e-Bangi Faculty of Social Sciences and Humanities Universiti Kebangsaan Malaysia
Journal of Social Sciences and Humanities

eISSN: 1823-884x

Volume 20, Issue 4, DOI: https://doi.org/10.17576/ebangi.2023.2004.21

Article

Socioeconomic Factors and its Role in Emotion Regulation in Children from a Socio-Ecological Perspective: A Systematic Literature Review

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Received: 06 July 2023
Accepted: 15 August 2023

Abstract: Socioeconomic status (SES) has been shown to affect children in their ability to regulate emotions. Factors related to SES such as parenting behavior and chaotic living environment is linked to decreased emotion regulation (ER) in children. This review explores the role of SES in the development of ER in children. Two online databases were searched and returned 261 articles. After the process of screening and eligibility according to PRISMA guidelines, 10 articles were included in this review. Results from this systematic review suggest that there is a significant relationship between SES and ER and a correlational, predictive and longitudinal relationship between SES and ER in children was found. Three main themes were found associated with SES and ER in children which were family income, parental and environmental factor. SES is an essential factor associated with the development of ER in children. Findings from the study supports the importance of targeted social-emotional intervention for lower SES children.

Keywords: Socioeconomic status; emotion regulation; development; children; socio-ecological

Introduction

Socioeconomic status (SES) affects the development of children via several pathways such as social support, parental resources, and mental health (Deater-Deckard et al., 2012; Conger & Donnellan, 2007). In addition, the mental risk factors in lower socioeconomic households leads to several conditions such as environmental adversity (Conger & Donnellan, 2007), negative parenting behavior (Spinelli et al., 2020; Gulseven et al., 2018), and increase in stress (Spinelli et al., 2020; Cheung et al., 2018). Emotion regulation is one of the mental health domains that is affected by socioeconomic factors. Emotion regulation (ER) is the ability to identify, manage and control emotions and express them in ways that are positive and following personal and social values (Dvir et al., 2014; Kaufman et al., 2016; Zeman et al., 2006). ER is categorized into implicit or automatic and explicit or effortful (Gross et al., 2010). Implicit ER occurs without conscious effort from the individual, usually through registration of sensory information which then activates schemas or knowledge paradigms that influence psychological functions. Explicit ER, on the other hand, requires effort from the individual to attend to the emotions and consciously and intentionally employing cognitive strategies to modify the experience and expression of emotions. It encompasses techniques such as cognitive reappraisal and expressive suppression, allowing individuals to regulate their emotions in a deliberate and controlled manner. By actively engaging in these cognitive processes, individuals can enhance their emotional well-being and adaptive functioning.

Several factors influence the ability to regulate emotions such as parenting styles and behaviors, socialization, and peer relationships (Dvir et al., 2014; Zeman et al., 2006). There are also biological factors that contribute to the ability to regulate emotions, such as the modulatory effect of prefrontal and cingulate regions in top-down control of the affective area (Ochsner et al., 2012; Ochsner & Gross, 2005), as well as the maturity of neural and neuroendocrine arousal system (Dvir et al., 2014). Failure to regulate emotions from an early age may have detrimental effects on the development of children. Studies have found that emotion dysregulation in children is associated with several psychopathologies such as anxiety, depression, substance abuse, eating disorder, and post-traumatic disorder (Dvir et al., 2014; Powers et al., 2017; Powers et al. 2015), and may persist during adulthood (Dvir et al., 2014). Emotional dysregulation is also associated with low resiliency and problems controlling emotions such as sadness and anger (Powers et al., 2015).

Bronfenbrenner's socio-ecological model (1979) proposed a framework on the dynamic interaction between an individual and the social environment. The socio-ecological model emphasizes on multiple-level factors that influence a behavior such as economic, policy and social influences that shapes an ecosystem, rather than only on individual level behaviors (Glass & McAtee, 2006). The ecosystem of an individual is believed to contribute to the development of the individual in their life course and impacts the social environment in the long run (Smedley & Syme, 2000).

From the perspective of the development of children and adolescents, the socio-ecological model (Bronfenbrenner, 1979) proposed that development is viewed as a dynamic process of complex interactions between individuals and different levels of the social ecology. For example, the interaction between a child at school with teachers, at home with parents and in the community with friends and peers. The socio-ecological framework has since been used by researchers to conceptualize the development of emotion regulation in children and adolescents (Boyes et al., 2020; Mance et al., 2019; Montreuil & Malikin, 2021).

A systematic review, according to Petrosino et al. (2001), is recognising, synthesising, and analysing all available data quantitatively and qualitatively in order to provide a robust, observationally determined response to an engaged research topic. As opposed to traditional literature reviews, the systematic review has various advantages. A transparent article retrieval procedure, a more prominent larger field of study, and more major aims that can reduce research bias can all help to improve reviews. Other than that, the researcher is encouraged to provide high-quality evidence with more significant outcomes (Mallet et al., 2012).

Given the increase in studies on socioeconomic factors and emotion regulation due to current trend of empirical and theoretical research emphasizing on social context (Herd et al., 2020), this review is timely to critically reflect on previous studies conducted regarding this topic. Although studies have shown associations between SES and ER, this review aims to systematically investigate risk factors relating to SES and ER in children. Despite the fact that there are a handful of reviews on ER in children (Herd & Kim-Spoon 2021; Golombek et al., 2020; Rawana et al., 2014), there seems to be a lack of review on SES factors in development of ER of children. In addition, reviews on SES factors and emotion regulation mainly revolves around studies on physiological as well as brain structures and functions (Kraft & Kraft, 2021; Noble & Giebler, 2020; Lyu et al., 2019; Muscatell, 2018; Johnson et al., 2016).

It is imperative to study SES and ER in children as it is considered a crucial stage for development as several disadvantages of SES in childhood were linked to a decrease in physical health, cognitive ability, and social-emotional and behavioral outcomes (Capistrano et al., 2016; Miller & Votruba-Drzal, 2017). SES is considered an important contextual moderator to ER as it benefits individuals from lower SES better due to less control they may have over their environment as compared to individuals from higher SES (Troy et al., 2017).

