#### Research

# Mothers of Young Children in Nepal Prefer *Poshan Nanglo* (Nutrition Tray) for Nutrition Social Behaviour Change Communication

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It is necessary to significantly accelerate the progress for optimal young child feeding practices in order to attain global nutrition goals and targets. Innovative and compelling communication approaches should be explored and tested to change social behaviours towards nutrition. A concept promoted in Nepal known as *Poshan Nanglo* (Nutrition Tray), is an interactive demonstration of locally available and nutritiously diverse foods. Using qualitative methodology, this study adopts the phenomenology method to understand preferences and perceptions of *Poshan Nanglo* among mothers of young children. A total of 305 mothers of children aged 6 to 23 months were interviewed from September 2019 to January 2020. 90% preferred *Poshan Nanglo* over printed materials. Three themes emerged: a simple and an easy way to learn, the use of real foods help to understand better and it is a practical approach.

Thus mothers preferred and appreciated *Poshan Nanglo* to improve their understanding of good child feeding practices. These mothers also showed improvements in relating the importance of locally available nutritious foods for optimal dietary diversity. Approaching behaviour change should be informed and shaped by the beneficiaries' interests and preferences. As a simple and sustainable approach in communicating about dietary diversity and good nutrition, *Poshan Nanglo* has wide relevance and potential.

## INTRODUCTION

Optimal infant and young child feeding (IYCF) is essential for children's growth and development. It is also an important contributor towards achieving nutrition targets of the World Health Assembly (WHA) and the Sustainable Development Goals (SDG) (WHO 2014). Improvement in IYCF practices is also crucial to meet the national nutrition goals and targets of countries committed to improve the nutrition of young children including Nepal. According to UNICEF estimates, less than one in five children receive a minimum acceptable diet and only 28 percent receive minimum dietary diversity (fed at least five food groups the previous day) in low and middle income countries (UNICEF 2021). There is thus an urgent necessity to significantly accelerate progress toward achieving optimal IYCF practices.

WHO recommends that children aged 6-23 months be fed a variety of foods to ensure that nutrient needs are met (WHO, 2005). Food group diversity is associated with better growth in young children (Onyango et al. 2013) while poor dietary diversity can have a damaging effect on children's physical as well as cognitive development (Aguayo et al. 2016; Prado and Dewey 2014). More compelling measures are required to promote the dietary diversity as well as attract the attention of multi-sector stakeholders responsible for provisioning a quality diet. It has become evident that 'business as usual' will not be enough. Innovative approaches ought to be explored to promote dietary diversity and need to be tested for their effectiveness as well as feasibility to scale up. Innovative initiatives that test and scale solutions are being increasingly realized as having tremendous potential for the attainment of the SDGs (UNDP 2017).

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Social behaviour change communication (SBCC) is an interactive and strategic communication approach using a variety of channels to positively influence knowledge and bring sustained behaviour change among individuals, communities and societies (SBC3 2021). The SBCC interventions focusing on nutrition (NSBCC) focus on lack of understanding and awareness, factors behind suboptimal diet and poor nutritional status among children (Mahumud and Uprety et al. 2021; SPRING 2017). "The 'first 1000 days of life,' a period from conception till two years of age, is considered particularly crucial for a child's development (Victora et al. 2008) and thus need to be a particular focus of NSBCC interventions. Promotion of the nutrition potential associated with locally available foods is a recurring recommendation resonating across global, regional and national reviews and reports (GLOPAN, 2016; Pokharel et al. 2009; Willett et al. 2019). However, this approach has not gained the expected momentum and there is no clarity or sufficient evidence on how to succeed in using this.

Amidst this backdrop of the necessity to promote optimal IYCF practices and bring about change for good nutrition in a sustainable manner, a concept known as Poshan Nanglo (Nutrition Tray) has been promoted in Nepal. It is an interactive demonstration of locally available and nutritiously diverse foods in a Nanglo, a traditional flat round bamboo tray used as a tool for cooking and for agriculture activities. In the past, food demonstration in Nanglos have been used by several non-governmental organizations pioneering community nutrition activities in Nepal including United Mission to Nepal (UMN) and Nepali Technical Assistance Group (NTAG) (Personal communication, n.d.) More recently, UNICEF together with the Nepal Ministry of Health and implementing partner NGOs, piloted the Poshan Nanglo concept as part of nutrition interventions to recover from the 2015 earthquake (Uprety and Chitekwe 2018). During that process, Poshan Nanglo terminology was coined by the first author denoting nutritionally diverse foods for a healthy diet in a Nanglo with a hope to accelerate wide promotion, adoption and scaling up of the approach.

