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Theory of planned behavior to analyze students' intentions in consuming tap water

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Abstract

Increased consumption of bottled water has a negative impact on the environment due to plastic waste. This study intends to assess the perceptions of Indonesian students toward tap water. This cross-sectional survey was conducted online using an online questionnaire. From 1,034 undergraduate students, our findings revealed that Indonesian students had a relatively low rate of bottled water consumption. Employing the framework of the theory of planned behavior, all factors were recognized as significant factors driving tap water consumption. Students who reported drinking two or fewer bottles of water per week perceive that tap water is safe and clean for consumption is practical, and has almost the same color, taste, and smell as bottled water. Students concede that consuming tap water is a habit and consider this action necessary to preserve the environment. As observed from demographic characteristics, students' fields of study affect the choice of drinking water. This study has contributed to uncovering the identified factors that determine the habits of students consuming tap water. Apart from the importance of environmental education, increasing the availability of ready-to-drink tap water facilities and disseminating information regarding the benefits and safety of consuming this water are also important factors in reducing the use of bottled water.

Keywords: theory of planned behavior, students' perception, environmental education

INTRODUCTION

Water is an important resource for daily life. It influences people's welfare. Some developed countries worldwide have succeeded in providing safe tap water for their citizens (Qian, 2018). However, several countries are still unable to optimally provide safe tap water, particularly developing countries (Edokpayi et

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Contribution to the literature

- The habit of consuming bottled water excessively has a negative impact on the environment. Universities play an important role in educating students to have pro-environmental behavior but research on the behavior of Indonesian students regarding water consumption is still rarely published.
- This survey research seeks to explore student perceptions regarding the habit of consuming tap water by using the theory of planned behavior.
- The findings of this study inform that many Indonesian students are accustomed to consuming tap water because of their awareness to protect the environment.

al., 2018) and low and middle-income countries (Bain et al., 2014) including Indonesia (Afifah et al., 2018). One of the alternatives to increase the accessibility of drinking water is to increase the production and distribution of bottled water. Bottled water is said to have an important role in achieving SDSs 6.1 (Walter et al., 2017). Asia and the Pacific are currently the largest regional markets for bottled water globally (Euromonitor International, 2020). In Indonesia, bottled water consumption increased by more than 12% per year from 2009 to 2014 (Prasetiawan et al., 2017).

The increase in bottled water consumption attracts considerable attention. The success of the bottled water industry has created a moral contradiction. Under international agreements, water is a public good and access to clean drinking water is a human right (Wilk, 2006). Nationally, it also contradicts the Constitution of the Republic of Indonesia Article 33 of 1945 (Ruslina, 2016). In addition, attention should be paid to the ecosystem destruction impact of the bottled water industry. First, production and distribution require up to 2000 times more energy than tap water (Gleick & Cooley, 2009). There is concern that distribution could increase emissions of greenhouse gases and other pollutants (Ballantine et al., 2019). Second, bottled water has negative environmental impacts, such as increasing plastic waste (Aslani et al., 2021; Ryan et al., 2019). Meanwhile, not all parts of plastic bottle waste are economically viable for recycling (Kristina et al., 2018). Third, related to safety and health, bottled water companies in Indonesia are among those that are less regulated. Many small-scale bottled water companies have not considered the risks of microplastics. It was recently reported that microplastics were detected in bottled water worldwide (Samandra et al., 2022; Weisser et al., 2021). There is a chemical transfer named bisphenol A (Abraham & Chakraborty, 2020) and antimony from plastic to water (Chu et al., 2021; Hu et al., 2021). Fourth, the rapid development of bottled water companies can conflict with the principles of sustainable development in the SDGs (Herrera, 2019).

