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## A Review of Data Analysis for Early-Childhood Period: Taxonomy, Motivations, Challenges, Recommendation, and Methodological Aspects

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### Abstract

Early childhood is a significant period when transitions take place in children. This period is a hot topic among researchers who pursue this domain across different scientific disciplines. Many studies addressed social, scientific, medical, and technical topics during early childhood. Researchers also utilized different analysis measures to conduct experiments on the different types of data related to the early childhood to produce research articles. This paper aims to review and analyze the literature related to early childhood in addition to the data analyses and the types of data used. The factors that were considered to boost the understanding of contextual aspects in the published studies related to early childhood were considered as open challenges, motivations, and recommendations of researchers who aimed to advance the study in this area of science. We systematically searched articles on topics related to early childhood, the data analysis approaches used, and the types of data applied. The search was conducted on five major databases, namely, ScienceDirect, Scopus, Web of Science, IEEE Xplore, and PubMed from 2013 to September 2017. These indices were considered sufficiently extensive and reliable to cover our field of the literature. Articles were selected on the basis of our inclusion and exclusion criteria (n = 233). The first portion of studies (n = 103/233) focused on the different aspects related to the development of children in early age. They discussed different topics, such as the body growth development of children, psychology, skills, and other related topics that overlap between two or more of the previous topics or do not fall into any of the categories but are still under development. The second portion of studies (n = 107/233) focused on different aspects associated with health in early childhood. A number of topics were discussed in this regard, such as those related to family health, medical procedures, interventions, and risk that address the health-related aspects, in addition to other related topics that overlap between two or more of the previous topics or do not fall into any of the categories but are still under health. The remaining studies (n = 23/233) were categorized to the other main category because they overlap between the previous two major categories, namely, development and health, or they do not fall into any of the previous main categories. Early childhood is a sensitive period in every child's life. This period was studied using different means of data analysis and with the aid of different data types to produce different findings from the previous studies. Research areas on early childhood vary, but they are equally significant. This paper emphasizes the current standpoint and opportunities for research in this area and boosts additional efforts toward the understanding of this research field.

### Keywords

**Author Keywords:** Early-childhood; panel data; longitudinal data; cross-sectional time series data  
**KeyWords Plus:** EARLY-LIFE EXPOSURE; SICKLE-CELL TRAIT; YOUNG-CHILDREN; BLOOD-PRESSURE; MENTAL-HEALTH; SOCIOECONOMIC-STATUS; GROWTH TRAJECTORIES; MEDIATING ROLE; LOW-INCOME; COGNITIVE-DEVELOPMENT

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