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Social contextual factors contributing to child and adolescent labor: an ecological analysis

Fatores sociocontextuais para o trabalho da criança e do adolescente: uma análise ecológica

ABSTRACT

OBJECTIVE: To examine the relationship between social contextual factors and child and adolescent labor.

METHODS: Population-based cohort study carried out with 2,512 families living in 23 subareas of a large urban city in Brazil from 2000 to 2002. A random one-stage cluster sampling was used to select families. Data were obtained through individual household interviews using questionnaires. The annual cumulative incidence of child and adolescent labor was estimated for each district. New child and adolescent labor cases were those who had their first job over the two-year follow-up. The annual cumulative incidence of child and adolescent labor was the response variable and predictors were contextual factors such as lack of social support, social deprivation, unstructured family, perceived violence, poor school quality, poor environment conditions, and poor public services. Pearson's correlation and multiple linear regression were used to assess the associations.

RESULTS: There were selected 943 families corresponding to 1,326 non-working children and adolescents aged 8 to 17 years. Lack of social support, social deprivation, perceived violence were all positively and individually associated with the annual cumulative incidence of child and adolescent labor. In the multiple linear regression model, however, only lack of social support and perceived violence in the neighborhood were positively associated to child and adolescent labor. No effect was found for poor school quality, poor environment conditions, poor public services or unstructured family.

CONCLUSIONS: Poverty reduction programs can reduce the contextual factors associated with child and adolescent labor. Violence reduction programs and strengthening social support at the community level may contribute to reduce CAL.

DESCRIPTORS: Child Labor. Socioeconomic Factors. Violence. Urban Zones. Social Inequity. Cumulative incidence of child and adolescent labor. Social deprivation. Contextual factors.

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RESUMO

OBJETIVO: Analisar a relação entre as variáveis sociocontextuais e o trabalho de crianças e adolescentes.

MÉTODOS: Estudo de coorte com 2.512 famílias residentes em 23 áreas urbanas de Salvador, BA, entre 2000 e 2002. A seleção das áreas e a identificação das famílias foram realizadas por amostragem por conglomerados. Entrevistas domiciliares foram realizadas com questionários individuais. A incidência cumulativa anual do trabalho de crianças e adolescentes foi estimada para cada área. Crianças e adolescentes que se tornaram trabalhadores ao longo dos dois anos de seguimento do estudo foram considerados casos novos. A incidência cumulativa anual do trabalho de crianças e adolescentes foi analisada como variável resposta e fatores contextuais foram as preditoras (ausência de apoio social, deprivação social e famílias não-estruturadas, percepção de violência, má qualidade das escolas e dos serviços públicos, e existência de problemas ambientais na vizinhança). Regressão linear múltipla foi utilizada para análise.

RESULTADOS: Foram encontradas 943 famílias com 1.326 crianças e adolescentes não trabalhadores de 8 a 17 anos. Ausência de apoio social, deprivação social e percepção de violência na vizinhança associaram-se positivamente ao trabalho de crianças e adolescentes quando analisadas separadamente. Ausência de apoio social e percepção de violência foram positivamente associadas com o desfecho na regressão linear múltipla. Má qualidade da escola e dos serviços públicos urbanos e a existência de problemas ambientais e familiares não apresentaram associação.

CONCLUSÕES: Programas que visem à redução da pobreza podem atuar positivamente nos fatores contextuais considerados. Programas de pacificação em áreas violentas, assim como o fortalecimento das redes sociais nas comunidades, podem contribuir para a diminuição do trabalho de crianças e adolescentes.

DESCRITORES: Trabalho de Menores. Fatores Socioeconômicos. Violência. Zonas Urbanas. Iniqüidade Social. Incidência cumulativa de trabalho de crianças e adolescentes. Deprivação social. Fatores contextuais.

