

# Sociodemographic Predictors of Perceived Stress in Children and their Mothers

## Predictores sociodemográficos del estrés percibido en niños y sus madres

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### Declaration of interests

The authors declare no conflicts of interest.

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### Ethics statement

This study was approved by the Ethics Committee of the Federal Scientific Center of Psychological and Multidisciplinary Research (Approval No. 1, dated 15 April 2024). All participants provided written informed consent prior to their inclusion in the study.

### Data availability

All relevant data is in the article. For further information, contact the corresponding author.

## Abstract

**Introduction.** Over the past decade, there has been a growing recognition of the need to study stress in both adults and children. Among the various factors influencing stress, sociodemographic characteristics play a significant role.

**Objective.** The current study aims to identify the environmental factors associated with stress in both mothers and children, as well as to explore the role of mothers' stress in the relationship between sociodemographic characteristics and child stress.

**Method.** The sample consisted of 419 mothers of preschoolers aged 20 to 48 ( $M = 34.75$ ,  $SD = 6.01$ ). Participants completed an online survey that included the Perceived Stress Scale for Children, the Perceived Stress Scale, The Multidimensional Scale of Perceived Social Support, and questions related to their sociodemographic characteristics.

**Results.** Mothers' perceived stress contributed positively to children's distress. Mothers' perceived stress was connected with the low socioeconomic status of the family. Analysis showed that when considering social support, the significance of the family's socioeconomic status diminished. Both children's and mothers' stress levels were related to their place of residence and social support. Mothers' stress mediated the association between socioeconomic status of the family and child stress.

**Conclusion.** Various sociodemographic characteristics can serve as both stress risk factors among children and their parents and play a protective role. Timely identification of at-risk individuals is crucial, along with implementing interventions aimed at preventing and reducing their stress levels. Considering the relationship between mother and child stress, these interventions should focus on both children and their parents, providing training in coping skills, emotional regulation, and resource search.

## Keywords

Perceived stress of children; perceived stress of mothers; social support; sociodemographic factors.

#### Contribution of the authors

**Zhamila Dzhansaidova:** Formal Analysis, validation, visualization, writing – original draft.

**Natalia Rudnova:** Conceptualization, formal analysis, investigation, methodology, writing – review & editing.

**Dmitriy Kornienko:** Conceptualization, formal analysis, methodology, supervision, writing – review & editing.

**Alexander Pashenko:** Funding acquisition, project administration, resources.

#### Generative AI declaration

The authors declare that no generative AI tools were used in the writing, editing, data analysis, or any other part of the preparation of this manuscript.

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## Resumen

**Introducción.** En la última década ha habido un creciente reconocimiento de la necesidad de estudiar el estrés tanto en adultos como en niños. Entre los diversos factores que influyen en el estrés, las características sociodemográficas desempeñan un papel significativo.

**Objetivo.** El presente estudio tiene como objetivo identificar los factores ambientales asociados con el estrés tanto en madres como en hijos, así como explorar el papel del estrés de madres en la relación entre las características sociodemográficas y el estrés infantil.

**Método.** La muestra estuvo compuesta por 419 madres de niños en edad preescolar de 20 a 48 años ( $M = 34,75$ ,  $SD = 6,01$ ). Los participantes completaron una encuesta en línea que incluía la Escala de estrés percibido para niños, la Escala de estrés percibido, la Escala multidimensional de apoyo social percibido y preguntas relacionadas con sus características sociodemográficas.

**Resultados.** El estrés percibido por las madres contribuyó positivamente al mal-estar de los niños. El estrés percibido por los niños se asoció con el menor nivel educativo de sus madres, mientras que el estrés percibido por las madres se relacionó con el bajo nivel socioeconómico de la familia. El análisis mostró que al considerar el apoyo social, la importancia del nivel socioeconómico de la familia disminuyó. Los niveles de estrés de los niños y de las madres se relacionaron con su lugar de residencia y el apoyo social. El estrés de las madres mediaba la asociación entre el nivel socioeconómico de la familia y el estrés del niño.

**Conclusión.** Diversas características sociodemográficas pueden servir como factores de riesgo de estrés entre los niños y sus padres y desempeñar un papel protector. La identificación oportuna de los individuos en riesgo es crucial, junto con la implementación de intervenciones destinadas a prevenir y reducir sus niveles de estrés. Considerando la relación entre el estrés de los padres y el de los niños, estas intervenciones deben centrarse tanto en los niños como en sus madres, brindándoles capacitación en habilidades de afrontamiento, regulación emocional y búsqueda de recursos.

