



# ***ALCOHOLIC BEVERAGES AND ALCOHOL CONSUMPTION***

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# ALCOHOLIC BEVERAGES AND ALCOHOL CONSUMPTION

Alcoholic beverages and alcohol consumption: an overview.

Alcoholic beverages classification.

Comparison between high alcoholic percentage beverages and medium – low alcoholic percentage beverages.

Alcohol (ethanol) effects on human health.



# ALCOHOLIC BEVERAGES AND ALCOHOL CONSUMPTION: AN OVERVIEW

Alcoholic beverages consumption is a widespread habit in many populations.


In Cristian religion, an alcoholic beverage, the wine, has a very important role in celebrations. As a consequence, in countries with cristian traditions, wine is associated to religious but also profane festivity.


In different areas, under the action of different agro-climatic conditions, various technologies for alcoholic beverages production from different raw matters had been developed (in Mediterranean area: grapevine  $\Rightarrow$  wine; in Central and Northern Europe: barley and other cereals  $\Rightarrow$  beer).




# ALCOHOLIC BEVERAGES CLASSIFICATION

Alcoholic beverages can be classified as:

 FERMENTED BEVERAGES, arising from alcoholic fermentation of a sugar raw matter (grapevine wort) or a starchy raw matter (barley malt wort).

 DISTILLATE BEVERAGES, obtained by distillation of hydro-alcoholic mixtures produced by means of alcoholic fermentation of sugar or starchy raw matter.

 LIQUEURS, arising from infusion in ethanol or in distillate beverages of vegetal parts, sugar and spices (such as juniper berries ⇒ gin; walnut ⇒ «nocino»; lemon ⇒ «limoncello» etc.).

Anyway, the first step of production process is always  
**ALCOHOLIC FERMENTATION!!!**



## Comparison between high alcoholic percentage and medium – low alcoholic percentage beverages

Effects on human health of an alcoholic beverage are mainly due to the total volume of ethanol drunk (= alcoholic percentage x drunk volume).

To give an example, it is possible to compare ethanol consumption as a result of: a) 1 little glass of «grappa»; b) 1 glass of wine; c) 1 tankard of beer:

<b>Alcoholic beverages</b>	<b>Alcoholic percentage (mL ethanol/100 mL)</b>	<b>Alcoholic beverage drunk (mL)</b>	<b>Ethanol volume drunk (mL)</b>
a) «grappa»	40	40	16
b) wine	12	150	18
c) beer	6	250	15



## Comparison between high alcoholic percentage and medium – low alcoholic percentage beverages

Drinking **little glasses** not always lead to a little ethanol consumption: it is necessary to consider the alcoholic percentage of the beverage drunk!!!

**Some sensations could be misleading**, such as the heat sensation due to «grappa» (or other distillate beverages), probably caused by the shorter swallowing time compared to beer and wine ( $\Rightarrow$  more rapid vasodilator effect).

Drinking mixed beverages with a not well defined composition (**cocktails**), make difficult to know exactly the volume of ethanol drunk: it would be necessary to know volume and alcoholic percentage of different drink components!!!



## ALCOHOL CONSUMPTION HABITS

The **alcoholic beverage mainly consumed** is a result of several factors:

- national or regional cultural characteristics;
- consumer age;
- drink-context (party, happy-hour, lunch or dinner etc.).

Ethanol has **exhilarating effects** so can facilitate socializing: alcoholic beverages are often consumed in convivial situations.

On the other hand, **ethanol can cause several damages** to human health. Therefore, it is necessary to drink responsibly and avoid dangerous alcohol consumption habits, often based on myth and false information.

## Example of a cocktail: "Bloody Mary"



Glass volume: 150 mL

### Composition:

vodka (40% ethanol) = 45 mL

tomato juice = 90 mL

lemon juice = 15 mL

### Ethanol consumption in a glass

Lemon and tomato juices are not considered because do not contain ethanol.

Vodka: volume (45 mL) x alcoholic percentage (40%) = 18 mL ethanol  $\Rightarrow$  a glass of wine 12% alcoholic percentage.



**HOT TIP!!!!** The presence of analcoholic ingredients could lead to undervalue total ethanol content.



## Other cocktail: gin e vermouth

Glass volume: 150 mL

### Composition:

gin (40 % ethanol) = 100 mL

vermouth (18 % ethanol) = 50 mL

### Ethanol consumption in a glass

**All ingredients contain ethanol!!!!**

gin: volume (100 mL) x alcoholic percentage (40% ethanol) = 40 mL ethanol;

vermouth: volume (50 mL) x alcoholic percentage (18% ethanol) = 9 mL ethanol.

Totale ethanol consumption in a glass is 49 mL!!!!

Other non-ethanol components (such as lemon slices, sugar, little umbrella on the glass etc.) do not reduce ethanol provided by alcoholic components.



**HOT TIP!!!! Ethanol content of 1 glass correspond to ethanol content of nearly 3 glass of wine!!!!**



# THINK BEFORE DRINK!!!

Ethanol effects depend on **consumed ethanol volume** which is the result of alcoholic beverage volume multiplied with beverage alcoholic percentage.

**Other evaluations**, based on number of consumed glasses, euphoria level, equilibrium problems etc. **are not completely reliable:**

**NOBODY CAN STAND HIGH DOSES OF ETHANOL!!!**

In case of drinking of **different volumes of different beverages** (with **different alcoholic percentage**) total ethanol consumed is hard to calculate: there is the risk of drink too much without realize it!



## ETHANOL EFFECTS ON DRIVING ABILITY

Ethanol reduces reflex rapidity  $\Rightarrow$  **INCREASE OF CAR ACCIDENTS RISK.**

In Italy, the maximum level admitted of ethanol in blood is 0.5 ‰<sub>m/v</sub> (namely 0.5 g of ethanol per L of blood).

To calculate how many g of ethanol a man could drink, is possible to apply the formula: body weight (kg) x 0,53 (for women the result must be reduced of 3 g).

