

# Labor in early life, vulnerability for health in Brazilian schoolchildren: National Adolescent School-based Health Survey (PeNSE 2012)

*Trabalho precoce, marcador de vulnerabilidades para saúde em escolares brasileiros: Pesquisa Nacional de Saúde do Escolar (PeNSE 2012)*

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**ABSTRACT:** *Objective:* This study describes exposure labor among Brazilian 9<sup>th</sup> grade students from public and private schools and investigates socio-demographic characteristics, behaviors, violent situations and psychosocial factors associated with labor among adolescents. *Methods:* The present study included 108,984 students from the National Adolescent School-based Health Survey carried out in 2012. Variables were grouped into sociodemographic characteristics, behavioral factors, violent situations and psychosocial aspects. Associations between labor and several health risk variables were identified by multiple logistic regression analysis, after adjustment for sex and age. *Results:* Approximately 13% of the students reported having a job: 17.4% of them were male. The chance of working was lower between females and individuals whose fathers' have incomplete superior education. Students who worked had greater chances to smoke (OR = 2.26; 95%CI 2.04 – 2.51), drink alcohol, use illicit drugs (OR = 2.63; 95%CI 2.29 – 3.02), drive motorized vehicles (OR = 2.15; 95%CI 2.03 - 2.27), have sexual intercourse (OR = 2.10; 95%CI 1.99 – 2.24), suffer physical violence (OR = 1.57; 95%CI 1.46 - 1.68), engage in fights (OR = 1.65; 95%CI 1.55 – 1.76), feel lonely (OR = 1.26; 95%CI 1.17 – 1.36) and report sleeping problems (OR = 1.46; 95%CI 1.34 – 1.60). They also have lower chances of having close friends (OR = 0.78; 95%CI 0.68 – 0.90). *Conclusion:* The prevalence of labor among students is high. Socioeconomical disadvantages increase the chances of early working. Early working is also associated to health damaging behavior, violent situations, sleeping problems, and social isolation. Adolescents who study and work experiment expositions that may affect distinct health dimensions and perpetuate disadvantages over lifetime.

**Keywords:** Child labor. Risk factors. Behavioral risk factors. Violence. Psychosocial impact. Students.

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**RESUMO:** *Objetivos:* Descrever a prevalência de trabalho em estudantes da 9ª série do ensino fundamental de escolas públicas e privadas brasileiras e investigar as características sociodemográficas, comportamentos relacionados à saúde, situações de violência e aspectos psicossociais associados ao trabalho. *Métodos:* Foram utilizados dados da PeNSE 2012 e investigadas associações independentes entre características sociodemográficas e trabalho e a associação entre trabalho e fatores comportamentais e de proteção à saúde, situações de violência e aspectos psicossociais, ajustadas por sexo e faixa etária. Utilizou-se regressão logística binária para obter o *Odds Ratio* e seu intervalo de confiança de 95%. *Resultados:* Foram incluídos 108.984 estudantes. Deste total, 13,1% trabalhavam: 17,4% eram meninos e 22,1% tinham 16 anos ou mais. A chance de trabalhar foi menor entre as meninas e entre aqueles com escolaridade paterna com nível universitário incompleto, e maior entre alunos das escolas públicas. Após ajuste por sexo e idade, os alunos que trabalhavam tiveram maior chance de tabagismo (OR = 2,26; IC95% 2,04 – 2,51), consumo de álcool, drogas ilícitas (OR = 2,63; IC95% 2,29 – 3,02), direção de veículo motorizado (OR = 2,15; IC95% 2,03 – 2,27), relação sexual (OR = 2,10; IC95% 1,99 – 2,24), sofrer agressão física (OR = 1,57; IC95% 1,46 – 1,68), envolvimento em briga (OR = 1,65; IC95% 1,55 – 1,76), sofrer ferimentos, sentir-se só e dificuldade em dormir, além de menor chance de ter amigos próximos (OR = 0,78; IC95% 0,68 – 0,90). *Conclusão:* A prevalência de trabalho é elevada. Desvantagens socioeconômicas aumentam a chance de trabalho precoce. Este também está associado a comportamentos prejudiciais à saúde, situações de violência, problemas de sono e isolamento social. Adolescentes que estudam e trabalham vivenciam exposições que podem afetar distintas dimensões da saúde e perpetuar desvantagens ao longo da vida.

