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Building Awareness on the Importance of Body Fluids

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A R T I C L E I N F O

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A B S T R A C T

Water makes up two-thirds of the composition of the human body. The body's need for water can eliminate thirst and prevent several health problems due to dehydration. Dehydration will cause a person to not focus on thinking, mood changes occur, increased body heat, and digestive disorders. The webinar theme raised is Hydration and Achievement, which aims to increase the knowledge capacity of webinar participants, who come from the general public and health workers, focusing on hydration, body fluid fundamentals, and health. The webinar method delivers material by two experts and oral presentations from three students. The results of the webinar pooling showed that the participants were interested in participating because they wanted to add knowledge.

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INTRODUCTION

Water is a natural resource that is as important as oxygen. Nearly 80% of body composition consists of water. Humans can survive long enough if they do not get food intake, but humans will not be able to survive without consuming water. At least humans need one to two and a half liters of mineral water intake or about six to eight glasses daily. Individual water needs vary depending on body weight, physical activity, age, climate, and diet. Apart from consuming water, the body also gets its fluids from nutrients from the food consumed (Kusumawardani et al., 2020). Water is the main component of cells, tissues, and organs. Water plays a role in macronutrient hydrolysis and general cell regulation throughout the body. Lack of water in the body can cause dehydration and impaired cognitive function. Children need adequate water intake, but the amount of water obtained from solid food and endogenous metabolism cannot meet fluid needs in children, so there are specific guidelines for water intake for individuals according to gender and age (Suh et al., 2019).

Maintaining fluid intake in children is very important to keep the physiology of the body. Water is essential in everyday life, such as thermoregulation and the elimination of substances that the body does not need. Water is a solvent and carrier for various substances and metabolic reactions (Bottin et al., 2019). Lack of fluids or dehydration can directly impact a person's cognition. One of the most apparent symptoms is decreased concentration or a lack of focus. Symptoms of severe dehydration can cause fainting and coma, and even death. Lack of fluids in school children will undoubtedly impact decreasing concentration or focus. A study conducted on elementary school children in Tangerang found students with moderate and poor concentration, both of which were associated with a lack of water consumption (Kusumawardani et al., 2020).

Hydration status is also related to one's physical fitness. Research on 50 schoolchildren aged 10-12 years showed that there is a relationship between hydration status and concentration power, and there is a relationship between concentration power and physical fitness (Sudrajat et al., 2019). In school children, the potential for short-term memory is needed and influences learning and academic processes. Brain work will be maximized by providing adequate nutrition and fluids. A study of 52 school-age children between grades 4 - 6 of SD in Gembong, Pati Regency, showed a relationship between nutritional and hydration status and children's short-term memory. From this research, children should get used to having breakfast before school and be provided with food and drinks (Winarsih et al., 2021). Improper hydration occurs almost all over the world in school-age children. Research in Poland in 2018 of 264 school-age children aged 7-15 years showed that 53% of children did not get enough fluid intake during school, and 16.3% experienced severe dehydration during school. This study also focuses on assessing the hydration status of children with excess weight. It concludes that special attention is needed for children with excess weight because they have a higher risk of dehydration and need for fluids (Koziol-Kozakowska et al., 2020). Research in Germany on 250 children in grades 5 and 6 of elementary school showed that children with adequate water intake during school had good cognitive performance, especially short-term memory

(Drozdowska et al., 2020). Other research shows that 60% of 13 countries of children do not get enough water intake (Bottin et al., 2019).

IMPLEMENTATION AND METHODS

This webinar will discuss hydration in all life cycles, focusing mainly on school and productive-age children. Topics prepared to achieve the activity's objectives are "*Air, Zat Gizi yang Terlupakan* (Water, The Forgotten Nutrient)" and "*Cairan dan Kerja Tubuh* (Fluid and Body Works)". Before and after the webinar, pre-test and post-test links were displayed to assess the achievement of the objectives presented in the previous points. This webinar involved four undergraduate medical students as presenters.

