



ARAŞTIRMA / RESEARCH

Water/fluid intake in students and influencing factors

Öğrencilerde su/sıvı alımı ve etkileyen faktörler

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Abstract

Purpose: The aim of this study was to investigate the water/fluid intake patterns of students and affecting factors.

Materials and Methods: In this cross-sectional study, water/fluid intake and affecting factors among 4922 students studying in primary, secondary and high schools in Ortahisar district of Trabzon province in 2017-2018 academic year were investigated. As the data collection tool, a questionnaire form evaluating sociodemographic characteristics and water/fluid consumption patterns was used.

Results: The plain water intake of the students was determined as 1199 ± 572 mL/day and the total fluid intake was found as 1611 ± 688 mL/day. In addition, it was revealed that daily fluid intake of 2098 (62.6%) of the students was below the sufficient amount advised by National Academy of Medicine (NAM). It was found that the amount of daily fluid intake of boys, older children, those whose maternal education level is high school or low, those who have maximum two siblings, and those who are not engaged in sportive activities was inadequate.

Conclusion: Daily fluid intake of more than half of the students is below the amount advised by NAM for children by age and gender groups. Considering the possible adverse consequences of this situation on health, it is suggested that appropriate interventions should be made to increase fluid intake of children.

Keywords: Adolescent, children, drinking water, students, water intake

Öz

Amaç: Bu çalışmada öğrencilerin su/sıvı tüketim özellikleri ve etkileyen faktörlerin değerlendirilmesi amaçlanmıştır.

Gereç ve Yöntem: Kesitsel tipteki bu çalışmada Trabzon ili Ortahisar ilçesindeki ilkokul, ortaokul ve liselerde 2017-2018 yılında eğitim gören 4922 öğrencinin su/sıvı tüketimi ve etkileyen faktörler değerlendirilmiştir. Veri toplama aracı olarak sosyodemografik özellikler ve su/sıvı tüketim özelliklerinin değerlendirildiği anket formu kullanılmıştır.

Bulgular: Araştırmaya katılan öğrencilerin sade su tüketim miktarının 1199 ± 572 mL/gün, toplam sıvı tüketim miktarının ise 1611 ± 688 mL/gün olduğu tespit edilmiştir. Ayrıca öğrencilerin 2098'inin (%62,6) günlük toplam sıvı tüketiminin National Academy of Medicine (NAM) tarafından önerilen düzeyin altında olduğu belirlenmiştir. Erkeklerin, büyük çocukların, anne eğitim düzeyi lise ve altında olanların, kardeş sayısı iki ve daha az olanların ve sportif faaliyeti olmayanların günlük sıvı tüketim miktarının daha yetersiz olduğu saptanmıştır.

Sonuç: Öğrencilerin yarısından fazlasının günlük sıvı tüketiminin NAM'ın çocuklar için yaş ve cinsiyet gruplarına göre önerdiği miktarın altında olduğu belirlenmiştir. Bu durumun sağlık üzerindeki olası olumsuz sonuçları dikkate alınarak çocukların sıvı alımını artırmak için uygun müdahalelerin yapılması önerilmektedir.

Anahtar kelimeler: Adölesan, çocuklar, içme suyu, öğrenciler, su alımı

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INTRODUCTION

Water is a substance responsible for maintaining all functions in the body and it is necessary for individuals of all ages¹⁻³. Since the amount of endogenous water production in the body is limited, fluid need of the body should be met from outside³. According to the studies, adequate fluid intake can reduce the prevalence of urolithiasis and several diseases such as urinary tract infection, hypertension, cardiovascular diseases, hyperglycemia, obesity, constipation and exercise asthma⁴⁻⁷. Failure to meet this need may be related to serious health problems for humans. Even mild dehydration, defined as the loss of fluid at approximately 1% of body weight, can affect physical and cognitive performance of children^{3,8,9}.

It is emphasized that adequate fluid intake is important in childhood as there is a rapid physiological development in this period. Since the thirst mechanisms of children are underdeveloped and their body surface area/body mass ratios and physical activity levels are higher than adults, they are at higher risk of dehydration¹⁰⁻¹². Besides, water and fluid intake patterns in the childhood period may affect lifelong health, including the adulthood period. Therefore, it is critical to build healthy water and fluid consumption habits among children.

