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Original Article

Inadequate water intake of breastfeeding women

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Summary. Despite evidence of importance of water for the general population' health, water intake estimates in breastfeeding women are lacking. Therefore, this study aimed at estimating water intakes and identifying dietary water sources in a sample of Croatian breastfeeding women one month postpartum. For the sake of comparison, water intakes of similarly aged non-breastfeeding postpartum women were estimated too. A total of 83 full-breastfeeding and 76 non-breastfeeding women were recruited. Data on total water intake were collected from two consecutive 24-hour dietary recalls. On average, the breastfeeding women take 73.61% and the non-breastfeeding 88.45% of the recommended water amount. In the breastfeeding women, 44.80% of the total water intake was represented by plain water, 20.02% by other beverages and 35.18% by food moisture, similar as with the non-breastfeeding group (39.40%, 28.30% and 32.30%, respectively). Except for the plain water, whose average intake was 890.32 ml/day in the breastfeeding and 696.24 ml/day in the non-breastfeeding women, the main water sources in the breastfeeding group were milk and dairy, while in the non-breastfeeding group these were sugar-sweetened beverages and vegetables. In the breastfeeding group, water intake positively correlated with the total ($r=0.47$; $p<0.001$), protein-derived ($r=0.16$; $p=0.036$) and carbohydrate-derived energy intake ($r=0.19$; $p<0.001$), but inversely with fat-derived energy intake ($r=-0.22$; $p=0.039$). The same was established in the non-breastfeeding group. Given that total water intake of the surveyed women was found inadequate, these estimates can guide both further research and messages raising general public awareness on the importance of adequate water intake in breastfeeding women.

Key words: beverages, breastfeeding women, dietary intake, food moisture, total water intake

Introduction

Water is the most represented constituent of the human body, essential for all of its main functions. It acts as a building material, a solvent, a reaction medium and a reactant, a carrier of nutrients and waste products, a thermal regulator, a lubricant and a shock absorber. Therefore, an adequate hydration is essential for life and for maintaining normal physical and cognitive functions (1). Water intake needs greatly vary between individuals, with a number of characteristics known to affect it, including age, sodium and protein intakes, climate and physical activity levels (2).

When it comes to nutrients intake assessments, water is often either disregarded or rarely mentioned, since most of the studies underestimate the importance of collecting data on water intake as a part of the given diet, which might be due to the fact that water does not contribute to energy intake. There exist no standardized questionnaires developed as research tools enabling for the evaluation of water intake in the general population. At times, the use of information from different sources and the use of different methodologies raise comparability issues difficult to overcome under the circumstances. Furthermore, dietary water intake is highly variable, the basic pattern of consump-

tion thereby significantly differing on a day-to-day basis, as well as depending on body size, physical activity and the surrounding climate (3).

Breastfeeding has been recognized as the best infant nutrition and has been recommended whenever possible. Many reports emphasize both short- and long-term benefits of breastfeeding for the mother and the infant (4). The effect of food and beverages taken by lactating women on the quality and quantity of their breast milk has been a topic of frequent discussion. Studies conducted on breastfeeding women have shown that the mother´s diet has greater impact on her long-term health than on the quality and quantity of her milk (5-7). On average, breast milk contains 88% of water (8), this content thereby varying depending on the time of day. During a single breastfeeding episode, the foremilk (the milk obtained at the beginning of breastfeeding) has higher water content and keeps the infant hydrated, whereas hindmilk (milk released by the end of the breastfeeding session) contains two to three times more fat than foremilk (9). Since breast milk is produced from the water contained by the maternal body, an average released milk volume of 750 to 850 ml/day represents a significant extra water loss as compared to usual daily losses. Maintaining water balance in breastfeeding women can therefore be challenging, and definitely makes them an extremely vulnerable population worth studying.

