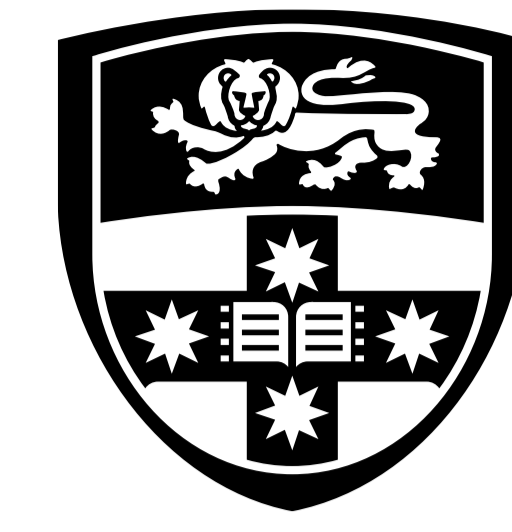


Co-designing the user experience of a childrearing mHealth app in low- and middle-income countries

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BACKGROUND

The ubiquity of mobile phones globally presents an opportunity to deliver parenting and early childhood development (ECD) information to promote the socio-emotional and cognitive development of children during the first five years of life.¹ However, it is crucial to ensure that mobile health (mHealth) solutions appreciate, among other things, cultural and linguistic diversity,² especially in low- and middle-income countries (LMICs).³ To that end, co-design is one way forward.

This project centres on the co-design of a childrearing app *Thrive by Five*, which seeks to distribute ECD information and childrearing activities to promote development globally.

AIMS

This work aims to (1) co-create the *Thrive by Five* app to ensure usability, acceptability, and cultural appropriateness for parents and caregivers in LMICs and (2) facilitate the successful implementation and adoption of the app to promote and optimise socio-emotional and cognitive development of children aged 0-5. Here, findings from nine countries in Asia and Africa relating to the user experience are presented.

METHODS

Thematic analysis was applied to co-design workshops conducted with 174 parents and caregivers and 58 in-country subject matter experts from Afghanistan, Indonesia, Kyrgyzstan, Uzbekistan, Namibia, Kenya, The Democratic Republic of the Congo, Cameroon, and Ethiopia. To best inform user experience design, workshop participants were given a walkthrough of the app prototype or a period of hands-on user testing, when possible.

RESULTS

One of the themes identified *User experience* captures feedback on participant interactions with the app, with implications for the ongoing app co-design centring on the app's user interface, language, illustrations, and features. Table 1. shows key examples of the *User experience* findings, as well as recommended changes to the app based on those findings.

User experience feedback	Country	Recommended changes to the app
App confused for a clinical intervention for identifying developmental delays in children	Indonesia, Afghanistan, Kyrgyzstan	Consider adding an introductory screen explaining the app's purpose; a disclaimer that it is not a diagnostic tool
Requests to further localise the app illustrations	Indonesia, Kenya, Ethiopia	Consider adding illustrations that reflect a range of living circumstances (e.g., Indonesian rural settings and small living spaces)
Needs video demonstrations to instruct users on the childrearing activities	Kyrgyzstan, Uzbekistan, Cameroon, The Democratic Republic of the Congo, Ethiopia	Consider adding short videos to the app. Alternatively, add GIFs to minimise app download size.
Add additional local language translations	Kenya, Uzbekistan, Ethiopia	Consider adding translations for Luo (Kenya) and Karakalpak (Uzbekistan)
App content length needs to be reduced; simplify the language.	Namibia, Kyrgyzstan, Uzbekistan, Ethiopia	Continue to iteratively simplify the content language and reduce the word count
Requests for a feature to share the app content with other users online via social media and instant messaging platforms	Indonesia, Kenya, Kyrgyzstan, Uzbekistan, Cameroon, Ethiopia	Consider adding buttons to instantly share content through other apps, or buttons to create shareable links

Table 1 – *User experience* theme findings and recommended changes to the *Thrive by Five* app

DISCUSSION

Findings indicated several changes based on user feedback, including simplifying and localising language, including videos, adding more bright colours, illustrations, and animations, and numerous improvements to the app features and functionality.

Participants' aesthetics, cultural factors, digital skills, literacy, needs, and expectations play a role in co-creating the user experience. For instance, the colour purple used as the app's default background colour was not considered inclusive in Indonesia as purple is associated with femininity and old age.

CONCLUSIONS

As tools to deliver information, mHealth apps have the potential to promote children's socio-emotional and cognitive development. Co-designing these apps creates space for stakeholder engagement, cultural inclusion, and person-centred solutions. This work moves off the drafting table and into the field with a practical, co-designed mHealth app for child caregivers in LMICs – inspiring *hope not hype*.

Using co-design, vital user experience feedback was elicited to further the ongoing co-creation of a childrearing app with and for nine select LMICs.

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