RESULTS

This section displays the results of the webinar participant questionnaire and participant documentation during the webinar.

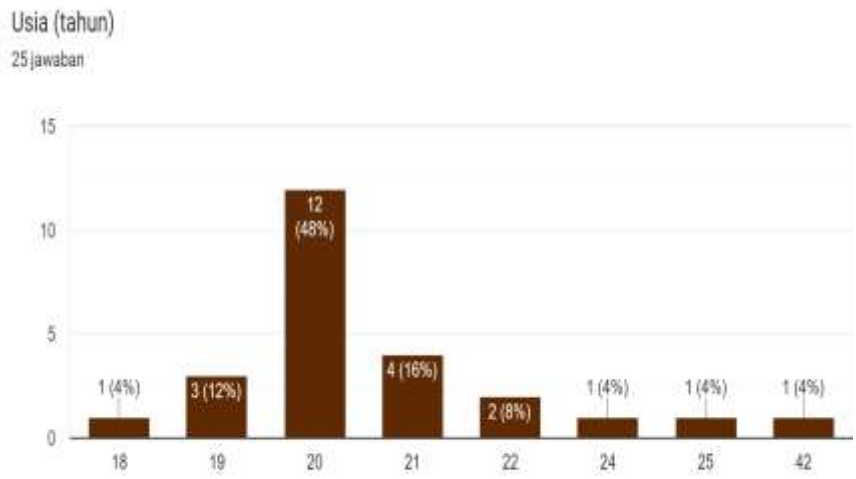

Figure 1. Age Distribution of Webinar Participants

The graphic above shows the age distribution of the participants, who were mostly 20 years old (48%) and evenly distributed among the fewest age groups, namely 18, 24, 25, and 42 years (4%). The oldest participant is 42 years old, and the youngest is 18 years old. Overall, the participants participating in this webinar were of productive age.

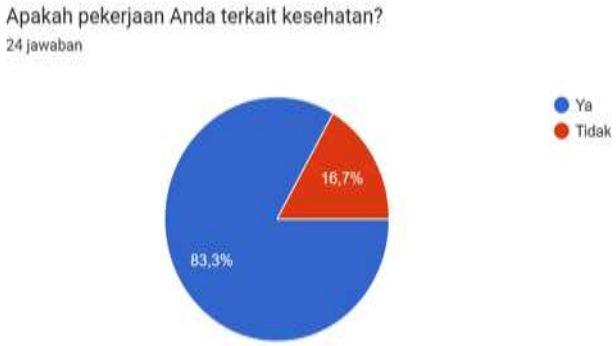

Figure 2. Distribution of the Work of Webinar Participants

The pie chart above shows that most of the participants came from the health sector (83.3%), and 17.7% were not from the health sector.

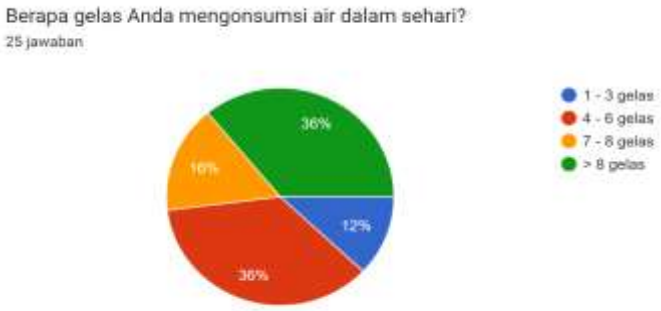

Figure 3. Percentage of Water Consumption of Webinar Participants

The pie chart above shows the same rate (36%) between the participants' water consumption in a day, 4-6 glasses and > 8 glasses. Participants who consumed 1-3 glasses of water daily were 12%, and 7-8 glasses were 16%.

