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WATER AND SALT CONSUMPTION - BENEFITS AND RISKS

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Abstract

Consumption of water and salts are vital processes associated with maintaining homeostasis in the body. Both water and salts have several benefits for the body if taken in moderation. Excessive use is connected with many health risks. The present study aims to examine the frequency of water and salt consumption and the factors that determine this choice.

A survey was conducted among 550 (324 women and 226 men), aged from 18 to 65 years, living in the district of Stara Zagora, the Republic of Bulgaria. The participants were not selected according to any proportions of the population in the country and represent a random sample. The answers to the survey are coded and applied in the processing as codes or as ordinal and nominal values. The statistical data processing was performed based on descriptive and inferential statistics.

The analysis of the data shows that the majority of respondents - 46%, consume less than one liter of water per day, and carbonated water is among the least preferred types of beverages. It is consumed every day by 11.49% of the respondents. There is approximately equal distribution of people who do not use extra salt (36.52%) in their daily routine, 32.02% of them sometimes use extra salt, and those who prefer a saltier taste are 31.46%.

More in-depth studies are needed on the frequency of water and salt consumption and its determinants, as it is directly linked to human health. In this way, it can contribute to maximizing the benefits of these important substances for the body and to suppressing health risks.

Key words: Consumption, Salt, Water, Benefit, Risk.

1. Introduction

Consumption of water and salts is a vital process associated with maintaining homeostasis in the body [1, 2]. The intake of water and salts in the body are related, interdependent, and indivisible processes. It is known that increased salt consumption leads to water retention in the body [3]. For this reason, all significant changes in salt and water consumption are balanced by the body through the corresponding necessary changes in renal function. This fact determines the body's response to large deviations in the amount of consumption of these substances. The burden in the subsequent processes falls mainly on the kidneys and they turn out to be the main target organ [4]. Sodium and fluid retention cause hypervolemia and lead to the development of hypertension in chronic renal failure [5, 6]. Excessive amounts of salt and fluids play an important role in the pathogenesis of hypertension in patients with end-stage renal disease [7]. Due to the severity of these problems, it is clear that it is very important to take salt and fluids in moderation. Moderate salt restriction is known to significantly reduce arterial hypertension and proteinuria in patients with chronic renal failure [8, 9].

Salt and water intake are also important for diseases of the cardiovascular system. In this regard, various health organizations - the European Society of Cardiology and the American Heart Association recommend limiting sodium intake in the population to prevent and limit the spread of hypertension and its complications such as heart failure [10, 11, and 12]. There is strong evidence of an increase in blood pressure due to sodium intake [13,14, and 15].

The present study aims to examine the frequency of water and salt consumption and the factors that determine this choice.



2. Materials and Methods

A questionnaire was conducted, which included about 550 participants aged 18 to 65 years (324 women and 226 men). Participation was voluntary and anonymous.

Respondents were divided into different groups based on sex, age, and education, as these factors are relevant to water and salt consumption among participants. There are six age groups (under 20 years, 21-30 years, 31 - 40 years, 41 - 50 years, 51 - 60 years, and over 60 years). According to your educational degree. The respondents are higher, secondary, primary education, college, and those without education.

The collected data were analyzed using descriptive and inferential statistics, variance analysis, ANOVA test, at p < 0.05 to indicate the statistical significance. The results are presented graphically.

3. Results and Discussion

The amount of water consumed per day is extremely important for human health. Therefore, the survey aims to study the daily water consumption among respondents. The data show that 46% of the participants in the study consume less than 1 liter of water per day, 30.33% drink about 1.5 liters per day, 15.33% from 1.5 to 2 liters and only 8.33% of respondents consume more than 2 liters of water. The analysis of the data shows some differences in water consumption depending on the sex of the individuals. A large percentage of those consuming more than 2 liters per day are men - 5% and only 3.33% are women. 31% of women consume less than 1.5 liters per day, to 15% of men consuming the same amount (Figure 1).



Figure 1. Amount of water consumed per day by sex

These results clearly show that men consume more water than women in their daily lives and confirm the results of other studies in the world literature [16 - 20]. The amount of daily water consumption is directly related to age. 16.39% of the respondents consume less than 1 liter and are mostly aged 21-30, followed

by those aged 41 to 50 - 10.37% and 21 to 30 - 9.03%. The largest amount - over 2 liters per day take people aged 31 to 40 years - 4.35%. Slightly older participants in the survey - between 51 and 60 years consume about 1.5 liters of water per day (Figure 2).



Figure 2. Amount of water intake per day by age

This supports data from other surveys showing that younger individuals consume more water [21, 22].

