The Iodine Knowledge of Pregnant Women in an Endemic Goiter Area: A Cross Sectional Study

NAZLI Nur ASLAN ÇİN (✉ nnaslan@ankara.edu.tr)

Ankara University <https://orcid.org/0000-0002-4458-8817>

Ayşe Özfer ÖZÇELİK

Ankara Üniversitesi

Research

Keywords: Iodine, Knowledge, Nutrition, Pregnancy

Posted Date: May 7th, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-26437/v1>

License: © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

Background: Iodine is an crucial micronutrient for fetal brain development, especially in the early stages of pregnancy. The level of knowledge about iodine among pregnant women has not been previously evaluated in Trabzon city where is an endemic area of iodine deficiency in the Blacksea region of Turkey. The aim of this study was to determine the level of knowledge about iodine nutrition during pregnancy among pregnant women living in an endemic goiter area of Turkey.

Methods: One hundred fifty pregnant women between ages 19-45 years who applied to Gynecology and Obstetrics Clinic in Trabzon were recruited. This cross-sectional study was conducted with one hundred and fifty pregnant women between the ages of 19-45 who applied to Trabzon Gynecology and Obstetrics Clinic. Research data were collected using questionnaire forms and face-to-face interviews. The questionnaire form consisted of questions determining the sociodemographic characteristics of the participants, their previous pregnancy data, iodized salt consumption habits, and knowledge about iodine.

Results: Although 68% of women know that iodine deficiency can cause serious consequences during pregnancy, about 30% did not know the problems caused by iodine deficiency. Three main dietary source of iodine in Turkey, fish, milk and dairy products and table salt are 68.0%, 20.0% and 77.3% of them correctly identified as good sources, respectively. The mean iodine knowledge score of the participants was 8.5 ± 4.5 . Higher educated pregnant women had significantly higher knowledge scores ($p < .05$). However, age, trimester, parity and those who had received information about iodine and iodine knowledge score between no significant differences ($p > .05$).

Conclusion: This study revealed that lack of knowledge about iodine in pregnant women living in an endemic goiter area of Turkey. Furthermore, pregnants also had limited knowledge about the most important dietary iodine sources that can meet their daily iodine requirements. The necessity of public education initiatives to improve iodine knowledge in the pregnant population is evident for healthier future generations.

Introduction

Iodine is a trace element involved in the synthesis of thyroid hormones, thyroxine (T4) and triiodothyronine (T3) [1]. These hormones are crucial for growth and development, particularly brain development starting from the first few weeks of embryonic life [2]. Although the effects of iodine deficiency are observed in individuals of all age groups, mild iodine deficiency in pregnant women leads to decreased cognitive functions in the child [3]. Many studies have shown that pregnant women are at a particular risk of iodine deficiency due to their high iodine requirements [3–5]. Iodine requirements increase during pregnancy due to the increase in renal iodine clearance, the increase in the production of thyroxine to maintain the euthyroid state of the mother while transferring thyroid hormone and iodine to the fetus [6].

Global Iodine Report classifies Turkey as a country with mild iodine deficiency, based on studies showing mild to moderate iodine deficiency in pregnant women population in European countries [7]. Several factors were accused of iodine deficiency in Turkey such as uncommon utilization of iodine-containing cleaners for dairy products, non-iodized animal feeds and insufficient consumption of iodized salt by the population (8). The fact that seafood, which is known as a very good source of iodine, is not sufficiently consumed by pregnant women due to heavy metal and mercury accumulation, can also contribute to the deficiency [9].

Increasing the general knowledge of iodine among pregnant women may prevent iodine deficiency [10]. Health professionals and pregnant school program in Turkey plays a unique role by providing precious education about healthy dietary and iodine consumption in pregnancy specifically for pregnant women [11]. Previous studies indicate that lack of awareness and knowledge about iodine may also be an important risk factor for iodine deficiency in pregnant women [12–15]. In these studies, it was observed that pregnant women were not capable of defining important iodine sources in the diet and negative health outcomes due to iodine deficiency. Martin et al (2014) performed a study with 200 pregnant women in Australia and only half of the women could describe seafood as a rich source for iodine. In addition, more than half of the pregnant women were not aware that iodine deficiency could cause health problems [16]. It was found that the age and educational status of women can affect their knowledge about iodine [13]. However, currently, there are few studies in the literature about the relationship between iodine knowledge and iodine status of pregnant. Therefore, this study aims to determine the knowledge level of pregnant women about iodine and to investigate possible determinants affecting iodine knowledge scores. To our knowledge, this is the first pilot study that evaluates the level of iodine knowledge of pregnant women in Turkey.