Several studies, including large cross-sectional ones, have examined the differences in consumption of various fluids (i.e. water, milk, fruit juice, coffee, tea, soft drinks, etc.) posing as water sources across various age and gender groups (10-17). Due to different study methodologies, the obtained results have shown significant inter-country differences in beverage consumption. However, data on water intake among breastfeeding women are lacking. To fill this gap, the objective of this study was to assess total water intake in a group of Croatian full- breastfeeding women one month postpartum. For the sake of comparison, water intakes of similarly aged non-breastfeeding one month postpartum women were assessed as well. Estimates of total (all-source) water intake (plain water, other beverages) and the intake of water coming from food moisture were compared against the European Food Safety Authority (EFSA) recommendations. The relationship between energy & macronutrient intakes and total water intakes was examined as well.

Subjects and Methods

Study participants

This study involved 83 full-breastfeeding and 76 non-breastfeeding women from the Croatian Primorsko-Goranska County, full breastfeeding thereby being defined as an almost exclusive breastfeeding allowing for some non-milk supplemental liquids (e.g. water or water-based drinks such as sweetened and flavoured water, teas and infusions), fruit juice, oral rehydration salt solution, drops and vitamins, minerals and medicines given in form of a syrup (18). The topic presented in this paper is a part of the comprehensive research whose aim was to investigate the relationship between dietary intake, changes in body composition and fatty acid profile of breast milk in a sample of breastfeeding women (19-21). The women included into the study were volunteers recruited in paediatric clinics 1 month ± 1 week postpartum *via* word-of-mouth. The sample selection criteria are described in detail elsewhere (21). After being thoroughly informed about the purpose, requirements and procedure of the study, all of the recruited women signed an informed consent. This research was conducted as a part of the national project coordinated by the Faculty of Food Technology University of Osijek as the Project Grant Holder. The research protocol was approved by the Board of Ethics of the above academic institution (Class 641-01/08-01/03 / Reg. No. 2158-82-01-08-02).

Food and beverage intake

Data on the mothers' intake of food and beverages were collected by a trained researcher during a home visit using two consecutive 24-hour recalls (that included one weekend day). In order to obtain reliable data, the researcher followed the multi-pass protocol. According to this protocol, the respondents first provide a list of all foods eaten and of all beverages drunk on the previous day using any recall strategy they desire (i.e. not necessarily in chronological order).

The interviewer then obtains a more detailed list by probing for additions to the listed items and by giving respondents an opportunity to recall the consumption of food initially omitted from the list. Finally, the interviewer reminds the respondents of the occasions on which they might have consumed any other food and makes additional entries if so necessary (22).

Water content in food and beverages

Macronutrient and water content in food and beverages was recorded using a computer programme based upon the Croatian Food Composition Tables (23) and data provided by the producers of food and beverages not included into the above Tables. Macronutrient representation in the diet of our subjects was established by virtue of comparing the amount of calories coming from carbohydrates, proteins and fat.

Food moisture originated from the following food: dairy, fruit, vegetables, legumes, cereals, sweets, meat, poultry and fish. The types of beverages under analysis included: plain water (tap and bottled), mineral water (plain or sparkling), milk (including milk and milk-based drinks such as cocoa or chocolate beverages), sugar-sweetened beverages, fruit juices (natural and canned, but sugar-free), coffee and tea (including instant coffee and tea in sachets), and alcoholic beverages.

Total water intake was calculated by summing up water contained in food and beverages consumed. The obtained values were then compared to the adequate intake (AI) recommended by the EFSA (8).

Data analysis

All variables were examined for normality of their distribution using the Kolmogorov-Smirnov test. Since the data were proven to be distributed normally, the results were expressed as means ± standard deviations. Statistical comparisons of the data obtained for breastfeeding and non-breastfeeding women were made using the *t*-test for continuous variables. In order to establish a possible linear relationship between daily energy intake, share of macronutrients in total daily energy intake and total water intake, Pearson´s correlation coefficients were calculated. Statistica 8.1 Software (StatSoft, Tulsa, Oklahoma, USA) was used for statistical analyses. All analyses were done separately for the breastfeeding and the non-breastfeeding women. P-values <0.05 were considered statistically significant.

Results

Description of the study sample

Physical characteristics of the study sample are summarized in Table 1. The women constituting our study groups did not statistically significantly differ in their physical characteristics. As explained in detail in our previous research (21) the fact that the majority of our study participants were primiparae could be the reason why they showed interest in taking part in this kind of research (Table 1).

