Original Research

Abusive alcohol consumption among adolescents: a predictive model for maximizing early detection and responses

M. de Freitas Ferreira [a,*], C.L. de Moraes [a,b], J.U. Braga [a,c], M.E. Reichenheim [a], G.V. da Veiga [d]

[a] Department of Epidemiology, Institute of Social Medicine, Rio de Janeiro State University, Rua São Francisco Xavier 524 7° Andar, Rio de Janeiro, RJ 20559-900, Brazil
[b] Medical School, Estácio de Sá University, Rua Riachuelo 27, Rio de Janeiro, RJ 20230-010, Brazil
[c] Professor Helio Fraga Reference Center, National School of Public Health, Fiocruz, Rio de Janeiro, Brazil
[d] Department of Nutrition Josué de Castro, Health Sciences Center, Federal University of Rio de Janeiro, Avenida Carlos Chagas Filho 373, Bloco J, 2° andar, Ilha do Fundão, Rio de Janeiro, RJ 21941-590, Brazil

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ABSTRACT

Objective: To present a predictive model of alcohol abuse among adolescents based on prevalence projections in various population subgroups.

Study design: Cross-sectional study.

Methods: The sample consisted of 785 adolescents enrolled in the second year of high school in Rio de Janeiro, Brazil. Alcohol consumption was assessed using the Alcohol Use Disorder Identification Test. Socio-economic, demographic, family, individuals, and school-related variables were examined as potential predictors. The logit model was used to estimate the prevalence projections. Model fitting was examined in relation to the observed data set, and in a subset, that was generated from 200 subsamples of individuals via a bootstrap process using general fit estimators, discrimination, and calibration measures.

Results: About 25.5% of the adolescents were classified as positive for alcohol abuse. Being male, being 17—19 years old, not living with mothers, presenting symptoms suggestive of binge eating, having used a strategy of weight reduction in the last 3 months, and, especially, being a victim of family violence were important predictors of abusive consumption of alcohol. While the model's prevalence projection in the absence of these features was 8%, it reaches 68% in the presence of all predictors.

Conclusions: Knowledge of predictive characteristics of alcohol abuse is essential for screening, early detection of positive cases, and establishing interventions to reduce consumption among adolescents.

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Introduction

Although several epidemiological studies have shown reduction trends in the early initiation and pattern of alcohol consumption among adolescents in recent years, the use of alcohol in this age group is still a major public health problem worldwide.[1−3] The relevance of the matter is based not only on its high prevalence but also because of its serious and varied negative consequences in all spheres of teenage life.[4]

Several initiatives have been conducted by government agencies to postpone experimentation and prevent alcohol abuse at this stage of life. Among these initiatives, health promotion actions and early detection of the problem have been interesting starting points for the construction of joint strategies involving family, school, and the health sector to address the situation immediately.[5,6] However, early identification of alcohol abuse in this population group through direct questions is not an easy task given the great social disapproval of the use of alcoholic drinks in adolescence. In this way, the use of predictors of easier access to professionals could be an alternative strategy for tracking situations.

Many determinants of alcohol consumption in adolescence are already known.[7,8] However, to the best of the authors' knowledge, this is the first epidemiological study to propose a plausible and inclusive predictive model for this subgroup. Considering that implementing predictive models can help early recognition of the problem by professionals who work with this population in schools and health services, it would be quite appropriate to develop models of this nature. An early identification of suspected cases allows a broader investigation to confirm the situation and enables immediate action to reduce consumption and negative effects of alcohol abuse, if necessary.

With this purpose, this article aims to present a predictive model of alcohol abuse among school adolescents based on the projections of the prevalence in different subgroups according to characteristics related to adolescents, their families, and the school environment. We hope that this predictive model will become a useful tool for health and education professionals, facilitating early detection of cases and the development of protective actions directed at adolescents and their families.

Methods

Study design and selection of participants

The present study is a nested project of the Longitudinal Study of Nutritional Assessment of Adolescents (ELANA), which began in 2010 and followed up two teenage cohorts of public and private schools in the metropolitan region of Rio de Janeiro, Brazil, for 3 subsequent years. The descriptive analyses involved 785 adolescents enrolled in the second high school year (99.5% of the eligible) who participated in the second wave of ELANA (2011). The multivariate analysis was based on 642 students with available data on all predictive variables (81.8%).

Variables and measuring tools

Information on alcohol consumption was obtained through the Alcohol Use Disorder Identification Test (AUDIT).[9] We used the Brazilian version proposed by Mendez,[10] which has a sensitivity and specificity of 91.8% and 62.3%, respectively, to identify suspected cases of alcohol abuse among adults. The AUDIT consists of 10 items with response options ranging from 0 to 4, addressing the frequency and amount of consumption, concern regarding abuse, negative health repercussions, and signs of dependence.[9−11] Adolescents scoring four or more were classified as suspected cases of alcohol abuse. This cutoff point followed the recommendation of Chung et al.[12] who obtained values of 0.94, 0.80, and 0.93 for the sensitivity, specificity, and area under the ROC curve (0.93, ±0.01), respectively, when evaluating North American adolescents aged between 13 and 19 years.

Variables commonly used in alcohol abuse studies during adolescence were tested to construct scenarios of the likelihood of abusive alcohol consumption. Skin color was evaluated according to self-reported information following the criteria of the Brazilian Institute of Geography and Statistics.[13] Adolescent nutritional status was assessed by body mass index (BMI) for age, expressed in kg/m^2. The classification followed the cutoff points of the BMI, by sex and age in z-score proposed by the World Health Organization (WHO).[14]

To assess binge eating, the teenagers were asked, 'In the last 3 months, how many times have you eaten a lot of food at one time and at the same time felt that the act of eating was out of your control?', as proposed by the Diagnostic and Statistical Manual of Mental Disorders, 4th edition.[15] Any response other than once was considered positive for symptoms suggestive of binge eating. The use of weight reduction strategy was considered when adolescents reported using at least one of the following strategies in the 3 months before the interview: laxatives; diuretics; caused vomiting to eliminate excess food ingested with the intention of losing weight or not gaining weight; eating too little to lose weight or not to get fat; and dieting to control weight. Smoking was measured by direct questioning about the current use of cigarettes.

The physical violence subscale of the Conflict Tactics Scale Form R, previously adapted for use in Brazil,[16,17] was used to identify family physical violence against adolescents. The endorsement of at least one of the nine component items of the subscale defined a positive case, regardless if perpetrated by the mother or the father. The recall period was the last 12 months.

The mother's schooling was evaluated by the number of years attending school (≤4, 5 to 8, ≥9 years). Economic stratification was based on the Brazilian Economic Classification Criterion, which includes information on the level of schooling of the head of the family, possession of durable assets (color TV, VCR or DVD, radio, vehicle, washing machine, refrigerator, and freezer), indoor bathroom in the house, and the presence of a housemaid in the residence. The scale classifies households into five decreasing levels of purchasing power (A to E).[18] The other variables used are self-explanatory and are presented in Table 1.