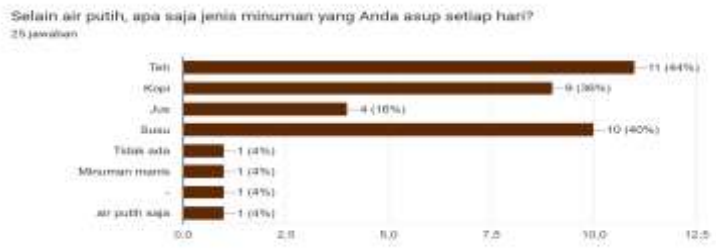

Figure 4. Percentage of Water Consumption By Webinar Participants Per Day Besides Water

The bar chart above shows that most participants consumed tea (44%), milk (40%), and water. Participants who consumed coffee were 9%, and juices were 4%. Participants who consumed other than water consumed 1% of sweet drinks; some even consumed nothing but water.

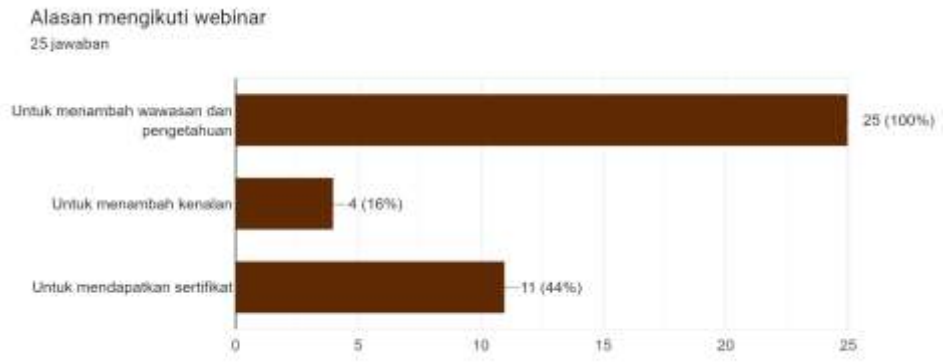

Figure 5. Reasons for Participating in the Webinar

All participants stated that the reason for participating in the webinar was to add insight and knowledge (100%); besides that, the reason was to obtain a certificate (44%) and add acquaintances (4%).

RESULTS AND DISCUSSION

The first topic explained that water is one of the essential macro-nutrients that function in various vital processes in the human body. The body cannot produce water to meet its needs, so it must be obtained from outside. Each individual has different fluid intake needs. Factors affecting the body's need for water intake are growth phase, physical activity, metabolism, respiration, body temperature, humidity, amount and type of filtrate secreted by the kidneys, child's condition, and macro-micronutrients. Children need more water intake because their body surface area is more extensive, and their breathing frequency is also faster, so they experience more water loss through sweat and evaporation. More water intake is also needed by teenagers who are still in their infancy and have high activity. Fulfillment of water intake is essential to do because it is beneficial for health, cognition, attention, memory, and physical performance.

Several impacts arise if you must meet your fluid intake sufficiently. A deficiency of 1% can cause mood disorders, while a lack of 2% or more can reduce physical, visuomotor, psychomotor, and cognitive abilities. However, water intake must be limited in conditions such as chronic kidney disease, heart failure, and low serum albumin levels. Some of the challenges of achieving healthy hydration were also conveyed by him, namely regarding parents' awareness and the economy. In addition, water and toilet infrastructure, the role of school stakeholders, and the availability of drinking water and clean water in the family, school, and regional environment can also be a challenge and an opportunity to strive to fulfill body fluid intake, especially for children and adolescents.

At the beginning of the presentation, he briefly explained the definition of cognition. Cognition is how the brain processes the information or messages it receives, including remembering, paying attention, and thinking creatively. The quality of brain cells and nerves influences memory and concentration. The brain plays a vital role in determining a person's cognition. Impaired brain function can cause cognitive impairment. Cognitive disorders can occur due to disturbances or changes in the brain's chemical composition and disruptions in the physiology of brain nerve cells. Various studies have proven that lack of water in school children causes fatigue and reduces attention and concentration in learning. Children who experience a lack of body water, as much as 2% of body weight, can decrease brain function and learning abilities. One of the simple indications that the body lacks water is dizziness, headache, thirst, dry lips, yellow-brown urine color, and so on.