Problems caused by bottled water consumption have convinced the public including students to adopt sustainable behavior by choosing tap water for consumption (Saylor et al., 2011). In this regard, education has an important role in developing sustainable behavior. In Indonesia, through science lessons in elementary school, students learn about environmental change, how to save energy, environmental balance, and waste management (Winanti et al., 2019). During junior high school, they studied several topics related to environmental conditions, such as global warming (Maulaa et al., 2020). While in high school, students also study environmental topics in biology class (Faisal & Martin, 2019). In addition to science subjects, geography subjects also play a role in teaching students to maintain the environmental sustainability. In geography subject, students gain knowledge about environmental problems and how to overcome them (Urbańska et al., 2021). These subjects are also expected to be able to optimize students' environmental awareness (Hanifah et al., 2020) and environmental ethics (Mahat et al., 2022). Awareness of the importance of protecting and preserving the environment plays an important role in changing students' habits to be responsible for their environment (Hanifah et al., 2020). Furthermore, improving environmental ethics will increase the positive relationship between students and their environmental conditions. However, people's attitudes toward environmental issues are still considered to be concerning (Hanifah et al., 2020). Therefore, the role of other educational institutions needs to be increased so that environmental sustainability can be optimally achieved.

Besides schools, universities are also believed to be the main drivers in educating about sustainable development (Abdah et al., 2020; Díez et al., 2018; Qian, 2018; Rahman et al., 2017; Saylor et al., 2011). In particular, to provide students with a broad understanding of the environmental hazards of consuming large quantities of bottled water (Sterling, 2004). Protecting the environment and preserving natural resources are key elements of sustainable university management (Dumitrascu & Ciudin, 2015). The current trend shows that universities start adopting a sustainability approach for their facility management and a holistic approach that explicitly links research and education (Mcmillin & Dyball, 2009). The effort is in line with one of the statements in SDGs 6 that changes in sustainable consumption and production must be driven by education and behavior change.

Students are one of the community groups with considerable concern for the environment (Qian, 2018). There is an assumption that bottled water is considered easier to drink as well as tastes better than tap water and thus is chosen (Juba & Tanyanyiwa, 2018; Raj, 2005). Therefore, research on this group in terms of perceptions and choices in drinking water is very important since it can serve as a catalyst to promote practical change on a wider scale (Colding & Barthel, 2017; Nunes et al., 2018; Sedlacek, 2013). In other words, it can be a steppingstone to understand the behavior of the general public. Student perceptions will affect the increasing transparency and credibility of institutions that are responsible for improving the quality of drinking water (Rahman et al., 2017), including universities in providing safe tap water for consumption for their students.

Although there have been many studies discussing student perceptions (Abdah et al., 2020; Qian, 2018; Saylor et al., 2011), there is still a need to identify this attitude in the local context in Indonesia. To date, there is no ban on plastic bottles at universities in Indonesia. On the other hand, commercialization, availability, and consumption of bottled water keep increasing. Some universities provide bottled water products with the university's logo and name. Thus, student perceptions play a major role in determining drinking water behavior and choices (Doria, 2006; Hu et al., 2011). To the best of the author's knowledge, research on Indonesian students' perceptions of bottled drinking water and tap water has not yet been conducted.

In this study, students' drinking water choices, the factors that determine their choice, and how the choice of consuming tap water for pro-environmental intentions was explored. In detail, this study used the theory of planned behavior (TPB) as a theoretical framework. This study intends to

(1) examine the behavior of current student drinking water choices,

(2) identify the main factors that determine the students' drinking water choice,

(3) know students' perceptions of the risks and benefits of consuming tap water,

(4) know students' perceptions of the environmental implications of tap water consumption,

(5) know student' perceptions on the benefits of using reusable bottles, and

(6) know students' perceptions of sustainable behavior by reducing bottled water consumption.

To measure the extent to which the university has made the efforts, we also examined the university's efforts to recycle used plastic bottles to reduce the negative impact on the environment. This study also explored the university's efforts to provide tap water as a real alternative to reducing bottled water consumption.

In this study, we hypothesized that student perceptions would be based on an individual's consumption of bottled water as shown in previous studies (Díez et al., 2018; Qian, 2018; Saylor et al., 2011). We also hypothesized that participants' beliefs may differ that demographic factors influence their drinking water choice. It has been stated by a number of previous studies that tap water quality can be associated with demographic variations such as gender, age, and income (Abdah et al., 2020; Anadu & Harding, 2000; Díez et al., 2018; Flynn et al., 1994; Saylor et al., 2011).