INTRODUCTION

Child and adolescent labor (CAL) is a worldwide problem that affects most developing countries, and it is widely recognized as associated with poverty.[2] Poverty is usually defined as a pattern of individual and family social disadvantages and rarely analyzed within contextual dimensions. Determinants of CAL are commonly studied under the framework of economy,[2] and the social context is analyzed using family-related variables such as number of children, birth order or family composition that are also used as proxy of economic dimensions.[2,9]

In developing countries, CAL prevails in the informal economy, particularly in home-based and street vending small business run by families.[2] Therefore, the household and surrounding environment may play an important role in shaping social practices regarding initiation and maintenance of CAL. City subareas are usually different according to socioeconomic characteristics of people living in the area.[11] These differences are also related to availability and access to public or private services, housing conditions and services such as schools and health care.[11] Within a neighborhood, models of social relations are shared and embedded in the prevailing socioeconomic condition, cultural background, religion, and ethnicity, reflecting particularities of community livelihood. This is shaped by reciprocal norms, behavioral practices, social ties, and trust at a microcontextual level, thus facilitating or promoting mutual benefits.[16,10] In poor neighborhoods, unique patterns of social cohesion and solidarity have been described as collective strategies of survival.[11]

In Brazil, studies about sociability in urban squatter settlements pointed they are not disorganized and chaotic living spaces. There is a common social and

historical identity enabling democratic practices and creating solidarity networks that help disseminate self-respect, and promote dignity and social esteem in these communities. These resources may mitigate their daily struggles and hardship.[11,15] Daycare is scarce in poor subareas and working mothers frequently share with friends and relatives child rearing. The lack of public daycare services has been reported as a reason why mothers take their children to workplaces when they go to work.[8] It is easier to engage children and adolescents in home-based businesses to work as unpaid helpers or paid apprentices.[2] In addition, some mothers take children to workplaces to protect them against being exposed to neighborhood violence or lured by street gangs and drug trafficking.[11,13] Therefore neighborhood contextual factors can contribute to child labor.

Studies have shown correlations between social contextual characteristics and health or well-being outcomes among adults[3] and children.[12] In addition, neighborhood-related variables have been associated to children and adolescent development,[4] but no studies were found on social contextual determinants of CAL.

Besides poverty, other social factors such as poor social support, violence, poor school quality and other contextual factors can be predictors of CAL. This study aimed to examine the relationship between social contextual factors and CAL.

METHODS

This is an aggregate analysis of data from a population-based cohort of Salvador, Northeastern Brazil. The parent study aimed to investigate working conditions of informal workers and health effects. The baseline study was carried out in 2000 with follow-up visits every two years since. A one-stage random cluster area sampling based on maps of different scales was used to select the study population. Demographic parameters from the 2000 Brazilian Population Census were used to estimate the number of subareas and families. Trained interviewers identified a key informant, the mother or any other adult at home who provided basic sociodemographic and occupational data for each family member. Further individual interviews were scheduled for those aged 10 to 65 years who reported being paid or unpaid workers. Paid workers were those reporting a paid job while unpaid workers were those engaged in household chores for at least eight hours a week for their own families without payment. The questionnaires covered the work history, employment conditions, social support, health status, and their perceptions about the social environment in their neighborhoods such as violence, schools, urban environment, and public services, among others.

Data from the baseline study conducted in 2000 and first wave (2002) were used in the present study. The

unit of analysis was the subarea for which aggregate measures of each conceptual dimension were calculated using data from individual interviews. Social contextual variables were potential predictors of CAL while the incidence of CAL (ICAL) was the response variable. The cohort was defined as all individuals aged eight to 17 years who had no history of paid work and were not current workers at the time of the first interview (baseline). Those who reported having a job at this time or before were excluded. New CAL cases were those who were current workers at the time of interview or reported having a paid job for at least one month over a two-year follow-up. The annual cumulative incidence was estimated by dividing cases entering into the labor market during the study period by the number of non-workers in the same age group at baseline. The estimates were divided by the number of years of follow-up to obtain an average annual ICAL.

