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Validation of the Brazilian version of the 2007 Youth Risk Behavior Survey

ABSTRACT

OBJECTIVE: To validate the psychometric properties of the Brazilian version of the 2007 Youth Risk Behavior Survey (YRBS) questionnaire.

METHODS: The original version of the 2007 YRBS was translated into Portuguese and back-translated into English. The questionnaire versions were analyzed by a committee of experts. The committee used semantic, idiomatic, cultural and conceptual equivalences as criteria of analysis. The final version of the translated 2007 YRBS questionnaire was administered in two occasions, with an interval of two weeks, in a sample of 873 high school students of both sexes, in the city of Londrina, Southern Brazil, to identify the psychometric properties. Test-retest reliability was analyzed by calculating the Kappa index of agreement and prevalence rate of each type of risk behavior when application was repeated. Chi-square test was used to identify statistical differences between the first and second questionnaire applications.

RESULTS: After minor changes identified in the translation process, the committee of experts concluded that the Portuguese version of the 2007 YRBS showed semantic, idiomatic, cultural and conceptual equivalences. Significant differences between the prevalence rates of both applications were found in 23.4% of items. The identification of 91% of items with moderate-to-substantial Kappa index of agreement and mean value of this index of 68.6% indicated the quality of psychometric properties of the Portuguese version of the 2007 YRBS.

CONCLUSIONS: The translation, cross-cultural adaptation and psychometric qualities of the 2007 YRBS questionnaire were satisfactory, thus enabling its application in epidemiological studies in Brazil.

DESCRIPTORS: Translations. Questionnaires. Adolescent Behavior. Psychometrics. Reproducibility of Results. Brazil.

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INTRODUCTION

The Youth Risk Behavior Surveillance System (YRBSS) is a surveillance program, originally developed by the Centers for Disease Control and Prevention (CDC) in the late 1980s. It is aimed at monitoring risk behaviors that contribute to the main causes of social problems, morbidities and mortality in American adolescents. The data guiding this survey are obtained from the application of the self-administered Youth Risk Behavior Survey (YRBS) questionnaire, which involves questions about six behavior categories: a) non-intentional injuries and violence; b) tobacco use; c) alcohol and other drug use; d) sexual behaviors that contribute to unintended pregnancy and sexually transmitted diseases; e) dietary habits; and f) physical activity practice.[7]

The first version of the YRBS questionnaire resulted from extensive research and field testing. It was used by the CDC to conduct the first national survey, in 1991. Surveys are conducted biannually, the questionnaires are revised and possible changes are proposed before each data collection. In 1997, the CDC established the objectives of the Healthy People 2010 and, to guarantee the information required by this program, it suggested changes to the 1999 YRBS version, which led to the creation of 16 new questions, elimination of 11 and adaptation of other 14.[3] The 2001, 2003, 2005 and 2007 versions included minor changes.

In Brazil, there is not a systematized health risk behavior surveillance program for the adolescent population. Studies concentrate results on isolated behaviors, such as alcohol and tobacco use,[11,13,18,21] illicit drug use,[8,15,19] dietary habits[1,6,16,20] and physical activity practice.[9,14,16,17] Instruments to gather information that have been standardized to the Portuguese language are not easily identified. Specific questionnaires for each study are designed from adaptations of different instruments, which can compromise the quality of psychometric properties and hinder comparisons among studies.

Carlini-Cotrin et al[5] translated the 1995 YRBS questionnaire and applied it to primary education students of two 7th and 8th grade classrooms of a state school of the city of São Paulo, Southeastern Brazil, aiming to test its clarity and adequacy. They made minor changes to adapt the questionnaire to the Brazilian context. Despite its relevance, this study did not give due attention to the methodological strictness of the process of translation and adaptation of questionnaires to other cultures. Such limitations suggest caution when using the translated and adapted questionnaire in these conditions.

The present study aimed to validate the psychometric properties of the Brazilian version of the 2007 Youth Risk Behavior Survey.

METHODS

The translation and cross-cultural adaptation protocols followed the procedures suggested by Guillemin et al.[10] The initial translation from the original language (English) to Portuguese was made independently by two researchers, specialists in YRBS. These researchers spoke Portuguese as their native language and were fluent in English, including experiences with translations of academic texts. In addition to the translation, they were requested to record expressions which could have ambiguous interpretation.