This systematic review main research objective was understanding SES and its role in ER in children. The principal focus of this review is on identifying the difference in level of ER of children from lower SES as compared to their counterparts. The review will also take into consideration the different study designs, age group of participants, measures of ER used and different context studies included are from This research seeks to shed light on the aspects of socioeconomic factors and emotion regulation in children previous researchers have been focusing on and what are the gaps for future research. It is hoped that this review will provide more

clarity on findings from previous literature and a better understanding of ER across socioeconomic households and age groups.

Methodology

This section focuses on the method used to retrieve the articles related to socioeconomic factors and their relation to ER in adolescence. The reviewer used Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), a technique used to run the systematic literature review. The process includes three main steps, which are identification, screening, and eligibility.

1. PRISMA

Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), a published standard to conduct a systematic literature review was adopted for this review. Sierra-Correa & Cantera Kintz (2015) noted the strengths of PRISMA, which are: 1) ability to define clear research questions that enable systematic research, 2) identifies inclusion and exclusion criteria, and 3) aim to examine an extensive database of scientific literature in a defined time.

2. Resources

The review utilized two primary databases, which were Web of Science (WoS) and Scopus. WoS is an extensive database consisting of more than 33,000 journals from over 256 disciplines such as psychology, interdisciplinary social sciences, environmental studies, and developmental studies. It was established by Clarivate Analytics and included 100 years of comprehensive backfile and citation data. The second database used in the review, Scopus, is one of the largest abstract and citation databases of peer-reviewed literature with more than 22,800 journals from more than 5000 publishers worldwide. It consists of diverse subject areas such as psychology, social science, and developmental studies.

3. Inclusion and Exclusion Criteria

The reviewers identified inclusion and exclusion criteria before the search of literature. The inclusion criteria includes only articles with empirical data. Second, only English publications were chosen in the study due to language barriers. Third, only publications from the past 10 years were included in the review (between 2012 and 2021). For the exclusion criteria, review articles, books, chapters in a book, and conference proceedings and articles with no empirical data were all excluded. Non-English publications were excluded due to difficulty in translating. Publications that exceeded 10 years since date of publication (2011 and prior) were also excluded from this review. Table 1 summarizes the inclusion and exclusion criteria for the review.

Table 1. Inclusion and exclusion criteria

Criterion	Inclusion	Exclusion
Literature type	Research articles with empirical data	Systematic review, chapter in book, book, conference proceeding
Language	English	Non-English
Timeline	2012 until 2021	2011 and below

4. Systematic Review Process

The review process consisted of three stages which were identification, screening and eligibility. The identification stage identified keywords used for the search process followed by an extensive search on related and similar terms from thesaurus, dictionaries and encyclopedia. Keywords were listed and screened based on previous studies and synonyms related to ER, adolescence, and SES (Refer Table 2) and returned a total of 261 articles.

Table 2. Search String

Database	Search String
WoS	TS=("emotion regulation" OR "emotional control" OR "emotion-related self-regulation" OR "mood-regulation" OR "affect-regulation" OR "emotional intelligence" OR "emotional quotient" OR "managing emotions" OR "emotional reasoning") AND ("socio*economic" OR "socio*economic status" OR "socio*economic background" OR "social class" OR "social position") AND ("adolescent*" OR "teenager*" OR "youth*" OR "children")
Scopus	TITLE-ABS-KEY("emotion regulation" OR "emotional control" OR "emotion-related self-regulation" OR "mood-regulation" OR "affect-regulation" OR "emotional intelligence" OR "emotional quotient" OR "managing emotions" OR "emotional reasoning") AND ("socio*economic" OR "socio*economic status" OR "socio*economic background" OR "social class" OR "social position") AND ("adolescent*" OR "teenager*" OR "youth*" OR "children")

The screening stage was used to screen and remove duplicate articles and articles that did not meet the inclusion criteria determined by the researchers. A total of 261 articles were screened and a total of 220 articles were excluded based on these criterias (Refer Figure 1). At the eligibility stage, the remaining articles' full text which included the title, abstract and main content were examined. Only articles that met the inclusion criteria were employed in this review. At this stage, a total of 41 articles were examined and 31 articles were excluded due to not meeting the inclusion criteria. Finally, a total of 10 articles remained and were ready to be analyzed (Refer Figure 1).

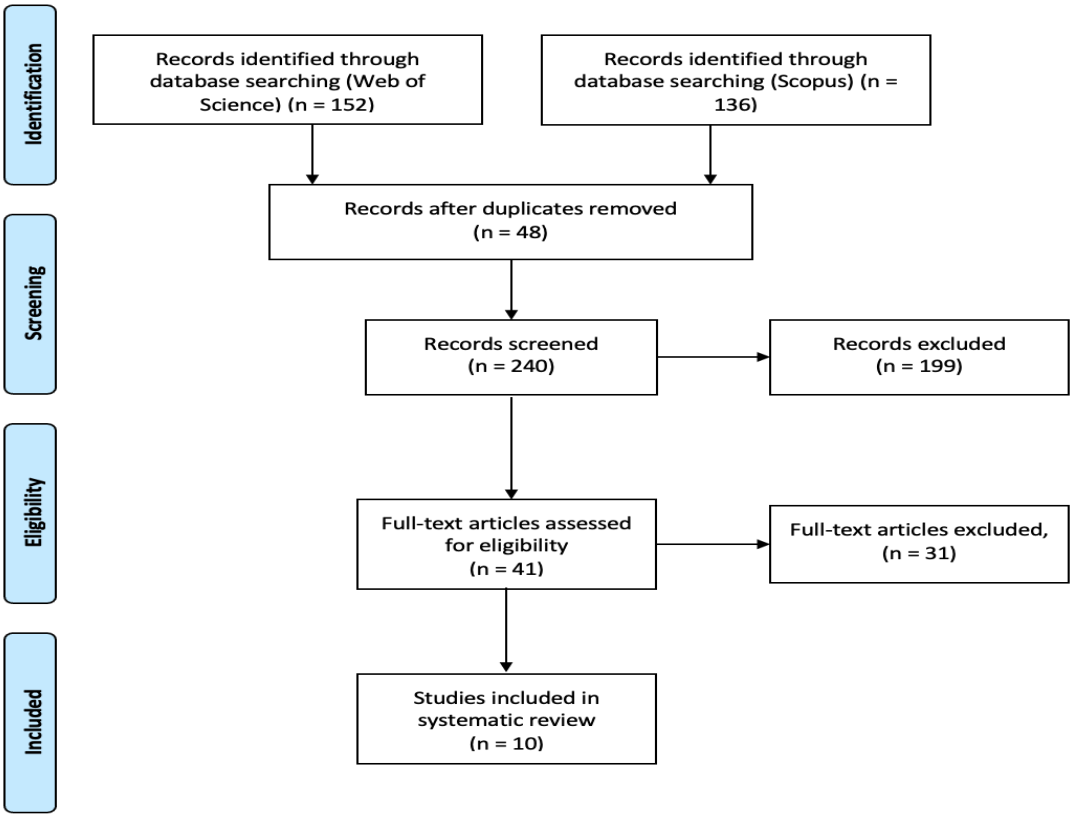

Figure 1. Flow Diagram of the study
Source: Adapted from Moher et al. (2009)

