



ORIGINAL ARTICLE

# Trends in consuming alcoholic beverages among adolescents and young adults of school age: sexes differences



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## KEYWORDS

Adolescent;  
Young adult;  
Risk behavior;  
Binge drinking;  
Alcohol consumption

## Abstract

**Objective:** To analyze the tendency of alcoholic beverage consumption among adolescents and young adults at school age according to their sexes.

**Methods:** This is a trend research study in public schools of the municipality of Petrolina, between 2014 and 2016, with 3146 students aged between 12 and 24 years old. The instrument was constituted by socio-economic inquiry and the Youth Risk Behavior Survey. Trends were assessed using the Centers for Disease Control and Prevention recommended approach. The analyses were conducted using logistic regression, with a statistical significance of 0.05.

**Results:** Close to 56% of the adolescents had already tried some alcoholic beverage, most of which had contact after 13 years of age. The prevalence of binge drinking ranged between 17% and 25%. The percentage of girls who tried alcohol before 13 years old remained similar over the three years ( $p = 0.943$ ). The prevalence of this behavior was stabilized at around 20%. There was a trend to decrease in the prevalence of boys who reported having tried alcohol before 13 years old ( $p = 0.014$ ). The percentage of boys who reported involvement in binge drinking in the past 30 days remained stable at around 20% over the years ( $p = 0.951$ ). The girls' data revealed a significant decrease in binge drinking ( $p = 0.019$ ).

**Conclusions:** The general analysis suggests a trend towards stabilization of consumption among boys, and an increase among girls.

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## Introduction

Different practices of alcoholic beverage consumption have already been observed in societies and represent a widespread cultural habit among social groups. Sociocultural contexts have a major influence on drinking culture. There are differences in terms of the frequency with which people consume alcohol above safe limits. These variations are extrapolated when considering data concerning binge drinking in adolescents and young people.<sup>1</sup>

In addition to the social, family, and religious aspects which pervade and influence the consumption of alcoholic beverages, two further aspects point out an association with the high prevalence of this behavior among young adults and adolescents: the age of initiation, and the consumption pattern. However, there is no consensus on what classifies premature alcoholic initiation.<sup>2</sup>

The consequences of uncontrolled alcohol use go beyond the individual context and impose a considerable charge of undesirable and highly burdensome grievances on an entire society. Among the problems cited as consequences of the use of alcoholic beverages in adolescents and young adults, there are serious traffic accidents, unintentional injuries, involvement in fights, and low study performance.<sup>3</sup> The age of alcoholic initiation is considered a risk marker for developing alcohol use disorder in adolescents and young adults and may affect developing abilities and behaviors which are necessary to manage the transition to the adult age, including a progression toward dependence.<sup>4</sup>

The use of alcohol also acts as an indicator of sexual risk due to a mechanism of collateral action which can result in a decrease and impairment in perception and control by the adolescent to undergo sexual experiences.<sup>5,6</sup> The lack of using condoms and the higher number of sexual partners is considered at-risk sexual behaviors which have the occurrence of sexually transmitted diseases (STDs) and unplanned pregnancies among their consequences.<sup>7</sup>

The representativity expressed by these groups justified this work which provided updated information on this theme with a longitudinal follow-up that may contribute to monitoring the health levels of adolescents and young adults. Thus, the aim of this study was to analyze the tendency of alcoholic beverage consumption among adolescents and young adults at school age according to their sexes.

## Methods

This is a trend research study in public primary and secondary schools of the municipality of Petrolina (State of Pernambuco, Brazil) between 2014 and 2016. The authors enrolled students of both sexes classified as adolescents (aged between 12 and 18 years old), and young adults (aged between 19 and 24 years old). Those students who did not deliver the properly fulfilled question forms or had unanswered questions referred to the “sexes” variable were excluded from the study.

The variable of interest in the study was alcoholic beverage consumption. Binge drinking was considered the ingestion of five or more doses on a single occasion.<sup>8</sup> The definition of early experimentation of adopting alcoholic beverage consumption was that occurring before 14 years of age.<sup>9</sup>

In aiming to guarantee the sampling proportion, the distribution of schools was performed according to their size: small (less than 200 students), medium (200 to 499 students), and large (500 students or more). The sample selection was stratified and random. All schools were considered eligible for their inclusion in the study. A total amount of 29 schools in the urban area were considered in this study. However, 31% of schools were considered for analysis, corresponding to nine schools. Randomization of the schools was performed using the *WinPepi* version 11.43 program.