It is necessary to take in consideration that 1 g of ethanol has a volume of 1,26 mL (ethanol density = 0,793 g/mL) and other factors such as: if you are drinking with or without eating, if you are drinking in a short or in a long time, etc.)

In conclusion, before driving it would be better drink moderately or **NOT DRINK AT ALL!**

Ethanol in blood (ethanol g / L of blood)	Effects	Consequences
0,3	Light euphoria	Reduced reflexes, particularly in tired people.
0,5	Euphoria, reduction of perception, influence on equilibrium	Driving ability reduction, reflex rapidity reduced of 30%
0,8	Lost of equilibrium, altered behaviour; risk evaluation capacity reduced	Dangerous driving: riskious overtaking, excessive speed, uncapability in going straight on.
1,6	Strong perceptions reduction, difficulties in standing up and walking.	Total driving uncapability, irresponsable and dangerous behaviour.
3 and beyond	Confusional conditions, coma, danger of death.	



Apart from ethanol effects on driving ability, ethanol has **further damaging effects** which vary as a function of **drunk doses**.

It is worth to distinguish **ethanol effects** due to a **moderate consumption** (lower or corresponding to maximum daily doses) and ethanol effects due to an **excessive consumption**.

First of all, it is necessary to **define** what are the **maximum daily doses** in terms of **ethanol consumption** and in terms of different kind of **alcoholic beverages consumption**.



## Maximum ethanol daily doses and consumption patterns

Not more than 50 g/day, corresponding to 63 mL/day (ethanol density is 0,793 g/mL) and not more than 10% of daily energy demand.

According to other recommendations, maximum ethanol daily doses should be lower: 40 g/day (= 50 mL/day) for men and 30 g/day (= 38 mL/day) for women.

Taking into account different alcoholic percentages of different alcoholic beverages, 50 mL of ethanol correspond to:

- 417 mL of wine with 12% of ethanol or;
- 833 mL of beer with 6% of ethanol or ;
- 125 mL of "grappa" or other distillate beverage with 40% of ethanol.

In case of drinking with empty stomach, ethanol assimilation (and increasing of ethanol concentration in blood) is very rapid whereas is slower drinking in occasion of meals (lunch and dinner).

The dilution of alcoholic beverages with water (a widespread praxis, particularly with wine) not always leads to reduction of ethanol consumption because could encourages the increasing of the beverage volume drunk → **ethanol percentage reduced with drunk volume increased = drunk ethanol is the same!!!**



# Metabolism and energy content of ethanol

Ethanol,  $\text{CH}_3\text{CH}_2\text{OH}$ , is metabolized by hepatocytes (liver cells): it is oxidated to acetaldehyde and then to acetic acid, as a consequence of the action of two enzymes:

- ADH (alcohol dehydrogenase);
- MEOS  $\Rightarrow$  Microsomial Ethanol Oxidizing System (enzymatic activity increases with the ethanol consumption).

Acetic acid -  $\text{CH}_3\text{COOH}$  - enters in Krebs cycle and produces energy.

The process provides 7.1 kcal per g of ethanol.

It is so possible to define these relations:

1 alcoholic degree (1% of ethanol) = 6 kcal per 100 mL

100 mL of wine with 12% of ethanol = 72 kcal

Nowadays, probably as a consequence of hand work reduction, total alcoholic beverages consumption is decreasing but alcohol consumption is more concentrate in particular occasions, such as party, happy hours, week- end etc. and this trend could represent a danger for consumers health....(**less alcohol concentrate in few days a week, often without eating.....**)

# Effects of ethanol moderate consumption

(lower or corresponding to maximum daily doses):

1) energy;

2) appetite stimulation;

3) thrombosis risk reduction;

4) HDL ("good cholesterol") increasing and consequent cardiovascular system protection.





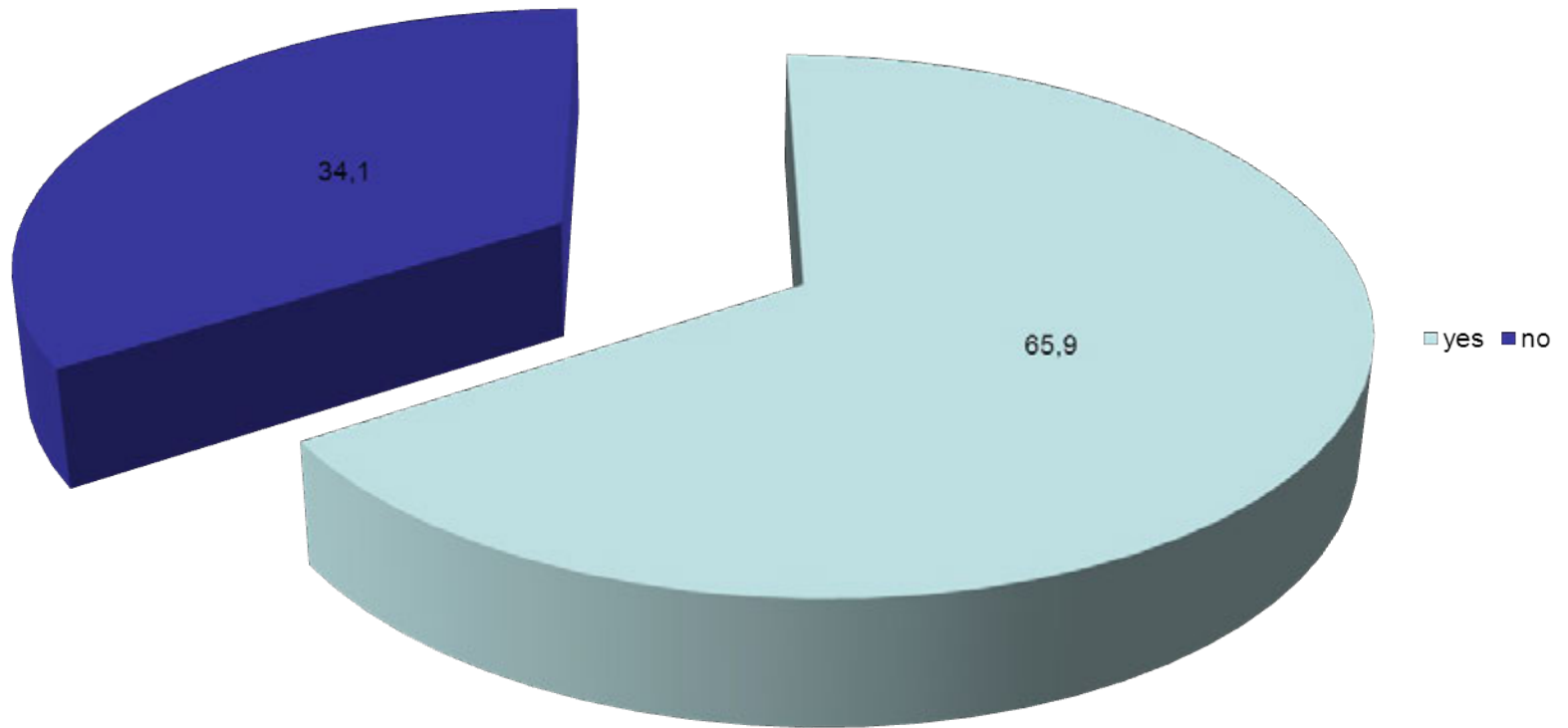
# Effects of ethanol excessive consumption

