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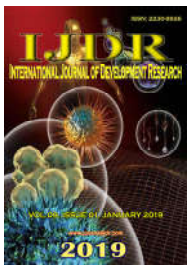

ORIGINAL RESEARCH ARTICLE OPEN ACCESS

HEALTH RISK BEHAVIOR EXCELS IN HIGH SOCIOECONOMIC CLASS AMONG ADOLESCENTS

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ABSTRACT

Objective: to estimate the prevalence of risk behaviors to health and its association with sociodemographic characteristics among adolescents. **Materials and Methods**: Socioeconomic information and health risk behaviors were collected from 2207 adolescents enrolled in public schools in Sergipe State, Northeastern, Brazil. **Results**: Females were associated with low levels of physical activity (PR=1.19; IC95%=1.15 – 1.24) and more than two hours watching TV (PR=1.07; IC95%=1.01-1.14). Males were associated with weapon carrying (PR female=0.28; IC95%=0.17-0.46), fights involvement (PR female=0.40; IC95%=0.33-0,49) and marijuana use (PR female = 0,55; IC95% = 0,32-0,93). The oldest group was associated with cigarette smoking (PR female=0,45; IC95%=0,33-0,63), drinking (PR female=0,71; IC95%=0,64-0,79), and marijuana use (PR female=0.53; IC95%=0,31-0,91). The highest socioeconomic status was associated with weapon carrying (PR=2.98; IC95%=1.06-8.35), fights involvement (PR=1.49; IC95%=1.05-2.12), and drinking (PR=1.68; IC95%=1.26-2.25). **Conclusions**: The study notes that males, older than 17 years and with high socioeconomic level were more exposed to risk behaviors to health. This study shows that there is association among the health risk behavior and high socioeconomic class in adolescents.

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INTRODUCTION

During the adolescence, individuals are establishing a lifestyle with several behaviors involving psychosocial aspects such as violence, sexuality, consumption of alcohol, drugs and physical inactivity, being these behaviors associated with biological, emotional and maturational adaptations (ARANCIBIA *et al*., 2016; MOURA *et al*., 2018). The main characteristics presented at this stage of life are the ability to procreate, a need of personal statement, construction of identity, new social relationships and independence-seeking before adulthood (FARIAS JÚNIOR *et al*., 2009).

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In addition, health risk factors have been associated with lifestyle, being that external causes may compete with infectious diseases as a source of health problems in adolescent populations (CDC, 1992). Currently, it has been demonstrated that the prevalence of health risk behaviors in adolescence is associated with morbidity and mortality causes (SCHULTE; HSER, 2014). The main health risk behaviors that raise these rates are early and unwanted pregnancy (CONDE-AGUDELO; BELIZÁN; LAMMERS, 2005), elevated body weight (MUST, 1996) and chronic degenerative diseases (RHODES *et al*., 2012). Moreover, socioeconomic and ethnicity may also be associated with health problems (POLONIJO *et al*., 2016; TURNER; BROWN; HALE, 2017). Thus, the identification of health risk behaviors in adolescents can support the implementation of health promotion programs,

either in population size or school size (MIROWSKY; ROSS, 2015). In the United States and Europe, regular mapping strategies have been developed to monitor the prevalence of risk behaviors in order to understand the association of these factors with the mortality of young people (CURRIE *et al*., 2008; EATON *et al*., 2012). However, such studies are scarce in Brazil. The last Brazilian survey (IBGE, 2016) mapped the risk behaviors that are most prevalent among adolescents, ninth grade students of public and private schools from different regions of the country in 2015. In this research, high prevalence of risk behaviors in adolescents was observed: physical activity (34.4% were active), daily time watching TV of more than two hours (60.0%), cigarette consumption sometime in life (18.4%), current alcoholic consumption (23.8%) and use of illicit drugs (9.0%). The Brazilian Northeast is the region with the highest growth and development in recent years, but despite the advances, it has one of the worst sanitation indicators such as poverty, housing, violence, education, and health in relation to children and adolescents (SILVA *et al*., 2009). Despite these indicators, no studies were conducted to analyze the behavior of adolescents in a demographically specific region. Therefore, the purpose of this study was to estimate the prevalence of risk behaviors to health and its association with sociodemographic characteristics among adolescents from Northeastern region of Brazil.