A total population of 15,148 registered students was considered, as referred by the data included in the System for the Information of Education of Pernambuco State for the year 2014. A 95% confidence interval, a sample loss of 20%, and an estimated prevalence of the dependent variable alcoholic beverage consumption of 50% were adopted, thus obtaining a sum of 469 students. A design effect of 2.0 was added, totaling a minimum sample of 938 students for each year of sampling performed.

The data sampling instrument was constituted of two parts. The first part was a socio-economic inquiry based on the Brazilian Criteria for Economic Classification with questions presented in an objective form and with multiple answering options (composed of 6 questions). The second part was the Youth Risk Behavior Survey (YRBS) using the Brazilian validated version (composed of 85 questions).<sup>10</sup> It was self-applied and anonymous. The domain associated with alcoholic beverage consumption was applied in this study, being composed of questions 38 to 43. Validation values (Kappa index) varied between 49.4 and 66.7.<sup>10</sup> In the three years of study, the data were obtained in the same period of months.

A pilot study was performed before beginning the first year of data sampling in order to train the team formed by ten researchers to identify and correct the presence of potential biases and limitations of the research methods.

Data were processed and analyzed using the Statistical Package for the Social Sciences (SPSS) version 20.0 program. Categorical data were expressed as relative and absolute frequencies. Descriptive analyses were conducted to determine the prevalence of alcohol use behaviors among adolescents and also by sexes at each time point. Next, trends in alcohol use behaviors by sexes from 2014 to 2016 were assessed using the CDC’s recommended approach for trend analysis.<sup>11</sup> The analyses for dichotomous risk behaviors were conducted using logistic regression. Time was modeled as a continuous variable and it was significant at  $p < .05$ . Analyses were stratified by sexes, controlled for age, race/ethnicity, and grade in school using categorical variables. The linear regression slope serves as a measure of the average increase or decreases over the 3-year period, and whether the slope was significantly different from 0 is a measure of whether the trend in alcohol use behaviors was on average upward or downward.

The research was submitted to the ethical committee in research of the University of Pernambuco CAAE 24288213200005207, respecting the precepts of resolution 466/12 of the National Health Council, and the Child and Adolescent Statute. The enrolled participants signed the Informed Consent Form and the assent form.

## Results

The final sample was composed of 3146 participants, as 45 questionnaires were excluded. There was data loss for any variable which was analyzed in the three years (2014–2016) due to a lack of completion of some questions.

The general sociodemographic and economic features of the participants displayed a higher prevalence of female students (56%), 14 years of age (17.3%), self-declared ethnicity (55%), catholic religion (47.9%), single (95%), no children (98.4%), mother's education with secondary school completed/superior uncompleted (22.1%), father's education when known, being illiterate/primary school uncompleted (20.1%). The average monthly income when known was two minimum monthly salaries (MS) (23.8%), and following the 8th year of primary school (21.5%) (Table 1).

The prevalence of alcohol consumption among adolescents and young adult students over the three years is shown in Table 2. Among the observed behaviors, the authors highlight that close to 56% of the adolescents had already tried some alcoholic beverage, most of which had contact after 13 years of age. In the past 30 days, about 30% of adolescents reported having consumed alcohol, half of whom obtained the drink directly and the other half through another person. The prevalence rates regarding binge drinking episodes ranged between 17% and 25%. In addition, 5% of adolescents reported having alcoholic drinks in schools.

The trends of alcoholic beverage consumption among adolescents and young adult school students according to sexes and controlled for age, race/ethnicity, and grade school are shown in Table 3.

The percentage of girls who tried alcohol before 13 years old remained similar over the three years analyzed ( $p = 0.943$ ). The prevalence of this behavior was stabilized at around 20%. There was a trend to decrease in the prevalence of boys who reported having tried alcohol before 13 years old ( $p = 0.014$ ). The percentage measured in 2014 was 24.5%, while this value dropped to 17.7% in 2016.