Although the daily fluid intake amount for adequate hydration of children may vary depending on many factors such as temperature, physical activity and diet, there are certain suggestions about the daily fluid intake of children made by some international organizations^{1,3}. Daily total fluid intake including plain water suggested by the National Academy of Medicine (NAM) according to gender and age groups is demonstrated in Table 1¹.

Table 1. Recommended total daily fluid intake from plain water and beverages

Age group	Girls	Boys
Age 4-8	1200 mL /day	1200 mL /day
Age 9-13	1600 mL /day	1800 mL /day
Age 14-18	1800 mL /day	2600 mL /day

Besides the quantity of the liquid, its quality also has important effects on health. Some minerals, toxic substances, sugar, sweeteners and additives in fluids may have both positive and negative effects on the functions in human body^{13,14}. For example, meeting fluid need with sugary drinks may cause some health

problems such as obesity, type 2 diabetes and tooth decay¹⁵⁻¹⁷. However, studies reveal that children prefer to consume calorie beverages such as fruit juice and sugar drinks instead of drinking water¹⁸⁻¹⁹.

According to the studies, water and fluid intake of children is much lower than the recommended amounts and they are susceptible to dehydration²⁰⁻²². It was found in the study of Turkey Nutrition and Health Survey conducted in our country in 2010 that daily water consumption among all gender and age groups are considerably low²³. Guelinix et al. and Iglesia et al. investigated water/fluid intake patterns of children and adolescents in 13 different countries including Turkey in their studies^{24,25}. However, there is no original articles and results made in our country on this topic in both national and international literature. This study will contribute to determine possible problems about this issue and develop interventions to eliminate these problems as it will be one of the first studies investigating water/fluid intake patterns of children in our country.

In this study, it was aimed to evaluate daily water/fluid intake of primary and secondary school students in Ortahisar District of Trabzon Province and affecting factors.

MATERIALS AND METHODS

Study population

This study was carried out within the scope of the 'Investigation of Water Intake Patterns, Frequency of Internet Addiction and Affecting Factors' Project conducted with the cooperation of Trabzon Provincial Governorship, Trabzon Directorate of National Education, Trabzon Provincial Directorate of Health and Karadeniz Technical University, Department of Public Health.

The participants of this cross-sectional study consist of primary, secondary and high school students studying in 2017-2018 academic year in Ortahisar district of Trabzon province. The necessary sample size was calculated by using Open Epi Program within the scope of the project and it was aimed to reach at least 4130 people with undetermined number of participants, 99% confidence interval, 50% prevalence and 2% deviation.

All schools (128 schools in total) in the district center were included in the study without making any selection. A total of 8651 students (2380 primary, 3751 secondary, 2520 high school students) in classes

chosen one for each of the 1-12th grades voluntarily responded to the questionnaire. The collected surveys were examined by the researchers and a total of 3026 questionnaires including printed incorrectly and incomplete or the questionnaires with no responses to the questions about fluid intake patterns were excluded from the study. In addition, the collected data on fluid intake patterns was examined and a total of 703 questionnaires (231 primary, 161 secondary, 311 high school) with low data quality and including incorrect responses to the questions about fluid intake amounts were excluded and the responses of 4922 students (1165 primary, 2674 secondary, 1083 high school) from 122 schools with appropriate data quality were analyzed. The research was completed with approximately 20% more participants than the calculated sample size.

This study is approved by Ortahisar District Directorate of National Education and Karadeniz Technical University Medical Faculty Ethical Committee (No.24237859-460, dated 09.07.2018). Before the data collection process, the students were informed about the aim of the study and the verbal consent of each student accepted to participate in the study was obtained.

Data collection

The data collection was performed in 2018 February. As the data collection tool, a questionnaire form developed by the researchers was used. The primary school students responded to the questionnaire form with the help of their parents while the students in other schools responded themselves under the supervision of teachers.

The questionnaire form consisted of two parts. The first part focused on socio-demographic and personal information (age, gender, grade, educational status of parents, total monthly household income, number of siblings, engagement in sportive activities). In the second part, the amount of daily fluid (water, tea, milk, ayran, fruit juice, carbonated beverages, other) intake of the students, the reasons for water intake and the type of the water consumed at home and school were investigated.

Dependent variables of the study were daily plain water and total fluid intake, and daily adequate amount of fluid intake while the independent variables were gender, age group, marital and educational status of parents, number of siblings, total monthly household income and engagement in sportive activities. Inadequate fluid intake status of

the students were determined based on the total fluid intake amounts recommended by NAM for gender and age groups¹.