MATERIALS AND METHODS

The study sample was composed by 13373 students enrolled in high schools that compose the State Education Network as population base, encompassing the Metropolitan Region of Aracaju, Nossa Senhora do Socorro, São Cristóvão and Barra dos Coqueiros. The sample size calculation followed procedures suggested for cluster-type sampling from Brazilian Health Department (MINISTÉRIO DA SAÚDE, 2009). Thus, the number of individuals in the sample was of 2207 subjects.

For sample definition, the two-stage cluster sampling procedure was used, considering the administrative distribution of Regional Education Boards. In the first stage, high schools in each municipality with enrollment above 350 students were considered clusters, totaling 19 schools, with a total of 13373 students. The second stage it was defined the number of students per classroom cluster, using the average of 32.62 students, a number that was obtained by dividing the total of students (13373) enrolled in these eligible Teaching Units by the total high school classes (410). As for the inclusion criteria, participants would be: a) students regularly enrolled in high schools; b) minimum age of 13 and maximum of 18 years; c) have returned the Informed Consent Form (ICF) signed by parents or guardians; d) students present in classroom on the day of data collection. Each Teaching Unit selected was visited in two days, between January and December 2011. At the first day, the study objectives were explained, doubts about the study were clarified and the ICF was delivered to students. The second day was for data collection. This study was approved by the Ethics Research Committee of the Federal University of Sergipe (CEP/UFS) under CAAE No. 5724.0.000.107-10) and written informed consent was obtained from all participants in accordance with the Declaration of Helsinki. For the collection of information, the following behaviors were selected in both gender: "low levels of physical activity", "more than two hours watching TV", through the Physical Activity Questionnaire for Adolescents (GUEDES; GUEDES, 2015), "weapon carrying", "involvement in fights", "marijuana use", “alcohol use” and “cigarette consumption”, identified by Youth Risk Behavior Surveillance System (YRBSS) instrument (GUEDES; LOPES, 2010). Sociodemographic variables were gender (male and female), age continuously collected and later dichotomized into $\leq$ 16 years and $\geq$ 17 years, and socioeconomic level (SEL) through the questionnaire developed by Brazilian Association of Research Companies (ABEP, 2010). Table 1 shows the variables used in the study, as well as the questions used for their identification and classification. Descriptive statistics was performed as proportions to identify the prevalence of each behavior in the sample. The association between health risk behaviors and independent variables (gender, age group, socioeconomic status) was analyzed using Poisson regression with robust adjustment for crude and adjusted variance, estimating prevalence ratios (PR) and confidence intervals of 95% (CI 95%). Variables that in the gross model showed significance level up to 20% remained in the final model (LUIZ; MAGNANINI, 2000). All analyses used significance level of 5% ($p < 0.05$), and were examined in the IBM SPSS Statistics for Windows (IBM SPSS, 22.0, 2012, Armonk, NY: IBM Corp.)