Regarding the consumption of at least one dose in the last 30 days, boys had an initial prevalence of 27% and maintained similar rates in subsequent years ( $p = 0.340$ ). However, a significant increase ( $p = 0.024$ ) was observed in the percentage of girls who reported having consumed alcohol in the last 30 days. The prevalence in 2014 was 28.8%, increasing to 36.5% in 2015 and 32.5% in 2016.

The percentage of boys who reported involvement in binge drinking episodes in the past 30 days remained stable at around 20% over the years analyzed ( $p = 0.951$ ). About 5% of the boys reported having consumed alcohol at school over the three years evaluated ( $p = 0.491$ ). On the other hand, the girls' data revealed a significant decrease in binge drinking episodes ( $p = 0.019$ ), and the percentage of girls doubled in the period evaluated, starting from around 2% and reaching 5% ( $p = 0.016$ ).

## Discussion

Although the present results have shown that around 55% of adolescents reported that they have tried alcoholic beverages throughout their lives, this prevalence was lower than in other national<sup>12</sup> and international studies.<sup>13</sup> Among

**Table 1** Distribution of sociodemographic and economic features of the adolescents and young students in the triennium 2014, 2015, and 2016.

Independents Variables	<i>n</i> (%)
<b>Sex (3.149)</b>	
Female	1.763 (56,0)
Male	1.383 (44,0)
<b>Years of age (3.139)</b>	
≤ 12	289 (9,2)
13	493 (15,7)
14	543 (17,3)
15	537 (17,1)
16	533 (17,0)
17	492 (15,7)
≥ 18	251 (8,0)
<b>Ethnicity (3.115)</b>	
White	613 (19,7)
Black	450 (14,3)
Brown	1.733 (55,0)
Yellow	170 (5,4)
Indigenous	149 (4,7)
<b>Religion (3.111)</b>	
Catholic	1.491 (47,9)
Evangelical	902 (29,0)
Spirits	31 (1,0)
Afro-Brazilian	8 (0,3)
None	571 (18,4)
Other	108 (3,5)
<b>Conjugal state (3.114)</b>	
Single	2.958 (95,0)
Married	40 (1,3)
Stable union	97 (3,1)
Separate	11 (0,4)
Widow	8 (0,3)
<b>Have children (3.074)</b>	
Yes	50 (1,6)
No	3.024 (98,4)
<b>Mother's education (3.043)</b>	
Illiterate or primary school uncompleted	486 (16,0)
Primary school completed	421 (13,8)
Uncomplete secondary school	411 (13,5)
Completed secondary school or superior uncompleted	674 (22,1)
Superior completed	467 (15,3)
Could not inform	584 (19,2)
<b>Father's education (3.022)</b>	
Illiterate or primary school uncompleted	608 (20,1)
Primary school completed	383 (12,7)
Uncomplete secondary school	345 (11,4)
Completed secondary school or superior uncompleted	501 (16,6)
Superior completed	312 (10,3)
Could not inform	873 (28,9)
<b>Family monthly income/ minimum salaries - MS* (3.001)</b>	
≤ 1	448 (14,9)
> 1 a 2	713 (23,8)
> 2 a 3	338 (11,3)

**Table 1** (Continued)

Independents Variables	n (%)
> 3 a 5	184 (6,1)
> 5	154 (5,1)
Could not inform	1.164 (38,8)
<b>School years (3.132)</b>	
7th primary school	374 (11,9)
8th primary school	674 (21,5)
9th primary school	597 (19,1)
1th secondary school	517 (16,5)
2th secondary school	482 (15,4)
3th secondary school	487 (15,5)

\* MS: minimum monthly salaries; \$145,91 in 2014; \$158,80 in 2015 e \$177,34 in 2016.

adolescents who consumed alcohol, most reported having tried the first dose when they were 13 or older, thus corroborating previous authors.<sup>12</sup> In contrast, about 20% of adolescents reported having tried alcohol before the age of 13. This prevalence rate showed a stabilization trend among girls. There was a tendency to decrease early consumption among boys.

