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Monitoring early childhood development at the population level: The ECDI2030

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Highlights

- Population-level monitoring of children's development informs research and policy.
- Caregiver-reported household surveys, such as the ECDI2030, can play this role.
- Results from two national samples support the use of the ECDI2030 for monitoring.
- Findings also suggest more research is needed on social and emotional development.
- Recommendations are made for ensuring the quality of data from caregiver surveys.

Abstract

Population-level monitoring of early childhood development (ECD) can inform research and guide national policy. One approach to population-level monitoring is through the design of surveys that (a) are feasible and cost-effective to implement at scale, (b) yield well-validated summaries of children's holistic development, and (c) can ideally support comparisons across national and cultural contexts. The Early Childhood Development Index 2030 (ECDI2030) is a caregiver-reported household survey designed to achieve these goals for children aged 24-59 months. This paper describes how the ECDI2030 was developed and provides initial results on its reliability, concurrent validity, and gender equity in nationally representative samples from Mexico (N=1641) and Palestine (N=1099). Overall, the results support the use of the ECDI2030 for population-level monitoring, but also suggest that the conceptualization of social-emotional development warrants further attention from researchers. Recommendations are made about statistical analyses that can be undertaken to ensure the quality of data collected from ECD assessments in international settings.

Introduction

Research across domains has converged on the critical importance of early childhood development (ECD). Poverty and environmental stressors have deleterious effects on neurological development in the early years of life (e.g., Blacketal., 2017; Luby,2015). Responsive caregiving, both inside and outside the home, provides children with opportunities to develop the cognitive and social-emotional skills required for success in school (e.g., Nores & Barnett,2010; Williamsetal., 2019). Consequently, investing in ECD can improve the lifelong well-being of individuals and provide economic returns in adulthood (e.g., Doyleetal., 2009; Gertleretal., 2014; Heckman,2006).

The importance of ECD as a central component of national and global development has been recognized through numerous policy initiatives seeking to increase access to high-quality early childcare and education (e.g., Sayreetal., 2015; UnitedNations,2015; UniversalChild Care and Early Learning Act,2021). However, the COVID-19 pandemic profoundly disrupted access to pre-primary care (McCoyetal., 2021), and has led to many challenges in re-prioritizing national-level policies (Neuman & Powers,2022), notably in low- and middle-income countries. In this context, it is especially important that nationally representative data are available to inform the need for and consequences of policy initiatives promoting ECD. One way to provide such data is through the design and implementation of surveys that can be used for population-level monitoring of ECD, which is the focus of the present paper.

Current conceptualizations of ECD emphasize the importance of a wide range of interrelated domains of human development (e.g., language, motor, social-emotional), which are themselves comprised of subdomains (e.g., receptive language, expressive language, print awareness). Several assessments of ECD have been designed to holistically measure these developmental domains in clinical settings (e.g., Bayley,2006, Squires & Bricker,2009; Frankenburgetal., 1992). More recently, multi-domain ECD assessments targeted at various age ranges between birth and 84 months have been developed for use across national contexts (e.g., GSED Team,2019; Halpinetal., 2019; Lancasteretal., 2018; McCoyetal., 2017, UNESCO,2017). Using these assessments, or adaptations thereof, for population-level monitoring requires that they (a) are feasible and cost-effective to implement at scale, (b) yield well-validated summaries of children's holistic development, and (c) can ideally support comparisons across national and cultural contexts.

This study describes how these challenges were addressed in the design of one particular population-level monitoring tool, the Early Childhood Development Index 2030 (ECDI2030; UNICEF,2022). The ECDI2030 is a 20-question household survey administered to primary caregivers, which is freely available in seven languages at the time of writing (UNICEF,2023). The ECDI2030 was developed using the psychometric theory of automated test assembly, which combines item response theory (IRT) with techniques from linear programming (vander Linden,2005). This paper describes the main steps used to develop the ECDI2030, which provides a case study of how the theory can be applied to population-level monitoring of ECD. We also provide initial evidence about the reliability, concurrent validity, and gender equity of the ECDI2030, using nationally representative samples from Mexico and the State of Palestine. A major implication of these analyses is the need for additional research on the conceptualization of children's social-emotional development and its relation to other developmental domains. In closing, we offer some recommendations about statistical analyses that can be undertaken to ensure the quality of data collected from assessments of ECD in international settings.

Section snippets

Background

The ECDI2030 was created in response to the United Nation's Sustainable Development Goal (SDG) 4.2, which aims to “ensure that, by 2030, all girls and boys have access to quality early childhood development, care, and pre-primary education so that they are ready for primary education” (UnitedNations,2023a). In particular, the ECDI2030 was designed to serve as SDG indicator 4.2.1, which addresses “the percentage of children aged 24-59 months who are developmentally on track in health, learning

Samples and data

Primary data on the ECDI2030 item pool were collected through representative household surveys implemented by national statistical offices in Mexico and the State of Palestine. These two countries were purposively selected based on existing partnerships and their availability to incorporate field testing of the ECDI2030 into previously scheduled surveys. The data collection methodology implemented in these primary samples is representative of the methodology to be used with the ECDI2030 more

Results

ATA. As shown in the last three columns of Table 1, the ATAs resulted in 17 out of 20 items in common across the two countries. Of the 17 items, 16 were included in the final ECDI2030. The remaining 4 items were selected based on input from the TAG. Note that while ECD45 (“Shows interest when others are sick”) was on the ATA forms in both countries, this item was ultimately dropped because it was considered too similar to ECD44 (“Offers to help someone”).

The final ECDI2030 form is shown in the

Discussion

The purpose of the ECDI2030 is to provide data that can be used for population-level monitoring of the development of children aged 24-59 months. In designing the assessment, a major challenge was to balance (a) the logistical considerations of large-scale survey administration in diverse national contexts with (b) current conceptualizations of ECD that emphasize children's holistic development across a range of domains including learning, health, and psychosocial wellbeing. To achieve this

Conclusion

As the ECDI2030 and similar tools begin to see wider application around the globe, it is important for researchers and policymakers to understand their design and interpretation, the evidence base supporting their use for population-level monitoring, and what steps can be taken to extend that evidence base as data become more widely available. This paper provided initial empirical evidence from Mexico and Palestine that suggests the ECDI2030 is suitable for population-level monitoring of the

CRediT authorship contribution statement

Peter F. Halpin: Conceptualization, Writing – original draft, Writing – review & editing, Methodology. **E. Filipa de Castro:** Data curation, Methodology. **Nicole Petrowski:** Writing – review & editing, Project administration. **Claudia Cappa:** Conceptualization, Resources, Supervision, Funding acquisition.

Recommended articles

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