RESULTS

There were assessed 2207 students (62.1% females) with a mean age of 16.26 ± 1.08. For socioeconomic status, it was found that 23.8% (525), 63.4% (1,399) and 12.8% (283) that belong, respectively, to social strata "high", "intermediate" and "low". The prevalence of risk behaviors found showed high values for behavior "low levels of physical activity", with 88.1% (94.1% for girls and 79.4% for boys). The prevalence of "daily time watching TV of more than two hours”, was 65.7% for the entire group (68.3% for girls and 61.6% for boys). Alcohol consumption was the third most prevalent behavior, with 38.2% for all groups (37.9% for girls and 38.8% for boys), and 24.7% (24.1% for girls and 25.7% for boys) of adolescents have consumed overly alcohol on a single occasion. About behaviors that characterize violence, it was found that 16.4% of individuals, 10.4% of girls and 26.3% of boys, reported involvement in fights in the last 12 months. In relation to weapon carrying (nightstick, weapon, firearm), prevalence of 3.5% was found for the entire group, 1.7% and 6.5% for girls and boys, respectively. As for marijuana use, prevalence of 2.4% for the whole group was found, 1.8% and 3.4% for females and males, respectively. In addition, the prevalence of cigarette smoking was 6.6% (6.2% and 7.3% for girls and boys, respectively). To calculate the prevalence ratio for association between health risk behaviors and sociodemographic variables, a Poisson regression model was used, where the variables considered for the model were those that obtained $p < 0.20$ (data not shown). Thus, the adjusted analysis data can be observed in table 2. Table 2 presents values for the prevalence of ratio adjusted for sociodemographic variables, which found association between being male and higher prevalence of violent behavior ("weapon carrying" and "involvement in fights"), and being female was associated with “low levels of physical activity” and sedentary behavior of “watching TV more than two hours per day”. In addition, the highest economic class was almost three times more likely to carry weapons and almost 50% more likely to be involved in fights compared to those of lower socioeconomic levels.

Table 1. Characterization of variables used in the study

Variables	Question used	Classification
Gender*	What is your gender?	Male
		Female
Age*	How old are you?	≤ 16 years
		≥ 17 years
Economic class*	Characterized from ABEP standard†	High ("A1", "A2", "B1","B2")
		Intermediate ("C1","C2")
		Low ("D","E")
Weapon carrying**	Over the past 30 days, on how many days have you carried a weapon like a knife, gun or nightstick?††	Never
		Once or more
Involvement in fights**	During THE PAST 12 MONTHS, how often did you get involved in a close fight††	Never
		Once or more
Alcohol consumption**	Over the past 30 days, on how many days did you take at least one alcoholic drink?††	Never
		Once or more
Consumption of more than five doses of alcohol per occasion**	Over the past 30 days, on how many days did you take five or more doses of alcohol in a single occasion?††	Never
		Once or more
Cigarette consumption**	Over the past 30 days, on how many days you smoked cigarettes?††	Never
		Once or more
Marijuana use**	During your life, how many times did you use marijuana?††	Never
		Once or more
Levels of physical activity**	Characterized from the PAQ-A score‡, referring to the last seven days.	Active (scores higher than three)
		Low levels of physical activity (scores less than three)
Time spent watching TV/day **	On average, how many hours do you watch TV per day?	Up to two hours
		More than two hours

* Sociodemographic variables; ** Variables referring to health risk behavior; †Associação Brasileira de Empresas de Pesquisa, 201017; †† YRBSS (Youth Risk Behavior Surveillance System) - Brazil16; ‡ Physical Activity Questionnaire for Adolescents - PAQ-A

Table 2. Prevalence ratios adjusted for sociodemographic variables and confidence intervals for the association between health risk behaviors and sociodemographic variables in adolescents from Aracaju and the metropolitan area, 2011.

