

# Refresher Training through Gamified Activities for Frontline Healthcare Workers on Maternal and Newborn care

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## Background

High and persistent levels of child malnutrition continue to be a matter of concern in India. The universal coverage of different healthcare and nutritional programmes targeted for children and mothers, have witnessed a rapid increase in the number of Frontline Workers (FLWs) [1] or Community Healthcare Workers (CHWs) i.e. the Anganwadi Workers (AWWs), Accredited Social Health Activists (ASHAs) and Auxiliary Nurse Midwife (ANMs). The job training of these workers leave a lot to be desired. The capacity deficit of field functionaries has been identified as a major factor affecting the effectiveness of these programmes [2]. Given the massive number of field functionaries and the continuously advancing base of knowledge and techniques, conventional training pedagogy is ineffective in updating the capacity of the CHWs and their supervisors. With the improvement of technology, widespread availability of smartphones and better access to the internet [3] in cities as well as rural and tribal villages of India, access to digital training systems can potentially benefit the healthcare workers and the healthcare system to a large extent, rendering reduced malnutrition and infant mortality rate. The conventional training methods are proving to be inadequate for the task. Gamification of the training material in the form of refresher training and use of digital tools for knowledge dissemination, offers a potential solution to this problem [4][5].

The study compares the effectiveness of learning through the gamified smartphone app based pedagogy and the conventional classroom instruction pedagogy, by conducting trials with groups of ASHA, and discusses ways to make it an adequate refresher training substitute for the Community Healthcare Workers.

## Proposed Model

To compare the effectiveness of both the models, the researcher is designing and developing physical card game and digital interactive smartphone games for Android platform aimed at engaging ASHAs in learning community healthcare curriculum, based on the vetted information available and training ASHAs to work efficiently in the field, with refreshed knowledge. The care protocol is gamified through different game mechanics. Card games appear as highly suitable for this purpose, as they are ubiquitous, cost-effective and easy to handle. A deck of cards can be played in numerous different ways just by altering the rules. Also different groups of cards can be added to the existing deck to enable new ways of playing with it. Researches [6] on engagement and collaboration in gameplay, suggest that playing in groups or multiplayer have significant advantages in learning.

## Work Done

Three research prototypes were built and tested in the field. The results were published in Asian CHI conference paper twice [4][5] and was awarded as Best Paper Award in full paper category. Physical Playing Card were designed and trials were conducted in some districts of Madhya Pradesh and West Bengal. The results are waiting to be published in a conference paper. Development of the latest app prototype of the multiplayer card game is in progress.

## Future Work

Complete the development of physical and android version of the card play in Hindi and other major Indian languages for testing in the field

Making iterations of the Playful Activity by tweaking the rules and making it more playful and engaging

Conduct a Field Trial comparing the effectiveness of Physical cards and Digital App

## Key Achievements

Majhi, A., Mondal, A., Joshi, A., Agnihotri, S. B., 2021. Refresher Training through Quiz App for capacity building of Community Healthcare Workers or Anganwadi Workers in India.", CHI 2021: Asian CHI Symposium 2021, Yokohama, Japan, May 2021, ACM International Conference Proceeding Series.

<https://dl.acm.org/doi/10.1145/3429360.3468186> [4]

Published on ACM Digital Library on September 7, 2021

Award : Best Paper award in the Long Paper (Journal) category

Majhi, A., Agnihotri, S. B., Mondal, A., 2023. Physical and Augmented Reality based Playful Activities for Refresher Training of ASHA Workers in India ", CHI 2022: Asian CHI Symposium 2022, New Orleans, LA, April 2022, ACM International Conference Proceeding Series.

<https://dl.acm.org/doi/10.1145/3516492.3558788> [5]

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Awards : Gary Marsden Travel Grant Award for attending the conference in person  
Best Paper and Best Presentation award in the Long Paper (Journal) category

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## References

1. Karan A. et al., 2021 <https://rdcu.be/c4bWz>
2. Roy B. et al., 2023 <https://doi.org/10.1093/polsoc/puac032>
3. Telecom Subscription Data (TRAI) Oct 2022 <https://pubmed.ncbi.nlm.nih.gov/18158669/>
4. Majhi A. et al., 2021 (Link in QR Code)
5. Majhi A. et al., 2023 (Link in QR Code)
6. Bochennek K. et al., 2007 <https://pubmed.ncbi.nlm.nih.gov/18158669/>



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