repeated this process with other data-rich codes from the transcript to explore their presence across the

data and identify dimensions of the codes. To further explore the relationships between emergent themes, I used complex coding queries to explore intersections and order for how codes are applied (followed-by and/or near functions). I present the themes and sub-themes which emerged from these processes here.

Section 3.5 - Next Steps

I intend to submit to the BMC Global Health journal with the support and review of my thesis chair and committee.

Chapter 4: Manuscript

Title: A Qualitative Assessment of Mothers' Perceptions and Behaviors in Response to an Intervention Designed to Encourage Safe Child Feces Disposal Practices in Odisha, India

Short Title: Mothers' Perceptions and Behaviors to Safe Child Feces Disposal Practices in Odisha, India

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Abstract

Child feces can be a key source of pathogenic diseases, but mothers and caregivers in rural India are often not aware of the danger of improper disposal of children's feces. As a result, many may not know or follow safe disposal practices. The aim of this study is to assess the attitudes and perceptions of child feces management of mothers and caregivers in Puri District, Odisha, India after receiving an intervention designed to encourage the safe disposal of children's feces. Twenty-four in-depth interviews (IDIs) and four focus group discussions (FGDs) were conducted in six villages. Findings from this sub-study will be critical to understanding if and how this intervention influences mothers' and caregivers' perceptions and practices of child feces disposal and how the intervention could be improved. It will also help explain findings from a trial evaluating the effectiveness of the intervention at scale. The results of this research will also contribute to scientific literature on the under-researched area of child feces disposal,

particularly in rural India where unsafe disposal practices are frequent and acceptable despite increases in latrine coverage.

Keywords

child feces disposal, India, intervention, mothers, open defecation, sanitation (6)

Introduction

The Joint Monitoring Program defines open defecation (OD) as the practice of "defecating in fields, forests, bushes, bodies of water or other open spaces" [35]. As of 2017, 892 million people, 12% of the global population, practice open defecation [1]. OD is a major facilitator of diarrheal disease and even threatens those who use latrines through the transmission of fecal pathogens by animal vectors, poor or absent handwashing practices, contaminated waterways, and/or contaminated food [17,28,42]. A critical but often neglected aspect of open defection is the lack of consistent, proper disposal of child feces [3,9–11]. When not disposed or improperly disposed, child feces can become a source of exposure for enteric disease, a source of impaired growth in children, and environmental enteropathy [12–16].

Mothers and caregivers reasons for not properly handling child feces include a lack of knowledge of the pathogenic risks, a lack of access to diapers, potties and/or cleaning supplies, and a lack of knowledge about safe disposal practices [3,5,11,17,28,38,42]. Further, in many low-income settings, children's feces are not considered to be dangerous so disposal near the household compound is considered acceptable [5]. A review of 33 child feces studies conducted 16 low-income countries throughout Asia, Africa, and Latin America, suggests that often, feces of young children are considered as harmless, or at least less harmful than those of adults, because they are smaller, the odor is not as strong, and less food residue is visible [42]. While it is known

there is a common perception in India that child feces pose a low risk, further research is needed to understand the motivations and cultural aspects of this belief [38].

Research has also encouraged exploring the role of the mother/caregiver as an access point to improve child feces management in these countries as their behaviors have observationally been correlated to the prevention or lack of child contact with fecal pathogens [5,12,39,45]. As most children under the age of five are too young manage their own defecation practices, they are dependent on mothers and caregivers. Thus, mothers and caregivers are a crucial focus for sustaining safe practices for this cohort. A recent study analyzing data from the 2005-06 NHHS in India found that sociodemographic characteristics of the mother including: non-literacy, lower exposure to media, belonging to lower castes, a lower wealth quintile, having access to unimproved toilet facility, and residing in a rural environment were all associated with unsafe child feces disposal [43]. In higher income countries, similar importance of the role of the mother and/or caregiver has been assessed in feces management of children [47,48,49]. This range in physical geography and cultures is representative of the importance of this role as an access point to promoting behavior change.

Another important research aspect of the safe child feces management focuses on the availability of tools and suitable facilities that mothers and caregivers in both low-income and high-income countries utilize when managing child feces or teaching young children where to defecate. Studies on the use of child potties in Bangladesh and Cambodia found mothers and caregivers supported the potties as they saved time, were cheap, and made the process of feces disposal easier [12,50]. However, in studies conducted in Peru, mothers disliked the use of latrines for young children because of a fear that children may fall in and be exposed to pathogens from adult feces [51,52]. However, from these studies, there is limited qualitative work on the narratives

and personal insights mothers have about their experience and the social norms that affect their choices.

Child feces disposal (CFD) is a particular challenge in India. The National Family Health Survey (NFHS) (2015-2016) states that 39% of the Indian population practices open defecation with the rural population accounting for 54% of these individuals [7]. The NFHS also reports that nationwide, safe feces disposal was only practiced for 36% of children under the age of five [7]. In Odisha State, CFD is the worst in the nation, with only 13% of children's feces safely disposed, raising concerns for child health outcomes [7]. A 2013 cross-sectional study in Puri, Odisha, reviewed the impacts of the Total Sanitation Campaign (TSC), a large scale-sanitation campaign India. They found that 72% of households had latrines, yet of those 39% reported that no member of the household used the latrine [26]. They also concluded that most members of the community still practiced open defecation [26]. Additionally, a 2014 cross-sectional study on child feces practices in Odisha found that among the 79% of houses that had latrines, only 23% used them for child feces disposal [3]. This suggests a need for qualitative research to better understand the reasons for low use for child feces disposal specifically despite increased latrine coverage, through programs such as TSC, in this region.

A cluster-randomized controlled trial was conducted in Odisha, India from November 2017- March 2019 to evaluate the effectiveness of a multi-level intervention that aimed to increase latrine use among latrine-owning households [69]. The multi-level intervention also included a specific activity, a Mothers Group, targeting mothers of children under age 5 to influence safe child feces disposal. This research aims to understand how mothers perceive of the child feces disposal components of the Mothers Group. This research has two primary objectives: (1) To assess the attitudes and perceptions of mothers in Puri District, Odisha, India

after receiving an intervention designed to encourage safe child feces disposal practices and (2) To determine 'spillover effects' of the intervention by assessing if mothers in neighboring, non-intervention communities heard about the intervention and, if they did, what they heard and thought about the information. Spillover effects may occur when the non-intervention community has social and economic interaction with the target-intervention community [70].

Methods

Study Setting & Design

The study was carried out across rural villages in Puri District, a coastal region of the state of Odisha in Eastern India, between June and July 2018. The state of Odisha has been the focus of multiple sanitation studies where findings report poor latrine uptake despite some increase in latrine coverage, and no detectable health impacts [4,26,58].

This research is embedded within a larger research project evaluating a multi-level, theoretically informed behavior change intervention [69]. The study involves 72 total villages, with 66 engaged in a cluster-randomized trial (CRT). The focus of this sub-study involved six supplemental villages not included in the CRT but engaged in qualitative research, three of which received the intervention. The community-level activities of the multi-level intervention included a *palla* (cultural skit) to provide sanitation education, a transect walk where Holi powder was sprinkled on feces to raise awareness about the state of their environment, gender-specific community meetings to reflect on the activities of the intervention, community wall paintings, and positive deviant posters,. The household-level activities of the intervention included household education visits, and low-cost latrine repairs.

The group-level element of the multi-level intervention was a targeted meeting open to all mothers and caregivers of children under age five, regardless of latrine ownership, to provide

them with action knowledge and hardware (scoops, potties) for safe child feces disposal. Facilitators from the local implementing partner, Rural Welfare Institute (RWI), provided instruction on the use of the hardware and importance of safe child feces disposal. The group setting intended to promote discussion among women to share views, knowledge, and questions on safe disposal.

Data Collection

Data was collected through in-depth interviews (IDIs) in intervention villages and focus group discussions (FGDs) in control villages, as described below. The interview guides for both were refined based on feedback from local research assistant feedback during piloting. Data was collected in Oriya by local, trained research assistants with experience in qualitative research and interviewing.

In-Depth Interviews

IDIs can inform on an individual's personal beliefs, perceptions, and motivations for a certain behavior [68]. For this reason, they were conducted with mothers from communities that received the intervention to gain personal insights about the intervention and proper child feces disposal practices. The interview tool was developed based on the process objectives of the education elements of the Mother's Group meeting in the intervention. The tool included questions about the mother's routine child feces practices, perceptions of the Mother's Group meeting education delivery and informational value, and perceptions and usage or non-usage of the potty and scoop they received. The tool was iteratively revised for cultural competency, appropriate language choice, and relevant subject content throughout the data collection process.

Twenty-four IDIs were conducted, recorded, and translated in three villages that received the intervention. One interview was excluded from data analysis because of researcher error in

interviewing a male figure. For two interviews, due to communication difficulties between mother and research assistant the interviews were completed despite the mother not attending the Mother's Group. These interviews represent accidental data however, their reflections were used as they build a more complex understanding of the relationship between mother-in-law and daughter-in-law. Recruitment for the IDIs was primarily conducted the day before the interviews by *anganwadi* (rural child care center) workers, who helped identify and recruit mothers to participate. After locating the initial contacts suggested by the *anganwadi,* snowball sampling [71] was used to identify additional participants from the initial contacts or other members of the community. Snowball sampling is recruitment method which utilizes the social networks of research participants to find additional participants for the study [71].

