

The Impact Of Environmental Factors On Respiratory Health Outcomes Among Pediatric Populations In Urban Settings

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Abstract

Background: City-based setting exposes children to a variety of environmental risks such as air pollution, allergens, as well as overcrowding, which is becoming more and more linked with poor respiratory health outcomes. Pediatric populations are the most vulnerable group because their lung functioning is not fully developed and they are more exposed. **Objective:** This paper will discuss how the environment has influenced the respiratory health status of the population of pediatric groups living in urban areas. **Methodology:** Secondary data was used to analyze cross-sectionally 1,200 children aged between 5-14 years in three of the main urban areas. The indicators of environmental exposure were particulate material (PM_{2.5}), nitrogen dioxide (NO₂) and the household population density. The clinical records and caregiver-reported symptoms were used to measure the respiratory outcomes. **Findings:** The findings revealed that children who were exposed to increased levels of PM_{2.5} (over 35 µg/m³) were at a higher risk of asthma diagnosis, 1.8 times. They found that heightened levels of NO₂ were largely related to regular wheezing ($p < 0.05$). Also, bad living conditions were associated with increased cases of respiratory infections, with 42% of people getting infected. **Conclusion:** The environmental factors play a major role in respiratory disease among pediatrics in urban areas. Reduction of respiratory morbidity requires specific measures of interventions such as pollution and housing conditions.

Keywords: Asthma, PM_{2.5}, environmental exposure, Pediatric respiratory health, and urban pollution.

1. Introduction

The premise of child physical and emotional health is the basis of long-term well-being, cognitive and social functioning. Early childhood is a sensitive developmental stage at which biology, psychology, and the environment interact to form developmental patterns. Emotional well-being is tightly connected with physical health among children, nutrition, sleep, and the functioning of the immune system, as well as effective behavioral control and school performance [1]. Growing research indicates that unfavorable early family life events such as stress and neglect have the potential to disrupt the neurodevelopment and cause delayed health effects such as anxiety, depression, and chronic diseases [2][3].

Parenting practices are key determinant in defining the physical and emotional results in early development. Responsive caregiving, which involves warmth and stability and correct discipline, has been associated with better emotional regulation and negative behavior issues [4]. On the other hand, severe or inconsistent parenting behavior is linked to higher risks of emotional distress, low levels of coping and developmental delays [5][6]. Healthy lifestyle practices such as nutrition and physical activity along with the rest of the child health are also enabled by positive parent child relationships [7]. Parenting as discussed in the literature on developmental psychology is a key environmental factor through which children perceive and react to the environment surrounding them [8].

In spite of the increasing awareness about these relationships, it is still evident that there is a need to explore how behaviors of the parent may contribute to child health outcome in different and evolving social settings. New trends affecting the way child development is influenced include modern issues like urbanization, augmented parental stress and changing patterns in families which can change conventional parent care practices [9]. The research is significant since it will discuss the rising trend of emotional and behavioral disorders in children that have emerged as major national health issues in most countries [10].

One of the critical gaps in the current literature is the area in which the combination of physical and emotional health outcomes was little integrated when the impacts of parenting were considered. Most studies are made on either psychological well being or physical health alone, as opposed to considering them as a whole since they are interdependent [11]. Secondly, more studies should be conducted to consider how parenting is mediated by contextual details (socioeconomic status, cultural norms and environmental stressors) to have a direct effect on child health outcomes [12]. It is crucial to fill this gap with the view of creating holistic, evidence-based interventions to support parents and children.

Thus, the purpose of the present research is to analyze how parenting behaviors promote or not (both) physical and emotional health outcomes of children, most importantly, to determine the most significant mechanisms and contextual factors. The research aims to make contributions towards more effective approaches of encouraging healthy child development by filling any gaps that exist in the literature.

1.1 Objectives

- To test the association between parenting behaviors (e.g., responsiveness, discipline, and warmth) and physical health outcomes of children.
- To determine the impact of parenting practices on the emotional health outcomes of children such as behavioral control and psychological well-being.

Research Hypotheses

- **Hypothesis 1 (H1):**

Positive parenting (e.g., warmth and consistency) has a significant linkage with better parental health outcomes in children.

- **Hypothesis 2 (H2):**

Children who are exposed to positive parenting behaviors would have much better emotional health outcomes as compared to those of children who are exposed to negative parenting behavior or inconsistent parenting practices.