(more than maximum daily doses):

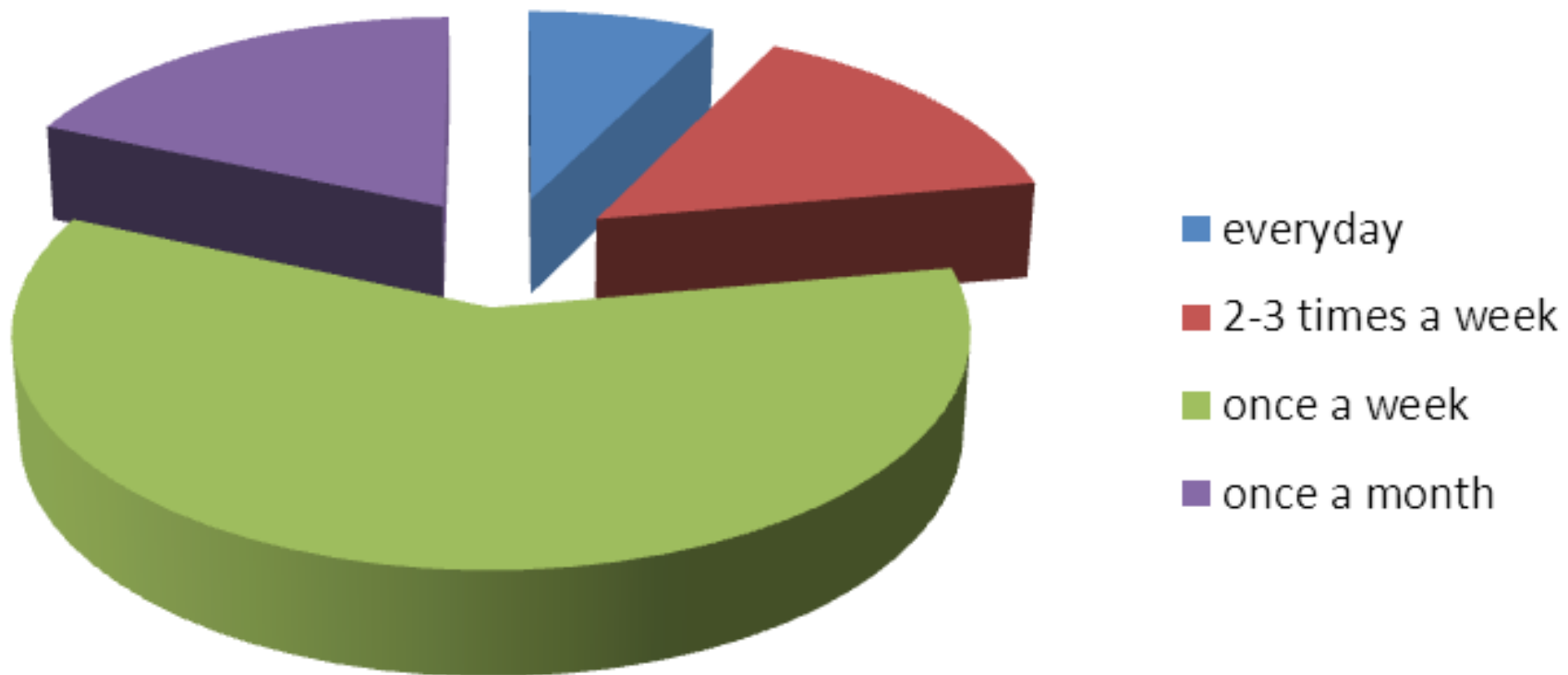
- 1) excess of energy intake ( $\Rightarrow$  body weight increasing);
- 2) heart problems;
- 3) hyperlipidemia (mainly triglycerides);
- 4) fatty acids ethyl esters in biological membranes  $\rightarrow$  biological membranes functionality alterations;
- 5) alteration of aminoacids intestinal absorption;
- 6) damages on pancreas;
- 7) damages on liver (steatosis, cirrhosis, hepatitis ecc.) that can lead to fatal effects;
- 8) excessive ethanol consumption is a risk factor for liver cancer.