**Palavras chave:** Trabalho de adolescentes. Fatores de risco. Fator de Risco Comportamental. Violência. Impacto psicossocial. Estudantes.

## INTRODUCTION

The initiation of children and adolescents in labor is a global problem that occurs mostly in poorer countries, but it is also relevant in middle-income countries. The 2012 Report by the International Labor Organization (ILO) showed that the number of children and adolescents who worked declined 33% from 2000 to 2012. Despite this major reduction, working in this stage of life is still a great social challenge. In 2012, about 265 million children and adolescents aged 5 to 17 years old (16.7%) were economically active, almost 168 million (10.6%) worked in positions that were not in accordance with the minimum established age, and 85 million (5.4%) worked in positions considered to be dangerous or with potential damaging effects<sup>1</sup>.

Brazil has obtained expressive results for fighting labor involving children and adolescents. In 2001, 12.7% of the children aged 5 to 17 years old were inserted in economic activities<sup>2</sup>; In 2012, this percentage reached 8.3%<sup>3</sup>, therefore, a 35% reduction in 11 years. The specific programs to eradicate and prevent labor in this stage of life, the improving economic situation of the families and the conditions imposed by income transfers programs contributed with these results<sup>4</sup>.

The early exposure to work has been more frequent among more vulnerable socioeconomic groups, in families whose parents have low schooling and more children, besides being influenced by social and cultural environments<sup>4,7</sup>. There is a two-way relationship between poverty and child labor, because the latter can perpetuate the former, once these children tend to become adults with lower professional qualification and, consequently, lower earnings in the work market<sup>8</sup>.

The early stages of life, including adolescence, are critical periods for the formation and development of the individual, which have a strong influence on life in general<sup>9</sup>. The exposure to labor can have a negative effect on physical and psychosocial development by interfering in school attendance and performance, as well as in leisure, in relationships with relatives and with peers, which provide a healthy environment for psychological and social formation<sup>10</sup>. These effects seem to be more damaging the lower the age of exposure to labor<sup>11</sup>. On the other hand, it is suggested that labor can have positive effects by favoring the acquisition of discipline, responsibility and self-confidence<sup>12</sup>.

The early exposure to labor can also be more damaging when associated to the exposure to toxic substances, heavy machinery, physical and emotional violence<sup>13,14</sup>. Studies pointed out to the association between labor among children and adolescents and musculoskeletal disorders<sup>11,14</sup>, behavioral issues, such as aggressiveness, anxiety and depression<sup>15</sup>, sleeping problems<sup>10</sup>, smoking<sup>8,16</sup>, and use of illicit drugs.

A few studies investigated the relationship between early exposure to labor and health. Obtaining information from children, family members and employers about insertion in the work market is a challenge, which may explain the lack of studies<sup>7</sup>. The main goal of the National Adolescent School-Based Health Survey (PeNSE) is to monitor the main risk and protective factors for the health of students. The second edition, carried out in 2012, included two questions related to insertion in labor<sup>17</sup>. The objective of this study was to verify the proportion of students who reported working, the sociodemographic characteristics that are independently associated with the work of students and to analyze if the report of working is associated with risk and protective health behaviors, violent situations and unfavorable psychosocial aspects.

## **METHODS**

This study used data from the National Adolescent School-Based Health Survey (PeNSE), conducted by the Ministry of Health, together with IBGE, in 2012. PeNSE was conducted with a sample of 9<sup>th</sup> graders, from elementary school, in daytime periods of public and private schools, representing the country, its five macroregions and the 26 Brazilian State capitals and the Federal District<sup>17</sup>.