Findings

The search from the two electronic bases yielded 261 articles. The reviewers screened titles and abstracts and 220 articles were excluded due to duplication and unmet eligibility criteria. The full text of the remaining 41 articles was read, and 31 were excluded due to not meeting the inclusion criteria and were not related to the objective of the review which was to explore the role of SES in the development of ER in children. Of the 10 articles remaining, five were conducted in the US, one in China, one in Hong Kong and Macau, one in Japan, one in Turkey, and one in Italy.

Five studies were conducted with the sampling population of preschool and infants aged seven and below. Another four studies were done with children in primary and secondary school, and one consisted of children of a wide range of ages, from infancy to high school. ER of children in these studies were measured either via self-reported measure only or via multi-informant measures answered by several people including children, parents, guardians and teachers.

1. Predictive Studies

Three studies were on SES factors as predictors of ER levels, and a predictive relationship was found between the two variables (Hosokawa & Katsura, 2018; Spinelli et al., 2020; Huang et al., 2018). Hosokawa and colleagues (2018) found negative univariate associations between family income as well as maternal and paternal education to mental health domains such as emotional symptoms. These associations were related to ER, conduct problems, and peer problems. A multivariate analysis found that SES was negatively associated with all mental health domains. Another study found that household chaos was a predictor of parenting stress which was then associated with lower ER in children (Spinelli et al., 2020). Spinelli and colleagues (2020) reported a bigger impact of parenting stress and involvement on ER of children from lower SES families. This shows that external stressors that affect parents will also affect the development of ER in their children. Huang and colleagues (2018) found that family SES was significantly and positively associated to ER in children who reported higher levels of resilience but not among children who reported lower level of resilience.

2. Correlational Studies

In the correlational analysis included, the studies have found that factors related to SES was significantly correlated to ER (Huang et al., 2018; Garner et al., 2015; Kao et al., 2020). For example, Huang et al. (2018) found that SES, resilience, and parents' positive emotions positively relate to adolescents' ER and life satisfaction, while Garner et al. (2015) found that income levels were associated with ER and emotion knowledge in children. Another study found that children with parents that used more adaptive ER strategies and are from higher income and less chaotic households have better emergent ER (Kao et al., 2020). This shows the importance of the environment the children grew up in on their emotional development.

3. Longitudinal Studies

Two studies that used longitudinal methods to investigate the longitudinal effects of SES found on children's ER found a positive association between SES and ER (Gulseven et al., 2018; Herd et al., 2018). Gulseven and colleagues (2018) found that family SES positively and directly affected ER and emotional lability of Turkish children over two years. Children from lower SES scored significantly lower than higher SES with gender, community, and previous ER and emotional lability scores controlled. Another study found that family SES was associated with parents' ER, parenting practices, and parent-child relationships over four years (Herd et al., 2020). In addition, SES was related to the development of childrens' ER as children from higher SES score significantly higher scores than those from lower SES over time.

4. Moderational Relationship

In regard to moderators, affective social competence, which encompasses ER and emotion knowledge, is a protective factor for students from lower SES and teacher-child relationships (Garner & Mahatmya, 2015). In another study on Chinese adolescents, the researchers found that resilience moderated the association between SES and ER in migrant adolescents. However, resilience protective factors in adolescents were lesser in lower

SES adolescents than higher SES children (Huang et al., 2018). Finally, one study focused on mediators found family emotional context, which assesses parents' ER, parenting practices, and parent-adolescent relationship as a mediator to the association between SES and changes in ER in adolescents (Herd et al., 2020). Table 3 below shows a summary of results from studies selected in the review.

Table 3. Summary of results

Author, Year, Country	**Aim**	**Design and number of participants**	**Age group of children**	**Data analysis**	**Findings**
Kao et al., (2020), US	Examine the unique contributions of parental and family factors to children's emergent ER and the asccociation between children's ER skills and social competence with an emphasis on problem behaviors and adaptive social functioning	Cross sectional, N = 90 children and N = 90 parents	3.5 years old	Correlation, Regression	Children whose parents use more adaptive emotion regulation strategies (r = 0.33, p = 0.001) and who grow up in a higher income (r = 0.25, p = 0.02), less chaotic household (r = −0.30, p = 0.004) have better emergent emotion regulation.
Gülseven et al., (2018).Turkey	Examine the extent of SES contribution to children's ER and lability at age 7 over 3 years, and mothers' responsive and harsh parenting as a mediator	Longitudinal study, N = 340	7 years old	Path analysis, multi-group analysis	SES was significantly related to children's emotional lability and ER. SES positively associated with responsive parenting and negatively associated with harsh parenting
Huang et al., (2018), China	Examine the association between SES and ER, life satisfaction and depression, and moderating effect of adolescents' resilience and parental positive emotion	Cross-sectional, N = 486	9-16 years old	Correlation, hierarchical regression,	Resilience and parental positive emotion moderated associations between SES and ER. (simple slope = 0.209, t = 1.982, p = .048) and (t = −1.74, p = .084) SES is significantly associated with adolescents' emotional outcomes.
Herd et al., (2020), US	Investigate longitudinal effects between family environment (SES and family emotional context)	Longitudinal study, N = 167	13 & 14 years old	Correlation, latent change score model	Family emotional context is identified as a mediator between SES risk and emotion regulation development. Those from higher SES