# Data concerning teen-agers alcohol consumption habits

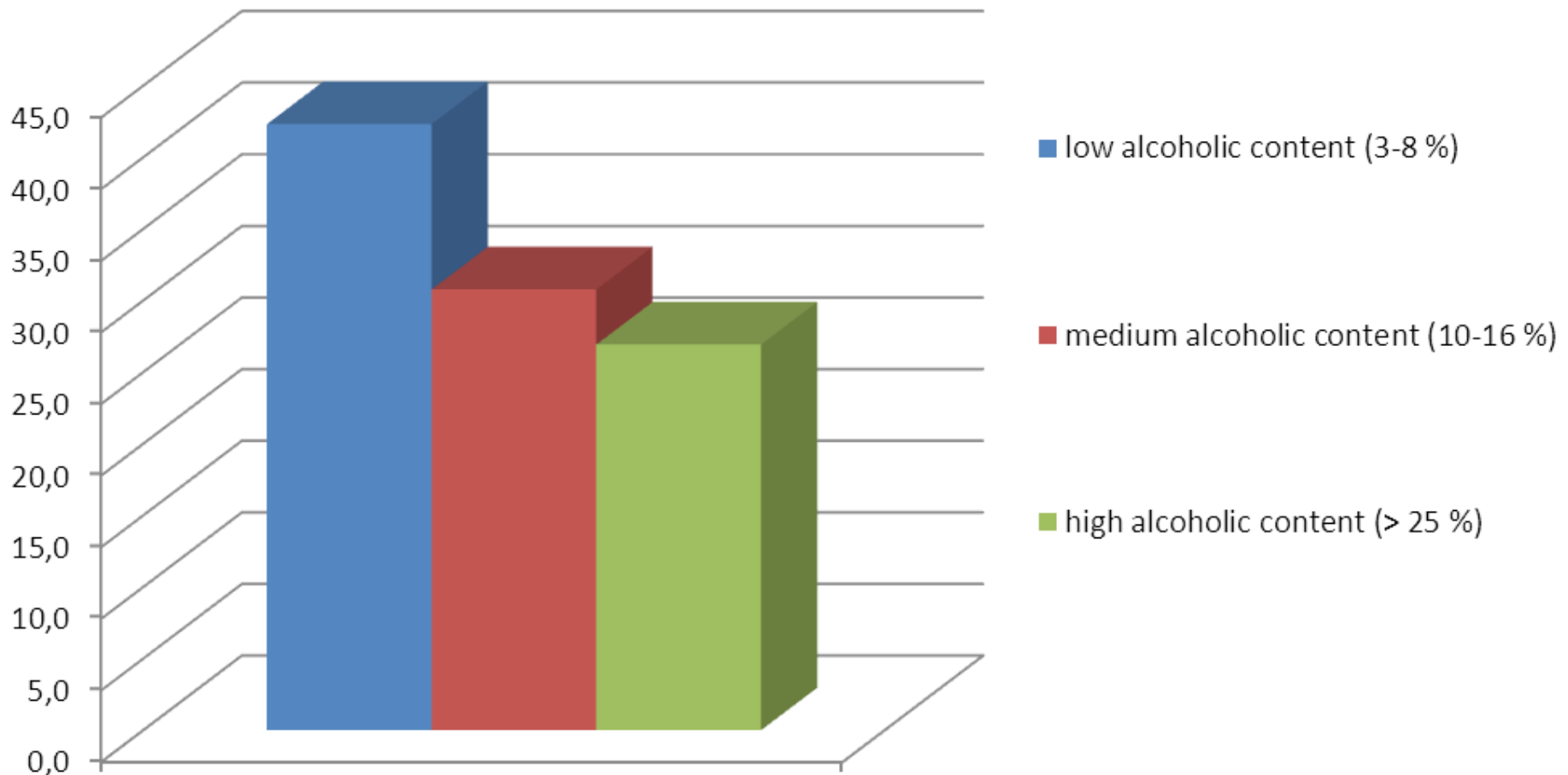
1. Are you used to drink alcoholic beverages?



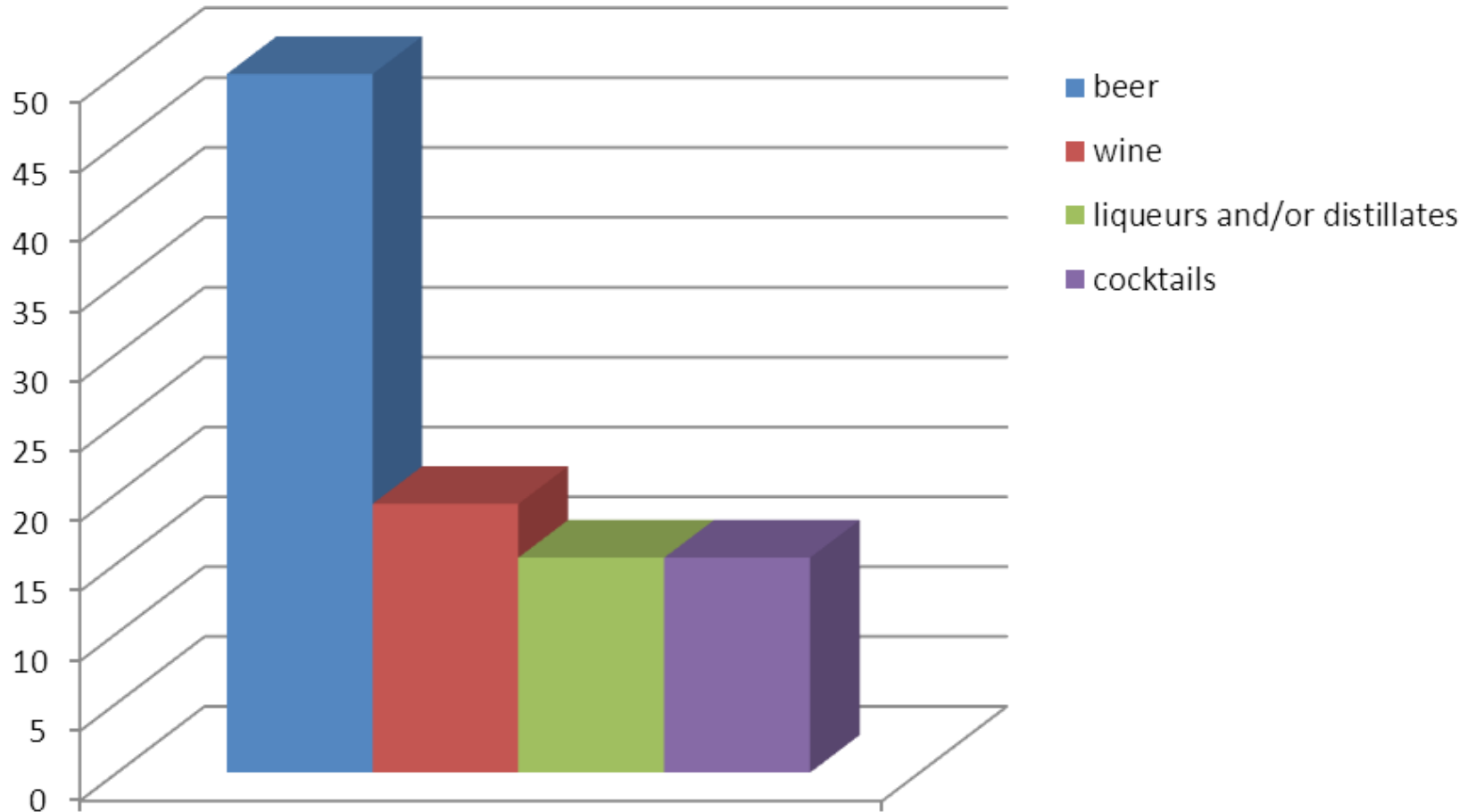
## 2. How often do you drink alcoholic beverages?