However, even considering that the decrease in early consumption is positive, it is necessary to exercise caution when interpreting these results and understand that this is an alarming situation. In the present sample, 90% of the adolescents were under the age of 18, which means that although the early experimentation rates of these adolescents have decreased, they still have contact with alcohol before the minimum age permitted by Brazilian law ( $\geq 18$  years). Furthermore, the age of alcoholic initiation is considered one of the most influential risk factors to perpetuate the abusive consumption of alcoholic beverages both in late adolescents and in young adults.<sup>14</sup>

Concerning recent consumption, about 30% of adolescents reported having consumed at least one dose in the last 30 days. The authors observed a tendency to maintain the prevalence rate among boys over the three years evaluated, while an increasing trend was observed among girls. This tendency along the study period, even if mild, reflects an alarming situation of earlier and earlier use of alcohol among students at school age,<sup>2,13</sup> especially considering the negative neuropsychological consequences represented by this substance.<sup>5</sup>

One of the possible factors associated with alcohol consumption among adolescents is the social influence on the acceptance of this risky behavior.<sup>15</sup> In addition to this element, there are many peculiarities of different natures associated with the limits established for alcoholic use: religious and cultural,<sup>3</sup> familiar and social<sup>13</sup> which influence alcohol consumption patterns among adolescents, and young adults.<sup>2,12</sup>

The present study displayed an increasing tendency in the prevalence of alcoholic initiation among the girls in this age range, overcoming the prevalence of boys over the three years studied. The literature points out different alcoholic consumption patterns according to sexes in the different regions of Brazil.<sup>16</sup> In agreement with the data on alcoholic initiation, the present research also displayed a higher

prevalence of the variable ingestion of at least one dose in the last 30 days by females, with a significant difference over the three years. Furthermore, males maintained the tendency of this variable over the three years, corroborating with other results published in this issue.<sup>17</sup>

The present data highlight that increased alcohol consumption among women may be related to the search for sexes equality and female emancipation, which is more and more diffused and socially defended.<sup>13</sup> This observation points out how alcohol drinking is losing its historical characterization of male predominance.<sup>18</sup> However, in adopting this risky behavior as a legitimate means to express identities and ideologies, women place themselves on a threshold of equality, or even in higher vulnerability due to the consequences to health in comparison to males.<sup>13</sup>

The higher female vulnerability to the effects of alcoholic beverages is due to a variety of different elements. The reduced hepatic capability of alcohol metabolism, together with the higher proportion of body fat contributes to higher concentrations of alcohol in a woman’s blood than in men with the same quantity of alcohol. Therefore, women consuming alcohol are more exposed than men to severe risks including interpersonal violence and risky sexual behaviors such as sex without consent, sex without protection, and unplanned pregnancies.<sup>9</sup>

Some authors report that binge drinking has been an increasingly common behavior among adolescents.<sup>3</sup> However, the reported prevalence remained close to 20% in the present study over the three years. Similar prevalences have been described in other national<sup>19</sup> and international studies.<sup>20</sup> These studies, such as those presented herein, reflect a negative behavior tendency, being above the data presented by the report of the Global Status of the World Health Organization on alcohol and health, which was 12.4%.<sup>9</sup>

Regarding binge drinking during the last 30 days, even if this behavior displayed a decreasing trend among girls, its prevalence was significantly higher than in boys over the three years. These results disagree with those presented in the literature. According to other authors, males display a higher prevalence and tendency toward this practice.<sup>21</sup> This fact may be associated with the search for sexes equality which has promoted girls toward vulnerable situations which are commonly associated with males.<sup>22</sup>

Binge drinking is often associated with other dangerous behaviors such as the use of illicit drugs;<sup>19</sup> current use of tobacco;<sup>20</sup> involvement in fights;<sup>23</sup> unprotected sex;<sup>24</sup> dangerous car direction under the effects of alcohol, and subsequent involvement in the accident,<sup>25</sup> in addition to being a predictor for sexual initiation.<sup>26</sup>

These attitudes may be associated with features inherent to the age marked by impulsiveness and lack of control, associated with the necessity to experiment with different and exciting feelings.<sup>4</sup> The desire for excitation is felt without thinking much about the consequences of these acts and the adverse or collateral effects of the abusive use of alcoholic beverages such as intoxication and alcoholic abstinence.<sup>27</sup>

The way to access alcoholic beverages during the last 30 days either personally or through other persons agrees with the results of other authors and points out worrying results. Legally fixed limits exist in 115 countries for

**Table 2** Prevalence of alcoholic beverage consumption of the adolescents and young students according to the sexes in the three-years of study.

