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"Aalana Palana", a community-based video-facilitated parenting intervention for child development in Telangana, India: Study protocol

Children thrive developmentally when they are surrounded by systems and relationships that consistently provide nurturing care. This care must operate across both proximal environments—such as the family and community-based workers (CBWs)—and distal influences such as supportive social policies, institutional services, and cultural norms (1). A nurturing home environment includes a constellation of factors: sensitivity and responsiveness to a child's health and nutritional needs, regular and developmentally appropriate opportunities for learning, emotionally enriching caregiver interactions, and protection from both environmental and psychosocial adversity (2). These elements are especially vital during the first 1,000 days of life, a critical window when the brain undergoes rapid development and lays the foundation for future cognitive, social, and emotional functioning.

While global progress has been made in reducing developmental risk, evidenced by a decline in the number of children under five at risk of not reaching their developmental potential from 279.1 million to 249.4 million between 2004 and 2010, the burden remains high, particularly in regions such as South Asia. Many of these risks stem from social and structural inequities that limit caregivers' access to knowledge, stimulation resources, and health-promoting environments (1).

Intervention research from LMICs has consistently demonstrated that programs integrating nutrition with responsive caregiving and play activities, particularly those delivered in the early years, yield significantly better developmental and nutritional outcomes than stand-alone nutritional approaches (3). Parenting programs that emphasize emotionally attuned and developmentally supportive interactions between caregivers and children are especially effective in improving child cognition, caregiver knowledge, parenting behaviors, and the quality of parent-child engagement (4). These findings have led to a global consensus around the need to scale up parenting interventions as a key strategy to support child development.

However, the practical implementation of such programs at scale faces several systemic barriers. In many LMICs, child development and health systems are often underfunded, fragmented, and overburdened (5). CBWs—who serve as the primary bridge between health systems and communities—are frequently tasked with delivering a wide range of services without sufficient training, resources, or institutional support (6). This can not only compromise their effectiveness but also increase burnout and attrition, ultimately weakening the sustainability of intervention efforts.

To overcome these limitations, experts have advocated for contextually appropriate, scalable delivery mechanisms that leverage and strengthen existing systems rather than bypass them. This includes equipping CBWs with tailored training, structured supervision, technological tools, and incentives that match the complexity of their work (7). As key

intermediaries, CBWs are uniquely positioned to foster behavior change within households and communities, provided they are adequately supported (8).

One promising avenue for such scalable innovation is the use of mobile health (mHealth) technologies, including video-based interventions. These platforms can reduce the cognitive and logistical burden on CBWs by standardizing messaging, providing engaging and repeatable content, and supporting fidelity in delivery (9). Videos are particularly effective at capturing caregiver attention, illustrating practical skills, and enhancing learning through modeling and storytelling—factors that make them well-suited for low-literacy or resource-constrained environments (10,11).

Evidence from various LMICs demonstrates the potential of video-based parenting programs to enhance early stimulation, improve ECD knowledge among caregivers, increase household safety practices, and promote father engagement (12). Furthermore, recent innovations such as video-viewing combined with facilitated discussion have been shown to be both feasible and impactful in resource-limited settings, enabling large-scale access to high-quality parenting support even in the absence of extensive professional infrastructure (13).

Building on global evidence and contextual relevance, this protocol outlines a study to implement and evaluate *Aalana Palana*, a culturally adapted, video-facilitated parenting intervention for caregivers of young children in Telangana, India. The intervention is designed to promote responsive caregiving practices and optimal nutrition in the early years of life. Aalana Palana will be integrated within the existing framework of the Integrated Child Development Services (ICDS) and delivered by frontline community-based workers, specifically trained Anganwadi Workers (AWWs). By embedding the intervention within routine maternal and child care services and utilizing pre-loaded video content as the primary delivery modality, the program aims to enhance fidelity, reduce provider burden, and improve caregiver engagement. This study will assess the effectiveness of the intervention in improving child developmental outcomes and the home caregiving environment, and will examine its feasibility as a scalable, low-cost solution for low-resource settings.