A bilingual group composed of three researchers in the area of health compared the translated texts, standardizing the use of ambiguous expressions, and a single version of the questionnaire was designed, summarizing the two previous versions. Next, the questionnaire was back-translated by two other translators in an independent way. The translators selected for this stage were native speakers of English and fluent in Portuguese, working as professors in Brazilian universities. Translators were requested to record expressions that could be unclear in the back-translation process. The bilingual group compared both back-translated texts, designing one single version.

A committee analyzed the translation process and the results achieved in the previous stages. This committee was comprised of nine members, including the authors of this study, the translators who participated in the translation/back-translation process and three university professors in the area of health, all bilingual in English and Portuguese. The committee reviewed the seven available versions of the YRBS questionnaire: the original version in English, two versions translated to Portuguese, summary version of both translations to Portuguese, two back-translated versions, and summary version of both back-translations.

This committee evaluated the types of equivalences between the original questionnaire and the Portuguese version. Members received written guidance on the objective of the study and the definitions adopted for such equivalences. They each completed an analysis form individually, which compared each question with the respective choice of response of the original questionnaire, of the summary version translated to Portuguese and of the summary back-translated version, in terms of semantic, idiomatic, cultural and conceptual equivalences. The analysis form was structured using a differential scale with discrete alternatives: "unaltered", "slightly altered", "greatly altered" and "completely altered".

The Portuguese version of the questionnaire was tested, aiming to investigate the difficulties and suggestions of adolescents in terms of their understanding of questions. Authors of this study applied the questionnaire experimentally to 140 adolescents aged between 14 and 18 years (81 females and 59 males), who were secondary education students of schools of Londrina, Southern Brazil, in April 2007. The results were considered after a new evaluation by the bilingual analysis committee members.

The aspect of reliability associated with reproducibility was investigated to identify psychometric properties, by repeating the application of the translated 2007 YRBS questionnaire. The target population of this study was comprised of students of both sexes, aged between 14 and 21 years, enrolled in public secondary schools of the city of Londrina. According to information from the State of Paraná Department of Education, this population was estimated to be approximately 20,000 students, in the 2007 academic year. The representative sample

was obtained through a cluster probabilistic process, using the number of students, in terms of sex, age, school grade and period in which they were enrolled, in each school, as reference. The sample size was established, including 50% prevalences, 95% confidence intervals (95% CI), 3% sampling error and an additional 10% for possible refusals and losses during data collection. The design effect of the sample (DEFF) was defined at 1.5, predicting a minimum sample of 820 students. The final sample was comprised of 873 adolescents. Data were collected between August and November 2007. Demographic characteristics are shown in Table 1.

The classroom selected was visited by researchers and the research objectives and principles of confidentiality, anonymity and non-influence on school performance were clarified to students.

The classroom was revisited and the students who handed in the signed informed consent form received an envelope containing two copies of the Portuguese version of the 2007 YRBS questionnaire with the same codification. Students took one copy of the questionnaire, wrote their respective names on the outer side of the envelope and returned it to the researchers who followed the application. Next, they received instructions on how to self-complete the questionnaire and information about researchers' availability to clarify any questions. After completing and returning the codified questionnaires, they were put in a ballot box with the remaining ones.

After 14 days, the application of the questionnaire was repeated. The classroom was revisited and students who participated in the study received the envelope with their name and were instructed to take out the questionnaire, tear it and throw away the envelope. The following instructions were identical to those given in the first application.

In the analysis of reproducibility, the following two procedures were used: the calculation of the traditional kappa agreement index and prevalence rates of the first and second questionnaire applications. Calculation of the kappa agreement index, followed by the respective 95% CI, was determined for each of the questionnaire items, except for items 6 and 7, classified as numerical variables, which resulted in the calculation of the intraclass correlation coefficient. Agreement among groups of items of the Portuguese version of the 2007 YRBS, according to demographic indicators, reference period of time and risk behavior category, was analyzed using median and mean values of kappa indices. Prevalence rates of the first and second applications were determined from one of the choices of responses to each questionnaire item, following the YRBS methodological recommendations to divide responses into "with risk" and "without risk".[4] Statistical differences between the prevalence rates of the first and second applications were estimated using the chi-square test (χ^2). Data were analyzed with the SPSS statistical package, version 15.0.