School children are one of the vulnerable groups who experience a lack of water in their bodies. This could be due to the lack of access to the water supply at school or obtaining mineral water by buying it, or in girls, the desire to drink is reduced to reduce the urge to urinate due to fewer clean toilets. In his next presentation, he also explained that lack of body water during physical activity can disrupt areas of physiological function and increase thermoregulatory stress and cardiovascular burden. This can increase the risk of heat-related illnesses, such as muscle heat cramps, fainting, and severe conditions such as heat stroke. Water requirements are different at each age level. On average, adults need 2 liters of water intake in 24 hours. Still, the need for additional water intake is adjusted to a person's circumstances, such as fever, physical exercise, environmental factors, etc. The following presentation delivers dr. Fika Tri Anggraini, MSc, Ph.D. by title "Cairan dan Kerja Tubuh". dr. Fika explained that the composition of body fluids consists of water and dissolved substances. Water is a universal solvent and can move from one space to another in the body. Solutes consist of electrolytes (salt, magnesium, calcium, acid-base, and protein) and nonelectrolytes (glucose, lipids, creatinine, and urea).

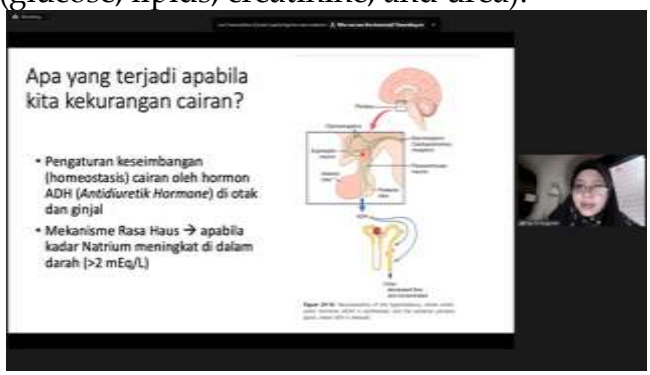

Figure 6. Presentation by dr. Fika Tri Anggraini, MSc, PhD

He explained the functions and needs of water, namely as a cell and body fluid formation, body temperature regulation, a medium for chemical metabolic reactions, a lubricant and cushion in joints, a medium for removing toxins and metabolic products, and a regulator of electrolyte balance. Everyone's fluid needs are different. Adults' recommended water consumption is around eight glasses of 230 ml per day or 2 liters. Water is needed in a hot environment, strenuous exercise, and sick conditions, so in these circumstances, water consumption must be increased. Furthermore, he explained that the body can defend itself for one or two weeks without eating and drinking and even longer if consuming water. In a study conducted, the human body can last the longest without drinking for up to eight days; if it takes longer, it will die if it does not receive further treatment Without food, humans can survive even longer than one month. This is because the body's need for water is more significant.

He explained the many benefits of drinking water, namely preventing dehydration, keeping the mind focused, helping to maintain body weight, improving skin health, healthy digestion, maintaining blood pressure, avoiding heart disease, and maintaining bone health. There are several symptoms if the body is not properly hydrated: dizziness, headache, fatigue, lack of energy, dry mouth, lips, and eyes. Some tips for meeting water needs include getting used to drinking water at every meal or snack, providing a glass or bottle filled with water on the table or bag during activities, and adding flavor to water to make it taste better. Finally, he explained the requirements for drinking water, namely tasteless, odorless, colorless, does not contain harmful microorganisms, and does not contain heavy metals. This activity also involves students as oral presentations. Students present a literature review on hydration and achievement in their research plan.