Methods

Study Setting

The proposed study will be situated in Telangana, the youngest state in India, established in 2014. Telangana presents a unique context for the implementation of early childhood development (ECD) interventions due to both its demographic characteristics and service delivery infrastructure. According to the National Family Health Survey-5 (2019–21) (14), while maternal and child healthcare indicators in the state have shown progress and are generally better than national averages—such as 70.4% of mothers receiving four or more antenatal check-ups, 97% institutional deliveries, and 84.7% full immunization coverage for children aged 12–23 months—there remain significant gaps in child nutrition and early feeding practices. Only 37.1% of children under three months were breastfed within the

first hour of birth, and just 9.2% of children aged 6–23 months received an adequate diet. Alarmingly, the state has seen a deterioration in under-5 anthropometric indicators over recent years, with increased rates of stunting, underweight, and wasting.

Given these challenges, the study will build on existing collaborations between Sangath, UNICEF, and the Department of Women Development and Child Welfare (DWDCW), Government of Telangana. The intervention, Aalana Palana, is proposed to be implemented within the Integrated Child Development Services (ICDS) framework (15). This initiative would be delivered across 30 Anganwadi Centres (AWCs) spanning three ICDS projects: Maheshwaram, Khairtabad, and Alwal. AWCs serve as key community-level service delivery points, catering to approximately 5,000 people in urban and 1,000 in rural areas, and are managed by Anganwadi Workers (AWWs), a cadre of community-based frontline workers.

A key enabling factor for intervention delivery in this context is the widespread mobile phone access in Telangana, with 96% of urban and 91% of rural households owning a mobile phone. Furthermore, 60% of women in the state have access to a mobile phone that they use personally, which enhances the feasibility of integrating digital or hybrid models of ECD delivery (14).

This context provides a strong foundation to evaluate and scale integrated, community-based, and technology-supported ECD interventions within public systems like the ICDS in Telangana.

The Aalana Palana Intervention

Aalana Palana is a facilitated video-viewing intervention combining responsive parenting and nutrition messaging. *Aalana Palana* which, in the local language Telugu, translates to 'caring and nurturing', represents a transition from largely paper-based counselling sessions to a facilitated video viewing, discussion and demonstration model. It aims to ensure fidelity of the intervention delivery by standardising the content delivered during sessions. AWWs would use these videos to conduct both individual and group counselling sessions with caregivers at AWCs and family homes. *Aalana Palana* was developed using the following steps:

Development of video content

Information synthesis: A desk review of published global research on parenting interventions specifically in LMICs, the Nurturing Care Framework (16), the WHO Care for Development Package (17), and the early years learning framework. Resources in the Indian context, such as the Mother and Child Protection card (18), Home-Based Care for Young Child (HBYC) program guidelines, Poshan Abhiyan (19), and *Intintiki Anganwadi* (20), were also reviewed for content and implementation guidelines.

Blueprint: A blueprint was developed based on this review, findings from our formative research (21), multiple consultations with system-level stakeholders and available resources for content development. Eleven videos were prioritized for development which included one video for pregnancy, eight videos for caregivers of children up to two years of age (each video specifically targeting 3-month periods viz., 0-3 months, 4-6 months, 7-9 months, up to 22-24 months), one video for caregivers of children aged 2-5 years and one specifically addressing fathers' involvement in parenting. ECD messages and parent-child interaction activities to be included in each video were listed to build a cohesive narrative for a specific

age group keeping in mind counselling sessions that would be conducted by AWWs and also to prevent information overload.

Scripting: This blueprint guided the iterative development of the scripts which were first drafted in English followed by Telugu and Hindi. Each English script was reviewed by the senior investigators of Aalana Palana and representatives of DWDCW and UNICEF. Once English scripts were finalised, they were translated in the two regional languages, ensuring the use of simple, colloquial, daily-use language, culturally relevant and relatable terms. The scripts incorporated learning objectives, visuals, narration, and discussion points.

