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Study Protocol

Psychometric Properties of Instruments to Measure the Well-being of Young Children: A Systematic Review Protocol

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Abstract

Background: Child well-being is an important outcome and has received attention from researchers for decades. Until recently, there has been difficulty in drawing conclusions from these studies because of the wide variety of measures used. **Objective**: This systematic review aims to summarize and assess the measurement properties of existing child well-being instruments presented in the literature. **Methods**: This systematic review will focus on studies that evaluated the psychometric properties of instruments to measure the well-being of children ages two to seven. The search strategy will aim to locate studies in the English language completed from 2000 to 2023. The databases to be searched include MEDLINE via PubMed, CINAHL Plus, and Psychology & Behavioral Sciences Collection via EBSCOhost. Proquest Dissertations and Theses, Google Scholar, and ResearchGate will be used to search unpublished studies. Following the search, all identified citations will be collated in Mendeley. The full text of selected citations will be uploaded to JBI-SUMARI, assessed in detail against the inclusion criteria, and critically appraised using the COSMIN Risk of Bias checklist by two independent reviewers. Data will be extracted using JBI-SUMARI by one reviewer and verified by another. Findings will be reported using a narrative synthesis and tables. If possible, a meta-analysis will be performed. The evidence for each measurement property for each instrument will be compared against acknowledged standards for appropriate measurement characteristics using the COSMIN-proposed "criteria for good measurement properties." **Expected Results**: This systematic review will provide further evidence regarding the measurement properties of instruments used to measure the well-being of children, specifically in the early years. The findings of this study will be disseminated through a conference presentation and publication in a peer-reviewed journal. **PROSPERO registration number**: CRD4202342T8953.

Key Words*: well-being, early childhood, measurement properties, systematic review, research protocol*

INTRODUCTION

Child well-being is an important outcome and has received attention from researchers for decades. There has been significant progress in the research in this area.[1,2] However, until recently, there has been difficulty in drawing a conclusion from these studies because of a need for a unified definition and a wide variety of measures used.[3] Studies that utilize different definitions of well-being make use of different indicators to measure it. This prevents the comparison of the results of these studies. Also, while there has been renewed interest in this area in recent years, such as during the Covid-19 pandemic, fewer studies have been performed with younger children than those eight years old and above.[4] Because of this, the current systematic review will focus on studies with younger children as participants, specifically those two to seven years old.

The definitions of well-being in studies of early childhood contain common critical elements and describe well-being as multidimensional, context-specific, dynamic, and related to a child's ability to meet the demands of life, resulting in positive feelings such as happiness and self-satisfaction.[5–7] Examples of the definitions of

well-being used in early childhood research are the ones identified by Bjorgen[5], "When individuals have the psychological, social and physical resources they need to meet a particular psychological, social and/or physical challenge" by Dodge, Daly, Huyton & Sanders[8], and "…refers to feeling at ease, being spontaneous and free of emotional tension, and is crucial to good mental health"…. by Laevers[9].

Recent studies on young children's well-being measure various indicators and dimensions of well-being and utilize diverse instruments. These include emotional well-being using the Smiley Face Likert Scale and Children's Emotional Manifestation Scale,[9] mental well-being using the Strengths and Difficulties Questionnaire (SDQ),[11–13] social well-being using the Peer Interactive Play Scale and Test of Playfulness[8] psychosocial well-being using a questionnaire developed from the Bayley Scales of Infant Development and Ages and Stages Questionnaire, and physical well-being using a pedometer and body mass index (BMI).[14]

An initial literature search found an existing review of measurement tools for child well-being.[4] However, this review focused on the conceptualization of well-being and the characteristics of the child well-being instruments. The current review will focus on assessing the measurement properties of existing instruments used to measure the well-being of young children. The findings of this review will provide the necessary information and guidance to other researchers who plan to perform research on the well-being of young children and encourage more research with this population with findings that are easier to synthesize.

Objective. This systematic review aims to synthesize and assess the measurement properties of existing well-being instruments presented in the literature for children two to seven years old.

METHODS

The JBI methodology for the systematic review of measurement properties shall provide the necessary guidance for conducting this systematic review.[15]Click or tap here to enter text. Likewise, procedures shall adhere to the Consensus Based Standards for the Selection of Health Measurement Instrument (COSMIN) guidelines for systematic reviews of patient-reported outcome measures (PROMs).[16] The systematic review protocol has been submitted to PROSPERO (http://www.crd.york.ac.uk/prospero/), the International Prospective Register of Systematic Reviews (CRD4202342T8953) and documented following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocols.[17] (Refer to Supplementary Material A).

Eligibility Criteria. The characteristics of studies that will be included in this review are described in the succeeding paragraphs (Refer to Table 1).

Population. This systematic review will consider studies in which participants are children ages two to seven. Participants may be from any country and setting.

Instruments and Construct. Studies evaluating the psychometric properties of any patient-reported instrument to measure the well-being of children will be considered. Current definitions of child well-being consider it a multi-faceted construct dependent on the developmental stage and context and related to a child's needs and desires. [2,18,19]

Outcomes. This review will consider studies evaluating the psychometric properties of well-being instruments, specifically validity, including content, construct, cross-cultural, and criterion validity, and reliability, including internal consistency and measurement error, for inclusion.