Total water intake from food and beverages

In the breastfeeding women, the representation of plain water in their total water intake was 44.80%, the representation of other beverages 20.02% and the representation of food moisture 35.18% (Table 2). The similar goes for the non-breastfeeding group as well (39.40%, 28.30% and 32.30%, respectively). The breastfeeding women were proven to drink significantly more plain water ($p<0.001$) and more water with meals ($p=0.033$) as compared to their non-breastfeeding counterparts. However, the non-breastfeeding women were proven to drink significantly higher amounts of other beverages than the breastfeeding ones ($p=0.021$). When compared to the EFSA-rec-

Table 1. Physical characteristics of breastfeeding and non-breastfeeding study participants

	Breastfeeding (n=83)	**Non-breastfeeding (n=76)**	**p***
Age (years)	31.82 ± 4.60	30.52 ± 4.51	0.074
Height (cm)	168.36 ± 5.51	167.75 ± 6.64	0.582
Education (years)	13.54 ± 2.10	12.89 ± 2.23	0.060
Number of live births	1.49 ± 0.72	1.46 ± 0.74	0.796

** t-test*

ommended AI, the total water intake of the breastfeeding women was shown to meet 73.61% of the recommended value on average, which was lower than in the non-breastfeeding women (who met 88.45% of the EFSA-recommended AI) (Table 2).

In the breastfeeding group, 69 participants (83.13%) failed to meet the recommended water intake of 2,700 ml per day. This proportion was lower in the non-breastfeeding group, in which 47 participants (61.84%) drink less than the recommended 2,000 ml water per day (Figure 1). The range of total water intake given as the percentage of AI recommended for breastfeeding women spanned from 23.30% to 157.47%, while in the non-breastfeeding group the correspondent range spanned from 32.25% to 176.46% AI. The shortfall in water consumption seen among the breastfeeding group relative to the AI proposed by the EFSA ranged from 10 ml/day to 1,730 mL/day, while in the non-breastfeeding group this shortfall ranged from 50 ml/day to 1,430 ml/day (*data not shown*).

In order to get more detailed information on the volume of water originating from the selected beverages and foodstuffs, the results are presented as mL of water coming from the selected beverages and food, not as the intakes of the latter (for instance, mL of water coming from milk, not mL of milk drunk are presented). As for the fluids, the main contributor to the total water intake of both groups was plain water. As for the breastfeeding women, the next highest daily water intake contributor was milk (221.77±112.22 ml), followed by water coming from sugar-sweetened beverages (49.63±22.31 ml) and fruit juices (32.64±19.31 ml). The percent distribution of water originating from milk, sugar-sweetened beverages and fruit juices reads as follows: 17.20%, 3.85% and 2.53%, respectively. As for the non-breastfeeding women, sugar-sweetened beverages contributed to their total water intake with 155.82±102.11 ml of water (13.02%), followed by milk whose contribution was 147.04±107.21 ml of water (12.28%). If the two groups are to be compared, it can be seen that the second major contributor to the water intake of the breastfeeding women is milk ($p<0.001$), while in the non-breastfeeding women this role is played by sugar-sweetened beverages ($p<0.001$) (Figure 2).

Table 2. Total water intake (ml) of breastfeeding and non-breastfeeding women

	Breastfeeding (n=83)	Non-breastfeeding (n=76)	p*
Plain water	890.32 ± 310.18	696.24 ± 330.87	<0.001
Water in beverages	397.89 ± 280.81	500.33 ± 267.79	0.021
Total fluid	1289.20 ± 300.28	1197.22 ± 285.07	0.048
Water in food	699.36 ± 330.85	570.87 ± 420.35	0.033
Total water intake	1987.41 ± 464.61	1769.01 ± 411.86	0.002

