Games people play: An innovative method for enhancing child health behaviors

Aastha Kant[1*], Sreeparna Ghosh Mukherjee[2], Baldeep K. Dhaliwal[1,3], Nilanjana Ghosh[2], Indrani Bhattacharyya[2], Meghendra Banerjee[2], Caitlin E Kennedy[3], Anita Shet[1,3]

[1] Maternal and Child Health Center India, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland, USA
* Corresponding author: aasthakant@jhu.edu
[2] Child in Need Institute, Pailan, West Bengal, India
[3]Department of International Health, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland, USA

Introduction

Knowledge alone has long been considered insufficient to independently induce and sustain behavior change[1]. Theories from social psychology have provided insights on how and why people initiate and sustain behavior change[1], which have, in turn, driven public health researchers to strategize and design effective interventions to motivate sustainable behavior change[2]. One of the most impactful ways to change behavior through public health interventions has been to engage the community in innovative, interactive, and iterative methods under the umbrella of social behavior change communication[3]. Using social behavior change communication strategies can support long-term behavior change, as these create a supportive social environment that encourages positive behavior change, and can in turn improve health outcomes. The Child in Need Institute (CINI) has been leading such efforts in the field of child empowerment in India for nearly 50 years with a human rights-based approach to facilitate behavior change. They have designed an approach to develop sustainable behavior change referred to as The CINI Method[©4].

Our team built on lessons grounded in The CINI Method[©] to design a novel approach to engage stakeholders in co-creating community games to address child health. Our approach drew on human-centered-design (HCD) approaches and the socio-ecological model (SEM), while simultaneously maintaining a human rights perspective, as this approach is emphasized in The CINI Method[©4]. With this unique combination of approaches, our team co-created community games to drive sustainable behavior change to facilitate improvements in child health. To augment our learning, we conducted informal post-game interviews to capture participants' experiences and reflections of each game. We outline the methodology of developing community games as a child-centered approach grounded in the principles of social and behavior change communication.

The CINI Method
The CINI method[©4] uses a multisectoral and participatory approach to creating lasting behavior change, while keeping child empowerment and needs at the center of all efforts. The CINI method[©4] (Figure 1) focuses on implementing a rights-based approach for promoting child friendly communities, systems, and organizations by involving key stakeholders across societal tiers to commit to respect and protect a child's right to health, nutrition, education, and protection from various types of exploitation and violence. Through The CINI Method[©] women and children, in particular, are involved in the identification of problems and participating in solution-oriented sustainable approach.
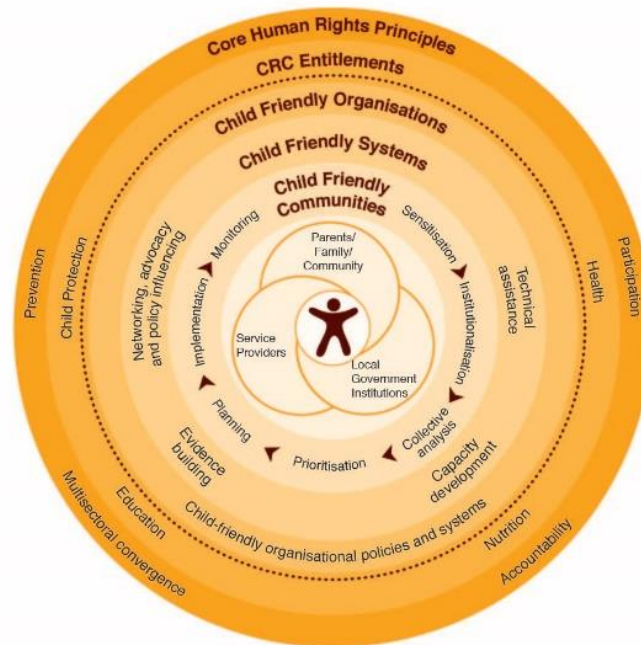
Figure 1: The CINI method© illustrating a multisectoral child rights-based approach to development for behavior change

This engagement involves all aspects of intervention design and implementation including the planning and design phases, the implementation of an intervention, any refinement, as well as ongoing monitoring and evaluation. The CINI Method©[4] relies on using HCD and the SEM, while maintaining a human rights perspective, to develop sustainable community-oriented solutions for stakeholders to play a more active role in improving child health in their community. By encouraging accountability and motivating sustainable changes in behavior, as well as relying on existing approaches through HCD and the SEM, The CINI Method©[4] can be highly effective in driving behavior change.