Types of Studies. Primary studies, specifically psychometric studies that aim to develop or evaluate the measurement properties of instruments to measure child well-being, will be included in this review. Other studies that evaluated the validity and reliability of a child well-being instrument as part of its methodology will be considered. Studies that used a well-being instrument as an outcome measure only or used the instrument to validate another instrument will be excluded. Only full-text studies written in English and completed from 2000 to 2023 will be included.

Search Strategy. The precise search filter developed by COSMIN will be used to

Table 1. Selection criteria

Inclusion	Exclusion
Participant Children ages 2 to 7 years old Construct PROM on child well-being Outcome Psychometric properties of well-being instruments, specifically validity (content validity, construct validity, cross-cultural validity, criterion validity) and reliability (internal consistency, inter-rater and intra-rater reliability) *Types of Sources* Psychometric studies Instrument development Other primary studies that evaluated the psychometric property of the instrument as part of its procedure Full-text English language Published in 2000-2023	Fetal or neonate RCTs, used CWB instrument to validate another instrument

formulate the search strategy (Refer to Table 2)[20]. The search filter will be used in combination with terms related to the construct (i.e., "well-being") and population (i.e., child*) in the study. The databases to be searched include MEDLINE via PubMed, CINAHL Plus, and Psychology & Behavioral Sciences Collection via EBSCOHost. Unpublished studies will be searched in ProQuest Dissertations and Theses, Google Scholar, or ResearchGate. The search strategy will be modified for each database and will seek to find both published and unpublished studies. Additional studies will be searched in the reference list of the included publications.

Study/Source of Evidence Selection. Following the search, all identified citations will be collated and uploaded into Mendeley version 1.19.5, 2019 (Elsevier, London, UK). Pilot testing with ten abstracts will be performed by all the reviewers prior to screening. Two independent reviewers will screen titles and abstracts of eligible studies for full-text screening. The full text of selected citations will be uploaded in the Joanna Briggs Institute System for the Unified Management, Assessment, and Review of Information (JBI SUMARI)[21] and assessed in detail against the inclusion criteria by two independent reviewers. Reasons for excluding sources of evidence at the full text that do not meet the inclusion criteria will be recorded and reported. Any disagreements between the reviewers at each stage of the selection process will be resolved through discussion or with an additional reviewer if needed.

Assessment of Methodological Quality. The methodological quality of eligible studies for inclusion in a systematic review of measurement properties will be evaluated using the COSMIN Risk of Bias checklist.[22] After doing separate evaluations, the two reviewers will agree on the study scores. Where appropriate, a third reviewer will be consulted. An Excel sheet (Redmond, Washington, USA) from the COSMIN website will be utilized to organize the ratings ("Guideline for Systematic Reviews," 2022).

Data Extraction. One reviewer will use the JBI-SUMARI standardized data extraction tool (Refer to Supplementary Material B: Data Extraction Sheet) to retrieve data from the papers included in the systematic review. A second reviewer will verify accuracy. Information that will be collected includes study characteristics (i.e., study participants, design, and methods), instrument characteristics (i.e., instrument title, target population, number of items), and findings related to measurement properties (i.e., validity

and reliability). Discussion between the reviewers or the assistance of another reviewer will be performed to settle any disputes. The authors of the papers will be contacted if