The first presenter of the students is Atika Chandra Kirana, titled “Status Gizi dan Dehidrasi”. The presenter highlighted the importance of water for life because it is the main component of the body. Water is essential in various metabolic processes in the human body and other living things. Generally, an individual is considered to have consumed enough fluids if drunk as much as 2 liters or eight glasses of 250 ml in household size. Failure to meet this body fluid will cause dehydration, a condition of lack of fluids. The effects can disrupt the body's metabolic balance, mood, and cognitive disorders. Teenagers are one of the subjects who are prone to dehydration. Teenagers usually have a lot of physical activity, which is draining and also results in a significant loss of water from the body. A literature review found that obese adolescents are more prone to dehydration, so total body water is lower than expected.

The second presenter is Aulia Sepriadina Larasati, with the title “Blue Gold”. Water is described as a vital resource for social life and health. The main problem raised by the presenter is that the amount of water consumption does not meet the recommended needs among adolescents. Based on general data, 48.1% of adolescents experience a lack of fluids, and data obtained in Bogor City show that 37.3% consume less than eight glasses of water daily.

Figure 7. Presentation of Aulia Sepriadina Larasati

The amount of water consumption not for daily needs will have an unfavorable impact, especially for a teenager still at school. The effect is that they can fall into a state of dehydration which affects the level of physical fitness, cognitive performance, and mood and can interfere with feelings, thereby reducing productivity. One approach that can be taken to change the status of fluid deficiency is education. The presenter explained several previous studies regarding the success of education in positively impacting a teenager's level of knowledge, attitude, hydration status, and performance. In the end, the presenter conveys the next plan based on the problems and approaches found, namely nutrition education with audio-visual media and assessment of hydration status in groups of school children. Audio-visual media was chosen because it can arouse interest and focus in school children when getting an education. In addition, an assessment of hydration status by examining urine-specific gravity was carried out to assess the effect of education on hydration status.

Then, the third presentation was delivered by Silvia Ayunda with the title "Academic Motivation dengan Student Engagement pada Siswa". The presenter emphasized the problem of Indonesian students' academic achievement, which is still low compared to other countries, and a population of children and adolescents who are not in school. One of these problems occurs in high school (SMA) students.

Figure 8. Silvia Ayunda's presentation

High school is a critical time for teenagers to determine and continue their career paths in the future. For some high school students, attending school is seen not as an opportunity to achieve achievement but as an obstacle to adulthood—various problems in emotions, behavior, and difficulties in learning cause this. The problems of high school students in a closer scope, namely in the city of Padang, namely students admit that they do not understand the material being taught and do not ask questions because they feel afraid; when the teacher explains the material, only a few actively participate and are nervous when asked questions, there are even students who do not pay attention when explanation is given. The explanation of the previous problem indicates that there is a problem with student engagement, namely the involvement of students in school activities and the learning process, both academically and non-academic, which can be observed through the behavior, emotions, and cognitive abilities of students during activities at school. Students are said to be engaged when they actively learn the material, socialize with other students and teachers, and emotionally engage with learning. Therefore, there are three aspects of student engagement, namely behavioral, emotional, and cognitive involvement.

Based on studies, one of the things related to student engagement is motivation, especially academic motivation. Academic motivation is an internal process that encourages and maintains activities aimed at specific educational goals. Motivated students will be involved and participate in class, practice material, and take notes to facilitate further learning. Thus, in closing, the presenter expressed his interest in finding out more about academic motivation with student engagement in students.

Figure 9. Documentation of Resource Persons and Webinar Participants

Overall, this webinar went smoothly and was full of exciting things. There are interactive sections such as mini-quizzes or games between the experts' presentations. This makes the course of the webinar flexible and varied. During the question session, there were also questions from the participants. The existence of these questions makes the material that has been delivered more comprehensive. Oral presentations from students also varied the material about hydration, so it provoked more discussion and questions from the participants.

CONCLUSIONS AND RECOMMENDATIONS

The holding of this webinar will broaden parents, students, and the general public's insight into the importance of thirst for water or hydration, especially for school children, because it will support children's achievements and maintain children's cognition during school. The follow-up to this webinar is implementing research that students will carry out. The webinar is hoped to provide students with initial knowledge on hydration-related topics. This can encourage student interest in the subject

ACKNOWLEDGMENT

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