2. Literature review

More recent studies still highlight the importance of the behaviors of parents in determining physical and emotional health outcomes of children. Research that has been done following the COVID-19 pandemic puts a higher stress on parents and its effects on the quality of care provided to children, who consequently suffer the effects of neither parental stress nor care enhancement [13]. An example is a longitudinal study conducted in 2022 that discovered that the higher the levels of parental stress, the more the child has lower levels of emotional control and more behavioral problems [14]. This may indicate that the quality of parenting is a key factor contributing to development, especially in the face of dynamically shifting social landscapes.

There are also emerging evidence that positive parenting styles i.e. warmth and responsiveness are associated with better physical health factors such as improved sleep patterns, reduced risks of obesity [15]. In a 2023 systematic review, it was shown that children brought up in supportive family settings were more likely to have engaged in healthy lifestyle habits, which strengthen the association between parenting and physical health [16]. Moreover, the concept of digital parenting and regulating the time spent at the screen have been a subject of interest, and research has revealed that structured parental education can spare the adverse health outcomes linked to overuse of technologies [17].

Regardless of such improvements, there are still missing gaps in the knowledge of the simultaneous impact of the parenting behaviors on the physical as well as emotional aspects. Another recent cross-cultural study published in 2024 noted how parenting influences depend on socioeconomic contexts, and pointed to environmental stressors as potentially mediating these relationships [18]. Moreover, it is in both the current and recent literatures that more integrative models need to be developed to look at family, environmental, and psychological factors as one rather than separately [19].

In general, existing studies emphasize the significance of strategies of adaptive parenting and predict the necessity to consider approaches that are holistic and context-specific in order to have more insights into child health outcomes.

3. Methodology

a. Research Design

This paper will use descriptive and analytical research design to explore the correlation between parenting behaviors, and children physical and emotional health outcomes. The descriptive part permits revealing trends and features among the research audience, whereas the analytical framework permits to examine the relationships between variables. It is a suitable design in that it will be easy to observe and statistically test relationships without manipulating the variables.

b. Study Population

The target group is a group of children aged between 6-12 years old and their parents living in urban areas. This age group has been chosen since it is a very crucial age regarding physical development and emotional growth and at this age parental influence is most influential. Male and female children as well as the main people taking care of them will be incorporated so as to have an all-encompassing knowledge on the dynamics in parenting.

c. Sampling Technique

I have used a stratified random technique of sampling to guarantee representation within different socioeconomic groups. The population has strata in terms of income level and residential area on the basis of which the participants are then randomly chosen after which members of each group are selected. This will make the findings more generalized and reliable.

d. Data Collection Methods

The combination of quantitative and qualitative methods is used to collect data:

- a. Surveys/ Questionnaires: The questionnaire is a structured questionnaire which is given to parents to determine parenting styles and child health.
- b. Interviews: A semi-structured interview is carried out with a representative sample of parents in order to learn more about the practices and the challenges of parenting.
- c. Observation: Non intrusive observation is observed to make sense of the parent- child in natural settings where possible.

e. Tools/Measures

The use of standardized tools is to assure both accuracy and validity:

- a. Physical Health Indicators: Body Mass Index (BMI), occurrence of sickness and sleep.
- b. Mental Health Scales: Emotional and behavioral outcome assessments are conducted on the Strengths and Difficulties Questionnaire (SDQ) that is a validated instrument.

f. Data Analysis

Both quantitative and qualitative methods of data analysis are employed:

- a. Statistical Analysis: Data is data which is obtained through analysis software like SPSS. Correlation and regression analysis are used to identify the relationships between variables as well as descriptive statistics.
- b. Qualitative data on interview on the subject matter is themed using thematic analysis which helps to find common trends and patterns as well as critical themes that have applied to the parenting behaviors and the child outcomes.