Women were eligible for the interviews if they had attended the Mother's Group meeting. We sought to capture variation in the sample of participants, as attendance data collected when the Mother's Group meetings were held demonstrated that the ages of women in attendance at the meetings varied. Thus, our sampling sought to maximize variation in participant ages to elicit a diverse range of perspectives and experiences of both the Mothers Group meeting and child feces management.

Focus Group Discussions

FGDs can provide information on social norms and values as well as community perspectives [68,72]. FGDs were conducted in neighboring, non-intervention communities to assess the possibility of intervention spillover effects [70]. FGDs were employed in this study as FGDs provided insight on community-level perceptions on child feces managements, in contrast to not individual perspectives from the IDIs. Four FGDs were conducted, recorded, and translated in three villages that did not receive the intervention. Two of these control villages were directly

adjacent to intervention villages, while one was not. Recruitment for the FGDs also primarily focused on the *anganwandi* teacher as a main gatekeeper and then relied on snowball sampling. The discussion tools included questions about awareness and/or attendance of the Mother's Group in a neighboring village, current practices with child feces, and perceptions of the overall intervention. This tool was co-designed with a research colleague to also incorporate their intended research questions about the other elements of the intervention. Tool development for the non-intervention FGD followed the same iterative processes as the IDI.

Procedures

Participants were explained the study and verbally consented to participation before data collection. Basic demographic information, including age, education, religion, child status, and latrine status, was captured on a paper survey and discussions were digitally recorded. IDIs took place at the household or *anganwadi* center. Interviews were between 12-52 minutes long. FGDs were held at the *anganwandi* center or village clubhouse. Discussions were between 18–33 minutes long. RW and/or a research colleague were present at interviews to take notes on non-verbal communication during the interview. For FGDs, one female research assistant facilitated the discussion, while another took detailed notes on participant comments and non-verbal communication.

Participant Characteristics

Twenty-four women aged 21–65 years (9 [20-29 years], 9 [30-39 years], 1 [40-49 years], 2 [50-59 years], 3 [60-69 years]) participated in interviews and 37 women aged 23-66 years (6 [20-29 years], 12 [30-39 years], 5 [40-49 years], 10 [50-59 years], 4 [60-69 years]) participated in four FGDs (7-15 participants each) *(Table 1)*. All interview participants were Hindu and married, 38% had some secondary education, 42% were either other backward caste (OBC) or general

caste, 64% had more than one child, and 75% had a functional latrine. All FGD participants were Hindu, 87% were married, 8% had some secondary education, 68% were general caste, 10% were OBC, 50% had two children, and 49% had a functional latrine.

Table 1: Demographic information for participants in IDI (n=24) and FGD (n=37)

Characteristics	IDI Participants		FGD Participants	
	N	% or SD	N	% or SD
Age (Mean)	34.7	13.3	41.9	11.5
20-29	9	37.5	6	16.2
30-39	9	37.5	12	32.4
40-49	1	4.2	5	13.5
50-59	2	8.3	10	27.0
60-69	3	12.5	4	10.8
Education				
None	3	12.5	10	27.0
Some Primary	3	12.5	12	32.4
Primary Completed	5	20.8	9	24.3
Some Secondary	9	37.5	3	8.1
Some Tertiary / University	4	16.7	1	2.7
No formal education, but literate	0	0.0	2	5.4
Own a BPL card				
Yes	19	79.2	31	83.8
No	5	20.8	6	16.2
Marital Status				
Single	0	0.0	1	2.7
Married	24	100	32	86.5
Widowed	0	0.0	4	10.8
Years Married				
0-5 years	2	8.3	1	2.7
6-10 years	3	12.5	1	2.7
11-15 years	1	4.2	3	8.1
21-25 years	0	0.0	4	10.8
26-30 years	0	0.0	4	10.8
31-40 years	0	0.0	2	5.4
No response	18	75.0	22	59.5
Hindu	22	100	37	100
Caste	.			
General caste	10	41.7	25	67.6

Scheduled case (SC)	4	16.7	2	5.4
Other backward caste (OBC)	10	41.7	10	27.0
Number of Children (Mean)	1.8	0.7	2.1	0.8
0	0	0.0	2	5.6
1	10	41.7	9	25.0
2	10	58.3	18	50.0
3	4	16.7	6	16.7
4	0	0.0	1	2.8
Youngest Child Age (Mean)	3.4	3.2	11.2	8.5
<1	3	12.5	2	2.9
1	3	12.5	1	1.4
2	3	12.5	3	4.3
3	10	41.7	2	2.9
4	4	16.7	5	7.1
5	0	0.0	1	1.4
>5	1	4.2	56	80.0
Youngest Child Sex				
Female	8	38.1	31	44.3
Male	16	61.9	39	55.7
Functional Latrine on Compound				
Yes	18	75.0	18	48.6
No	1	4.2	19	51.4
No Response	5	20.8	0	0.0
Mother's Use of Latrine				
Always	10	41.7		
Sometimes	1	4.2		
Never	10	41.7		
No Response	3	12.5		
Mother’s Reported Child's Use of Latrine				
Always	13	54.2		
Sometimes	4	16.7		
Never	4	16.7		
No Response	3	12.5		

Data Management and Analysis

Interviews and FGDs were digitally recorded and translated directly into English.

All transcribed interviews, field notes, and debrief sessions were analyzed using MAXQDA 12. An inductive coding approach was used to maintain the integrity of the intentions and meaning of the quotes that developed each code. With limited discourse on the subject, it was important to establish codes that highlighted the unique perspectives this population to develop a thick description of the data [68]. The development of the codebook included consultation with another member of the research team. Thematic analysis was used to examine emergent patterns and variations. Specifically, queries of coded segments were pulled from MAXQDA to explore the variations in narratives. Analytic memos were written for conceptual depth from these queries. Key themes and sub-themes were identified from these processes that seek to capture the lived experiences of the population. A conceptual model was built to describe the context and pathways of CFM derived from these themes.

Ethics

Study protocols have been reviewed and approved by the Institutional Review Board at Emory University in Atlanta Georgia (00098293) and the Ethics Review Committee at Xavier Institute of Management in Bhubaneswar, Odisha, India.

Results

Child Feces Management in a Dynamic Sociocultural Context

Women's narratives revealed how the sociocultural context of their lived environment influences their child feces management (CFM) practices, as seen in the conceptual model (*Figure 1*). The sociocultural context highlights the impacts that family structure and roles, health knowledge, risk perceptions, and attitudes have on informing practices of child feces disposal. Within this sociocultural context, the implementation of the intervention interrupted the CFM pathway by offering mothers the opportunity for access to the MG. Mothers who

experienced the meeting generated a perception of the meeting that could possibly inform their original child feces management practices. Mothers who have access to the meeting also represent a source for potential spillover to other non-intervention villages that could in turn affect their CFM practices. In the following sections, we describe the thematic findings from each of these relationships, which emerged from the interviews in the intervention villages and focus groups in the control villages.

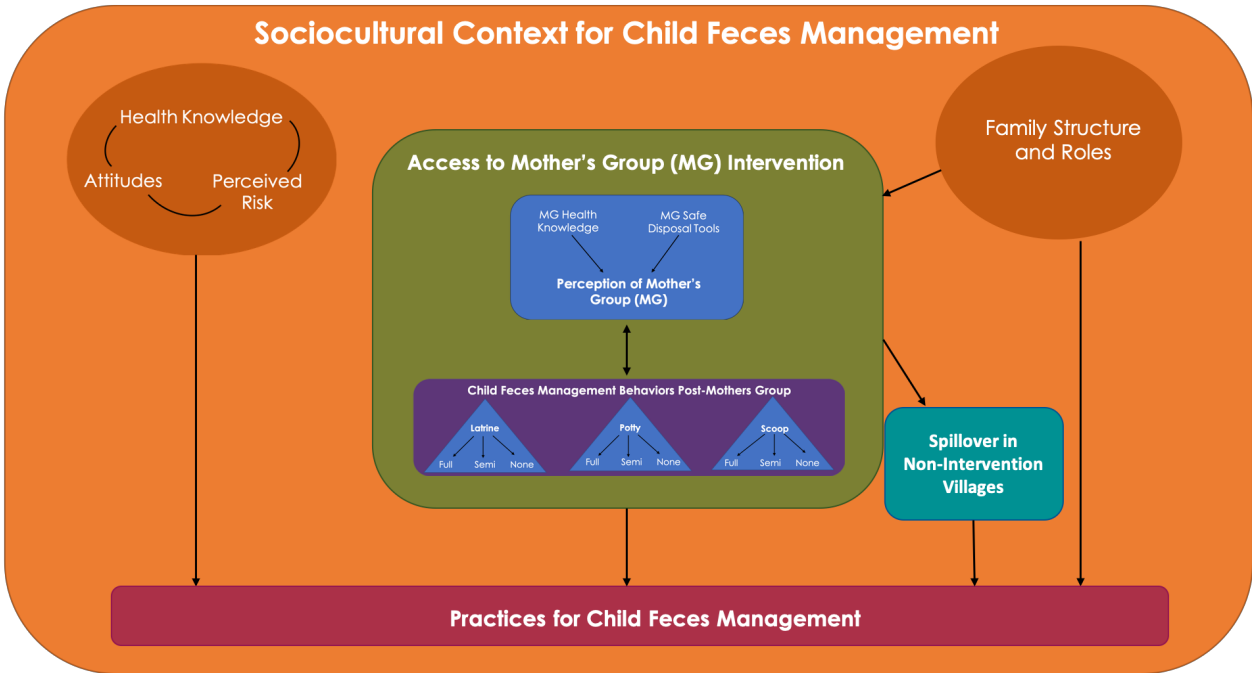

Figure 1: Conceptual Model

Sociocultural Context for Child Feces Management

Health Knowledge, Risk Perceptions, and Attitudes Related to Child Feces Management

Overall the majority of women perceived child feces to be a potential health risk. Women described that there were germs in feces, germs would begin to grow in feces if left undisposed, and feces could carry germs from other feces. The smell of feces was frequently referred to by women when describing health risk. Several women discussed the bad smell of feces when children become sick or when it is left in the open as disgusting, dirty, or filthy.

