

An evaluation of water balance in pregnant women in Greece

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OBJECTIVE

Dehydration during pregnancy may be harmful for the mother and the fetus. The objective of the study was to assess water balance in pregnant women.

METHODS

The Water Balance Questionnaire (WBQ) records water intake, loss and balance. The WBQ, validated in the past in the general public, was modified to incorporate questions that reflect pregnancy (Water Balance in Pregnancy Questionnaire, WBQ-P), and validated in pregnant women. The WBQ-P was administered in 60 healthy pregnant women, 20 from each trimester, who completed three day diaries. From this sample, 40 women also provided a morning urine sample for determination of osmolality, specific gravity, pH, color. Subsequently the WBQ-P was administered to a sample of 298 pregnant women in Greece aged 19-46 years (33±6 yrs), 95 from the first trimester, 100 from the second trimester and 97 from the third trimester of their pregnancy. Answers of 96 non pregnant women, ages 19-46, approached in the same season used herein for comparison on water intake, loss and balance between pregnant and non pregnant women.

RESULTS

Mean water balance was 203 (-577, 971) ml/day, water intake was 2917 (2187, 3544) ml/day and water loss 2658 (2078, 3391) ml/day.

Water balance, intake and loss did not differ between three trimesters, however women in the third trimester had lower water intake from beverages (p<0.001).

Water balance, intake and loss in pregnant women were not different than that in non-pregnant, however more pregnant women were falling in the higher quartiles of water balance distribution than non pregnant.

TABLE 1: Water balance, water intake and water loss for pregnant women in first, second and third trimester.

Water Intake or Loss (ml/day)	Non pregnant (n=96)	Pregnant (n=298)	P [‡]
Water Balance	26 (-1217, 710)	203 (-577, 971)	0.11
Water Intake	2638 (2168, 3483)	2917 (2187, 3544)	0.39
<i>Water from beverages</i>	671 (490, 963)	678 (401, 1052)	0.63
<i>Water from drinking water</i>	1200 (720, 1680)	1440 (960, 1920)	0.35
<i>Water from foods</i>	668 (495, 911)	680 (487, 893)	0.94
Water loss	2848 (2066, 4368)	2658 (2078, 3391)	0.11

TABLE 2: Water balance, water intake and water loss for pregnant and non pregnant women.

Water Intake or Loss (ml/day)	1st trimester (n=95)	2nd trimester (n=100)	3rd trimester (n=97)	P [†]
Water Balance	189 (-496, 854)	218 (-754, 942)	244 (-506, 1137)	0.58
Water Intake	2876 (2230, 3540)	3046 (2208, 3529)	2736 (2074, 3589)	0.43
<i>Water from beverages</i>	823 (484, 1216)	734 (459, 1144)	536 (328, 800)	<0.001
<i>Water from drinking water</i>	1200 (960, 1800)	1440 (960, 1920)	1440 (960, 1920)	0.44
<i>Water from foods</i>	654 (484, 896)	656 (470, 878)	701 (573, 924)	0.26
Water loss	2663 (1947, 3475)	2664 (2168, 3489)	2635 (2055, 3070)	0.37

FIGURE 2: Water from beverages for pregnant women.