The contextual variables are proportions of individual attributes or scores calculated with algorithms corresponding to the simple sum of proportions of each component variable (Annex). Social deprivation was measured by the sum of the proportion of people in the lowest tertile of material assets of the family and having less than elementary education. The material assets of the family were assessed from a list of nine items including car, computer, washer, dishwasher, video player, laser disc player, microwave, telephone, and beach house ownership. This variable was categorized by the number of items as low (less than two items), medium (three to five), and high (more than five). We estimated the proportion of all study respondents with less than elementary education. These estimates were added to calculate a composite social deprivation score analyzed as a continuous variable. Another variable was unemployment estimated by the proportion of unemployed adults defined as those looking for jobs in the last 30 days, and the percent of workers with informal jobs in the subareas. Female-headed families were estimated by the proportion of female single-headed households. Poor social support was measured by the proportion of individuals reporting having no relatives or friends to count on in case of material or emotional needs, or having nobody who could help taking care of their children, elderly or a sick family member. Answers to these two questions were categorized and coded as 0 (always or most of the time) and 1 (sometimes or never), and analyzed as a 1 (at least one) and 0 (none).

The other predictor contextual variables were based on self-reported perceptions of the neighborhood context, measured by algorithms obtained from the sum of proportions of answers to each component variable (Annex). All component variables correspond to a standard question: "Thinking about your neighborhood do you believe these are local problems?". The answers were coded as 0 ("it is not a problem") and 1 ("it is a

serious or too serious problem"), and algorithms were calculated based on the sum of answer codes. The dimensions and related component variables were the following: a) perceived violence (drug trafficking, crimes, gangs and drug use); b) poor school quality (excessive noise, poorly organized, crowded school, and few learning resources such as books, computers, sports equipment, among others); c) poor environment conditions (excessive noise, and dirty and messy spaces in the neighborhood); d) poor public services (poor street lighting, lack of leisure and recreational spaces, and insufficient public transportation).

Factors associated to CAL were identified using ordinary linear regression with all variables treated as continuous. Pearson's correlation analysis was performed with all predictor contextual variables to identify the pattern of interdependence between them. Statistical two-way interactions were assessed using product terms representing the combination of social deprivation and the following variables: female-headed families, poor social support, perceived violence, school quality, environment conditions, and public services. Regression models were created with all dimensions under analysis and their related product terms to evaluate statistically significant effect modifiers. Assumptions were all checked, and residual analysis was performed in the final model.

Data were double entered and checked for errors. A database was created in EpiInfo version 6.0, and the statistical analyses were performed using SAS 8.1.

The study was approved by the Research Ethics Committee of the Hospital Prof Edgard Santos, Universidade Federal da Bahia, in June 7 2000. All requirements were followed to ensure an ethical research study. Each interview was preceded by an explanation of the study objectives and purposes and all respondents signed informed consent form.

RESULTS

Twenty nine subareas were selected but there were no households in two subareas and four of them did not have any children or adolescents at baseline, totaling 23 for the analysis. At baseline 2,512 families were selected, comprising 5,571 respondents whose data were used to estimate social contextual variables. To estimate the ICAL, 1,437 non-working children and adolescents aged eight to 17 years were identified at baseline. In the 2nd wave, 111 of them (7.7%, 111/1437) were not found or refused to participate, and 1,326 remained in the analysis. During the follow-up, 149 adolescents became paid workers. The average annual cumulative incidence of CAL was 5.6% (149/1326 = 11.2 over 2 years). The ICAL was 2.8% among children under 13 years of age, 10.4% in those aged 13–14, and 21.0% among those older than 14. The ICAL range from zero to 9.3% across the study subareas (Table 1). The proportion of respondents in the low level of material assets of the family ranged from 15.5% in Graça to 99.1% in Bairro da Paz. Three of the seven subareas having low ICAL had high proportion of poor, i.e., greater than the 69.3% estimated in the overall study population: Tancredo Neves (86.5%), São Marcos (75.8%) and Marechal Rondon (73.9%). The district with the highest material assets of the family had 15.5% of its residents in the lowest level and had no new CAL cases. In contrast, the poorest subarea from the district of Bairro da Paz, had the highest annual incidence of CAL, 9.1%.

