

Assessment of Unfermented Beverages Intake by Adult Population in Herat City

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ABSTRACT

Beverages play a prominent role in regulating body activities, such as regulating body temperature, helping to absorb food, protecting tissues, disposal of waste materials, refreshing the body, and increasing body performance. Usually, the human body obtains its required water through the consumption of drinking water, tea, cola, energy drinks, milk and dairy products, coffee and other beverages. We evaluated the amount of beverage intake by the adult population of Herat city during summer 2021. In this research 583 standard questionnaires were randomly distributed among adult population of 15 regions of Herat city and the results were analyzed. The highest beverage intake was observed for water (2.81 ± 0.92 times/day @ 349.57 ± 190.12 ml for each time) and followed by was tea (1.84 ± 0.89 times/day @ 426.76 ± 228.78 ml each time). The average fluid intake by the adult population was 2390.61 ml per day, where the men drank an average of 2528.91 ml/day and women averaged 2363.88 ml/day of beverages. Most of the participants consumed beverages for the purposes of quenching thirst, health concerns, habitual and refreshment. The findings indicate that the amount of beverage intake by adult population of Herat city is lower than the WHO guidelines and the United States fluid intake recommendations.

Keywords: Adult, Beverages, Herat, Water, Tea

INTRODUCTION

Water is one of the most essential components of human diet. Commonly, water is consumed by every person for nutritional, medical and social reasons. The human body obtains a large part of its required water through beverages and water which is present in food products. Unfermented beverages include water, tea, fruit drinks, artificial drinks, and milk which contain 90 to 95 percent of water (Ashurst and Hargitt, 2009). Beverages play a vital role in human metabolism for health and physical performance, especially for the

elderly, sick and pregnant women. Mild dehydration can have adverse effects on mental and physical performance (Lieberman, 2001). Most of the international recommendations for beverages consumptions have taken into account the factors such as age, weight and physical activity. Human's daily water needs are different according to people's characteristics and lifestyle. In normal conditions, the recommended total daily consumption of fluids is 2.6 liters per day, this can be provided by direct consumption of beverages or by foods which are consumed daily



(Martin, 2007). According to the guidelines of the World Health organization, daily intake of 2.9 liters and 2.2 liters of fluid intake is considered necessary for men and women respectively (Howard and Bartram, 2003). The National Academy of Sciences, Engineering and Medicine of the United States of America in 2004 recommended daily beverage intake of about 3.7 liters for men and about 2.7 liters for women, which includes drinks such as plain water, beverages, and water in food. The percentage of water intake from food varies according to the type of diet. Usually, about 20 percent of daily fluid intake comes from food and the rest from drinks (Nissensohn et al., 2013).

The beverages consumption by the adult population of Tehran city was about 1.9 liters per day. Where, pure water (without considering the water used in the preparation of food or drinks) intake is about 5 percent of all liquids intakes (hot and cold) which includes: tea, coffee, juice and carbonated drinks (Abdullahi et al. (2013). Plain water, soft drinks, coffee, tea, milk, and fruit drinks are the most important liquids consumed by Americans, respectively (Randy et al., 2011). 76 percent of people, 2 years and older in the United States consume an average of 3.9 cups (one cups=238 ml) of water per day (Rhonda et al., 2011). A study conducted in Indonesia showed that sugar-sweetened beverages (artificial beverages) constitute 35 percent of the total fluid intake of youth and adults (Strippoli et al., 2011). A systematic review of total fluid consumption between 2000 and 2013 showed that the amount of total fluid consumption were between 0.6 and 3.5 liters per day and this amount is different for age groups, the difference is more among men than women (Ozen et al., 2015). The French population usually consumes liquids with the main meals, while the elderly more than 65 years consume liquids with snacks (Zizza et al., 2009). Daily water intake by U. S. men and women were reported 3.46 liters and 2.75

liters respectively (Rosinger and Herrick, 2016). Present research was conducted to analyze amount of beverages consumption by the adult population of Herat city during the summer of 2021.

MATERIALS AND METHODS

Research Type

This research was carried out to assess beverages consumption by the adult population of Herat city during the summer season of 2021. The research was designed as descriptive-survey method such that the subjects were randomly selected from the Herat city population.

The area under study (case study)

Herat is the largest province in the west of Afghanistan, which has a common border with Iran and Turkmenistan. The latitude of Herat, Afghanistan is 34.343044, and the longitude is 62.199074. Herat is located category with the GPS coordinates of 34° 20' 34.9584" N and 62° 11' 56.6664" E. According to the Afghanistan statistical yearbook 2019-20 Herat city population estimated was 632206 people distributed in 15 regions.

