

Factors that affect cognitive and mental emotional development of children: a scoping review

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ABSTRACT

One of the factors that affect the quality of children is growth and development that takes place optimally. Cognitive and mental emotional development is very important for children's growth and development both for the present and the future. The purpose of this scoping review was to determine the factors that are related to the cognitive and mental emotional development of children.

The method of this scoping review uses 4 databases (Pubmed, Wiley Online Library, Science Direct, and Springer Link), the search is limited to articles published in the last 10 years (2010-2020). The study was identified using the PRISMA flowchart, in conducting critical appraisal the researcher conducted an assessment using JBI tools.

The findings of this scoping review are that factors that are associated with children's cognitive development are parental factors (maternal depressive and anxiety disorder) and child factors (child's condition at birth, stunting, and hemoglobin levels). Factors related to children's emotional mental development are parental factors (family socioeconomic, parenting styles, family mental health, parental education level, and parents' marital conflict), child factors (children's health conditions), and factors other (regional characteristics).

Of the factors associated with children's cognitive development, the most frequent factor emerged from the 10 articles reviewed, namely the factors of the parents maternal depressive and anxiety disorder and the factors of the child, namely the condition of the child at birth. Then, from the factors related to the mental emotional development of children, the parent factor in the form of family socioeconomic factors is the most frequent factor that appears from the 10 articles that have been reviewed.

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1. Introduction

One of the factors that affect the quality of children is growth and development that takes place optimally. Cognitive and mental emotional development is very important for children's growth and development for both the present and the future (Marliana, 2018). Early childhood development forms the basis of adult health and well-being and is an important component of the Sustainable Development Goals (SDGs). The quantification of children with poor development is a global challenge, as there are no established standards for measuring child development, nor are there representative population data for early skills of children in low and middle income countries (WHO,

2020b). Cognitive and mental emotional development is very important for the development of children both for the present and the future, so that special attention is needed in detecting cognitive and mental emotional development problems and what factors are related to developmental problems that occur (Lu et al., 2016).

By the time a child is around 3 years old, the child's basic neuronal connection system is well connected, while the neural network begins to expand, strong connection pathways are built in the associative network (Ac et al., 2016)(*Body Size at Birth, Physical Development and Cognitive Outcomes in Early Childhood: Evidence from the Longitudinal Survey of Australian Children: Education Economics*., 2020). These pathways strengthen the connections between the hearing and visual centers, between the auditory and motor areas, allowing better coordination of the visual, auditory and motor nerves. As these connections become stronger, the child begins to control creaks, stops, moves again, changes direction suddenly, imitates other people's movements such as clapping or kicking at high speed. With the strong capacity of the brain network, it allows children to do movements to twist, jump, run, tiptoe, walk on tiptoes and so on. Then at this age the mental abilities of the child are more refined than the previous age (Davis-Kean & E, 2005). In addition, the child's brain has also been able to think symbolically by using abstract concepts (Rodriguez et al., 2011). By the time the child is 4 - 6 years old, the structure of the child's nerve connections is functioning properly so that it can coordinate the brain and movement, both physically and non-physically. At this age, children generally enter kindergarten (Kindergarten) or the equivalent. Therefore, kindergarten was created as a bridge to facilitate the transition period between infancy and childhood (Investigators, 2018).

Adequate responsive stimulation during the first years of life is important for children to reach their development potential (Grazuleviciene, R., Andrusaityte, S., Petraviciene & Balseviciene, 2017). The first thousand days, which lasts from conception to the end of the second year of the child, is a very important period for cognitive development (Behere et al., 2017). In this period, minor brain disorders due to biological and psychosocial factors can affect the structural and functional development of the brain.

It is estimated that more than 200 million children worldwide are not developing to their full cognitive potential. The impact of the problem on cognitive development is loss of human potential, associated with > 20% deficit in adult income with broader implications for national development (de Onis et al., 2013). Ensuring optimal cognitive development, benefiting the country's social and economic growth and helping to break the intergenerational cycle of poverty (Investigators, 2018). Apart from cognitive development, another factor that becomes an important focus in child development is mental and emotional development of children. Indonesian health data in 2007 shows that 11.6% of children and adolescents experience mental and emotional health problems or around 19 million people (Google Cendekia, 2020b). Based on data from the 2015 Global School Based Student Health Survey, there were 60.17% of junior high school students experiencing symptoms of emotional mental disorders, with details of 44.54% experiencing loneliness, 40.75% feeling anxious and as much as 7.33% having wanted to commit suicide (Mubasyiroh et al., 2017)(Prendergast, A. J., Humphrey, 2014).

2. Method

2.1 Research Question

The [table 1](#) describes the PEO framework to develop the scoping research question.