Study Variables	Female			Male			Total		
	2014 <i>n</i> (%)	2015 <i>n</i> (%)	2016 <i>n</i> (%)	2014 <i>n</i> (%)	2015 <i>n</i> (%)	2016 <i>n</i> (%)	2014 (1.272) <i>n</i> (%)	2015 (932) <i>n</i> (%)	2016 (942) <i>n</i> (%)
<b>Age in first drink of alcohol (years)</b>									
Never drink alcohol	305 (42.6)	206 (39.7)	228 (43.3)	247 (44.4)	190 (46.3)	202 (49.0)	552 (43.5)	406 (42.6)	435 (45.6)
First drink < 13 years	147 (20.6)	123 (23.7)	101 (19.2)	136 (24.5)	102 (24.9)	73 (17.7)	283 (22.3)	228 (23.9)	178 (18.7)
First drink ≥ 13 years	260 (36.5)	190 (36.6)	197 (37.5)	173 (31.1)	118 (28.8)	137 (33.3)	433 (34.2)	320 (33.6)	341 (35.7)
Total	712 (100)	519 (100)	526 (100)	556 (100)	410 (100)	412 (100)	1.268 (100)	954 (100)	954 (100)
<b>At least one drink of alcohol during the past 30 days.</b>									
Yes	202 (28.2)	190 (36.5)	171 (32.5)	155 (27.7)	102 (24.8)	102 (24.5)	357 (28.0)	292 (31.3)	273 (29.0)
No	512 (71.8)	331 (63.5)	355 (67.5)	403 (72.3)	309 (75.2)	314 (75.5)	915 (72.0)	640 (68.7)	669 (71.0)
Total	714 (100)	521 (100)	526 (100)	558 (100)	411 (100)	416 (100)	1.272 (100)	932 (100)	942 (100)
<b>How usually get the alcohol during the past 30 days</b>									
Did not get	496 (70.5)	323 (62.5)	350 (68.4)	391 (71.6)	301 (74.9)	302 (75.3)	887 (71.0)	624 (67.9)	652 (71.4)
In person	97 (13.8)	83 (16.1)	72 (14.1)	91 (16.7)	56 (13.9)	54 (13.5)	188 (15.0)	139 (15.1)	126 (13.8)
Another person	111 (15.8)	111 (21.5)	90 (17.6)	64 (11.7)	45 (11.2)	45 (11.2)	175 (14.0)	156 (17.0)	135 (14.8)
Total	704 (100)	517 (100)	512 (100)	546 (100)	402 (100)	401 (100)	1.250 (100)	919 (100)	913 (100)
<b>Drinking in binge during the past 30 days</b>									
Yes	134 (25.3)	132 (18.7)	122 (23.2)	117 (20.9)	70 (17.0)	84 (20.2)	251 (19.7)	202 (21.7)	206 (21.9)
No	580 (74.7)	389 (81.3)	404 (76.8)	441 (79.1)	341 (83.0)	332 (79.8)	1.021 (80.3)	730 (78.3)	736 (78.1)
Total	714 (100)	521 (100)	526 (100)	558 (100)	411 (100)	416 (100)	1.272 (100)	932 (100)	942 (100)
<b>At least one drink of alcohol during the past 30 days on school</b>									
Yes	15 (2.1)	33 (6.4)	26 (5.0)	24 (4.4)	28 (6.9)	21 (5.1)	39 (3.1)	61 (6.6)	47 (5.0)
No	689 (97.9)	480 (93.6)	495 (95.0)	521 (95.6)	380 (93.1)	391 (94.9)	1.210 (96.9)	860 (93.4)	886 (95.0)
Total	704 (100)	513 (100)	521 (100)	545 (100)	408 (100)	412 (100)	1.249 (100)	921 (100)	933 (100)

Note: Drinking in binge = 4 or more drinks of alcohol in a row, that is, within a couple of hours (female) or 5 or more drinks of alcohol in a row, that is, within a couple of hours (male).