METHODOLOGY

Research Design

This study adopted an online cross-sectional descriptive survey to evaluate perceptions of tap water consumption among Indonesian students. This study aims to gain insight into students' perceptions of bottled water versus tap water consumption as well as and their environmental impact. Participants in the study were 1,034 undergraduate students (the academic year 2020/2021). The average age of the participants was 20 years.

Since the university was closed due to a pandemic at the time of data collection, population-based surveys were not possible. The questionnaire was designed and distributed using a Google Form was shared in the lecturer's WhatsApp group. The link was also shared privately with other lecturers by the principal researcher. Lecturers are required to complete approval from the department before forwarding the URL to their students. Links sent to students were shared with fellow students. Thus, the technique used in this survey is snowball sampling to help select and expand respondents (Creswell, 2014).

Questionnaire Design

This exploratory survey was conducted in March 2021. The questionnaire was adapted from previous similar studies (Díez et al., 2018; Qian, 2018; Saylor et al., 2011). The questionnaire was translated from English into Indonesian. The questionnaire included 48 items (24 pairs of positive and negative items), which were grouped into four measurement factors referring to TPB, as has been done by Harland et al. (1999). Harland et al. (1999) highlight the role of personal norms:

(1) attitude with 12 pairs of items (24 items),

(2) subjective norms with six pairs of items (12 items),

(3) perceived behavioral control with three pairs of items (six items), and

(4) personal norms with three pairs of items (six items).

The questionnaire also included items on the demographic characteristics such as gender, number of

household members, community type, family income, the field of study, and school year.

The SPSS for Windows and Winstep were used to assess the quality of the questionnaire items using descriptive analysis (mean and standard deviation [SD]), correlation with Pearson correlation, and the Rasch model. This trial involved 250 respondents. The sample size is sufficient to produce good output in the Rasch test (Hagell & Westergren, 2016). This series of trials were conducted to ensure the validity and reliability of the questionnaire. The initial instrument consisted of 61 items and the results of the empirical validation showed there were 24 pairs of items that met the criteria. The SD of each item did not reach 2.5 SD, which was between 0.56-1.24. The point-biserial correlation coefficient was less than 0.05 (significant) with a moderate level (0.13-0.57). Almost all items had MNSQ, Zstd, and PTMEA scores according to the recommendations (Bond & Fox, 2007). Some of the items did not meet one of them but can still be maintained with revisions (Ismail et al., 2020). The consistency of the answers was classified as good (Pearson reliability= 0.80). The quality of the items in the special instrument (item reliability= 0.99). This value reflects that the questionnaire can be widely distributed (Gerbing & Anderson, 1988). Cronbach's alpha value was good (α=0.83) (Guilford, 1956).

Data Analysis

Survey responses were downloaded from Google Drive in the form of an excel file which was exported to the SPSS for Windows software. Based on the distribution of responses to the question "During the past week, how many bottles of water did you drink?" we made an ordinal variable for the level of bottled water consumption. This variable categorized respondents into groups based on how much bottled water they drink in the past week (i.e., responses from zero bottle were recoded as 1; one or two bottles were recoded as 2, three to five bottles were recoded as 3, and six or more bottles are recoded as 4). This ordinal variable facilitated comparisons between groups with different levels of bottled water consumption.

Since the data was extracted from the Likert scale (five points), the data were treated as ordinal. Meanwhile, demographic characteristics are nominal data. Thus, the data were analyzed using the following non-parametric method (Lomax & Hahs-Vaughn, 2012). First, Kruskal-Wallis test by ranks or one-way ANOVA on rank test was used to compare students' perceptions on bottled water and tap water consumption. Post-hoc pairwise comparisons of the mean rank were performed using the "kluskal mc". Second, Spearman's correlation was conducted to evaluate the correlation of TPB factors with drinking water choice. Third, the chi-squared test was conducted to see the relationship between demographic characteristics (gender, school year, number of household members, community type, family income, and field of study) and drinking water choice.