Table 1. PEOs Framework

P (Population)	E (Exposure)	O (Outcomes)
Children who are in the age range of 3 to 6 years	Factors that influence cognitive and mental emotional development of children	Symptoms of a child's cognitive and mental emotional development problems

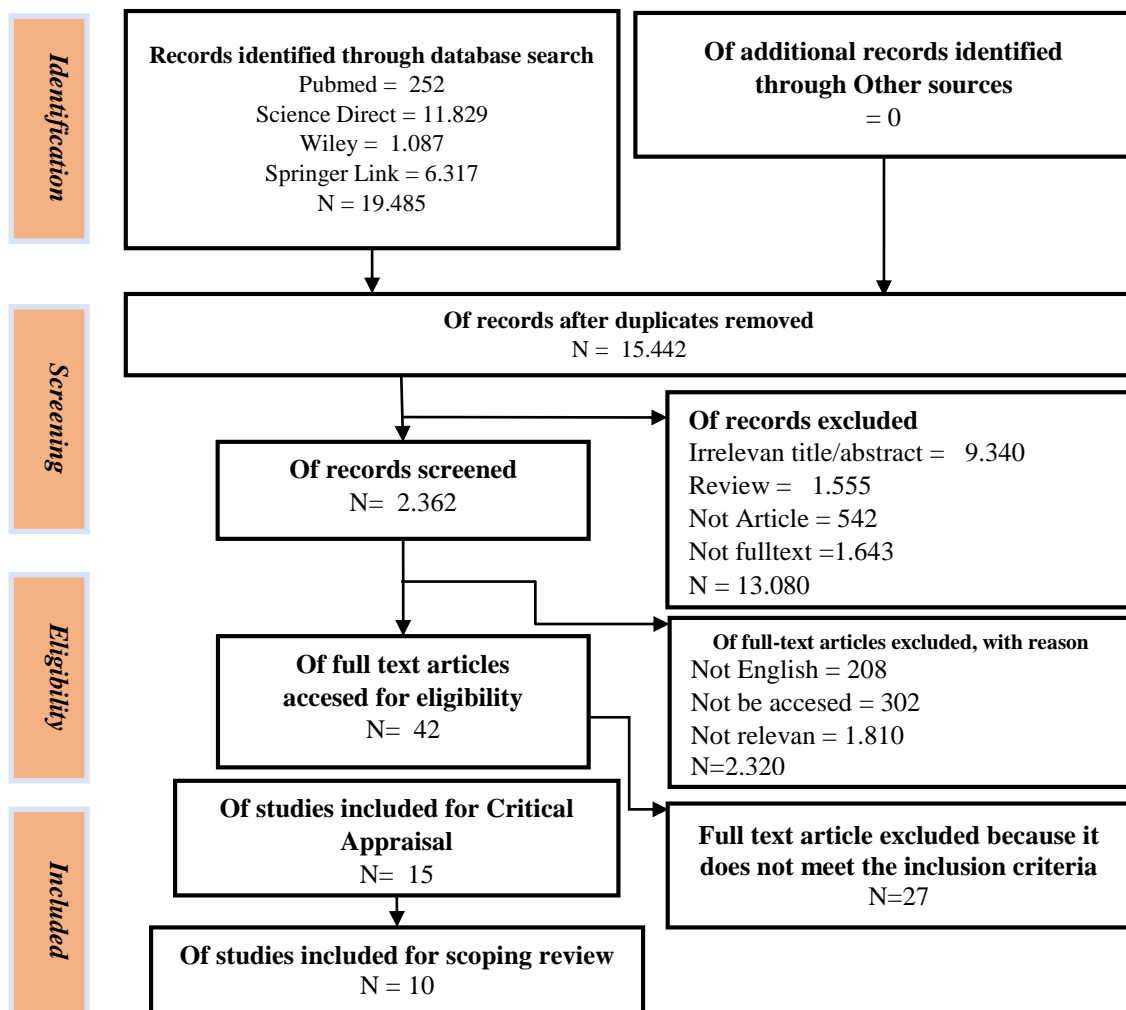
Based on the PEOs Framework above, there are two questions the researcher wants to answer in this scoping review, namely:

1. What are the factors that influence cognitive development of children aged 3-6 years?
2. What are the factors that influence mental emotional development of children 3 - 6 years old?

2.2 Search strategy design

The author used a three-step strategy in the search. The first step is to search there is a limited scope using the initial search term. The second step is to use all the identified keywords. All of these keywords have been searched for in: Wiley, Pubmed, and Science Direct. The third step is a reference list of all identified reports and articles that are searched for additional studies ([Prendergast, A. J., Humphrey, 2014](#)). The articles are obtained based on the keywords used in the review variables contained in the journal. The databases used to compile this scoping review are Pubmed, Science Direct, Wiley, and Springer Link. The compiled keywords are entered into the search database with the following format: (Factors) AND (Related)) AND (child)) AND (Cognitive)) AND (Mental)) AND (emotional)) AND (Development), then determine the existing literature search method this study is limited to articles published in the last 10 years Zotero software was used to collect and manage article search results ([Sudfeld et al., 2015](#)). Study selection was performed by reading the titles, abstracts, or full text of the papers. Selected articles with following criteria: 1) Publication in the period 2010 to 2020, 2) Articles published in English, 3) original research, 4) Article discusses the factors that affect cognitive and mental emotional development of children at age 3-6 years, 5) Articles with qualitative study design, RCT, cohort, cross sectional, systematic review, meta-analysis. In selecting articles, the researcher combines all articles from the search results from four databases which are then described using the PRISMA flowchart. PRISMA is considered appropriate to use because its use can improve the quality of publication reporting ([Zhong et al., 2016](#)). Through the article selection process from the three databases, after going through several filtering stages, it was found that several relevant articles met the inclusion criteria. The selection of articles is presented in a flow diagram in [Fig. 1](#)

Fig. 1. PRISMA-Flow diagram of screening, selection process and inclusion of studies