Table 1. Proportion of individuals with low socioeconomic condition and annual cumulative incidence of child and adolescent labor by study subareas. Salvador, Northeastern Brazil, 2000–2002.

Study subareas (neighborhood)	Low socioeconomic condition (%)	Annual cumulative incidence of child labor
Incidence of child labor (lowest tertile)		
Graça	15.5	0.0
Cabula	28.5	3.1
Itapuã	65.7	3.7
Águas Claras	68.8	2.6
Marechal Rondon	73.9	3.6
São Marcos	75.8	3.3
Tancredo Neves	86.5	3.4
Incidence of child labor (medium tertile)		
Ribeira	36.8	4.1
Mussurunga	57.6	3.9
Coutos	61.0	4.8
Engenho Velho de Brotas	70.8	5.9
Sete de Abril	78.8	5.7
Praia Grande	82.1	4.2
Vila dos Ex-combatentes	80.9	6.0
Itacaranha	90.0	4.1
Periperi	92.8	4.1
Incidence of child labor (highest tertile)		
Pituaçu 1	25.6	7.1
Pituaçu 3	70.2	7.0
Engenho Velho da Federação	74.1	6.2
Fazenda Grande	84.1	7.3
Pau da Lima	86.1	6.9
Lobato	89.6	6.2
Bairro da Paz	99.1	9.3

Table 2. Pearson correlation coefficients of social contextual variables. Salvador, Northeastern Brazil, 2000–2002.

Variables	Social deprivation	Poor social support	Perceived violence	Poor school quality	Poor environment conditions	Poor public services	Female-headed families
Social deprivation	1.00	0.45 (0.03)	0.56 (0.005)	0.48 (0.01)	0.19 (0.37)	0.30 (0.15)	-0.47 (0.02)
Poor social support			0.21 (0.33)	0.38 (0.06)	-0.13 (0.54)	-0.04 (0.83)	-0.17 (0.41)
Perceived violence				0.25 (0.23)	0.38 (0.06)	0.16 (0.44)	0.06 (0.48)
Poor school quality					0.54 (0.006)	0.52 (0.01)	-0.31 (0.14)
Poor Environment conditions						0.59 (0.002)	-0.05 (0.79)
Poor public services							-0.37 (0.08)
Female-headed families							1.00

Many variables were correlated to each other. Social deprivation was positively correlated to poor social support, perceived violence and poor school quality, but negatively associated with female-headed families. Poor school quality was positively associated with poor environment conditions and public services (Table 2). Individually, the overall scores of social deprivation, poor social support, perceived violence in the neighborhood, and poor school quality were positive predictors of the incidence of CAL (Table 3). Unemployment, poor environment conditions, poor public services, and female-headed families were not associated with the CAL occurrence. Although poor school quality was positively associated to CAL, this association was not statistically significant. No effect modifiers for the association of social deprivation and CAL were found (Table 4). The crude positive association of social deprivation and incidence of CAL disappears when poor social support and perceived violence remained in the model. However, these variables were statistically significant predictors of the incidence of CAL. Although composite variables were used collinearity persisted in the regression modeling, particularly for product terms; therefore potential effect modifiers were analyzed one by one.

DISCUSSION

Living in a context of social deprivation predicts new cases of CAL, but this association is no longer seen when low social support and perceived violence in the neighborhood are considered. Poor social support and violence are more relevant to CAL at the society level than social deprivation, as measured by material assets of the family and level of education. Poor school quality was not a significant predictor of CAL, neither were poor environment conditions, poor public services, or the proportion of female-headed families.