## Palabras clave

Estrés percibido de los niños; estrés percibido de las madres; apoyo social; factores sociodemográficos.

## Introduction

The increase in socioeconomic uncertainty and the escalation of intergroup conflicts globally in recent years underscored the significance of studying stress [1-4]. Research on stress commenced in the previous century and has recently gained considerable attention. However, the subjective nature of stress and the ambiguity of its effects pose considerable challenges, even among adult participants. Children are also affected by the global stressors, making the study of child stress increasingly relevant [5-7]. Researching stress in children is complicated by the absence of appropriate evaluation tools, which is largely due to the unique child developmental characteris-

tics. Addressing these challenges is crucial for enhancing the understanding of stress and its effects on both adults and children.

Perceived stress is a significant risk factor for mental health, potentially resulting in anxiety, depression, diminished quality of life, and elevated mortality rates [8,9]. Sociodemographic features significantly influence the stress level of people. Analyzing stress across different sociodemographic groups can aid the prevention of stress-related issues and major health concerns on a global scale.

### **Perceived stress of parents**

The concept of perceived stress was developed in the early 1980s by American psychologist Sh. Cohen and his colleagues. According to their theory, perceived stress encompasses the perception of life events experienced by individuals as potentially dangerous or threatening, and an amalgamation of cognitive and emotional reactions to these events. Perceived stress is characterized by the degree of psychological discomfort or distress caused by a stressor. The degree of coping with a stressor depends on the personality characteristics, the initial state of mental and psychological functioning, and the abilities and strategies for overcoming challenging and crisis situations in life [10,11].

Perceived stress is a significant risk factor for mental and physical health, and leads to anxiety, depression, insomnia, low quality of life, increased death rates [8,9]. The level of perceived stress depends on personal traits —research shows that a high neuroticism positively, while extraversion and conscientiousness negatively correlate with elevated perceived stress [12,13]. Self-evaluated health status [14], self-efficacy and self-esteem [8], life balance [15], and sociodemographic variables [16-19] are the features that influence perceived stress.

People with children may face a type of perceived stress such as parental stress, that is, stress related to the experience of parenting. Researchers have discovered a correlation between parental stress and variables including factors related both to parents and children [20-22]. Parents' physical and mental health status makes a significant contribution to parental stress [23]. For example, there is consistent evidence that parental stress can be increased by parental depression [24], general anxiety and vulnerability in early pregnancy [25]. In addition, parents' coping ability also has a significant impact on their stress level. Accordingly, research has demonstrated that parental emotion-focused coping strategies contribute significantly to parenting stress, whereas problem-focused coping strategies have been linked to decrease stress level [26]. Predictors of parental stress also include factors directly related to children [27]. For example, it has been demonstrated conclusively that accompanying mental health problems of the child [23] and especially more difficult child temperament are sources of parental stress [28]. For example, studies have demonstrated that parents of children with ADHD report higher levels of stress due to the challenges of managing disruptive behaviors and the associated social and academic difficulties [29].

Social environment could affect perceived stress and parental stress [8,25,26,30,31]. Social support is a characteristic of the social environment that serves a protective role in promoting mental health and reducing stress [32,33], social isolation in opposite can increase stress levels [8,34]. People facing various stressors, who receive substantial support from friends and family members, experience lower stress compared to those who receive minimal assistance. Family and friends can provide practical support via social networks, financial aid, the development of social capital through external connections, and emotional help for their mental and emotional health [35]. Particularly, social support is believed to be a crucial protective factor for low-income families experiencing psychological distress [36].

### Perceived stress of children

The perceived stress of children reflects their interaction with the environment. It includes the severity of the stressor, such as bullying, physical injury, and personal conflicts, as well as the individual's perceived response to these actual or imagined stressors [37]. This response relates to the child's ability to cope with stress, which enhances with age as their cognitive abilities develop and mature [38-40]. Therefore, signs and symptoms of stress in children can vary depending on the age group [41]; stress manifests differently depending on the age of children. In infancy, stress presents as psychomotor delays and unpredictable physiological rhythms [42-44]. In toddlers, stress reactions reveal as repetitive behaviors, sleep disturbance, somatic manifestations like gastrointestinal symptoms [45]. Preschoolers may show regressive behavior (enuresis, fear of separation from parents, fear of strangers, and previously acquired skills), irritability, and sleep problems [46-49]. School-age children may demonstrate impaired academic performance and concentration, repetitive themes in play and sleep disturbance [41]. Experience of stress in children can lead to emotional and behavioral problems, which can raise the risk of mental and physical health issues as an adult [50], hence, children endure short- and long-term consequences from stress [44].

