

Wójcik-Grudzień Justyna, Ozga-Stachurska Alicja, Pawłowska Paulina, Rozenbajgier Martyna. Iodine supplementation by women of childbearing potential and in pregnancies - analysis of knowledge among students. *Journal of Education, Health and Sport*. 2022;12(9):477-483. eISSN 2391-8306. DOI <http://dx.doi.org/10.12775/JEHS.2022.12.09.055>
<https://apcz.umk.pl/JEHS/article/view/39708>
<https://zenodo.org/record/7051248>

The journal has had 40 points in Ministry of Education and Science of Poland parametric evaluation. Annex to the announcement of the Minister of Education and Science of December 21, 2021. No. 32343. Has a Journal's Unique Identifier: 201159. Scientific disciplines assigned: Physical Culture Sciences (Field of Medical sciences and health sciences); Health Sciences (Field of Medical Sciences and Health Sciences). Punkty Ministerialne z 2019 - aktualny rok 40 punktów. Załącznik do komunikatu Ministra Edukacji i Nauki z dnia 21 grudnia 2021 r. Lp. 32343. Posiada Unikatowy Identyfikator Czasopisma: 201159. Przynależność dyscypliny naukowej: Nauki o kulturze fizycznej (Dziedzina nauk medycznych i nauk o zdrowiu); Nauki o zdrowiu (Dziedzina nauk medycznych i nauk o zdrowiu).
© The Authors 2022;
This article is published with open access at Licensee Open Journal Systems of Nicolaus Copernicus University in Torun, Poland
Open Access. This article is distributed under the terms of the Creative Commons Attribution Noncommercial License which permits any noncommercial use, distribution, and reproduction in any medium, provided the original author (s) and source are credited. This is an open access article licensed under the terms of the Creative Commons Attribution Non commercial license Share alike. (<http://creativecommons.org/licenses/by-nc-sa/4.0/>) which permits unrestricted, non commercial use, distribution and reproduction in any medium, provided the work is properly cited.
The authors declare that there is no conflict of interests regarding the publication of this paper.
Received: 21.08.2022. Revised: 02.09.2022. Accepted: 05.09.2022.

Iodine supplementation by women of childbearing potential and in pregnancies - analysis of knowledge among students

Justyna Wójcik-Grudzień^{1a}, Alicja Ozga-Stachurska^{2b}, Paulina Pawłowska^{2c},
Martyna Rozenbajgier^{3d}

a) justynawojcik455@gmail.com; <https://orcid.org/0000-0001-7163-6784>

b) aozga1@gmail.com; <https://orcid.org/0000-0003-1291-905X>

c) paulina.piotrowska222@gmail.com; <https://orcid.org/0000-0002-5516-952X>

d) rozenbajgier.martyna@gmail.com; <https://orcid.org/0000-0001-5165-9719>

¹⁾ Mazowiecki Szpital Specjalistyczny Sp. z o.o. w Radomiu

²⁾ Wojewódzki Szpital Specjalistyczny im. Kardynała Wyszyńskiego Samodzielny Publiczny Zakład Opieki Zdrowotnej w Lublinie

³⁾ 5 Wojskowy Szpital Kliniczny z Polikliniką w Krakowie

Corresponding author: Justyna Wójcik-Grudzień

e-mail: justynawojcik455@gmail.com

ORCID: 0000-0001-7163-6784

ABSTRACT

Introduction

Iodine is necessary for the proper production of triiodothyronine and thyroxine, which affect the development and proper functioning of the body. Thyroid hormones are involved in the transformation of proteins, fats, carbohydrates and vitamins, and also regulate the processes of cell growth and maturation. Iodine deficiency during pregnancy has many

consequences for the fetus and newborn, some of them an increased risk of miscarriage, stillbirth, birth defects or abnormal mental development. Iodine deficiency through lack of supplementation or deficiency in the daily diet, as well as the consumption of an excess amount of this microelement, may be associated with serious and irreversible consequences affecting the development and further functioning of the fetus.

Aim of the study

Presentation of the impact of iodine supplementation in reproductive age and pregnancy on fetal development and students' knowledge of the need for this supplementation.

Materials and method

A survey of 404 students. The results were compared with the current scientific literature. Statistical analysis was performed using Microsoft Excel.

Results

In the study group, almost every third student believed that current recommendations recommend that women planning pregnancy should take iodine preparations. Every tenth student gave the correct dose of recommended supplementation of the microelement in question.

Conclusions

Research shows that more than half of students are not aware of the need to supplement iodine at the reproductive age. The data indicate that young people should be made aware of the need for iodine supplementation.

