

# Selected dietary restrictions and the frequency of alcohol consumption among adolescents

## Authors' Contribution:

- A Study Design
- B Data Collection
- C Statistical Analysis
- D Data Interpretation
- E Manuscript Preparation
- F Literature Search
- G Funds Collection

Mariusz Jaworski<sup>1, 2 ABCDEFG</sup>, Anna Fabisiak<sup>1, 3 BCDEFG</sup>

<sup>1</sup> Warsaw School of Tourism and Hospitality Management, Vistula Group of Universities, Warsaw, Poland

<sup>2</sup> Department of Medical Psychology, Medical University of Warsaw, Warsaw, Poland

<sup>3</sup> Higher School of Enterprise, Warsaw, Poland

## abstract

**Background:** Increasing alcohol consumption by adolescents is a major public health problem. One reason for this is that young people want to solve their difficulties by using alcohol. Therefore, an important aim of the current study is to analyze selected nutrition-related health behaviors which are taken before the planned consumption of alcoholic beverages among young people.

**Material/Methods:** The study group consisted of 77 adolescents from secondary school. The research tool consisted of two parts. The first one analyzed the frequency of selected alcohol consumption, the second - nutrition-related behaviors in adolescents before the planned consumption of alcoholic beverages.

**Results:** The study showed that about 78% of the respondents – regardless of gender – had consumed beer in the past 12 months. The use of restrictive diets was more important for women than for men. However, restrictions on food consumption were very similar in both analyzed groups.

**Conclusions:** Behaviors associated with restrictive diets before the planned consumption of alcohol are the same for both women and men. These behaviors may contribute to the development of eating disorders among adolescents.

**Key words:** youth, nutritional status, alcohol, adolescents.

## article details

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**Corresponding author:** Dr Mariusz Jaworski, Warsaw School of Tourism and Hospitality Management, Vistula Group of Universities, 3 Stokłosa Str., 02-787 Warsaw, Poland; e-mail: m.jaworski@vistula.edu.pl

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## INTRODUCTION

In recent years, researchers have pointed out that there is increased interest in proper nutrition and an active lifestyle among all age groups. These activities can directly affect physical attractiveness, physical effectiveness, and self-esteem [1].

Modern social communication promotes a slim body as a symbol of ideal beauty, as well as the source of success both in professional and social life. Therefore, actions which are associated with a reduction of body weight are undertaken to seek improved body image. One of the most common activities in this area is a weight loss diet and fasting [2].

One form of weight control may be to reduce the consumption of food throughout the day, especially before the planned consumption of alcoholic beverages [3]. According to some studies, this phenomenon is characteristic of young people and sometimes it could evolve into one of the forms of eating disorders, especially anorexia or bulimia [3, 4]. A characteristic feature associated with dietary restrictions before the planned consumption of alcohol is the fear of gaining weight. A likely cause of this phenomenon could be an increased awareness among young people that consumed alcohol contains calories which can cause weight gain [5]. One of the forms of weight gain prevention is actions related to achieving zero or negative energy balance [3, 6]. In other words, the use of fasting or reducing the consumption of food during the day enables an increase in the consumption of alcohol and the awareness that the consumed calories will not have an influence on positive energy balance and weight gain [7]. The more frequently this behavior is undertaken, the more like it is to become a habit. Consequently, such activities are observed more frequently. In behavioral psychology, we can state that the behavior becomes a habit only after it has been reproduced many times [8]. The discussed phenomenon is particularly observed among young adults and youth [3, 6].

According to an eight stage theory of identity and psychosocial development by Erikson, we can say that adolescence and early adulthood are periods when a lot of behavior is shaped, including health-related behavior. This process is based on the need for socialization and social acceptance. Most of the health-related behavior which is undertaken during this period is associated with a social learning theory (developed by Albert Bandura). This theory states that people learn which behavior is accepted in society by using observation, including direct instruction, modeling, and imitation. Adolescents learn which behaviors are acceptable and gratified in the group. This process also occurs in the context of behavior associated with alcohol consumption and eating [9].