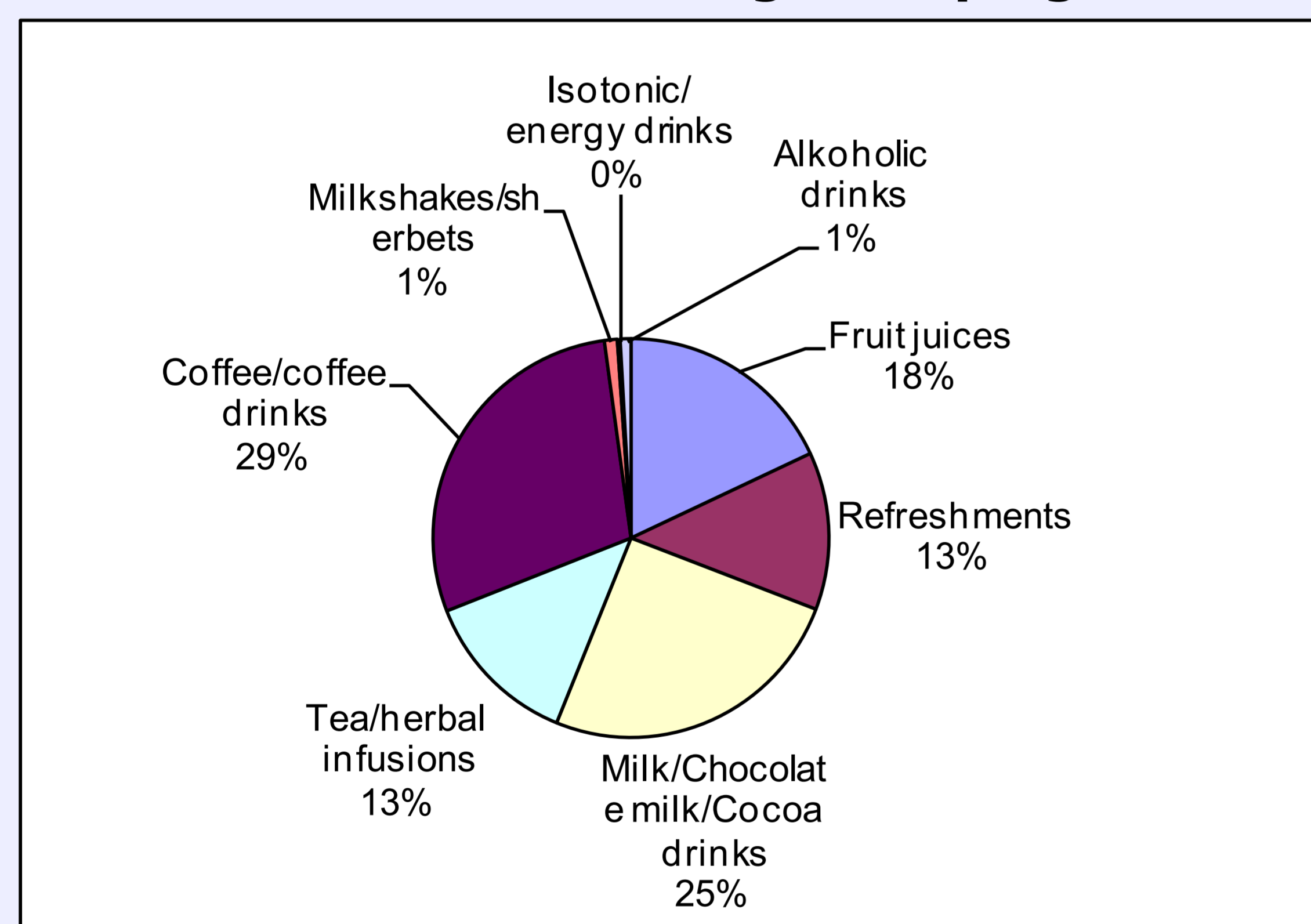