Women in both the control and intervention villages also cited dogs and flies as key reasons for why child feces are harmful. Women noted that it was 'unhygienic' that dogs ate that child feces that were thrown outdoors. Flies were described to be a risk for poor health outcomes because they sit on feces and then come into contact with food and utensils in the household, bringing feces, germs, and diseases with them. A few women described throwing feces far away from the home but noted that this was still a health risk because flies would still be able to come in contact with the feces. Some disagreed stating that if feces were thrown far enough away from the home it could not be a health risk.

> *Flies sits on the feces, then, flies come and sit on the food. Children will have allergy, if they consume that food. They will have vomiting, loose motions, also fever because of vomits and loose motion…. then bad smell…We ourselves can't even stand that, will feel disgusted.*
>
> *(Mother Age: 38; Children: 3-year-old, Male; 6-year-old, Male)*

Overall, the majority of women in both the control and intervention villages described that allergies, vomiting, 'loose motions' or diarrhea, and fever were possible poor health outcomes for children. However, women rarely cited that an ailment *their* child had experienced was due to child feces. Only three women attributed their child's fever to feces. A few women described that children were more likely than adults to get infections because they were more susceptible or because of weak immunity. Women in both the control and intervention villages described managing child sickness by using doctor prescribed medicine for diarrhea and 'urine infections'. If seeking care, women primarily discussed seeking medical care from a hospital or clinic, only in one instance a woman discussed using religious methods to seek treatment for her child.

While in the minority, some mothers did not consider child feces to pose a risk and held a perception the child's diet was protective and believed that a greater risk was consuming

contaminated water. Several women in the control and intervention villages discussed that child feces were not harmful because the food, specifically milk, that children consumed was different than adults. Food consumed by adults was described as 'outside food' and a basis for why adult feces posed a harm while child feces did not. Additionally, two women described that water, not exposure to child, feces were linked to infections or fever in children. They stated that poor health outcomes in children came by drinking water that was 'not good' or not boiled, bathing, or other activities for a length in time in water.

Female and Male Roles and Responsibilities Related to Child Feces Management

The majority of women described their role as primary caregiver for their children which included fecal management, feeding, bathing, and escorting children to school and/or to bus transport to school. In most cases, responsibility of caring for a child's defecation belongs to the mother sometimes due to the belief that no one would be able to do the task as well. Only in one instance did a mother with a child under the age of five describe that her mother-in-law had primary responsibility of childcare. Several women described that if they were busy their mother-in-law would assist with their duties for childcare, including the cleaning of feces. Grandmothers described a decrease in their household tasks, compared to when they were younger, with a focus instead on assisting her daughter-in-law with childcare if needed (i.e.: when a child is sick or tending to a younger child while the other prepares for school), as well as ordering and managing the cooking of the household. Several of the women, especially mothers with children under the age of five and mothers-in-law, described their household tasks with an emphasis on time management. Women described how tasks needed to be completed by specific times of the day, such as getting children ready for the *anganwandi* in the mornings or making sure dinner was completed in the evenings.

I: What are your responsibilities within your family?

P: All the responsibilities that a daughter in law has, I have all those responsibilities, like cooking, take care of family members like father in law, husband, child's work.

(Mother, Age: 23; Children: 3-year-old, Female)

Women interviewed from the intervention villages emphasized that keeping the child clean was a role intended for the mother. Women described that if a child was clean, they could not become sick from feces. To keep a child clean, women emphasized the use of 'Dettol' (an antibacterial and disinfectant soap) when washing the child's clothing and bedding and then hanging these items in the sun to dry, especially when a child was younger. Women frequently stated that their child had not become sick due to feces because they had kept their child clean.

If we don't take care of the child, then will the child not have loose motions? Since his birth, I have taken extra care of him…Yes, all depends on the mother, If the child is not kept clean, will that not happen.

(Mother, Age: 30; Children: 3-year-old, Male)

Women's descriptions of the role men played in child feces management varied. Some women expressed that their husband would help in cleaning the child and the feces. Among these descriptions of men's involvement, women indicated that men would take a child to defecate in a field, taking a child to the latrine, or by throwing feces into a waste pile. Some participants described however that men do not and should not? be involved in child defecation practices because they are responsible for work outside the home and they would feel disgusted doing the task.

I: Is there anyone else, who should be responsible to clean the child like – father or grandfather?

P: No no, they can't do. They are responsible to the outside work, and we are in charge of caretaking. And they often don't stay at home, so, they should not be doing all these."

(Mother Age: 26; Children: 1-year-old, Female; 6-year-old, Male)

These direct descriptions and reasons for men's roles are consistent in the conversations with many of the other women who only focus on responsibilities of the household when referencing their work and daily routines.

Current Practices for Child Feces Management

Women in the control and intervention groups described current practices for child feces disposal that progressed from defecation within the household to either use of the latrine or open defecation with progression in age.

For children under age three, women from the intervention villages reflecting on their practices before receiving the intervention and women in the control villages agreed that typically a child should defecate in the home on a cloth or paper. Women described that the paper and, sometimes cloth, containing feces was thrown outside the home into a waste pile, compost pile, or dustbin. One woman clarified that a compost pile posed no harm because it was used for the 'agriculture fields'. In some cases, if a cloth was used to throw the feces, it was washed after throwing the feces, sometimes with 'Dettol', and sometimes hung outside to dry.

Some women describe taking their child to the tubewell (water pump) and less often, a river, to wash after defecation. For a 1-year old child, too young to be taken to the tubewell, the mother described cleaning the child with a cloth dipped in water and 'Dettol'. After cleaning, water from the tubewell was described to either flow into a drain which flows to an open field, or in the absence of a drain it soaks into the soil. Two mothers described that the water from this drain flowed to an open field.

Some women described cleaning their own hands afterward with hand soap and Dettol, because as a mother described, they were the ones more actively engaged in the cleaning of

feces. Among these women, some described cleaning their children's bottoms, legs, and hands with hand soap and 'Dettol'. However. two women described that they did not need to wash their child's hands because the child's hand didn't touch feces and because the child was too young to eat on their own with their hands. In both the control and intervention villages women described that 'Huggies' (pampers) were often used when a child had diarrhea or at night and was then thrown in the waste pile.

To clean the defecation site mothers described methods for varying flooring and locations. If the defecation occurred on concrete floor a mother described spraying with water and cleaning with a broom. If the defecation was on soil mother described using a mixture of water, cow dung, and straw to clean. If the defecation site was in the home, which could involve any other previous types of flooring, the addition of 'phenyl' (disinfectant) and Dettol were used.

For children age three and above, control group mothers indicated that defecation in the open fields was most commonly practiced. Among the women who received the intervention, twelve (50%) described that at least one of their children under the age of 15 used the latrine. Of these women, 83% (n=10) specifically stated that their child under the age of five used the latrine regularly. Among these women, the majority of children were age three or four. Among these women, they described flushing the feces with water after defecation. Some also discussed cleaning their hands and legs as well as the child's hands and legs with soap and water. Water for this was often brought from the tubewell at home in a bucket or mug. Prior to these children using the latrine, some mothers described how their children defecated in the household on a cloth or paper and disposed feces in an outdoor waste pit.

Women's Access to the Intervention

Women described how the family structure prevented them from going to the MG—or

other intervention activities—and experiencing it directly. Some women were only able attend the MG and no other intervention activities. Among these women, reasons for non-attendance included that it was not acceptable for them to be seen in public spaces or spaces with elder brothers-in-law.

> *I did not attend anything. Our mother-in-law had heard about them [intervention activities] and she shared those things with us. We daughters-in-law cannot go anywhere…We are not permitted to go[to] those places where our elder brothers-in-law are present. Being daughters-in-law, can we go there? Mothers-in-law can go, and we daughters-in-law cannot go everywhere. We have restrictions on our movements.*
>
> *(Mother Age: 30; Children: 3-year-old, Female; 8-year-old, Male)*

At both the MG and other intervention activities, mothers-in-law went as a representative for the family and sometimes conveyed the information from the meeting to the mother with a child under the age of five—the target group—at home.