Considering predictors of children's stress, it is essential to highlight that age-related characteristics of children render family and parental features important in affecting stress levels. Parent characteristics influencing children's stress include single parenthood, low education attainment [51,52], substance abuse, health issues, low self-esteem, adverse parental, a criminal history, hyper-reactivity and anger, inadequate problem-solving abilities, and endorsement of physical punishment [52]. Research also shows that parent's stress is positively correlated with child's stress [53,54], and, on the contrary, children's stress levels can be lowered or prevented by the presence of a supporting adult [55,56].

### The role of sociodemographic characteristics for stress of parents and children

Sociodemographic features also have a great influence on stress level. Research demonstrates an association between perceived stress and socioeconomic status: people in general and particularly parents, with lower economic status tend to have higher stress levels [57-59]. Low-income parents face numerous daily challenges, such as limited financial resources, unequal access to educational opportunities, insecurity, criminal activity, substandard housing, and employment insecurity, all of which contribute to increased stress [60,61].

It is important to note that the educational level of people is associated with a different experience of stress. Some studies show that the most stressed participants are those with the lowest education, and, on the contrary, participants with the highest education level tend to be less stressed [62]. Another study demonstrates that people with either a high or low level of education experienced more stress than people with an intermediate level of education [63]. There is also research that demonstrates the connection between a low level of a parent's education and the risk of children's abuse, which, accordingly, increases the level of child stress [52]. Apparently, it is important to consider factors that can mediate the influence of education levels on stress, such as social support and economic status [64].

Another sociodemographic factor that can affect stress level is place of residence. People residing in different places may have different availability of resources needed to solve problems. For example, a study of post-traumatic stress among parents of children with cancer in China showed that living in rural areas is a risk factor for post-traumatic symptoms among parents, and the dearth of medical resources and services in rural areas may be the cause of

this outcome [19]. City living is associated with numerous environmental and social stressors, including traffic, noise, pollution, subpar housing, constrained space, a lack of social cohesiveness, social conflicts, and an increased rate of crime. There is evidence that there are differences between people who grew up in urban and rural areas in the activity of the hypothalamic–pituitary–adrenal (HPA) axis, one of the major stress response systems of a human organism [65].

### Current study

Our study fills a gap in the research on the impact of social factors on stress, which primarily focuses on their impact on adults rather than children. The present study aimed to identify environmental factors that are associated with both mothers' and children's stress. In addition, we tested whether mothers' stress mediates the effects of stressors on children's stress levels, given the significant association between children's stress and mothers' stress. The objectives of this research study are outlined below:

1. To pinpoint the sociodemographic factors that affect the reported stress levels of children and mothers.
2. To ascertain the role of mothers' stress as a mediator in the association between sociodemographic variables and child stress.
3. To identify the groups of children and mothers who are most vulnerable to stress.

## Method

### Participants and Procedure

The study involved 419 mothers of children aged 20 to 48 ( $M = 34.75$ ,  $SD = 6.01$ ). Children ranged in age from 4 to 7 years ( $M = 5$ ;  $SD = 1.06$ ), with 57.2% being male. More detailed information and additional demographic characteristics of participants are presented in Table 1.

Table 1. Demographic characteristics of sample.	
Demographic characteristics	%
<b>Children</b>	
Sex	
Male	57.2
Female	42.8
Age	
4	44.4
5	25.7
6	16.9
7	13
<b>Mother</b>	
Age	
20-29	17.1
30-39	44.4
40-48	20.4

No information	18.1
Education	
General education	4.7
Technical and vocational education	17.6
Higher education	60
No information	17.7
Employment status	
Non-working	16
On maternity leave	15
Part-Time Employment	10.5
Full-Time Employment	40.9
Other	17.6
Marital status	
Single	21
Married	62
No information	17
Place of residence	
Countryside/ Town (population up to 100,000)	7.6
City (population 100,000-500,000)	12.4
City (population up to 1,000,000)	40.6
City (population over 1,000,000)	22.3
Economic status	
Bottom	4
Lower-middle	21.6
Middle	25.2
Upper-middle	27.1
Upper	5

This cross-sectional study employed an online survey design. Participants were recruited via simple random sampling, with invitations extended to all primary caregivers (mothers, fathers, grandparents, or legal guardians) of children aged 4–7 years. The link to the questionnaires was provided to parents through the administration of preschool institutions.