Human-Centered Design Overview
The principles of HCD[5] have been emphasized in The CINI Method to develop community-oriented solutions to complex problems. HCD traditionally begins by empathizing with the community and understanding unspoken or unrealized motivations to develop novel solutions. HCD then aims to build on this understanding of the primary issue to create a flexible, and easily adaptable, framework that facilitates further decision-making. HCD provides teams with an opportunity to engage with the community in a collaborative conversation and facilitate interventions that motivate sustainable behavior change.

The Social-Ecological Model Overview
The CINI Method[4] further draws on the SEM[6], which documents how behavior is influenced by all societal domains. These domains include the following: intra-personal (personal characteristics), inter-personal (closest social circle- such as family), institutional (schools, workplace), community (community level groups), and the larger society (policies, laws, social norms). The combination of influences from these domains may ultimately influence an individual's actions. The CINI Method model builds on the SEM by moving away from using communication as a traditional top-down approach, and, instead, approaching communication as an iterative process, requiring the involvement of key stakeholders across domains to truly understand the multiple layers of influence on health behavior.

Our Approach to Using Community Games to Drive Sustainable Behavior Change
To overcome existing barriers to designing social behavior change interventions, our team used The CINI Method$^©$ to co-develop innovative community games. These community games aimed to drive sustainable behavior change to facilitate improvements in maternal and child health, and emphasize the role of the community in ensuring improved child health. Community members across different levels, program staff from CINI, and academic researchers from the Johns Hopkins Bloomberg School of Public Health, collaborated to co-create these community games to ultimately build child friendly communities.

Community Games Development Process
The community game development process provided a platform to behavior change in order to build child friendly communities, based on The CINI Method$^{©4}$, to strengthen child health outcomes. This involved various participants including adolescents, pregnant mothers, husbands, mothers-in-law, frontline health workers, women's collectives and village governing leaders. By working with this range of stakeholders, we were able to identify barriers and drivers that community members face in accessing child health services, such as myths and misconceptions. The community games were specifically designed to address low birth weight, childhood immunization, and early marriage and teenage pregnancy, as these were the most prominent issues in the community. We based our approach to build community games on The CINI Method$^{©4}$ that aims to build a child friendly community (Figure 1).

Phase I: During the **sensitizing phase**, the CINI staff and other researchers sensitize the key stakeholders and the community members on child friendly communities, through which a child's right to health and nutrition, education, and protection is respected. The stakeholders are trained to empathize with the community on the challenges faced accessing health services- one of the aspects of child friendly communities.
Phase II: In the **institutionalization phase**, stakeholders from multiple sectors including family, local governing bodies, and healthcare providers, come together to participate and understand their own accountability towards ensuring the protection of children's rights.
Phase III: In the **collective analysis phase**, multisectoral stakeholders collectively identify key community needs and map various resources and facilitators to address the said needs. The needs identified during this process were low uptake of childhood immunization services, early marriage and teenage pregnancy, and low birth weight.
Phase IV: Through the **prioritization phase**, key needs are ranked based on the collective analysis and deliberations. In this phase, adolescents in West Bengal reported that early marriage and teenage pregnancy were issues that were prevalent in their area, and, as such, were of upmost importance to address.
Phase V: In the **planning phase**, key stakeholders collaborate to design a prototype to address the issues prioritised by the community. While planning the prototype, templates are heavily contextualised in the local setting to make it as relatable as possible to the target setting. In this phase, we co-created community games, with an emphasis on using local terminology and commonly known and used phrases. The games were further designed to use locally available and inexpensive materials as props, such as wooden sticks and pieces of cloth, and they were designed to be simple enough for anyone to engage in. This is followed by pilot testing of the prototype, user feedback is used to strengthen the prototypes. Community feedback was particularly helpful in designing and refining the games to make them more user-friendly and targeted to the needs of the community.
Phase VI: In the **implementation phase** community members formally introduce the designed prototype to address the issues raised in earlier phases. For instance, in community games, community members – including children, adolescents, mothers-in-law, husbands, mothers, community-level women collective members – in conjunction with other key stakeholders, such as

frontline health workers, members of local governing institutions, self-help group members, came together to discuss prevalent myths, misconceptions, superstitions, and perceived barriers to address barriers to accessing immunization services. They further discussed potential solutions and best practices in the game to make the participants more accountable for addressing the identified key needs.