After finding several articles of 15 relevant articles, the next step to take is to assess the quality of the articles (critical appraisal). In assessing the quality of the articles in this scoping review, the tool chosen to assess the quality of the articles is the Joana Briggs checklist from the Joana Briggs Institute. At the critical appraisal stage, there are 10 relevant articles for review. Most of the articles used the research design Cross Sectional (1 article), Randomized Controlled Trial (2 articles), Case Control (1 article), and Cohort (6 articles). Each research method has a different critical appraisal checklist (Lucas-Thompson, R. G., Lunkenheimer, E. S., Dumitrache, 2017). After doing the critical appraisal and getting articles that are considered good quality, the next step is to extract / synthesize data. In assessing the quality of the articles the researcher conducted the assessment independently, the researcher determined that articles that had an assessment or answer that were not ≤ 3 were categorized into good quality articles, articles with an answer of "no" or "unclear" more than > 3 were said to be of poor quality and then excluded. To facilitate the presentation of the results of this scoping review, the author synthesizes or maps the findings into a data extraction table (Dalwood et al., 2020)(Indrayanti et al., 2019). The synthesis of the findings will be presented in the following table 2;

Table 2. Synthesis of Scoping Review Findings

Title/ Author/ Years	Country	Aim	Design Study	Participant & Sample	Result	Limitations
Maternal depressive symptoms (MDS) are negatively associated with child growth and development: Evidence from rural India/ (Nguyen et al., 2018)	USA	This study examined the relationship between maternal depressive symptoms (MDS) and children's physical growth and cognitive development in India, where poverty, malnutrition, and poor mental health coexist.	Randomized Controlled Trial	Research data were obtained from a baseline household survey (n = 2,934) of randomized controlled trials assessing early childhood development programs.	<ul style="list-style-type: none"> The prevalence of developmental delay in children ranges from 16% to 27% in various developmental domains. Compared to children of mothers with low MDS, mothers with high MDS had high z-scores for age, weight-for-age, and weight-for-height (0.22, 0.21, respectively, and 0.15), higher rates of stunting and underweight (~ 1.5 times), and higher rates of developmental delay (partially adjusted odds ratios ranged from 1.3 to 1.8 for different developmental domains and fully adjusted odds ratio = 1.4 for fine motor skills). There is a significant relationship associated with child malnutrition and developmental delays, the higher the level of maternal depression will increase the delay in child development. 	<ul style="list-style-type: none"> Some limitations of this study are the cross-sectional study design, which only proves the association between risk factors and child development, not designed to test causality directly. Then there are several factors that may be directly related to cognitive development of 4 year olds and depression in mothers which were not identified in the multivariate analysis.
Association between stunting and early childhood development among children aged 36–59 months in South Asia/ (Kang et al., 2018)	Bangladesh	This study examined the relationship between z scores (height for age, weight for age, weight for height and malnutrition (stunting or short), wasting, underweight) with learning / cognitive abilities, socio-emotional development of children.	Randomized Controlled Trial	Data from Multiple Indicator Cluster Surveys in Bangladesh (n = 8,659), Bhutan (n = 2,038), Nepal (n = 2,253), and Pakistan (Punjab n = 11,369 and Sindh n = 6,718) were used. Children were assessed developmentally "on-track" based on the learning / cognitive or socio-emotional domains if they met specific early childhood development criteria.	<ul style="list-style-type: none"> Stunting was associated with a lower chance of learning ability / cognitive development in the collected sample (OR = 0.72, 95% CI [0.60, 0.86]) Underweight was associated with poorer learning outcomes (OR = 0.75, 95% CI [0.66, 0.86]) Significant heterogeneity with stunting (I² = 61.1%; P = 0.04) and wasting (I² = 74.1%; P = 0.004) in the collected sample was found, but the OR collected was accepted using meta-analysis random effect. No indicators of malnutrition were associated with the socio-emotional domain in the collected sample (OR = 0.99, 95% CI [0.92, 1.07], for stunting; OR = 1.05, 95% CI [0.97, 1.14], for underweight, and OR = 1.07, 95% CI [0.86, 1.33], for wasting). From this article it can be concluded that the level of stunting in children can significantly influence cognitive development or learning ability in children aged 39-59 months. Children who are stunted are likely to have lower learning abilities. 	The limitation in this study is that the cross-sectional study design used only shows the relationship between risk factors and cognitive development of children aged 3-6 years, not allowing to conclude the causality or mediation of the relationship between stunting and cognitive development of children.