Materials And Methods

This descriptive, cross-sectional study included 150 pregnant women who applied to Akçaabat Haçkallı Baba State Hospital Gynecology Clinic in Trabzon, Turkey between September-December 2016. This hospital was chosen as the research place hence we could assess individuals from various socioeconomic degrees. The ethics committee approval was obtained from _____ (No. 11-478-16 dated 23.06.2016) and the Helsinki Declaration principles were followed in the research. Each participant was informed about the contents of the study prior to the survey and signed the informed consent form which indicated voluntary participation in the research.

The research participants were selected among pregnant women between 19–45 years old, with no history of thyroid disease or receiving any medications that may intervene in thyroid parameters. Research data were collected using questionnaire forms and face-to-face interviews. The questionnaire form consisted of questions determining the sociodemographic characteristics of the participants, their previous pregnancy data, iodized salt consumption habits, and knowledge about iodine. The iodine knowledge questions were selected from previous information questions about iodine. The intelligibility of the questions was tested with 10 women and the survey form was finalized after the necessary corrections

were performed. The iodine knowledge of pregnant was evaluated with 23 questions/statements such as “*what is iodine*”, “*which organ is effective in its functioning*”, “*what are the good dietary sources of iodine*” and “*whether iodine deficiency causes health problems during pregnancy*”. Each correct answer was scored as “1”, and false or I don't know as “0”. The maximum score to be obtained was 23.

Statistical Analysis

SPSS 22.0 (Statistical Package for the Social Sciences) package program was used for the evaluation of the data. Age, previous pregnancy, education status, and previous nutrition knowledge were normally distributed and presented as mean ± standard deviation. The Independent t-test was used to assess the iodine knowledge score between two groups which were normally distributed and the One-Way ANOVA test was used to evaluate the iodine knowledge score among the three groups. In all statistical tests, the range of reliability was accepted as 95.0% and was evaluated at the significance level of $p < 0.05$.

Results

The sociodemographic data of participants are shown in Table 1. The average gestational week of women was 25.4 ± 10.0 and, more than half of them were in the second (42.0%) or third trimester (46.0%). It is the first pregnancy of 39.3% of women. The 2.6% of pregnant were using tobacco, 4.7% of them ceased after pregnancy and 92.7% had never smoked before. None of the participants had a history of alcohol consumption.

TABLE I

Nutrition and supplement knowledge

The participants were asked, “*Have you ever received information about nutrition?*” 50.7% of the participants stated that they received information about nutrition. They received information from the internet (44.7%), the healthcare personnel (35.6%), TV (13.2%), relatives and friends (3.9%) and books (2.6%).

Most of the participants (82.7%) stated that they were using supplements. The most common supplementary pill was iron (82.0%) and followed by iodine-free multivitamins (57.2%), folic acid (23.3%), magnesium (3.2%), calcium (0.8%), vitamin C (0.8%), omega 3 (0.8%) and vitamin B12 (0.8%). None of the participants were receiving supplements containing iodine. All of the participants stated that they choose their supplements with a physician recommendation.

Habits of Using Iodized Salt

Iodized salt consumption habits of the participants are presented in Table 2. Most of the participants (89.1%) had consumed iodized salt for more than 10 years. 26.0% of the participants stated that they were reading the information on the package while buying salt; 51.3% of them declared that they were only checking the expiration date. 58.6% of them stated that they were keeping the salt in colorless glass, 51.3% of them were keeping it by the stove, and 56.7% of them were adding salt to the food just before finishing cooking.

TABLE II

Iodine related information

Some of the questions used to determine iodine knowledge of the participants are shown in Table 3. Half of the participants (50.0%) correctly stated that iodine is a mineral. 52.7% of the participants correctly answered that the thyroid gland is the effective organ for the functioning of iodine. 68.0% of participants replied that iodine deficiency may cause serious problems during pregnancy and 42,0% of them thought that it is necessary to add iodine to table salt in Turkey. Finally, 58.0% of them stated that smoking affects the absorption of iodine.

TABLE III

In Figure 1, the answers given by the participants to the statements about the health problems caused by iodine deficiency are presented. The 44.7% of participants marked goiter, 63.3% mental retardation, 31.3% preterm birth; 29.3% knew that it can cause miscarriages and 26.7% of them stated that it can cause stillbirths.