** t–test*

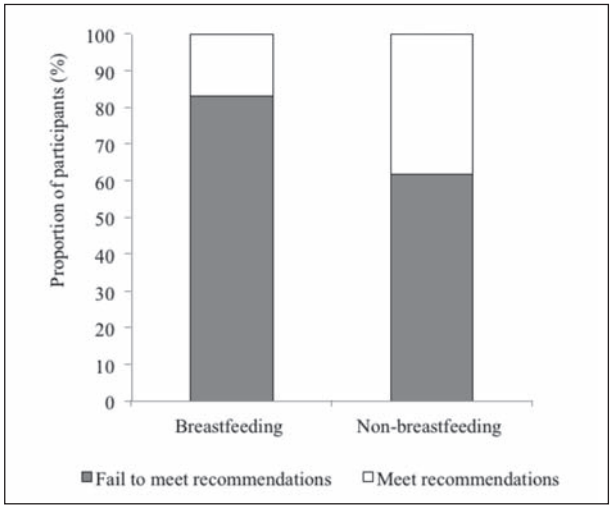

Figure 1. Proportion of breastfeeding and non-breastfeeding participants meeting EFSA- recommended total water intakes

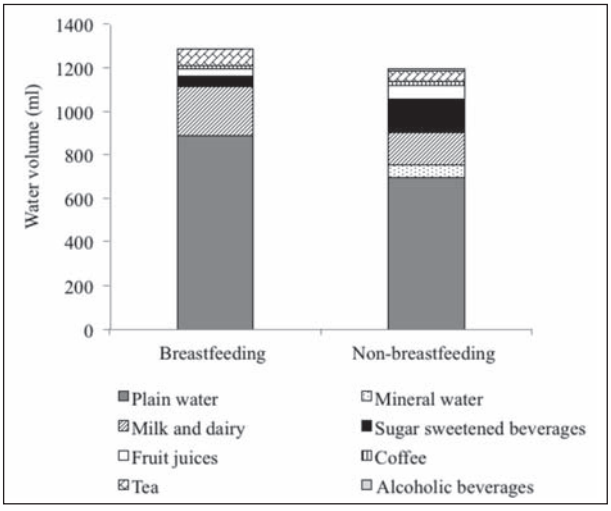

Figure 2. Daily water intake of breastfeeding and non-breastfeeding women provided by the consumed fluid

As for food, three major food groups that contributed to the daily water intake of breastfeeding women were dairy (194.22±132.15 ml), fruit (172.53± 93.68 ml) and vegetables (154.14±110.18 ml), while in the non-breastfeeding women the major contributors were as follows: vegetables (152.02±114.32 ml), fruit (142.95±91.12 ml) and dairy (113.77±98.32 ml) (Figure 3). No statistically significant differences in the portion of water coming from food sources were seen between the groups, except for dairy (p<0.001) and fruit (p=0.045), whose contribution to the total water intake was significantly higher in the breastfeeding group. In the breastfeeding group, three food groups contributed with 74.48 % of the total water coming from food moisture (dairy contributing with 27.77%, fruit with 24.67% and vegetables with 22.04%). In the non-breastfeeding women, food moisture provided 570.87 ml of water a day, vegetables thereby contributing with 26.63% ml, fruit with 25.04% and dairy with 19.93% of the above amount.

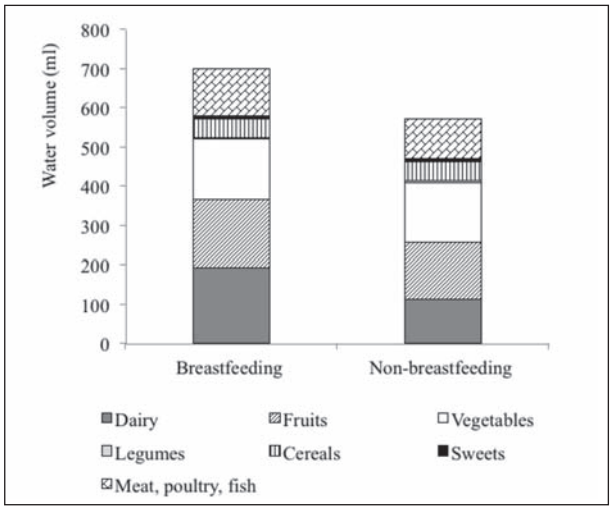

Figure 3. Daily water intake of breastfeeding and non-breastfeeding women supplied by the consumed food