	and ER development				linked to better family emotional context, which led to a higher increase in emotion regulation every year
Garner & Waajid, (2018), US	To understand sociodemographic variables' role in global and discrete-level ER ability in predicting school children's peer victimization.	Cross-sectional, N = 109	Mean age 9.76 years old	Correlation, regression analyses	Children from lower SES reported more relational victimization than higher SES, F(1, 107) = 11.55, p , .01. Relational victimization has a positive relation to sadness regulation for boys but not for girls.
Cheung et al., (2018), Hong Kong & Macau	To test the mediating role of adolescents' emotional intelligence for the effects of family risks in adolescent adjustment	Cross-sectional, N = 804	11-17 years old	Multi-group path analysis bootstrapping	Economic stress predicted family conflict ($\beta = .16$, $p < .001$), children's emotional intelligence ($\beta = -.17$, $p < .001$), prosocial behaviors ($\beta = .07$, $p < .05$), internalizing problems ($\beta = .08$, $p < .05$), and externalizing problems ($\beta = .08$, $p < .05$).
Miller et al., (2016), US	To test whether child cortisol moderated the association and negative home environment factors and ER outcomes.	Cross-sectional, N = 380	Mean 4.2 years old	Correlation, moderation analysis	Higher chaos was related to higher negative lability and lower positive regulation. Child cortisol level moderated the association between family routines and ER, lack of regular routines lead to lower ER
Garner & Mahatmya (2015), US	Examine whether race and family income level is a moderator to children's affective social competence and teacher-child relationship	Cross-sectional, N = 132	Mean 4.3 years old	Correlation, multilevel modeling	Income level associated with emotional knowledge and ER. Low SES children scored lower on emotion knowledge, $t(130) = -4.26$, $p < .001$ and on ER, $t(130) = -3.31$, $p < .01$
Hosokawa & Katsura (2018), Japan	Assess the impact of SES on mental health functionings of pre-school children	Cross-sectional,N = 3218	5-6 years old	ANOVA, multiple linear regression	Significantly higher scores of emotional/behavioral problems in lower SES children and low

					maternal and paternal education. All three were predictors of emotional/behavioral problems in children.
Spinelli, M., Lionetti, F., Setti, A., & Fasolo, M. (2020), Italy	Explore risk factors associated with parenting stress and implications for child' ER from different SES	Cross-sectional, N = 810	2-14 years old	Correlation, multivariate regression model	Household chaos showed a moderate and positive relation to parents' stress (r = .37) and childrens' ERC negativity (r = .41) and a moderate negative correlation with parental involvement (r = -.28) and children's ER (r = -.30). At-risk SES families, parental involvement was a significant mediator on parenting stress and childrens' ER.

Discussion

This systematic review aimed to explore the role of SES in the development of ER in children. The reviewers found a correlational, predictive and longitudinal relationship between SES and ER. The reviewers also found a moderating and mediating associations between SES, ER, and other variables. Three main SES related themes associated with ER development in children were family income, parenting or family factor and, environmental factors.

Findings showed that family income was a factor related to ER development of children (Kao et al., 2020; Gulseven et al., 2018). Children from lower SES scored significanly lower on ER scores as compared to children from higher SES (Gulseven et al., 2018) and have parents with more adaptive ER strategies (Kao et al., 2020). Families from lower SES with lower income tend to have less resources compared to their counterparts. These resources may emerge in several aspects such as education, health and basic necessitites.

One possible explanation to children from lower SES scoring lower in ER scores is due to lack of exposure and knowledge on emotions. Garner and Mahatmya (2015) found that income level is associated with emotional knowledge with children from lower income families scoring lower in emotional knowledge. Lack of knowledge and exposure to emotions and adaptive methods to cope with difficult emotions will naturally affect emotion regulation levels of these children. Family income hence can be seen as a very crucial factor as it can be considered a domino effect and will affect the remaining two factors that will be discussed below.

Parenting or family factor has a huge impact on ER development of children as parents from higher SES was found to have more adaptive ER strategies and family emotional context was found to mediate the relationship between SES and ER (Kao et al., 2020; Herd et al., 2020). SES was found to predict lower ER levels in children with lower maternal and paternal education levels, more chaotic households, and more parenting stress (Spinelli et al., 2020; Hosokawa & Katsura, 2018). These parenting and family factors may directly impact the children as children may model their parents' behaviors. While family income is important and is considered as financial capital, parents' education is vital as it is regarded as human capital (Hoff et al., 2002; Liu et al., 2004). These findings were similar to results from the correlational analysis that found parents' positive emotions and their emotional involvement in their children were correlated to higher ER and life satisfaction scores in adolescents (Huang et al., 2018).

Parental warmth and involvement are crucial dimensions that predict children's development and adjustment outcomes (Steinberg, 2014). Findings showed that family context mediate the relationship between SES and ER in children (Herd et al., 2020). This implied that SES impact children directly and indirectly through the environment and care they grow up in and receive before their transition into adulthood. Parents from lower income households may also be less involved with their children's development as they are preoccupied with their financial problems. More stressed parents are less aware and engage with their children's emotional awareness and needs, affecting their emotional development (Fernandes et al., 2020; Gillis & Roskam, 2019).

Environmental factors were associated with ER levels of children with children from more chaotic environment scored lower in levels of ER (Kao et al., 2020; Spinelli et al., 2020). This is due to several factors such as parenting stress and lack of involvement in children's lives (Spinelli et al., 2020) and children's stress which can be measured via their cortisol level (Miller et al., 2016). Chaotic households is often linked to lower SES families due to cumulative stress, lack of resources, shifting of work schedules and single parenthood faced by these families. Stress endured by parents is often spilled over on their children and when parents use maladaptive ER strategies to cope with these stressors, their children will tend to learn these strategies through observational learning. As compared to higher SES parents who are less prone to be exposed to these environmental stressors and will less likely affect their children.

Parents in chaotic households and stressful environment reported a less enjoyable experience interacting with their kids (Spinelli et al., 2020). This may explain the lack of involvement in their children lives further leading to lack of parental figure in low SES children's lives. Children from lower SES are then required to navigate childhood more often on their own and are expected to have the same level of emotional knowledge and emotion regulation as their peers as they grow up. The environmental factors of low SES not only affect the parents but the children as well and may well be inherited by their offspring in the future. The finding further demonstrate that poverty and SES is a systemic issue and affects parents and children for generations to come.