The present study was approved by the Human Research Ethics Committee of the Universidade Estadual de Londrina (Official Opinion 073/07).

RESULTS

Minor divergences in the use of expressions were found in the stages of the translation process. These divergences were discussed by the analysis committee and the expressions that were more easily understood and more frequently used among adolescents were maintained to facilitate understanding. When establishing questions whose literal translation raised doubts about the use of the expression "*quão freqüentemente*" ["how often"], which is grammatically correct in Portuguese, although rarely used by adolescents, the expression "*com que frequência*" was chosen. The difficulties and

Table 1. Demographic characteristics of the sample used in the study. City of Londrina, Southern Brazil, 2007. (n = 873)

Variable	n	Proportion of distribution (%)
Sex		
Female	469	53.7
Male	404	46.3
Period of study		
Day-time	560	64.1
Night-time	313	35.9
Secondary school grade		
First	305	34.9
Second	274	31.4
Third	294	33.7
Age group (years)		
14 to 17	678	77.7
> 17	195	22.3
Socioeconomic level		
A (high)	70	8
B	453	51.9
C	306	35.1
D (low)	44	5
Ethnicity		
White	637	72.9
Black	200	22.9
Others	36	4.2
Paid work		
Does not work	520	59.6
Works part-time	197	22.6
Works full-time	156	17.8

suggestions reported by the group of adolescents did not require changes.

Of all the 87 items that comprise the YRBS, 79% of them were indicated as "unaltered" by the analysis committee, in terms of semantic, idiomatic, cultural and conceptual equivalences. The remaining 21% were indicated by this committee as having at least one of the equivalences "slightly altered". Table 2 shows the summary of the adjustments made to these items. No items of the translated version of the 2007 YRBS questionnaire had the "greatly altered" or "completely altered" choices marked, when compared to the original version.

The statistical indicators associated with the psychometric properties are shown in Table 3. Kappa agreement index varied from 31.6% to 100%, with a mean value of 68.6% and median of 68.5%. According to the qualitative considerations suggested by Landis & Koch,[12] 68.3% of the items achieved at least "substantial" reproducibility (kappa≥61%), and 90.6% achieved at least "moderate" reproducibility (kappa≥41%). A total of eight items (9.4%) showed a kappa agreement index<41%. Based on the χ^2 test, 23.4% of the items showed significantly different prevalence rates when the application of the questionnaire was repeated. Of all the 19 items that showed significant differences between the prevalence rates of the first and second applications, nine items had a kappa agreement index lower than 61%. The items associated with self-reported weight and height measurements had an intraclass correlation coefficient of 0.98 and 0.97, respectively.

Table 4 shows the median, mean and 95% CI values of kappa agreement indices of the items of the Portuguese version of the 2007 YRBS, according to demographic indicators, reference period of time and risk behavior category. The analysis of reproducibility indicates that day-time students of both sexes tended to show a higher kappa agreement index than boys and night-time students; however, the differences found were not statistically significant. Kappa scores among the grades and age groups were similar. With regard to the reference period of time, the items involving "seven days" showed kappa agreement index scores significantly lower than those of items for longer periods of time. The items indicating reference periods of time equivalent to

Table 2. Adjusted items in the Portuguese version of the 2007 YRBS. City of Londrina, Southern Brazil, 2007.