Phase VII: In the final phase, **monitoring**, the extent to which a community has been succeeding in becoming increasingly child-friendly as a result of participating in the implemented prototype is measured. The success of these community games was measured through rapid qualitative assessments.

Co-Created Community Games

Three games were developed to focus on maternal and newborn health, childhood immunization, and adolescent health, and they primarily relied on a folklore narrative style approach to create child-friendly communities[7]. Our team implemented these games at the block level in rural West Bengal, India, and qualitatively captured participants' experiences.

The Safety Net Game

This game was designed to facilitate participant reflection on the role of each community stakeholder in creating a safety net to improve maternal health to support healthy birth outcomes. This game involved frontline health workers, self-help group members, pregnant women, and family members to gain insights on their respective responsibilities towards improved maternal and child health outcomes. To play this game, participants were asked to sit in a circle with each person holding two wooden sticks pointing towards the center of the circle (symbolizing a radiating circular net). A doll would then be placed at the center of the 'net' where the wooden sticks converged (Figure 3). The game facilitator then narrated a story of a first-time mother who was newly pregnant, and they described the journey towards the birth of this mothers' baby. In this story, the players each represented a stakeholder who played a vital role in the outcome of the healthy newborn and mother. As the story continues to unfold, the participants learn how some stakeholders may not optimally fulfill their duties to ensure that a healthy child is born. This non-fulfillment of duties by each stakeholder can lead to missed health opportunities for mothers and children; each of these missed opportunities is represented by taking away the sticks one by one. As several missed opportunities accumulate, and as sticks continue to be removed, the center becomes unstable and results in the doll falling off the wooden stick net. The fall of the doll signifies that the baby may be malnourished or may experience other poor health indicators at birth. As the falling baby doll is an unexpected turn of events, participants are more emotionally and cognitively engaged. This is immediately followed by a discussion on the roles and responsibilities of every stakeholder that could contribute to a healthier mother and child. The facilitator then narrates a second story where a pregnant woman and her community collectively and collaboratively ensure that she has a healthy pregnancy. With each positive and proactive initiative from the family and the community members, the facilitator returns the stick to the relevant stakeholder. The game ends with all sticks pointing towards the center and converging towards the original position of the wooden sticks, re-forming the safety net. The 'positivity' or 'negativity' of each step is collectively determined by the community. Further, each of the positive and negative outcomes are closely examined by the participants to understand the corresponding actions and missteps; this discussion is designed to support the community in realizing that a positive outcome can be supported through deep community engagement. This game also attempts to break gender stereotypes and presses on the importance of male involvement in women's reproductive health.

A husband, in the context of his pregnant wife said, *'Today I understood that to have a healthy mother and child, as a husband, I, along with my family members should also take responsibility of taking care of my wife'.*

4

Figure 3: The Safety Net Game

'Ties and Truths Game'
This game addresses community myths, taboos, and misconceptions around childhood immunization. In this game one of the participants – typically a childbearing woman – is seated on a chair facing the other participants. Using a story-telling format, the facilitator describes situations and activities that pose barriers to routine immunization, and then asks the participants for their opinion on each barrier. When participants endorse a specific barrier, the facilitator ties a ribbon around different sections of the childbearing participant's body such as their hands, legs, shoulders, and eyes and mouth (Figure 4). This is used to symbolize how the woman and child are constrained by societal norms in their right to vaccine knowledge and health care. This is followed by a discussion on ways to 'untie' her, so she is free to access health rights for herself and her child by addressing prevalent community myths and misconceptions around childhood immunization. Once there is a group consensus on addressing each of the barriers, the ribbons are untied one by one. If the group feels that a particular ribbon could not be untied, despite brainstorming for probable solutions, it is left as it is. The game focuses on the role of barriers that impact community members in their daily lives and limit them from achieving positive health outcomes for mothers and children. The untying of the ribbon symbolizes the removal of barriers, and ultimately the liberation of woman from the various shackles of societal myths, taboos, and misconceptions. Removing these shackles empower her and her family to make decisions around accessing and accepting health care.