Association of total water intake and intake of energy and macronutrients

To describe the relationship between water intake and dietary factors in more detail, energy and macronutrient intake were analysed against the EFSA recommendations and summarized in Table 3. Several p-values indicated significant differences between the breastfeeding and non-breastfeeding women in this regard. Breastfeeding women who failed to meet total water intake recommendations were proven to have significantly lower total energy (p=0.034), carbohydrate-derived (p=0.034) and protein-derived

Table 3. Energy intake of breastfeeding and non-breastfeeding women and the representation of energy derived from various macronutrients expressed against the recommended water intake values

	Breastfeeding (n=83)		**Non-breastfeeding (n=76)**	
	<AI (n=69)	**≥ AI (n=14)**	**<AI (n=55)**	**≥ AI (n=21)**
Energy intake (kcal/day)	2216.23 ± 581.08	2596.99 ± 696.91	1686.6 ± 211.17	1838.7 ± 249.9
p-value	0.034		0.009	
Energy intake (kJ/day)	9272.71 ± 581.08	10865,81 ± 696.91	7056.73 ± 211.17	7693.12 ± 249.9
p-value	0.034		0.009	
Energy from carbohydrates (%/day)	45.01± 5.92	48.85 ± 6.84	48.96 ± 4.99	51.48 ± 4.42
p-value	0.034		0.001	
Energy from fat (%/day)	39.78 ± 6.09	33.82 ± 5.41	35.86 ± 4.67	32.13 ± 2.70
p-value	0.011		0.001	
Energy from protein (%/day)	15.20 ± 2.71	17.32 ± 3.34	14.84 ± 2.14	16.41 ± 2.16
p-value	0.012		0.005	
Water intake per 1000 kcal (litre/1000 kcal)	0.84 ± 0.29	1.40 ± 0.52	0.85 ± 0.31	1.6 ± 0.55
p-value	<0.001		<0.001	

(p=0.012) energy intake, while the intake of energy derived from fat was significantly higher (p=0.011) as compared to the women who met total water intake recommendations. The relationships between the total water intake and the share of daily energy intake derived from various macronutrients were similar in the non-breastfeeding group, as well (Table 3). As for the water intake per 1,000 kcal, women meeting the water intake recommendations were demonstrated to have a significantly higher (p<0.001) water intake per 1,000 kcal. The established water intake per 1,000 kcal ranged between 0.30 and 2.38 l in the breastfeeding and between 0.32 and 2.96 l in the non-breastfeeding women. Of the non-breastfeeding women who met EFSA recommendations, more (91%) take over 1 l of water/1,000 kcal than the correspondent breastfeeding women, out of which only 71% take more than 1l/1,000 kcal as recommended by the EFSA (8).

Table 4 shows several significant correlations between the total water intake and dietary variables in both participating groups. In the breastfeeding study arm, the total water intake and the proportion of water coming from beverages and water-supplying food were positively correlated with the total energy intake (r=0.47; p<0.001), protein-derived energy intake (r=0.16; p=0.036) and carbohydrate-derived energy intake (r=0.19; p<0.001), but inversely correlated with the fat-derived energy intake (r=-0.22; p=0.039). In the non-breastfeeding arm, significant correlations were found between the total water intake and the total energy intake (r=0.36; p=0.047), protein-derived energy intake (r=0.20; p=0.041) and carbohydrate-derived energy intake (r=0.12; p=0.030), while the correlation with the fat-derived energy intake was inverse, as with the breastfeeding women (r=-0.24; p=0.036).

Discussion

The analyses of total water intake from all sources, including plain water, beverages and food moisture, were conducted among the breastfeeding women in Croatia and surrounding countries for the first time ever. The amounts of dietary water provided by food and beverages to breastfeeding and non-breastfeeding women who have gave birth one month ago were compared to the EFSA reference values.