Key words: iodine supplementation, iodine deficiency, pregnancy, newborn

INTRODUCTION

Iodine is a chemical element necessary for the production of thyroid hormones – thyroxine and triiodothyronine. The term iodine comes from the French word "iodine" originally proposed by J.P. Gay-Lussac, derived from the Greek "ἰοειδής" due to its characteristic purple color in the gaseous state[1]. It is not stored in the human body and must be supplied with the diet or supplemented in the form of iodides and iodates[2]. The role of iodine is to participate in the synthesis of thyroid hormones, which affect the development and functioning of, for example, the nervous and skeletal systems, cell growth and maturation

processes and maintaining adequate body temperature, in addition, it is a strong antioxidant and has a protective effect in inflammatory and cancer processes[3,4]. Oxidation of iodine to hypoiododit (IO^-) also has a strong bactericidal, antiviral and antifungal effect[5,6]. Estimated population studies indicate that iodine deficiency affects about 2 billion people in the world, the most vulnerable to its deficiency are children, pregnant and lactating women. Deficiency in all age groups causes goiter or increased sensitivity to nuclear radiation, while fetuses and newborns have a risk of miscarriage and higher perinatal mortality, a risk of birth defects, or a risk of endemic cretinism. Adults with iodine deficiency are at risk of mental impairment, lower performance at work, the development of tuberosus neutral or hyperactive goiter, hypothyroidism in conditions of severe and moderate iodine deficiency[3]. The mechanism that causes neuronal and developmental defects is considered a direct consequence of the lack of thyroid hormones acting on responsive nerve tissues during critical stages of fetal development[7]. To avoid these consequences, it is recommended to take oral iodine supplementation during pregnancy and breastfeeding before the planned pregnancy and breastfeeding at a dose of 150 μg per day in addition to about 100 μg provided in the daily diet[8,9]. However, it should be remembered that both iodine deficiency and overdose can have significant consequences. Therefore, in consultation with a specialist gynecologist, it is necessary to determine the time, safety and effectiveness of prophylactic iodine supplementation in pregnant and lactating women and confirm that deficiencies and excessive consumption of iodine during pregnancy should be avoided[10].

AIM OF THE STUDY

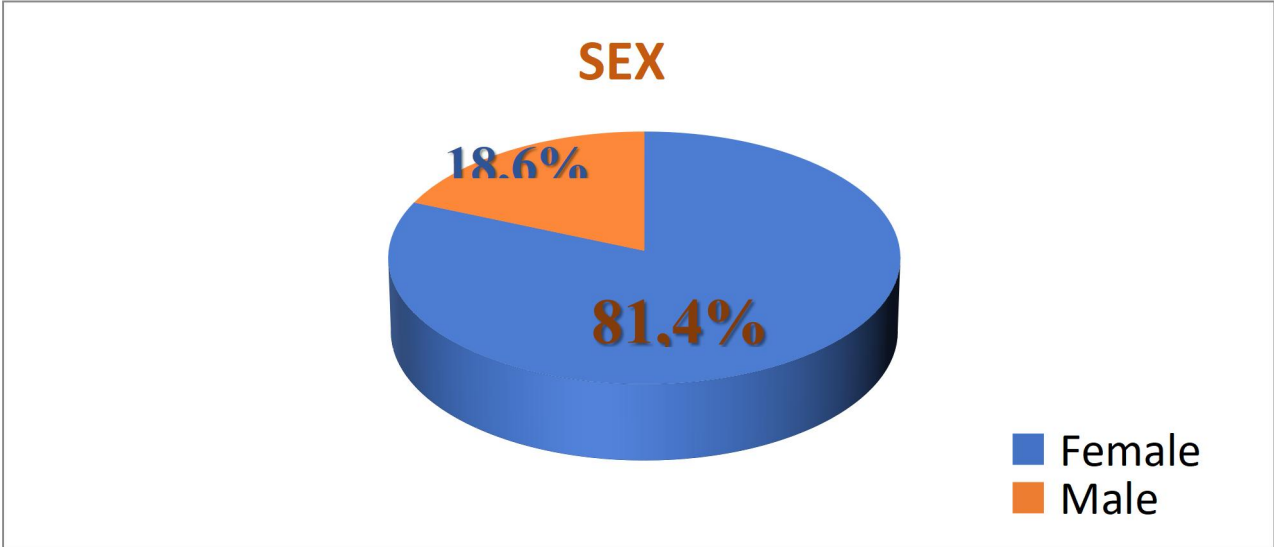
Presentation of the impact of iodine supplementation in reproductive age and pregnancy on fetal development and examination of students' awareness of the need for this supplementation.

