

Water Consumption among Adolescents for Overall Well-Being

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Abstract

This study examines plain water consumption among 1128 adolescents in Melaka, Malaysia addressing the rising diabetes cases linked to high sugar intake from sweetened beverages. The objectives are to identify levels of plain water consumption and to assess adolescents' awareness of the importance of drinking plain water daily. Using a quantitative approach, the data were collected via structured online questionnaires and analyzed with descriptive statistics. Results indicate that 76% of adolescents have a high level of water intake, influenced by effective health campaigns. The study underscores the need for ongoing education and better access to clean water sources to promote healthy hydration habits. The impact of the study highlights the importance of health education in schools and community programs that successfully raise awareness about the benefits of drinking plain water. Improved access to clean water, such as installing water filters in schools, also contributes significantly to increased water intake among adolescents. Future research should explore the long-term effects of adequate water consumption on academic performance, mental health, and overall physical well-being. This research is vital for developing targeted interventions to ensure that adolescents maintain healthy hydration levels, ultimately reducing the risk of diabetes and other health complications.

Keywords: Plain Water, Drinking Water, Teenagers, Hydration, Well-being

Introduction

In the year 1990, a total of 43 teenagers aged 15 and below were diagnosed with diabetes mellitus. This disease has been among the chronic and concerning types of diabetes because it disrupts mental and physical development (Chong et al. 1995). Furthermore, this number has continued to rise until 2023, involving children and teenagers (May Hayin, 2023). This issue occurs due to high sugar intake from carbonated drinks, milk-based beverages, and

sweetened drinks. Nevertheless, this problem could be mitigated by promoting a healthy lifestyle and adequate intake of plain water especially among teenagers.

Due to these factors, the government has taken proactive steps by implementing various strategies to overcome the issue. There were two strategies to ensure nutritional well-being among teenagers as outlined in the National Plan of Action for Nutrition of Malaysia III, 2016-2025. These included "Prevention and Control of Nutritional Deficiencies" "Active Lifestyle" and "Promotion of Healthy Nutrition" which focused on overall well-being of Malaysian. Consequently, efforts to nurture physically and mentally healthy teenagers were being reinforced as well. One such effort was the promotion of the "Let's Drink Plain Water" campaign by The Ministry of Health Malaysia which led to the awareness of healthy drinking habits.

At the level of higher education institutions, it was reported that there was an issue with the lack of water sources for the stakeholders. This has made it difficult for students to consume clean plain water and they would have to purchase bottled water which might not be cost effective or even environmentally friendly. As reported, the cost of obtaining mineral water daily was indeed expensive (Universiti Teknologi MARA, 2023). Therefore, the ministry had been taking every effort to provide a continuous and phased supply of healthy, clean, and quality drinking water by installing several water filters to facilitate students' access to plain water. Therefore, this study examines the consumption of plain water among adolescents with the following objectives:

- i. To identify the level of plain water consumption among adolescents.
- ii. To assess adolescents' knowledge about the importance of drinking plain water daily.

Hence, this study was necessary to address the stated problems. It was crucial to conduct this study to ensure that the welfare of students was prioritized in fostering a healthy and active society through the consumption of plain water. It is also crucial to create awareness on the significance of a hydrated body and its positive impacts to the adolescents. By investigating adolescents' water consumption patterns, this study seeks to highlight key factors that influence hydration habits, providing insights for public health strategies to encourage daily plain water intake, reduce reliance on sugary beverages, and improve access to clean drinking water for adolescents.

Literature Reviews

Water has been a critical element that ensures the stability of human health. As the main component that makes up about 60% of the human body, plain water plays a crucial role in ensuring that bodily functions run smoothly. A lack of plain water in the body can cause serious disruptions to the growth system, especially for teenagers who are in a critical phase of growth and development.

The water needs of everyone varies depending on various factors such as body mass, level of physical activity, age, and height. This emphasizes the importance of assessing adequate and appropriate water intake for everyone. The Ministry of Health Malaysia (2020) outlined the importance of using a water intake calculator to determine the ideal amount of water intake, ensuring individuals can meet their hydration needs more effectively.

Additionally, lack of water in one's body not only affects fluid balance but can also disrupt normal body functions. Loss of fluids without adequate replacement will cause the body to draw fluids from other sources such as blood, fat, and glucose, which can lead to dehydration and other health issues. Therefore, sufficient intake of plain water is critical for maintaining optimum health and preventing health complications (World Health Organization 2017; The National Academies of Sciences, Engineering and Medicine 2005; Centers for Disease Control and Prevention 2022).