In order to calculate the sample in each geographic stratum, a 50% prevalence of exposure, maximum error of 3% and 95% confidence interval (95%CI) were considered. The sampling plan defined 27 geographic strata corresponding to all State capitals and the

Federal District, and other five geographic strata corresponding to the five macroregions containing the other cities. The sample of each geographic stratum was proportionally allocated to the number of schools, according to administration (private and public). In the strata formed by capitals and the Federal District, a two-stage cluster sample was selected. Schools were in the first stage; the eligible classrooms in the selected schools were in the second stage. In strata formed by the other cities, which were grouped according to criteria related to homogeneity and geographic proximity, the sample was developed in three stages: in the first stage, there was the group of cities; in the second stage, there were schools; and in the third stage, the eligible classrooms.

Afterwards, all students attending the selected classrooms were invited to answer the questionnaire. Then, a weighing factor was used in the sample so it could represent all enrolled 9<sup>th</sup> graders who attend classes regularly<sup>17</sup>. The 9<sup>th</sup> grade was chosen because the students were considered to be able to answer the self-applicable questionnaire, since they were more prone to being exposed to several risk factors and because it would be possible to compare these data with systems from other countries<sup>18</sup>.

For data collection, a self-applied structured questionnaire was used, which included sociodemographic characteristics, risk and protective behaviors for health and other factors. Students answered the questionnaire in a smartphone. The participation in the study was voluntary, with the non-response possibility. No information that could identify the student was collected, and data related to the school were confidential, therefore, not shown in the data base. The research project was approved by the National Research Ethics Committee – CONEP, n. 16.805. The detailed methodology is described in PeNSE, 2012<sup>17</sup>.

## STUDIED VARIABLES

The variable work situation (does not work, non-paid work, paid work) was obtained by two questions: “Do you currently have a job, position or business?”, and “Are you paid for this job, position or business?”. Afterwards, the categories “working without wages” and “working with wages” were grouped, and the variable work (no, yes) was used to investigate the associations with sociodemographic factors, behavioral risk factors, violent situations and psychosocial aspects.

The analyzed sociodemographic characteristics of students were: sex, age group ( $\leq 13$  years old, 14 – 15 years old, 16 years old or more), ethnicity/color (white, black, yellow, mulatto, indigenous), maternal schooling (incomplete elementary school – including mothers who did not attend school and the ones who did not complete elementary school, incomplete high school, incomplete higher education, complete higher education, could not inform it), paternal schooling (incomplete elementary school – including fathers who did not attend school and the ones who did not complete elementary school, incomplete high school, incomplete higher education, complete higher education, could not inform it), school administration (private, public) and macroregion of residency (Southeast, North,

Northeast, Center-West, South). Students who could not inform maternal and paternal schooling remained in the analysis, since they represented 18.4% and 23.7% of the total, respectively.

Variables related to health were grouped into:

- Risk/protective behaviors of the student: current smoker, defined as having smoked in the past 30 days (no, yes); alcohol consumption in the past 30 days (no, once or more); use of illicit drugs – marijuana, cocaine, crack, solvent-based glue, ether and chloroform substances, poppers, ecstasy or others – in the past 30 days (no, once or more); having had sexual intercourse in the past 12 months (no, yes); having driven a motorized vehicle in the past 30 days (no, once or more); having practiced physical activities during leisure time in the past seven days (up to 4 days, 5 days or more).
- Violent situations: report of physical aggression in the past 12 months (none, once or more); being involved in fights in the past 12 months (none, once or more); being injured in the past 12 months (none, once or more).
- Psychosocial aspects: number of close friends (none, one or more); frequency of feeling lonely in the past 12 months (never/rarely, sometimes/most of the time/always); frequency of having difficulty sleeping in the past 12 months (never/rarely, sometimes/most of the time/always).

