

# HEALTH PROMOTION INTERVENTION TO ACCELERATE EARLY CHILD DEVELOPMENT: SCOPING REVIEWS

Ida Nursanti<sup>1,3)</sup>, Bhisma Murti<sup>2)</sup>, Sri Mulyani<sup>1)</sup>

<sup>1)</sup>Doctoral Program in Public Health, Universitas Sebelas Maret, Surakarta

<sup>2)</sup>Master's Program in Public Health, Universitas Sebelas Maret, Surakarta

<sup>3)</sup>Department of Nursing, Universitas Jenderal A. Yani, Yogyakarta

## ABSTRACT

**Background:** Child development issues are of concern to the global community, and are often found in developing countries due to stunting or extreme poverty. Behavior change health promotion interventions are believed to increase the acceleration of early childhood development. This study aimed to review research on various intervention strategies in efforts to develop children and accelerate early childhood development.

**Subjects and Methods:** The scope of this review of studies explores the available literature using the PubMed, Science Direct, ProQuest, and Clinical Key electronic databases. Include randomized controlled trials that examine child development health promotion interventions on early childhood development. Selecting articles online published between 01 July 2012 to 31 July 2022, identified 1,924 articles, and 11 of them met the inclusion criteria. Data were analyzed narratively.

**Results:** Interventions to accelerate child development are carried out through health promotion and behavior change provided at the family level and in schools that provide care for early childhood (0-72 months). The intervention strategies used include health education, providing play equipment, providing incentives, involving the role of the family (husband) and the environment (peers, cadres, PAUD teachers, and health workers). Interventions are carried out within a period of 6-12 months with home visits, group meetings, and visits to clinics, integrated health center, and schools. The results of the intervention revealed that there were 3 studies that had little effect on changes in behavior stimulating development, but all studies succeeded in increasing the acceleration of early child development.

**Conclusion:** Intervention strategies that integrate efforts to increase knowledge, skills, availability of social support and facilities can be used effectively in improving child development behavior and accelerating early child development.

**Keywords:** early child development, stimulation, behavior change.

## Correspondence:

Ida Nursanti. Doctoral Program in Public Health, Universitas Sebelas Maret, Surakarta. Jl. Ir. Sutami 36 A, Surakarta 57126, Central Java, Indonesia. Email: nursantida@gmail.com. Mobile: +6281225412615.

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## BACKGROUND

The quality of children shows the quality of human resources (HR), which influences the economy and development of a nation (De Onis and Branca, 2016). The quality of children is indicated by optimal development, namely the achievement of children's physical,

cognitive, motor, and socio-emotional development according to their age, and having multiple intelligences according to their genetic potential (Clark et al., 2020). The occurrence of developmental delays in children results in barriers to cognitive abilities, decreased academic achievement, and

low opportunities to earn a decent income and welfare in the future (Evans et al., 2013; Daelmans et al., 2015; De Onis and Branca, 2016).

The failure of children to fulfill their development according to their potential is still a problem in many countries, especially in low- and middle-income countries. The results of a global analysis by Lu et al., (2016), in 2010, an estimated 43%, or 250 million children under five, are at risk of not fulfilling their development potential due to exposure to stunting or extreme poverty. After almost a decade, based on the results of the 2018 national health data analysis in several developing countries, a decrease in the percentage of developmental delays in children aged 36-59 months was found, namely in Indonesia 10.3% (Saptarini et al., 2021), Bangladesh 25%, Costa Rica 14.1%, and Ghana 30.7% (Haq et al., 2021). However, the occurrence of developmental delays in children under three years of age is still high, the results of a review of 19 studies conducted by Emmers et al. (2021), it is known that 85% of 3,353 children in rural areas of China have at least one type of developmental delay, namely 49% cognitive, 52% language, 53% social-emotional, and 30% motor.

Improving child development can be done by promoting health care and early childhood care. Parents have an obligation and responsibility for quality care by providing stimulation to children so they can grow and develop optimally (WHO, 1997). Child development stimulation must begin within the first 1000 days of life, as this is a critical period for the development of the brain's nervous system, which is

very sensitive to environmental stimuli and lasts only a short time (Fox et al., 2010). According to the research results of Miguel et al. (2019) and Sinani et al. (2022), stimulation of development through the enrichment of positive environmental exposures is proven to reduce the risk of delays in the development of the nerves that occur in the early days of life. The stimulation provided will support brain nerve maturation, stimulate nerve cell synapses to improve neurotropism, and release neurotransmitters to build a strong brain architecture (Bundy et al., 2018; Black et al., 2017; Britto et al., 2017; Sinani et al., 2022).