Table 2. Sample search strategy from PubMed

Search strategy	Results
"well-being" OR "wellbeing" OR "well being" AND child* AND ((instrumentation[sh] OR Validation Studies[pt] OR ‘‘reproducibility of results’’[MeSH Terms] OR reproducib*[tiab] OR ‘‘psychometrics’’[MeSH] OR psychometr*[tiab] OR clinimetr*[tiab] OR clinometr*[tiab] OR ‘‘observer variation’’[MeSH] OR observer variation[tiab] OR ‘‘discriminant analysis’’[MeSH] OR reliab*[tiab] OR valid*[tiab] OR coefficient[tiab] OR ‘‘internal consistency’’[tiab] OR (cronbach*[tiab] AND (alpha[tiab] OR alphas[tiab])) OR ‘‘item correlation’’[tiab] OR ‘‘item correlations’’[tiab] OR ‘‘item selection’’[tiab] OR ‘‘item selections’’[tiab] OR ‘‘item reduction’’[tiab] OR ‘‘item reductions’’[tiab] OR agreement[tw] OR precision[tw] OR imprecision[tw] OR ‘‘precise values’’[tw] OR test–retest [tiab] OR (test[tiab] AND retest[tiab]) OR (reliab*[tiab] AND (test[tiab] OR retest[tiab])) OR stability[tiab] OR interrater[tiab] OR inter-rater[tiab] OR intrarater[tiab] OR intra-rater[tiab] OR intertester[tiab] OR inter-tester[tiab] OR intratester[tiab] OR intra-tester[tiab] OR interobserver[tiab] OR inter-observer[tiab] OR intraobserver[tiab] OR intra-observer[tiab] OR intertechnician[tiab] OR intertechnician[tiab] OR intratechnician[tiab] OR intra-technician[tiab] OR interexaminer[tiab] OR inter-examiner[tiab] OR intraexaminer[tiab] OR intra-examiner[tiab] OR interassay[tiab] OR inter-assay[tiab] OR intraassay[tiab] OR intra-assay[tiab] OR interindividual[tiab] OR inter-individual[tiab] OR intraindividual[tiab] OR intra-individual[tiab] OR interparticipant[tiab] OR inter-participant[tiab] OR intraparticipant[tiab] OR intra-participant[tiab] OR kappa[tiab] OR kappa’s[tiab] OR kappas[tiab] OR ‘‘coefficient of variation’’[tiab] OR repeatab*[tw] OR ((replicab*[tw] OR repeated[tw]) AND (measure[tw] OR measures[tw] OR findings[tw] OR result[tw] OR results[tw] OR test[tw] OR tests[tw])) OR generaliza*[tiab] OR generalisa*[tiab] OR concordance[tiab] OR (intraclass[tiab] AND correlation*[tiab]) OR discriminative[tiab] OR ‘‘known group’’ [tiab] OR ‘‘factor analysis’’[tiab] OR ‘‘factor analyses’’[tiab] OR ‘‘factor structure’’[tiab] OR ‘‘factor structures’’[tiab] OR dimensionality[tiab] OR subscale*[tiab] OR ‘‘multitrait scaling analysis’’[tiab] OR ‘‘multitrait scaling analyses’’[tiab] OR ‘‘item discriminant’’[tiab]OR ‘‘interscale correlation’’[tiab] OR ‘‘interscale correlations’’[tiab] OR ((error[tiab] OR errors[tiab]) AND (measure*[tiab] OR correlat*[tiab] OR evaluat*[tiab] OR accuracy[tiab] OR accurate[tiab] OR precision[tiab] OR mean[tiab])) OR ‘‘individual variability’’[tiab] OR ‘‘interval variability’’[tiab] OR ‘‘rate variability’’[tiab] OR ‘‘variability analysis’’[tiab] OR (uncertainty[tiab] AND (measurement[tiab] OR measuring[tiab])) OR ‘‘standard error of measurement’’[tiab] OR sensitiv*[tiab] OR responsive*[tiab] OR (limit[tiab] AND detection[tiab]) OR ‘‘minimal detectable concentration’’[tiab]OR interpretab*[tiab] OR (small*[tiab] AND (real[tiab] OR detectable[tiab]) AND (change[tiab] OR difference[tiab])) OR ‘‘meaningful change’’[tiab] OR ‘‘minimal important change’’[tiab] OR ‘‘minimal important difference’’[tiab] OR ‘‘minimally important change’’[tiab] OR ‘‘minimally important difference’’[tiab] OR ‘‘minimal detectable change’’[tiab] OR ‘‘minimal detectable difference’’[tiab] OR ‘‘minimally detectable change’’[tiab] OR ‘‘minimally detectable difference’’[tiab] OR ‘‘minimal real change’’[tiab] OR ‘‘minimal real difference’’[tiab] OR ‘‘minimally real change’’[tiab] OR ‘‘minimally real difference’’[tiab] OR ‘‘ceiling effect’’[tiab] OR ‘‘floor effect’’ [tiab] OR ‘‘Item response model’’[tiab] OR IRT[tiab] OR Rasch[tiab] OR ‘‘Differential item functioning’’[tiab] OR DIF[tiab] OR ‘‘computer adaptive testing’’[tiab] OR ‘‘item bank’’[tiab] OR ‘‘cross-cultural equivalence’’[tiab]))	2843
Limits: Full-text only	Date last searched: May 31, 2023

YEAR 2000 – 2023
Age: Preschool child 2-5 years
Child 6-12 years

additional information is required or if any data is missing.

Data Synthesis. Findings will be reported using a narrative synthesis and tables to include the methodological quality of the studies, consistency of the results, and homogeneity of the studies and tables presenting the study and instrument characteristics. If possible, a meta-analysis of the general effect sizes of the measurement properties will be performed.

Using the COSMIN-proposed "criteria for good measurement properties," the evidence for each measurement property for each instrument of interest will be compared against acknowledged standards for appropriate measurement characteristics.[16] Each measurement attribute can be classified as sufficient, insufficient, or undetermined based on these criteria. This total score is crucial in establishing if a measurement tool is suitable for usage with specific demographics and situations.

EXPECTED RESULTS

This systematic review will provide further evidence regarding the measurement properties of instruments used to measure the well-being of children, specifically in the early years. The findings of this review may enable researchers to perform more studies with young children with results that are easier to synthesize and to identify gaps that could be addressed by future research in this area. This study will be disseminated through a conference presentation and publication in a peer-reviewed journal.

Individual Author's Contributions

All authors contributed equally to the development and writing of this systematic review protocol.

Disclosure Statement

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Conflicts of interest

PME and ING are part of the editorial board of PJAHS.

Supplementary Materials

Supplementary Material A. PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) 2015 Checklist

Supplementary Material B. Data Extraction Instrument

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