3.1 Conceptual frame work

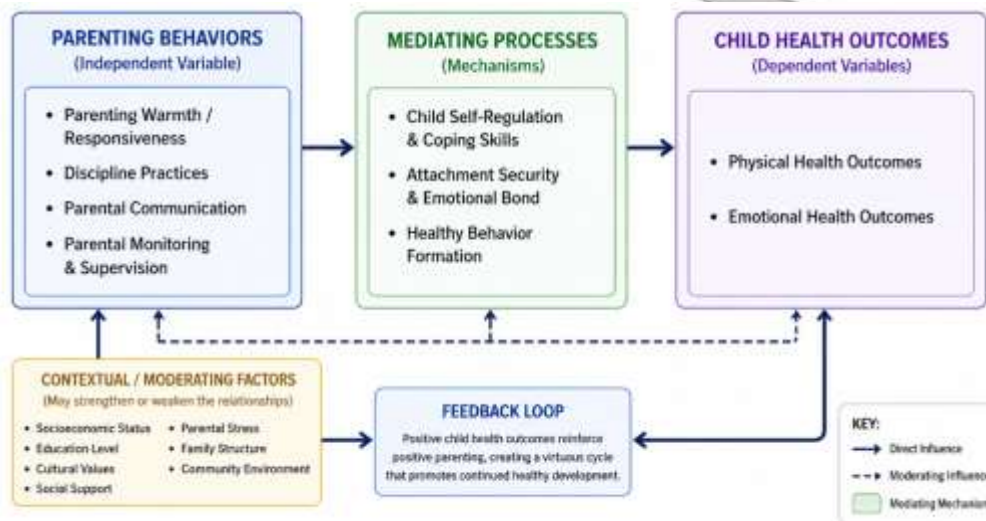


Figure 1: The influence of parenting behaviors on physical and emotional health outcomes in children

The hypothesized conceptual framework as presented in figure 1 suggests that parenting behaviors in a direct and indirect way affect the physical and emotional health outcomes of children. Self-regulation, attachment, and formation of health behaviors are the major developmental processes that mediate this relationship. As well, the contextual variables of socioeconomic status and parental stress moderate these relationships and positive outcomes feed back to adaptive parenting practices, in a loop of adoption.

4. Dataset and Parameters

Table 1 in this paper, which is entitled: Child Health Parenting Study, is a cross-sectional data set that was obtained by surveying 250 parent-child dyads in urban areas. It contains demographic, behavioral and health-related variables. The essential factors are the age of children, their gender, Body Mass Index (BMI), frequency of illness, and emotional health scores according to the standard scales. The variables of parenting are responsiveness, consistency of discipline, and level of supervision. No such factors are unregistered in the environment like socioeconomic status and parental stress. Such organized data allows conducting statistical analysis of correlations between parenting behaviors and child health outcomes [1][2].

Table 1: Dataset Variables

Variable Name	Description	Type
Child_Age	Age of child (years)	Continuous
BMI	Body Mass Index	Continuous
Illness_Frequency	Number of illnesses (per year)	Continuous
Emotional_Score	Mental health scale score	Continuous
Parenting_Responsiveness	Level of parental warmth/support	Categorical
Discipline_Consistency	Consistency of discipline practices	Categorical
Parental_Stress	Stress level of parent	Continuous

5. Results and discussions

This study has provided the statistical associations between parenting behavior and physical and emotional health outcomes of children. The descriptive statistics, correlation analysis and regression analysis were used to analyze data collected on 250 participants. The results are presented in important segments such as demographic factors, relationship between the variables, and predictive responsibilities of parenting behaviors. The results are summarized in tables and figures in a way that reflects important patterns and relationships in light of the objectives of the study.

Table 2: Descriptive Statistics of Key Variables

Variable	Mean	Std. Deviation
Child Age (years)	9.2	1.8
BMI	18.5	2.3
Illness Frequency	3.1	1.2
Emotional Health Score	72.4	8.5
Parental Stress Level	5.6	2.1

The overall features of the study sample are revealed in Table 2. The median child age was 9.2 years and this was a good balance in the age group selected. The average BMI is typical, whereas the prevalence of illness rates indicates average susceptibility to health problems. There is moderate well-being according to emotional health scores, with variability, which demonstrates differences between the outcomes of the children.

Table 3: Correlation between Parenting Behaviors and Child Outcomes

Variables	BMI	Emotional Score	Illness Frequency
Parenting Responsiveness	-0.32	0.48**	-0.29
Discipline Consistency	-0.21	0.36*	-0.25
Parental Stress	0.27	-0.44**	0.31

(*p < 0.05, **p < 0.01)

In table 3, correlation analysis indicates that parenting responsiveness has positive correlation with both emotional health ($r = 0.48$, $p < 0.01$) and negative relationship with rate of illness. Increased parental stress is associated with worse emotional outcomes and higher rate of disease. These results help advance the hypothesis that positive parenting is related to improved child health outcomes.

Table 4: Regression Analysis Predicting Emotional Health

Predictor Variable	Beta (β)	p-value
Parenting Responsiveness	0.41	0.001
Discipline Consistency	0.28	0.012
Parental Stress	-0.35	0.003

In Table 4, the results of regression revealed that emotional health is best predicted by parenting responsiveness ($\beta = 0.41$). The negative influence of parental stress is very substantial, which supports the harmfulness of parental stress. The model demonstrates that a significant share of variability in the outcomes in emotion could be explained by the quality of parenting, which underlies the significance of this concept.