All respondents provided written consent for study participation and completed questionnaires about their sociodemographic characteristics, social support features, and their children's stress level. All study materials were presented in the official language of the Russian Federation. Mothers completed the survey for one child each. If a mother had multiple children aged 4–7 years, she was instructed to report data for the oldest child within that age range.

The study was conducted online in May-June 2024. Preliminary analysis showed that mothers comprised 92% of respondents (419 individuals), while other caregivers collectively accounted for fewer than 8% of completed surveys. To maintain sample consistency and reduce confounding variables related to caregiver roles, only maternal responses were included in the final analysis.



## Ethical Procedures

The study and consent procedures were approved by the Ethics Committee of Federal Scientific Center of Psychological and Multidisciplinary Research (the approval No. 1 dated 15 April 2024). Participating parents provided written informed consent prior to completing the survey.

## Measures

The Perceived Stress Scale for Children (PSS-C) developed by White was used to identify the level of perceived stress in children [66]. The Russian-language version of PSS-C has a two-factor structure that includes Distress and Well-being [67]. In this study, we used only a subscale of Distress, which includes 6 questions presented to the parents. Parents were asked to evaluate every question on a four-point scale (from 1 = never to 4 = almost all the time) how often in the last week their child felt or behaved as follows: felt rushed or hurried, felt worried about being too busy, felt worried that something did not work out, felt scared or nervous, felt angry, and had fights with his friends. The Cronbach's alpha for Distress was 0.682.

The short Russian version of Perceived Stress Scale (PSS-4) developed by Cohen [68] and adapted by Zolotareva [69] was used to identify the level of perceived stress in mothers. Participants should evaluate every question on a four-point scale (from 1 = never to 4 = almost all the time) how often in the last month they felt as follows: were unable to control the important things in their life, felt difficulties were piling up so high that they could not overcome them, felt confident about their ability to handle their personal problems, felt things were going their way. The Cronbach's alpha for PSS-4 was 0.551.

The Multidimensional Scale of Perceived Social Support (MSPSS) developed by G. Zimet [70] and adopted by Chistopolskaya [71] was used to measure social support of mothers. This scale has 12 items (e.g., "My family is ready to help me make decisions"), which participants rated on a seven-point scale (from 1 = totally disagree to 7 = quite agree). In this study, we used only a general rate of social support. The Cronbach's alpha for MSPSS was 0.928.

Sociodemographic information includes data about the age of the parent, the sex and age of the child, place of residence, marital status of parents, employment status, education level, socioeconomic status of family (SES). SES was self-reported by participants using a 5-point scale (1 = bottom, 5 = upper). The sample distribution was as follows: lower-middle (21.6%), middle (25.2%), upper-middle (27.1%), with smaller proportions in the bottom (4%) and upper (5%) categories (Table 1).

## Data analysis

All statistical analyses were performed using *JASP 0.19.1.0*. The Shapiro-Wilk test indicated that the data significantly deviated from a normal distribution ( $p < 0.05$ ). Consequently, we used Spearman's correlations to examine relationships between maternal/child stress and sociodemographic factors. Linear regression assessed predictors of maternal stress and child stress. Mediation analysis tested whether maternal stress mediated the SES and child stress link. Cluster analysis (k-means) identified high-risk groups based on SES and social support, with Kruskal-Wallis-test comparing stress levels across clusters. All tests used two-tailed  $\alpha = .05$ , with effect sizes ( $\beta$ ,  $R^2$ ) reported where applicable.

## Results

The results of correlation analysis showed that the perceived stress level of children has positive correlation with the perceived stress level of mothers ( $r = 0.225$ ,  $p < 0.001$ ), while perceived stress level of mothers has negative association with socioeconomic status of family ( $r = -0.165$ ,  $p < 0.01$ ). Both children and mothers' stress levels are negatively associated with place of residence ( $r = -0.101$ ,  $p < 0.05$  for children and  $r = -0.113$ ,  $p < 0.01$  for parents), and variable of social support ( $r = -0.156$ ,  $p < 0.01$  for children and  $r = -0.277$ ,  $p < 0.05$  for parents). All results of Spearman correlation analysis are demonstrated in Table 2.

**Table 2.** The results of Spearman correlation analysis of the perceived stress level of children, the perceived stress level of mothers and sociodemographic variables.