Statistical analysis

The data were analyzed using SPSS 23.0 statistical package program. In the evaluation of descriptive statistics, number (n) and percentage (%) were used for qualitative data while mean, standard deviation (SD), median, minimum (min) and maximum (max) values were used for quantitative data. The normality of the quantitative data was evaluated by using Kolmogorov-Smirnov test. Since there is no normality, Mann Whitney U test was used to compare numerical variables between two independent groups, and Kruskal-Wallis test was used in comparing more than two independent groups. In order to determine the source of the significant difference between the groups, Bonferroni test was used. Logistic regression analysis was utilized to determine the factors affecting inadequate daily fluid intake. In one-variable analysis performed to determine the factors affecting inadequate daily fluid intake, parameters found as $p < 0.20$ (gender, age, educational status of mother, educational status of father, number of siblings, engagement in sportive activities, marital status of the parents) were included in the model. Statistical significance level was accepted as $p < 0.05$.

RESULTS

A total of 4922 students including 1165 (23.7%) primary school, 2674 (54.3%) secondary school and 1083 (22.0%) high school students were included in this study conducted in primary and secondary schools located in Ortahisar district of Trabzon province. According to the results, the average age of the students was 12.2 ± 2.8 (6-18) years and total monthly household income was 1036.4 ± 969.9 (40.0-17333.3) \$. Sociodemographic characteristics of the students are presented in Table 2.

The daily plain water intake of students was found as 1199 ± 572 mL while the total daily fluid intake was 1611 ± 688 mL. Considering the daily fluid intake advice of NAM for gender and age groups, it was found that daily fluid intake of 2908 (62.6%) students was inadequate while the daily fluid intake of 1739 (37.4%) students was adequate. Plain water constituted 75% of daily fluid intake of the students. Daily water and fluid intake of the students are presented in Table 3. Daily water/fluid intake of the

students by their age and gender group is presented in Table 4. According to the statements of the students related to daily plain water intake moments, it was found that 4700 (95.5%) of the students consume water when they are thirsty, 3693 (75.0%) students when the weather is hot and 3385 (68.8%)

students consume water during their meal. It was determined that 3776 (76.7%) of the students consume tap water at home and 3299 (67.0%) students consume packaged water at school. Students' plain water intake patterns are presented in Table 5.

Table 2. Sociodemographic characteristics of the students

Demographic	n	%
Gender (n = 4846)		
Female	2578	53.2
Male	2268	46.8
Age group (n = 4747)		
Age 6-8	496	10.4
Age 9-13	2710	57.1
Age 14-18	1541	32.5
Educational status of mother (n = 4833)		
Illiterate/Literate	260	5.4
Primary school graduate	1048	21.7
Secondary school graduate	892	18.5
High school graduate	1342	27.7
University graduate	1291	26.7
Educational status of father (n = 4762)		
Illiterate/Literate	226	4.7
Primary school graduate	602	12.7
Secondary school graduate	876	18.4
High school graduate	1453	30.5
University graduate	1605	33.7
Engagement in sportive activities (n = 4922)		
Yes	2923	59.4
No	1999	40.6

Table 3. Daily water/fluid intake of the students

Fluid intake (mL/day)	Mean \pm SD	Median	Min. - Max.
Plain water	1199 \pm 572	1200	80 - 3078
Dairy products			
Milk	94 \pm 141	24	0 - 900
Ayran	82 \pm 121	32	0 - 780
Hot beverages			
Tea	84 \pm 119	30	0 - 660
Non-alcoholic beverages			
Fruit juice	74 \pm 117	24	0 - 900
Carbonated beverages	61 \pm 128	0	0 - 1279
Other beverages	18 \pm 65	0	0 - 900
Total fluid intake	1611 \pm 688	1505	233 - 3900

SD, standard deviation.

Table 4. Daily water/fluid intake of the students by their age and gender group

Fluid intake (mL/day)	6-8 age		9-14 age		14-18 age	
	Girl	Boy	Girl	Boy	Girl	Boy
Plain water	908±366	970±413	1146±555	1203±558	1292±603	1394±618
Beverage	320±290	311±343	414±372	455±390	362±346	460±421
Total fluid	1228±486	1281±532	1560±670	1658±690	1654±697	1854±714

Data are presented the mean with standard deviation.