The association of early linear growth and haemoglobin concentration with later cognitive, motor, and social-emotional development at preschool age in Ghana/ (Me et al., 2019)	Ghana	This study aimed to investigate the relationship between initial linear growth and hemoglobin concentration with cognitive, motor, and socio-emotional development of preschoolers.	Cohort	Participants in this study were children who were participants in a follow-up study of a randomized controlled trial of nutritional supplementation in Ghana. At 4–6 years of age, cognitive, motor, and socio-emotional development was assessed using standardized tests tailored for this population. Author estimated the relationship of length-for-age z-score (LAZ) for age at birth and postnatal linear growth (n = 710) and Hb (n = 617) with developmental scores in the regression model, using multistage least squares analysis to calculate residuals that were uncorrelated for postnatal growth	<ul style="list-style-type: none"> • Cognitive development at age 4-6 years was significantly associated with LAZ (body length) at birth ($\beta = 0.12$, 95% CI = 0.05, 0.19), ΔLAZ from 6 to 18 months ($\beta = 0.16$, 95% CI = 0.04, 0.28), • Hb concentration at 18 months ($\beta = 0.13$, 95% CI = 0.06, 0.20), but not with ΔLAZ for 0–6 months, ΔLAZ from 18 months to 4–6 years, Hb at 6 months, or Hb at 4–6 years. • These results suggest that in the same context, the period earlier before birth and up to 18 months is more sensitive to the long-term cognitive development risk factors associated with LAZ and Hb compared with childhood. • It can be concluded that the hemoglobin level factor (iron deficiency anemia) and the condition of the child at birth have a significant effect on the cognitive development of children aged 4 - 6 years. Children who have hemoglobin levels in the normal threshold, and children who have normal birth length have good cognitive abilities. 	The potential for selection bias due to the large number of loss to follow-up caused by missing data. Nonetheless, most of the baseline maternal characteristics were similar between the LAZ and Hb subsamples and were excluded from analysis, indicating a low probability of bias. The researchers were also unable to adjust for genetic potential and other factors such as the health conditions of the children at follow-up.
Maternal depression and anxiety disorders (MDAD) and child development: A Manitoba population-based study/ (Comaskey et al., 2017)	Canada	This study aimed to investigate the relationship between <i>maternal depression and Anxiety Disorders</i> (MDAD), development of toddlers	Cohort	The population in this study were children aged 5-6 years, born between January 1 2000 and December 31 2001 with a valid EDI (Early Development Instrument) score in their first year of kindergarten (2006 or 2007) associated with their biological mother uses an anonymous identifier from the personal health information number (PHIN) record. The final sample was 18,331 mother-child pairs, some of which included multiple children (n = 1547) from the same mother: single births (n = 1051); twins (n = 228 pairs) and triplets (n = 4 sets).	<ul style="list-style-type: none"> • MDAD was negatively associated with child outcomes across all models tested, Family Context had a stronger direct relationship to all outcome domains (range = -0.21, p <.001 for emotional maturity to -0.37, p <.001 for language and cognitive development for recurrent MDAD). A modest negative association (-0.03, p <0.01) was found between MDAD and language and cognitive development for prenatal and repeated exposure. • Health at birth was negatively associated with EDI outcome in all models tested (-0.05 to -0.09, p <0.001), especially for physical health (-0.09, p <0.001). For the prenatal years, Health at Birth partly mediated the relationship between MDAD and child outcomes and, for all other time periods, Health at Birth was indirectly associated with outcomes through MDAD and Family Context. It can be concluded that the health condition of children at birth has a significant effect on cognitive development problems of children aged 5 - 6 years. 	Data collection on linear growth during the main trial was completed when the children dropped out of the study at 18 months of age, thus the investigators were unable to examine growth faltering during the sub-interval between 18 months and 4-6 years in this cohort. The challenges in using administrative data and exclusion from the study model, researchers used administrative data to measure MDAD, but maternal symptoms and functions were not available in this data. Despite these limitations, research can identify important patterns in the relationship between MDAD and children's cognitive development across age.
Maternal depressive symptoms and children's	Canada	This study aimed to determine the relationship between maternal depression	Cohort	Population (n = 1364) consisting of well-validated measures of cognitive development of children including academic readiness and language development in kindergarten and	<ul style="list-style-type: none"> • Type of parenting or sex of child did not moderate the relationship between MDS and children's cognitive outcomes except for MDS which was associated with lower scores on reading 	

