

Mazi Umntanakho: A Digital Tool for Social Emotional Development and Mental Health of Young Children

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The social emotional development and mental health of young children in vulnerable South African settings are issues that need to be addressed. While technology-based solutions hold promise to address this challenge, the collaboration with community-based organizations is crucial to developing viable options for collaborative care. Following this premise, we developed "*Mazi Umntankho*," a WhatsApp tool that has been designed considering community-based organizations to provide real-time support to assess the socio and emotional development of children. .

CCS Concepts: • **Human-centered computing** → **Empirical studies in ubiquitous and mobile computing**

KEYWORDS: Mobile health (mHealth), conversational agent, early childhood development, culturally appropriate methods

ACM Reference format:

Catherine E Draper, Caylee J Cook, Elizabeth A Ankrah, Jesus A Beltran, Franceli L Cibrian, Jazette Johnson, Hanna Mofid, Kimberley D Lakes, Lucretia Williams, Gillian R Hayes. 2023. *Mazi Umntanakho: A Digital Tool for Social Emotional Development and Mental Health of Young Children*. In *Proceedings of the ACM on Human-Computer Interaction*, Vol. #, CSCW1, Article #, XX pages, <https://doi.org/10.1145/33XXXXX>

This work is supported by the Connecting the Ed-tech Research Ecosystem (CERES), funded by the Jacobs Foundation.

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<https://doi.org/124564XXX>

1 INTRODUCTION

Due to the lack of accessible services for children with developmental challenges in vulnerable South African settings, there is a need to build capacity amongst caregivers and community-based workers to promote social emotional development and mental health of young children (3-5 years) from these settings.

Digital platforms leverage the potential to reach a range of vulnerable settings (e.g., [1-5]) and therefore help more children. Thus, collaborating with community-based organizations (CBOs) working with young children in these settings provides a viable option for collaborative care using technology.

The aim of the project was, therefore, to co-design with community-based organizations working in vulnerable South African settings a digital tool that help them promote social emotional development and mental health via assessing real-time using WhatsApp and getting personalized feedback and resources for each child. chatbot that would provide feedback on assessment results and contextually relevant resources for caregivers of young children.

2 DESIGN METHODS

2.1 The co-design process

A multi-disciplinary team with local and technical expertise was established, and CBOs working in early childhood development in the Western Cape and KwaZulu-Natal provinces were engaged as partners for the co-design process. The co-design process entailed: 1) focus groups to understand CBO priorities and context and present initial tool ideas; 2) development of tool prototype; 3) focus groups to obtain feedback on prototype; 4) finalizing of tool for piloting; 5) training of CBOs; 6) piloting of the tool; 7) pilot follow-up; and 8) evaluation.

3 RESULTS AND DISCUSSION

3.1 Community-based organization feedback

From the co-design process thus far, CBOs have affirmed that social emotional development and mental health of young children are important topics to address in their communities. In fact, the name '*Mazi Umntanakho*' ('know your child') was given by one of the CBO staff who highlighted that caregivers needed to know their children. CBOs also highlighted the stigmatization of challenges in these developmental areas, as well as the lack of services for children with these challenges. They agreed that WhatsApp was the best digital platform for the tool, given the resource challenges in their context, and that the tool should be available in their local languages. CBO's feedback provided valuable insights into how this tool could be integrated into the existing work of their organization, and what some of the challenges of implementation may be.

3.2 The Mazi Umntanakho tool

The *Mazi Umntanakho* tool is a WhatsApp chatbot available in English, isiXhosa, isiZulu, and Afrikaans (with plans to make it available in Sepedi, Sesotho, Setswana, Tshivenda, and Xitsonga). The tool aims at supporting community-based workers through two sets of questions. Firstly, the child’s caregiver is asked about the child’s mental health, using adapted questions from the Strengths and Difficulties questionnaire [6]. Secondly, questions from the social emotional subsection of the International Development and Early Learning Assessment [7] are asked of the child. These proposed assessments were acceptable to the CBOs. Feedback on the assessment results and some additional information are then provided in the chatbot, using a simple traffic light system: green for no concerns, orange for some concerns, and red for many concerns (example shown in Figure 1). Caregivers can then choose to receive resources on the following topics: self-awareness, emotions, social skills, difficult behavior, and healthy habits and routines. These resources are available as a pamphlet, infographics, videos, and voice notes, and caregivers can choose to receive as many resources as they would like (examples shown in Figure 2).