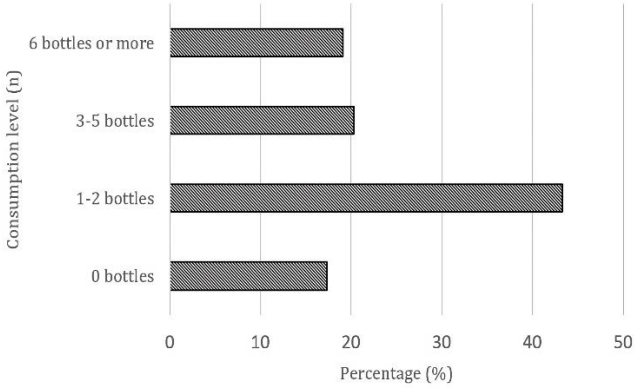

Figure 1. Weekly self-reported consumption of bottled water by Indonesian students (Source: Authors' own elaboration, using Microsoft Excel software)

RESULTS

Demographic Characteristics

One-third (76.3%) of the participants were women. They were dominated by second-year students of 396 students (38.3%). More than half of the participants were education students (59.2%). About half of participants (54.7%) were from families with 3-4 household members. Nearly one-third of the respondents came from villages (73.8%). Students with a family income of less than IDR 2,000,000 (55.8%) more than those whose income is more than IDR 2,000,000 (44.2%).

Drinking Water Choice

Respondents were asked to determine how many single-use plastic water bottles they consumed in the past week by choosing from four categories. Approximately, 20.3% and 19.1% of the respondents reported consuming from three to five to more than six bottles per week, respectively (**Figure 1**). Respondents who chose categories 1 or 2 were asked to name the material of bottle they usually use to drink water. Around 75.1% stated that they use reusable bottles (tumblers), and 24.9% answered that they use glasses. Collectively, these results indicate that students drink tap water more regularly than bottled water.

Student Perception

Statistical analysis using Kruskal-Wallis H showed that students who consumed tap water expressed a much more positive attitude towards tap water quality than the other groups (consuming bottled water), except in terms of safety from biological contaminants, availability, and affordability. Although practically it showed a higher attitude, statistically it did not show a significant difference (**Table 1**). The data source was processed from the results of the Kruskal-Wallis H test.

Table 1. Student perceptions on the risks and benefits of consuming tap water

Aspect	Consumption rate during the past week			
	1 (0 bottle) (n=179)	2 (1-2 bottles) (n=448)	3 (3-5 bottles) (n=210)	4 (6 or more bottles) (n=197)
Tap water safety in general*	589.45 (a)	528.02 (ab)	484.68 (b)	436.18 (b)
Tap water safety from biological contaminants	547.27	514.54	511.90	503.15
Tap water cleanliness*	610.40 (a)	518.06 (b)	472.78 (b)	479.49 (b)
Tap water practicality*	586.12 (a)	530.58 (ab)	469.07 (b)	477.03 (b)
Tap water availability	514.02	523.26	533.83	490.16
Tap water affordability	548.63	500.98	515.00	529.46
Tap water clarity (color)*	573.46 (a)	500.32 (b)	505.48 (ab)	518.53 (ab)
Tap water taste*	567.08 (a)	541.77 (ab)	460.59 (b)	477.91 (b)
Tap water smell*	566.19 (a)	529.21 (ab)	458.54 (b)	509.48 (ab)
Trust in the government in providing ready-to-drink tap water*	565.56 (a)	533.49 (ab)	464.91 (b)	493.44 (ab)
Trust in campus in providing ready-to-drink tap water*	533.91 (ab)	496.63 (b)	503.55 (ab)	564.93 (a)
Trust in campus in providing information about ready-to-drink tap water*	626.50 (a)	506.50 (b)	479.70 (b)	483.96 (b)