cognitive development: Does early childcare and child's sex matter?/ (Raposa et al., 2014)		symptoms and children's cognitive development		reading and mathematics achievement in grade one. Information on MDS was collected repeatedly from 5 months to 5 years of age and on childcare from 5 months to 4.5 years.	achievement in first grade for girls with very small effect sizes ($sr^2 = .003$). <ul style="list-style-type: none"> • Presence of parenting was associated with higher scores for children's cognitive development, but this association disappeared after adjusting for covariates including child, mother and family characteristics. • Regardless of MDS and type of parenting, boys had, even after adjusting for covariates, lower scores on academic readiness ($sr^2 = 0.029$) and higher scores on math achievement ($sr^2 = 0.004$). 	
Social and emotional developmental vulnerability at age five in Aboriginal and non-Aboriginal children in New South Wales: a population data linkage study/ (Williamson et al., 2019)	Australia	The aim of this study was to explore the relationship between child, family and regional level characteristics associated with developmental vulnerability, among Aboriginal and non-Aboriginal children in their first year of school. Then measure the magnitude of the social and emotional development inequality between Aboriginal and non-Aboriginal children and the extent to which differences in socioeconomic disadvantage and perinatal characteristics explain this.	Cohort	This retrospective cohort study used linkage of cross-cutting data to identify and follow participants from birth to school age. In this way, social and emotional development was examined in 7,384 Aboriginal and 95,104 non-Aboriginal children who were admitted to the Australian Census of Early Development in their first year of full-time schooling in New South Wales (NSW) in 2009 or 2012 and birth registration was carried out. and / or perinatal records in NSW. The main outcome measures were teacher-reported social competence and emotional maturity as measured using the Australian version of the Early Development Instrument	<ul style="list-style-type: none"> • Mean age at start of schooling for children in the study sample was 5.2 years ($SD = 0.36$ years). While 84% of Aboriginal children score well - above the vulnerability threshold - for social competence and 88% for emotional maturity, Aboriginal children are twice as likely as non-Aboriginal children to be vulnerable on measures of social development ($RR = 2.00$; 95% CI, 1.89-2.12) and had an 89% risk of being more susceptible to emotional vulnerability ($RR = 1.89$; 95% CI, 1.77-2.02). • Inequality between Aboriginal and non-Aboriginal children is largely due to differences in socioeconomic characteristics and perinatal health of children and families. Thus, after adjusting for differences in the measures of socioeconomic gains and losses (Model 2), the relative risk was reduced to 1.31 (95% CI: 1.23-1.40) in the social competency domain and 1.24 (95% CI , 1.15-1.33) on the emotional maturity domain. • From this article, it can be concluded that family socio-economic conditions and regional characteristics are factors that are significantly related to children's mental emotional development. Low socioeconomic conditions and an unsupportive environment can cause mental emotional development problems for children. • Grandmother's symptoms were associated with more emotional and behavioral problems in grandchildren after adjustment for confounding factors. The size of the relationship between mental health symptoms of grandmothers and grandchildren is proportional to the relationship between emotional symptoms of mothers and emotional problems and children's behavior. There is no evidence of an association with paternal 	<ul style="list-style-type: none"> • This study is one of the largest and most comprehensive studies examining socio-emotional issues among children A is limited in the borigine study in Australia, so this was not found. • A limitation in this study is that the regional characteristics are not described in detail in both Aboriginal and non-Aboriginal children.
Grandmothers mental health is associated with grandchildren's emotional and behavioral development: a three-generation prospective study in	Brazil	The study aimed to examine the impact of the emotional symptoms of grandmothers, whose role in childcare is increasing worldwide, on internalizing and externalizing symptoms in grandchildren from a	Cohort	Prospective data from three generations in two cohorts of births spaced 22 years (1982 and 2004) in Pelotas, Brazil, were used ($n = 92$). The mental health of grandmothers and parents was assessed using the Self-Reported Questionnaire (SRQ-20).	<ul style="list-style-type: none"> • Grandmother's symptoms were associated with more emotional and behavioral problems in grandchildren after adjustment for confounding factors. The size of the relationship between mental health symptoms of grandmothers and grandchildren is proportional to the relationship between emotional symptoms of mothers and emotional problems and children's behavior. There is no evidence of an association with paternal 	

Brazil/ (Pearson et al., 2019)		three-generation birth cohort study.		Grandchildren are members of the 2004 birth cohort, and behavioral and emotional problems were measured using the Child Behavior Checklist (CBCL) at age 4.	<p>symptoms. This effect was substantially stronger for mothers compared to paternal grandmothers.</p> <ul style="list-style-type: none"> Statistical test results show strong evidence that maternal grandmother mental health is associated with emotional improvement [adjusted β coefficient: 2.1, 95% CI 0.8, 3.4, $p = 0.001$] and behavior [adjusted β coefficient: 2.5, 95% CI 0.5, 4.7, $p = 0.018$] problems with grandchildren. 	
Impact of Psychosocial Environment on Young Children's Emotional and Behavioral Difficulties/ (Grazuleviciene, R., Andrusaityte, S., Petraviciene & Balseviciene, 2017)	Lituania	This study investigated the combined effects of socioeconomic status and parent-child relationships on emotional and behavioral difficulties in preschool children.	Case Control	The case-control study involved 1,416 mothers and their spouses of children aged 4-6 years, who lived in the city of Kaunas, Lithuania. Parent-child relationships were measured using the Parent-Child Dysfunctional Interaction subscale. Children's mental health difficulties were assessed by a Strength and Difficulty Questionnaire	<ul style="list-style-type: none"> Low educational attainment was associated with a statistically significant increase in the odds ratio for emotional symptoms and total behavioral difficulties by 44% (aOR 1.44; 95% CI 1.02–2.08), and the mother-child pathological relationship - by 69% (aOR 1.69; 95% CI 1.24–2.31). With reference to the better educated cohort of mothers and normal mother-child relationships, lower education and pathological mother-child relationships statistically significantly increase the risk of total distress in children aged 4–6 years; adjusted odds ratio was 2.45; 95% CI 1.51–3.99. It can be concluded that the socio-economic factors of the family and the level of education of the parents significantly influence the mental emotional development of children. Poor socioeconomic conditions and the low level of parental education can cause mental emotional health problems for children aged 4 - 6 years. 	Limitations in this study are that uncontrolled confounding factors may affect the risk of maternal mental health problems, low socio-economic conditions due to unhealthy environment.
A longitudinal study of socioeconomic status, family processes, and child adjustment from preschool until early elementary school: the role of social competence/ (Hosokawa & Katsura, 2017)	Japan	This study examined the simultaneous and longitudinal relationships between familial Social Economy Status (SES; i.e., family income and education levels of mothers and fathers), marital conflict (i.e., constructive and destructive marital conflicts), parenting practices (i.e., positive and negative parenting practices), the child's social competence (i.e., social skills), and the adjustment of children's behavior (i.e., internalization and	Cohort	The sample included a total of 1604 preschool children aged 5 years at Time 1 and grade one students aged 6 years at Time 2 (51.5% boys). Parents completed self-reported questionnaires about SES, marital conflict, parenting practices, and their children's behavior adjustments. The children's social competence is also assessed by the teacher.	<ul style="list-style-type: none"> Indirect causes from family economy to children's mental health functions (ie, social skills and problems of internalization and externalization) through marital conflict and parenting practices were found to be significantly related. Maternal education level was found to be a significant predictor for lower levels of negative parenting practice ($\beta = -.07$, $p < .05$), higher rates of marital conflict ($\beta = .07$, $p < .05$), higher rates higher positive parenting practices ($\beta = .06$, $p < .05$), and lower rates of T2 internalization problems ($\beta = -.09$, $p < .001$) and T2 externalization problems ($\beta = -.05$, $p < .05$). The indirect pathway from the father's education level to the child's mental health function (ie, social skills and problems of internalization and externalization) through marital conflict and parenting practices is also significant. In particular, in terms of the negative dimensions of family processes (marital conflict and parenting 	The limitation of this study is that it has a longitudinal study design. However, some of the designs are cross-sectional to identify the relationship between family-related factors on mental and social health functions of children aged 5-6 years, which raises some limitations for inferring causal relationships. The limitation in this study is that the causality between parenting styles and children's emotional mental conditions cannot be concluded with certainty, because basically the mental health of children affects the parenting style of parents and vice versa.