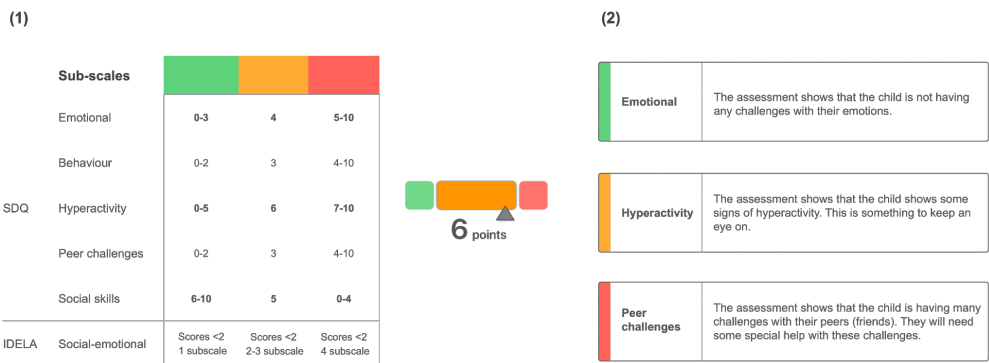


Fig. 1. Example of traffic light feedback system.



Fig. 2. Examples of Mazi Umntanakho resources.

4 CONCLUSIONS

Mazi Umntanakho responds to the need to build capacity amongst caregivers and community-based workers to promote social emotional development and mental health of young children in vulnerable settings. Currently, the tool has been pilot-tested and the project findings so far indicate that it is feasible to co-design a digital tool with CBOs to assess social emotional development and mental health, and that the acceptability of this tool with CBOs is promising for collaborative care in these settings.

ACKNOWLEDGMENTS

Acknowledges the support of Jacobs Foundation CERES network and was approved by the IRB of University of the Witwatersrand in South Africa.

REFERENCES

- [1] World Health Organization. 2019. Recommendations on digital interventions for health system strengthening. World Health Organization, 2010-10.
- [2] Diwakar Mohan, Kerry Scott, Neha Shah, Jean Juste Harrison Bashingwa, Arpita Chakraborty, Osama Ummer, Anna Godfrey, Priyanka Dutt, Sara Chamberlain, and Amnesty Elizabeth LeFevre. 2021. Can health information through mobile phones close the divide in health behaviours among the marginalised? An equity analysis of Kilkari in Madhya Pradesh, India. *BMJ Global Health* 6 (Suppl 5), e005512.
- [3] Ryunosuke Goto, Yoko Watanabe, Ako Yamazaki, Masatoshi Sugita, Saturo Takeda, Masao Nakabayashi, and Yasuhide Nakamura. 2021. Can digital health technologies exacerbate the health gap? A clustering analysis of mothers' opinions toward digitizing the maternal and child health handbook. *SSM Population Health*, 16, 100935.
- [4] Yogan Pillay and Pakishe Aaron Motsoaledi. 2018. Digital health in South Africa: innovating to improve health. *BMJ Global Health*, 3 (Suppl 2), e000722.
- [5] Joanne Elizabeth Peter, Peter Barron, and Yogan Pillay. 2016. Using mobile technology to improve maternal, child and youth health and treatment of HIV patients. *South African Medical Journal*, 106(1), 3-4.
- [6] Robert Goodman. 1997. The Strengths and Difficulties Questionnaire: a research note. *Journal of Child Psychology and Psychiatry* 38, 5 (1997), 581-586.
- [7] Lauren Pisani, Ivelina Borisova, and Amy Jo Dowd. 2015. International development and early learning assessment technical working paper. Technical Report. Save the Children.