Foods groups displayed and promoted by *Poshan Nanglo* are based on the international standards for measuring minimum dietary diversity in young children recommended by WHO (WHO, 2021). These nutritionally diverse foods are preferably locally available and in season, tailored to the local context. They include grains, roots and tubers, legumes and pulses, nuts and oilseeds, seasonal Vitamin A rich and other fruits and vegetables, green leafy vegetables, and eggs. Certain nutritious foods like fresh milk and milk products, meat and fish may not be wise to include due to the risk of spoilage and/or unavailability or cost. Health workers and female community health volunteers (FCHVs) are guided and encouraged to use interactive food demonstrations to communicate to mothers and other caregivers about nutritionally diverse diets for their young children.

It is important to generate evidence to advocate for uptake and proliferation of the *Poshan Nanglo* approach. A recent systematic review and meta-analysis of 80 studies looking at NSBCC interventions reported gaps in evaluating a better understanding the specific NSBCC approaches and

recommended further research in the area (Mahumud and Uprety et al. 2021). Accordingly, the present study seeks to understand the preferences and perceptions of *Poshan Nanglo* among mothers of young children, a key intended target of the NSBCC. To our knowledge, this kind of research has not been carried out previously.

Our specific research questions were:

- 1. Between *Poshan Nanglo* and printed Information Education and Communication (IEC) materials (such as flipcharts, posters, photos, etc.), which is preferred by the mothers of young children?
- 2. What is the perception of the mothers on the use of *Poshan Nanglo* as a tool for nutrition counselling?

#### **METHODS**

We conducted a mixed-method study based at Siddhi Memorial Hospital for Women and Children in Nepal. The study site was chosen since services offering nutrition counselling services using *Poshan Nanglo* had been started at the hospital from August 2019 and it also provided a platform to reach out to the intended participants. Non-probability convenience sampling was used to select participants for the study. Mothers of children aged 6-23 months living in urban/peri-urban areas and visiting the hospital along with their children for regular immunization services were invited to participate. The total number of participants was 305 which we deemed to be sufficient in gathering the perspectives of the mothers. This study has been reported in accordance with the Standards for Reporting Qualitative Research (SRQR) (O'Brien et al. 2014).

Ethical approval was received from Siddhi Memorial Hospital and Nepal Health Research Council (reference number 718-2019). Also, information about the purpose of the study was communicated to the mothers to receive written consent from them prior to data collection. Their anonymity and confidentiality were maintained throughout the study process.

We adopted Phenomenology, a qualitative research approach, to understand the essence of how others understand a phenomena (Creswell 2013). *Poshan Nanglo* was the phenomenon for our study which we used as a NSBCC tool for nutrition counselling to the mothers. Our aim was to derive the essence of the mothers' experience and understand their preferences and perceptions regarding *Poshan Nanglo*.

Data were collected from September 2019 to January 2020. Semi-structured interviews were conducted face-to-face, asking open-ended questions and using unplanned probes as necessary. The overall interview approach was designed to give the participants an opportunity to speak their mind. The interview was conducted in the Nepali language by health care personnel trained on the research methods. Each interview took half an hour on average and was recorded and later transcribed into English.

The mothers were interviewed as they came for nutrition counselling after the regular immunization of their children. A newly established nutrition counselling room had regular interactive demonstrations of *Poshan Nanglo* using the food groups recommended by the WHO (WHO, 2021).



Figure 1. A participating mother receiving IYCF counselling using the demonstrated *Poshan Nanglo* 

Table 1. Education and Occupation Characteristics of Participating Mothers (n=305)

Mother's Characteristics	N	%	
Formal education			
Primary (0-5 years of school)	28	9.2	
Secondary (6-10 years of school)	103	33.8	
Higher secondary (11-12 years of school)	81	26.6	
Bachelor's degree	61	20	
Master's degree	19	6.2	
None (never attended school)	13	4.3	
Mother's occupation			
Homemaker	208	68.2	
Engaged in income generation	96	31.5	
NA	1	0.3	

Printed information education and communication (IEC) materials developed by the Nepal Ministry of Health to promote child nutrition were also displayed. Mothers were specifically asked about their preference and perceptions with questions framed as 'How did you find the use of *Poshan Nanglo* for the nutrition counselling?' 'How does it compare with the use of printed materials like the photo or the poster or the booklets?' 'Between printed materials and *Poshan Nanglo*, what would you prefer to be used for nutrition counselling, and why?' etc.

As we adopted an inductive approach, a code frame was developed manually using the language and expression of the participants. Answers were then manually coded accordingly, after which common themes and emerging patterns were identified and compiled. Based on the evidence generated from the data, assertions, i.e., declarative statements of summative synthesis, were developed.

#### RESULTS

<u>Table 1</u> provides education and occupation characteristics of the 305 mothers who were interviewed.