Variables	Risk Behavior							
	Weapon carrying*		Involvement in fights**		Low levels of physical activity*		Time spent watching TV**	
	PR (CI 95%)	p	PR (CI 95%)	p	PR (CI 95%)	p	PR (CI 95%)	p
Gender								
Female	0.28 (0.17 – 0.46)	≤ 0.001	0.40 (0.33 – 0.49)	≤ 0.001	1.19 (1.15 – 1.24)	≤ 0.001	1.07 (1.01 – 1.14)	0.03
Male	1		1		1		1	
Age								
≤ 16 years	0.66 (0.42 – 1.02)	0.06	-	-	0.98 (0.95 – 1.01)	0.12	1.07 (1.01 – 1.14)	0.02
≥ 17 years	1		-		1		1	
SEL								
High (A1, A2, B1, B2)	2.98 (1.06 – 8.35)		1.49 (1.05 – 2.12)		0.98 (0.93 – 1.03)		-	
Intermediate (C1, C2)	2.15 (0.79 – 5.87)	0.02	1.18 (0.84 – 1.65)	0.01	1.01 (0.96 – 1.05)	0.24	-	-
Low (D, E)	1		1		1		-	
	Cigarette consumption‡		Alcohol consumption#		Excessive alcohol consumption		Marijuana use**	
	PR (CI 95%)	p	PR (CI 95%)	p	PR (CI 95%)	p	PR (CI 95%)	p
Gender								
Female	-	-	-	-	-	-	0.55 (0.32 – 0.93)	0.03
Male	-		-		-		0	
Age								
≤ 16 years	045 (0.33 – 0.63)	≤ 0.001	0.71 (0.64 – 0.79)	≤ 0.001	0.66 (0.57 – 0.76)	≤ 0.001	0.53 (0.31 – 0.91)	0.02
≥ 17 years	1		1		1		0	
SEL								
High (A1, A2, B1, B2)	-		1.52 (1.25 – 1.87)		1.68 (1.26 – 2.25)		-	
Intermediate (C1, C2)	-	-	1.28 (1.06 – 1.55)	≤ 0.001	1.43 (1.10 – 1.89)	≤ 0.001	-	-
Low (D, E)	-		1		1		-	

SEL – Socioeconomic Level; PR – Prevalence Ratio; CI – Confidence Interval. Model adjusted for gender, age and SEL; *Model adjusted for gender, age and SEL; **Model adjusted for gender and age; #Model adjusted for age and SEL; ‡Model adjusted for age

For the adjusted values between risk behaviors related to licit and illicit drugs and sociodemographic variables, the association was only maintained between males and marijuana use. It was also verified that being older was associated with all risk behaviors considered related to licit and illicit drugs. The adolescents of higher economic level were more exposed to behaviors of "alcohol consumption" and " excessive alcohol consumption ", reaching probability of 52% and almost 68% higher, respectively, to these behaviors when compared to adolescents of lower economic levels (Table 2).

DISCUSSION

This study evaluated the health risk behaviors in adolescents of high school in Northeastern Brazil Region. The key findings of this study suggested that males, older than 17 years and with high socioeconomic level are more exposed to risk behaviors to health, and high prevalence of violent behavior. It appears that the associations found between the male and the variables that characterize violent behavior follows the same trend of association of other studies conducted in Brazil (MOURA *et al*., 2018) and other countries (PERLUS *et al*., 2014) suggesting that this behavior in boys is the same independently of the country where it was observed. Furthermore, involvement in fights (16.4%) was more prevalent in males, as was also observed in a review study conducted with adolescents (10-19 years old), in which the violent behavior prevalence was bigger in male sex (RAPOSO *et al*., 2016). Preventing violent situations in which teenagers may be exposed to should be an important public health strategy to prevent injuries and deaths from them. This includes decreasing the cultural acceptance of violence, reduce

aggressive behavior in the family and exposure of children and adolescents to violence in the media. For alcohol consumption (38%) and excessive consumption of alcohol, (25%) were the most prevalent risk behaviors between licit and illicit drugs investigated. In this respect, these variables were associated with older teenagers and high economic class. According to the literature, these behaviors tend to favor mortality from external causes such as accidents and violent behavior (MOURA *et al*., 2018). This finding raises the debate about teen access to alcohol and the urgent need for supervision and awareness of them as the evils associated with alcohol consumption.

In this paper, cigarette consumption had a prevalence of 6.6% for the whole group, with 6.2% for girls and 7.3% for boys and was associated with older adolescents (≥17 years). The results of this study were lower than the surveys conducted by the Center for Disease Control (2014) and HBSC (CURRIE *et al*., 2012), but found similar results to the association of smoking with age. The association of cigarette smoking with adolescents has indicated that this habit is related to the influence of parents or relatives and structure of family problems such as divorce or separation and low family cohesion (URRUTIA-PEREIRA *et al*., 2017). Cigarette smoking exposes adolescents to other risk behaviors such as unhealthy diet, alcohol use, early sexual initiation, low level of satisfaction with life and injuries. In this sense, policies and programs should be developed to reduce this risk behavior.