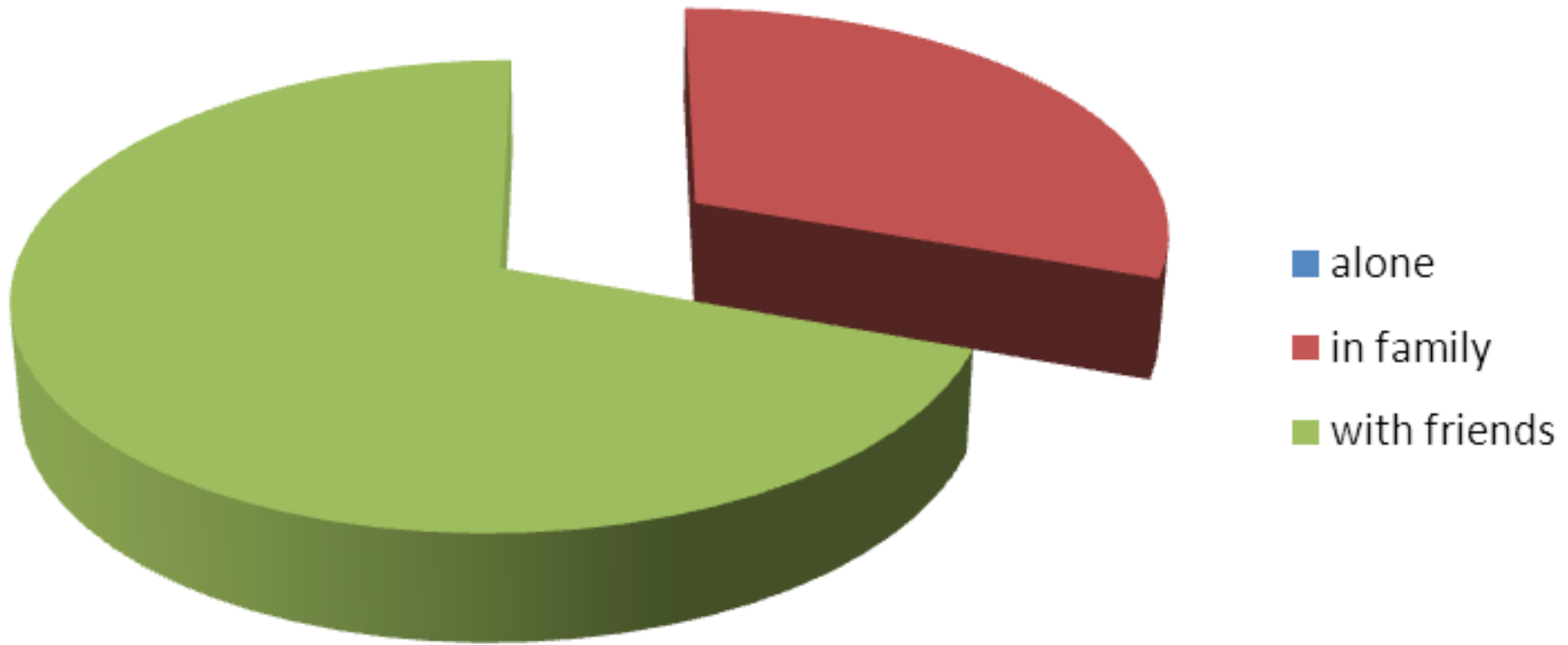
### 3. Considering the alcoholic percentage, which kind of alcoholic beverages do you consume mainly?