## ANALYSIS

Work was described (does not work, working without wages, working with wages) according to sex, age group, ethnicity/color, school administration and macroregion of residency. Afterwards, the variable work status was transformed into a binary variable (no, yes) and the prevalence of work was estimated according to all of the analyzed sociodemographic characteristics. The association between sociodemographic and work characteristics was verified by the Pearson's  $\chi^2$  test, with a 0.05 significance level. In order to identify the sociodemographic variables that are independently associated with work, the Odds Ratio (OR) was obtained; the 95%CI was obtained by the use of a multiple logistic regression model. The multivariate analysis included the variables that presented 0.20 significance level on the univariate analysis.

Afterwards, the prevalence of risk and protective behavioral factors was estimated, as well as the prevalence of violent situations and psychosocial aspects among those who work and those who do not. The association between work and these variables was assessed by the Pearson's  $\chi^2$  test, with a 0.05 significance level. The magnitude of the association between work and the variables related to health was estimated by OR (95%CI), with adjustment for sex and age group obtained by logistic regression.

The analysis was conducted in the software Stata (version 11), using the "svy" procedure (with weighing factors), which is adequate to analyze data obtained by a complex sampling plan.

## RESULTS

Out of the 109,104 students who participated in PeNSE, 108,984 were included in this analysis, and 120 were excluded because they did not have information about work. Out of these, 52.2% were female, 63.4% were between 14 and 15 years old, 82.8% attended public schools, 13.1% reported working at the time of the study, and 8.9% worked with earnings. In the capitals and in the Federal District, the percentage of working students was of 12%, out of which 10.8% earned a earning.

The distribution of students according to work status (does not work, paid work and non-paid work) and sex, age group, ethnicity/color, school administration and macroregion of residency presented statistically significant differences. The percentage of students with wages was higher in public schools than in private ones (89.4% and 10.6%) (Table 1).

The prevalence of work (paid and non-paid) was higher among boys (17.4%;  $p < 0.00001$ ) aged more than 16 years old (22.9%;  $p < 0.00001$ ), those who reported being indigenous and yellow (15.5% and 15.2%;  $p < 0.0001$ ), the ones who informed maternal and paternal schooling up to the stage of incomplete high school, the ones studying in public schools and those living in the South and Center-West regions (Table 2).

The results of the multiple analysis showed that, in comparison to adolescents who did not work, the chances of working increased with the increment in age group. The chances of working were lower among girls (OR = 0.50; 95%CI 0.47 – 0.53) and among students whose parents had incomplete higher education (OR = 0.90; 95%CI 0.83 – 0.97) in comparison to those whose parents had up to incomplete elementary school. The chances of working were higher among those attending public schools (OR = 1.51; 95%CI 1.37 – 1.67) in comparison to the ones attending private schools, participants who reported having yellow skin (OR = 1.26; 95%CI 1.10 – 1.45) or being indigenous (OR = 1.25; 95%CI 1.08 – 1.46) in relation to the ones who mentioned white color and living in the South, Center-West and North regions in comparison to those living in the Southeast (Table 2).

The description of prevalence rates of behavioral risk factors, violent situations and psychosocial aspects according to work status is presented in Table 3. The prevalence of all behavioral factors was higher among the ones who worked, as well as the prevalence in the report of exposure to violent situations. The proportion of students who reported having no close friends (18.0%;  $p < 0.0001$ ), feeling lonely in the past 12 months (13.9%;  $p = 0.02$ ) and having difficulty sleeping in the past 12 months (16.1%;  $p < 0.0001$ ) was higher among those who worked. The proportion of people who practiced physical activities for leisure for five days a week or more was higher among the ones who worked (16.1%;  $p < 0.0001$ ).