The study by Ahmad et al. (2018), showed that awareness about the importance of hydration significantly increased plain water intake among teenagers. Before the educational program, only 40% of teenagers consumed the recommended amount of water each day. After awareness programs, this figure increased to 70%. Meanwhile, the study by Lee and Kim (2019) found that teenagers who consume enough plain water tend to have better mental health scores, including lower stress and higher happiness, compared to those who do not consume enough water. The study by Martinez et al. (2020), investigated the correlations between installed water filters in schools and measured their impact on student water intake. Results showed a significant increase in plain water intake among students after the installation of water filters, highlighting the importance of access to clean water sources to improve health levels. In contrast, the qualitative study by Singh et al. (2021), used in-depth interviews and focus groups to explore teenagers' perceptions of water intake. The study revealed that although teenagers were aware of the importance of consuming plain water, many did not meet the daily intake recommendations due to preferences for sweet or caffeinated beverages.

In summary, past studies indicate the importance of plain water intake for the physical and mental health of teenagers. The awareness about hydration, access to clean water sources, and environmental influences such as the presence of water dispensers in schools play an important role in improving water consumption habits among teenagers. Although many teenagers were aware of the importance of consuming enough water every day, there were still barriers in their daily practices, including a tendency to choose sweet or caffeinated beverages. Therefore, intervention strategies focused on increasing awareness, health education, and facilitating access to clean water are necessary to support teenagers in adopting a healthier lifestyle.

Methodology

This study is quantitative in nature, involving a total of 1128 adolescents residing in the state of Melaka, Malaysia as the sample. The selection of this number of respondents is based on statistical calculations to ensure adequate strength and validity of the analysis, as recommended by the Ministry of Health Malaysia (2020), and supported by principles outlined in (Cohen et al., 2018).

The sampling technique used is stratified random sampling, which ensures proportional representation of each subgroup or strata in Melaka. Strata were divided based on factors such as geographical location, age, and type of educational institution, enabling an in-depth analysis of water consumption patterns among diverse adolescent demographics. This method follows the guidelines suggested by (Bryman, 2016).

Data were collected using a structured questionnaire distributed online through Google Forms. This allows for extensive, easy, and efficient data collection from adolescents. The questionnaire included elements such as demographic information, daily water intake quantity, water sources, knowledge about the benefits of water, and lifestyle habits that influence hydration. The questionnaire was pilot tested on a small group of adolescents to ensure clarity and reliability of the questions, aligning with techniques discussed in Creswell (2014). Content validity was also verified by experts, and research ethics were maintained, consistent with (Denscombe, 2010).

The data were then analyzed using statistical software, where descriptive statistics were used to provide an overview of demographics and survey responses. The analysis involved calculating minimum values, frequencies, and percentages to illustrate the study findings, following the statistical analysis techniques detailed in (Field, 2013).

The research followed ethical guidelines related to studies involving human participants. Consent was obtained from all participants, and for minors, consent was also obtained from parents or guardians. Participant response confidentiality was maintained throughout the study, adhering to ethical practices outlined in (Sieber et al 2013). The methodology used in this study provides a systematic framework to understand the factors influencing water intake among adolescents in Melaka, potentially leading to targeted interventions to promote adequate water consumption as part of a healthy lifestyle.

Findings

Demographic of Participants

The study findings indicate that the consumption of plain water among adolescents consists of 75.9% (862) females and 24.1% (266) males, aged between 18 – 22 years. The status reveals that 97.6% are students, while 1.8% are employed, 0.2% are self-employed, and others. The study found that 85.6% of adolescents live in dormitories, 9.2% in rented houses, and 5.2% in their own homes. Overall, female adolescents were reported to have a higher rate of plain water consumption compared to males. Furthermore, most of the adolescents are students, and most reside in dormitories or residential colleges.