Stimulating activities do not require special time, they can be carried out together with daily routine activities with children, such as when playing, studying, eating, bathing, and watching television (Kington et al., 2013; Landry et al., 2008; McFayden et al., 2020). Family awareness about the importance of quality care needs to be increased, and through the promotion of healthy behaviors, it is expected to increase the role and responsibility of parents in quality child care. Families can provide quality care and improve child development if they have information (Zhong and Luo, 2020), knowledge (Zhong et al., 2020), self-efficacy (Wang et al., 2022), and good parenting skills (Zhong et al., 2020).

Unfortunately, there are not many studies on intervention strategies in efforts to promote child development behaviors and accelerate early childhood development. The review conducted by Jeong et al., (2021) regarding parenting interventions is still limited to children aged less than

three years who are in family care. We reviewed the published literature to assess the scope of interventions that promote early childhood development in family settings, orphanages, and early childhood schools. The goal that we set to guide the scoping of this review is to identify intervention strategies in an effort to promote child development behaviors and accelerate early childhood development.

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## SUBJECTS AND METHOD

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### 1. Study Design

This research is a scoping review. Articles were obtained from four online databases, namely PubMed, Science Direct, ProQuest, and Clinical Key. The keywords used in the article search are "Health Promotion" OR "School Health Services" OR "Health Education" AND "Parenting" OR "Mother-Child Relations" AND "Child Development" OR "Growth and Development".

### 2. Inclusion Criteria

The inclusion criteria we used in this study were guided by Peters et al. (2020), which include participants, concepts, and contexts. We included randomized controlled trials that tested health promotion interventions for behavior change in early childhood development.

Child development promotion interventions are carried out at the family and school levels that care for children aged 0-72 months. Interventions are aimed at mothers, other family members, and PAUD teachers.

English publications published in the last 10 years (from July 1, 2012, to July 31, 2022).

### 3. Exclusion Criteria

This study did not include literature with an observational research design or using secondary data. Children with poor nutritional status are given interventions, and the results of the intervention only show one of the aspects set in the goal (measures only the results of child development behavior or child development outcomes).

### 4. Data Analysis

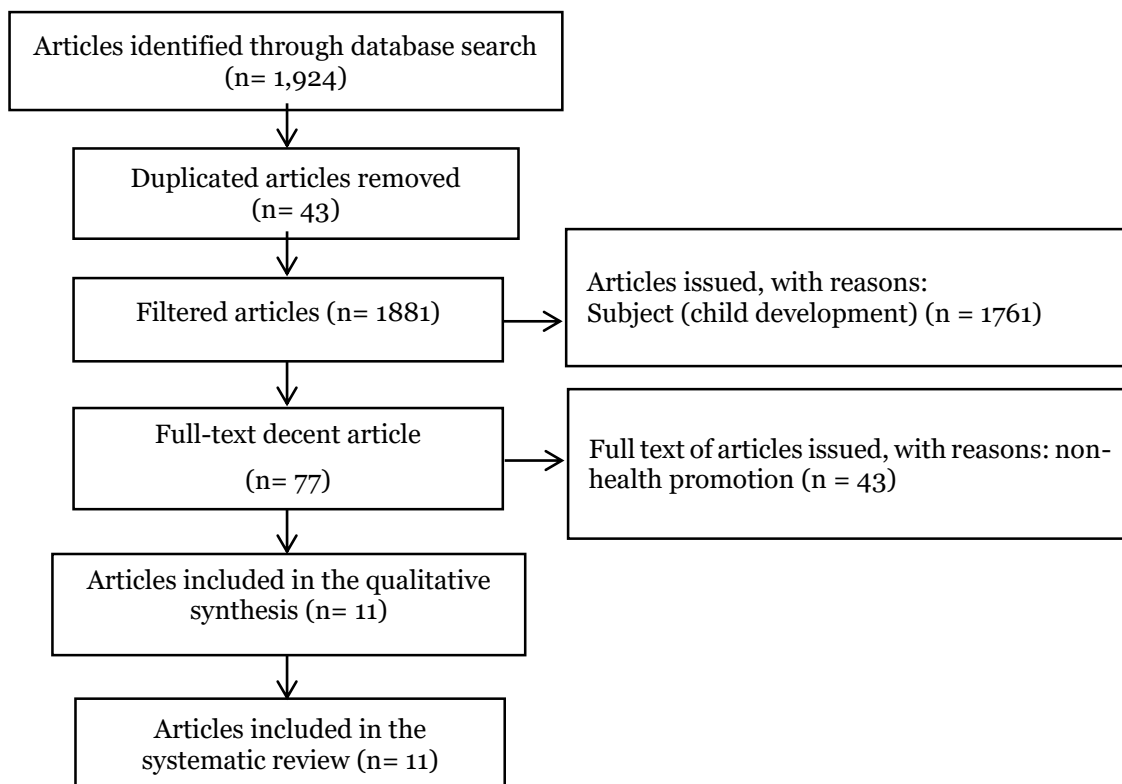
In the initial stages, 1,924 articles were discovered. Multiple articles were issued totaling 1,881. There were 77 articles published. From the search results, 11 journals were relevant to be reviewed.