Note. For items marked with an asterisk, Kruskal-Wallis H with Bonferroni correction shows statistical differences between groups & *The mean rating values with the same letter are not significantly different at the 5% confidence level based on subsequent pairwise comparisons of the mean ratings between groups

Table 2. Students' perceptions of the environmental implications of tap water consumption

Aspect	Consumption rate during the past week			
	1 (0 bottle) (n=179)	2 (1-2 bottles) (n=448)	3 (3-5 bottles) (n=210)	4 (6 or more bottles) (n=197)
Personal habits*	667.38 (a)	546.80 (b)	414.79 (c)	424.18 (c)
Family habits*	636.35 (a)	545.03 (b)	429.45 (c)	440.75 (c)
Habits in choosing reusable bottle *	639.62 (a)	501.90 (b)	461.60 (b)	501.61 (b)
Concern for environmental sustainability*	601.31 (a)	510.74 (b)	491.85 (b)	484.07 (b)
Concern for waste reduction*	628.52 (a)	506.20 (b)	474.36 (b)	488.29 (b)
Concern for the issue of global warming*	640.94 (a)	511.26 (b)	476.57 (b)	463.15 (b)

Note. For items marked with an asterisk, Kruskal-Wallis H with Bonferroni correction shows statistical differences between groups & *The mean rating values with the same letter are not significantly different at the 5% confidence level based on subsequent pairwise comparisons of the mean ratings between groups

Table 3. Student perceptions on the benefits of using reusable bottles

Aspect	Consumption rate during the past week			
	1 (0 bottle) (n=179)	2 (1-2 bottles) (n=448)	3 (3-5 bottles) (n=210)	4 (6 or more bottles) (n=197)
Reusable bottle is easy to clean*	604.65 (a)	511.52 (b)	496.48 (b)	474.31 (b)
Reusable bottle is easy to carry*	567.22 (a)	525.11 (ab)	487.85 (b)	486.63 (b)
Reusable bottle is easy to recycle	484.54	522.18	521.89	532.14

Note. For items marked with an asterisk, Kruskal-Wallis H with Bonferroni correction shows statistical differences between groups & *The mean rating values with the same letter are not significantly different at the 5% confidence level based on subsequent pairwise comparisons of the mean ratings between groups

For easier interpretation, a low value indicated a low level of agreement, and a high value indicated a high level of agreement.

Students who consume tap water also have a higher concern for the environment than those who consume bottled water. They stated that consuming tap water is a personal and family habit (**Table 2**). The data source was processed from the results of the Kruskal-Wallis H test. For easier interpretation, a low value indicated a low level of agreement, and a high value indicated a high level of agreement.

From the third aspect, regarding the use of reusable bottles (tumblers), students who consume tap water agree that tumblers are easy to clean and easy to carry. In addition, although practically they disagree that plastic bottles are easy to recycle, they are not statistically significantly different from the group of students who consume bottled water (**Table 3**). The data source was processed from the results of the Kruskal-Wallis H test. For easier interpretation, a low value indicated a low level of agreement, and a high value indicated a high level of agreement.

Table 4. Student perceptions on sustainable behavior by reducing bottled water consumption

Aspect	Consumption rate during the past week			
	1 (0 bottle) (n=179)	2 (1-2 bottles) (n=448)	3 (3-5 bottles) (n=210)	4 (6 or more bottles) (n=197)
Awareness to bring drinking water from home*	616.97 (a)	516.51 (b)	491.50 (b)	457.09 (b)
Awareness to motivate others using reusable bottle*	537.82 (ab)	514.95 (b)	469.95 (b)	555.53 (a)
Awareness to encourage others to reduce bottled water consumption*	586.94 (a)	519.89 (ab)	485.77 (b)	482.80 (b)

Note. For items marked with an asterisk, Kruskal-Wallis H with Bonferroni correction shows statistical differences between groups & *The mean rating values with the same letter are not significantly different at the 5% confidence level based on subsequent pairwise comparisons of the mean ratings between groups