The results of the analysis adjusted for sex and age group showed that, in comparison to students who did not work, those who worked had higher chances of smoking (OR = 2.26; 95%CI 2.04 – 2.51), consuming alcohol (OR = 1.89; 95%CI 1.78 – 2.00), using illicit drugs (OR = 2.63; 95%CI 2.29 – 3.02), driving a motorized vehicle (OR = 2.15; 95%CI 2.03 – 2.27)

and having had sexual intercourse in the past 12 months (OR = 2.10; 95%CI 1.99 – 2.24). They also presented higher chances of having suffered physical aggression (OR = 1.57; 95%CI 1.46 – 1.68), having been involved in fights (OR = 1.65; 95%CI 1.55 – 1.76), having been injured (OR = 1.73; 95%CI 1.60 – 1.87), as well as having felt lonely (OR = 1.26; 95%CI 1.17 – 1.36), and having had difficulty sleeping in the past 12 months (OR = 1.46; 95%CI

Table 1. Distribution of 9<sup>th</sup> grade students according to work status and sociodemographic characteristics. Brazil, National Adolescent School-based Health Survey, 2012.

	Does not work n = 53.929 (88.1%)	non-paid work n = 709 (1.14%)	paid work n = 6.444 (10.8%)
<b>Sex*</b>			
Male	45.1 (43.3 – 47.7)	59.8 ( 56.4 – 63.0)	63.9 (62.1 – 65.6)
Female	54.5 (52.3 – 56.8)	40.2 (37.0 – 43.6)	36.1 (34.7 – 38.0)
<b>Age group (years)*</b>			
< 13	24.1 (18.6 – 30.7)	20.3 (16.3 – 25.0)	14.5 (9.9 – 20.6)
14 – 15	64.1 (61.7 – 66.3)	58.3 (53.5 – 62.9)	63.4 (61.9 – 64.9)
>16	11.8 (7.9 – 17.3)	21.5 (15.8 – 28.6)	22.1 (16.9 – 28.4)
<b>Ethnicity/skin color*</b>			
White	37.0 (31.9 – 42.4)	36.6 (27.3 – 47.0)	36.8 (31.8 – 42.2)
Black	13.2 (10.8 – 16.0)	15.4 (14.2 – 16.7)	13.4 (13.0 – 15.8)
Yellow	4.0 (3.4 – 4.7)	3.9 (2.1 – 6.1)	4.1 (3.8 – 4.9)
Mulatto	42.4 (39.4 – 45.4)	40.7(31.6 – 50.1)	42.2 (37.2 – 45.6)
Indigenous	3.4 (2.8 – 4.3)	3.4 (2.1 – 5.5)	4.2 (3.3 – 5.5)
<b>School*</b>			
Private	18.1 (13.7 – 23.5)	18.1 (13.9 – 23.3)	10.6 (8.3 – 13.5)
Public	81.9 (76.5 – 86.3)	81.9 (76.8 – 86.2)	89.4 (86.5 – 91.7)
<b>Macroregion - residency*</b>			
Southeast	45.1 (42.3 – 48.0)	41.8 (36.4 – 47.3)	38.7 (34.3 – 43.2)
North	7.8 (7.2 – 8.4)	9.0 (7.9 – 10.3)	8.9 (7.6 – 10.2)
Northeast	24.4 (23.6 – 27.3)	25.0 (20.3 – 30.4)	25.3 (22.6 – 26.8)
Center-West	7.7 (6.3 – 9.3)	8.8 (7.2 – 10.7)	9.5 (8.5 – 10.5)
South	14.0 (12.2 – 16.1)	15.4 (12.1 – 19.5)	14.6 (13.4 – 15.8)

\*Statistically significant difference (p < 0.05).

Table 2. Prevalence of work according to sociodemographic characteristics in 9<sup>th</sup> grade students and adjusted Odds Ratio. Brazil, National Adolescent School-based Health Survey, 2012.