Table 5. Plain water intake patterns of students*

Plain water intake patterns	n	%
Daily water intake moments		
Feeling thirsty	4700	95.5
Hot weather	3693	75.0
During the meal	3385	68.8
During sports	2675	54.3
Before sleeping	2178	44.3
After waking up	1783	36.2
Randomly	1394	28.3
On parental warning	456	9.3
Other	153	3.1
Water intake resources at home		
Tap water	3776	76.7
Packaged water	1698	34.5
Purified water	114	2.3
Other	130	2.6
Water intake resources at school		
Packaged water	3299	67.0
Water bottle	1431	29.1
Tap water at school	1102	22.4
Other	39	0.8

* Participants could select selected multiple items.

As a result of the analysis of factors affecting daily water intake, it was found that boys, older students, students with maternal education status of high school or higher, students with monthly household income more than 800 \$ and students engaging sportive activities consume more water. Daily fluid intake was higher among boys, older students, students with more than 2 siblings, students with monthly household income more than 800 \$, and students engaging sportive activities. Factors

affecting daily water and fluid intake of students are presented in Table 6.

According to the results of logistic regression analysis, it was found that being in male gender group, being in the older age group, having maternal education status lower than high school, having 2 siblings or more and the absence of sportive activities are the risk factors of inadequate fluid intake. Factors affecting students' inadequate daily fluid intake are presented in Table 7.

Table 6. Factors affecting daily water and fluid intake of students

Factors	Daily water intake (mL)	<i>p</i>	Daily fluid intake (mL)	<i>p</i>
	Mean ± SD		Mean ± SD	
Gender				
Female	1168 ± 567	< 0.001	1555 ± 673	< 0.001
Male	1238 ± 578		1680 ± 700	
Age group				
Age 6-8	939 ± 389	< 0.001	1255 ± 511	< 0.001
Age 9-13	1170 ± 558		1603 ± 682	
Age 14-18	1337 ± 610		1744 ± 710	
Educational status of mother				
Lower than high school	1176 ± 563	0.012	1605 ± 681	0.472
High school or higher	1222 ± 581		1622 ± 696	
Educational status of father				
Lower than high school	1173 ± 550	0.070	1608 ± 686	0.655
High school or higher	1216 ± 585		1618 ± 692	
Number of siblings				
≤ 2	1200 ± 575	0.280	1606 ± 688	0.013
> 2	1220 ± 570		1672 ± 697	
Household income (monthly)				
< 800 \$	1146 ± 541	< 0.001	1572 ± 659	0.002
≥ 800 \$	1250 ± 584		1662 ± 712	
Engagement in sportive activities				
Yes	1250 ± 583	< 0.001	1694 ± 703	< 0.001
No	1125 ± 549		1489 ± 646	

SD, standard deviation

Table 7. Factors affecting inadequate daily fluid intake of the students

Factors	Inadequate fluid intake		OR	95% CI
	n	%		
Gender				
Female	1433	58.2	Ref.	
Male	1471	67.7	1.681	1.471-1.921
Age group				
Age 6-8	214	46.0	Ref.	
Age 9-13	1599	59.9	1.895	1.515-2.370
Age > 14	1095	72.3	3.310	2.607-4.203
Educational status of mother				
Less than high school	1335	64.6	1.166	1.003-1.356
High school or higher	1520	60.7	Ref.	
Educational status of father				
Less than high school	1027	64.1	1.061	0.908-1.239
High school or higher	1791	61.8	Ref.	
Number of siblings				
≤ 2	2338	63.1	1.321	1.104-1.581
> 2	417	60.2	Ref.	
Engagement in sportive activities				
Yes	1694	60.9	Ref.	
No	1214	65.1	1.390	1.211-1.595

CI, confidence interval; OR, odds ratio; Ref., reference.