	Stress of mothers	Stress of children	Education of mothers	Place of residence	SES
Stress of mothers	—				
Stress of children	0.225***	—			
Education of mothers	-0.034	-0.095	—		
Place of residence	-0.113*	-0.101*	0.054	—	
SES	-0.165**	-0.038	0.113*	0.000	—
Social support	-0.277**	-0.156*	0.008	0.026	0.306***

**Note.** \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

We used Kruskal-Wallis-test to identify the differences in children's and mothers' stress among mothers with different employment and marital status. The results of comparative analysis showed that differences in stress levels among these groups were not identified.

We used hierarchical linear regression analysis to identify the contribution of such variables as SES, place of residence and social support to mothers' stress. Variables of SES and place of residence were presented in the quasi-interval scales. The regression model with SES and place of residence as independent variables explained 3.57% of the variance in mothers' stress and when we added the variable of social support, a portion of the explained variance increased to 12.9% ( $R^2$  changed is 0.093). More specific information can be found in Table 3.

The regression analysis shows that place of residence and SES are negative predictors of stress of mothers. The contribution of the SES ceases to be significant when social support was added, while the contributions of place of residence and social support are negative ones (Table 3). As shown in the Table 3, hierarchical regression revealed **social support** as the main predictor of maternal stress, showing the largest incremental explained variance ( $\Delta R^2 = +9.3\%$ ,  $\beta = -0.32$ ,  $p < 0.001$ ).

We also used hierarchical linear regression analysis to determine the contribution of a mothers' education level, family SES, place of residence, social support and mothers' stress to child stress. All the listed variables except for social support and mothers' stress were presented in the quasi-interval scales. The resulting regression model explains 7.5% of the variance in children' stress and it is presented in Table 4. In this model, **maternal stress** emerged as the primary predictor ( $\beta = 0.12$ ,  $p = 0.021$ ), accounting for the largest unique variance contribution (2.7%) after controlling for maternal education, SES, residence, and social support.



**Table 3.** Results of the regression analysis for the mothers' stress.

Variables	Unstandardized b	Standard Error	Standardized Beta	t	p
Model 1					
R <sup>2</sup> = 0.036					
Adjusted R <sup>2</sup> = 0.031					
F (346) = 6.968, p<0.001					
(Intercept)	2.479	0.151		16.403	< .001
Place of residence	-0.058	0.027	-0.108	-2.133	0.034
SES	-0.079	0.026	-0.154	-3.041	0.003
Model 2					
R <sup>2</sup> = 0.129					
Adjusted R <sup>2</sup> = 0.122					
F (346) = 18.530, p<0.001					
(Intercept)	3.131	0.177		17.711	< .001
Place of residence	-0.052	0.026	-0.096	-1.988	0.048
SES	-0.019	0.026	-0.037	-0.708	0.480
Social support	-0.014	0.002	-0.328	-6.340	< .001

**Table 4.** Results of the regression analysis (child stress).

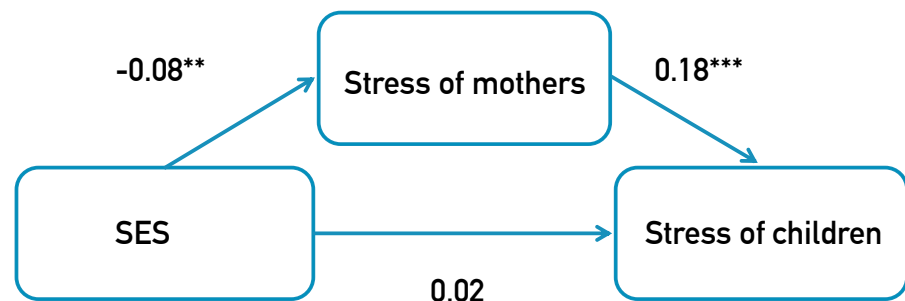
Model	Unstandardized b	Standard Error	Standardized	t	p
R <sup>2</sup> = 0.087					
Adjusted R <sup>2</sup> = 0.075					
F (346) = 7.117, p<0.001					
(Intercept)	2.552	0.245		10.429	< .001
Education of mothers	-0.034	0.018	-0.094	-1.894	0.059
Place of residence	-0.057	0.025	-0.112	-2.243	0.025
SES	0.014	0.026	0.029	0.547	0.585
Social support	-0.007	0.002	-0.178	-3.187	0.002
Stress of mothers	0.115	0.050	0.122	2.310	0.021

### Multiple mediation effect test

The results of the mediation effect of mothers' stress level in the connection between SES and children's stress level test are demonstrated in Table 5. It shows that the indirect effect differs significantly from zero, indicating that there is indeed a mediation effect (44.7% of the total effect is accounted for by the indirect effect). The path estimates demonstrate that SES reduces mothers' stress level, and mothers' stress level in turn increases children's stress level, while SES does not increase children's stress level directly (Figure 1).