ER can also be moderated by children's resilience, which serves as a buffer to decrease ER levels due to SES. However, resilience does not have much of a moderating role in lower SES children due to the severity of the conditions they may live in (Huang et al., 2018). Huang et al. (2018) described the level of resilience exhibited here as protective-reactive, the protective factor of resilience generally provide an advantage but less when risk levels are higher. This finding is partly in line with previous studies that found resilience as a promotive factor to buffer severe effects of adversity in children (Ye et al., 2016; Zhu et al., 2015).

Findings from this review highlights the importance of SES factors on the development of ER on children from a socio-ecological perspective. The evidence strengthens the socio-ecological model that views human development as a product of dynamic process of complex interactions between individuals and different levels of the social ecology. This review supports a socio-ecological perspective on SES factors and the development of ER in children and emphasizes the importance of proximal socio-ecological context, mainly family, as well as other contexts such as income and environment. Honing resilience in children is also an important protective factor, especially for lower SES children, to mitigate the impact of SES related factors on development of ER in children.

1. Risk of Bias Assessment

The validity of the data and results from the included research determines the extent to which the present review may make conclusions regarding the SES-ER relationship. The Newcastle–Ottawa Scale (NOS) is a measure for determining the risk of bias in case–control and longitudinal research (Margulis et al. 2014). The NOS assesses eight particular items based on three quality parameters (selection, comparability, and outcome). Except for comparability, which may be adapted to the individual topic of interest to earn up to two points, each item on the scale is worth one point. As a result, the maximum score for any research is 9, with studies scoring less than 5 indicating a significant likelihood of bias. We chose to consider "yes" for studies that controlled prior levels of the outcome in their analysis for the "demonstration that outcome of interest was not present at the start of the study" item as conducted by Herd and Kim-Spoon (2021). Figure 2 presents a

summary of the findings. The two most significant areas of concern were construct evaluation (many studies used self-report rather than a more objective measure) and appropriate time before a follow-up assessment (many studies were cross-sectional). These limitations should be taken into account when interpreting the results.

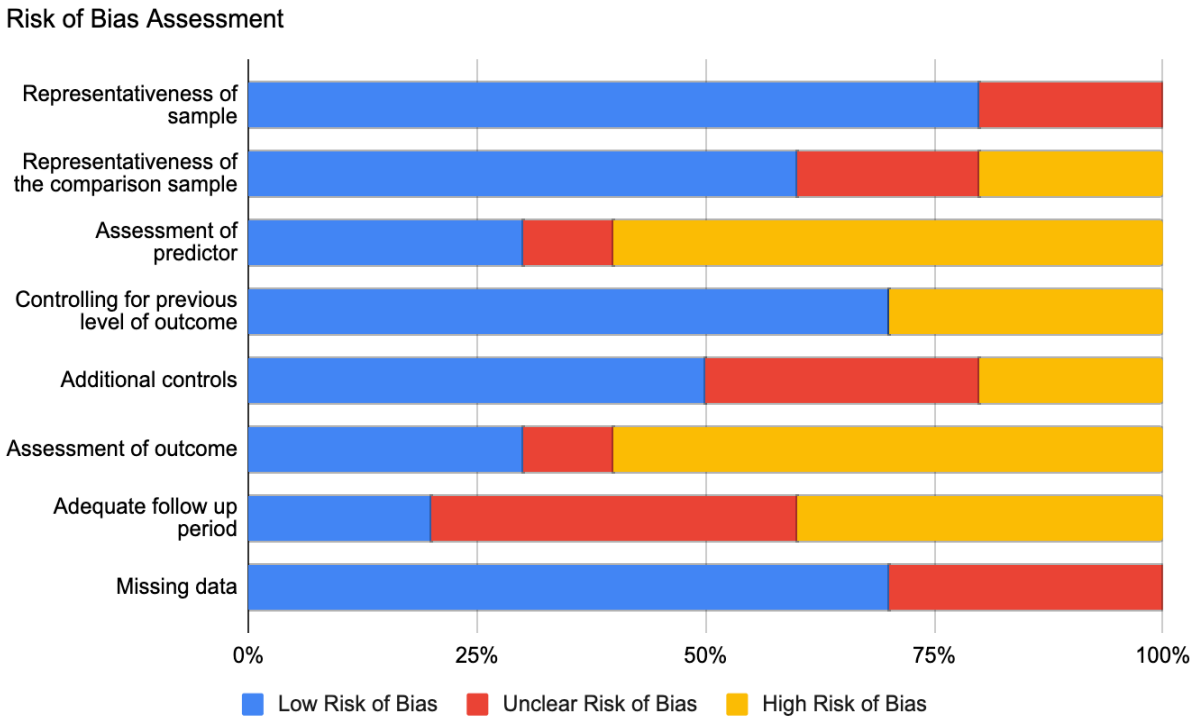

Figure 2. Risk of assessment bias summary

2. Limitations

Limitations of this review were that only studies published in English were included, and findings from other studies in different languages and countries may found different results on the issue. Other limitations include that half of the studies in the review were conducted in the US and lack of comparison between different countries and cultures in understanding emotions and different challenges each country's lower SES children may have. Most of the studies included were also from developed countries hence the findings may not be applicable to lower income and developing countries which has different socioeconomic context.

It is also important to take note of the lack of negative and non-significant results. Earp (2018) noted on the failure of most journals to publish negative results in which was termed by Greenwald (1975) as "consequences of prejudice against the null hypothesis" or now known as "publication bias". This review didn't include other developmentally relevant studies published in other relevant fields such as sociology. Some of these fields may have studied the issue of SES and poverty in greater depth than psychology although not from an ER point of view.

3. Direction for Future Research

Future research should consider focusing on differences in understanding emotions and challenges lower SES may have in different countries to help understand further difficulties of ER in lower SES children from a multicultural approach. A comparison of interventions used in lower SES children and their efficacy may also be helpful to plan effective interventions in lower SES children and families effectively. Studies included in this review focused on children from the age range of 3-18 years old. There are no differences in findings between age groups of children and association between SES and ER. However, it is essential to take into consideration the methodologies used in previous research.

Only two of the studies included in this review conducted longitudinal studies, and both studies showed greater increase in ER level in children from higher SES households as compared to their counterparts. These findings are significant as they exhibit a considerable disparity in emotional development across different SES levels that will eventually lead to a substantial gap as they enter adulthood. Future research should strive to use longitudinal studies that explores causal relationships between socioecological factors related to SES and ER in children at different stages of development.