Adolescence is also a period during which self-esteem and physical attractiveness is very important. These two factors are associated with the need to achieve an ideal body weight which determines being physically attractive for others [2, 9]. Some of the most common eating behaviors in this context are various types of weight loss diets and fasting [2]. The first consumption of alcohol usually occurs during adolescence. Adolescent alcohol consumption may be undertaken in the context of obtaining social acceptance among peers. It increases self-esteem in peers on the one hand; on the other hand, the consumption of these beverages may contribute to weight gain [2, 3, 8].

The use of dietary restrictions such as weight-loss diets as well as fasts before the planned consumption of alcohol significantly affects health. These activities could lead to many disorders and abnormalities in the functioning of the cardiovascular, digestive, and nervous systems and also contribute to the development of eating disorders [3, 10]. As a result, early and effective prevention, as well as correct promotion of health-related behavior among adolescents and young adults may be a key element in preventing the development of these disorders.

The aim of this study was to analyze the frequency of undertaking specific eating restrictions before planned alcohol consumption among adolescents. Among the behavior associated with dietetic restrictions, the following was analyzed:

- a. the frequency of use of weight loss diets;
- b. food intake reduction before planned (evening) alcohol consumption;
- c. the frequency of fasts undertaken before the planned consumption of alcohol.

The study also delivered knowledge about the frequency of alcoholic beverages consumption, such as beer, wine, vodka, among adolescents.

The following research questions were formulated in relations to the main aim of the research:

- Q1: How often did young people declare alcohol consumption in the last year?
- Q2: How often did adolescents adopt dietary restrictions, such as food intake reduction or a fast, before planned evening alcohol consumption during the last year?
- Q3: Is there a relationship between the frequency of alcoholic beverages consumption - beer, wine, vodka - and behavior aimed at reducing food intake or fasting before planned evening alcohol consumption?

## **MATERIAL AND METHODS**

The research involved 77 adolescents from secondary school between the ages of 17 and 18. The mean age of participants in the research was  $17.1 \pm 0.8$  years old. There were more women in the respondents' group - 58.4% women (n = 45) and 41.6% men (n = 32).

The choice of secondary school students was based on a review of literature. The review suggests that adolescents could more frequently display behavior associated with dietary restrictions before the planned consumption of alcohol than other age groups [3, 11].

An important aspect of respondent selection was also the development of self-identity. An eight stage theory of identity and psychosocial development by Erikson was used for this purpose. According to this theory, adolescence is a period of self-identity formation and building closer interpersonal relationships which can have an influence on health behavior, including dietary behavior [9].

All participants in the study were informed about the aim of the study. All respondents gave their informed consent.

The research questionnaire method combined with a prospective technique for

The research questionnaire method combined with a prospective technique for the diet assessment was used in the research. The study was conducted from the perspective of respondents involved in the project. An original questionnaire consisting of two parts was used in the study. The first part analyzed the frequency of selected alcohol consumption – such as beer, wine, vodka – during the last year. The frequency of use of all alcohols was evaluated on a 5-point scale (0 – never, 2 – once a month or less, 3 – several times a month 4 – several times a week, 5 – every day, 6 – several times a day). The second part analyzed selected diet-related behaviors which were displayed by adolescents before the planned consumption of alcoholic beverages during the last year. The following was analyzed:

- I. the frequency of use of weight loss diets;
- II. the frequency of reduction of food intake before the planned evening alcohol consumption;
- III. the frequency of use of a fast before the planned consumption of alcohol.

The frequency of undertaking these dietary restrictions was evaluated on a 5-point scale (0 – never, 2 – once a month or less, 3 – several times a month 4 – several times a week, 5 – every day, 6 – several times a day).

The present research also assessed the respondents' weight and height. The BMI value was calculated based on these data.

The snowball method was used to recruit the respondents, because of the difficulty in locating and reaching potential participants. The recruitment was made according to the principle of random (comfortable) selection.

## STATISTICAL ANALYSIS

Statistical analysis of the obtained empirical material was performed using the statistical package SPSS 21.0. The distribution of data was tested using Shapiro-Wilk statistics and Quantile plots for normality. Skewness and kurtosis were also calculated. Standard Error of Means (SEM) estimated the standard deviation of the distribution of mean estimators. The criterion for statistical significance was set at  $p \leq 0.05$ . A student's t test for two independent groups was used to evaluate the differences between men and women for variables with normal distribution, but for variables with abnormal distribution – the Mann-Whitney U Test. *d Cohen coefficient*, which analyzes the strength of difference between variables, was used to assess the effect of size. This coefficient is defined as the difference between the means divided by the standard deviation. A Spearman correlation coefficient was used to evaluate the relationship between the frequency of alcohol consumption – beer, wine, vodka – and the frequency of dietary restrictions.