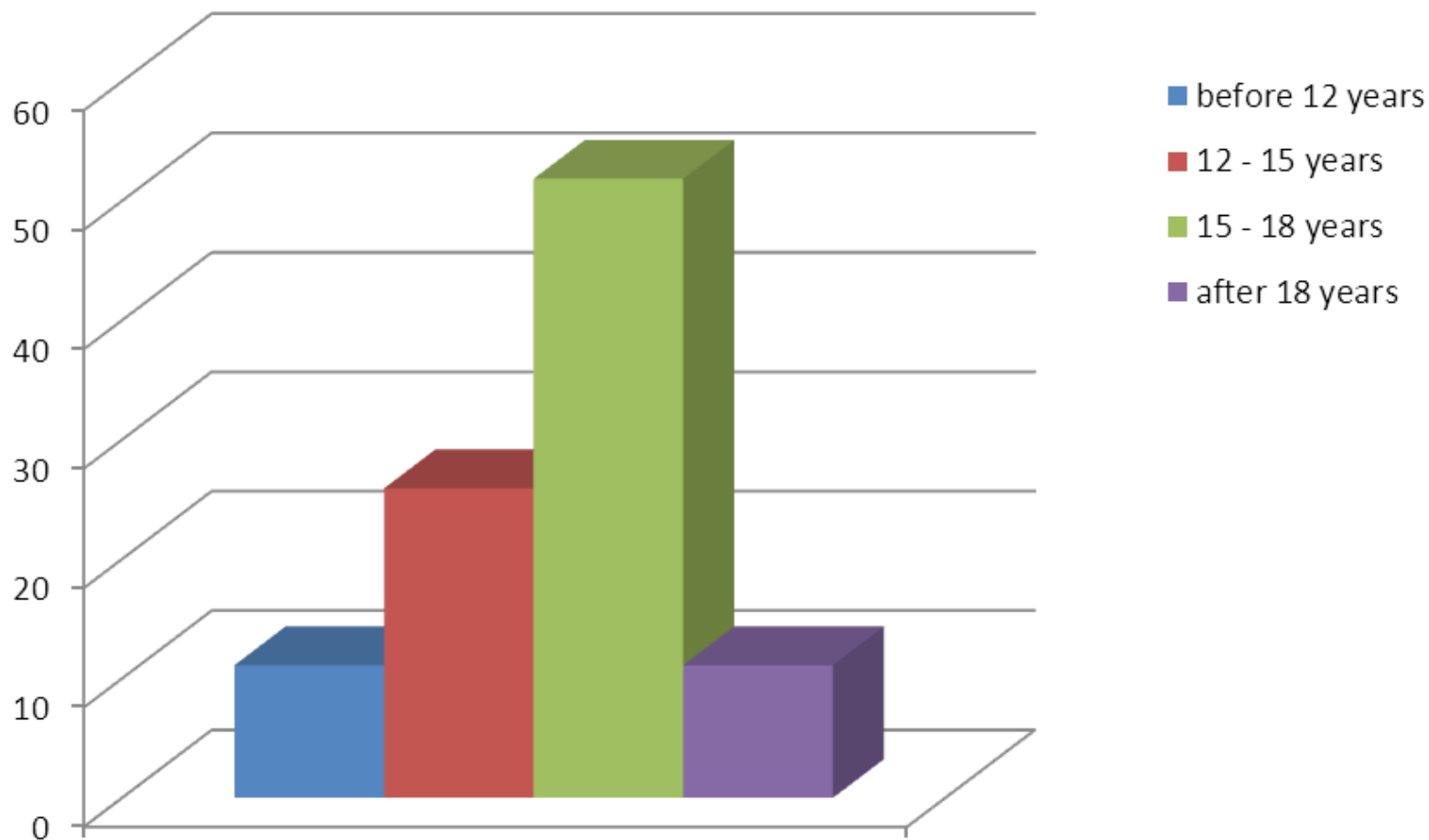
# 4. Considering the typology, which kind of alcoholic beverages do you consume mainly?



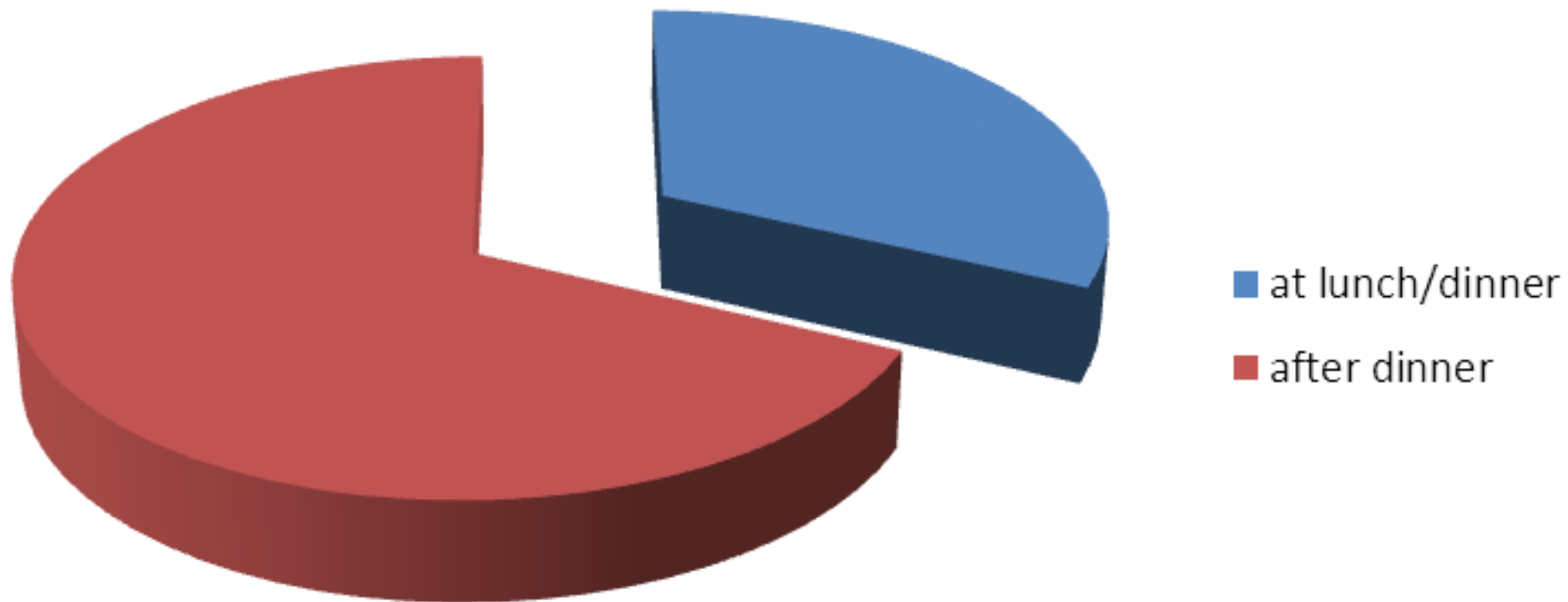
## 5. In which context did you start to drink alcoholic beverages?