**Table 5.** Significance test for mediating effect of mothers' stress level in the connection between SES and children's stress level.

Effect	Estimate	SE	Z	p	% Mediation
Indirect	-0.0141	0.00599	-2.355	0.019	44.7
Direct	-0.0174	0.02461	-0.708	0.479	55.3
Total	-0.0315	0.02474	-1.274	0.203	100.0
Path Estimates	Estimate	SE	Z	p	
SES → Stress of mothers	-0.0795	0.0260	-3.057	0.002	
Stress of mothers → Stress of children	0.1772	0.0480	3.691	< .001	
SES → Stress of children	-0.0174	0.0246	-0.708	0.479	

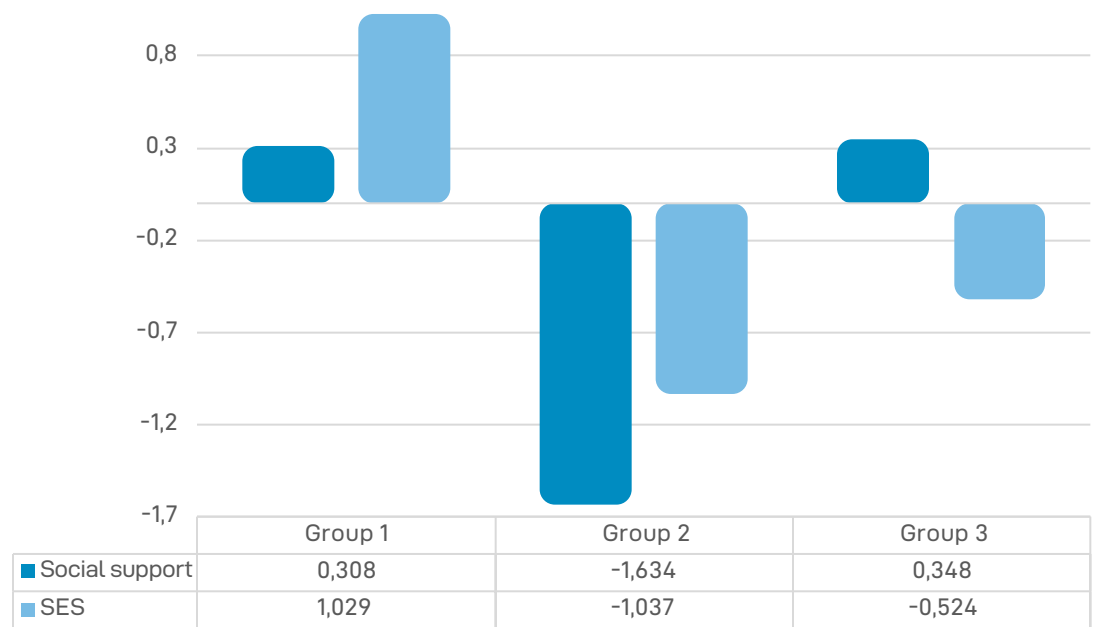


**Figure 1.** Path diagram of a mediation model for SES, stress of mothers and children. Note: \*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001