externalization problems) in a comprehensive model.

practices), destructive T1 conflict is directly related to social skills ($\beta = -.11, p <.001$), and indirectly, negatively related to social skills. T1 social skills through negative T1 parenting practices. T1 parenting practice was negative directly, negatively related to social skills ($\beta = -.10, p <.001$). Regarding the positive dimensions of family processes, T1 constructive conflict has a positive direct relationship with social skills ($\beta = 0.09, p <.01$), and is indirectly positively related to T1 social skills through positive T1 parenting practices. T1 parenting practice was directly positive, positively related to social skills ($\beta = .08, p <.01$). In turn, T1 social skills were found to be a direct and significant predictor of lower levels of T2 internalization problems ($\beta = -.38, p <.001$) and T2 externalization problems ($\beta = -.45, p <.001$).

Factors influencing child mental health: A state-wide survey of Victorian children/ (Goldfeld & Hayes, 2012)

Australia

This study aimed to estimate the prevalence of mental health problems among Victorian children and to investigate the factors associated with poorer mental health.

Cross sectional

Computer-assisted telephone interviews were conducted with the parents of 3370 randomly selected Victorian children aged 4 to 12 years. They report their child's mental health and special health care needs as well as their own mental health, family functions and various community and socio-demographic variables. Population estimates and odds ratios (ORs) were calculated with 95% confidence intervals (95% CI).

- Overall, 11.6% (95% CI = 10.3-12.9%) of Victorian children were at risk for mental health problems.
- Independent factors that place children at increased risk of mental health problems of 'concern' include children with special health care needs (OR = 7.89, 95% CI 5.16-12.08), unhealthy family functioning (OR = 3.84, 95% CI 2.19 to 6.74), mental health problems of the elderly (OR = 7.89, 95% CI 5.16 to 12.08), environmental safety (OR = 2, 47.95% CI 1.20 to 5.07) and area of residence (OR = 2.01, 95% CI 1.33 to 3.02).
- It can be concluded that the factors of parenting style, regional characteristics, parent's mental health, and current children's health conditions significantly influence children's mental emotional development. Poor parenting style, unsupportive regional characteristics, mental health problems for parents, and children with special needs can cause mental emotional health problems in children

The limitation in this study is that the interview was not conducted directly through face-to-face meetings, but via computer-assisted telephone, so the risk of bias may occur. The safety of the environment or neighbors is only explored based on perceptions, not by a measure or indicator of environmental feasibility for children. This study shows the relationship between the mental health of both parents and mental development of children aged 4-12 years.

The abbreviation "i.e." means "that is," and the abbreviation "e.g." means "for example."

3. Results and Discussion

3.1 Factors Associated with Children's Cognitive Development

a) Parental Factors

Mother's Mental Health

In this review, two articles were found showing the close relationship between mental health problems in mothers and cognitive development in children (Ma et al., 2014). Research by (Goldfeld & Hayes, 2012) shows that, maternal depressive symptoms are significantly associated with child malnutrition in India, with mechanisms that may occur despite poorer home environments, less involvement with children, less use of health services. lower levels, and less than optimal complementary feeding practices (Google Cendekia, 2020a)(Eickmann et al., 2003). Depressive symptoms are also associated with developmental delay in children <4 years, although the strength of the association depends on the developmental domain being considered. Compared with children of mothers with low depressive symptom scores, mothers with high depressive symptom scores had an increased risk of stunting and underweight by 1.5 times and increased cognitive developmental delays 1.3 to 1.8 times. Further research by (Comaskey et al., 2017) shows that depressive symptoms and anxiety disorders in mothers are negatively associated with child outcomes in all tested models, family context has a stronger direct relationship to all outcome domains (range = -0.21, p. <.001 for emotional maturity to -0.37, p <.001 for language and cognitive development for recurrent MDAD). A modest negative association (-0.03, p <0.01) was found between MDAD and language and cognitive development for prenatal and repeated exposures (Huang et al., 2019).