The statistical population under investigation

Since the population of Herat city estimated was 632206 people, Morgan's table was used to retrieve the data and for more accuracy, 583 standard questionnaires with 16 questions (for each questionnaire) were distributed to the study population. Among questionnaires, 285 were assigned to men and 298 to the women. The questionnaires included three main parts: demographic characteristics, amount of different beverages consumption (ml) and reasons for consumption of beverages. The community under investigation was randomly selected and the questions were asked to them face to face.

Data analysis

First, the obtained data was checked for their validity. After that, the questionnaires were analyzed by using SPSS-26 software and descriptive statistics methods (frequency, percentage, average, and standard deviation). At the end, the amount of beverages consumed by the adult population of Herat city was compared with the WHO and the National Research Council of the United States guidelines.

RESULTS AND DISCUSSION

The demographic characteristics of the participants of this survey are shown in Table 1. 48.88 percent of participants were males. Regarding educational qualifications, out of 568 respondents 38.4 percent were diploma holders followed by 35.0 % bachelors. With respect to economic status, most participants (74.6%) had an average income of 10,000 to 50,000AFN. Regarding the age, the 18-25 years old were maximum respondents (50.1 %). Similarly, Table 1 indicates weight and height of all participants in the survey. 50.86% population had the weight range of 60-79 Kg and 50.61% population were in the height range of 150-169 cm.

Table 2 shows the average unfermented beverages intake by the adult population of Herat city. The consumption of plain water was reported highest as compared with other listed beverages. The response for the water intake was 2.81 ± 0.92 times per day with 349.57 ± 190.12 ml for each time of consumption. This was followed by tea consumption with 1.84 ± 0.89 times/day and 426.76 ± 228.78 ml for each time of intake. Similarly, the response for the consumption of other beverages included buttermilk, fruit drinks, milk, energy drinks, cola, and coffee @ 1.28 ± 0.86 , 0.31 ± 0.65 , 0.28 ± 0.54 , 0.26 ± 0.63 , 0.25 ± 0.58 , 0.09 ± 0.36 times/day with 351.98 ± 215.60 , 175.64 ± 159.54 , 150.60 ± 142.25 , 114.24 ± 152.59 , 165.01 ± 178.99 , 55.23 ± 97.57 ml for each

time of consumption respectively. The average beverage intake by the adult population of Herat city reported 2390.61 ml per day, which is lower than the WHO guidelines and the daily water consumption by American men and women as reported by Rosinger and Herrick, (2016). It was slightly more than the amount of beverages intake by the adult population of the Tehran city which was reported by Abdullahi et al. (2013).

Men drank an average of 2528.91 ml/day while women averaged 2363.88 ml/day of beverages. There was no significant difference in the consumption of water, tea, coffee, milk, fruit drinks and cola, while significant difference was recorded in the consumption of energy drinks and buttermilk between men and women participated in this survey (table 3). Men were more likely to consume energy drinks and butter milk than Women ($P < 0.05$). Higher consumption of energy drinks by men might be due to traditional masculinity ideology of men, financial independency by men, sports and more daily activity. Similar finding was reported by Alrasheedi, 2016 in Jeddah, Saudi Arabia and Wimer, 2013 in United states of America. The amount of beverages intake by men was slightly higher than the women but was lower than the WHO guidelines recommended for beverages intake. The results showed that the beverages intake by the adult population of Herat city is lower than the amount of beverage intake reported in the United States by Rosinger and Herrick, (2016) while this amount is higher than the beverage intake by men and women in Tehran city reported by Abdullahi et al. (2013). Consumption of water lower than the WHO and other international guidelines could lead to dehydration and adverse effects including decrease of attention, concentration and other cognitive and motor functions, feeling of fatigue, headache, increase risk of stroke and mental fog (Kre cara et al., 2014).



Table 4 shows the reasons for consuming different drinks. Tea, soft drinks and fruit drinks were mostly used to quench thirst. Most people consumed butter milk, coffee and energy for health purposes. Likewise, most respondents consumed water to quench their thirst, health, and refreshment.

CONCLUSION

Beverages intake by the adult population of Herat city was analyzed using, 583 respondents. Water, tea and butter milk were reported as the most consumed beverages among people who participated in this survey, while energy drink and coffee reported as the lowest consumed beverages. An average of 2528.91 ml beverage per day was consumed by men while, women consumed 2363.88 ml/day of beverages. The beverages intake by men showed a slightly higher than women. No significant difference was recorded in consumption of water, tea, coffee, milk, fruit drinks and cola, while significant difference was recorded in the consumption of energy drinks and buttermilk between men and women. Beverages were consumed for health benefits and to quench thirsty.