	Working (%)	p-value	OR	95%CI
<b>Sex</b>				
Male	17.4	< 0.00001	1.00	
Female	9.2		0.50	0.47 – 0.53
<b>Age group (years)</b>				
< 13	8.6	< 0.00001	1.0	
14 – 15	12.9		1.50	1.38 – 1.62
> 16	22.1		2.58	2.34 – 2.85
<b>Skin color</b>				
White	12.6	< 0.00001	1.00	
Black	14.3		1.03	0.94 – 1.13
Yellow	15.2		1.26	1.10 – 1.45
Mulatto	12.9		1.01	0.94 – 1.08
Indigenous	15.5		1.25	1.08 – 1.46
<b>Maternal schooling</b>				
Incomplete elementary school	14.3	< 0.00001		
Incomplete high school	14.4			
Incomplete higher education	12.6			
Complete higher education	10.8			
Could not inform	11.9			
<b>Escolaridade paterna</b>				
Incomplete elementary school	14.9	< 0.00001	1.00	
Incomplete high school	14.6		1.02	0.94 – 1.12
Incomplete higher education	11.9		0.90	0.83 – 0.97
Complete higher education	11.5		0.97	0.85 – 1.09
Could not inform	11.2		0.80	0.74 – 0.87
<b>School administration</b>				
Private	8.6	< 0.00001	1.00	
Public	14.1		1.51	1.37 – 1.67
<b>Macroregion of residency</b>				
Southeast	11.6	< 0.00001	1.00	
North	14.7		1.14	1.06 – 1.23
Northeast	12.8		1.05	0.97 – 1.13
Center-West	15.7		1.34	1.25 – 1.44
South	16.4		1.52	1.40 – 1.64

OR (95%CI) adjusted by all variables, except for maternal schooling (p > 0.05).

Table 3. Prevalence of behavioral factors, violent situations and psychosocial aspects according to work, and adjusted odds ratio for age and sex in 9<sup>th</sup> grade students. Brazil, National Adolescent School-based Health Survey, 2012.

	Working		OR <sub>adj</sub>	95%CI
	%	p-value		
<b>Health-related behaviors</b>				
Current smoker				
No	12.4		1.00	
Yes	26.1	< 0.0001	2.26	2.04 – 2.51
Alcohol consumption in the past 30 days				
No	10.9		1.00	
Once or more	19.4	<0.0001	1.89	1.78 – 2.00
Use of illicit drugs in the past 30 days				
No	12.7		1.00	
Once or more	30.0	< 0.0001	2.63	2.29 – 3.02
Sexual intercourse in the past 12 months				
No	10.4		1.00	
Yes	23.2	< 0.0001	2.10	1.99 – 2.24
Driving a motorized vehicle in the past 30 days				
No	9.8		1.00	
Once or more	22.0	< 0.0001	2.15	2.03 – 2.27
Physical activity in leisure in the past 7 days				
Up to 4 days	12.1		1.00	
5 days or more	16.1	< 0.0001	1.26	1.19 – 1.34
<b>Violent situations</b>				
Physical aggression in the past 12 months				
None	12.2		1.00	
Once or more	17.8	< 0.0001	1.57	1.46 – 1.68
Fights in the past 12 months				
None	14.4		1.00	
Once or more	19.5	< 0.0001	1.65	1.55 – 1.76
Being injured in the past 12 months				
None	12.1		1.00	
Once or more	20.7	< 0.0001	1.73	1.60 – 1.87

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Table 3. Continuation.

	Working		OR <sub>adj</sub>	95%CI
	%	p-value		
<b>Psychosocial aspects</b>				
Close friends				
None	18.0		1.00	
One and more	12.9	< 0.0001	0.78	0.68 – 0.90
Feeling lonely in the past 12 months				
Never/rarely	12.9		1.00	
Sometimes, most of the time, always	13.9	= 0.02	1.26	1.17 – 1.36
Frequency of difficulty sleeping in the past 12 months				
Never/rarely	12.7		1.00	
Sometimes, most of the time, always	16.1	< 0.0001	1.46	1.34 – 1.60

1.34 – 1.60), and lower chances of having close friends (OR = 0.78; 95%CI 0.68 – 0.90). Students who worked had more chances of practicing physical activities during leisure time for five days a week or more in the past seven days in comparison to those who do not work (Table 3).