Table 2. Preference of NSBCC Method Reported by Participating Mothers (n=305)

Preferred NSBCC method	N	%
Poshan Nanglo	283	92.8
Both Poshan Nanglo and printed materials	14	4.6
Printed materials	7	2.3
Don't know	1	0.3

More than two thirds of the mothers were homemakers (68.2%) while around a third (31.5%) were engaged in some form of occupation and income generating activities. These ranged from agriculture, armed forces, health workers, journalist, teacher, marketing agent, office-based work in banking and finance sector, graphic designing, skills related work such as boutique or tailoring, creative crafts such as knitting, painting, manual work such as brick factory worker or daily wage labourer and running businesses such as grocery or furniture shops.

<u>Table 2</u> provides a summary of the preferred NSBCC method reported by the participating mothers. Out of total 305 mothers interviewed, 283 (92.8 percent) reported preference for *Poshan Nanglo* over the printed IEC materials.

Three themes that emerged from the analysis of the mothers' reports regarding the reasons for their preference for *Poshan Nanglo* are as follows:

#### A. 'SIMPLICITY FOR LEARNING'

Common responses under this theme were 'easy to see and understand,' 'can see clearly,' 'easy even for those unable to read or write,' 'different food groups to be fed to children are displayed' and 'can learn about different foods for child feeding at once.'

One participant mentioned;

"I can clearly see in *Poshan Nanglo* and immediately understand all the different types of food to feed my child. We already have most of the foods shown here at home or grow them in our kitchen garden. So feeding healthy food to children seems not that different or difficult. I was not giving fruits and vegetables from our garden before, as I thought they would cause cough and cold to my small baby. Now, I learned that I need to give the seasonal fruits and green vegetables as they are very nutritious. I like it as I can actually see with my own eyes and it is simple and easy to understand."

#### Another participant said:

"I would always wonder what to feed my baby. Sometimes, I would also look up on the internet to know what food is healthy for my baby and what food I should not be giving but I would get confused. *Poshan Nanglo* easily shows what kinds foods should be fed. I had no idea that it is so simple. And we can actually see everything right in front of us and can also take photos to see later. Before, I did not give legumes and pulses thinking that it will give tummy ache and the baby will get sick. But upon seeing here, I am reassured now."

# B. 'REAL FOODS EASE UNDERSTANDING'

The second theme that emerged was 'real foods ease understanding.' Key common responses under this theme were 'use of real/natural foods are better', 'real foods are easier to understand,' 'real foods are more attractive and grab attention,' and 'shows the real nutritious foods to feed children.'

One participant said:

"You see pictures for a bit and then later it is difficult to recall what picture it was. But with *Poshan Nanglo*, I can easily remember all the familiar foods. These real foods register better in the mind and so it can help to feed our children accordingly."

## Another participant said:

"Poshan Nanglo is better and different than pictures since we can see the foods directly. For me, real materials like this is more believable than pictures and that helps to understand better. I also do not see any packaged foods here in Poshan Nanglo, so that is also a learning to avoid those unhealthy foods for children and only give the fresh and healthy foods shown here."

Lastly, visuals were given positive feedback:

"Learning what to feed children this way is so much better than hearing only or looking at photos. The visuals put here with real foods gives a better image and less likely to forget. We can also recognize the familiar foods immediately and these real foods are clear and easy to remember, even for those who cannot read."

# C. 'A PRACTICAL APPROACH'

The third theme that emerged is 'a practical approach.' Key common responses under this theme were 'ability to touch and feel the foods gives different perception,' 'easy to remember', 'more practical and effective learning' and 'can think of foods at home.'

Extracts from participants' interviews include:

"I prefer the good demonstrative way of *Poshan Nanglo*. It shows and helps to talk about the nutritious foods for children that we have in our homes."

"I think looking at posters or photos is only theory but *Poshan Nanglo* is practical. There is a different perception while seeing and touching the foods. This is more effective."

Of the 14 mothers (4.6 percent) who preferred the use of both *Poshan Nanglo* and printed IEC materials together, their common responses were 'use of both methods is clearer,' 'easier to teach and understand' 'can show foods that are not in *Poshan Nanglo*.' Similarly, of the seven mothers (2.3 percent) who preferred printed IEC materials only, the common themes were 'gives information,' 'easier to see and understand', 'they last a long time and no need to change regularly,' 'can be taken home,' 'can be used for foods that are perishable or not available for display,' and 'does not occupy much space.'

Based on the above results from the analysis, a key assertion is drawn from this study that there was a clear preference of *Poshan Nanglo* over the printed IEC materials by nine out of 10 of the participating mothers of young children. In addition, the participating mothers perceived *Poshan Nanglo* to be a simple and easy way to learn about child feeding, the use of real foods helped to understand better and also found it to be a practical NSBCC approach.