Video content development: A creative team from Telangana (22) was engaged for the pre-production, shoot and post-production of the videos. All content for *Aalana Palana* videos were shot in local communities where AWCs facilitated identification and selection of pregnant women and caregivers of children in their catchment areas based on briefings provided by the Aalana Palana team. All families were consented before initiating shoots.

Shoot habituation was done to make family members accustomed to the creative team and equipment (lights and cameras) inside their households. This was done such that the final visuals were as close to real life interactions as possible. Additionally, the usual routine of families especially ones with young children was discussed to identify mutually convenient times during the day when shoots could be organized to capture specific interactions. For play activities, existing reference videos and suitable coaching was also given to caregivers. Specific planning was done to include families and caregivers of both male and female children, belonging to varied social and religious groups to ensure equitable representation.

Content and structure of *Aalana Palana* videos: The videos promote responsive and sensitive parenting, early learning opportunities and desired nutritional practices for young children and pregnant women. The content not only describes 'WHAT' behaviours caregiver should adopt, 'HOW' they could include these behaviours in their routines but also 'WHY' a particular behaviour is important for their child's development.

Each 5–6-minute video is divided into three segments which focus on a specific set of parenting practices. At the end of each segment instructions are displayed to pause and discuss key issues on the viewed content. These pauses are aimed at facilitating a two-way communication between AWWs and their audience, while providing listeners an opportunity to share their opinions and concerns regarding the topics being discussed. At the end of each video, a *sutradhaar* (narrator), who is a well-known media personality from Telangana (23), summarizes key takeaways and actionable practices. To address specific behaviours, shorter 1–2-minute variants of these videos were developed and shared with caregivers which were derived from the 5–6-minute videos.

Feedback on video content: During the production and post-production phases of the video content development, stakeholders from DWDCW, UNICEF and the Sangath team iteratively provided feedback to the creative team. These recommendations on organization of visuals in each video, language used in scripts, voice modulation, and cultural diversity of content were used to refine the videos.

Implementation of Aalana Palana

Training plan: Consultations with DWDCW and UNICEF were conducted to develop a capacity building plan which would be integrated within the existing training schedules of AWWs. A three-day training of four hours was implemented that focused on experiential

learning and role plays. Training content included session plans, learning objectives for each session, and expected competencies required for the delivery of *Aalana Palana*. The topics covered - importance of the early years of life and responsive caregiving, objectives of Aalana Palana , intervention content, values of two-way communication, intervention delivery processes, and supportive supervision. *Aalana Palana* videos were also uploaded on the phones of the AWWs using external solid-state drives and they were trained to select age-specific videos for session delivery.

In December 2021, 30 AWWs from three ICDS projects, along with their supervisors and Child Development Project Officers (CDPOs), underwent in-person training. Pre and post-tests were done at the beginning and end of each training day to understand any changes in knowledge and obtain feedback about sessions from AWWs.

Session delivery: Qualitative research conducted during the formative stage of Aalana Palana highlighted challenges on time use and workload of AWWs (21). One of the mitigation strategies that emerged during further consultations with AWWs which could facilitate effective implementation of *Aalana Palana* was the prioritisation of group over individual counselling sessions. Evidence also indicated benefits of parenting interventions involving group-based sessions on child outcomes, particularly in LMICs (24). Based on this, AWWs were encouraged to use the *Aalana Palana* videos primarily during group-based counselling sessions. AWWs started delivering *Aalana Palana* sessions from January, 2022.

Supportive supervision: The Aalana Palana team conducted at least one in-person supervision visit per month for all 30 AWWs and used a semi-structured questionnaire to observe the sessions. To record session delivery, stickers were placed next to the names of caregivers in existing registers maintained by AWWs.

The process of *Aalana Palana* video development and implementation can be seen in Figure 1.