FIGURE I

The answers of the participants to evaluate their knowledge about the iodine content of some foods are presented in Figure 2. Approximately half of the participants defined fish and seafood (68.0%) and iodized table salt (77.8%) as the most important dietary sources of iodine. The knowledge of the participants about dairy products as a source of iodine was inadequate (20.0%). Some have described meat (27.3%), fruit (22.0%) and bread (34.0%) as the most important sources of iodine. About half of the pregnant could not correctly mark which sources of iodine are the best.

FIGURE 2

The relationship between average iodine knowledge scores and some variables is presented in Table 4. The mean iodine knowledge score of the participants was 8.5 ± 4.5 . In the subgroup analysis, the mean

iodine knowledge score was higher in participants aged 19-30 years compared to 31-45 years. However, the difference was not statistically significant ($p > 0.05$). As the educational status of women increased, iodine knowledge scores were also increased, and the difference between the groups was statistically significant ($p < .001$).

TABLE 4

Discussion

This study revealed that the iodine knowledge of pregnant in Turkey is insufficient. Despite the implementation of a national salt iodization program in the past 20 years, iodine knowledge and habits of pregnant were not previously determined. To our knowledge, this is the first study assessing the iodine knowledge of pregnant in Turkey. Several studies performed in New Zealand, the UK, Australia, and Norway also found that pregnant had little knowledge of iodine [10, 12, 16, 17]. It was detected that the participants had difficulty in defining the most important dietary sources of iodine. In this study, fish and seafood were stated as the best iodine source in the diet, similar to other studies [13, 18]. Some studies reported as the best source of dietary iodine [13, 16, 18]. However, iodophors are not applied to milk containers and milk doesn't contain iodine in Turkey. Therefore, it was found that Turkish pregnant have less knowledge about milk as a source of dietary iodine.

In the Norwegian study, 41.0% of pregnant women stated that iodized salt is one of the most important sources of iodine in the diet [10]. However, in this study, the majority of pregnant women (77.3%) reported table salt as one of the best dietary iodine sources. It is compulsory to iodize the table salt and label the package in Turkey. The knowledge difference between the two countries can be explained by table salt regulations. The permissible limit to iodize table salt in Turkey is 25–40 mg/kg potassium iodate, which can affect the iodine intake of those who use this salt. Even though only 42% of the participants knew the mandatory iodine regulations, probably most of the population consider the “iodized table salt” as an extra commercial specification of table salt brands.

In the present study, more than half of pregnant women (68.0%) stated that iodine deficiency would cause serious problems. On the other hand, it was found that they could not correctly relate the diseases with deficiency. Another study evaluated 520 childbearing-age women in the UK and Ireland and reported that almost half (41.0%) of the participants did not know or accurately identify any health problems associated with iodine deficiency [13]. Studies among women of childbearing age in New Zealand, the UK and Australia also showed low awareness of iodine deficiency as a public health problem [16–18]. This study was carried out in Trabzon, where is known to be an endemic goiter area of Turkey. Therefore, the higher knowledge of the participants about iodine deficiency-related diseases can be explained by the social interactions of the participants to have some friends or relatives suffering from one of these diseases.

This study found out that the mean iodine knowledge score of participants was low. In addition, there was no significant difference between iodine knowledge scores according to age, trimester and previous

pregnancy ($p > 0.05$). O'Kane et al. (2016) reported that young women (18–25) had higher iodine knowledge levels [13]. In a study conducted by Charlton et al. (2012) with pregnant and lactating women, there was no significant difference between iodine-related knowledge scores during pregnancy and lactation [6]. Previously in a qualitative study, it was determined that pregnant women in Norway receive very little information about nutrition in antenatal care. It was reported that pregnant women usually receive basic education towards the end of their pregnancy. [19]. Similarly, it was observed that the women participating in the “Pregnancy School Project” at the state hospitals in Turkey are mostly in the second trimester of their pregnancies and are more willing to get information about nutrition. In this study, it was found that pregnant women who received education about nutrition had higher iodine knowledge scores. However, half of the pregnant women (50.3%) stated that they had never received any nutritional education before. Studies in Australia, New Zealand, and the UK and Norway also reported a lack of knowledge about iodine during pregnancy [12, 13, 20]. Also, other studies indicated that pregnant women were more sensitive about nutrition than non-pregnant women. [21, 22]. In this study, the iodine knowledge scores of the pregnant women in the first trimester were lower than the other trimesters. As previously mentioned, the health professionals providing prenatal care to women in Turkey are encouraged to provide general information about a healthy diet. In previous studies conducted in different regions of Turkey, the pregnant women were found to have insufficient iodine intake during pregnancy [8, 23, 24]. However, although pregnant women are at risk of inadequate iodine intake, there is currently no public education initiative to improve the situation. It is determined that better education is associated with higher iodine knowledge scores during pregnancy. Hence, it is suggested that pregnant women should be given specific education about iodine starting from the pre-pregnancy period.