Plain Water Consumption

The results of the study indicate that plain water consumption is high as detailed in Figure 1 below:

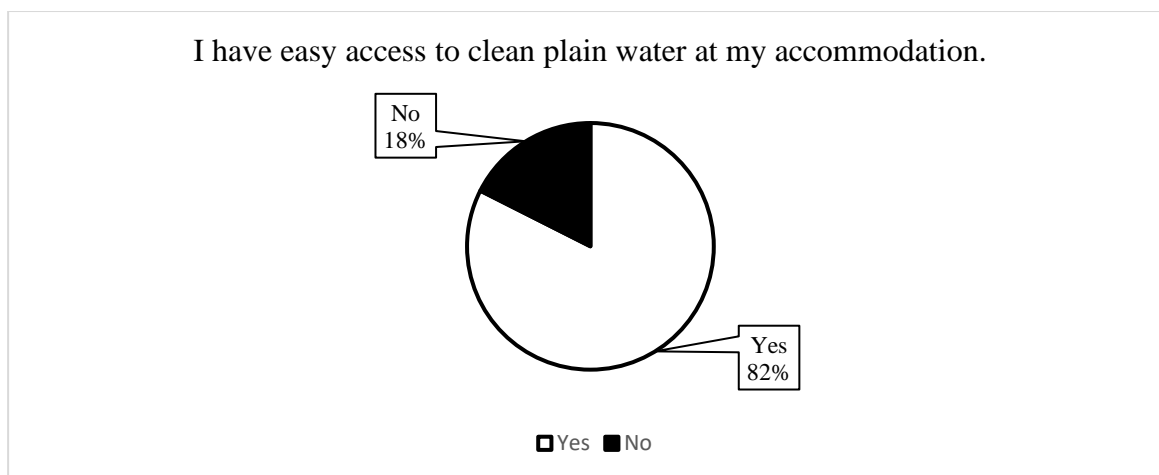


Figure 1. Access to plain water sources

Figure 1 illustrated the accessibility of plain water for adolescents involved in the study. Out of the total sample of 1128 adolescents, a significant majority, 930 individuals (82%), reported that it is easy for them to access plain water. This high percentage indicates that most adolescents have convenient access to water sources, which is crucial for maintaining hydration and promoting healthy water consumption habits. Conversely, 193 adolescents (18%) reported difficulty in accessing plain water sources. This notable minority highlighted a critical area for potential intervention, as limited access to water can hinder adequate daily water intake and negatively impact health and well-being. This disparity in water source accessibility could be influenced by various factors including geographic location, the infrastructure of residential areas or schools, and socio-economic conditions. Understanding and addressing the barriers faced by the 17.5% who found it difficult to access water is essential for developing targeted interventions to ensure all adolescents could maintain proper hydration, which was fundamental for their overall health and academic performance.

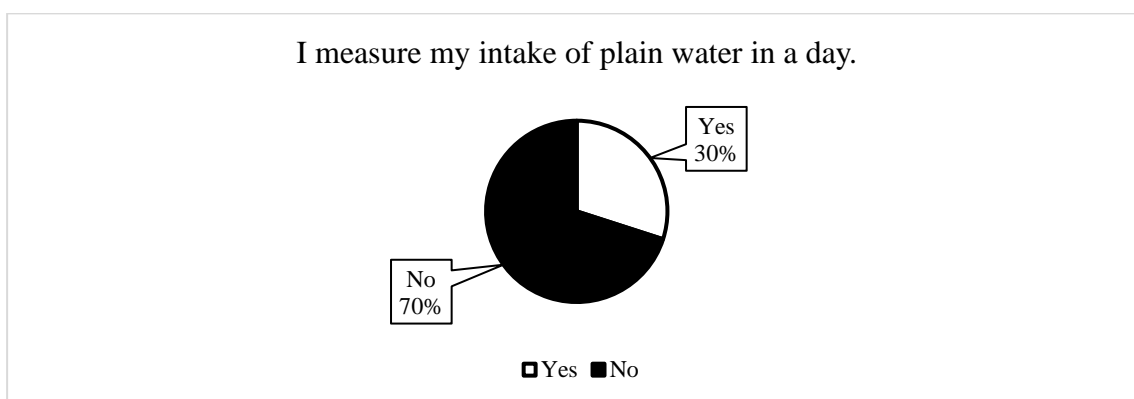


Figure 2. Measurements of plain water intake

Figure 2 presents the distribution of daily water consumption among adolescents. Out of the total sample of 1128 participants, 790 individuals (70%) reported their plain water intake, which aligns with the recommended daily water intake guidelines. This indicated a significant portion of the adolescents that were not only aware of but were also actively meeting or possibly exceeding the recommended amounts of water they should consume daily for optimal health. The remaining 338 adolescents (30%) reported their water intake

levels fell below the recommended guidelines. This suggested that nearly one-third of the sample may not be sufficiently hydrated, which could impact on their health, cognitive function, and overall well-being. The reasons behind this lower intake could vary, including factors such as limited access to water, lack of awareness about the importance of hydration, or lifestyle choices that do not prioritize water consumption. The data from Figure 2 emphasized the importance of educational interventions that promote adequate water consumption among youth. Addressing the gaps in water intake can help ensure that all adolescents understand the health benefits of hydration and are encouraged to maintain healthy habits in their daily lives.