> *Only the mother's meeting was held in the back side of our house, near the temple, so I could attend only the mother's meeting. The kid is small, so I could not have attended if the mother's meeting would have been conducted far away. And we don't go outside much, because, mother-in-law is alive, and since she is present, she will be given the preference to attend the meetings.*
>
> *(Mother Age: 22; Children: 1-year-old, Male; 3-year-old, Female)*

A grandmother described that the majority of attendees at the MG she attended were mothers-in-law and only a few mothers of children under age five were present. When describing what they learned at the meeting, mothers who did not attend or had an early departure from the meeting were less willing to discuss what they learned at the meeting. They cited their absence or early departure as a limitation in their comprehension.

The role that women play as primary care takers for children was identified as a barrier to attending the Mothers Group (MG), as well as other intervention events. Some mothers described that the meeting conflicted with aspects of their children's routines, other work they

had to finish, or was too far away from their home to travel and attend to with a child.

> *I: Which other place could it have been conducted, so that it would have been easier for you to attend?*
>
> *P: It was conducted in the evening. And it was raining hard. So we were not able to attend that.*
>
> *I: Was it conducted after 5 pm?*
>
> *P: Yes, we had the work of the children and then cooking too.*
>
> *(Mother Age: 30; Children: 3-year-old, Male)*

A few mothers stated that their child crying or being "naughty" at the MG meeting sometimes caused others to suggest that they go home, or influenced them to independently choose to go home or stand outside the meeting room to listen from afar.

Women's Perceptions of the MG Messaging

Among women who attended the MG, they commented on the delivery of the content and their perceived values. The majority of women who attended positively perceived the educational delivery on the basis of repetition of information presented, the use of pictures to illustrate examples of behaviors and potential barriers to safe disposal, and information presented in Odia (the local language). Overall women perceived the MG as valuable because the meeting provided new information. Information participants deemed valuable included guidance on cleaning children after defecation, cleaning disposal tools after use, digging pits for disposal of feces in the absence of latrine, and health risks around adult and child feces.

Some women, however, did not perceive MG as a source of new information because they had prior knowledge about the information provided in the MG given to them from their older children who travelled outside the village, previously had access to disposal tools (potties, scoops, and Huggies), or believed that mothers already know how to clean their children and

their clothing.

Child Feces Management Practices Post-Intervention

After receiving the intervention, women described varying extents of implementation of the tools with their children. Among women who did use the tools, for any length of time, there was variation in consistency of safe usage.

Among the women who received the intervention, eight women (33.3%) described the proper and safe use of the potty by at least one of their children. Among these women they described dumping the feces directly from the potty into the latrine, then cleaning the potty with water and 'phenyl' and setting the potty in the sun to dry. A mother described also cleaning with 'Surf' (detergent) to eliminate the smell of feces from the potty. Some mothers used a specified brush, kept in the latrine, for cleaning the potty. Among these women, however, there is lack of clarity on the method and consistency with which the potty and child is cleaned after defecation. Additionally, among women whose children used the latrine, some described that the potty was used as an alternative if it was cold outside or during the night.

Among five women (20.8%) who described using the tools with at least one of their children, it was unclear if feces were disposed in a latrine or safely buried. Among these women the potty was described to be cleaned with 'Surf' and set in the sun to dry. Of these five women, one woman did not have a latrine. Additionally, 12.5% (n=3) women described not using the tools and disposing of feces in an unsafe manner, for at least one child. Among these three women, child refusal of the potty or a broken potty after sibling fighting were reasons for non-use, leading to continued practice of disposal in an open site after defection in a cloth or paper in the home. Of these three women, practicing unsafe disposal without the potty or scoop, two did not have a latrine and one did not have a functional latrine.

Unsafe use of the disposal tools was explicitly discussed by two women (8.3%) without latrines, for at least one child. These women described disposing of the feces in outdoor waste piles after their child defecated in the potty or scoop and washing the disposal tools in river water, which they used for cooking purposes.

Among all women, three women varying stages of potty implementation (safe use, unclear safe use of potty, and failed attempted use) shared a potty usage technique not taught in the MG. All three mothers described lining the potty with paper for the child to defecate in and then disposing of the paper. One mother described this was done because it made it easier to clean the potty as feces did not stick to the potty.

Perceptions of the Scoop

When describing their perceptions of the scoop, women cited that it provided a more hygienic option for disposal because it enabled no fecal contact with the mother's hands, was useful for cleaning when a child had defecated in the open without notifying the mother prior, and was useful for older children who could defecate directly into the scoop so the feces could easily disposed.

> *"It [the scoop] is more clean. If we use paper, then we dirty our hands when the faeces touch our hands. And more germs also go into our hands. But with the scoop, we can just pick it up and throw it."*
>
> *(Mother Age: 24; Children: 4-year-old, Male; 5-year-old, Male)*

Perceptions of the Potty

Overall women described that they enjoyed receiving the potty at the MG, however the acceptability of the potty by their child and usefulness of the potty in their daily lives varied among women. Among positive remarks of the potty, women described that they appreciated that the potty was designed well for younger children to sit on and that it aided in time management as it allowed them to cover the defection in the potty and clean it later. In instances

of both successful and non-successful usage of the potty, mothers described that the child used the potty as a toy. In some instances, this is a positive attribute, as one woman described that the potty was helpful to both entertain her child and provide somewhere for him to defecate since her household does not have a latrine. However, in some instances, because the child considers the potty to be a toy, they will not defecate in it.

Women who were still training their children to use the potty or were not using the potty also described deterrents to use, including child age, a fear of damage to the potty, and disgust. Some women described that for children three years and above, the potty was too low for children to use and that the position for defecation for them was uncomfortable. Among these mothers, one described that she was considering setting the potty on bricks to make it more comfortable for the child to use. Alternatively, a few mothers described difficulty using the potty with children under the age of three because they could not sit on the potty without being held. Women also frequently cited a fear that the child would break the potty or indicated that the child had already broken the potty. Some noted that siblings would fight over the potty. For both breaking the potty and fighting over the potty mothers discussed hiding the potty in the upper shelves or by hanging it out of reach. Hiding the potty was done by three women no longer using potties, and one woman who did have success with the potty (as a precaution to keep it safe from breaking by children).

> *The potty is half broken now. Both the kids have been fighting over it. So, I have kept it in the upper shelves, so that their hands don't reach there… During the fight, they have broken some of the household assets.*
>
> *(Mother Age: 38; Children: 3-year-old, Male; 6-year-old, Male)*

Finally, one woman reported that a child in her care was disgusted to use the potty because of the smell of defecating in the same location consistently, preventing use.

Prior to having the potty, mothers described that they knew when a child needed to defecate because the child explicitly said so or women could tell based on their facial expressions. After receiving the potty, some women described that their child specifically would ask for the potty when they needed to defecate. Alternatively, some women described that their child would decide they did not want to the use the potty or latrine due to their mood, or in one case, because the child described to the mother that others do not use the potty for defecation. In these situations, women did not describe further pressure to encourage the child to use the potty.

Women also discussed their varying perceptions of the time and effort needed for potty training. A few mothers indicated a need for no training period. These mothers described that their children reacted well to the potty and were able to use it without discomfort. A few women described trying to suggest that the child use the potty, in one case 2-3 times, but that the child refused to continue, due to discomfort or unwillingness.

> *He was made to squat three times. But then refused to use. The potty is too low for him to use. The potty can be used by a much younger child, may be around 1-year old child, not the grown up, like my son. Will the child sit on that? It's very uncomfortable for him.*
>
> *(Mother Age: 30; Children: 3-year-old, Male)*

Only two mothers discussed that they understood the time for the training was necessary to implement the new habit with the child.

Perceptions of Intervention Spillover in Control Villages

In the control villages none of the women heard about the MG or the tools (potty or scoop) used. Some women described hearing about the overall intervention through telephone calls from individuals in the intervention villages or claimed to have heard about it on television but could not provide further information about the activities conducted.

Discussion

The aim of this study was to assess the attitudes and perceptions related child feces management of mothers and caregivers in Puri, India after receiving an intervention designed to encourage the safe disposal of children's feces. Qualitative research revealed that the sociocultural context is informed by the varying health knowledge, attitudes, and perceived risk women hold about child feces management. The sociocultural environment is also defined by the gendered roles and responsibilities within the family around child feces management. The impact of a child feces sanitation intervention targeted to mothers under the age of 5 is also affected by this sociocultural environment. The impact of the intervention is influenced by the family barriers women encounter in accessing the intervention and the acceptability of the safe disposal tools by mothers and their children. Child feces disposal practices post-intervention represent variations in the extent of the implementation of the safe disposal tools and the safe usage of these tools. Mother's actions or non-actions are a reflection of the perceptions they have about the intervention, access to facilities to safely dispose feces, and/or adaptations to their perceptions of health risk.

Sociocultural context factors were identified as key components to understanding how women navigated their child feces decisions. Our results and previous research suggest that mothers play a crucial role in the direct communication of defection and disposal process with children [5,12,28,39,45]. However, women's identities in their family and their household responsibilities were found to be barriers to how women could access the MG specifically—and the overall intervention more generally. Additionally, a lack of spillover, despite close proximal distance for two control villages, underscores how women's movements outside the household does not support the diffusion of information beyond village borders. This is consistent with other findings from rural Odisha, India that found women were excluded from sanitation

decision-making in their households, finding that the family networks and cultural power dimensions play a much stronger role in sanitation outcomes than interventions have previously considered [73]. The intervention was designed to target young mothers with children under the age of five, but during intervention delivery, this ideal target group was missed due to social and cultural norms limiting their movement. Moving forward, future interventions should consider the dynamics of matriarchal roles that exist within the household environment and then be purposive in building trust with female gatekeepers, such as grandmothers and in mothers-in-laws, in order to gain access to younger mothers. In Senegal, the Grandmother Project seeks out grandmothers as a cultural resource in developing intergenerational programs focused on maternal and child health as well as overall community development [74]. The project cites that culturally in Senegal grandmothers carry a great deal of influence in the family structure for bother men and women [74]. Future work must continue to be intentional in developing interventions that thoughtfully and respectfully work within the social and cultural norms of a community to meet young mothers where they are in order to see effective and sustained change in child feces management.