Although pregnancy education is important to improve the knowledge about iodine, the general education level of the women should be considered, as well. This study found that as the education level of the participants increased, mean iodine knowledge scores were also increased ($p < .05$). The studies conducted in Norway, the United Kingdom and Sri Lanka revealed similar results and participants with higher education levels were found to have higher iodine knowledge scores [13, 20, 25]. Contrary to these results, in a study conducted by Lucas et al. in Australia, it was reported that education level did not affect iodine knowledge score [20].

This study had some limitations. Firstly, as it was a cross-sectional study and the results may not be generalizable for all pregnant women. Since the research area is an endemic goiter region, iodine awareness may be higher than in the rest of the country. Besides, that would be more inclusive to perform a study not only with pregnant women, also including women who are breastfeeding and in childbearing age. As being a pioneer study in the research area, further studies in different regions and larger populations will provide more knowledge about the situation in the whole country. Despite the limitations, this study can be considered as an anchor in the literature to compare the development of awareness in Turkey.

Conclusion

Although there are increasing concerns about the iodine status of pregnant women in Turkey, this study revealed the lack of knowledge about the importance of iodine. Moreover, pregnant women also had limited knowledge about the most important dietary iodine sources that can meet their daily iodine requirements. The necessity of public education initiatives to improve iodine knowledge in the pregnant population is evident for healthier future generations. Different predictors of iodine knowledge in this study can assist education professionals to achieve their goals in public education.

Declarations

Ethical approval and consent to participate

Approval of the Ethics Committee was received from Ankara University Faculty of Medicine (No. 11-478-16 dated 23.06.2016) and the Helsinki Declaration principles were followed in the research.

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare no conflicts of interest.

Funding

The funders had no role in the design, analysis or writing of this article.

Authors' contribution

NNAÇ and AOO designed the study. NNAÇ performed the analysis. NNAÇ drafted the initial manuscript and NNAÇ and AOO revised the manuscript; NNAÇ and AOO provided important advice for the calculations, reviewed and revised the manuscript making important intellectual contributions; All authors read and approved the final manuscript.

Acknowledgements

We are grateful to pregnant women for participating in this study.

¹Department of Nutrition and Dietetics, Faculty of Health Science, University of Ankara, Ankara, Turkey.

References

1. Harding KB, Peña-Rosas JP, Webster AC, Yap CMY, Payne BA, Ota E, et al. Iodine supplementation for women during the preconception, pregnancy and postpartum period. *Cochrane Database Syst. Rev.* John Wiley and Sons Ltd; 2017.
2. Pérez-López FR. Iodine and thyroid hormones during pregnancy and postpartum. *Gynecol Endocrinol.* 2007;23:414–28.
3. Murcia M, Rebagliato M, Iñiguez C, Lopez-Espinosa M-J, Estarlich M, Plaza B, et al. Effect of iodine supplementation during pregnancy on infant neurodevelopment at 1 year of age. *Am J Epidemiol* [Internet]. 2011 [cited 2020 Feb 6];173:804–12. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/21385833>.
4. Velasco I, Carreira M, Santiago P, Muela JA, García-Fuentes E, Sánchez-Muñoz B, et al. Effect of iodine prophylaxis during pregnancy on neurocognitive development of children during the first two years of life. *J Clin Endocrinol Metab* [Internet]. 2009 [cited 2020 Feb 6];94:3234–41. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/19567536>.
5. Berbel P, Mestre JL, Santamaría A, Palazón I, Franco A, Graells M, et al. Delayed neurobehavioral development in children born to pregnant women with mild hypothyroxinemia during the first month of gestation: the importance of early iodine supplementation. *Thyroid* [Internet]. 2009 [cited 2020 Feb 6];19:511–9. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/19348584>.
6. Charlton K, Yeatman H, Lucas C, Axford S, Gemming L, Houweling F, et al. Poor knowledge and practices related to iodine nutrition during pregnancy and lactation in Australian women: pre- and post-iodine fortification. *Nutrients* [Internet]. MDPI AG; 2012 [cited 2020 Mar 12];4:1317–27. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/23112919>.
7. Global scorecard of iodine nutrition. in 2019 in the general population based on school-age children (SAC).
8. Anaforoğlu I, Algün E, Inceçaylır O, Topbaş M, Erdoğan MF. Iodine status among pregnant women after mandatory salt iodisation. *Br J Nutr.* Cambridge University Press; 2016;115:405–10.
9. FOR HEALTHY AND BALANCED NUTRITION DURING LIFELONG TIME
Öksüz A, Alkan ŞB, Taşkın H, Ayrancı M. BENEFITS OF FISH CONSUMPTION. FOR HEALTHY AND BALANCED NUTRITION DURING LIFELONG TIME. *Food Heal. Scientific Web Journals (SWJ)*; 2018;43–62.
10. Garnweidner-Holme L, Aakre I, Lilleengen AM, Brantsæter AL, Henjum S. Knowledge about iodine in pregnant and lactating women in the Oslo area, Norway. *Nutrients.* MDPI AG; 2017;9.