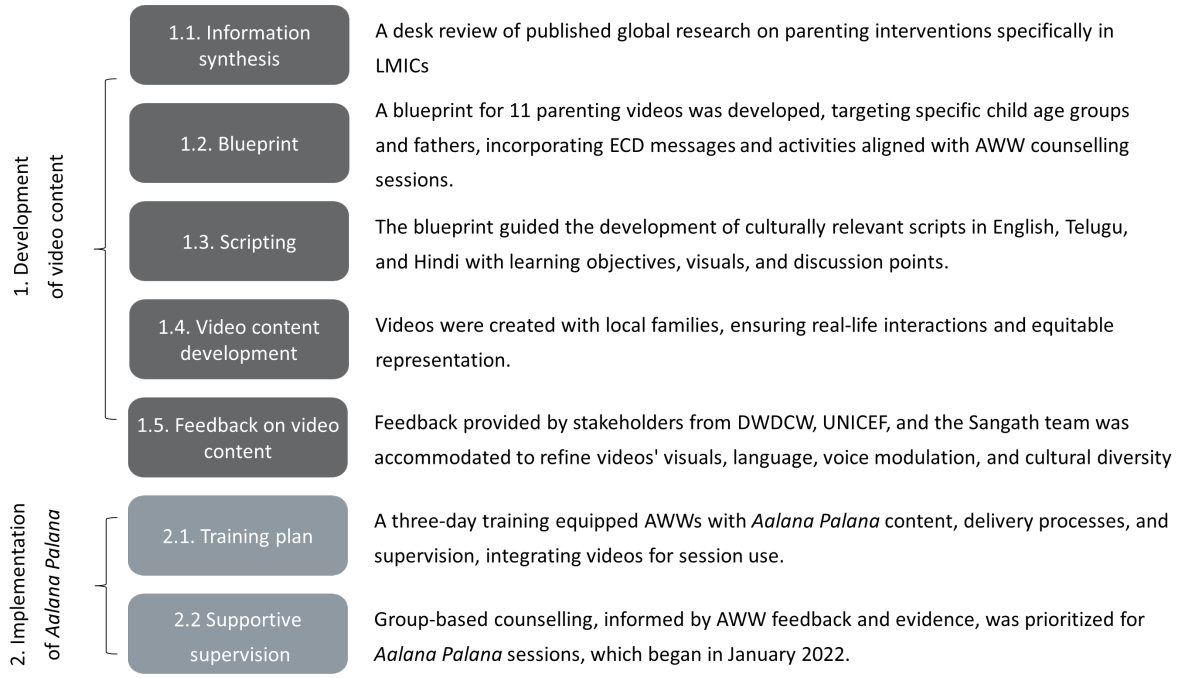

Figure 1: Process of Aalana Palana video development and implementation

Study Design and Participants

To assess the impact of the *Aalana Palana* intervention, we propose a quasi-experimental, non-randomized post-test only design incorporating a convenience-based comparison group. The study will be conducted in the catchment areas of 30 Anganwadi Centres (AWCs), previously identified as implementation sites through partnerships with government and community stakeholders.

Household mapping within these catchment areas will be undertaken to identify eligible participants, specifically caregivers of children under three years of age. All eligible participants who provide informed consent will be included in the study. The intervention (or "exposed") group will comprise caregivers who report having viewed an *Aalana Palana* video within the three months preceding data collection.

A comparison (unexposed) group will be formed using a convenience sampling approach, including participants from the same catchment areas who have not been exposed to the intervention. Importantly, participation in the study will not be restricted to households registered at an AWC, allowing for the inclusion of a broader range of community members and enhancing the generalizability of findings within the selected geographies.

This design enables the assessment of real-world exposure and its potential effects under naturalistic conditions while acknowledging limitations related to non-random allocation.

Data Collection Tools

For all participants who consent to participate in the proposed study, basic demographic and identifying information will be collected, including GPS coordinates of households; child's name, sex, and date of birth; names and dates of birth of parents; contact details; address; and maternal education level. Maternal education will be categorized using classifications from the modified Kuppuswamy scale (25), which has been adapted for Indian socio-economic contexts.