DISCUSSION

Inadequate water/fluid intake among children can be associated with negative health behaviors such as unbalanced and malnutrition, physical inactivity, and also with some diseases including constipation, urolithiasis and obesity²⁶. In this study, plain water intake of students was determined as 1199 mL/day. In other studies conducted in different countries, it has been revealed that the amount of children's water intake varies between 258-823 mL/day^{20,22,27-32}. According to the Turkish Nutrition and Health Survey issued in 2010, daily average water intake in Turkey is 694.1 mL among boys and 682.8 mL among girls at the age of 6-8; 788.4 mL among boys and 756.2 mL among girls at the age of 9-11; 788.9 mL among boys and 815.4 mL among girls at the age of 12-14; 947.6 mL among boys and 906.5 mL among girls at the age of 15-18²³. In the study of Guelinckx et al. carried out with children at the age of 4-17 from 13 different countries, it was found that plain water intake in Turkey is 773 mL/day among boys and 851 mL/day among girls²⁴. In this study, considering the amounts recommended by the National Medical Academy, daily water intake of 62.6% of students was inadequate. In studies conducted in different countries, it has been indicated that water intake of 75-90% of the children is below the recommended amounts^{20,28,31,32}. According to the study of Iglesia et al., the amounts of water consumed by 25-50% of the children in Turkey are inadequate and this ratio is lower compared to other countries²⁵. Besides, it was found in this study that total fluid intake of the students is 1611 mL/day. In the study of Duffey et al. conducted in 10 different European countries, total fluid intake (TFI) of adolescents was 1455 mL/day, in the study of Fenández-olvira et al. conducted in Spain with the children at the age of 3-17, TFI was 1669 mL/day, in the study of Bougatsas et al. conducted in Greece with the children at the age of 8-14, TFI was 1771 mL/day and in the study of Bello et al. conducted in Saudi Arabia with the children at the age of 12-13, TFI was 1917 mL/day^{30,32-34}. Differences in the amount of water intake in the studies might be in part related to dissimilarities in climatical conditions and collection of data during distinct seasons. Because water needs might be influenced by temperature, humidity and seasonal variation^{1,3}. However, in the present study, despite of the fact that the data was compiled during a temperate season, a favorable finding was that the amount of fluid intake was relatively high and insufficient intake rates were lower among the

participants than those reported in other studies. On the other hand, when the potential effects of lack of hydration are taken into consideration, it is noteworthy that more than a half of the students are exposed to insufficient fluid intake risks, which delineates the continuing importance of the topic in regard to child health.

The quality of the fluid can affect health in a both positive or negative way. However, although it is recommended to consume plain water, individuals can meet this need from different fluids. For example, it is known that beverages containing high levels of sugar cause several health problems, particularly obesity³⁶. Although there is no recommendation about the proportion of plain water in daily fluid intake, studies have revealed that high amounts of plain water intake is more related to the decrease of the inadequate hydration risk compared to other beverages^{35,37}. The proportion of plain water in the daily fluid intake was reported in the study of Senterre et al. with school-age children in Belgium as 41%, in the study of Bello and Al-Hammad with the children at the age of 12-13 in Arabia as 37% and in the study of Feferbaum et al. with the children at the age of 3-17 in Brazil as 31-34%^{30,35,38}. In their study about water and fluid intake of children and adolescences in 13 different countries, Guelinckx et al. found that this proportion is below 50% in 11 countries and is also 46-50% in Turkey²⁴. In this study, it was observed that students' daily plain water intake constitutes 75% of total fluid intake.

In the literature, while no difference has been found between gender groups in some studies investigating the effect of gender on water and fluid intake^{22,24,28,32,34}, in certain studies, water and fluid intake amounts of boys are higher than girls^{20,27,29,31,34}. In the present study, although the water and fluid intake of boys was statistically and significantly higher compared to girls, in the logistic regression analysis, it was found that male students were at higher risk of inadequate fluid intake (OR=1.681, 95% CI=1.471-1.921). These findings reveal that the group of male children should be intervened to improve their healthy water/fluid consumption habits.

It is expected that the need for fluid will increase with age due to the differences in water requirement³. In this study, it was found that the amount of water and fluid intake increases significantly in parallel with age, but the amount of daily fluid intake of older children is more inadequate. According to the studies, although children consume more water and fluid as

they get older^{20,22,28,31}; these amounts are not adequate and older children are at higher risk of inadequate fluid intake^{22,28,31,35}.

Could physical activity play a role in these results arising with increasing age? Physical activities are beneficial for children and young people. Children engaging in intense physical activities will behave to fulfill their body needs³⁹. In addition, since high physical activity is associated with positive healthy behaviors, these children may have higher awareness of physical health⁴⁰. Similarly, it was found in this study that the students engaging in intense physical activities had higher water/fluid intake amounts and their daily fluid intake was more adequate compared to the students not engaging in physical activities. In addition, in the study of Kant and Graubard with children at the age of 2-19 in United States and the study of Senterre et al. with school-age children in Belgium, it was reported that children engaging in more physical activities have higher daily water intake than those who engage in less physical activities^{29,35}.