Of great importance for health is the consumption of carbonated water. Respondents have been asked how often they drink carbonated water and the results showed that it is a daily part of the menu only at 11.49%, and 12.81% take it every 2-3 days, 15.07% - once a week, 30.32% less often than this and the same percentage -30.32%, undoubtedly state that they do not consume carbonated water. The percentage of regular consumers is the lowest, which reports a positive trend concerning human health. The frequency of consumption of carbonated beverages is also directly related to sex. It is noteworthy that among men the intake is more common - 6.59% of them take carbonated drinks daily to 4.90% of women. 7.16% of men consume soda every 2-3 days against 5.65% of women.

The results are very convincing for women who never consume carbonated - 24.11%, and men only 6.21% (Figure 3).



Figure 3. Frequency of consumption of carbonated water and carbonated beverages by sex

According to the age distribution, there is a tendency towards more frequent consumption of carbonated water among younger individuals and it is often found in large percentages in children [23, 24]. Of those who consume carbonated water, those aged 41 - 50 have the largest share - 4.13%, followed by those aged 31 - 20 - 3.19%. Respondents in the age group 31 - 40 most often consume carbonated drinks - 8.26% of them consume carbonated beverages every day (Figure 4).



Figure 4. Frequency of consumption of carbonated water and carbonated drinks by age

Another factor is also related to the choice of carbonated drinks - the education of the respondents. The results show that people with higher education almost do not consume carbonated water. 15.49% of them definitely deny the use of carbonated, followed by those with secondary education - 13.81%. Only 2.80% of people with higher education and 7.84% of those with an average consumption of carbonated beverages daily. All this can be explained by better awareness of the effects of carbonated on health (Figure 5).



Figure 5. Frequency of consumption of carbonated water and carbonated beverages by education

It is a well-known fact that salt is also important for maintaining homeostasis in the body. Salts are involved in maintaining the balance of fluids in the body, the transmission of nerve impulses, muscle contraction. Fluid and sodium balance plays a key role in organs such as the heart, liver, and kidneys. It regulates blood fluids and prevents extreme lowering of blood pressure. Excessive sodium levels can be the result of too much fluid in the body, for example, due to their retention. Studies show that if blood sodium levels fall, it affects brain activity. Muscle twitching may occur, followed by seizures, loss of consciousness, coma, and death [25, 26].

On the other hand, with high salt intake, the kidneys fail to excrete large amounts of sodium in the urine, as a result of which the level of sodium in the blood rises, it binds to water, and blood volume increases, leading to an increase in blood pressure. This leads to serious health consequences. It can lead to cardiovascular problems, stroke, heart attack, aneurysm, heart failure, kidney dysfunction, complications of kidney disease, formation of kidney stones [27, 28, and 29]. Precisely because of this importance of salt intake in everyday life, the study also addressed the topic of supplemental salt intake with food. The analysis of the data shows that the percentages of people who add extra salt to their diet regularly, sometimes or those who do not extra salt their food, are approximately the same. 36.52% of respondents do not use extra salt for food, 32.02% - sometimes add extra salt, and 31.46% always use salt for food. Looking at the results between men and women, it is clear that women are less likely to use extra salt in their diet [30, 31]. They are known to be susceptible to triggering diseases such as salt-sensitive hypertension [32]. 25.66% of them completely deny the additional intake of salt against 10.86% of men. Some scientists find that their salt consumption is connected to their menstrual cycle [33] (Figure 6).



Figure 6. Distribution of the consumption of additional salt intake by sex

Besides human health, salt is also related to the technological processes of food production. It turns out that it is the most important ingredient in meat products, thus influencing the technological and organoleptic properties of meat products. It is considered necessary to reduce the amount of NaCl in meat products to a level where the overall quality of the products will not be significantly affected [34].

There are differences in habits regarding salt use and depending on different levels of education. 17.44% of people with higher education do not add extra salt to their food, followed by those with secondary education - 16.14%. Among the respondents, 16.70% of those with secondary education and 14.47% of those with higher education only occasionally consume additional amounts of salt. 18.37 of the participants who never add salt have secondary education, 9.46% - with higher education, and 2.97% with a college education. This leads to the conclusion that among the more educated the use of additional amounts of salt is moderated and rare.

4. Conclusions

Consumption of salt and water have several benefits for the body if taken in moderation. It should be consumed in moderation. Excessive or too-low intake of these substances is associated with the emergence of many health problems with manifestations of various organs and systems. Their consumption is influenced by various factors such as sex, age, and education.

- Consumption of water and salt is directly related to the health of individuals.

- Men consume more water per day than women.

- In terms of age, younger individuals are more likely to drink more than 2 liters of water.

- Men consume carbonated water and carbonated beverages more often than women.

- According to the age distribution, there is a tendency towards more frequent consumption of carbonated water among younger individuals.

- The results show that people with the highest level of education very rarely consume carbonated water.

- Men are more likely to use extra amounts of salt to flavor food.

- The use of additional amounts of salt is less common among more educated individuals.

- Salt is related to the technological processes of food production.

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