Worldwide, the prevalence of women experiencing mental health problems is around 10% of pregnant women and 13% of women who have just given birth, of which the most important mental health problem is depression (Kozyrskyj et al., 2012). In developing countries the prevalence is even higher, namely 15.6% during pregnancy and 19.8% after delivery (Alan Baddeley, 2012). In severe cases, the mother's suffering may be so severe that they may even commit suicide. In addition, the affected mother cannot play a good role as a mother so that the development of the child can be negatively affected (WHO, 2020a). Maternal depression that occurs when the child is 2 to 3 years old is a risk factor for anxiety disorder in children aged 10 and 11 years (Pamela & Davis-Kean, 2013) (Larson et al., 2017). The risk of poor child outcome is greatest in mothers who experience persistent depression or when their child is 2 to 3 years old or older (Letourneau & Tramonte, L., & Willms, 2013). Other studies have also found negative effects of depression or maternal anxiety on social and emotional outcomes, as well as children's physical development (Letourneau & Tramonte, L., & Willms, 2013).

b) Child Factor

1) Stunting

In this review, we found one article that shows the relationship between stunting and cognitive development in children. research by (Letourneau & Tramonte, L., & Willms, 2013) found that stunting was statistically significant with a lower chance of learning ability or cognitive development in children aged 3 to 5 years (OR = 0.72, 95% CI [0.60, 0, 86]. Stunting can cause children's abilities to decrease, both in the motoric, adaptive, language and thinking / cognition aspects (Ford & Stein, 2016). Stunting affects the growth of children's brain cells, so that the number of neurons is reduced, as well as impaired or reduced brain neurotransmitters (Sm et al., 2000).

2) Haemoglobin Level

Research by (Me et al., 2019) showed that hemoglobin levels in children aged 18 months had a statistically significant relationship with children's cognitive development at the age of 4 - 5 years ($\beta = 0.13$, 95% CI = 0.06, 0, 20). Hb concentration at 18 months was associated with a 0.13 SD increase in cognitive scores at 4–6 years when controlling for age at follow-up (95% CI = 0.06, 0.20, 0.0003) and for other pooled covariates. at baseline, where the Hb concentration accounted for 2.1% of the variation in cognitive scores of children aged 4–5 years (Salam et al., 2016). The importance of iron in cognitive function has been highlighted in several previous studies, which show that there are some changes related to psychomotor development and cognitive function generally associated with iron deficiency (Jáuregui-Lobera, 2014). Generally, iron deficiency in the neonatal period and early childhood is considered a key developmental disorder in cognitive development (Rodriguez et al., 2011).

3) Child's Condition at Birth

Research by (Comaskey et al., 2017) shows that the health condition of children at birth is negatively associated with early childhood development outcomes in all tested models (-0.05 to -0.09, $p < 0.001$), especially for health physical (-0.09, $p < 0.001$). Then the study by Me et al., (2019) showed that cognitive development at the age of 4-6 years was associated with a child's body length at birth and with linear growth over a period of 6 to 18 months but not during the period from birth to 6 months or 18 months to 4-6 years (Akseer et al., 2017). There is a critical period when the systems and organs of the human body are sensitive to the environment, and most occur in the uterus. Something that occurs during a critical or sensitive period of development may have a long-term effect on the structure or function of tissues, known as 'programming'. Programming occurs as a result of adaptation to survive during a critical period when the environment is disturbed (Nurliyana et al., 2016).

3.2 Factors that influence the child's emotional mental development

a. Parental Factor

1) Family Socio-Economy

In the context of the family, socioeconomic status (SES) and parenting styles in the family are generally seen as two fundamental factors. SES is a multidimensional concept and most contemporary researchers agree that SES is represented by a combination of family income, parental education and employment status (Xu et al., 2019).

According to family investment model, compared to parents of high SES, parents with low SES have less financial capital, lower education, and employment status, so they are less likely to provide material conditions well and engage in positive parenting behavior, thereby increasing the risk of developing emotional problems in their adolescent (Gottfredson, 1997).

2) Parenting Style

In this review, two articles were found showing the relationship between parenting styles and children's emotional mental development. found that family processes (consisting of marital problems and parenting patterns) have a significant relationship with social abilities and mental health of children aged 5-6 years.

Then the research of shows that overall, 11.6% of Victorian children are estimated to be at risk of mental health problems, independent factors that place children at increased risk of mental health problems, one of which is unhealthy family function or parenting. negative ones (OR = 3.84, 95% CI 2.19 to 6.74).

Parenting styles in educating children can affect various aspects of children's psychological health, such as self-esteem, emotional regulation, socio-emotional adjustment, and well-being. The style or pattern of parenting for children that is remembered later is associated with functions throughout the ages that affect their development and mental health. This suggests that parenting styles and resilience may correlate with mental health throughout life.

3) Parents' Mental Health

Research which aims to examine the impact of grandmother's emotional symptoms on internalization and externalization symptoms in grandchildren. The results of a statistical test showed strong evidence that maternal grandmother mental health was associated with emotional enhancement [adjusted β coefficient: 2.1, 95% CI 0.8, 3.4, $p = 0.001$] and behavior [adjusted β coefficient: 2.5, 95% CI 0.5, 4.7, $p = 0.018$] problems with grandchildren. The results showed a significant relationship between grandmother's mental health and emotional mental development of children at the age of 4 years. Research by Gorldfeld & Hayes, (2012) found that as much as 11.6% (95% CI = 10.3-12.9%) Victorian children are thought to be at risk of mental health problems, and one independent factor that puts children at increased the risk of mental health problems in children is parents who have mental health problems (OR = 7.89, 95% CI 5.16 to 12.08). According to Keller the psychopathological history of parents makes children more likely to experience an increase in depression and other psychopathology when compared to children of parents who do not have affective diseases. Furthermore, research has also shown that the course of depression in these children may be more chronic with increasing relapse rates (Jefferson et al., 2011).