The high level of educational status and awareness of the mothers play an important role in the development of nutrition and other healthy lifestyle habits, including children's fluid intake^{41,42}. For example, in their studies with pre-school children, Ebenegger et al. and Pinket et al. stated that children with lower maternal education status consume less plain water^{43,44}. However, in the study of Kant et al. conducted in United States the education level of the parents did not affect the water and fluid intake of children²⁹. In this study, it was found that children with higher maternal educational status had higher water intake and lower risk of inadequate fluid intake. This finding of the study emphasizes the importance of maternal education status in adequate and healthy fluid intake of children. In fact, according to the responses of some of the students (9.3%) in the study, they consume water on parental warning and this finding shows that parents closely monitor and give importance to water intake of their children.

In the literature, there are different findings of studies investigating the effect of income level on children's water and fluid intake. In some of the studies, it was determined that income level did not affect the amount of plain water intake^{29,31,45} while Drewnowski et al., in their study conducted in United States and Vieux et al., in their study conducted in United Kingdom reported that the amount of plain water intake of children increases in parallel with the income level^{28,22}. Similarly, in the present study, it was

found that the students with high income level had higher water and fluid intake, but in the logistic regression analysis, the income level was not associated with adequate fluid intake.

Tap water, which is low cost, widespread in settlements and schools, is constantly and effectively checked in terms of health, environmentally friendly due to the use of air pollution-free technology in its transportation to households and contains some necessary natural minerals, should be the main drinking water resource^{46,47}. On the other hand, it is stated that the consumption of packaged water increases the risk of acute diarrhea in children and is associated with inadequate fluoride intake⁴⁸. However, packaged water consumption is increasing all over the world⁴⁹. For example, it is reported that even in countries such as France and the United States where tap water systems are well-developed, only 53% and 60% of children consume tap water^{20,28}. Additionally, in a study conducted by Patel et al. with middle school students in the United States, 59% of the students thought that water taps in schools were dirty and 80% of them had negative attitude towards using taps in school⁵⁰. In the present study, it was found that 77% of the students preferred tap water at home, while 67% of them prefer packaged water at school and these results suggest that there are some concerns about providing healthy and safe drinking water in schools.

This study had some limitations. A source for bias might have arose since the amounts of daily fluid intake are based on self-report and recollection. Additionally, although the questionnaires were answered together with the parents or under the supervision of the teachers, the fact that they were filled in by the children have lead to incompletely or incorrectly filled questionnaires which were excluded from the study. Despite these limitations, since the number of participants enrolled is sufficient to represent the universe and the research is one of the first studies covering this topic in our country, it is inferred that it will make an important contribution to the literature.

In conclusion, although the amount of daily water intake of students in our country is high compared to the other literature findings, it should be noted that the amount of fluid intake of more than half of the children is inadequate. This result reveals that fluid deficiency in children is an important public health problem. The amount of daily water intake of boys, older children, children with maternal educational

status higher than high school, children with high monthly income and those engaging in sportive activities is higher. On the other hand, it is indicated that daily fluid intake of boys, older children, children with maternal education status of high school or lower and children not engaging in physical activities is inadequate. The awareness of water and fluid intake habits of children should be raised among parents, particularly among mothers. In addition, from a holistic approach, in terms of gaining healthy living habits, engagement in sportive activities is important for children's fluid intake.

It is a significant finding of the study that students mostly prefer packaged water in schools. Facilitating access to clean drinking water in schools will considerably contribute to the increase of water intake. For this purpose, it may be suggested to increase the number of taps providing clean drinking water in schools apart from toilets.

Yazar Katkıları: Çalışma konsepti/Tasarımı: BPS, MT; Veri toplama: BPS, KŞ, CA, MGÜ, ID, YEB; Veri analizi ve yorumlama: BPS, MT, KŞ, CAG, MGÜ, ID; Yazı taslağı: BPS, MT, KŞ, CAG, MGÜ, ID, YEB, GÇ; İçeriğin eleştirel incelenmesi: BPS, MT, KŞ, CAG, MGÜ, ID, YEB, GÇ; Son onay ve sorumluluk: BPS, MT, KŞ, CAG, MGÜ, ID, YEB, GÇ; Teknik ve malzeme desteği: -; Süpervizyon: BPS, MT, GÇ; Fon sağlama (mevcut ise): yok.

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