Sociocultural context factors also revealed how perceptions of risk and attitudes create cases of full awareness of factual health knowledge, cases of a mixed understanding of incorrect and factual knowledge, and also cases of only incorrect information about how to handle child feces. Mothers who considered feces to pose a low-risk provided reasoning that was consistent with the child feces practices of women in other low-income, rural settings. In studies in Burkina Faso and Kyrgystan, children's feces were not considered to be dangerous, making disposal near the household compound acceptable [5]. Findings in Peru are similar to beliefs found by our research, suggesting that the feces of young children are considered as harmless, or at least less

harmful than those of adults because they are smaller, the odor is not as strong, and less food residue is visible [42]. Among these women with low-risk perceptions of child feces, a barrier to motivating behavior change is a limited perceived severity of health risks from the practice. Future work must continue to emphasize mother-centric health education curriculum in their design that is cognizant of the social and cultural reasons for perceived low-risk in order to begin to address these gaps.

Additionally, our research finds that mothers who could describe the possible risks associated with child feces might still carry out unsafe disposal behaviors. While this is likely the result of multiple factors, in this study women commonly addressed a lack of tools, especially latrines, as key barriers for carrying out safe disposal. Our research highlights how mothers are aware of the importance of cleaning their children as an act of being good mother by caring for their child. However, in the steps mothers take to manage the fecal practices of their child, limited access to functional latrines, difficulty with accessing water, and poor drainage contribute to overall poor sanitation outcomes, despite mothers' efforts. This finding highlights how providing a balance of both functional tool coverage and health education is essential to an ethical sanitation intervention, a combination is currently overlooked by Swachh Bharat's current endeavors and many other large-scale sanitation programs.

Experiences with implementation of the safe disposal tools varied among women's narratives. Our research revealed themes on the appropriateness of the tools based on the mother's needs. In regard to the mother's time, both the potty and scoop required cleaning techniques in order to be used safely. For most mothers the washing and drying of the potty was possible, but added additional steps in in the disposal process, as opposed to tossing a cloth or paper in a waste pile. For mothers where water access was difficult and/or access to a latrine for

disposal was not possible the tool was simply not cleaned properly. To make the process of using the tool easier, women innovated by using papers on the potty for faster disposal. These actions indicate a recognition by mothers that child feces must be disposed, removing a potential barrier for behavior change. This suggests that future interventions can place more emphasis on working provide safe sites of disposal and focus on making the action of disposal easier for women. Additionally, women's innovation with the tools provided to better meet their needs emphasize that women should be the first source of information for future about their needs as they are equipped to be experts about the nuances of their experiences.

Additionally, our research highlights how the time to train a child to use the potty interacted with a mother's tasks. The training time needed for a child to learn how to use the potty and/or request the potty required allotted time in a mother's schedule to teach, encourage, and verbally support a child through the process. Our findings also underscored the strict time management women operate on to accomplish household responsibilities in addition to the limited decision-making role they may have in sanitation outcomes in their households. These findings are supported by Caruso's 2017 study also conducted in Odisha, India [75]. They found that women's gendered household responsibilities restricted women's ability to freely manage their defecation needs [75]. As a result women adapted by the usage of suboptimal location, or the suppression of their needs [75]. These findings reiterate that tools provided to women for the improvement of health, must consider their roles, responsibilities, and identity within their family, in order to be implemented, deemed useful by the user, and see sustained behavior change.

Our research also revealed themes on the appropriateness of the tools based on the child's needs. In regard to child discomfort, our results found that some children found the potty to be

uncomfortable to sit on, as it did not mirror the squatting position they were accustomed to in the household compound over paper or cloth and might later continue in a latrine. In future interventions, perhaps greater emphasis should be placed on the use of the scoop, as some mothers did appreciate and use the scoop for squatting with older children. Alternatively, a potty with a design more comfortable for squatting could be used. Some mothers also tried to suggest that children under one-year use the potty, with poor outcomes in terms of child comfort and parent committal. In these cases, future interventions need to provide stronger health education on methods and/or tools of proper disposal for infants, to avoid the parental discouragement and confusion by trying to implement safer practices on a child that is too young for the provided tool. Health education provided through an intervention must also engage behavioral messaging that evolves with the child as they age. While the potty or scoop may be applicable for a specific phase of child's life, continual educational resources may be needed to education mothers about the management of the feces of infants with pampers or aid in the transition to the latrine and/or applicable tools.

In high-income countries, studies on the toilet training of both children with and without developmental disorders is met with conflicting advice on the best timing and training techniques [48,53,54]. Physicians have encouraged both adolescent mothers and adult parents to seek out health education to boost their self-efficacy in making a decision about an appropriate start time, as it unique to each child [55–57]. From this work, it is important to note the indeterminate, customary course this process takes, where suggesting a new standardized method of toilet training may not be initially welcomed or understood. A similar understanding of cultural norms and shifts in practice should be incorporated into the development of health promotion interventions in lower-income countries as well, to give reflexivity to the project design. Our findings suggest that the

WASH sector focus their interventions to build on the narratives and lived experiences of their intended users, to create solutions that are effective and respectful of their sociocultural context and practical needs.

To accomplish the goal of improving child health through mother's actions, it is imperative to remain cognizant of the mother's health in future intervention design as well. Jain discussed the differences between "instrumental" and "intrinsic" freedoms as they apply to sanitation outcomes [73]. Jain suggests that prior interventions have placed greater focus on "direct" outcomes such as health, social, and economic factors, while undermining outcomes including mental health, human rights, and overall safety of individuals [73]. Applied to our research subject in seeking out solutions for child feces disposal, we cannot neglect the experience of the mother. For example, mothers in this study described how training with the tools and cleaning of tools were new tasks added to already tightly scheduled days. While perhaps, if cleaned and used safely, the tool could provide physical health benefits to her child, it remains unclear how the intervention contributes to the mother's well-being. Future research and interventions are needed that synergistically consider the well-being of child and mother concurrently.

Strengths

Our research study benefited from the use of multiple data collection methodologies to strengthen the validity of the thematic analysis and findings. By using both IDIs and FGDs in intervention and non-intervention villages, we able to analyze a wider spectrum of perspectives around our intended behavior. This study provides narratives on an understudied aspect of open defecation, child feces disposal. The findings of this research will complement quantitative

studies of child feces disposal practices in Odisha by providing narratives around for reasoning and norms around practices.

Limitations

While we sought to apply organized methodology throughout the research process, there were some limitations to this study that may have affected the data collection. Due to scheduling conflicts, the qualitative villages had very recently received this intervention, some less than a week prior to data collection. Based on the short follow-up period, analysis of the results must be critical of participants recollection and application of the lessons learned. With limited hiring options, we used a male research assistant as part of our team to conduct seven interviews and work as a notetaker an all FGDs. We consulted with the local implementing team prior to working with this individual and were assured that because of the non-invasive nature of the questions, there would be limited bias from mothers in speaking. In traditional IDI methodology, the interview process is between only consenting individuals and the researcher and/or notetaker. In many cases, especially with younger mothers, there were others present during the interview. Our team did not think it culturally appropriate to ask individuals to leave but instead encouraged others to remain quiet during the interview. We believed this was the best compromise for the data collection.

Conclusion

This research was an exploratory study of the narratives women hold about their experiences and perspectives of the child feces disposal. Our findings informed a conceptual model to better understand how women's sociocultural context composed of family structure in tandem with beliefs and perceptions of health knowledge are significant indicators of how women in Puri make decisions for their children's defecation practices. Within this context our

findings highlighted how young women's strict time management and limited outdoor access were social norm barriers to the effective implementation and delivery of the educational intervention. Our findings also illuminate how safe disposal tools may need to be reassessed for usage by children based on age and/or cultural preference. Throughout the transition to using a tool, our findings also underscore the importance of consistent and adaptable information on safe practices dependent on child needs and facility access for mothers. We intend that our findings concerning the sociocultural context of women encourages further research and discourse on CFM solutions that benefit the well-being of both mother and child.

Chapter 5: Public Health Implications
Implications for Safe Child Feces Disposal in Odisha, India

Findings from this qualitative study can be used to inform woman-centric designs for future interventions. Women's identities in the familial network and household responsibilities were both found to be barriers to how women could access the overall intervention, the MG specifically, and also implement the tools (potty and scoop). Additionally, a lack of spillover, despite close proximal distance for two control villages, underscores how young women's limitations in movements outside the household restrict their access to information. As a result, future work should consider the dynamics of matriarchal roles that exist within the household environment and then be purposive in building trust with female gatekeepers, such as grandmothers and in mothers-in-laws, in order to gain access to younger mothers. Future work must continue to be intentional in developing interventions that thoughtfully and respectfully work within the social and cultural norms of a community to meet young mothers where they are in order to see effective and sustained change in child feces management.