In addition to poverty, other important dimensions of society need to be addressed in further studies about the determinants of CAL, particularly in developing countries, where efforts to ban child labor is still an incipient issue. Knowledge about other poverty-related issues that require specific intervention programs can help developing more effective social and health policies toward CAL. Social support, specifically material and emotional support, was found to be a protective factor, e.g., having someone who can help in times of financial difficulties, or taking care of family members with special needs such as children or the elderly. The type of information used to assess social support does not cover the entire scope of this construct, particularly the collective or community dimension, such as social networks and other similar resources. Nevertheless, individual-based social support could indicate the availability of community resources or vice-versa.[7] Community ties are recognized valuable resources to reduce social exclusion and improve access and provision of public services such as schools, childcare and health care.[17] Our results point out the relevance of further exploring these aspects of CAL.

The role of community resilience for health protection or reduction of risk factors has been addressed in a growing number of epidemiological studies,[5,15] but not yet addressed in studies of CAL. In poor neighborhoods in Brazil, parents usually have to take children with

Table 3. Results from the bivariate analysis of social contextual variables for cumulative incidence of child and adolescents labor. Salvador, Northeastern Brazil, 2000–2002.

Conceptual dimensions (value range)/ component variables	Regression coefficient β
Social deprivation (0.33;1.76)	5.06*
Percent of low material assets	8.09*
Percent of low education	10.81*
Unemployment (0.01;0.35)	10.39
Percent unemployed	
Poor social support (0.00;0.38)	25.74*
Percent of individuals having no social support	
Perceived violence in the neighborhood (0.44;2.76)	3.40**
Percent of individuals reporting drug trafficking	11.66*
crimes	10.85*
gangs	11.57**
drug use	9.89*
Poor school quality (0.25;2.56)	3.96*
Percent of individuals reporting excessive noise	13.57**
poor organization	15.07**
crowding	8.99*
poor learning resources	1.66
Poor environment conditions (0.0;1.33)	4.11
Percent of individuals reporting environmental noise	2.65
dirty and messy spaces	10.35***
Poor public services (0.14;1.89)	0.74
Percent of individuals reporting poor street lighting	10.20
Lack of public leisure and recreational resources	-1.44
Inadequate public transportation	3.01
Female-headed families (0.02;0.15)	0.72
Percent female-headed families	

* p≤0.05
** p≤0.01
*** p≤0.10

Table 4. Regression coefficients for the association of social contextual variables and annual cumulative incidence of child and adolescent labor. Salvador, Northeastern Brazil, 2000–2002.

Models	Multiple linear coefficient β
Model 1	
Social deprivation	5.09
Poor social support	19.31*
Perceived violence in the neighborhood	6.83*
Poor school quality	1.94
Social deprivation x perceived violence	-3.61
Model 2	
Social deprivation	-0.78
Poor social support	6.85
Perceived violence in the neighborhood	2.54**
Poor school quality	1.92
Social deprivation x Poor social support	6.99
Final model	
Social deprivation	0.72
Poor social support	19.43**
Perceived violence in the neighborhood	2.66*

* p≤0.05
** p≤0.10

them to their workplaces because the school day is only four hours long and commonly they are not able to afford child care services. Working parents have no option either than leaving their children alone or unattended.[9] Most children who work help their parents in informal economy or home-based businesses,[9] a cause of early engagement in paid labor. In poor subareas, working parents who can get some help would not need to take their children to work. The availability of social support could also eliminate some financial needs, widely reported as a major predictor of underage labor.[2] Collective child rearing and shared community-based

child care responsibility could improve the quality of children rearing. Child care becomes a less isolated experience, with more support and positive guidance.[1]

Urban violence has been a growing phenomena worldwide concentrated in poor areas in Brazil. In 2000, approximately 6.5 million people were living in substandard areas, mostly in peripheral areas of great metropolitan areas. In these areas, organized crime has flourished, mostly drug trafficking, recruiting children and adolescents for selling drugs.[18] Drug trafficking is a highly paid activity that strongly attract poor children and adolescents especially in areas where the State's presence is weak or absent, allowing the organization of militia for providing safety and security services, among others.[3,18] Militia groups also have been involved in mass murders (*chacinas*) of young male adults and adolescents. Mothers try to protect their children by pressing them to take paid legal jobs, thereby preventing them from going down a pathway towards delinquency and even death. However, it has been criticized as a moral excuse to make children work.[3,18]

The social deprivation indicator was not associated with child labor when poor social support and perceived violence were kept in the model. It can be a result of the relative higher contribution of these two factors, or measurement limitations. One possible

reason is that CAL is a considerable contribution to the family's income and could increase their material assets,[6] a component variable of the social deprivation composite indicator.