## 6. At which age did you start to consume alcoholic beverages?

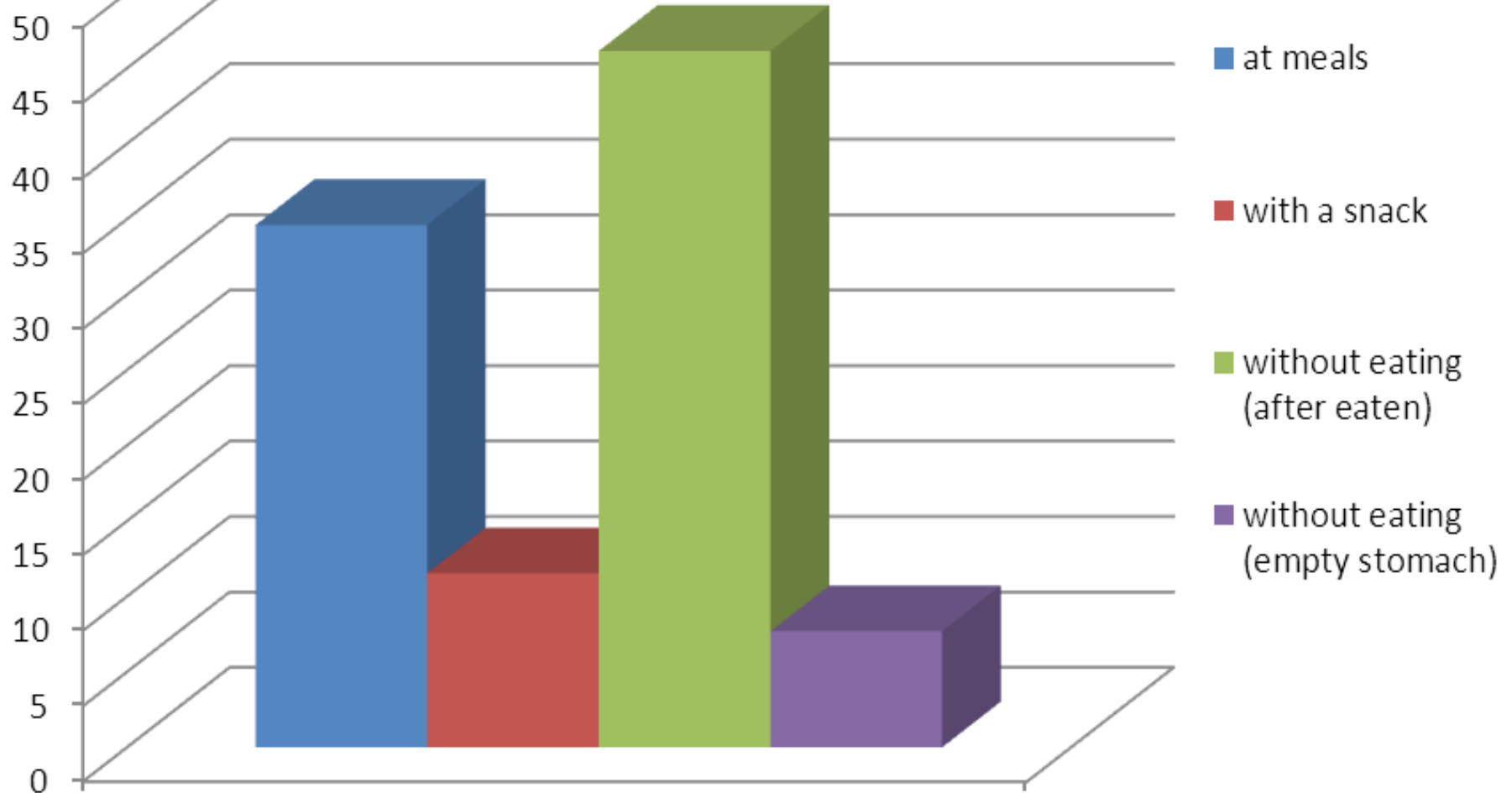


## 7. In which occasions do you drink alcoholic beverages mainly?



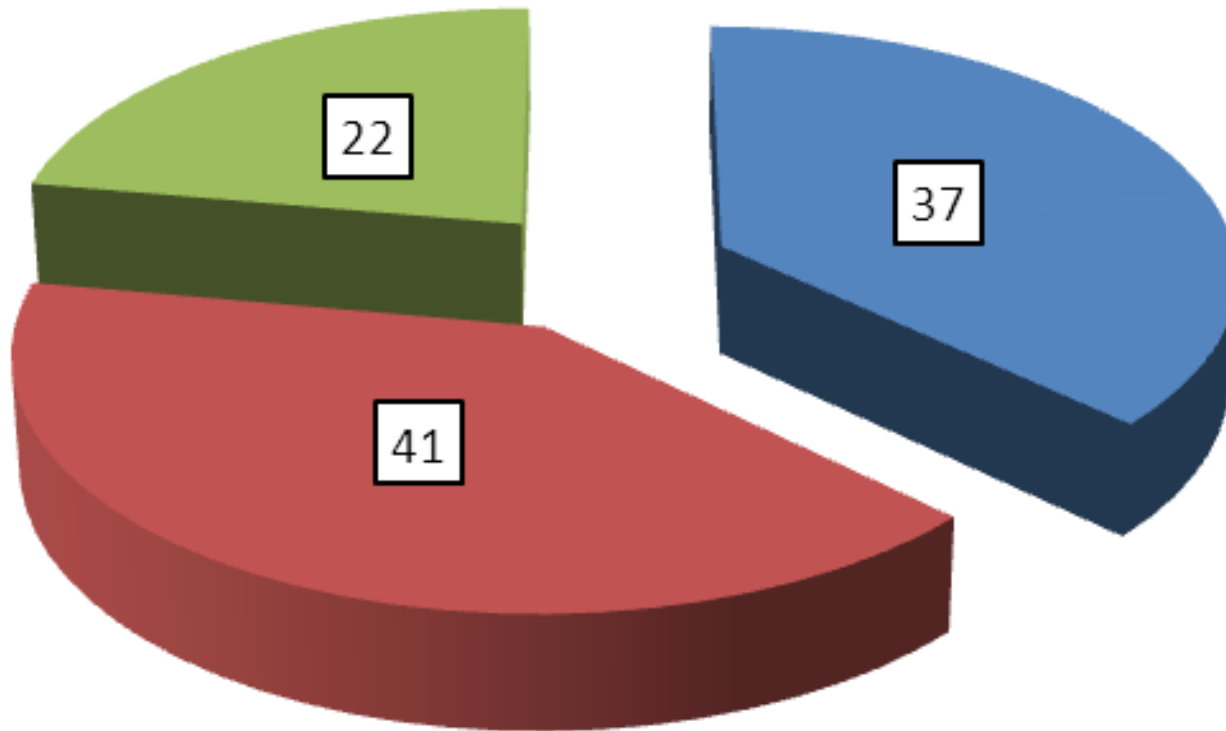


## 8. Relation alcohol – food → are you used to drink alcohol:



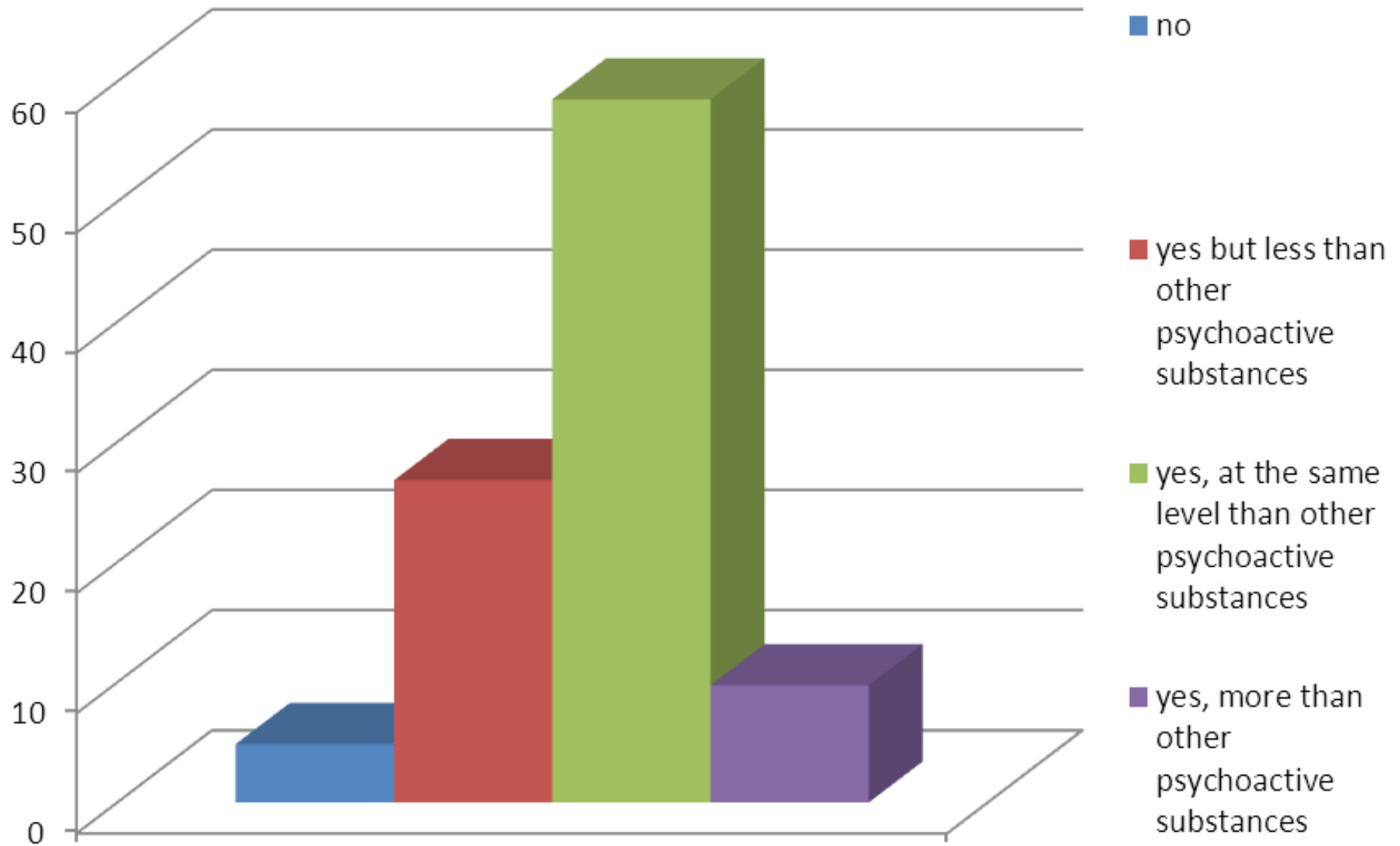


## 9. Do you practise *binge - drinking*?



■ never    ■ 2-3 times a year    ■ once a month - once a week

# 10. Do you think that alcohol can cause addiction?



## Conclusions

More than 60% of interviewed teen-agers is used to drink alcoholic beverages, mostly once a week.

The most popular alcoholic beverages are characterized by a low alcohol content, such as beer. On the other hand, consumption of high alcohol content beverages is quite significant. Wine is the preferred drink for a 15 – 20% of interviewed.

Generally, alcoholic beverages consumption starts with friends, at an age of 15 – 18 years.

Alcoholic beverages are mainly consumed with or after food ingestion (at meals or after dinner).

**Unfortunately, the dangerous habit of *binge – drinking* is frequently practised by a 22% of interviewed teen-agers!!!**

More than 50% of interviewed people think that alcohol can cause addiction as other psychoactive substances.