### Neighborhood-based clustering

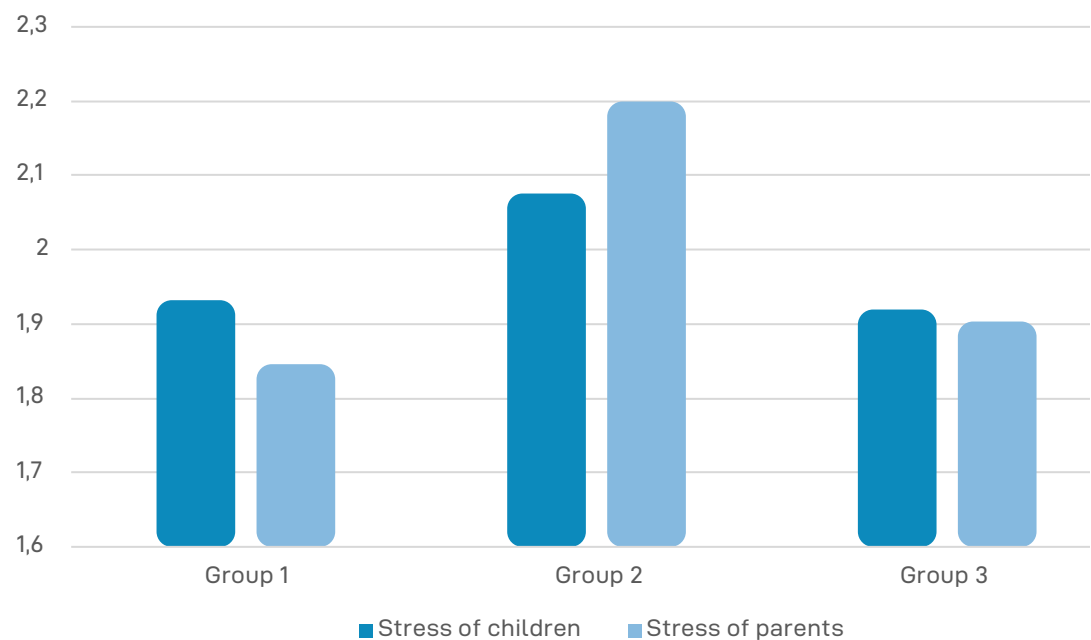
We used neighborhood-based clustering to identify the groups with different SES and social support levels. The analysis of silhouette index, likelihood-based information criterion (AIC and BIC), and the elbow method were used to determine the number of clusters. The elbow method revealed that the three-cluster model was found to be the most suitable and explained 63% of the variation.

Figure 2 illustrates that three groups of mothers were identified. The first cluster (Group 1) includes a group with high SES and moderate rate of social support (35% of the sample). The second cluster (Group 2) includes a group with low SES and low rate of social support (15% of the sample). And the third cluster (Group 3) describes a group with a below average SES and above average rate of social support (50% of the sample).



**Figure 2.** Results of the cluster analysis on social support and SES.

Since the Shapiro-Wilk test indicated that the data significantly deviated from a normal distribution ( $p < 0.05$ ), we used Kruskal-Wallis-test and Dunn's Post Hoc Comparisons to identify differences in children and mothers' stress levels in these three groups. The means for the indexes of perceived stress in the investigated groups are displayed in Figure 3.



**Figure 3.** Expressiveness of the parameters in the group of children and parents with different levels of social support and SES.

The results indicate that Group 2 demonstrates the highest rates of children's stress and level of mothers' stress in comparison to Group 1 ( $p < 0.001$ ) and Group 3 ( $p < 0.001$ ).

## Discussion

Based on the results we may conclude that mothers' perceived stress associated with low socioeconomic status of the family among the other sociodemographic characteristics. Children's and mothers' stress were connected to each other, and both children's and mothers' stress levels were associated with place of residence and social support.

Understanding the relationship between children's and mothers' stress is very important both in the study of children's stress and in the development of interventions to prevent and reduce stress and its consequences. Our results demonstrate a statistically significant positive association between maternal and child stress levels, and these findings are consistent with the results described earlier [53,54]. When a child is under stress, mothers may allocate their internal resources to managing negative emotions and overcoming challenges, potentially leaving them with insufficient resources to manage the child's stress, thereby negatively impacting the child's condition. In this regard, interventions to reduce children's stress should include not only working directly with children, but also working with their parents: training them in coping skills, emotional regulation, and resource searching.

The family's socioeconomic status's influence on maternal stress is consistent with the results of many studies [60,61]. Families with low socioeconomic status may have less access to quality healthcare, education, social services, and these limited financial resources can lead to constant worry about basic needs. Moreover, many low-income jobs are unstable or lack benefits, which can lead to anxiety about job loss and the inability to provide for their families. Low-income families may also live in neighborhoods with higher crime rates, poor infrastructure, and limited time-spending opportunities, all of which can contribute to a stressful living environment. In summary, the socioeconomic status of a family significantly influences the quality of life of its members, thereby understanding its role in the mother's well-being.

However, we have discovered an intriguing correlation between the family's socioeconomic status and the child's stress. The mediation analysis revealed that socioeconomic status does not directly influence children's stress levels but does so indirectly through mother's stress. Mothers with lower socioeconomic status are more likely to experience higher levels of stress due to financial instability, limited access to resources, and other socioeconomic challenges. This stress, in turn, can affect their parenting behaviors, emotional availability, and ability to provide a supportive environment for their children, ultimately influencing the child's stress levels. It turns out that the well-being of the mother plays a protective role when the child encounters various stressors. The mediation effect highlights the importance of early identification and intervention for families at risk. Families with low socioeconomic status are more vulnerable to stress, and without adequate support, this stress can perpetuate across generations. By recognizing the role of parental stress as a mediator, policymakers and practitioners can develop preventive measures that address the root causes of stress in low-income families: community-based programs that offer social support, parenting workshops, et cetera.