Item	Original version	Translated version
3	What grade are you in (7th grade 3th grade)	Grade according to the Brazilian school system (5th grade 3th grade)
4	Are you Hispanic or Latino?	Are you a foreigner?
5	What is your ethnic group? (American Indian or Alaska Native; Asian; Black or African American; Native Hawaiian or Other Pacific Islander; White.	Ethnicity: White, Black, Japanese, Indigenous; and Others: _ Which?
6 and 7	Tables with figures available to indicate the measures of body weight and height	Replaced by spaces in front of the words "weight" and "height" to record the measurements
17	Objects stolen or deliberately damaged on school property: car, clothing, or books	Objects common to Brazilian adolescents were included: motorcycle, bike, skate, skateboard, tennis shoes, watch, mobile phone, CD, disc-man.
24	Suicide	The expression "kill yourself" in brackets was added to illustrate suicide.
36	Tobacco trademarks: Redman, Levi Garrett, Beechnut, Skoal, Skoal Bandits, or Copenhagen.	Tobacco brands marketed in the United States were excluded.
51	Slang expression "high"	Replaced by the expression "ligado".
52	Common expressions relating to heroin: smack, junk or China White.	Expressions were excluded.
53	Common expressions relating to methamphetamines: speed, crystal, crank or ice.	Expressions were excluded.
54	Expression for ecstasy – MDMA	Replaced by the expression "love drug".
55	Expression "steroid pills"	Replaced by the expression "anabolic-androgenic steroid".
63 and 64	Condom	The word "camisinha" in brackets was included to illustrate condom.
70	North American product Slim Fast.	Expression was excluded.
72	Examples of juices: orange juice, apple juice, or grape juice.	Examples were excluded.
78	Soda or pop	The words "Fanta" and "Tubaína" were included.

"30 days" and "12 months" had similar kappa scores, whereas those with periods of time equivalent to "throughout life" and "without time reference" showed the highest kappa index scores.

Dietary habits and physical activity practice showed kappa index scores significantly lower than those of the remaining categories. The sexual behavior category achieved the highest kappa score, followed by tobacco use, alcohol and other drug use, other health-related topics and non-intentional injuries and violence. Of all items that mention a period of time equivalent to "seven days", eight refer to dietary habits and two to physical activity practice. Except for the reference period of time of "seven days", dietary habits and physical activity practice, groups showed scores equivalent to substantial kappa indices (≥ 61%).

DISCUSSION

The process of questionnaire translation did not present difficulties due to the methodology adopted and the simple and objective structure of the 2007 YRBS items. The initial translation made by two translators was slightly changed in the subsequent stages. The back-translation, when compared to the original questionnaire, showed minor discrepancies, resulting from the adjustments made to meet the specifications of certain items. The analysis of semantic, idiomatic, cultural and conceptual equivalences, comparable to the cross-cultural adaptation, such as the translation stage, indicated that the questionnaire was easily translated.

The analysis of equivalences showed that the 2007 YRBS domains are appropriate and the attributes used in the original version of the questionnaire are equally valid for the target culture, which meets the cultural equivalence. The conceptual equivalence indicated that few items required adjustments. Items could be considered in a way similar to the original format, once again showing that the structure of development of 2007 YRBS items was well designed. With regard to the idiomatic equivalence, the translated version revealed that approximately 80% of the questions were evaluated as "unaltered" and the remaining ones as "slightly altered" between the original and back-translated versions of the questionnaire. None of the analysis committee members considered any items as "slightly altered", when the original, translated and back-translated questionnaire versions were compared, thus suggesting semantic equivalence.

Brener et al[2] administered the 1991 YRBS version to American students in two occasions, with an interval of 14 days. The results indicated kappa agreement index scores between 14.5% and 91.1%, with 72% of items showing kappa≥61%. There were no significant differences between the prevalences of repetitions of questionnaire application. In this same study, the analysis of age group showed that better consistency of responses was found among adolescents aged≥12 years. A study with a similar design, involving the 1999 YRBS,[3] was performed, with results showing kappa index scores between 23.6% and 90.5%, a mean of 60.7%, and 47.2% of items with kappa ≥ 61%. Approximately 22% of items showed statistically significant differences between the prevalences of the first and second questionnaire applications.[3]

The kappa agreement index in the second application of the Portuguese version of the questionnaire indicated from moderate to substantial reproducibility in the majority of items. The proportion of 68.3% of items with kappa agreement index ≥ 61% was lower than that found in the analysis of the 1991 YRBS (72%) and higher than that found in the analysis of the 1999 YRBS (47.2%). This suggests that this proportion is within the expected limit. Brenner et al[2,4] considered the kappa values of the studies as adequate for instruments such as questionnaires. The mean kappa index found in the translated 2007 YRBS (68.6%) was higher than the mean of kappa index of the original version of the 1999 YRBS (60.7%). Data from the original version of the translated 1999 YRBS and 2007 YRBS were similar: 23.4% of the items of the 2007 YRBS in Portuguese and 22% of the items of the 1999 YRBS in the original version showed significant differences between the prevalences of the first and second applications. The items that had significant differences between the prevalence rates of the repetitions of questionnaire application and kappa agreement index < 61% showed questionable reproducibility. Thus, caution is required when interpreting this information.