## RESULTS

The mean body weight in all groups was  $66.39 \pm 17.42$  kg (mean  $\pm$  Standard Error of Mean [SEM]). The lowest noted value of body weight was 44 kg, but the highest – 144 kg. The height in the analyzed group of youth ranged from 150 cm to 220 cm. The mean height in the analyzed adolescents was 172 cm. The BMI factor was calculated and interpreted in accordance with the guidelines of the WHO (World Health Organization). The BMI value ranged from  $14.5 \text{ kg/m}^2$  to  $48.8 \text{ kg/m}^2$ . The mean value of the BMI was  $22.50 \text{ kg/m}^2$ . Table 1 shows the respondents' characteristics by gender.

**Table 1.** The respondents' characteristics in terms of anthropometric variables

| Variable                 | Women |      |       |       | Men   |      |       |      | t      | d     |
|--------------------------|-------|------|-------|-------|-------|------|-------|------|--------|-------|
|                          | M     | SD   | Min   | Max   | M     | SD   | Min   | Max  |        |       |
| Weight [kg]              | 59.42 | 10.3 | 44    | 95    | 76.19 | 20.6 | 55    | 148  | -4.24* | -1.03 |
| Growth [cm]              | 165.2 | 7.1  | 150   | 183   | 181.9 | 11.7 | 170   | 220  | -7.16* | -1.72 |
| BMI [kg/m <sup>2</sup> ] | 19.93 | 3.0  | 14.53 | 26.42 | 25.88 | 7.3  | 18.16 | 48.8 | -1.50  | 0.14  |

\* - statistically significant at  $p < 0.01$

t - student's t test for two independent groups

d - d Cohen coefficient

## ALCOHOL CONSUMPTION AND UNDERTAKING SOME DIETARY RESTRICTIONS - RESPONDENTS CHARACTERISTICS

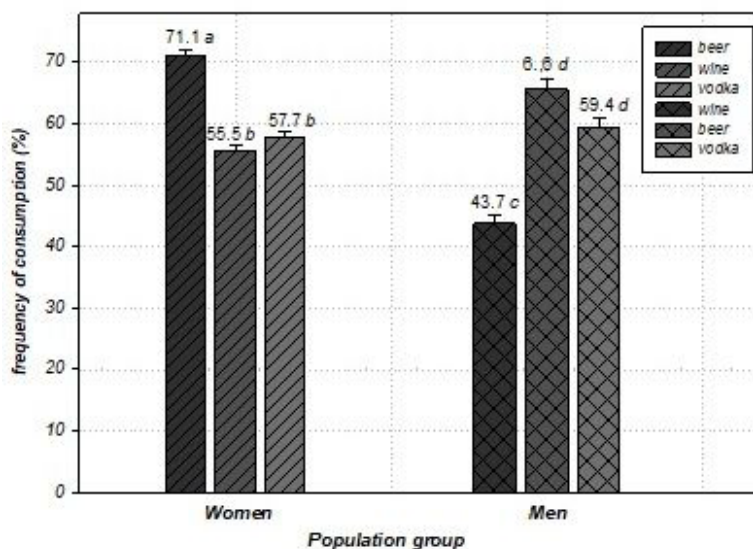
There were no statistically significant differences between men and women in terms of the frequency of the consumption of beer ( $Z = -0.06$ ;  $p > 0.05$ ), wine ( $Z = -0.08$ ;  $p > 0.05$ ) and vodka ( $Z = -1.29$ ;  $p > 0.05$ ) in the last year. The detailed characteristics of the frequency of the consumption of alcoholic beverages are shown in Table 2.