Table 5. Correlation test in the theory of planned behavior framework

TPB framework	Factors	Correlation with behavior	p-value
Attitude	Safety and cleanliness	0.591	<0.001
	Convenience and availability	0.458	<0.001
	Organoleptic	0.580	<0.001
	Trust in authority	0.551	<0.001
Subjective norms	Habit	0.722	<0.001
	Environmental concern	0.586	<0.001
Perceived behavioral control	Constraints using non-plastic bottles	0.418	<0.001
Personal norm	Self-impact	0.596	<0.001

Finally, related to sustainable behavior, **Table 4** shows that students who consume tap water agree that to support pro-environmental behavior, one should bring water from home in a tumbler. This can also influence others to do the same and reduce bottled water consumption. The data source was processed from the results of the Kruskal-Wallis H test. For easier interpretation, a low value indicated a low level of agreement, and a high value indicated a high level of agreement.

Overall, the factors in these four aspects significantly affect the choice and behavior in choosing drinking water ($p<0.01$) (**Table 5**), where the source of the data was processed from the results of the Spearman test.

Differences Based on Demographic Characteristics

Statistical analysis using chi-square test showed that gender ($\chi2=0.218$, $p=0.641$), school year ($\chi2=4.108$, $p=0.392$), number of household members ($\chi2=0.995$, $p=0.803$), community type ($\chi2=0.535$, $p=0.464$), and family income ($\chi2=0.000$, $p=0.985$) were not related to students' choice of drinking water. Meanwhile, students' field of study associated with drinking water choice ($\chi2=25.664$, $p=0.001$), where art and design students are more likely to choose tap water compared to bottled water with a ratio of 2:1.

It was followed by students from the language and mathematics and natural science fields with a ratio of 1:3, technology and engineering students with a ratio of 1:4, and students from education with a ratio of 1:5.

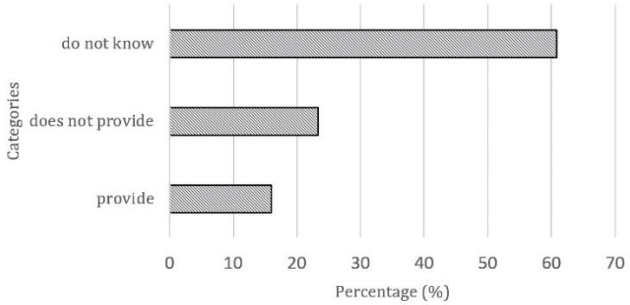

Figure 2. Student responses to questions on university's efforts to provide a plastic bottle recycling (Source: Authors' own elaboration, using Microsoft Excel software)

University's Efforts in Mitigating Impact of Bottled Water Consumption and in Providing Tap Water

Respondents were asked to inform whether their university has a place for recycling plastic bottles and whether they provide ready-to-drink tap water for students. Only 16% of students stated that their campus provided a place for recycling plastic bottles, 23.2% of them said no, the remaining 60.8% said they did not know (**Figure 2**). Meanwhile, in terms of ready-to-drink tap water availability, only 16.4% stated that their campus provided ready-to-drink tap water. 55.9% said no and 27.7% said they did not know (**Figure 3**).

DISCUSSION

The survey results show that the choice of drinking water for students is bottled water. However, beyond our estimates, most students only consume one-two bottles per week. The number of students who only drank tap water was almost the same as students who consumed large amounts of bottled water (six bottles or

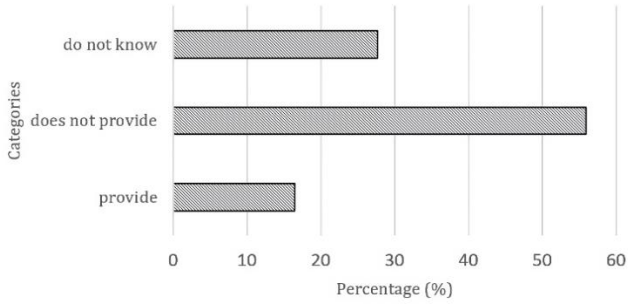

Figure 3. Student responses to questions on university efforts to provide tap drinking water (Source: Authors' own elaboration, using Microsoft Excel software)

more). Collectively, students tend to consume tap water. This is in line with the results of the previous study (Díez et al., 2018) and contradicts several other research results (Abdah et al., 2020; Qian, 2018; Saylor et al., 2011).