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Table 1. Demographic characteristics of adult population of Herat city

| Variables | | Frequency (n=583) | Percent (%) | Mean ± SD | Total (Valid) |
|--------------------------|----------------------------|----------------------|----------------|--------------|------------------|
| Gender | Male | 285 | 48.88 | - | 583 |
| | Female | 298 | 51.12 | | |
| Education | Illiterate | 73 | 12.85 | - | 568 |
| | Primary School | 72 | 12.68 | | |
| | Diploma | 218 | 38.38 | | |
| | Bachelors | 199 | 35.03 | | |
| | M. Sc. | 6 | 1.06 | | |
| | Ph. D. | 0 | 0.00 | | |
| Economic (AFN/Month) | Status | | | - | 583 |
| | Low (<10000 AFN) | 112 | 19.21 | | |
| | Moderate (10000-50000 AFN) | 435 | 74.61 | | |
| | High (>50000 AFN) | 36 | 6.18 | | |
| Age (years) | 18-25 | 292 | 50.09 | 31.28±13.10 | 583 |
| | 26-40 | 179 | 30.70 | | |
| | 41-0 | 102 | 17.50 | | |
| | 60-100 | 10 | 1.71 | | |
| BMI (Kg/m ²) | Underweight | 134 | 22.98 | - | 583 |
| | Normal weight | 353 | 60.55 | | |
| | Overweight | 96 | 16.47 | | |
| Weight (Kg) | 40- 59 | 171 | 29.69 | 68.02±15.13 | 576 |
| | 60-79 | 293 | 50.86 | | |
| | 80-99 | 96 | 16.67 | | |
| | 100-120 | 16 | 2.78 | | |
| Height (cm) | 120-149 | 20 | 3.49 | 168.20±12.39 | 573 |
| | 150-169 | 290 | 50.61 | | |
| | 170-189 | 252 | 43.98 | | |
| | 190-210 | 11 | 1.92 | | |

Table 2. Average of unfermented beverages intake by the adult population of Herat city

| Beverage Type | Mean±SD (Times/day) | Mean±SD (ml/time) |
|-----------------------|---------------------|-------------------|
| Water | 2.81±0.92 | 349.57±190.12 |
| Tea | 1.84±0.89 | 426.76±228.78 |
| Coffee | 0.09±0.36 | 55.23±97.57 |
| Milk | 0.28±0.54 | 150.60±142.25 |
| Fruit Drinks | 0.31±0.65 | 175.64±159.54 |
| Energy Drinks | 0.26±0.63 | 114.24±152.59 |
| Cola | 0.25 ±0.58 | 165.01±178.99 |
| Butter milk | 1.28±0.86 | 351..98±215.60 |
| Total (ml/day) | | 2390.61 |

Table 3. Unfermented beverages intake by men and women of Herat city population

| Beverage Type | Male (n=285) | | Female (n=297) | | Mean Compression |
|-----------------------|---------------------|-------------------|---------------------|-------------------|------------------|
| | Mean±SD (Times/day) | Mean±SD (ml/time) | Mean±SD (Times/day) | Mean±SD (ml/time) | |
| Water | 2.87±0.90 | 370.53±197.81 | 2.74±0.95 | 329.97±180.68 | NS |
| Tea | 1.77±0.86 | 414.04±225.99 | 1.91±0.91 | 439.06±231.526 | NS |
| Coffee | 0.10±0.41 | 56.84±99.84 | 0.07±0.32 | 53.87±96.18 | NS |
| Milk | 0.31±0.59 | 160.00±150.87 | 0.25±0.0.47 | 140.74±132.50 | NS |
| Fruit Drinks | 0.33±0.64 | 173.33±160.52 | 0.29±0.66 | 177.78±159.10 | NS |
| Energy Drinks | 0.32±0.66 | 138.25±156.02 | 0.20±0.59 | 91.58±145.99 | * |
| Cola | 0.24±0.56 | 164.21±181.49 | 0.25±0.60 | 166.33±176.90 | NS |
| Butter milk | 1.38±0.86 | 387.37±233.43 | 1.18±0.86 | 317.85±191.70 | * |
| Total (ml/day) | | 2528.91 | | 2363.88 | |

NS- Non Significant

*- Significant at 5 percent level



Table 4. Purpose of unfermented beverages intake

| | | Beverages | | | | | | | |
|---------|----------------|-----------------|---------|----------|-----------------|----------|------------------|-------------------|------------|
| Purpose | | Water (%) | Tea (%) | Milk (%) | Butter Milk (%) | Cola (%) | Fruit Drinks (%) | Energy Drinks (%) | Coffee (%) |
| | | Feeling thirsty | 41.74 | 46.30 | 7.29 | 6.49 | 63.13 | 60.25 | 17.36 |
| | Health purpose | 3.13 | 8.15 | 53.80 | 3.82 | 6.19 | 22.96 | 16.60 | 1.95 |
| | Habit/Enjoy | 0.70 | 39.26 | 35.87 | 84.35 | 23.89 | 8.64 | 53.21 | 72.73 |
| | All | 54.43 | 6.30 | 3.04 | 5.34 | 6.78 | 8.15 | 12.83 | 5.84 |
| | Total | 100 (%) | | | | | | | |