Assessment of Exposure to *Aalana Palana*

Exposure to the *Aalana Palana* intervention will be determined through a structured set of questions developed by the intervention team. These will include:
(i) Whether the participant has heard of *Aalana Palana* (with follow-up on the source of information);
(ii) Whether the participant has watched any *Aalana Palana* video in the three months prior to data collection;
(iii) Whether anyone in the household has any *Aalana Palana* video stored on their mobile device (with follow-up on the source).
For the purposes of this study, exposure will be defined as having watched any *Aalana Palana* video within the three-month period preceding data collection.

Outcome Measures

Child development outcomes will be measured using three validated tools appropriate for low- and middle-income country (LMIC) settings:

1. **Family Care Indicators (FCI)** (26)– Developed by UNICEF and adapted from the HOME inventory, this caregiver-report tool assesses the quality of the home environment, focusing on caregiving practices that support early child development in children aged 0–5 years. The FCI includes yes/no items covering the availability of and variety in play materials and play-related activities.

2. **Infant and Young Child Feeding (IYCF) Framework** (27)– This tool captures data on key nutrition indicators, particularly breastfeeding and complementary feeding practices for children under two years of age. It follows WHO and UNICEF recommendations and includes 17 operationally defined indicators to assess adequacy in early feeding practices.
3. **Caregiver Reported Early Development Instruments (CREDI)** (28)– Designed to measure developmental progress in children aged 0–36 months, this population-level, caregiver-reported tool assesses four domains: motor, language, cognitive, and socio-emotional development. The long-form, which includes 108 items, will be used. With necessary permissions, the CREDI tool has been translated into Telugu by the Sangath team to ensure cultural and linguistic relevance for the study population.

These tools have been selected for their strong psychometric properties, appropriateness for use in community settings, and feasibility for administration by trained data collectors.

Data collection

Two different teams were deployed to collect data between July 2023 and January 2024. This was done to minimize assessor bias by ensuring that exposure and outcome data was collected by two separate teams. The first team comprised of two field workers who mapped the study geography, consented eligible participants, and collected data on geolocations, demographic, socio-economic, and exposure to *Aalana Palana*. The list of consented participants identified by the first team was shared with a second team who visited the households three-to-four weeks post consenting. The second team of non-specialist child development assessors collected all outcome data on FCI, CREDI, and IYCF practices. Data on IYCF practices was collected from a subset of children aged >6 months and <2 years at the time of data collection.

Data Analysis

All data will be analyzed using Stata 15 and SPSS 27.

- Descriptive Analysis: Frequencies, means, and standard deviations will be used to summarize participant characteristics, exposure levels, and outcomes. Group differences will be tested using chi-square tests for categorical variables and t-tests for continuous variables.
- Primary Analysis: Linear regression will be used to estimate the association between intervention exposure and CREDI z-scores, adjusting for child age, child sex, maternal education, FCI score, and AWC registration status.
- Secondary Analyses:
    - Logistic regression will assess the association between exposure and binary outcomes for FCI and MAD.
    - Moderation analysis will examine interaction effects of child age, sex, and maternal education on the primary outcome.

- Mediation analysis will be conducted using structural equation modeling (SEM) to assess whether the effect of the intervention on child development is mediated by the quality of the home environment (FCI score).

Sensitivity Analysis: Subgroup analyses will be performed for caregivers registered at AWCs to account for potential confounding due to engagement with AWC services.

Data Management and Confidentiality

Data will be collected digitally on secure tablets using encrypted platforms (e.g., REDCap). Data will be uploaded to a password-protected server accessible only to designated research personnel. Identifiers will be stored separately from de-identified datasets. Regular backups and integrity checks will ensure data security and accuracy.

Ethics Approval and Consent

Ethical approval has been granted by the Sangath Institutional Review Board (Ref: RR_2019_58). Written informed consent will be obtained in the local language (Telugu) from all participants. Illiterate participants will consent via witnessed thumbprint. All field staff will be trained in ethical research practices, confidentiality, and participant rights.

Limitations

This quasi-experimental study may be affected by confounding and selection bias due to the absence of randomization. We will address this through multivariable regression, and subgroup analyses. Lack of baseline data and reliance on caregiver recall are additional limitations. However, use of standardized tools and blinded outcome assessors mitigate potential bias.

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