The results of this study may be closely related to several factors reinforced by a strong positive correlation between factors and behavior. First, the habit factor. Consistent with TPB, the group that only drank tap water and drank a little bottled water (one-two bottles) stated that the habit of drinking tap water was their personal and family habit (Xu & Lin, 2018). They also stated that even if they had to buy bottled water, they would buy reusable bottles.

The second part deals with the factor of trust in authority. The group that only drank tap water had a high trust. This may be related to the government regulation of providing ready-to-drink tap water in several regions in Indonesia. This result is quite encouraging since a study reported that in a country where tap water is affordable, clean, and safe, there are still denials from the community to the government (Wilk, 2006). From these results, we can see that discrediting services and inadequate public information by water suppliers and regulators are factors that greatly influence the choice of drinking water.

Third, from the results of the analysis related to demographic factors, students' field of science affects the choice of drinking water. Students who are grouped in literature, language, and art have a more positive habit of consuming tap water than other groups. Meanwhile, other demographic factors such as gender and family income are not associated with drinking water choices. The results of this study contradict previous studies (Dupont et al., 2010).

Survey analysis showed that the group of students who only drank tap water had a higher awareness of environmental impacts than other groups. This is in line with previous research that reducing bottled water consumption has a positive impact on the environment, especially reducing plastic waste (Abdah et al., 2020). Most of the students from this group stated that they used reusable bottles and felt comfortable using them because they were easy to carry and easy to clean. Individuals who have an intrinsic motivation to protect the environment tend to avoid single-use items and avoid products that cannot be recycled (Ebreo & Vining, 2001). Economically and environmentally, it is said that the behavior of using reusable bottles for water consumption is a better choice (Saylor et al., 2011).

The survey analysis also shows that perception of tap water consumption as a convenient (practical) choice is much greater than expected, and as our survey and previous studies show, these are closely related to the two main factors influencing preferences and consumption of tap water, which are their perceptions of perceived health risks and perceived benefits (de Queiroz et al., 2013; Doria, 2006). The group that only drank tap water and consumed small amounts of bottled water assumes that tap water has almost the same taste, color, and smell as bottled water. From a health perspective, they considered that tap water was clean and safe for consumption with proper processing. The main aspects that are usually the main concern in the selection of drinking water such as organoleptic and health (Ferrier, 2001) in tap water show no problem for students. Previous research has also revealed that bottled water has the same quality as bottled water, even worse (Ahmad & Bajahlan, 2009).

The survey results showing that most students could reduce bottled water consumption can be taken as proof of the success of the university in educating and providing knowledge to their students. This is encouraging since students have the power to influence other communities and generate social transformation (Di Fabio & Kenny, 2018). In our survey, consistent with the TPB framework, those who only drink tap water have high awareness to encourage and motivate others to reduce bottled water consumption and switch to using reusable bottles (Xu & Lin, 2018). This personal norm factor has an effect on drinking water behavior (Qian, 2018; Saylor et al., 2011). Thus, these results also prove that personal norms are an important modulating factor for effective behavior change.

Although the percentage of students consuming bottled water in large quantities is smaller, this group cannot be ignored. Campaign to reduce bottled water consumption is required for quick and wide social transformation. It is very important to convey persuasive information that reminds environmental concerns of the impact of excessive bottled water consumption and the benefits of drinking tap water (van der Linden, 2015). From TPB's point of view, campaign will be more effective if supported by behavioral changes that can be triggered by policy designs that enforce personal norms that support environmentally caring behavior (Qian, 2018). The combination of social norms and persuasive information will have a great effect on drinking water behavior (van der Linden, 2015).