MATERIAL AND METHODS

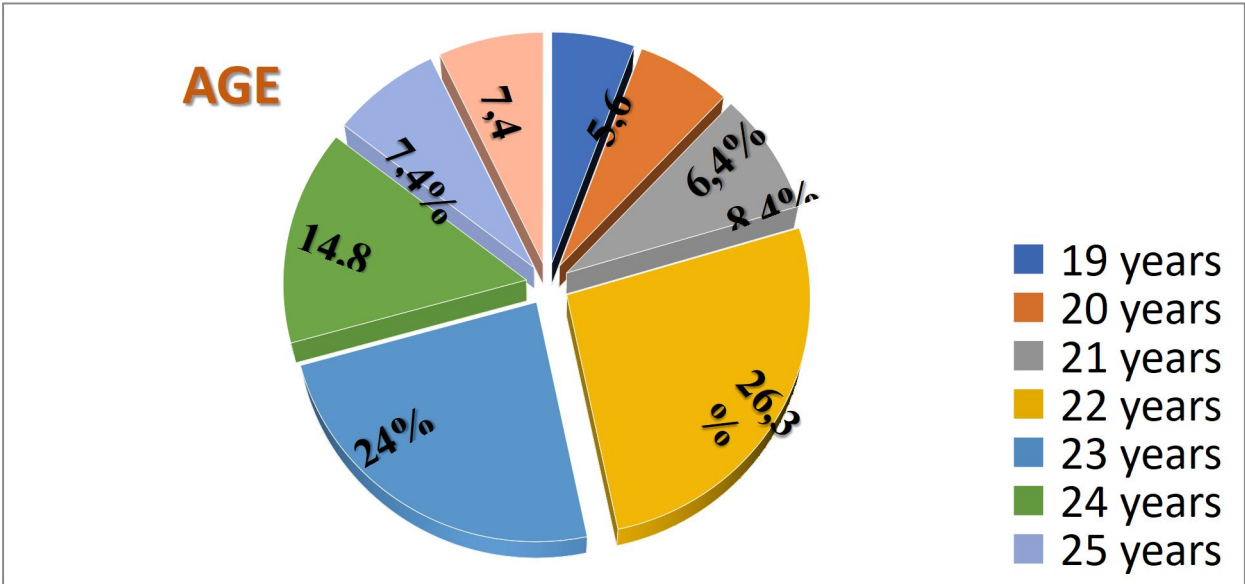
A survey of 404 students (330 women and 74 men). The results were compared with the current scientific literature. Statistical analysis was performed using Microsoft Excel. Articles by PubMed and Google Scholar were used on the topic: iodine supplementation in pregnancy, iodine deficiency.

RESULTS

A survey of 404 people was conducted, where a significant proportion of people were women, constituting 81.4% of the respondents.

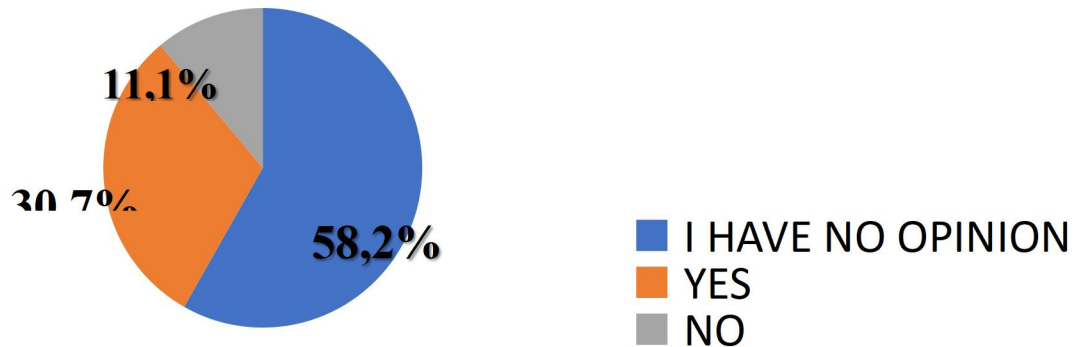


More than half of the respondents were people in the range of 22-23 years.



Among the respondents, the question was asked : "Do you think that taking iodine by women planning to have pregnancy is recommended in Poland?" More than half of the respondents did not know what the recommendations were, and only 30.7% of the respondents considered the need to supplement this microelement.

AKING IODINE BY WOMEN PLANNING PREGNANCY IS RECOMM



The survey shows that only 11.1% of the respondents knew the correct dose of additional iodine supplementation at procreative age and in pregnancy, assuming that 100 micrograms are taken with food.

CONCLUSION

Almost 70% of the surveyed people are not aware of the need for iodine supplementation in childbearing age, and only every tenth student correctly administers the dose of recommended supplementation of the microelement in question, which shows that there is a need to make adolescents and adults aware of the consequences of iodine deficiency and the need to supplement it.