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## RESULTS

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Electronic search results returned as many as 1,924 articles. We found 42 duplicates, the number of articles considered further was 1,881 articles. Furthermore, a selection was made based on the subject (child development), 1761 articles were issued, and based on the type of intervention (non-health promotion), 43 articles were issued. After selecting based on the title and abstract, there were 77 articles with full text that were assessed. Each article was identified based on established criteria, 65 non-RCT intervention articles were found. Finally, 11 articles were identified according to the study criteria. The flowchart in figure 1.



**Figure 1. Results of PRISMA flow diagram**

### **Intervention Strategy**

Child development intervention settings are carried out in early childhood for children who are in family care, and there is one study showing that parenting by teachers in PAUD schools is used as a control (Özler et al., 2018). Intervention began to be given to families with children aged 0-72 months. All studies target behavior change interventions aimed at mothers, as well as husbands (Singla et al., 2015; Jensen et al., 2021; Luoto et al., 2021), and PAUD teachers (Özler et

al., 2018). Table 1 compiles all health promotion strategies in an effort to accelerate early childhood development.

All interventions for changing the behavior of mothers/caregivers in an effort to accelerate development are carried out through health education. In addition, interventions were also found by providing play equipment or reading books (Hartinger et al., 2017; Weisleder et al., 2018) and providing incentives to PAUD teachers (Özler et al., 2018).

**Table 1. Intervention Strategy for the Promotion of the Acceleration of Early Childhood Development**

<b>Studies (Country)</b>	<b>Participants</b>	<b>Strategies</b>	<b>Measurements</b>	<b>Results</b>
<b>Andrew et al., 2020 (India)</b>	Population: mother-child pairs aged 10-20 months. The sample size of 559 was divided into 2 groups: 267 interventions and 292 controls.	Providing health education: Material: Psychosocial stimulation for child development, and Provision of a home environment that supports child development Executor: cadre Technique: home visits Time: 18 months.	Mother's knowledge about psychosocial stimulation was measured by a questionnaire The mother's stimulation skills were measured by structured interviews. The quality of the home environment is measured by observation. Child development is measured by the Bayley-3 scale.	Intervention increases: The quality of the environment that supports the development of children Accelerating the development of children in cognitive abilities, language and fine motor skills. There is no increase in mother's knowledge about stimulation of child development.
<b>Hamdani et al., 2019 (Bangladesh)</b>	Population: mother-child pairs aged 5-24 months. The sample size of 687 was divided into 2 groups: 344 interventions and 343 controls.	Providing health education: 1. Material: Quality care, Stimulation of development 2. Executor: health officer 3. Technique: visits to community clinics 4. Time: 12 months.	Mother's knowledge about parenting was measured by a questionnaire Mother's skills in stimulating child development are measured by observation. Child development is measured using the Bayley-3 scale.	Intervention improves: Mother's knowledge of child-care. Mother's skills stimulate child development. Acceleration of children's development in cognitive, language, motor, and behavioral abilities (responsive and cooperative).
<b>Hartinger et al., 2017 (Peru)</b>	Population: mother-child pairs aged 6-35 months. The sample size of 534 was divided into 2 groups: 258	Providing health education: 1. Material: Developmental stimulation Provide play equipment	Mothers' parenting behavior was measured by interviews. Child development is measured using a national standardized child development checklist.	Intervention improves: Mother's confidence to interact more often with children. Acceleration of child development in each developmental domain (12 domains), but the