**Table 2.** The respondents' characteristics in terms of the frequency of alcohol consumption

| Variable | Women |      |     |     | Men  |      |     |     | Z     | d     |
|----------|-------|------|-----|-----|------|------|-----|-----|-------|-------|
|          | M     | SD   | Min | Max | M    | SD   | Min | Max |       |       |
| Beer     | 2.22  | 0.90 | 1   | 4   | 2.44 | 1.52 | 1   | 6   | -0.06 | -0.18 |
| Wine     | 1.78  | 0.80 | 1   | 3   | 2.03 | 1.45 | 1   | 6   | -0.08 | -0.21 |
| Vodka    | 1.87  | 0.84 | 1   | 3   | 2.53 | 1.70 | 1   | 6   | -1.29 | -0.39 |

Z - the Mann-Whitney U test

d - d Cohen coefficient



**Fig. 1.** The respondents' characteristics in terms of the frequency of alcohol consumption

## SELECTED DIETARY RESTRICTIONS - RESPONDENTS CHARACTERISTICS

Women who participated in the study significantly more often chose weight loss diets than men in the previous year (Table 3). These differences were not seen in the case of restriction on food consumption before planned evening alcohol consumption. Both women and men displayed the analyzed eating behavior with the same frequency. Similar observations were reported in the case of a fast before the planned alcohol consumption (Table 3).

**Table 3.** The respondents' characteristics in terms of selected dietary restrictions

| Variable   | Women |      |     |     | Men  |      |     |     | Z      | d   |
|--|-------|------|-----|-----|------|------|-----|-----|--------|-----|
|  | M     | SD   | Min | Max | M    | SD   | Min | Max |        |     |
| The frequency of the use of weight loss diets  | 1.82  | 1.13 | 1   | 5   | 1.38 | 1.04 | 1   | 6   | -2.46* | .41 |
| The frequency of reducing food intake before the planned evening alcohol consumption | 1.53  | 0.82 | 1   | 3   | 1.38 | 0.98 | 1   | 6   | -1.23  | .17 |
| The frequency of the use of fasting before the planned consumption of alcohol        | 1.20  | 0.59 | 1   | 4   | 1.13 | 0.34 | 1   | 2   | -0.18  | .15 |

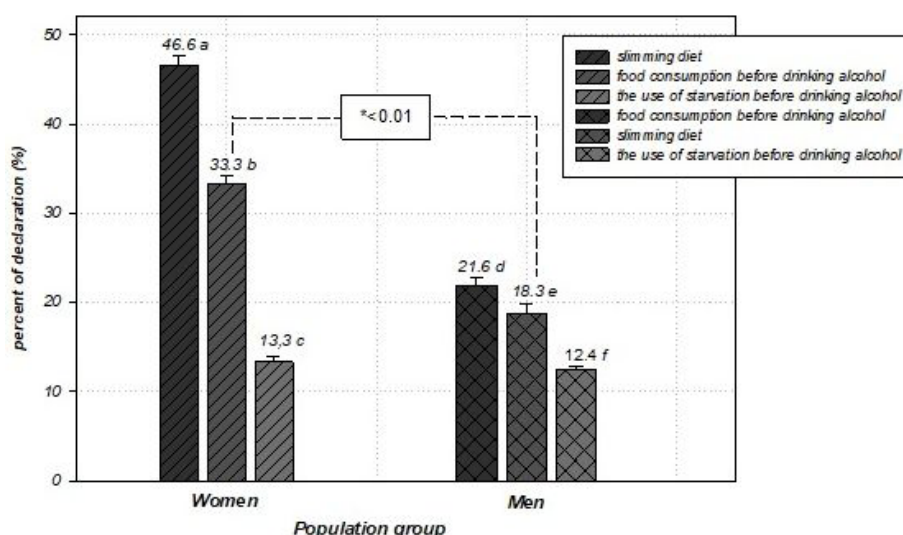
\* - statistically significant at  $p < 0.01$

Z - the Mann-Whitney U test

d - d Cohen coefficient

## REDUCTION IN FOOD CONSUMPTION BEFORE THE PLANNED EVENING ALCOHOL CONSUMPTION - RESPONDENTS CHARACTERISTICS

The analysis showed that 33.3% (n = 15) of women and 21.8% (n = 7) of men declared that they had undertaken eating behavior aimed at limiting food intake before the planned evening alcohol consumption at least once during the previous 12 months. The use of a fast was declared by 12.5% (n = 4) of men and 13.3% (n = 6) of the women who participated in the study.