The use of CAL cumulative incidence rather than prevalence and contextual variables are major methodological and theoretical advances in this study. However, conclusions need to be taken with caution due to some methodological limitations. For instance, the small number of units of analysis (23 subareas) limit the study power. Also, the study subareas comprise parts of the urban area rather than neighborhoods, in the sense of communities having a social or geographic identity. In addition, most predictor variables were strongly correlated to each other because of their close conceptual relationships. Therefore, modeling was only possible with a limited number of potential predictor variables each time. In contextual analysis, variables are usually based on particular operational definitions which limit comparisons with other studies.

The analysis of social context in epidemiology is still a theoretical and methodological challenge,[14] particularly regarding the validity of empirical measures of dimensions and constructs. Additional qualitative studies were carried out as part of the parent study but the data were not available for this analysis. Non-reporting of child labor may have occurred since employment of children under 14 years of age was already unlawful in Brazil at the time of data collection. Collecting information on the age of first job rather than directly mentioning child labor might have helped reducing misreporting and it would not have been a serious methodological drawback because in Brazil, at community level, child labor is widely accepted or tolerated.[9] Losses in the follow-up were small but they may have affected precision and caused bias.

The present study's approach was not based on individual low socioeconomic condition, but rather on poverty concentration on the neighborhood level. Social support may have a protective role for CAL and community violence must be taken into consideration in policies against child labor. Successful violence reduction programs in violent areas could potentially reduce child and adolescent labor.

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Annex. Dimensions and component variables with their related codes and measures.

Contextual dimensions	Components	Variable definition (codes)	Measures
Social deprivation	Low material assets of the family	Individuals in the lowest tertile of the variable material assets of the family from a list of 12 items (1 = yes, 0 = no)	Sum of proportions of: individuals in the lowest tertile of material assets of the family with less than
	Low education	Individuals having less than elementary education (1 = yes, 0 = no)	
Unemployment	Unemployed	Individuals out of the labor market and looking for a job in the last 30 days (1 = yes, 0 = no)	Proportion of unemployed people
Female-headed families	Female family head	Female-headed families (1 = yes, 0 = no)	Proportion of female-headed families
Social support	Low social support	Individuals who reported having no relatives or friends to count on in case of material and emotional needs or having nobody who could help take care of children. Codes: always or often = 1, sometimes or none = 0;	Proportion of individuals reporting low social support
Perceived violence	Drug trafficking	Serious or very serious problem = 1, not a problem = 0;	Sum of proportions of individuals reporting problems
	Crimes	Serious or very serious problem = 1, not a problem = 0;	
	Gangs	Serious or very serious problem = 1, not a problem = 0;	
	Drug use	Serious or very serious problem = 1, not a problem = 0;	
	Excessive noise	Serious or very serious problem = 1, not a problem = 0;	
School quality	Poor organization	Serious or very serious problem = 1, not a problem = 0;	Sum of proportions of individuals reporting problems
	Crowding	Serious or very serious problem = 1, not a problem = 0;	
	Poor learning resources	Serious or very serious problem = 1, not a problem = 0;	
Environment conditions	Excessive noise	Serious or very serious problem = 1, not a problem = 0;	Sum of proportions of individuals reporting problems
	Dirty and messy	Serious or very serious problem = 1, not a problem = 0;	
	Poor street lighting	Serious or very serious problem = 1, not a problem = 0;	
Public services quality	Poor leisure and recreational resources	Serious or very serious problem = 1, not a problem = 0;	Sum of proportions of individuals reporting problems
	Insufficient transportation	Serious or very serious problem = 1, not a problem = 0;	