There are also different advantages for studies that focus on different age groups. For studies that focus on ER and SES at a younger age, such as infancy and preschool, researchers are able to focus on parenting behaviors as children were not exposed to other environments. Parenting influences also starts from infancy and are related to several aspects of children's performance such as working memory, impulse control, and categorization (Bernier et al., 2010; Bernier et al., 2012; Kraybill & Bell, 2013).

Lastly, as ER is dependent on cultures and societal norms (Ford & Mauss, 2015), future research should balance between the usage of established psychometric instruments that are comparable to previous studies and instruments and methods that are culturally appropriate to improve cultural applicability (Scharpf et al., 2021).

4. Implications

The findings from this review would be beneficial to government and non-government organizations that work with at-risk children. There is a need to take a multidisciplinary approach to intervene in SES-related risk factors associated ER of children. A whole of society approach and cross-collaborations between policymakers, community leaders, schools, and other organizations are essential as psychological interventions, social and economic interventions are needed to lift the quality of living in these families.

Social buffering, the ability of social factors such as caregivers to dampen or buffer physiological response to stressors (Hostinar et al., 2015), is important in reducing the impact of poverty related stressors in children. Previous studies have shown that caregivers play an important role in social buffering of children since infancy (Nachmias et al., 1996), early adolescence although not as effective during late adolescence (Hostinar et al., 2015). Caregivers, especially parents, play an important role in reducing the impact of stressors experienced by chilren in their daily lives. With less chronic stress induced from SES related factors, children would be able to learn to regulate emotions at their own pace and the impact of poverty related stressors in low-income household could be dampended.

Targeted interventions related to social-emotional learning (SEL) and other preventive interventions would be helpful and more effective as children from lower SES are more prone to SES risk factors associated with ER. In addition, investments in programs that educate caregivers and teachers on managing daily stressors and regulating emotions would be useful to help them to adopt more sensitive parenting and teaching behaviors.

A long-term solution includes policy changes and funding allocations to lower SES neighborhoods to encorporate SEL in schools and community centers as well as provide economic opportunities to parents and increase employability of graduating students via upskilling programs. From increasing inrechments programs to children to reach their full potential to providing quality jobs and opportunities to lower SES individuals to work would help to stop the poverty cycle and intergenerational of social class structure (Amso & Lynn, 2017).

Conclusion

In summary, results from this systematic review suggest that there is a significant relationship between SES and ER and a correlational, predictive and longitudinal relationship between SES and ER in children was found. Children from lower SES households are more prone to have lower levels of ER as compared to children from higher SES. The SES factors found associated to development of ER in children were family income, parenting and environmental factors. Resilience was also found to moderate the relationship between SES and ER. Future studies should consider sociocultural differences and focusing on different stages in the development of ER in children. Additionally, more studies on ER and SES from other developing countries

would also give more context on the socioeconomic context from different countries. Importantly, findings from this review contributes to the growing literature on ER in children and the factors contributing to ER development from the SES context. From an implication perspective, the findings support the need for targeted intervention and support for lower SES children and their families.

Acknowledgement: This article was funded by the Transdiciplinary Research Grant Scheme (TRGS/1/2020/UKM/01/4/1) provided by the Ministry of Higher Education Malaysia

Conflicts of Interest: The authors declare no conflict of interest.

References

Amso, D., & Lynn, A. (2017). Distinctive mechanisms of adversity and socioeconomic inequality in child development: A review and recommendations for evidence-based policy. *Policy Insights from the Behavioral and Brain Sciences, 4*(2), 139-146.

Balzarotti, S., John, O., & Gross, J. (2010). An Italian adaptation of the emotion regulation questionnaire. *European Journal of Psychological Assessment, 26*(1). https://doi.org/10.1027/1015-5759/a000009

Bernier, A., Carlson, S. M., Deschênes, M., & Matte-Gagné, C. (2012). Social factors in the development of early executive functioning: A closer look at the caregiving environment. *Developmental Science, 15*, 12–24. https://doi.org/10.1111/j.1467-7687.2011.01093.x.

Bernier, A., Carlson, S. M., & Whipple, N. (2010). From external regulation to self-regulation: Early parenting precursors of young children's executive functioning. *Child Development, 81*, 326–339. https://doi.org/10.1111/j.1467-8624.2009.01397.x.

Boyes, M. E., Leitão, S., Claessen, M., Badcock, N. A., & Nayton, M. (2020). Correlates of externalising and internalising problems in children with dyslexia: An analysis of data from clinical casefiles. *Australian Psychologist, 55*(1), 62-72.

Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Harvard University Press.

Capistrano, C. G., Bianco, H., & Kim, P. (2016). Poverty and internalizing symptoms: The indirect effect of middle childhood poverty on internalizing symptoms via an emotional response inhibition pathway. *Frontiers in Psychology, 7*, 1242.

Cheung, R. Y. M., Leung, M. C., Chung, K. K. H., & Cheung, H. Y. (2018). Family risks and adolescent adjustment in Chinese contexts: Testing the mediating role of emotional intelligence. *Journal of Child and Family Studies, 27*(12), 3887–3896. https://doi.org/10.1007/s10826-018-1233-y

Conger, R. D., & Donnellan, M. B. (2007). An interactionist perspective on the socioeconomic context of human development. *Annual Review of Psychology, 58*, 175–199.

Deater-Deckard, K., Chen, N., Wang, Z., & Bell, M. A. (2012). Socioeconomic risk moderates the link between household chaos and maternal executive function. *Journal of Family Psychology, 26*, 391–399.

Dvir, Y., Ford, J. D., Hill, M., & Frazier, J. A. (2014). Childhood maltreatment, emotional dysregulation, and psychiatric comorbidities. *Harvard Review of Psychiatry, 22*(3), 149–161. https://doi.org/10.1097/HRP.0000000000000014

Earp, B. D. (2018). The need for reporting negative results-a 90 year update. *Journal of Clinical and Translational Research*, *3*(Suppl 2), 344.

Emond, J. A. (2020). Household chaos: a risk factor for adverse child outcomes gains attention in public health. *BMC Public Health*, *20*(1). https://doi.org/10.1186/s12889-020-08680-y

Fernandes, D. V., Canavarro, M. C., & Moreira, H. (2020). The mediating role of parenting stress in the relationship between anxious and depressive symptomatology, mothers' perception of infant temperament, and mindful parenting during the postpartum period. *Mindfulness*, 1–16. https://doi.org/10.1007/s12671-020-01327-4

Ford, B. Q., & Mauss, I. B. (2015). Culture and emotion regulation. *Current Opinion in Psychology*, *3*, 1-5.