## DISCUSSION

This study was conducted with 9<sup>th</sup> graders, from elementary school in the daytime period of public and private Brazilian schools, and it showed that 13.1% of them reported working, and that work has been associated with worse social indicators. The prevalence of work was extremely high, considering a sample of students who attended school. The results in this study point out that adolescents who worked presented risk behaviors, such as smoking and consumption of alcohol and other drugs, more frequently, and they were also more exposed to violence and psychosocial problems, such as sleeping disorders and social isolation, when compared to the ones who did not work, regardless of age and sex. The findings in this study suggest that working at early stages of life is an important marker for social vulnerabilities concerning health.

The prevalence of work among adolescents ranges a lot due to the criteria used to define work, the considered age group and the social context of each studied population. Therefore, the comparison of estimates is limited. In the United States, 13.5% of the students aged 14 to 18 years old who lived in the state of Wisconsin were working in 2003<sup>19</sup>. The frequency of seasonal jobs in the summer, among students aged 10 to 14 years old in the same American state in 2001, was

of 58%<sup>20</sup>. In Brazil, the prevalence of work among students in public schools aged from 10 to 19 years old in cities in the countryside of São Paulo, in 1998, was of 70%<sup>21</sup>, while this proportion for adolescents in the same age group living in the city of Pelotas (Rio Grande do Sul State), in that same year, was of 17%<sup>16</sup>. Among adolescents in the birth cohort of 1993, in the city of Pelotas, who were interviewed in 2008, 22% reported having worked in the past year<sup>22</sup>.

For children and adolescents who work, especially in family enterprises and in the household, seasonality is frequent, and there is major variability in the number of working hours. Informality, the exercise of unregulated work, with no legal guarantees, is an usual characteristic, which makes this group even more vulnerable<sup>23</sup>. We do not have data to characterize the work of the analyzed adolescents. The reports of activities can be very different in relation to aspects such as regularity, workload and formality. On the other hand, the information was provided by the students themselves, being less subject to any sort of constraint.

The Brazilian law establishes that the minimum age to enter the work market is 16 years old. A job that can cause any damage to health is allowed after the age of 18. Adolescents aged between 14 and 15 years old can only work as apprentices<sup>4</sup>. Despite the established legal limitations, 11% of the adolescents who worked with wages were up to 13 years old, which shows the non-observance of legal limitations. The violation of law is also observed in other countries, including developed ones<sup>24</sup>. It is possible that legal restrictions could partly explain the increasing chances of working with the increment of age.

One of the main motivations for work among children and adolescents is poverty<sup>23,25</sup>. The work of children and adolescents can contribute with an effective improvement in family incomes<sup>7</sup>. However, being exposed to labor early is also influenced by cultural aspects, for belonging to migrant and monoparental families<sup>26</sup>, or due to the existence of family business and paternal schooling<sup>25</sup>. More than half of the students who worked received some sort of earning, and the only statistically significant difference between them and the ones who were not paid was the higher attendance to public schools. We also observed that the chance of working, regardless of earnings, was lower among those whose parents had incomplete higher education and for those who studied in private schools. These results may suggest that the work of these adolescents may have some importance for family income.

As to gender differences concerning the insertion in the work market, girls had less chances of working than boys, as observed in other studies<sup>7,22</sup>. The act of working among girls tends to be underestimated, since they do household chores more often<sup>22</sup>; this is almost an invisible activity, even for the girls. We also observed that adolescents who reported being indigenous and yellow had more chances of working than the others regardless of macroregion of residency.

The relationship between working at an early age and health has been little studied. The compromising of health does not only involve the direct effects over the current and future health status, but also the well-being and the development of potentialities in children and adolescents. A broad approach of the relationship between working at early ages and health damage should consider both the risks of the environment and the conditions of work, and also the potential effects over behaviors related to health and psychosocial aspects.