Our research finds that mothers who could describe the possible risks associated with child feces might still carry out unsafe disposal behaviors. While this is likely the result of multiple factors, in this study women commonly addressed a lack of tools, especially latrines, as key barriers for carrying out safe disposal. This finding highlights how providing a balance of both functional tool coverage and health education is essential to an ethical sanitation intervention, a combination is currently overlooked by Swachh Bharat's current endeavors and many other large-scale sanitation programs.

Experiences with implementation of the safe disposal tools varied among women's narratives. These findings reiterate that tools provided to women for the improvement of health, must match the dimensions of their lived environment in order to be implemented and deemed

useful by the user in order to see long-term effects of health promotion. Providing physical access to safe disposal tools without designing a program to implicitly and explicitly consider gender, religion, age, and caste, creates a weak assumption for changes in behavior.

Limitations

While I sought to apply organized methodology throughout the research process, there were some limitations to this study that may have affected the data collection. When I arrived in June, the intervention was not yet complete in the villages I planned to work in. When I began data collection in July, the qualitative villages had very recently received this intervention, some less than a week prior. Based on the short follow-up period, analysis of the results must be critical of participants recollection and application of the lessons learned. Additionally, since the intervention was not complete upon arrival this hindered the amount of piloting and data collection time for the study, which may be observed in the robustness of the analysis.

Data collection was completed during monsoon season which affected our data collection near the end of July. Due to the heavy flooding, the roads to some villages were inaccessible or the team found that participants were not available to meet because of additional work due to the rains. Originally, the project was designed to also include FGDs with mothers in intervention villages. Due to a shortened period for data collection, it was not possible to complete both FGDs and IDIs for the project, since I was also sharing research assistants with Renee. I made the decision to solely collect IDIs as I believed the structure of a one-on-one interview could best ascertain the individual perceptions and attitudes a mother held. This, I believe, still captures the intention of my original research question.

In traditional IDI methodology, the interview process is between only consenting individuals and the researcher and/or notetaker. In many cases, especially with younger mothers,

there were others present during the interview. For younger mothers, this was often a husband. For other mothers, it could be passersby or other relatives in the household. Our team did not think it culturally appropriate to ask individuals to leave but instead encouraged others to remain quiet during the interview. We believed this was the best compromise for the data collection.

During data collection, our team learned that in the villages it was not always clear the organization we presented and/or intentions and consequences of our questions. Some believed we were from the government or an NGO, and perhaps there might be an incentive or latrine repair associated with our visit. Our team sought to make it clear that these were not our intentions and express the true intention of our work. In most cases, participants still agreed to interview with us, but in some instances, this terminated their involvement in the sessions.

As our research assistants primarily spoke Oriya, sometimes we encountered English translation difficulties. Our main concern was around the issue of probing. During early debriefing sessions, we realized that the research assistants often did not probe further on comments of great interest to the research. While my Emory colleague and I were present to take notes, we could not quickly catch these instances during the interview due to the language barrier. We sought to refresh the team on proper interview protocol throughout the data collection period. However, with limited time for recruitment and training, we believe that issues involving a commitment to the project and true reflexivity also hindered the ability of some members of our team to effectively collect rich and true data.

Future Directions

The methods and findings of this exploratory study lend itself to a variety of avenues for future research. To accomplish the goal of improvement of child health through mother's actions, it is imperative to remain cognizant of the mother's health in future intervention design

as well. In seeking out solutions for child feces disposal, we cannot neglect the experience of the mother. For example, mothers in this study described how training with the tools and cleaning of tools were new tasks added to already tightly scheduled days. While perhaps, if cleaned and used safely, the tool provides physical health benefits to child, it remains unclear how it meets the holistic health needs of the mother. Future research is needed to understand how to access the intersections of mother and child in a synergistically healthy outcome.

Appendices
Appendix 1: In-Depth Interview Guide: English Translation

IN-DEPTH INTERVIEW: Mother's Group Activity Attendees

Interview Details	
Interviewer Name:	
Note-taker's Name:	
Date (dd/mm/yyyy):	__ __ / __ __ / __ __ __ __
Village Name:	
Village ID:	
Consent Given:	☐1. Yes ☐2. No
Start Time:	____:____
End Time:	____:____
Recorder Number:	
Recorder File Number:	

Introduction

Good morning/afternoon, my name is_____. We are working with a team from Emory University. Emory University is working with the London School of Hygiene and Tropical Medicine to conduct a trial sanitation project in the district of Puri. Today, I am here with some colleagues to learn about mothers and caregivers attitudes and behaviours towards child feces disposal.

Thank you very much for taking the time to talk with me today. I am interested in learning more about how families dispose of children's feces in your village. You were selected for this interview because you attended the Mothers Group event held in the village. Is this an appropriate time for you to be interviewed?

IF YES: Great.
IF NO: Still thank and end interview.

The interview should take no more than one hour and a half. I will be recording some notes while we talk and will also audio record the interview. This interview is completely voluntary, and you may choose to not answer a question or to end the interview at any time. The information you provide will only be shared with our fellow team members. Your name will not be used in any reports or documents and quotes will be de-identified.

Would you like to proceed with the interview?

IF YES: Great.
IF NO: Still thank and End interview.

Is it okay if I audio record the interview?

IF YES: Thank you!
IF NO: Not a problem. I will simply take notes instead.

Do you have any questions for me at this time, or any concerns that you would like to share?

IF YES: answer their questions / address
IF NO: proceed

Opening Questions

To get started, I would like to learn more about you and what your daily life is like.

1) Please tell me how has your day been.
2) What are the different responsibilities you have in the house?
    - Probes:
        a. Interactions with other, including care for children
        b. When defecating, bathing
        c. Hygiene practices
3) Please tell me the different things that you have to do after your child wakes up.
    - Probes:
        a. Bathing practices
        b. Defecation behavior
        c. Feeding behavior

Section A: Child Feces Disposal Practices

Thank you for telling about your child and the responsibilities in day to day life. Now let us talk about your child feces disposal practices in your household (either by you or any other household member).

4) Can you tell me about what happens when a child (your/from this household) defecated? Can you describe (guide) me through those steps?
    - How old is the child?
    - Is the child able to walk unassisted?

- What is the sex (gender) of the child?

a. Who noticed that the child had defecated?
b. How did you get to know that the child had defecated?
c. Where had the child defecated?
d. What was done (action) after you noticed that the child had defecated (to dispose of the stool)?
    - *(If a potty is mentioned)* Could you describe that process (what you do when your child defecates) of using the potty?
e. How long for action after the child defecated to remove the feces? (Include allowance for inaction).
f. How was the child (bottom) cleaned?
    - Did the child clean him or herself? With what (soap, cloth…)
g. How was water obtained to clean the child?
    - (If yes) From where was water obtained to clean the child?
    - (If yes) Where was the water disposed of?
h. What was done with the disposal tools (potty, scoop, nappy, cloth, etc)?
    - Were the tools cleaned/ disposed of?
    - How were they cleaned/ disposed of?
i. The person (mother / caregiver) engaged in cleaning the child, what did she do with her hands after cleaning the child?
    - (If yes) What were the hands washed with?
j. What was done to the child's hands?
k. What process happens to the mother's clothing?
    - What process happens to the child's clothing?

5) After a child defecates, who in your household must clean the child? Who must clean the feces?
    - Probe:
        a. Are there others that share this task (job) in your household?
        b. What cleaning process do these people use after helping?
            1. Hands?
            2. Clothes?

6) What do you think of child feces?
    - Probe:
        a. Are they harmful at all?
        b. Are they harmful, as adult's feces?

7) Do you think child's feces is related to illness? What makes you think so?
    - Probe:
        a. (If 'yes') When in the past do you think child feces caused illness? Please explain.

8) What is your opinion on children defecating in the open or caregivers disposing of child feces in the open?

9) **<u>Section B: Intervention Elements – Key Elements</u>**

Thank you for your responses. Now let us talk about your experiences with the sanitation intervention.

10) Can you tell me your thoughts about the sanitation related events that took place in your village recently?
    - Probes:
        a. Do you know of any awareness events taking place in the recent past in your village to sensitize on sanitation?
        b. Can you remember (list all the) activities that occurred in your village?
        c. Can you tell me the activities you have attended?
        d. Probe: (If did not attend all events) Why did you not attend X activity?
        e. What you enjoyed/liked most about these events/programming?
        f. What you didn't enjoy/like about the events/programming?

11) Did you attend the meeting of mothers on sanitation for children?
    - Probe:
        a. What interested/attracted you to attend the activity?
        b. Can you tell me about where the meeting of mothers was held?
            1. What were your thoughts about this location?
        c. Can you tell me about when the meeting of mothers was held?
            1. What were your thoughts about this time?
        d. Can you tell me your opinion about the mother's meeting?
        e. Who else was at the meeting of the mothers?
        f. How was the meeting of the mothers promoted? How did you find out about the mothers group?
            1. What are your thoughts about how it was promoted?
        g. What did you like about the meeting?
        h. What didn't you like about the meeting?
        i. Did anything surprise you?
        j. Where you able to stay for the whole activity?
            1. *(If they couldn't stay the entire time)* How long did you stay?
        k. Were there any problems at the meeting?