This study identified low prevalence of marijuana use (2.4%) associated with male gender and older adolescents. An investigation conducted in Brazil with adolescents aged 15 to 19 found that 7.4% of the subjects used marijuana, however no significant interaction was found between genders (JORGE *et al*., 2017). In the United States (CDC, 2014), the prevalence of marijuana use among teens is 23.4%, predominantly males; it occurred a reduction in consumption between the years 1991-2013, but the prevalence is still considered high opposing in our study. In addition to these factors, multiple drug use is associated with a lower perception of physical and psychological well-being, self-perception, relationship with parents (ARAVENA *et al*., 2017). Moreover, it is considered a risk behavior for schizophrenia, depression, memory and learning disability (ROBLYER *et al*., 2017). School and family-based interventions, to increase knowledge about drugs and to increase resistance to peer pressure, can help alleviate the problem. The behavior of the low levels of physical activity (88.1%) was associated with female and aged less than 17 years before adjustment for gender, age and SEL, following the trend in other studies (IBGE, 2016; MARIA; STOCHERO; CENI, 2018). In a survey of health risk behaviors conducted in 41 countries in Europe and North America, the HBSC (CURRIE *et al*., 2008) identified among adolescents over 13 years, the prevalence of low levels of physical activity.
It ranged from 58-88% and among those over 15 years varied between 63-92%. Higher prevalence of low levels of physical activity was reported for females compared to males (CURRIE *et al*., 2008). In accordance with the above mentioned results, a review article that aimed to evaluate the prevalence of physical inactivity in Brazilian adolescents showed that 50% of the subjects are inactive, being the highest prevalence in females, suggesting actions to solution this problem (ARANCIBIA *et al*., 2016). After adjusting for gender, age and socioeconomic status, low levels of physical activity were associated only with females. It is believed that the difference between the gender is related to social, biological and sociocultural factors Regarding sedentary behavior, represented by the action of watching Tv for more than two hours, it was found that girls and younger teens have more probability (approximately 7%) of developing this behavior than boys and older. It is important to emphasize that similar results were also found in other recent studies (IBGE, 2016; ROBLYER *et al*., 2017). Using a cutoff of two hours to characterize sedentary behavior, the HBSC (CURRIE *et al*., 2012) identified a prevalence ranging between 39% and 84% for older adolescents of 13 years and 46% and 84% among those over 15 years, which is consistent with the results found in this study (65.7%). The National Research of School Health (IBGE, 2016) found that 60.0% of TV watched Brazilian schools for more than two hours a day, observing a prevalence of 61.3%% for girls and 58.1%% for boys, values close to those found here (68.3% female and 61.6% male). The present study has some limitations. In assessing the association between risk behaviors and sociodemographic characteristics in adolescents one of the limitations to differentiate between the cutoff points considered among the various instruments. However, the lack of night shift students, a common situation in Brazil, may be considered a limitation of this study.

Conclusion

The study notes that males, older than 17 and with high socioeconomic level, are more exposed to risk behaviors to health. The riskiest health behaviors and the most prevalent factors were low levels of physical activity and habits like watching television for more than two hours. Those factors are predominant in females and they seem to be independent of social class. The use of alcohol, regardless of substance abuse, is associated with adolescents of both genders, aged over 17 years and with high economic class. In addition, this study demonstrated that violent behaviors are mainly associated to the male gender and high economic class. Considering these identifications of health risk behaviors in adolescents, one could recommend the implementation of health promotion programs for the specific age groups and gender at the specific topics pointed out in this study. In addition, health services should work in conjunction with guidance programs on health risk behaviors.

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