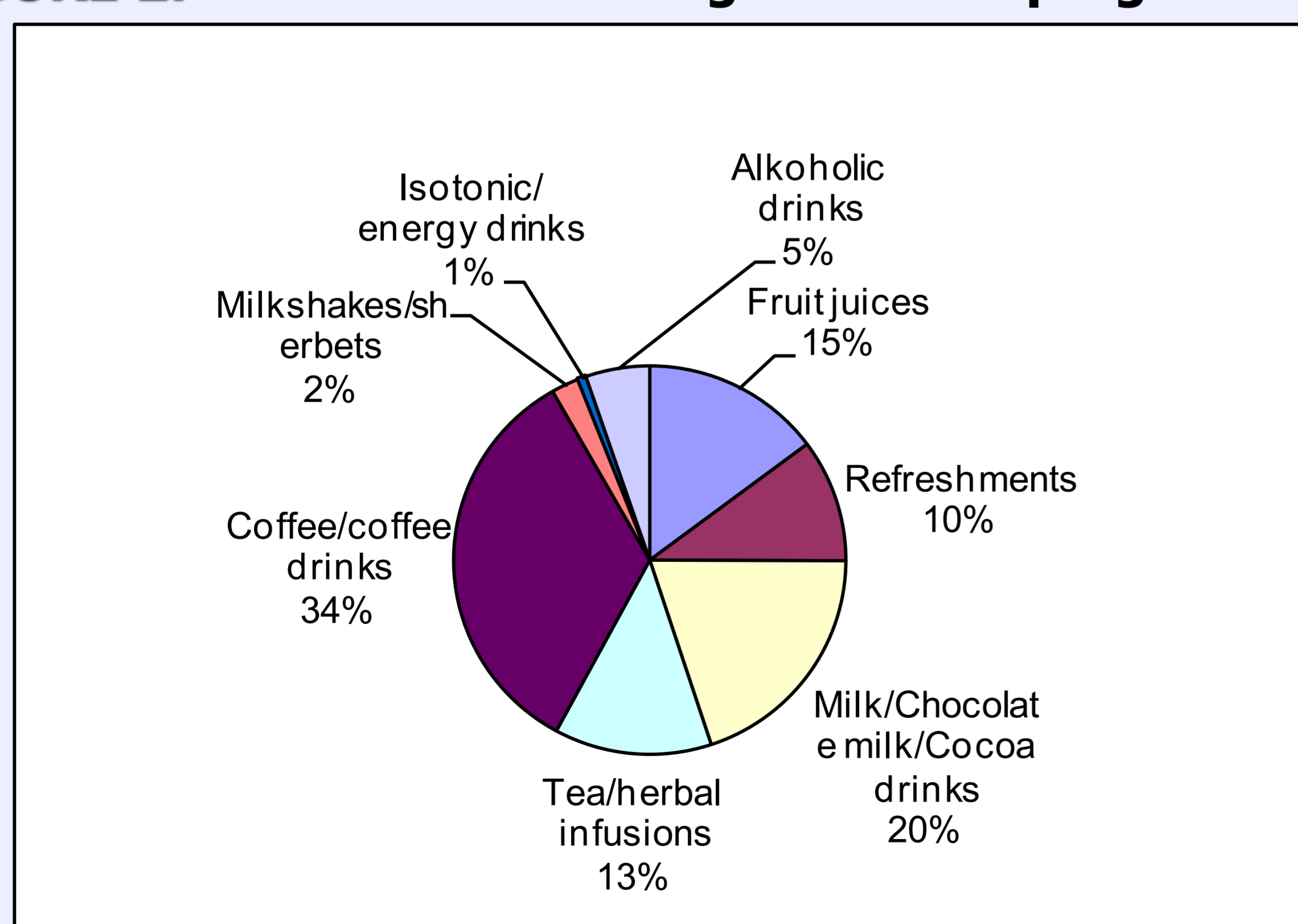