11. Gebe Okulu Genelgesi. Yayınlandı [Internet]. [cited 2020 Feb 6]. Available from: <https://khgmsaglikbakimdb.saglik.gov.tr/TR,49327/gebe-okulu-genelgesi-yayinlandi.html>.
12. Brough L, Jin Y, Shukri NH, Wharemate ZR, Weber JL, Coad J. Iodine intake and status during pregnancy and lactation before and after government initiatives to improve iodine status, in Palmerston North, New Zealand: A pilot study. *Matern Child Nutr*. Blackwell Publishing Ltd; 2015;11:646–55.
13. O’Kane SM, Pourshahidi LK, Farren KM, Mulhern MS, Strain JJ, Yeates AJ. Iodine knowledge is positively associated with dietary iodine intake among women of childbearing age in the UK and Ireland. *Br J Nutr* [Internet]. 2016 [cited 2020 Feb 6];1–8. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/27855727>.
14. Combet E, Bouga M, Pan B, Lean MEJ, Christopher CO. Iodine and pregnancy - A UK cross-sectional survey of dietary intake, knowledge and awareness. *Br J Nutr* Cambridge University Press. 2015;114:108–17.
15. Jooste P, Upson N, Charlton K. Knowledge of iodine nutrition in the South African adult population. *Public Health Nutr*. Cambridge University Press (CUP); 2005;8:382–6.
16. Martin JC, Savage GS, Mitchell EKL. Health knowledge and iodine intake in pregnancy. *Aust New Zeal J Obstet Gynaecol* Blackwell Publishing. 2014;54:312–6.
17. McMullan P, Hunter A, McCance D, Woodside JV, Mullan K. Knowledge about iodine requirements during pregnancy and breastfeeding among pregnant women living in Northern Ireland. *BMC Nutr* [Internet]. Springer Science and Business Media LLC; 2019 [cited 2020 Apr 9];5:24. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/32153937>.
18. Axford S, Charlton K, Yeatman H, Ma G. Improved iodine status in breastfeeding women following mandatory fortification. *Aust N Z J Public Health* [Internet]. 2011 [cited 2020 Mar 12];35:579–80. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/22151171>.
19. Garnweidner LM, Sverre Pettersen K, Mosdøl A. Experiences with nutrition-related information during antenatal care of pregnant women of different ethnic backgrounds residing in the area of Oslo, Norway. *Midwifery* [Internet]. 2013 [cited 2020 Mar 12];29:e130-7. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/23481338>.
20. Lucas CJ, Charlton KE, Brown L, Brock E, Cummins L. Antenatal shared care: Are pregnant women being adequately informed about iodine and nutritional supplementation? *Aust New Zeal J Obstet Gynaecol* [Internet]. Blackwell Publishing; 2014 [cited 2020 Mar 12];54:515–21. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/25196454>.
21. Sz wajcer EM, Hiddink GJ, Koelen MA, van Woerkum CMJ. Nutrition-related information-seeking behaviours before and throughout the course of pregnancy: consequences for nutrition communication. *Eur J Clin Nutr* [Internet]. 2005 [cited 2020 Mar 12];59 Suppl 1:S57-65. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/16052197>.
22. Carolan M. Health literacy and the information needs and dilemmas of first-time mothers over 35 years. *J Clin Nurs*. 2007;16:1162–72.