**Fig. 2.** The respondents' characteristics in terms of the reduction in food consumption before planned evening alcohol consumption

## RELATIONSHIPS BETWEEN FREQUENCY OF ALCOHOL CONSUMPTION AND UNDERTAKING SOME DIETARY RESTRICTIONS

The analysis showed that the frequency of a fast before the planned alcohol consumption positively correlates with the frequency of beer consumption among men. This dependence had not been recorded in terms of the frequency of consumption of wine and vodka. The relationship between the frequency of a fast and the frequency of selected alcoholic beverage consumption was not established among women (Table 4). The reduction of food intake before planned alcohol consumption positively correlated with the frequency of vodka consumption for men (Table 4) and the frequency of the consumption of all analyzed alcohols, such as beer, wine and vodka, for women (Table 4). There was no relationship between the frequency of weight loss diets and the frequency of consumption of beer, wine and vodka for both women and men (Table 4).

**Table 4.** Relationships between selected dietary restrictions and the frequency of alcohol consumption

| Frequency of consumption |     | Women   |  |                                     |   | Men                                    |                                     |
|--------------------------|-----|---|--|-------------------------------------|---|--|-------------------------------------|
|                          |     | The frequency of the use of weight loss diets | The frequency of food intake reduction | The frequency of the use of fasting | The frequency of the use of weight loss diets | The frequency of food intake reduction | The frequency of the use of fasting |
| Beer                     | rho | .16   | .32                                    | .14                                 | -.17  | .29                                    | .36                                 |
|                          | p   | .30   | .04                                    | .36                                 | .36   | .11                                    | .04                                 |
| Wine                     | rho | .07   | .47                                    | .03                                 | -.20  | .28                                    | .19                                 |
|                          | p   | .65   | .01                                    | .84                                 | .28   | .12                                    | .29                                 |
| Vodka                    | rho | .17   | .50                                    | .23                                 | -.12  | .35                                    | .25                                 |
|                          | p   | .27   | .01                                    | .12                                 | .51   | .05                                    | .17                                 |

rho - Spearman correlation coefficient

p - level of statistical significance

## DISCUSSION

Alcoholic beverages are the most widely used psychoactive substances among adolescents in secondary school [12]. According to ESPAD (2011), up to 95.2% of pupils in secondary schools have consumed alcohol. Mazur and Małkowska-Szkutnik [13] have shown that the dominant proportion of young people in secondary schools have consumed alcohol at least once in their lifetime. Some authors stress that the percentage of young people who have never tried alcohol, and those who have never got drunk decreases with lifetime. The presented study results also have shown that a significant proportion of young people from secondary schools reported that they had already experienced alcohol consumption. This tendency is confirmed by the data presented by Ponczek and Olszowy [14]. These authors have shown that almost the entire youth population between 15 and 17 years old (98%) have attempted alcohol consumption. Therefore, there is a need to take appropriate action on health promotion related to the reduction of alcohol consumption among secondary school students. As is generally known, alcohol not only has negative health consequences, but also psychological, social and economic ones [3, 10].

Binge drinking among adolescents contributes to the development of numerous health problems and it can negatively affect the structure and functioning of the central nervous system (CNS). Moreover, it increases the possibility of displaying so called "risky behaviors", such as conflicts with the law, crime, early sexual initiation or learning problems [15, 16, 17]. One of the reasons

for alcoholic intoxication among young people is bad relationships with peers. The frequency of alcohol consumption more than one time per week is higher in groups of people who have incorrect social relationships than among people who have correct social relationships [18].

Alcohol has a negative impact on the nervous system among young people. This relationship is highlighted by many researchers, such as Brown et al. [19], Squeglia et al. [16], Tapert, Caldwell & Burke [17]. Alfonso-Loeches et al. [15] stress the harmful effect of ethanol on the prefrontal cortex, hippocampus, cerebellum, and glial cells. Additionally, alcohol disrupts the normal development of the brain and cognitive functions, such as memory and concentration. It is emphasized that adolescents who drink alcohol excessively are exposed to a greater risk of depression, behavioral disorders, and psychoactive substances use, for example drugs or cigarettes [16, 17, 19].

The presented study has not shown any difference in the frequency of alcoholic beverage consumption between young females and males. These results are consistent with results of other researchers who emphasize that the differences in the frequency of drinking among boys and girls are not statistically significant, or do not occur [20].