<b>Studies (Country)</b>	<b>Participants</b>	<b>Startegies</b>	<b>Measurements</b>	<b>Results</b>
	interventions and 276 controls.	2. Executor: PAUD teacher 3. Technique: home visit 4. Time: 12 months.		most prominent is fine motor skills.
<b>Jensen et al., 2021 (Rwanda)</b>	Population: parents (mothers and fathers) with children aged 6-36 months. The sample size of 1,029 was divided into 2 groups: 528 interventions and 501 controls.	Providing health education: 1. Topic: Parenting 2. Executors: professional officers and peers. 3. Technique: home visit. 4. Time: 12 months.	Family parenting practices were measured by a questionnaire Child development was measured by questionnaires, observations, and interviews with primary caregivers Father's involvement in parenting is measured by observation	Intervention improves: Higher quality parenting practices Father's involvement in parenting Acceleration of children's development in motor skills, communication, problem solving, and personal and social development.
<b>Luo et al., 2019 (China)</b>	Populasi: pasangan ibu - anak usia 6-18 bulan. Besarnya sampel 449 dibagi dalam 2 kelompok: 222 intervensi dan 227 kontrol.	Providing health education: 1. Topic: Child health care, and quality care 2. Executor: health officer. 3. Technique: home visit. 4. Time: 12 months.	The caregiver's level of trust in parenting was measured by a questionnaire. Parenting skills and practices were measured by a questionnaire. Child development is measured by the Bayley-3 scale	1. Intervention increases: Caregivers' beliefs stimulate development. The ability to practice stimulation of child development. Child health status. The acceleration of children's development in the intervention group was only on cognitive abilities. 2. There was no effect of the intervention on language skills, social emotional and skills.
<b>Luoto et al., 2021 (Kenya)</b>	parents (mother and father) with children aged 6-24 months. Sample	Providing health education: 1. Material: Child development.	Mother's knowledge was measured with a questionnaire.	1. Intervention increases: Knowledge about child development in the group of

<b>Studies (Country)</b>	<b>Participants</b>	<b>Startegies</b>	<b>Measurements</b>	<b>Results</b>
	size: 1,152 divided into 3 groups: 376 intervention I, 400 intervention II, and 376 controls.	Developmental stimulation 2. Executors: health cadres 3. Techniques: group meetings and home visits. 4. Time: 8 months	Stimulation practices were measured by questionnaires and observation. Child development is measured by the Bayley-3 scale.	mothers who received the intervention. Stimulation practices carried out by parents at home. The acceleration of child development stands out in cognitive, language, and social-emotional aspects 2. No measurable effect was found on father involvement in the intervention group.
<b>Ozler et al., 2018 (Malawi)</b>	Population: mother-child pairs aged 36-61 months. Sample size: 2,400 children participating in the PAUD program. Divided into 4 groups, and each group 600 children.	Population: mother-child pairs aged 36-61 months. Sample size: 2,400 children participating in the PAUD program. Divided into 4 groups, and each group 600 children.	The quality of the home environment that supports parenting is measured by a questionnaire. Mother's ability to do parenting was measured by a questionnaire. Educational practice in PAUD is measured by observation. Child development is measured by standardized instruments.	1. Intervention increases: Quality of parenting done by parents. The accelerated development of children who are cared for by parents has a higher score in terms of language and socio-emotional than children who are cared for by PAUD teachers. 2. The teacher training intervention group and teacher incentives did not have a significant effect on the quality of childcare.
<b>Pitchik et al., 2021 (Bangladesh)</b>	Population: nanny couples aged less than 15 months. Sample size: 621 divided into 3	Providing health education: 1. Material: Childcare and provision of a suitable home	Parenting practices were measured using an observation sheet.	Intervention improves: The activeness of caregivers in play activities. The acceleration of child development is most prominent