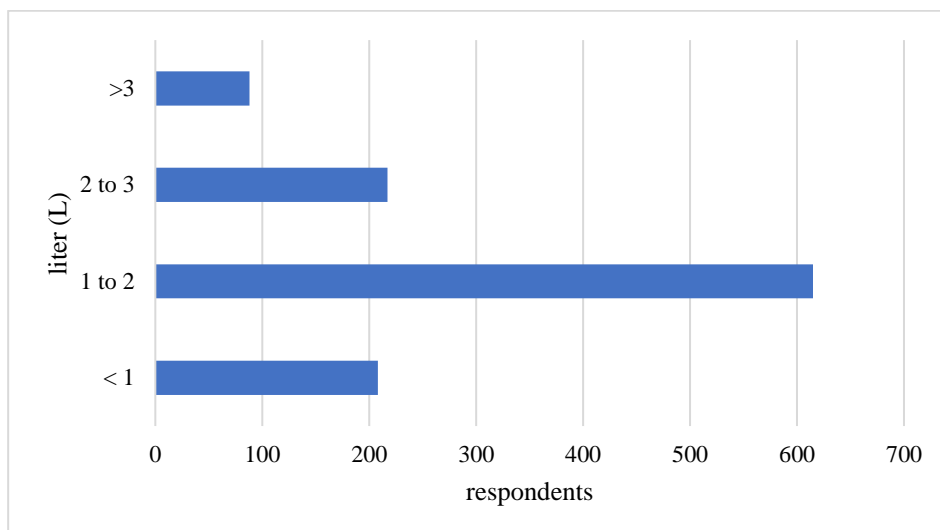


Figure 3. Daily plain water consumption

Figure 3 showed the amount of water consumed by adolescents every day. The data reveals that most adolescents, about 615 or 54.52%, drink between 1 to 2 liters of water daily. This amount has met the usual recommendations for daily water intake, meaning more than half of the adolescents are drinking enough water to stay healthy and support their body's needs. However, the figure also showed that a smaller number, 88 or 7.8%, drink more than 3 liters of water each day. This lower percentage suggests that fewer adolescents drink a lot of water, which might be needed for those who were very active or live in hot climates where the body loses more water. Overall, Figure 3 showed that most adolescents are drinking a good amount of water every day. This is a positive sign that many of them understand how important it is to drink water regularly to keep their body healthy and function well.

Table 1

Frequency of Plain Water Consumption

No.	I often drink plain water while... (* can choose more than one answer)	Respondents	Percentage (%)	Rank
1.	thirsty	1043	89.3	1
2.	hot weather	968	82.9	2
3.	outdoor activities	859	73.5	3
4.	taking meal	812	69.5	4
5.	waking up	589	50.4	5
6.	feeling sleepy	452	38.7	6
7.	before sleeping	433	37.1	7
8.	free time	428	36.6	8
9.	waiting for transportation	170	14.6	9
10.	study time	14	1.2	10

Table 1 focused on the time where adolescents tend to drink water. The results showed that a large majority, 89.3%, of the adolescents drink water mainly when they feel thirsty. This suggests that most of them are responding to their body's natural signals to hydrate, which is a good practice for maintaining basic hydration. However, the figure also highlighted that only 1.2% of the adolescents drank water while studying. This low percentage indicates that many may not be drinking enough water during activities that require concentration and cognitive function, like studying. Keeping hydrated is important for brain function and can help in improving focus and cognitive performance. Overall, Table 1 showed that while adolescents are good at drinking water when they feel thirsty, there is a need to encourage them to drink water regularly throughout the day, not just when they feel the need. This could help them stay consistently hydrated, which was beneficial for both their physical and mental health.