DISSCUSION

The presented study showed how low is the awareness of young people about iodine supplementation at procreative age and during pregnancy. Iodine supplementation during pregnancy and lactation is recommended to prevent the potentially severe and irreversible consequences of iodine deficiency for the development of offspring. A large part of the respondents were women who should be particularly aware of the need for additional supplementation of this microelement. Over the past few decades, it has been proven that the functional roles of iodine go beyond the role of TH biosynthesis, as it plays a role in the

innate immune response against pathogens and as an anti-cancer agent[11]. The results of the study speak and oblige the medical community to organize social campaigns aimed at raising awareness about the importance of fetuses, newborns and other age groups maintaining serum iodine concentrations at an adequate level, since there is evidence that even slightly excessive iodine intake during pregnancy in women who do not have severe iodine deficiency can paradoxically cause neurodevelopmental disorders in the fetus [12,13].

BIBLIOGRAPHY:

1. Zimmermann, M.B. Niedobór jodu. *Endocr. Rev.* **2009**, *30*, 376–408.
2. Niwattisaiwong S, Burman KD, Li-Ng M. Niedobór jodu: implikacje kliniczne. *Cleve Clin J Med.* 2017 Mar;84(3):236-244. doi: 10.3949/ccjm.84a.15053. PMID: 28322679.
3. Zimmermann MB. Skutki niedoboru jodu w ciąży i niemowlęctwie. *Paediatr Perinat Epidemiol.* 2012 Lip;26 Suppl 1:108-17. doi: 10.1111/j.1365-3016.2012.01275.x. PMID: 22742605.
4. Niwattisaiwong S, Burman KD, Li-Ng M. Niedobór jodu: implikacje kliniczne. *Cleve Clin J Med.* 2017 Mar;84(3):236-244. doi: 10.3949/ccjm.84a.15053. PMID: 28322679.
5. Bosch, ET; van Doorne, H.; de Vries, S. System laktoperoksydazy: Wpływ jodku oraz stabilność chemiczna i przeciwdrobnoustrojowa w okresie około 18 miesięcy. *J. Appl. Mikrobiol.* **2000**, *89*, 215–224.
6. Huang, Y.Y.; Choi, H.; Kushida, Y.; Bhayana, B.; Wang, Y.; Hamblin, M.R. Szerokie spektrum działania przeciwdrobnoustrojowego fotokatalizy przy użyciu nanocząstek dwutlenku tytanu są silnie wzmacniane przez dodanie jodku potasu. *Środki przeciwdrobnoustrojowe. Środki Chemoter.* **2016**, *60*, 5445–5453.
7. Williams, G.R. Neurorozwojowe i neurofizjologiczne działanie hormonu tarczycy. *J. Neuroendokrynol.* **2008**, *20*, 784–794.
8. Gietka-Czernel M. Profilaktyka niedoboru jodu. *Postępy Nauk Medycznych* 2015, 12, 839-845
9. Chittimoju SB, Pearce EN. Iodine Deficiency and Supplementation in Pregnancy. *Clin Obstet Gynecol.* 2019 Jun;62(2):330-338. doi: 10.1097/GRF.0000000000000428. PMID: 30829881.
10. Eastman CJ, Ma G, Li M. Optymalna ocena i kwantyfikacja odżywiania jodem w ciąży i laktacji: metody laboratoryjne i kliniczne, kontrowersje i przyszłe kierunki.

Składników odżywczych. 2019 paź 5;11(10):2378. doi: 10.3390/nu11102378. PMID: 31590373; PMCID: PMC6835375.

- 11.** Sorrenti S, Baldini E, Pironi D, Lauro A, D'Orazi V, Tartaglia F, Tripodi D, Lori E, Gagliardi F, Praticò M, Illuminati G, D'Andrea V, Palumbo P, Ulisse S. Jod: jego rola w biosyntezie hormonów tarczycy i nie tylko. *Składników odżywczych*. 2021 Gru 14;13(12):4469. doi: 10.3390/nu13124469. PMID: 34960019; PMCID: PMC8709459.
- 12.** Abel, M.H.; Caspersen, I.H.; Meltzer, H.M.; Haugen, M.; Brandlistuen, R.E.; Aase, H.; Aleksander, J.; Torheim, L.E.; Brantsæter, A.-L. Nieoptymalne spożycie jodu przez matkę jest związane z zaburzeniami neurorozwoju dziecka w wieku 3 lat w norweskim badaniu kohortowym matki i dziecka. *J. Nutr.* **2017**, *147*, 1314–1324
- 13.** Corcino, CM; Berbara, T.; Saraiva, D.A.; Morais, N.; Schtscherbyna, A.; Gertrudes, L.N.; Teixeira, P.d.F.d.S.; Vaisman, M. Zmienność statusu jodu w czasie ciąży i jej związek z czynnością tarczycy u kobiet z Rio de Janeiro w Brazylii. *Zdrowie publiczne Nutr.* **2019**, *22*, 1232–1240