One month postpartum, the majority of breastfeeding and non-breastfeeding women failed to meet the EFSA recommendations for total water intake. In Croatian breastfeeding women, the premier dietary water source was proven to be plain water, which accounted for about forty five percent of their total water intake, followed by food moisture and beverages as the next major contributors. The breastfeeding women had a higher milk-derived water intake, while the non-breastfeeding ones had a higher supply of water from sugar-sweetened beverages. Food moisture as an important source of water contributing to the total water intake of the breastfeeding women came mainly from

Table 4. Pearson correlation coefficient established between the total water intake and dietary variables

	Breastfeeding (n=83)	**Non-breastfeeding (n=76)**
Energy intake (kcal/day)	0.47	0.36
p-value	<0.001	0.047
Energy intake (kJ/day)	0.45	0.35
p-value	<0.001	0.047
Energy from protein (%/day)	0.16	0.20
p-value	0.036	0.041
Energy from fat (%/day)	-0.22	-0.24
p-value	0.039	0.036
Energy from carbohydrate (%/day)	0.19	0.12
p-value	<0.001	0.03

dairy, while in the non-breastfeeding women the main contributor were vegetables. The total water intake positively correlated with the total energy intake and the share of protein- and carbohydrate-derived daily energy intake, while the correlation between the water intake and the share of fat-derived energy intake was established to be inversed in both groups.

Maternal water intake during breastfeeding should be sufficient so as to compensate for the water loss through the excreted breast milk. Thus, water intake of breastfeeding women should theoretically be at least equivalent to that of non-breastfeeding women plus the quantity of water transferred into the maternal milk. According to estimations, daily water intake of breastfeeding women should be at least as high as that in their non-breastfeeding counterparts plus 600 to 700 ml of water per day, based on the assumption that the daily breast milk output equals to 750 to 850 ml and that the milk in question contains 88% of moisture (8). In view of the above, EFSA proposed that the adequate water intake of breastfeeding women aged 19 to 50 years should be 2,700 ml of water per day, while in non-breastfeeding women of the same age the latter was set at 2,000 ml of water per day (8). This provided the basis for the estimation of median water intake originating from the combination of all fluids taken in, including plain and food-supplied water (water contained in foods and recipes). However, earlier recommendations proposed by the United States Institute of Medicine (IOM) were set at higher levels: 3,800 ml water per day for breastfeeding and 2,700 ml water per day for non-breastfeeding women (2). If we are to compare our results with the IOM recommendations, only two breastfeeding (2.41%) and nine non-breastfeeding participants (11.84%) of our study met the IOM recommendations.

Data on the actual fluid intake in breastfeeding women are important, since infants receive nutrients and water they need from their mothers, sometimes to the detriment of maternal health, the quantity of the excreted breast milk thereby being driven by infant's needs. However, healthy diet and adequate hydration are often highlighted by healthcare professionals as necessary for maintaining good health of breastfeeding mothers (24, 25). Two studies performed on a limited number of subjects have shown fluid intake in breastfeeding women to be about 16% (300 ml) higher than in non-breastfeeding ones (26), but still insufficient to meet theoretical requirements (27). From the physiological point of view, a powerful thirst sensation reported during a breastfeeding episode could help to increase fluid intake (28). Scientific data have consistently shown that neither an increased nor a restricted fluid intake affect the volume of breast milk produced (29,30).

Due to the lack of data on this vulnerable population, we had to compare our results with data on the general population. As recently reviewed by Őzen and co-workers (17), based on the data of 65 studies from 17 European countries, China, Canada, Mexico and USA, a total all-source water intake in adult women averaged to 2,097 ml/day, ranging from 800 to 3,400 ml/day. Similar to the Croatian data, plain water represented 40% of the total fluid intake on average (range, 5 to 80%). After water, coffee and tea (22% of total fluid intake) and alcoholic drinks (10% of total fluid intake) were proven to be the most popular, while fruit/vegetable juices were proven to be the least popular beverages. Milk and milk beverages represented approximately 9% of the total fluid intake.

The importance of dietary water source is underestimated, although various sources of total water intake were shown to differ based on dietary habits (31). European and USA water intake recommendations operate on the assumption that about 20% of total water intake should be supplied by food (2, 8). However, our results confirmed a higher representation of food moisture in total water intake (approximately 35%). Food water content of bakery products is usually below 40%, that of hot meals between 40% and 70%, that of fruit and vegetables >80% and that of human and cow milk about 90%. Diets rich in vegetables and fruit provide significant proportions of total water intake, whereas, for example, fast food products generally contain a low amount of fluid (32).