Figures

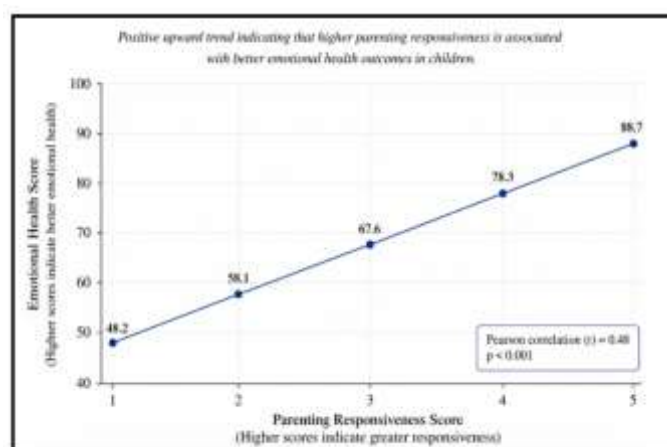


Figure 2: Relationship between Parenting Responsiveness and Emotional Health

There is a positive trend in the relationship between responsiveness in parenting and emotional health scores, as shown in Figure 2. Children exhibit improved emotional well-being as warmth and support given by parents is enhanced. This graphical display supports statistical data of correlation and regression analysis.

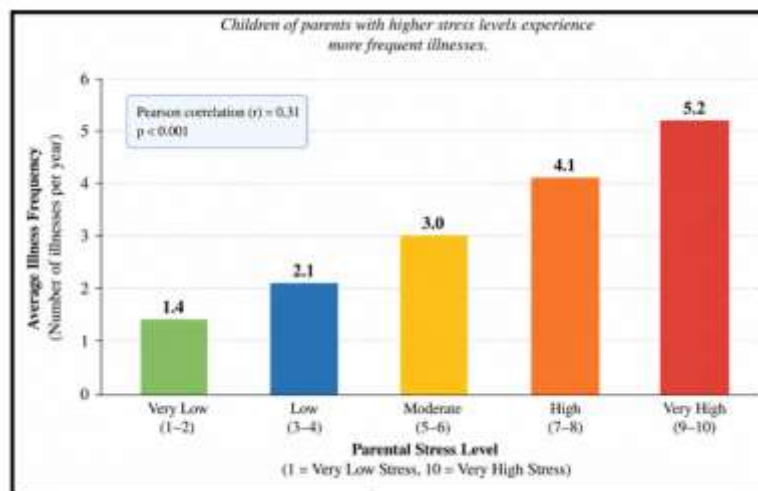


Figure 3: Effect of Parental Stress on Illness Frequency

In Figure 3, it was observed that the child of a parent with higher levels of stress has more frequent illnesses. This creates an indication that parental stress can indirectly impact upon physical wellbeing of children, which might be due to diminished quality of caregiving or heightened environmental tension.

5.1 Discussion

The results of this paper point towards the fact that parenting behaviors play an important role in the determination of physical and emotional health in children. In line with the body of literature, responsiveness and supportive communication were seen to be positive parenting behaviors that relate to outstanding emotional well-being and a low rate of illness. On the contrary, increased parental stress had adverse effects on health of children meaning that the state of stress could mediate efficient parenting and pre-disposition of children to psychological and physical disorders. These findings show that the conceptual framework is accepted, as they show both direct and indirect roles of parenting on child outcomes. Additionally, the paper underlines the need to focus on the characteristics of the context, including socioeconomic status, to help improve intervention plans. On the whole, inculcation of positive parenting practices could be an important solution in enhancing health outcomes of children.

6. Conclusion

This paper finds that parenting patterns are important towards determining the physical and emotional health outcomes of children. Responsiveness, consistent discipline, and effective communication as some of the most common practices of positive parenting were identified to have a significant relationship with positive emotional well-being and other indicators of physical health. Conversely, greater parental stress levels were associated with adverse effects, including more illnesses and worse emotional control. This supports the notion that the quality of caregiving has a crucial effect within early developmental phases and reveals parenting as one of the important variables in the health of children.

Another point that is highlighted in the study is the necessity of comprehensive strategies that may take into consideration psychological and physical aspects of child development. The effectiveness of interventions would also be enhanced by the additional attention to contextual factors, e.g., socioeconomic status and family environment. In future research, longitudinal designs are suggested, to analyze long-term consequences of parenting behaviour to child health outcomes. Moreover, it may be useful to investigate the implications of digital parenting, cultural differences, and programs implemented to improve this. Increased studies in different populations will as well improve on generalizability, and help in coming up with specific, evidence-based policies and practices.

Limitations

Study has limitations in the form of cross-sectional research design as it does not allow causal interpretation. Self-reported data might be subject to response bias. Moreover, the sample is limited only to populations in urban locations and hence not generalizable to rural locations. Other unmeasured factors, like genetic factors, could also affect child health outcomes.

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