There were no statistically significant differences in terms of sex, school grade and age group in the indicators of reproducibility between the translated version and the original version of the 2007 YRBS. With regard to the reference period of time, "seven days" showed a kappa index significantly lower than the other reference periods. The reference periods of "30 days" and "12 months" showed similar values, while the reference periods of "throughout life" and "without time reference" showed the highest kappa index scores. The 1999 YRBS version does not include the reference period of "seven days"; in both studies, the reference period of "throughout life" stood out in terms of the kappa index level. Dietary habits and physical activity practice had the lowest kappa indices, such as in the 1999 YRBS. Whereas "tobacco use" had the highest kappa index in the 1999 YRBS version, sexual behavior showed the highest kappa index in the translated 2007 YRBS, followed by tobacco use, alcohol and other drug use, other health-related topics and non-intentional injuries and violence. In the group of items that showed significant differences between the prevalence rates

Table 3. Kappa agreement index and prevalence rates of applications of the Portuguese version of the 2007 YRBS questionnaire. City of Londrina, Southern Brazil, 2007.

Item	Kappa (%)	Prevalence Rates (%)		χ^2 Test
		Time 1	Time 2	
Unintentional injuries and violence				
During the past 12 months, always wore a helmet when riding a motorcycle	71.3	61.5	55.3	0.019
Always wear a seatbelt when riding in a car driven by someone else	62.7	29.4	30.4	ns
During the past 30 days, did not ride in a car driven by someone who had been drinking alcohol	54.5	62.7	64.8	0.043
During the past 30 days, did not drive a car after drinking alcohol	45.7	93	93.2	ns
During the past 30 days, did not carry a weapon such as a gun, knife or club	84.4	97.4	97.5	ns
During the past 30 days, did not carry a gun	68.5	98.6	98.6	ns
During the past 30 days, did not carry a weapon such as a gun, knife or club on school property	54.6	98.7	98.5	ns
During the past 30 days, did not feel unsafe to go to school	53.3	90.6	92.4	ns
During the past 12 months, did not threaten or injury with weapon on school property	62.9	96	96.8	ns
During the past 12 months, was not stolen on school property	60.4	84.6	86.3	ns
During the past 12 months, was not involved in a physical fight	67.7	78.8	81.4	0.031
During the past 12 months, was not injured in a physical fight	60.4	98.3	97.9	ns
During the past 12 months, was not involved in a physical fight on school property	72.6	90.5	92.2	ns
During the past 12 months, was not physically hurt by boyfriend or girlfriend	59.5	97	95.9	ns
Throughout life, was not forced to have sexual intercourse	100	99.4	99.4	ns
During the past 12 months, did not feel sad and hopeless almost every day for two weeks or more	62.8	77.5	83.4	ns
During the past 12 months, did not consider suicide	86	88.3	89.6	ns
During the past 12 months, did not plan suicide	76.8	92.7	94.6	ns
During the past 12 months, did not attempt suicide	68.5	97.3	96.8	ns
During the past 12 months, was not injured in a suicide attempt	43.6	21	19.5	ns
Tobacco use				
Throughout life, never tried cigarette smoking, even one or two puffs	86.4	56.4	58.9	0.035
Throughout life, never smoked a whole cigarette	74.2	62.2	61.7	ns
During the past 30 days, did not smoke cigarettes	68.9	80.5	81	ns
During the past 30 days, smoked ≤ 1 cigarette/day	67.6	3.8	4.7	ns
During the past 30 days, got cigarettes with family member	80.5	0.5	0.6	ns
During the past 30 days, did not smoke cigarettes on school property	78.1	89.3	88.3	ns
During the past 30 days, did not smoke cigarettes daily	77.1	91	91.7	ns
During the past 12 months, tried to quit smoking cigarettes	64.9	13.2	12.1	ns
During the past 30 days, did not use chewing tobacco, snuff or dip	83.2	99	99.4	ns
During the past 30 days, did not smoke cigars, cigarillos or little cigars	66.2	96.7	96.3	ns
Alcohol and other drug use				
Throughout life, never used alcohol	59.9	16.1	19.7	0.02
Age when first drank alcohol ≥ 13 years	62.2	28.2	30.5	ns
During the past 30 days, never used alcohol	51.4	38.6	42.9	0.017
During the past 30 days, did not have ≥ 5 drinks of alcohol in a row	49.4	63.3	64.8	ns
During the past 30 days, got alcohol with family member	66.7	10.3	10.3	ns
Throughout life, never used marijuana	78.5	88	88.8	ns
Age when first used marijuana ≥ 13 years	88.4	5.2	4.5	ns
During the past 30 days, did not use marijuana	71.1	96.5	96.7	ns
During the past 30 days, did not use marijuana on school property	83.2	99.4	99.2	ns
Throughout life, never used any form of cocaine, including powder, crack, or freebase	82.7	95.8	96.4	ns

