community health workers were inadequately trained which resulted in inadequate communication regarding health benefits and use of micronutrient powder to the beneficiaries.

Focus group participants from this study mentioned that messages on MNP usage were not clear. Kodish *et al.*, 2011 opine that messages are part of social mobilization program design features which influence caregiver knowledge and adherence. In addition, these messages should have the correct content, clarity, and cultural appropriateness of the information.

Other studies reported that side effects of MNPs were a reason for not giving MNPs to children. Studies from Bangladesh (Karim *et al.*, 2006, Hyder *et al.*, 2007) reported that change in colour and consistency of stool as common side effects in children. A cluster randomized trial from Pakistan showed that use of MNPs was associated with a significant increase in diarrhoea incidence (Soofi *et al.*, 2018), as a result caregiver did not use MNPs. This shows that side effects of MNPs may cause low uptake of micronutrient powders.

In other studies, by Mirkovic *et al.*, 2016, mothers perceiving ≥1 positive effects in their child after MNP use was also associated with high intake (OR=6·55, 95 % CI 4·29, 10·01). However, perceiving negative affects was not associated with low uptake. The study found out that child preference on MNPs lower odds of high of MNPs (OR=0·12, 95 % CI 0·08, 0·20) Mirkovic *et al.*, 2016.

Participants in this study mentioned that the lack of information, education, and communication material (IEC) for use in interpersonal communication may affect knowledge on MNPs. According to Jolly *et al.*, 2016, even though IEC material were useful for illiterate women, there were limitations found using printed materials in maternal and child health programme intervention in rural Bangladesh.

Limited mobility of community health workers to visit clients who may need resupply, and experiencing side effects after usage of MNPs were mentioned as barrier to uptake of MNPs. Creed-Kanashiro *et al.*, (2015) conducted a qualitative study and explored the role of health personnel in three regions. Results from the study showed that home visits were key in promoting usage of MNP by caregivers since misunderstandings on preparation, required consistency and optimum practices were common. In the same study, health workers were found to play a critical role in influencing caregiver understanding, use of the MNP, training to avoid confusing messages and provide counselling to families on local feeding routines.

After distribution of MNPs, participants mentioned the need for monitoring MNP activities. In a study conducted by Angdembe *et al.*, 2016, community health volunteers are the key to improving uptake of MNPs through regular visits to households. Post distribution monitoring visits provides opportunity for discussions of problems, encouragement of continued MNP consumption, and recommendations for regular child health care via health care centres.

Unavailability of food was mentioned as barrier to uptake of MNP. Caregivers mentioned that available food was mostly in solid form. The nature of food as semi-solid and liquid were mentioned by participants in improving uptake of MNPs. Creed-Kanashiro *et al.*, (2015) conducted a qualitative study explored the acceptability of MNP by caregivers, the study found out that there was greater acceptance of MNP by caregivers giving semi-solid foods (e.g. purees) to their children than those who served dilute preparations (e.g. soups).

Conclusion

Administering micronutrient powders to children aged 6-23 months remains a key priority to improve micronutrient supplementation to children. In this study, qualitative research was employed to identify key barriers to uptake of micronutrient powders. Poor accessibility of MNPs, poor social mobilization, lack of information, education and communication and food unavailability resulted in low uptake.

There is need to institute MNP distribution platforms at community level and develop social mobilization activities to address lack of information and community awareness. Nutrition program planners must consider providing MNPs as ready to eat supplement form, to bridge food unavailability at household level. Action at these levels will improve uptake of MNPs and hence micronutrient supplementation to children.