<b>Studies (Country)</b>	<b>Participants</b>	<b>Startegies</b>	<b>Measurements</b>	<b>Results</b>
	groups: 160 intervention I, 160 intervention II, and 301 controls.	environment for childcare. 2. Executor: health cadres 3. Technique: intervention I with group meetings and intervention II with group meetings and home visits. 4. Time: 9 months.	The quality of the home environment was measured using an observation sheet. Child development using the Bayley-3 scale	in the language aspect, in addition to motor skills, social skills, and problem solving.
<b>Singla et al., 2015 (Uganda)</b>	Population: parents (mothers and fathers)- children aged 12-36 months. Sample size: 292 divided into 2 groups: 160 interventions and 132 controls.	provide health education: 1. Material: child care (disease prevention and nutrition) and child development and parenting (psychosocial stimulation) 2. Executor: peers 3. Techniques: group meetings and home visits. 4. Time: 3 months	Mother's knowledge about child development was measured using a questionnaire. Mother's knowledge of developmental stimulation was measured using a questionnaire. Child development is measured by the Bayley-3 scale.	Intervention improves: Mother's knowledge of child care. Mother's knowledge of child development. Mother's ability to practice stimulation The acceleration of child development stands out in cognitive and language aspects.
<b>Susanto et al., 2019 (Indonesia)</b>	Population: mother-child pairs aged 0-72 months. Sample size: 160 divided into 2 groups: 80 intervention and 80 control	Health education: 1. Topic: Childcare and Childcare 2. Executor: health cadres 3. Technique: visit to Posyandu 4. Time: 12 months	Mother's confidence in parenting was measured by structured interviews Child development is measured using the Developmental Pre-Screening Questionnaire (KPSP).	Intervention improves: Have confidence in doing innovative and quality parenting Significantly the proportion of normal development in the intervention group



<b>Studies (Country)</b>	<b>Participants</b>	<b>Startegies</b>	<b>Measurements</b>	<b>Results</b>
<b>Weisleder et al., 2018 (Brazil)</b>	Population: mother-child pairs aged 24-48 months. Sample size: 566 divided into 2 groups: 279 intervention and 287 control.	1. Health education Material: read a story book. Executor: trained facilitator Technique: daycare visits Time: 12 months 2. Provide reading books to read to children at home.	Parent-child interaction is measured by observation. Reading practice was measured by structured interviews. Child development is measured by a questionnaire.	Intervention improves: Active involvement of parents in cognitive stimulation. Quality and quality in reading interaction. Acceleration of children's development in cognitive, language, and socio-emotional.

Almost all studies provide that the subject matter of health education is quality parenting (parent-child stimulation and interaction). Other material provided includes providing an appropriate environment for parenting (Andrew et al., 2020; Pitchik et al., 2021), child health care (Singla et al., 2015; Luo et al., 2019; Susanto et al., 2019). There is only one study that specifically provides material about increasing mother-child interaction through reading activities (Weisleder et al., 2018). Behavior change health education is carried out directly with home visits, group meetings, and visits to clinics/integrated health services or PAUD schools. In addition to health workers and professionals, interventions involve the role of the community, such as peers, cadres, and PAUD teachers. Intervention is given within a period of 3–18 months.

The intervention of the effect of knowledge, skills, self-confidence, and child development behavior are some of the variables measured by changes in parent or teacher behavior. Measurements were carried out using questionnaires, observations, and interviews. Aspects of child development are measured using standardized measurement tools, 6 studies used the Bayley-3 international scale measurement tool that measures cognitive, motoric, language, and social-emotional abilities, (Singla et al., 2015; Hamadani et al., 2019; Luo et al., 2019; Andrew et al., 2020; Luoto et al., 2021; Pitchik et al., 2021) and the rest used standardized measurement tools used by each country where the study was conducted, such as the developmental pre-screening questionnaire

(KPSPP). used in Indonesia (Susanto et al., 2019).

Most of the behavior change and health education interventions have a significant influence on the knowledge, skills, and confidence of parents in stimulating development in early childhood. There are three studies that are less successful in influencing behavior change, namely mother's knowledge (Andrew et al., 2020), father's involvement (Luoto et al., 2021), and parenting practices by PAUD teachers (Özler et al., 2018). All intervention strategies have a positive effect on the accelerated development of early childhood, most of which show significant differences in the accelerated development of cognitive, language, and social-emotional abilities.

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## DISCUSSION

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According to WHO (2020), efforts to promote optimal child development can be carried out by fulfilling children's essential needs, which include integrated nutrition interventions, early learning, and positive parenting. Positive parenting can be done through quality family social interactions, namely interactions based on affection, mutual respect, fulfilling and protecting children's rights, building warm, friendly, and friendly relationships between children and parents, and stimulating children's growth and development from an early age. Hirve et al., 2021). The stimulation provided will stimulate basic abilities so that children grow and develop optimally (WHO, 1997). An intervention strategy for promoting child development aimed at families is appropriate, considering that most of the time, early

childhood is still in family care.