Knowledge Level on the Importance of Plain Water

table 2 showed that adolescents have a high level of knowledge regarding the importance of consuming plain water

Table 2

Awareness about the Importance of Plain Water

No.	Items	Mean perception
1.	I know that drinking enough plain water helps me stay healthy.	6.60
2.	I know that drinking plain water is essential for enhancing oxygen circulation throughout the body.	6.59
3.	I know that drinking plain water is important for helping with excretion.	6.52
4.	I know that drinking plain water is important for helping the kidneys eliminate toxins from the body.	6.52
5.	I know that drinking plain water is important for maintaining skin hydration.	6.51
6.	I know that drinking plain water is important for helping to reduce calories in the body.	6.26
7.	I know that drinking plain water is important for helping regulate body temperature.	6.57
8.	I know that drinking plain water is important for maintaining water balance in the body.	6.63

Table 2 displays the level of knowledge adolescents have regarding the importance of drinking plain water. The results indicated that the average scores for each item are high, demonstrating good awareness among the participants. The highest average score was 6.63, which shows that adolescents strongly agree that drinking plain water helps maintain the body's water balance. This suggested that they understood how crucial water is for keeping their body functioning properly by regulating temperature and other bodily processes. The lowest score was 6.26, related to the understanding that drinking plain water is important for helping to reduce calories in the body. Although this was the lowest score among the high scores, it still indicated a strong recognition of the role water plays in keeping the skin moisturized and healthy. Overall, Table 2 demonstrates that adolescents were well-informed about the benefits of drinking plain water, particularly in maintaining bodily functions and skin health. This high level of knowledge was a positive indication that they were likely to engage in healthy hydration behaviors.

Discussion

The result showed that 75.9% of adolescents consumed a high amount of plain water are a positive sign indicating good awareness and practices among the younger generation. This success reflected not only the individual efforts of the adolescents to ensure they drink enough water daily but also the effectiveness of awareness programs implemented by residential college authorities.

In addition, consuming sufficient plain water is crucial for the growth and development of adolescents, ensuring optimal body functions, and enhancing cognitive and

physical abilities. Plain water aids in the detoxification process, regulates body temperature, and ensures the digestive system functions properly. Therefore, the success in increasing plain water intake among adolescents should be viewed as a significant achievement in efforts to enhance the well-being and health of future generations. This aligns with findings from Smith et al (2019), which emphasized the impact of structured water intake programs in schools on improving students' hydration and overall health.

The recorded average knowledge level of adolescents about the importance of plain water, with a mean score of 6.52, showed that adolescents did not only practice good hydration habits but also had a good understanding of its benefits. This aspect was crucial because deep knowledge about the importance of hydration forms the foundation for healthy lifestyle practices. This was further supported by Johnson and Anderson (2020), who reported similar findings in their study on adolescent health behaviors, noting a strong correlation between knowledge and behavior.

This high level of knowledge results from effective health education in schools, community awareness campaigns, and easily accessible information through digital media. This underscores the importance of continuing educational efforts and promotions about the critical value of plain water, focusing on delivering this message through the most effective channels to influence adolescents. According to Lee and Park (2021), ongoing educational initiatives and public health campaigns constantly played a pivotal role in maintaining high levels of awareness and proper hydration practices among young people.

Supporting such efforts, which included encouraging interactive learning, using technology and social media to spread knowledge about hydration and health in ways that are engaging and relevant to adolescents. Additionally, strengthening health education programs in schools with practical activities that allow students to plan and implement their daily schedules is vital. Collaboration with stakeholders such as local authorities, NGOs, and food and beverage companies can provide easy access to clean water in schools and community areas. Finally, establishing a recognition or reward system for schools or communities that show extraordinary commitment in promoting plain water consumption and awareness can further enhance these efforts, as suggested by Green et al. (2018), who explored the effectiveness of reward systems in promoting healthy behaviors among adolescents.

Conclusion

In conclusion, there were two important aspects related to plain water intake among adolescents: high intake levels and deep knowledge about the importance of hydration. Most of the adolescents reported satisfactory plain water intake, while their knowledge about the importance of plain water was also high. This has proven the effectiveness of raising awareness and promoting healthy hydration practices among the younger generation, which was crucial for long-term health and well-being. The findings provide actionable data can serve as a guide for policymakers, and healthcare providers in implementing effective interventions that encourage healthy hydration practices. This study highlights the impact of health education programs and awareness campaigns that have been implemented. The impact on the community was significant, showing an increase in healthy hydration practices among adolescents, which was important not only for their growth and development but also

for preventing long-term health issues. The study also emphasized the importance of access to clean water sources and how this influences daily water intake habits. In other words, it becomes a catalyst or source of motivation for young adults to be aware of their well-being, especially being in a constantly hydrated state. Moreover, this study paves the way for future research into the broader impact of hydration on adolescent well-being, exploring how simple lifestyle changes can have a profound effect on academic success and mental health outcomes. Hence, future research should investigate the long-term effects of adequate plain water intake on academic performance, mental health, and physical well-being of adolescents. In summary, by continuing to emphasize education and access to clean water, we can help ensure that the younger generation achieves optimal health.

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