Given that the availability of tap water varies from campus to campus, even very few campuses provide it, we agree with Díez et al. (2018) that a good starting point is the installation of tap water in each faculty building. One study also reported that a campaign to introduce bottle filling stations could increase students willingness to use reusable bottles (Uehara & Ynacay-Nye, 2018) thereby avoiding single-use plastic bottles (Díez et al., 2018). In this regard, we also adhere to the reflection by Hawkins (2011) emphasizing good water infrastructure and governance can promote tap water as a valuable and unique product. Considering that more students only drink tap water and consume small amounts of bottled water, effort to make tap water a real alternative for a sustainable university can run effectively.

Although more tap water across campuses needs to be encouraged, this does not mean that the sale and use of single-use plastic water bottles on campus should be totally banned. It will ignite a lot of criticism, especially from drinking water companies. In addition, there are doubts that it can increase tap water consumption and at the same time reduce waste in universities (Berman & Johnson, 2015; Bohme, 2016; Hawkins, 2011). The drinking water industry can also change its marketing strategy aggressively (Verma & Kushwaha, 2014). On the other hand, plastic bottles are still considered more practical (Doria, 2006; Juba & Tanyanyiwa, 2018; Raj, 2005). In addition, in some areas, it is difficult to get proper, clean, and safe drinking water. As stated by Walter et al. (2017), bottled water is still needed for equal access to water as stated in SDG's 6.1. It must be admitted that there is a big dilemma, on the one hand bottled, water plays a big role in providing clean water, on the other hand, there is a big issue regarding its social and environmental impacts (Brei & Böhm, 2011). The most reasonable action for the promotion of tap water consumption could be to limit the sale of bottled water in university canteens. Furthermore, to reduce the environmental impact of the use of single-use plastic bottles, universities need to recycle. Providing recycling stations remains one of the priorities considering that there are still very few campuses providing this. However, it must be noted that universities should involve students and provide opportunities for them to be directly involved in the recycling process. This effort can maximize students' sensitivity to social norms, and further increase participation (Vining & Ebreo, 1989).

CONCLUSION

There is information obtained from this survey research. First, regarding students' drinking water choices, only about 40% of students often consume bottled water, the rest 60% of them rarely and never consume it. From these results, it can be estimated that the availability of tap water for students is quite good. Therefore, the government and institutions (universities) need to continue to improve services and provide accurate information related to the quality of tap water, while keep educating the public about the risk of excessive consumption of bottled water and the benefits of consuming tap water. This effort will have a positive effect on a more massive social transformation considering that students have high trust in the government and institutions.

Second, regarding the reasons why students prefer certain types of water, all factors in the TPB framework are identified as significant factors that encourage the consumption of tap water among students. Third, students perceive that tap water is safe and clean for consumption, practical, and has almost the same color, taste, and smell as bottled water. Fourth, students admit that consuming tap water is a habit. This action is a manifestation of their concern for environmental issues and the impact of excessive drinking of bottled water. Fifth, students assert that reusable bottles are easy to carry and clean. Sixth, students consider that it is necessary to reduce the consumption of bottled water. Furthermore, judging from the demographic characteristics, the field of study influences the choice of drinking water. The arts and language groups tend to consume tap water. Broadly speaking, this research is following the TPB that changes in drinking water choice can be encouraged through the concern on the environment. Considering that students also have a strong drive to motivate and influence others (persuade) to reduce bottled water consumption, education and policies can be designed to encourage changes in student drinking water behavior.

Seventh, in terms of university efforts, to date, there are very few universities that provide places for recycling plastic bottles. Eight, tap water is a real alternative to reduce bottled water consumption. The limitation of this study is that the data do not discuss the relationship between the availability of tap water on campus and the level of bottled water consumption, perceptions of its quality, and concern for the environment. Regarding recommendations of reducing single-use plastic water bottles by providing tap water, further research investigating its impact on students' attitudes and choices towards tap water consumption should be conducted.

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