**Table 3** Trends in alcohol use behaviors by sexes, Youth Risk Behavior Survey 2014–2016.

	2014		2015		2016		Change 2014–2016	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	$\beta$	<i>p</i>
<b>Female</b>								
<b>Age in first drink of alcohol (years)</b>								
First drink < 13 years	147	20.6	123	23.7	101	19.2	−0.006	0.943
<b>At least one drink of alcohol during the past 30 days</b>								
Yes	202	28.2	190	36.5	171	32.5	<b>0.141</b>	<b>0.024</b>
<b>Drinking in binge during the past 30 days</b>								
Yes	134	25.3	132	18.7	122	23.2	<b>−0.163</b>	<b>0.019</b>
<b>At least one drink of alcohol during the past 30 days on school</b>								
Yes	15	2.1	33	6.4	26	5.0	<b>0.350</b>	<b>0.016</b>
<b>Male</b>								
<b>Age in first drink of alcohol (years)</b>								
First drink < 13 years	136	24.5	102	24.9	73	17.7	<b>−0.216</b>	<b>0.014</b>
<b>At least one drink of alcohol during the past 30 days</b>								
Yes	155	27.7	102	24.8	102	24.5	−0.073	0.340
<b>Drinking in binge during the past 30 days</b>								
Yes	117	20.9	70	17.0	84	20.2	−0.005	0.951
<b>At least one drink of alcohol during the past 30 days on school</b>								
Yes	24	4.4	28	6.9	21	5.1	0.100	0.491

All analyses above controlled for age, race/ethnicity and grade school.  
 \* Boldface indicates statistical significance ( $p < 0.05$ ).

initiating alcohol consumption, varying between 16 and 21 years of age.<sup>28</sup>

However, regardless of the way adolescents and young adults access alcoholic beverages, many forms of media platforms and involvement with internet alcohol marketing stimulate alcohol consumption, promoting a premature adhesion to this behavior.<sup>29</sup>

There was an upward tendency among girls who declared they ingested alcohol during the last 30 days inside the school in the present study, and it was maintained among boys. This result stimulates reflection on the management of the educational institutions, as it refers to the access to alcohol inside the school environment where this behavior is prohibited to the students, being minors or not. Such results are worrisome due to two relevant questions: the matter of age, and the existence of the consumption of alcoholic beverages inside the school environment. In the legal framework, the school is in charge together with the families for the training and education of the students, as these individuals spend most of their time inside this environment.<sup>13</sup>

Some limitations should be pointed out in the current study: even if the sample size was representative, this equivalent corresponds to 20% of adolescents and young people in Petrolina, so the data interpretation and generalization must be evaluated with caution. The study duration (three years) might be considered short compared with other cohort studies embracing more extended periods. However, the last YRBS report (2017) considers a three-year period as the minimum for temporal tendency analyses.

With the self-applied questionnaire, it is crucial to consider the possibility that the answers given by the students might have been untruthful, mainly referring to variables associated with the consumption of alcoholic beverages. Girls tend to underestimate their experiences, and boys tend to overestimate them.<sup>30</sup>

Due to these considerations, the authors suggest that further studies with longitudinal designs should be performed. These studies should analyze young adults and adolescents extrapolating the regional borders, and assessing the different influences in major cities and smaller inland cities.

### Conclusion

The results of this study point to a high prevalence of the variables associated with alcoholic beverage consumption by adolescents and young adults by an overall analysis of the sample. The trend analysis showed that boys showed stabilization in consumption and episodes of binge drinking and a decrease in early consumption. On the other hand, girls showed a tendency to increase consumption, and even though they showed a tendency to decrease binge drinking episodes, their prevalence rates were higher than boys. Thus, in the authors' general analysis, there seems to be a tendency of equalization between the sexes with regard to alcoholic beverage consumption over the three years evaluated.

### Authors' contributions

RM was responsible for drafting the manuscript, collected and interpreting the data. RC, was responsible for analyzing the data and for critically reviewing the manuscript. SAB and LSA were responsible for collecting and interpreting the data. ACRP was responsible for drafting the manuscript, coordinated and interpreting the data. The authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

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## Conflicts of interest

The authors report no potential conflicts of interest relevant to this article. The authors are the only ones responsible for the content and writing of the article.

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