In the present study, the significant proportion of total water intake was proven to come from beverages. Surprisingly, beverage consumption among our participants was lower than that shown by other general population studies, although in breastfeeding women a more intense thirst sensation and consequently a higher water intake could be expected. Based on the European and the USA studies, it has been estimated that

around 70-80% of total water intake comes from beverages of various types (including water, tea and coffee, milk, soft drinks, juices and alcoholic drinks) (31,8). Besides plain water as the most common fluid drunk by the study participants, beverages such as milk are valuable sources of nutrients important for this population (33). However, other beverages such as sugar-sweetened ones have been shown to have a detrimental health impact and have been widely viewed as contributors to the obesity epidemic (34-36). Some studies have shown that plain water consumption is associated with healthier diets, more favourable health-related behaviours, and lower chronic disease burden (37,38). Consequently, drinking water instead of caloric beverages may help to manage body weight (38,39). Non-breastfeeding women should be concerned about their intake of sugar-sweetened beverages, since these so-called "liquid calories" are more likely to result in passive overconsumption and excess energy intake than "solid calories" (40). Moreover, the results of our previous research group obtained on the same participants showed that non-breastfeeding women are at a significantly greater risk of postpartum weight retention and consequent overweight then breastfeeding ones (21). The promotion of an increased intake of foods with high water content so as to achieve adequate water intakes is in line with the current public health guidelines that advocate reducing the energy-dense food consumption, since water from beverages and food, more than any other macronutrient, is the key determinant of energy density of any diet (41).

Relations between the total water intake and dietary parameters established in our study sample turned out to be significant, so that it was safe to assume that women taking a sufficient amount of water have a more desirable dietary profile as compared to women whose water intake was proven insufficient. Such a significant correlation between the total water intake and energy & macronutrient intake could be explained by the results of an experimental study on human subjects, in which extended fluid restriction led to the decrease in energy intake that came as the consequence of decreased protein and carbohydrate, but unreduced fat intake (42). Thus, it is imaginable that dehydration induces a preference for a high-fat diet as a potential compensatory mechanism helping to deal with dehydration (43). The significant relationship found between water and fat intake can further be corroborated by our previous finding that fat intake in postpartum women significantly exceeds the recommended values (19,21), as proven also by other researchers (44,45). In the long run, such an excessive fat intake may put these women at increased risk of becoming overweight or even obese. Based on more conservative criteria (total water intake below AI and below 1 L/1,000 kcal of energy intake), approximately 66.27% of the breastfeeding and 50.00% of non-breastfeeding women were classified as having low water intakes, which may theoretically put them at greater risk of poor hydration.

Although this study represents the very first effort to investigate into total water intake in the general Croatian population and breastfeeding and non-breastfeeding postpartum women in specific, several potential limitations to our study deserve commenting on. To begin with, our sample size was relatively small, so that its representativeness on the entire breastfeeding community scale might be questionable. However, the major limitation to the study is the absence of a direct assessment of individual breast milk output, which will be useful for establishing individual water needs of each breastfeeding woman on any given day. EFSA proposed the AI based on the combination of intakes established in certain population groups, desirable urine osmolarity values and desirable water volumes per energy unit consumed. Additionally, the 24-hour dietary recalls tend to underestimate fluid ingestion by as much as 500 ml/day as compared to fluid-specific intake diaries (46). However, this methodology allowed for the obtaining of detailed recipe information that improved the accuracy of estimations of water contents in beverages and prepared dishes.

Conclusion

We have found that, on average, the surveyed women had inadequate total water intakes, although in the absence of clinical parameters this could not be equated to poor hydration. These detailed estimates can be used as a basis for further research and a guide for public health messages tailored to raise awareness on the importance of an adequate water intake in

breastfeeding women. Given that this study confirmed a positive correlation between water intake and protein & carbohydrate intake, and also an inverse correlation between water and fat intake, the results of this study might be a useful tool in promoting sufficient water intake as a part of broader efforts engaged to put a stop on ever rising rates of overweight and obesity prevalence in postpartum women of childbearing age.

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