4) Parents Education Level

Research shows that low levels of maternal education are associated with a statistically significant increase in odds ratios for emotional symptoms and total behavioral difficulties by 44% (aOR 1.44; 95% CI 1.02–2.08), and the pathological relationship between mother and child was 69% (aOR 1.69; 95% CI 1.24–2.31). Referring to a group of better educated mothers and normal mother-child relationships, lower education and pathological mother-child relationships statistically significantly increase the risk of total distress in children aged 4–6 years; adjusted odds ratio was 2.45; 95% CI 1.51–3.99.

Hosokawa & Katsura's research, (2017) showed that the level of maternal education was a significant predictor of lower levels of internalization problems ($\beta = -.09$, $p < .001$) and externalization problems ($\beta = -.05$, $p < .05$). Then the indirect path from the father's education level to the mental health function of children aged 5-6 years (social skills and internalization and externalization problems) through marital conflict and parenting practices is also statistically significant.

Parental education level is an important predictor of educational outcomes and behavior. Parental education is an important index of socioeconomic status, and as is well known, it predicts educational outcomes and children's behavior. According to direct effect of parental education, on standard achievement scores of European American children; both parental education and income have an indirect effect on parental achievement-enhancing behavior, and subsequently children's achievement, through their effect on parental educational expectations.

5) Parental Marriage Conflict

In this review, it was found that one of the studies showed a relationship between parental marital conflict and children's mental health problems. Research by Hosokawa & Katsura, (2017) found that the indirect causes of the family economy to the mental health function of children aged 5-6 years (namely, social skills and problems of internalization and externalization) through marital conflict and parenting practices were found to be significant. Marital conflict explains a significant proportion of the variation in externalizing problems, including aggression, vandalism, behavioral problems, and delinquency, and the variation in internalizing problems, including depression, anxiety, and low self-esteem. Research by (Rodriguez et al., 2011) shows that children born to single mothers have a 1.3 times higher risk of experiencing emotional problems compared to children born to complete parents.

b. Child Factor

Children's Health Conditions

One of the studies in this review shows the relationship between children's health conditions and their mental emotional development. In a study by Goldfeld & Hayes, (2012), it was shown that one of the independent factors that put children at increased risk of mental health problems was children who had special health care needs (OR = 7.89, 95% CI 5.16-12.08). So it can be concluded that the relationship between children's health conditions and mental development at the age of 4-12 years. Children and adolescents with special health care needs are those who have a chronic physical, developmental, behavioral, or emotional condition and who also require health and related services of a similar or greater number than those required by most children (Houtrow et al., 2012) according to (Mattson et al., 2019), children and adolescents with special health care needs and their families are at risk of experiencing various internal (i.e. emotional and behavioral) and external (namely, interpersonal, financial, housing, psychosocial factors). and education) which can affect their health and well-being

c. Another Factor

Regional Characteristics

In this review, two studies were found that showed a relationship between regional characteristics and children's mental development. In a study by (Williamson et al., 2019) which aims to explore the relationship between child, family and regional-level characteristics associated with developmental vulnerability, among Aboriginal and non-Aboriginal children it was found that 84% of Aboriginal children scored well - above the vulnerability threshold - for social competence and 88% for emotional maturity, Aboriginal children were twice as likely as non-Aboriginal children to be vulnerable on measures of social development (RR = 2.00; 95% CI, 1.89-2.12) and had an 89% risk of being more susceptible to emotional vulnerability (RR = 1.89; 95% CI, 1.77-2.02). So that

child, family and regional characteristics associated with vulnerability are identified. Research by Goldfeld & Hayes, (2012) shows that one of the independent factors that put children at increased risk of mental health problems of 'concern' is environmental safety (OR = 2.47, 95% CI 1.20 to 5.07) and residence (OR = 2.01, 95% CI 1.33 to 3.02). The characteristics of the area where a child lives can affect his psychological condition, this is because the negative effects on the development and behavior of the child are caused by a complex interaction between genetic, biological, psychological and environmental risk factors. The main factors affecting children's mental health are the social and psychological environment. The effects of cumulative risk are more important in determining emotional problems in children than the presence of a single stressor, regardless of the magnitude of symptoms.

4. Conclusion

Factors related to children's cognitive development are parental factors (maternal depressive and anxiety disorder) and child factors (child's condition at birth, stunting, and hemoglobin levels). Factors related to children's mental emotional development are parental factors (family socioeconomic, parenting style, family mental health, parental education level, and parental marital conflict), children's factors (children's health conditions), other (regional characteristics). of the factors related to children's cognitive development, the factor most frequently emerged from the 10 articles reviewed. namely the factors of the parents maternal depressive and anxiety disorder and the factors of the child, namely the condition of the child at birth. Then, from the factors related to the mental emotional development of children, the parent factor in the form of family socioeconomic factors is the most frequent factor that appears from the 10 articles that have been reviewed.

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