To be continued

Table 3 continuation

Item	Kappa (%)	Prevalence Rates (%)		χ^2 Test
		Time 1	Time 2	
During the past 30 days, did not use any form of cocaine, including powder, crack, or freebase	76.8	98.7	99.1	ns
Throughout life, never used inhalants	75.1	95.7	96.6	ns
Throughout life, never used heroin	85.7	99.5	99.6	ns
Throughout life, never used methamphetamines	82.2	98.5	98.6	ns
Throughout life, never used ecstasy	85.6	98.3	98.3	ns
Throughout life, never used steroid pills or shots without doctor´s prescription	66.4	98.1	98.2	ns
Throughout life, never injected illegal drugs	66.6	99.4	99.8	ns
During the past 12 months, nobody offered, sold, or gave illegal drugs on school property	42.8	92.8	92.3	ns
Sexual behaviors				
Never had sexual intercourse	95.6	46.8	47.3	ns
Age when first had sexual intercourse ≥ 13 years	81	7.9	7.7	ns
Throughout life, had ≤ 3 lifetime sex partners	86.7	10.4	10.4	ns
During the past 3 months, had only one sex partner	82.7	22.2	20.3	ns
Last time one had sexual intercourse, did not drink alcohol or use drugs	85.9	37	37.1	ns
Last time one had sexual intercourse, used a condom	89.1	30.5	30.6	ns
Last time one had sexual intercourse, used a method to prevent pregnancy	87.5	7.4	7.5	ns
Body weight and dietary behaviors				
Favorable perception of body weight	84	38.3	40.9	0.042
Trying to lose body weight	74.7	13.8	15.8	ns
During the past 30 days, did not exercise to lose or keep from gaining body weight	67.6	56.1	58.6	0.036
During the past 30 days, did not eat less food, calories, or fat to lose or keep from gaining body weight	67.8	66.4	70.8	0.015
During the past 30 days, did not fast to lose or keep from gaining body weight	63.9	93.6	94.3	ns
During the past 30 days, did not take diet pills, powders, or liquids to lose or keep from gaining weight	56.8	96	96.6	ns
During the past 30 days, did not vomit or took laxatives to lose or keep from gaining body weight	77.7	96.6	96.7	ns
During the past 7 days, did not drink 100% fruit juice	36.2	39.8	33.2	0.002
During the past 7 days, did not eat fruits	32.2	19	17.3	ns
During the past 7 days, did not eat green salads	39.8	18.1	19.8	ns
During the past 7 days, did not eat potatoes	31.6	41.5	32.6	0.001
During the past 7 days, did not eat carrots	45.1	61	55.7	0.032
During the past 7 days, did not eat other vegetables	33.8	39.3	39.9	ns
During the past 7 days, did not drink soda or pop	36.5	9.1	8.2	ns
During the past 7 days, did not drink milk	44.3	18.2	19.5	ns
Physical activity				
During the past 7 days, were not physically active ≥ 60 minutes/day	37.2	32.7	33.5	ns
On an average school day, did not watch television	50.8	15.3	15.9	ns
On an average school day, did not play video or computer games	50.1	30.3	31.2	ns
Did not attend physical education class in school	79	4.1	2.7	ns
During the past 12 months, did not play in a sports team	59.5	40.3	44.2	0.039
Other health-related topics				
Has been taught about AIDS or HIV infection in school	64.6	46.5	41.6	0.024
Did not have a diagnosis of asthma made by a doctor or nurse	73.2	90.2	88.8	ns
Did not have symptoms of asthma	40.4	52.2	39.9	0

ns: not statistically significant (p <0,05)