Social support turned out to be another important factor influencing both children's and mothers' stress, which is also consistent with the previously obtained data [8,25,26,30]. Mothers with high social support have more resources to cope with various difficulties, from emotional support to financial assistance. The impact of social support on reducing maternal stress turned out to be so strong that adding social support to the regression model of mother's stress reduced the significance of socioeconomic status. In addition, the results of the

cluster analysis showed that mothers with a combination of low socioeconomic level and low level of social support are the most stressed group, while there are no significant differences in stress levels between groups with the same level of social support and different levels of socioeconomic status. It can be assumed that social support plays a protective role by equalizing the perceived stress between mothers with different incomes when they encounter financial difficulties.

The last factor that influences the stress of children and mothers is their place of residence. Our study demonstrates that the stress of children and mothers escalates the size and population of their settlements decrease. One possible explanation for this may be underdeveloped infrastructure, less access to quality services, including medical services, and various resources in small towns and villages. As has been shown in previous research, in the case of a child's illness, limited access to medical services and resources in rural regions forces families to travel long distances to urban tertiary hospitals for treatment. Such travel not only increases financial burdens, such as transportation and accommodation costs, but also leads to separation from other family members, further straining family resources, which exacerbate stress levels for parents and children alike [19].

Our findings suggest some concrete measures to reduce social inequalities and promote access to resources and support services for vulnerable families:

1. routine stress screening in schools/preschools for at-risk children (those with low-SES), using brief validated tools like the PSS-C;
2. tailored parent support programs, including evidence-based trainings (e.g., emotion-regulation workshops) for stress-management and child development knowledge;
3. support groups to reduce isolation, leveraging our observed buffering effect of social support;
4. digital mental health platforms featuring free Q&A with psychologists.

### Limitations and Recommendations

The current study has some limitations. First, this study focused exclusively on mothers as primary caregivers, which may limit the generalizability of the findings to other caregivers, such as fathers or grandparents. Future research should include a more diverse range of caregivers to provide a comprehensive understanding of family stress dynamics. Moreover, information about children's stress was received from mothers. Mothers may not be accurate enough in assessing their children's problems, therefore, additional sources of information are required for a more reliable analysis. Examples of these sources include children's self-reports, the results of monitoring children's behavior, and assessments from educators in preschool institutions.

Besides, our sample was drawn primarily from Central Russia region, which may limit the generalizability of findings to other regions. Given Russia's vast geographical and sociocultural diversity—including variations in climate, economic development, ethnic composition, and cultural norms—stress perception and coping mechanisms might manifest differently in other parts of the country.

There are also limitations related to the measurement tools. The moderate reliability of the "Distress" subscale of the PSS-C (Cronbach's  $\alpha = 0.682$ ) and the PSS-4 (Cronbach's  $\alpha = 0.551$ ) may have impacted the strength of the observed relationships. While these values are consistent with prior research, they suggest that the results should be interpreted with caution, and future studies should consider using more reliable measures or larger sample

sizes to improve the robustness of the findings. Discussing limitations of data analysis, we acknowledge that correlation and regression analyses demonstrated notably low effect sizes, which permits cautious interpretation of our findings. Low regression coefficients indicates that other important factors influencing stress were not included in the analysis. This is consistent with the complex and multifaceted nature of stress, which is influenced by a wide range of individual, familial, and environmental factors beyond those examined in this study. For example, internal family dynamics, parenting styles, and other resources may play significant roles in shaping stress levels but were not captured in our models. Future studies may consider the interaction of these factors and sociodemographic characteristics to better understand their impact on the stress of children and parents.

## Conclusions

The results of our study showed the relationship between children' and mothers' stress and their relationship with various sociodemographic factors, including family socioeconomic status and residence location. Our findings also showed the important role of social support in reducing stress for children and parents. The results obtained can be useful in identifying risk groups and offering early assistance to find protective resources and imparting skills to manage the experiences of both children and parents themselves. The mediating role of parental stress opens new avenues for research and practice. Future studies could explore additional mediators, such as parenting styles, family cohesion, or community resources, to further elucidate the complex relationships between sociodemographic factors and child stress.

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