A mother-law-in, who participated in the game expressed, *'I used to feel that vaccination harms the body, but after today's game, my perceptions changed. I would now encourage my daughter-in-law to take the child for vaccination'.*

Figure 4: The Ties and Truths Game

'Linking Minds and Actions Game'
This game focuses on improving communication between adolescents and their parents to address issues around early marriage and teenage pregnancy, with the eventual goal of improving adolescent health. This game is played with pairs (one parent and one adolescent child), where one of them is blindfolded (Figure 5). The participant who is not blindfolded is expected to tear paper into strips and hand the strips over to the blindfolded partner. Using glue, the blindfolded partner is expected to stick the ends of strips together to make circles that link together like a chain. Since the one who was making the chain is blindfolded, the communicating partner is required to provide clear and consistent instructions to make a successful paper chain. The roles are then switched during the second round to give both partners a sense of how good communication can facilitate a successful outcome. The purpose of this game is to communicate the message that when adolescents communicate with respect and honesty with their parents and elders, and when this communication is received and returned with equal respect, they can identify solutions to prevalent issues such as early marriage, teenage pregnancy, and other disruptive behaviors that fragment a family and society.

An adolescent girl played the game with her father. Her father discussed the importance of communication and coordination to solve a problem, while the girl said, *'After playing the game, I learnt that we should share our problems with our parents, so that in the future, we can together address issues specifically to our health'.*

Figure 5: Linking Minds and Actions Game

Contextualizing Lessons from Community Games to Other Settings

Co-creating community games using the The CINI Method[©4] can facilitate creative and innovative ways to bring together education and entertainment for awareness building, changing people's perceptions, and addressing a range of myths and misconceptions. Community centric participatory games, and the symbolism and messages associated with these games, can make an effective method for engaging communities and bridging the gap with service providers.

The uniqueness of this method lies in utilizing co-creation to work with community members to identify solutions to behavior related barriers. It is essential to co-create these games with community members, as these games often rely on traditional customs, folklore, local cultural references, and stories that local communities can identify with. Engaging with real participants, through a story format grounded in the everyday experiences of the participants, contributes to the design of meaningful and impactful games. Community games as a social and behavior change platform can be localized and contextualized to diverse key needs of the community, beyond child health.

The bottom-up approach of the community games method, the ownership that is inherent with co-creation, as well as the elements of integrated fun, demonstrate that community games can have remarkable potential in creating effective and lasting behavior change. Further research is required to build evidence about the effectiveness of the community games method in changing key stakeholders' behavior in the realm of child health.

Conclusion

This bottom up, iterative, and multi-pronged approach to creating behavioral interventions through The CINI method[©] is a unique approach to involving various stakeholders to collectively strengthen the health of the community. This comprehensive and replicable approach allows for the amplification of local voices, identification of local concerns and local knowledge, and the utilization of co-created, bottom-up interventions that can facilitate long-term behavioral change.

References

[1]Lamstein S, Koniz-Booher P, Beall K, Aakesson A, Meghan A (2014a). *SBCC pathways for improved maternal infant and young child nutrition practices*. Working Paper, Strengthening Partnerships, Results, and Innovations in Nutrition Globally project (SPRING) Project. Arlington, VA: USAID. Available at https://www.springnutrition.org/sites/default/files/publications/briefs/spring_sbcc _pathways_for_improved_miycn_practices.pdf. (Accessed 13 September 2023)

[2]Lamstein S, Stillman T, Koniz-Booher P, Aakesson A, Collaiezzi B, Williams T, Beall K, Anson M (2014b). *Evidence of Effective Approaches to Social and Behavior Change Communication for Preventing and Reducing Stunting and Anemia: Report from a Systematic Literature Review.* In: 20th International Congress of Nutrition, Spain.13-20 September 2013.

[3]Nair S, Darak S, Parsekar, S, Menon S, Parchure R, Ratheebhai V, Darak T, Nelson H (2016) Effectiveness of behaviour change communication (BCC) interventions in delivering health messages on antenatal care for improving maternal and child health (MCH) indicators in a limited literacy setting: an evidence summary of systematic reviews. Report, EPPI-Centre, Social Science Research Unit, UCL Institute of Education, University College London, UK.

[4]Child In Need Institute. CINI's Rights-Based Approach to Development: Creating Child Friendly Community. Available at http://www.cinindia.org/ (Accessed 1 September 2023)

[5]IDEO (2009) What is Human Centered Design?
Available at: https://www.ideo.com/post/design-kit (Accessed 13 September 2023)

[6]McLeroy KR, Bibeau D, Steckler A, Glanz K. An ecological perspective on health promotion programs.
Health education quarterly. 1988 Dec;15(4):351-77.

[7]Johns Hopkins Maternal and Child Health Center India and Child in Need Institute (2022) KHEL:
Knowledge on Health, Education and Learning through community games. Available at:
https://www.jhsph.edu/ivac/resources/khel/ (Accessed 10 October 2023)