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References

[1]. Akoto Osei, A. S. (2014). Using Formative Research to Inform the Design of a Home Fortification with Micronutrient Powders (MNP) Program in Aileu District, Timor-Leste. Food and Nutrition Bulletin, 68-82.
[2]. Best C, N. N. (2011,). Can multi micronutrient food fortification improve the micronutrient status, growth, health, and cognition of schoolchildren? A systematic review. Nutrition Reviews. International Life Sciences Institute, 69 (4): 186-204.
[3]. Clements, R. J. (2011). Spatial heterogeneity of haemoglobin concentration in preschool-age children in sub-Saharan Africa. Bulletin of the World Health Organization, 2011;89:459-468.
[4]. Halati S, V. H. (2013). Home fortification in refugee camps: micronutrient powder supplementation program for Bhutanese refugee children in Jhapa and Morang districts, Nepal. Geneva: The HF-TAG website (http://hftag.gainhealth.org/).
[5]. Hilary Creed-Kanashiro, R. B. (2015). Promoting multi-micronutrient powders (MNP) in Peru: acceptance by caregivers and role of health personnel. Maternal and Child Nutrition, 152-163.
[6]. Hyder SMZ, H. F. (2007). Effect of daily versus once-weekly home fortification with micronutrient Sprinkles on hemoglobin and iron status among young children in rural Bangladesh. Food Nutrition Bulletin, 156–164.
[7]. Jefferds ME, M. K. (2015). of micronutrient powder sachet coverage in Nepal. Maternal Child Nutrition, 11:77-89.
[8]. Jefferds ME, O. L. (2010). Formative research exploring acceptability, utilization, and promotion in order to develop a micronutrient powder (Sprinkles) intervention among Luo families in western Kenya. . Food Nutrition Bulletin, S179-85.
[9]. Karim F, C. N. (2015). Adherence to multiple micronutrient powder among young children in rural Bangladesh: a cross-sectional study. Bangladesh: BRAC.
[10]. Kodish S, R. J. (2011). Understanding low usage of micronutrient powder in the Kakuma Refugee Camp, Kenya: findings from a qualitative study. Food Nutrition Bulletin, 32: 292-303.
[11]. Kristina Michaux, A. A. (2014). Home Fortification with Micronutrient Powders: Lessons learned from formative research across six countries. Sight and Life, 25-35.
[12]. Mahama Saaka, P. A.-l. (2017). The effect of social behavior change communication package on maternal knowledge in obstetric danger signs among mothers in East Mamprusi District of Ghana. Bio-Med Central, 13-19.
[13]. Mirak Raj Angdembe, N. C. (2015). Adherence to multiple micronutrient powder among young children in rural Bangladesh: a cross-sectional study. BMC Public Health, 15:440.
[14]. Mirkovic KR, P. C. (2016). Predictors of micronutrient powder intake adherence in a pilot programme in Nepal. Public Health Nutrition, 19:1768–76.
[15]. Munyoro, G. (2014). An Evaluation of the Effectiveness of Handouts in Enhancing Teaching and Learning in Higher Education. AFRICA DEVELOPMENT AND RESOURCES RESEARCH INSTITUTE (ADRRI) JOURNAL, 95-107.
[16]. Organization, W. H. (2016). Use of multiple micronutrient powdersfor point-of-use fortification of foods consumed by infants and young children aged 6-23 months and children aged aged 2-12 years. World Health Organization.
[17]. Organization, W. H. (2017). Multiple micronutrient powders for point-of-use fortification of foods consumed by children 6–23 months of age. Geneva: e-Library of Evidence for Nutrition Actions (eLENA).
[18]. Osei A, S. A. (2014). Using formative research to inform the design of a home fortification with micronutrient powders (MNP) program in Aileu District, Timor-Leste. Food Nutrition Bulletin, 35:68–82.
[19]. Parminder S Suchdev, O. Y.-A. (2016). Effects of community-based sales of micronutrient powders on morbidity episodes in preschool children in Western Kenya. American Journal Clinical Nutrition, 1-16.

[20]. Rehana A Salam, C. M. (2013). Effectiveness of Micronutrient Powders (MNP) in women and children. BioMed Central Public Health, S22.
[21]. Seidel, J. V. (1998). Qualitative Data Analysis. Qualis Research.
[22]. Soofi S, C. S. (2013). Effect of provision of daily zinc and iron with several micronutrients on growth and morbidity among young children in Pakistan: a cluster-randomised trial. Lancet, 382(9886):29–40.
[23]. Stephen Kodish, J. H. (2011). Understanding low usage of micronutrient powder in the Kakuma Refugee Camp, Kenya: Findings from a qualitative study. Food and Nutrition Bulletin, 292-303.
[24]. Survey, Z. N. (2018). Food and NUtrition Council of Zimbabwe.
[25]. Yount, R. (2006, 4th Edition). Population and sampling.