Garner, P. W., & Mahatmya, D. (2015). Affective social competence and teacher-child relationship quality: Race/ethnicity and family income level as moderators. *Social Development, 24*(3), 678–697. https://doi.org/10.1111/sode.12114

Garner, P. W., & Waajid, B. (2019). Sociodemographic variations in the linkage between emotion regulation and peer victimization. *Journal of School Violence, 18*(1), 121-133.

Gillis, A., & Roskam, I. (2019). Daily exhaustion and support in parenting: Impact on the quality of the parent-child relationship. *Journal of Child and Family Studies, 28*(7), 2007–2016.

Glass, T. A., McAtee, M.J. (2006). Behavioral science at the crossroads in public health:extending horizons, envisioning the future. *Social Science & Medicine, 62*(16), 50–71.

Golombek, K., Lidle, L., Tuschen-Caffier, B., Schmitz, J., & Vierrath, V. (2020). The role of emotion regulation in socially anxious children and adolescents: A systematic review. *European Child & Adolescent Psychiatry, 29*(11), 1479-1501.

Granero, R., Louwaars, L., & Ezpeleta, L. (2015). Socioeconomic status and oppositional defiant disorder in preschoolers: parenting practices and executive functioning as mediating variables. *Frontiers in Psychology, 6*, 1412.

Greenwald, A. G. (1975). Consequences of prejudice against the null hypothesis. *Psychological Bulletin*, *82*(1), 1.

Gross, J. J., Sheppes, G, Urry, H. L. (2011). Cognition and emotion lecture at the 2010 SPSP emotion preconference. *Cognitive Emotion, 25*, 765–781.

Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology, 2*, 271–299. https://doi.org/10.1037/ 1089-2680.2.3.271

Gross, J. J. (2014). Emotion regulation: Conceptual and empirical foundations. In J. J. Gross (Ed.), *Handbook of emotion regulation* (p. 3–20). The Guilford Press.

Gross, J. J. (2001). Emotion regulation in adulthood: Timing is everything. *Current Directions in Psychological Science, 10*, 214–219.

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology*, *85*(2), 348.

Gülseven, Z., Kumru, A., Carlo, G., Palermo, F., Selcuk, B., & Sayıl, M. (2018). The mediational roles of harsh and responsive parenting in the longitudinal relations between socioeconomic status and Turkish children's emotional development. *International Journal of Behavioral Development*, *42*(6), 563-573.

Herd, T., & Kim-Spoon, J. (2021). A systematic review of associations between Adverse Peer Experiences and emotion regulation in adolescence. *Clinical Child and Family Psychology Review*, 1-23.

Herd, T., King-Casas, B., & Kim-Spoon, J. (2020). Developmental changes in emotion regulation during adolescence: Associations with socioeconomic risk and family emotional context. *Journal of Youth and Adolescence, 49*(7), 1545–1557. https://doi.org/10.1007/s10964-020-01193-2

Hoff, E., Laursen, B., & Tardif, T. (2002). Socioeconomic status and parenting. In M. H. Bornstein (Ed.), *Handbook of parenting: Biology and ecology of parenting* (2nd ed). (pp. 231–252). Erlbaum.

Hosokawa, R., & Katsura, T. (2018). Socioeconomic status, emotional/behavioral difficulties, and social competence among preschool children in Japan. *Journal of Child and Family Studies, 27*(12), 4001–4014. https://doi.org/10.1007/s10826-018-1231-0

Hostinar CE, Gunnar MR. (2013). Future directions in the study of social relationships as regulators of the HPA axis across development. *Journal of Clinical Child & Adolescent Psychology*. 42:564–575. DOI: 10.1080/15374416.2013.804387 [PubMed: 23746193]

Huang, S., Han, M., Sun, L., Zhang, H., & Li, H. J. (2019). Family socioeconomic status and emotional adaptation among rural-to-urban migrant adolescents in China: The moderating roles of adolescent's resilience and parental positive emotion. *International Journal of Psychology*, *54*(5), 573-581.

Johnson, S. B., Riis, J. L., & Noble, K. G. (2016). State of the art review: poverty and the developing brain. *Pediatrics*, *137*(4).

Kao, K., Tuladhar, C. T., & Tarullo, A. R. (2020). Parental and family-level sociocontextual correlates of emergent emotion regulation: Implications for early social competence. *Journal of Child and Family Studies*, *29*(6), 1630-1641.

Kaufman, E. A., Xia, M., Fosco, G., Yaptangco, M., Skidmore, C. R., & Crowell, S. E. (2016). The difficulties in emotion regulation scale short form (DERS-SF): Validation and replication in adolescent and adult samples. *Journal of Psychopathology and Behavioral Assessment, 38*(3), 443–455. https://doi.org/10.1007/s10862-015-9529-3.

Kraft, P., & Kraft, B. (2021). Explaining socioeconomic disparities in health behaviours: A review of biopsychological pathways involving stress and inflammation. *Neuroscience & Biobehavioral Reviews*, *127*, 689-708.

Kraybill, J. H., & Bell, M. A. (2013). Infancy predictors of preschool and post-kindergarten executive function. *Developmental Psychobiology, 55*, 530–538. htpps://doi: 10.1002/dev.21057.

Liu, W. M., Ali, S. R., Soleck, G., Hopps, J., Dunston, K., & Pickett, T. (2004). Using social class in counseling psychology research. *Journal of Counseling Psychology, 51*, 3–18.

Lyu, Z., Peng, K. & Hu C. (2019). Socioeconomic status and brain structure and functions: A critical review. *Chinese Science Bulletin, 64*, 2114-2126.

Mallett, R., Hagen-Zanker, J., Slater, R., & Duvendack, M. (2012). The benefits and challenges of using systematic reviews in international development research. *Journal of Development Effectiveness, 4*(3), 445-455.

Mance, G. A., Grant, K. E., Roberts, D., Carter, J., Turek, C., Adam, E., & Thorpe Jr, R. J. (2019). Environmental stress and socioeconomic status: Does parent and adolescent stress influence executive functioning in urban youth?. *Journal of prevention & intervention in the community*, *47*(4), 279-294.