The Polish study has shown that up to 98% of the respondents in secondary school have admitted to alcohol consumption. This study also has shown that the gender was not a differential factor in alcohol consumption [21]. The probable cause of this phenomenon is change in social patterns of alcohol intake. Stereotyped patterns of alcohol consumption have stressed that it was the domain of men. Nevertheless, the increase in female emancipation accentuates the equalization of social differences in drinking patterns among adolescents [20]. It is noteworthy that the trend in the dynamics of the popularity of beer, wine and vodka are actually very similar in boys and girls [20]. In the presented study, it has been shown that adolescents prefer the consumption of beer rather than wine and vodka. This observation was confirmed by other authors [16, 19]. Secondary school students consumed beer most frequently, with vodka in second place, and wine in third [20]. In the years 1995–2003, there was an upward trend in beer consumption among secondary school students. In 2011, the frequency of beer consumption was stable in the discussed social group [20].

A study carried out by Turczynska [21] has shown that secondary school students more often drunk alcohol; however, it was an upward trend. 72% of the respondents reported consumption of alcoholic beverages at least once per week. They most often chose beer (83%), a little less often vodka (68%) and wine (52%). A similar trend was observed when the study group consisted of only women. 48% of female respondents also declared that they had consumed beer once a week. In second place among the selected alcohol assortment which was chosen by women was wine (14%) and much less often vodka (6%) [22].

The presented results have shown that behavior associated with dietary restrictions before the planned consumption of alcohol was undertaken both by young females and males. Frequent displays of such behavior could lead to the development of eating disorders combined with alcohol abuse [3, 4, 7, 11].

In the preliminary phase of the disease, the person who consumes alcohol has control over both dietary restrictions and the amount of alcohol consumed. At this phase, people conceal their behavior and surroundings and do not see



the first symptoms of the disease. In the next phase of the disease, the diet becomes more and more restrictive, while the amount of consumed alcohol increases. The environment of the ill person recognizes the problem and tries to intervene. This is a crucial phase of the disease, because it is a period during which the so-called loop of drunkorexia occurs [3, 7].

Patients who demonstrated drunkorexia's features are characterized by an increased fear of weight gain, which becomes a source of motivation to fast. The result of these changes increases the frequency of alcohol consumption in order to reduce emotional stress. Symptoms of eating disorders and addiction to alcohol intensify. This behavior contributes to the counting of calories coming from alcohol consumption and reduced food intake during the day [7].

The presented results of the study have stressed that reducing the quantity of food consumption before the planned alcohol intake positively correlates with the frequency of vodka consumption in the case of men, and the frequencies of consumption of beer, wine and vodka for women. As demonstrated by the study reports, the reduction of food consumption before the planned alcohol consumption is particularly important among young women in secondary schools. Young women could adopt dietary restrictions before planned alcohol consumption, regardless of the type of consumed alcohol. On the other hand, young men from secondary schools restricted their diet mainly before the planned consumption of vodka. One of the concepts which could explain this phenomenon among women from secondary schools is the awareness of physical attractiveness, physical effectiveness, and self-esteem. It should be noted that the subjective perception of physical attractiveness is assessed through the prism of body weight [2].

The authors emphasize that women, regardless of age, are more often dissatisfied with their appearance and experience a number of negative emotions, including anxiety associated with weight gain. Consequently, women more often display behavior associated with the control of body weight (in terms of attractiveness) than men. Thus, they may be more likely to experience disturbed body image which could contribute to the development of eating disorders [2, 23, 24, 25, 26]. Cited studies may explain the observed phenomena associated with the reduction of food intake before the planned consumption of alcohol among women. According to women in this research, dietary restrictions before the planned consumption of alcohol could be one of the activities that will help to maintain proper body mass.

Results of this study indicate a need for further research which will evaluate dietary restrictions before planned alcohol consumption among both men and women. Moreover, this problem could also include a wider range of society. There is a need for additional studies on the basis of other factors associated with nutrition, which may affect the frequency of selected alcohol consumption.

## CONCLUSIONS

Both women and men from secondary school display behavior associated with dietary restrictions before the planned consumption of alcohol with the same frequency. These results underline that restrictive behavior before planned alcohol consumption is a very complex problem.

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