TABLE 3: Water balance, intake and loss in pregnant women in first, second, third trimester according to the quartiles of water balance of non pregnant women.

Water Intake or Loss (ml/day)	Quartiles of water balance (ml/day)				P [‡]
	1st quartile (<=1217)	2nd quartile (-1217 to 26)	3rd quartile (26 to 710)	4th quartile (>710)	
Non pregnant, n=96, (%)	19 (25)	20 (25)	20 (25)	19 (25)	
Water Intake	2556 (2163, 3528)	2402 (1782, 3048)	2554 (2336, 2903)	3341 (2615, 4010)	0.004
<i>Water from beverages</i>	637 (524, 801)	660 (374, 1000)	661 (490, 925)	1011 (725, 1408)	0.009
<i>Water from drinking water</i>	1200 (720, 1920)	1200 (720, 1680)	1260 (720, 1680)	1440 (960, 1920)	0.43
<i>Water from foods</i>	681 (507, 916)	510 (405, 732)	666 (519, 856)	819 (532, 1055)	0.04
Water loss	4842 (4515, 5703)	2909 (2535, 3732)	2311 (1796, 2647)	1875 (1265, 2785)	<0.0001
Pregnant, n=298, (%)	45 (15)	85 (29)	66 (22)	102 (34)	
Water Intake	2276 (1996, 3127)	2284 (1869, 3131)	2861 (2279, 3350)	3475 (2959, 4015)	<0.0001
<i>Water from beverages</i>	639 (382, 1086)	543 (355, 847)	681 (293, 934)	859 (535, 1246)	<0.0001
<i>Water from drinking water</i>	1200 (720, 1440)	1200 (720, 1440)	1440 (960, 1920)	1680 (1200, 2160)	<0.0001
<i>Water from foods</i>	672 (465, 851)	642 (474, 793)	657 (482, 897)	740 (548, 1027)	0.01
Water loss	4880 (3860, 5855)	2800 (2195, 3500)	2540 (1878, 2981)	2197 (1788, 2615)	<0.0001
1st trimester, n (%)	12 (12)	29 (29)	28 (28)	30 (30)	
Water Intake	3071 (2033, 3855)	2376 (1904, 2954)	2861 (2269, 3530)	3305 (2632, 4185)	0.001
<i>Water from beverages</i>	1045 (568, 1388)	584 (407, 938)	783 (500, 1269)	880 (493, 1232)	0.20
<i>Water from drinking water</i>	1440 (720, 1530)	1080 (720, 1320)	1440 (780, 1770)	1440 (960, 2220)	0.05
<i>Water from foods</i>	683 (417, 996)	533 (389, 787)	631 (503, 905)	753 (589, 1060)	0.06
Water loss	5412 (4602, 6486)	2800 (2127, 3470)	2747 (1965, 3134)	2102 (1700, 2311)	<0.0001
2nd trimester, n (%)	18 (18)	29 (29)	20 (20)	33 (33)	
Water Intake	2564 (2082, 3650)	2183 (1736, 3142)	2969 (2410, 3519)	3476 (3127, 3854)	<0.0001
<i>Water from beverages</i>	755 (480, 1160)	623 (203, 783)	722 (361, 866)	1141 (727, 1580)	<0.0001
<i>Water from drinking water</i>	1380 (720, 1740)	1080 (720, 1440)	1680 (1080, 2010)	1440 (1140, 1920)	0.008
<i>Water from foods</i>	643 (474, 812)	634 (473, 836)	617 (368, 972)	680 (492, 936)	0.79
Water loss	5366 (3738, 6005)	2700 (2195, 3660)	2577 (2099, 3109)	2230 (1972, 2613)	<0.0001
3rd trimester, n (%)	15 (15)	27 (27)	18 (18)	39 (39)	
Water Intake	2069 (1653, 2204)	2284 (1860, 3209)	2683 (1951, 2956)	3640 (2822, 4055)	<0.0001
<i>Water from beverages</i>	382 (132, 639)	493 (356, 771)	398 (229, 712)	704 (404, 980)	0.003
<i>Water from drinking water</i>	720 (600, 1200)	1200 (600, 1920)	1200 (1140, 1740)	1680 (1440, 2400)	<0.0001
<i>Water from foods</i>	714 (501, 862)	684 (582, 742)	702 (574, 778)	839 (573, 1244)	0.18
Water loss	4342 (3140, 4897)	2833 (2260, 3537)	2135 (1688, 2762)	2250 (1650, 2681)	<0.0001

FIGURE 2: Water from beverages for non pregnant women.



4. CONCLUSIONS

The study delivered data on water balance in pregnancy with details referring to different sources of water intake and on distribution of the sample in four water balance quartiles.