12) Who gave comments during the mother's group?
    - Probe:
        a. What did they say?

13) How was the potty distribution process?
    - What were the requirements to get a potty?
    - Did everyone get a potty?
    - Did everyone get the correct number of potties?

14) Can you tell me what you learned about (child) feces and safe disposal from the mother's meeting?
    - Probes:

a. Can you please tell me how you have used the learnings from the meeting in your life? Can you tell me how you have not used these learnings?
    1. (If yes use): Can you tell me about why you have started applying this knowledge?
    2. Can you describe potential reasons you may not continue following these learnings the future?
b. (If no use): Can you tell me about why you have not used these messages?
    1. Can you tell me more about why you do not want to or are not able to practice these learnings?

15) Can you tell me about any learnings you don't understand from the mother's meeting?
- Probe:
    a. Do you have suggestions on what might help you better understand the message(s)?

16) Can you tell me what your thoughts are about the hardware materials (equipment/tools) given during the mother's meeting?
- Probes:
    a. Can you tell me about what you like about the potty and scoop?
    b. Can you tell me what you don't like about the potty and scoop

17) Can you describe how you currently use or do not use the hardware (equipment/tools) in your life?
- Probe
    a. (If no use): Can you tell me about why you have not used the hardware?
    b. (If yes use): Can you tell me about why you have started using the hardware?
        1. How do you dispose of the feces in the potty? In the scoop?
        2. How do you clean the potty? Scoop?
        3. Where do you clean the potty? Scoop?
        4. Where do you store the potty? Scoop?
        5. **How has the child responded to using the potty?**
        6. **Do you have to remind the child?**

18) Can you describe a time a child <u>should not</u> use a potty?

19) Can you describe a time when a child <u>cannot</u> use a potty?

<u>Closing Questions</u>
Thank you for your responses. We just have a few more wrap-up questions before we end.

20) Are there things the mother's meeting did well? What are they?

21) Is there anything else that wasn't covered in this discussion that you'd like to say?

Appendix 2: Focus Group Discussion Interview Guide: English Translation

Opening Question: (Encourage discussion, break the ice)

1. Let's go around the circle and tell everyone your name and favorite food.

   [If given consent to record, start recorder after this question. then start recorder, if "no" then say, "That's fine, we will just take notes."]

Introductory Questions:

2. What are the good things about your village?
   a. Probe: Physical structures like temples, qualities like cleanliness, traits, like people's attitudes, etc.
3. Are there things that should change in your village to make this a better place to live?
   a. Probe: If so, what are they?
   b. Probe: What parts of the village do you NOT like? Why?
   c. Probe: What parts of the village could be BETTER?

Transition Questions:

4. Have you heard about the recent sanitation events in [neighboring village]?
   a. [If limited or NO response]: Skip to HISTORY OF SANITATION IN VILLAGE section
   b. Probe: How did you hear about it?
   c. Probe: What were the different components/activities?
   d. Probe: Why was it conducted?
   e. Probe: Did anyone present here attend any of those events in the neighboring village?
   f. About how many people in this village know about these events?

For questions 6-11, skip activities that no one in the group has heard about.	**6. Palla**	**7. Transect Walk**	**8. Community Meeting *Explain what this meeting was if there is confusion**	**9. Mothers Groups**	**10. Household visits/ Positive Deviant Banner**	**11. Wall Painting**
What did you hear about your activity?				Probe: Who was invited? How were they invited?	Tell me about the household visit.	
How did you find out about the activity?						
Where was it held?						
Who was it for?	Probe: Ages, genders, castes	Probe: Ages, genders, castes	Probe: Ages, genders, castes	Probe: Older women, younger women	Who in your household attended?	How many people do you think have seen it?
Did anything surprise you?						
Were there any problems?						
What did you think of the activity?						
Individual activity questions	What skit did you like the best? What did you think about the length? Which age group enjoyed it the most?	How did it make you feel? Do you think it is appropriate to use holi powder on feces? Why or why not?		How did the potty distribution go? Did everyone get a potty who should have gotten one? Did anyone get a potty who shouldn't have gotten one?	Have you seen the poster? What do you think about it?	

12. How have these events changed how people in your village use the latrine?
    a. Probe: Who uses latrines the most in your village?
        i. Has this changed? How?
    b. Probe: How often do people use latrines in your village?
        i. Has this changed? How?
    c. Probe: Do people dispose of children's feces in latrines?
        i. Has this changed? How?
    d. Probe: Do people use latrines for any other purposes?
        i. Storage?
        ii. Has this changed? How?
13. What do people in this village think about using latrines?
    a. Probe: How important is using a latrine in this village?
        iii. Has this changed since the sanitation events?
        iv. How?
14. Given everything that was said here, would you say that overall the program was good or bad?
    a. Probe: What went well?
    b. Probe: What could be improved?
    c. Probe: What should be removed?
    d. Probe: If it was good, good for whom? How? Why?
15. Are these events something you would like to see in this village?
    a. Probe: Why or why not?
    b. What aspects of the events/programming would you like to see or not see?

History of Sanitation in the Village

16. What do people in this village know about sanitation?
    a. Where did they learn what they know?
17. How many households in this village have latrines?
    a. Probe: numbers and percentages
18. When did people in this village get latrines?
    a. Who paid for them?
    b. Who maintains them?
    c. How many of the latrines work?
19. Has there ever been sanitation promotion events in this village?
    a. What were they?
    b. When were they?
    c. Who sponsored them?
    d. What impact did it have on the village?
    e. How did you find out about them?
    f. What were the main messages in the events?
    g. Do you think these events were good? Why or why not?
20. If NGOs or government organizations have worked in this village, how was your relationship with them?

a. What was the village's relationship (*treatment of community by organization*) with the organization like BEFORE the work? (Planning, initial meetings, assessments, etc – how did they go?)
b. What was the village's relationship with the organization like DURING the work? (treatment of people, satisfaction with work)
c. What was the village's relationship with the organization like AFTER the work? (follow-up, communication, etc)
d. Overall, were you happy with the work done in your village? How could it have been better?

21. What is your village's experience with Swachh Bharat mission?
22. What are your biggest sanitation problems?
    a. Probe: Latrines
    b. Probe: Tube wells
    c. Anything else?

Ending Questions:

23. Is there a penalty for people who open defecate in this village?
    a. If YES:
        i. What is the penalty? How is it enforced?
        ii. Do you think this penalty is good or bad? Why?
    b. If NO:
        i. Should there be a penalty? Why or why not?
        ii. If there should be a penalty, what should it be? How would it be enforced?
24. What would you like to see happen in your village, regarding sanitation?
    a. Suggest ONLY IF they have a hard time thinking of things on their own: Government support, promotional messages, water access, etc.
    b. Probe for details on each thing that they suggest.

25. Is there anything else that wasn't covered in this discussion that you'd like to say about the sanitation events?

Thank you for your time!

Appendix 3: Demographic Questionnaire IDI

PART A. To Be filled out by RA at start of Activity					
A.1	Community Name: _____	**A.2**	Community ID#: _____	**A.3**	Hamlet?: ☐ 1. Yes ☐ 2. No
A.4	RA Initials: _____	**A.5**	Date: (y/d/m) __ __ __ __ / __ __ / __ __		

PART B. To be asked of and answered by participant			
B.1	Age: _____ →**B.1_1: RA:** Explain if age seems wrongly reported: _____	**B.2**	What is your position in the household? ☐ Head of Household ☐ Wife ☐ Daughter ☐ Daughter-in-law ☐ Grandmother ☐ Caregiver
B.3	Number of years living in community: _____		
B.4	Education: ☐ 1. None ☐ 2. Some Primary School ☐ 3. Primary Completed ☐ 4. Some Secondary ☐ 5. Secondary Completed ☐ 6. Some Tertiary / University ☐ 7. Tertiary / University Completed ☐ 8. No formal education but literate	**B.5**	Religion: ☐ Hindu ☐ Islam/Muslim ☐ Christian ☐ Sikh ☐ Buddhist ☐ Jain
B.6	Caste: _____	**B.7**	Has Ration Card: ☐ 1. Yes ☐ 2. No
B.8	Marital Status (check one): ☐ 1. Unmarried ☐ 2. Married → **B.8_1 If married, number of years married:** _____		
	Children (check one)? ☐ 1. No *(end interview)* ☐ 2. Yes → **B.8_1 If yes, how many children (include ages, gender, and ability to walk):**		

	Gender	**Age**	**Ability to Walk**
#1	☐ Male ☐ Female		☐ No ☐ Crawling ☐ Walking
#2	☐ Male ☐ Female		☐ No ☐ Crawling ☐ Walking

	#3	☐ Male ☐ Female		☐ No ☐ Crawling ☐ Walking
	#4	☐ Male ☐ Female		☐ No ☐ Crawling ☐ Walking
B.9	Do you have a mobile phone within your household compound? ☐ 1. Yes ☐ 2. No			
B.10a	Do you have a latrine? ☐ 1. Yes ☐ 2. No			
B.10b	If you have a latrine, is it functional? ☐ 1. Yes ☐ 2. No → **B.10b_1. If no, how long has it been non-functional?** _____ → **B.10b_2. Why is it non-functional?** _____			
B.11	How long have you had your latrine? _____**Year(s)** _____**Month(s)**			
B.12	How often do you use the latrine for urination? ☐ 1. Always ☐ 2. Sometimes ☐ 2. Never			
B.13	How often do you use the latrine for defecation? ☐ 1. Always ☐ 2. Sometimes ☐ 2. Never			
ASK if Participant has any questions OR anything else to ADD				
THANK PARTICPANT				