23. Oguz Kutlu A, Kara C. Iodine deficiency in pregnant women in the apparently iodine-sufficient capital city of Turkey. Clin Endocrinol (Oxf) [Internet]. 2012 [cited 2020 Mar 12];77:615–20. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/22587848>.
24. Oral E, Aydogan Mathyk B, Aydogan BI, Acikgoz AS, Erenel H, Celik Acioglu H, et al. Iodine status of pregnant women in a metropolitan city which proved to be an iodine-sufficient area. Is mandatory salt iodisation enough for pregnant women? Gynecol Endocrinol [Internet]. Taylor and Francis Ltd; 2016 [cited 2020 Mar 12];32:188–92. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26489983>.
25. 10.4038/gmj.v20i1.7921/
Zoysa GED, De, Hettiarachchi M, Jayathilaka KAPW, Liyanage KDCE. Knowledge and practices of iodized salt consumption among pregnant women in Galle district. Gall Med J [Internet]. 2015 [cited 2020 Feb 6];20:10. Available from: <https://gmj.sljol.info/article/10.4038/gmj.v20i1.7921/>.

Tables

Table 1. General features of pregnant women

Variables	n	Frequencies (%)
Age/years	28,6±5,8 (19-42)	
Age groups		
19-30 years	97	64.7
31-45 years	53	35.3
Previous pregnancy		
First	39	26.0
Second	59	39.3
Third and more	52	34.7
Trimester		
First	18	12.0
Second	63	42.0
Third	69	46.0
Education level		
Primary school	29	19.3
Secondary school	38	25.4
High school	47	31.3
College	36	24.0

Table 2. Salt use habits of participants

Salt use habits	n	Frequencies (%)
Iodized salt usage time (years)		
< 1	2	1.4
1-5	6	4.1
6-9	8	5.4
≥10	131	89.1
Reading packaging information		
Yes	39	26.0
No	111	74.0
See the expiration date		
Yes	77	51.3
No	73	48.7
Salt storage container		
Colorless glass	88	58.6
Plastic	11	6.7
Porcelain pot/Colored glass/ Marble	52	34.7
Salt storage location		
Beside the stove	77	51.3
Kitchen cupboard	43	28.7
Kitchen shelf	30	20.0
Salt Addition Time		
At the beginning of cooking	59	39.3
Close to food getting off the stove	85	56.7
After turning off the food	4	2.7
Doesn't pay attention	2	1.3

Table 3. Knowledge questions about iodine

Knowledge questions about iodine	n	%
What is Iodine?		
Vitamin	7	4,7
Mineral	75	50,0
Don't know	68	45,3
Is the thyroid gland effective in functioning?		
Yes	79	52,6
No	16	10,7
Don't know	55	36,7
Is iodine deficiency a serious problem in pregnancy?		
Yes	102	68,0
No	12	8,0
Don't know	36	24,0
The addition of iodine to table salt in Turkey mandatory?		
Yes	63	42,0
No	39	26,0
Don't know	48	32,0
Does smoking affect iodine absorption?		
Yes	87	58,0
No	5	3,3
Don't know	58	38,7

Table 4. Iodine knowledge scores according to some characteristics of pregnant

Variables	Iodine knowledge score				
	n	±SS	Min-Max	F/t	p
Age [¶]					
19-30 yıl	97	8.6±4.5	0.0-17.0	0,352	0.725*
31-45 yıl	53	8.3±4.7			
Previous pregnancy ^{¶¶}					
First	39	9.5±4.2	1.0-17.0	1.433	0.242
Second	59	8.3±4.9	0.0-17.0		
Third and more	52	7.9±4.2	0.0-17.0		
Trimester [¶]					
First	18	8.1±4.3	1.0-17.0	0.203	0.816
Second	63	8.7±4.3	0.0-17.0		
Third	69	8.3±4.8	0.0-17.0		
Education level ^{¶¶}					
Primary school	29	5.5±3.7	0.0-13.0	12.596	0.000**
Secondary school	38	7.1±4.2	0.0-15.0		
High school	47	9.2±4.3	0.0-17.0		
College	36	11.3±4.0	0.0-17.0		
Received information about nutrition					
Yes	76	7.9±4.3	0.0-17.0	.549	0.208
No	74	8.9±4.7	0.0-17.0		

[□]Data was used as Independent t-test.

^{□□}Other data presented as minimum and maximum and was used One-Way ANOVA.

*p<0.05 **p<0.01

Figures

Figure 1

Pregnants knowing the diseases caused by iodine deficiency (n=150) ‡Potential adverse outcomes caused by iodine deficiency.

Figure 2

Pregnants knowledge about iodine-containing foods (n=150) ‡Denotes correct answers