Both parents have obligations and responsibilities for child care by providing stimulation from an early age and a positive social environment. Mothers were identified as the primary target of child development promotion interventions by all researchers; in the household setting, mothers were regarded as the primary role holders in child rearing. Stimulating activities can also be carried out together with routine daily activities with children, such as when playing, studying, eating, bathing, and watching television (Kington et al., 2013; Landry et al., 2008; McFayden et al., 2020). However, not all mothers can take good care of them because of the stress from the busy daily household chores, work, young age, and low education. These conditions affect the mother's ability to stimulate and provide proper care (Emmers et al., 2021; Haq et al., 2021; Saptarini et al., 2021).

Promotion of child development at an early age is a priority, and stimulation of child development must be given as early as possible. This is based on the fact that the first 1000 days of life are a critical period for developing children's skills and intelligence, the brain's nervous system develops faster, is very sensitive to environmental stimuli, and lasts a short time (Fox et al., 2010). Based on the results of Barreto et al. (2017) and Ma et al. (2016), the intensity and quality of parental stimulation will affect the improvement of cognitive, language, and socio-emotional abilities in early childhood, and the effect of stimulation will be more effective if done early.

Based on the review of existing articles, all studies applied behavior change interventions through health education. Through the promotion of health behavior change, it is expected to increase the role and responsibility of parents in quality child care. The interventions provided will increase knowledge, self-efficacy, motivation, and developmental stimulation skills through parent-child interaction (Jeong et al., 2021). According to Bloom's Taxonomy, behavior is divided into three domains, namely the cognitive domain, the affective domain, and the psychomotor domain (Chambers, 2020). Individuals will practice the desired health behavior if they have the right information, good motivation, and effective skills (Fisher and Fisher, 1992).

Mothers' knowledge, attitudes, and beliefs about improving child development are influenced by the involvement of family members, peers, cadres, PAUD caregivers, and health workers (Rockers et al., 2018; Jeong et al., 2021; Kim et al., 2021). Including husbands as intervention recipients and involving peers, cadres, and PAUD teachers as intervention providers will be useful for developing a sense of social support and a perception of social norms. Parents will be more responsive and motivated to stimulate and provide a positive environment if they have the support of family and friends (Mizutani et al., 2019; Kim et al., 2021; Kuhn et al., 2021). Interventions carried out in groups can also facilitate social support for mothers, they interact with each other to exchange information and learn about child development (Chang et al., 2014). A

high level of social support will increase individual attitudes toward child development to be more positive (Fisher and Fisher, 2002).

Behavior changes interventions in child development and seeing the results of child development are processes, so the intervention techniques planned to carry out behavior change interventions require sufficient time (Hulme, 1999). The duration of the intervention was 6–18 months, and the duration of the intervention affected the duration of the intervention effect. The intervention's effect on behavior change lasted from immediately after to 12 months later. One previous study suggested that a 6-week behavioral intervention could show behavioral changes that lasted 12 months post-intervention (Pearson et al., 2007).

All studies show that successful interventions accelerate early childhood development. Intervention strategies that combine efforts to increase knowledge, skills, and behavior encouragement can be used effectively to improve child development behavior and accelerate early childhood development. The availability of play equipment and an appropriate environment to support parenting is also important for increasing parental involvement in caring for children (Özler et al., 2018; Rhoad-Drogalis et al., 2020). Study results that show an effective behavior change intervention model are needed to increase the effectiveness of the child development intervention approach.

#### **AUTHOR CONTRIBUTIONS**

Ida Nursanti prepared the first draft of

the research protocol, and then Bhisma Murti and Sri Mulyani gave direction on developing the first draft. All authors contributed to the development of the eligibility criteria, search strategy, and selection of articles for inclusion in the study. All authors read and approved the final manuscript.

#### **FUNDING AND SPONSORSHIP**

The research implementation was supported financially by Jenderal A. Yani University, Yogyakarta. Funders are not involved in research, manuscript writing, and publication.

#### **CONFLICT OF INTEREST**

The authors declare no conflict of interest in this study.

#### **ACKNOWLEDGEMENT**

The author would like to thank all parties involved in this research.

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