One of the most analyzed aspects of the relationship between health and work among adolescents concerns accidents, which are considered as a public health issue in this age group. Teenagers are more vulnerable than adults when it comes to work-related risks, since they are going through physical and psychological development<sup>5</sup>. It is believed that the non-observance of age specificities, such as the circadian rhythm pattern, the adoption of inadequate supervision practices and the lack of training can explain part of these accidents<sup>23</sup>. A study with teenagers aged 16 to 24 years old who were formally inserted in the Brazilian work market identified that being on leave due to work accidents was more common for teenagers, aged between 16 and 19 years old<sup>27</sup>. An analysis in this study identified that students who worked had higher chances of being injured in the past 12 months than those who did not work, regardless of sex and age group.

Behaviors such as the use of licit and illicit drugs and sexual activity, which usually initiate in the transition from childhood to adulthood, are influenced by the social and the cultural contexts, by family and school environment and by relationships with peers<sup>28,29</sup>. The early exposure to labor may stimulate maturity and lead to the adoption of roles that are fit for adults, such as the adoption of unhealthy behaviors and the formation of a new family<sup>30</sup>. It is also suggested that due to the intensity of work, adolescents have more time for social unwanted activities, and also that they have less time to engage in healthy behaviors and school activities<sup>31</sup>. Adolescents who worked presented higher chances of smoking, using alcohol and illicit drugs, driving motorized vehicles, having sexual intercourse and being more exposed to violent situations as observed in other studies<sup>16,28,32,33</sup>. It is important to consider that these behaviors tend to take place simultaneously, so the insertion of one of them would increase the risk for the others, thus potentializing the adverse effects of work among adolescents<sup>28,34</sup>.

Children and adolescents who work have less time for family and social relationships, for recreation or rest, and also difficulties to combine work and school<sup>23</sup>. Sleeping problems are common, especially among those who work 20 hours a week or more<sup>12</sup>. Both tasks, school and work, can contribute with reduced time for sleeping, which leads to the perception of chronic tiredness, difficulties concentrating and abstract thinking, with damages for school performance and higher risk of accidents<sup>10</sup>. Data in this study suggest that work has a negative impact on the quality of sleep, and that it favors social isolation for adolescents, once they felt lonely more often and had less chances of having close friends. Besides, there is the fact that they were involved in more fights and were more assaulted than those who did not work. Therefore, the disadvantages related to work can act in synergy. Socioeconomic disadvantages increase the chances of early exposure to labor, which, on the other hand, it associated with the use of psychoactive substances and other risk behaviors, with social problems and difficulties at school, as well as to discussions with peers, thus contributing with higher risk of abuse of substances, which feeds a cycle of disadvantages<sup>35</sup>.

This analysis did not aim at identifying the cause-effect relation, nor to identify independent associations, since the estimated Odds Ratio was adjusted only for age and sex.

However, it is difficult to think of reverse causality when it comes to work, since it is unlikely that risk behaviors will lead the student to work. However, it is probable that work and risk behaviors express the same scenario of social and economic vulnerability, which becomes a cycle with time.

## CONCLUSION

To sum up, our data enable to conclude that adolescents who study and work go through exposures that can affect different health dimensions. Exposure to work at an early age is associated with health damaging behaviors, violent situations, sleeping disorders and social isolation. These, on the other hand, tend to have a negative impact on school performance, thus leading to disadvantages throughout life. Besides, the adverse circumstances of childhood and adolescence are associated with the worse evaluation of health in the adult life. Efforts to fight work in early stages of life should be re-established.

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**CORRECTIONS / ERRATA**

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**Labor in early life, vulnerability for health in Brazilian schoolchildren: National Adolescent School-based Health Survey (PeNSE 2012)**

*Trabalho precoce, marcador de vulnerabilidades para saúde em escolares brasileiros: Pesquisa Nacional de Saúde do Escolar (PeNSE 2012)*

Where it read:

- Sandy Maria Barreto

Now it reads:

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