#### DISCUSSION

Our study has demonstrated that the mothers of young children prefer *Poshan Nanglo* or Nutrition Tray over the printed IEC materials as a NSBCC tool. We have also generated evidence that the mothers appreciate the simplicity and the ease to understand good nutrition through *Poshan Nanglo* and relate the importance of locally available nutritious foods for optimal dietary diversity for their children. There is existing literature on use of food as a sensory approach to teach healthy eating among children in developed countries (Dazeley and Houston-Price 2015; Sepp and Höijer 2016; Woo and Lee 2013) but none from developing countries. Hence, there is a scarcity of literature to compare our findings.

Operational research was conducted among a group of female community health volunteers of Nepal who used the tool for counselling during Nutrition Week implemented in the areas affected by the 2015 earthquake. The FCHVs found *Poshan Nanglo* to be more effective and easier to use than flip-chart or pictures (Uprety and Chitekwe 2018). As a lesson learned from the emergency intervention, the Government of Nepal and UNICEF have jointly scaled up this approach to increase community awareness and nutrition education in 30 Multi-sector Nutrition Plan districts and it has been included as a long term plan of UNICEF Nepal (UNICEF 2018).

Behaviour change approaches should be informed and shaped by the beneficiaries' interest and preferences to help reduce barriers and facilitate adoption of improved behaviours (SBC3 2021). Encouraging the caregivers of young children to use their own resources to address problematic feeding practices is understood as effective for changing behaviours and is recommended as a critical component to the success and sustainability of the interventions (USAID 2011). In that regard, the use of Poshan Nanglo can be considered to help empower the local communities. It can also support to enhance their confidence that good nutrition is possible from recognizing, promoting, producing, and utilizing nutritious foods that are already available and those that can be easily available. Through community participation to provide the Nanglo or any local tray and the locally available foods for display, this will also be a minimal cost approach. Furthermore, it will save paper and other costs such as printing. This approach of promoting nutritious, affordable and sustainable diet also aligns well with the increasing global realization that good nutrition and environmental sustainability mutually reinforce each other (Willett et al. 2019). The Global Nutrition Report 2021 reiterated that the imbalanced human diet low in fruits, vegetables,

legumes, nuts and seeds, and whole grains and high in red and processed meat are affecting both human and planetary health and called for substantial changes food production and consumption (Springmann et al. 2021). *Poshan Nanglo* therefore is a concept embedded within the necessity for a change to achieve the SDGs.

As a simple and sustainable way to communicate about dietary diversity and good nutrition, this approach may have global relevance and potential. Locally available nutritious foods in any given context or area can be utilised and promoted. Any local big tray-like utensil or tool that symbolises the linkage of nutrition with local foods and agriculture can be used. For further simplicity and adaptation, the approach can be named combining the native terms for nutrition and the specific tray-like tool used in the particular place. Our study setting and process also demonstrated its relevance in urban areas as well as the feasibility of using it through the hospital platform.

Global attention drawn by the EAT Lancet report as well as post pandemic emergence of the world has created further enabling policy environment and opened the possibilities for multi-sector integration and utilisation of *Poshan Nanglo* (Willett et al. 2019; Ntambara and Chu 2021; Heidkamp et al. 2021). The concept has strong linkages with other sectors including health, agriculture, early childhood, and education. The use and visibility given to the actual foods can contribute towards sensitization of increased homestead production as well as broader agricultural production of wide variety of nutritious foods. This approach can also be used to promote and revive the indigenous food varieties that are nutrient-dense but underutilized and even wild foods.

Our study included a diverse group reflecting the perspectives of mothers from various socio-economic backgrounds, as demonstrated by the varying education levels and different occupations of the interviewed mothers. However, we relied on convenience sampling and generalizing our findings outside of the Nepalese context should be done with caution. To our knowledge, our study is also the first to explore the perceptions of the mothers of young children on NSBCC approach using interactive food demonstration.

Poshan Nanglo as an easy and interesting NSBCC approach for mothers may be utilised during planning and implementing nutrition interventions. Further research should be conducted in varied locations and settings to generate more evidence on the approach. Additional qualitative studies should explore the perceptions and preferences of the intended target groups in various contexts and geographic areas. Quantitative studies with robust design should test the hypothesis that this approach is effective to improve young child feeding practices and consequently child nutritional status.

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CONFLICT OF INTEREST

None

**CONTRIBUTIONS** 

S.U. conceptualised and monitored the study, conducted data analysis, and wrote the paper; A.K. assisted in designing and monitoring the study, supported pre-testing of the questionnaires and conducted data collection; D.S. supported the study process by reviewing the study design, quality monitoring and reviewing the draft manuscript. All authors have approved the final manuscript for publication.

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