Table 4. Median and mean values and 95% confidence intervals of kappa agreement indices of groups of items of the Portuguese version of the 2007 YRBS, according to demographic indicators, reference period of time and risk behavior category. City of Londrina, Southern Brazil, 2007.

Variable	Median	Mean	95% CI
Sex			
Female	68.2	69.1	62.9;75.2
Male	65.9	65.7	60.0;71.4
Period of study			
Day-time	70.5	70.3	65.2;75.7
Night-time	66.9	66.1	59.6;72.3
Secondary school grade			
First	70.6	69.9	64.2;75.6
Second	69.7	68.8	62.1;75.4
Third	72.4	71.7	63.5;75.0
Age group (years)			
14 to 17	69.5	70	64.0;76.0
> 17	74.4	70.6	65.8;75.4
Reference period of time of items			
7 days	36.9	41.6	39.2;43.7
30 days	62.9	67.9	62.2;73.6
12 months	67.7	64	58.9;69.1
Throughout life	80.4	76.9	68.4;85.5
Without time reference	84.6	79.9	78.3;81.5
Risk behavior categories			
Non-intentional injuries and violence	62.9	65.8	60.9;71.4
Tobacco use	77.1	76.9	72.9;81.0
Alcohol and other drug use	71.1	69.7	62.6;76.7
Sexual behaviors	86.7	86.8	85.4;88.2
Dietary habits	36.4	37.4	35.1;39.8
Physical activity practice	50.8	55.3	53.0;57.6
Other health-related topics	67.7	67.1	63.3;70.9

of repetitions of questionnaire application and kappa index < 61%, more than half of the items were associated with dietary habits, physical activity practice and other health-related topics.

The analysis of reproducibility of the original version of the 1999 YRBS and translated 2007 YRBS were expected to indicate lower agreement between repetitions of questionnaire application for items associated with dietary habits, physical activity practice and other health-related topics. Behavior related to use of substances, such as tobacco, alcohol and drugs; sexual activity; and behavior that involves rebelliousness, such as reckless driving and violence, can be more prevalent and considered to have greater importance in adolescents than behaviors associated with routine (dietary habits and physical activity practice). The low kappa index scores (< 41%) and the inconsistency among prevalence rates of repetitions of questionnaire application can reflect behavioral changes in the period of 14 days.

Adolescents aged more than 17 years, who went to school during the day, showed higher kappa index scores than those of adolescents aged between 14 and 17 years, who went to school in the evening. Studies involving the YRBS indicated greater reproducibility in older adolescents.[2,3] With regard to the period of study, there appear to be differences between secondary education students who were in day-time schools and those in night-time schools, as a result of paid work performed by these students. In the sample selected for the present study, 22.1% of students who went to school during the day reported performing a certain type of paid job, compared to the 64.9% of students who went to school in the evening, of which 37% performed work full-time (40 hours/week). Night-time students are older and, due to their being in the job market, they remain closer to a non-familial adult environment, have some independence, and can behave in a less usual way, thus having an influence on the change of behaviors in relatively short periods of time, such as the 14-day interval between questionnaire applications.

The Portuguese version of the 2007 YRBS was found to be a questionnaire capable of gathering information about health risk behaviors in Brazilian adolescents. The methodology of translation adopted enabled it to have quality and safety. The simple and objective structure of design of items of the original 2007 YRBS version contributed to the success of this stage.

The cross-cultural adaptation showed that the domains dealt with by the questionnaire are suitable for the Brazilian adolescents' culture and that certain items needed minor adjustments. The identification of the psychometric properties of the Portuguese version of the 2007 YRBS indicated high reproducibility of items.

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