Margulis, A. V., Pladevall, M., Riera-Guardia, N., Varas-Lorenzo, C., Hazell, L., Berkman, N. D., & Perez-Gutthann, S. (2014). Qual-ity assessment of observational studies in a drug-safety system-atic review, comparison of two tools: the Newcastle-Ottawa Scale and the RTI item bank. *Clinical Epidemiology*, 10, 359–368. https://doi.org/10.2147/CLEP.S66677.

Miller, A. L., Song, J.-H., Sturza, J., Lumeng, J. C., Rosenblum, K., Kaciroti, N., & Vazquez, D. M. (2016). Child cortisol moderates the association between family routines and emotion regulation in low-income children. *Developmental Psychobiology, 59*(1), 99–110. https://doi.org/10.1002/dev.21471.

Miller, P., & Votruba-Drzal, E. (2017). The role of family income dynamics in predicting trajectories of internalizing and externalizing problems. *Journal of Abnormal Child Psychology, 45*, 543–556.

Moher, D., Liberati, A., Tetzlaff, J., Altman, D.G., The PRISMA Group., 2009. Preferred reporting items for systematic reviews and MetaAnalyses: the PRISMA state- ment. *PLOS Medicine. 6*(7) https://doi.org/10.1371/journal.pmed1000097 e1000097.

Montreuil, T., & Malikin, H. (2021). Online risk interventions: implications of theory of mind and other considerations. In *Child and Adolescent Online Risk Exposure* (pp. 379-401). Academic Press.

Muscatell, K. A. (2018). Socioeconomic influences on brain function: implications for health. *Annals of the New York Academy of Sciences*, *1428*(1), 14-32.

Nachmias, M., Gunnar, M., Mangelsdorf, S., Parritz, R. H., & Buss, K. (1996). Behavioral inhibition and stress reactivity: The moderating role of attachment security. *Child Development, 67*(2), 508–522. https://doi.org/10.2307/1131829.

Noble, K. G., & Giebler, M. A. (2020). The neuroscience of socioeconomic inequality. *Current Opinion in Behavioral Sciences*, *36*, 23-28.

Ochsner, K., & Gross, J. (2005). The cognitive control of emotion. *Trends in Cognitive Sciences*, *9*(5), 242–249. https://doi.org/10.1016/j.tics.2005.03.010.

Ochsner, K. N., Silvers, J., & Buhle, J. T. (2012). *Functional imaging studies of emotion regulation: A synthetic review and evolving model of the cognitive control of emotion.* Annals of the New York Academy of Science.

Petrosino, A., Boruch, R. F., Soydan, H., Duggan, L., & Sanchez-Meca, J. (2001). Meeting the challenges of evidence-based policy: The Campbell Collaboration. *The Annals of the American academy of political and social science*, *578*(1), 14-34.

Powers, A., Stevens, J., Fani, N. & Bradley, B. (2015). Construct validity of a short, self-report instrument assessing emotional dysregulation. *Psychiatry Research, 225*(0), 85–92. https://doi.org/10.1038/jid.2014.371.

Powers, A., Stevens, J. S., van Rooij, S. J. H., Ely, T. D., Fani, N., Jovanovic, T., Ressler, K. J., & Bradley, B. (2017). Neural correlates and structural markers of emotion dysregulation in traumatized civilians. *Social Cognitive and Affective Neuroscience, 12*(5), 823–831. https://doi.org/10.1093/scan/nsx005.

Rawana, J. S., Flett, G. L., McPhie, M. L., Nguyen, H. T., & Norwood, S. J. (2014). Developmental trends in emotion regulation: A systematic review with implications for community mental health. *Canadian Journal of Community Mental Health*, *33*(1), 31-44.

Sancis-Sanchis, A., Grau, M. D., Moliner, A.-R., & Morales-Murillo, C. P. (2020). Effects of age and gender in emotion regulation of children and adolescents. *Frontiers in Psychology*, *11*. https://doi.org/10.3389/fpsyg.2020.00946.

Scharpf, F., Kaltenbach, E., Nickerson, A., & Hecker, T. (2021). A systematic review of socio-ecological factors contributing to risk and protection of the mental health of refugee children and adolescents. *Clinical Psychology Review*, *83*, 101930.

Sierra-Correa, P. C., & Cantera Kintz, J. R. (2015). Ecosystem-based adaptation for improving coastal planning for sea-level rise: A systematic review for mangrove coasts. *Marine Policy, 51*, 385–393. https://doi.org/10.1016/j.marpol.2014.09.013.

Smedley, B. D., & Syme, S. L. (2000). Understanding and reducing socioeconomic and racial/ethnic disparities in health. In *Promoting health: Intervention strategies from social and behavioral research*. National Academies Press (US).

Spinelli, M., Lionetti, F., Setti, A., & Fasolo, M. (2020). Parenting stress during the COVID-19 outbreak: Socioeconomic and environmental risk factors and implications for children emotion regulation. *Family Process, 60*(2), 639–653. https://doi.org/10.1111/famp.12601.

Steinberg, L. (2014). *Age of opportunity: Lessons from the new science of adolescence*. Houghton Mifflin Harcourt.

Troy, A. S., Ford, B. Q., McRae, K., Zarolia, P., & Mauss, I. B. (2017). Change the things you can: Emotion regulation is more beneficial for people from lower than from higher socioeconomic status. *Emotion*, *17*(1), 141–154. https://doi.org/10.1037/emo0000210.

Ye, Z., Chen, L., Harrison, S. E., Guo, H., Li, X., & Lin, D. (2016). Peer victimization and depressive symptoms among rural-to-urban migrant children in China: The protective role of resilience. *Frontiers in Psychology*, *7*, 1542.

Zeman, J., Cassano, M., Perry-Parrish, C., & Stegall, S. (2006). Emotion regulation in children and adolescents. *Journal of Developmental and Behavioral Pediatrics, 27*(2), 155–168. https://doi.org/10.1097/00004703-200604000-00014.

Zhu, Q., Guo, H., Pan, J., & Lin, D. (2015). Perceived discrimination and problem behaviors among rural-to-urban migrant children: The moderating role of resilience. *Chinese Journal of Clinical Psychology*, *23*(3), 529–533.