Appendix 4: Demographic Questionnaire FGD

PART A. To Be filled out by RA at start of Activity					
A.1	Community Name: _____	**A.2**	Community ID#: _____	**A.3**	Hamlet: ☐ 1. Yes ☐ 2. No
A.4	RA Initials: _____	**A.5**	Date: (y/d/m) __ __ __ __ / __ __ / __ __		
A.6	Participant Type: ☐ 1. Female – Control village ☐ 2. Male – Control village ☐ 3. Female – Intervention village ☐ 4. Male – Intervention village				

PART B. To be asked of and answered by participant			
B.1	Age: _____	**B.2**	How many members are in your household? _____ What is your relation to the head of household? ❑ Self ❑ Spouse ❑ Son / Daughter ❑ Other: _____
B.3	How long have you been living in this village? _____		

<table>
<tr><td>B.4</td><td>Education:

☐ 1. None
☐ 2. Some Primary School
☐ 3. Primary Completed
☐ 4. Some Secondary
☐ 5. Secondary Completed
☐ 6. Some Tertiary / University
☐ 7. Tertiary / University Completed
☐ 8. No formal education, but literate</td><td>B.5</td><td>Caste:

☐ General
☐ Schedule caste
☐ Scheduled tribe
☐ Other backward classes</td></tr>
<tr><td>B.6</td><td>Religion:

☐ Hindu
☐ Islam/Muslim</td><td>B.7</td><td>Does your household have a Ration Card?

☐ 1. Yes
☐ 2. No</td></tr>
<tr><td>B.8</td><td colspan="3">Marital Status (check one):

☐ 1. Single
☐ 2. Married → B.8_1 If married, number of years married: _____
☐ 3. Widowed
☐ 4. Divorced/Separated</td></tr>
<tr><td>B.8.1</td><td colspan="3">Children (check one)?

☐ 1. No
☐ 2. Yes → B.8_1 If yes, fill in table below:

<table><tr><th></th><th>Gender</th><th>Age</th><th>Ability to Walk</th></tr></table></td></tr>
</table>

	#1	☐ Male ☐ Female		☐ No ☐ Crawling ☐ Walking
	#2	☐ Male ☐ Female		☐ No ☐ Crawling ☐ Walking
	#3	☐ Male ☐ Female		☐ No ☐ Crawling ☐ Walking
	#4	☐ Male ☐ Female		☐ No ☐ Crawling ☐ Walking

B.9	Does someone in your household have a mobile phone? ☐ 1. Yes ☐ 2. No
B.10	Do you have a latrine? ☐ 1. Yes ☐ 2. No → **If no, skip to B.14**
B.11	How long have you had your latrine? _____ **Months**
B.12	Is the latrine functional? ☐ 1. Yes ☐ 2. No **If non functional, how long has it been non-functional** **_____Months**
B.12	How often do you use the latrine for urination? ☐ 1. Always ☐ 2. Sometimes ☐ 2. Never
B.13	How often do you use the latrine for defecation? ☐ 1. Always ☐ 2. Sometimes ☐ 2. Never
B.14	Intervention activities (Fill in the table for intervention activity involvement)

Activity Name	**Heard of Activity (Y/N)**	**Attended (Y/N)**	**# of household members who attended or saw it**

	1. Palla			
	2. Transect Walk			
	3. Community Meeting			
	4. Community Wall Painting		Seen it? (Y/N) Participated in planning it? (Y/N)	
	5. Positive Deviant Posters		Seen it? (Y/N) Received a poster? (Y/N)	
	6. Mother's Group			
	7. Household Visits		Received a visit? (Y/N) Received a poster? (Y/N)	If received a visit, how many household members attended? _____
ASK if Participant has any questions OR anything else to ADD, then Thank Participant				

Appendix 5: IDI Consent Form: English Translation

Study No.: **«ID»**

Emory University IRB
IRB use only

Document Approved On: «ApproveDate»
Project Approval Expires On: **«ExpireDate»**

Emory University
Oral Consent for IDI

Title: **A Qualitative Assessment of Mothers' Perceptions and Behaviors in Response to an Intervention Designed to Encourage Safe Child Feces Disposal Practices in Odisha, India**

Introduction/Study Overview
Good morning/afternoon, my name is_____. We are working with a team from Emory University. Emory University is working with the London School of Hygiene and Tropical Medicine to conduct a trial sanitation project in the district of Puri. Today, I am here with some colleagues to learn about mothers and caregivers attitudes and behaviours towards child feces disposal.

Procedures
The interview should take no more than one hour and a half. I will be recording some notes while we talk and will also audio record the interview. This interview is completely voluntary and you may choose to not answer a question or to end the interview at any time. The information you provide will only be shared with our fellow team members. Your name will not be used in any reports or documents and quotes will be de-identified.

Risks and Discomforts
There are few risks to participation. Some questions may be uncomfortable to talk about. You do not have to answer any questions that are uncomfortable. You are free to stop the discussion at any time. We aim to protect your privacy. But, privacy may be breached. Others may hear what you say. We will try to prevent this. If people are in hearing distance of our conversation, we will stop.

Benefits
This study is not designed to directly benefit you. We hope that what we learn will inform new programs that meet people's needs.

Compensation
Participants will not be offered payment for being in this study.

Confidentiality
I will not be telling others in the community what you have said. I will only be sharing the ideas you have with the people in the project. None of your names will be written down. You may introduce yourself with another name to assure your privacy. Members of the Emory and LSHTM research teams will be the only people that listen to the recording of our conversation. The only instance in which I would share information outside of our group would be if I think that your security or the security of others is in danger.

Contact Information
If you have any questions or concerns about this research, you may contact: **Parimita Routray, Researcher, London School of Hygiene and Tropical Medicine: Flat no. 301, Plot no. 676, Jayakrushnagar, Lingipur, Post office - Shishupalgarh, Khordha, 751002, ph. 9861072266**

If you have any questions about your rights as a participant in this research study, please contact the **Emory University Institutional Review Board** at irb@emory.edu / +1 404 712 0720

Consent
If you are willing to participate, please say 'Yes, I will participate' once I turn the recorder on.

Version: 22 June 2018

Appendix 6: FGD Consent Form: English Translation

Study No.: **IRB00093599**

Emory University IRB
IRB use only

Document Approved On: «ApproveDate»
Project Approval Expires On: **«ExpireDate»**

Emory University
Oral Consent for Focus Group Discussions

Title: **Understanding Perceptions of a Sanitation Intervention in Rural Odisha**

Introduction/Study Overview
Hi, my name is [FACILITATOR'S NAME] and this is [NOTETAKER'S NAME]. We are working with a team from Emory University. Emory University is working with the London School of Hygiene and Tropical Medicine to conduct a trial sanitation project in the districut of Puri. Today, we are here to learn what people thought about this project.

Procedures
Our discussion today will last between one hour and two hours. We want to know your thoughts about the recent sanitation events that happened in this area. We will ask about each of the different activities. We would like to know what people in this community thought about the activities, even if you did not attend them.

Everyone's opinions are important to us. If you agree with others in this room, please tell us. If you don't agree, please tell us. There are no right or wrong answers. I do not want anybody to feel bad about sharing opinions. You do not have to talk about your personal experiences. If you're not comfortable talking, you do not have to. We want to record the interview and we will also take notes. The recordings will be written down afterwards and translated into English.

Risks and Discomforts
There are few risks to participation. Some questions may be uncomfortable to talk about. You do not have to answer any questions that are uncomfortable. You are free to stop the discussion at any time. We aim to protect your privacy. But, privacy may be breached. Others may hear what you say. We will try to prevent this. If people are in hearing distance of our conversation, we will stop.

Benefits
This study is not designed to directly benefit you. We hope that what we learn will help improve new sanitation programs.

Compensation
Participants will not be offered payment for being in this study.

Confidentiality
I will not be telling others in the community what you have said. I will only be sharing the ideas you have with the people in the project. None of your names will be written down. You may introduce yourselves with another name to assure your privacy. Members of the Emory and LSHTM research teams will be the only people that listen to the recording of our conversation. The only instance in which I would share information outside of our group would be if I think that your security or the security of others is in danger. I also ask that each of you keep this conversation private. Please do not share it with others outside the group. People are sharing their personal opinions and experiences and we want to respect everyone's privacy. Please keep this discussion between us.

Are there any questions?

Contact Information
If you have any questions or concerns about this research, you may contact: **Parimita Routray, Researcher, London School of Hygiene and Tropical Medicine: Flat no. 301, Plot no. 676, Jayakrushnagar, Lingipur, Post office - Shishupalgarh, Khordha, 751002, ph. 9861072266**

Version: 5 December 2016

If you have any questions about your rights as a participant in this research study, please contact the **Emory University Institutional Review Board** at irb@emory.edu / +1 404 712 0720

Consent

If you are willing to participate, please say 'Yes, I will participate' once I turn the recorder on.

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