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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии
საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებშიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman (Кириллица)**, для текста на грузинском языке следует использовать **AcadNusx**. Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - <http://www.spinesurgery.ru/files/publish.pdf> и http://www.nlm.nih.gov/bsd/uniform_requirements.html В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректур авторам не высылаются, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or computer-printed on a single side of standard typing paper, with the left margin of 3 centimeters width, and 1.5 spacing between the lines, typeface - **Times New Roman (Cyrillic)**, print size - 12 (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf

In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

**Articles that Fail to Meet the Aforementioned
Requirements are not Assigned to be Reviewed.**

ავტორთა საქურაღებოლ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დაიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx**. შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრაფიების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შედეგების ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფხიხლებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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THYROID CANCER AS A PUBLIC HEALTH CHALLENGE IN GEORGIA

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Abstract.

Background: Thyroid cancer (TC) is the most common endocrine cancer. The increase in thyroid cancer incidence has been observed in both developed and developing countries in different Geographical and climate areas. The share of thyroid cancer drastically increased during the last decades in Georgia and ranked as the second most prevalent cause of cancer among women. Although for addressing the burden of cancer, important steps were taken by the State during the last decades, the burden of this disease is still significant. The presented paper aims to provide an overview of the current burden of thyroid cancer in Georgia, delving into its risk factors.

Methods: To explore the opinion of key stakeholders about the factors causing the increased trend of thyroid cancer in Georgia in-depth interviews were used. The study was conducted from March to August 2023 in the capital of Georgia – Tbilisi. Women and men who had thyroid cancer and survived, women and men who are suffering from thyroid cancer along with healthcare providers, policymakers, and national professional bodies were the respondents in this study. The guides for the in-depth interviews were prepared based on the literature review.

Results: Stakeholders agreed that the number of thyroid cancer cases has increased during the last decades. The concern that the prevalence and incidence of thyroid cancer is the highest in the world in Georgia and it is the second leading cause of cancer among women was also expressed by respondents. According to study findings, new diagnostic methods revealed more cases of thyroid cancer. Other respondents stated that the development of the cancer registry, and the improvement of the reporting system existing cases of this disease. The issue of over-diagnosis was also mentioned by the stakeholders. Almost all study participant patients are challenged by the post-operational period. Some of them had not gotten information on how to deal with this period. Several patients mentioned financial problems due to fee-for-service or co-payments.

Conclusion: According to the study participants, the recent sharp increase in the incidence and prevalence of thyroid cancer cases might be associated with overdiagnosis and the lack of monitoring and unified diagnostic and treatment methods.

Key words. Thyroid Cancer, health challenges.

Introduction.

Thyroid cancer has become a significant global health concern, posing a substantial burden on healthcare systems worldwide [1]. This malignancy arises from the abnormal growth of cells in the thyroid gland, a vital endocrine organ located in the neck responsible for producing hormones that regulate metabolism. While thyroid cancer has historically been considered relatively

rare, its incidence has been steadily increasing over the past few decades, making it one of the fastest-growing cancers globally [2].

Thyroid cancer is the most common endocrine cancer, with a global incidence of 6.1 per 100,000 women and 1.9 per 100,000 men [3]. During the last three decades, with an age-standardized incidence of 10.1 and 3.1 per 100,000 women and men, respectively [2,4]. Worldwide, an estimated 586,202 people were diagnosed with thyroid cancer in 2020 [5]. Thyroid cancer can be placed into two distinct categories, differentiated cancers and non-differentiated cancers. Differentiated cancers include papillary thyroid cancer and follicular thyroid cancer/hurthle cell carcinoma. Non-Differentiated cancers include medullary thyroid cancer, anaplastic thyroid cancer and thyroid lymphoma [4].

The burden of thyroid cancer has indeed been increasing in Europe. The rise in thyroid cancer incidence has been observed in both developed and developing countries. However, it is essential to note that the incidence rates can vary significantly between regions and countries due to differences in risk factors, environmental exposures, and healthcare practices [6]. In Europe, thyroid cancer is among the ten most common cancers among women. It is more prevalent in countries with higher levels of iodine deficiency and in regions where environmental radiation exposure has occurred due to past nuclear accidents or radiation therapy for other medical conditions [7]. Thyroid cancer is generally more common in females compared to males, and the highest incidence rates are often observed in countries with better access to healthcare and advanced diagnostic technologies [7]. For example, In Croatia, there has been a significant increase in the incidence of thyroid cancer in men and women in the past 15 years, while the mortality rate has remained stable. According to the Croatian Institute of Public Health, the most significant increase in the incidence of thyroid cancer cases is in women aged 55-64 and men aged 60-69 [8,9]. The incidence of thyroid cancer has increased tremendously in the past 15 years in Georgia; thyroid cancer moved from ranking 15th to 2nd among the most prevalent cancers in women. Interestingly, while all over the world the sex ratio for thyroid cancer is 3.5 women for 1 man, in Georgia it is 6 women for 1 man [10].

The reason for these dramatically increasing trends is unclear yet. Researchers have postulated that overidentification or overdiagnosis of clinically occult, asymptomatic tumours, as well as recent advancements in diagnostic technologies, are responsible for the increase [11,12]. However, it is likely that other factors, such as environmental factors, lifestyle, family history and comorbidities, also have significant roles in thyroid

cancer development [13,14]. Several environmental factors suggested to be endocrine disruptors have been associated with the occurrence of thyroid cancer.

In this context, it becomes imperative to examine the burden of thyroid cancer. Understanding the prevalence, risk factors, and regional disparities in the spread will aid in the development of effective prevention, early detection, and treatment/rehabilitation strategies. This paper aims to provide an overview of the current burden of thyroid cancer in Georgia, delving into its risk factors. By shedding light on the challenges posed by thyroid cancer, this research aims to contribute to the efforts towards reducing its burden and improving patient outcomes in Georgia.

Background.

There is limited literature that analyses the current situation regarding the spread of thyroid cancer in Georgia. The initial search yielded 15 articles and reports in Georgian and 5 in English. Most of the articles and reports explore the situation regarding the spread of thyroid cancer and the State measures regarding reducing the burden in Georgia.

The desk review revealed that cancer is one of the leading causes of death in Georgia. To address the burden of cancer, the following important steps were taken by the State during the last decade: The Government of Georgia implemented the population-based cancer registry and approved The National Strategy for Prevention and Control of Non-Communicable Diseases 2023-2030 with the action plan 2023-2025 [15]. The population-based cancer registry has dramatically improved the surveillance of oncological diseases. In 2017, the Government launched a program for the socially vulnerable population, which considered the provision of drugs for chronic non-communicable diseases, among them was thyroid gland disease treatment [15]. Moreover, in 2019, a unified cancer information system was created, which integrated cancer screening, cancer registry and laboratory data. According to the newly introduced system, the prevalence of thyroid gland pathologies and among them thyroid cancer drastically increased in the country and ranked as the second cause of cancer among women [16].

The incidence of thyroid cancer tremendously increased during the last decades, however, it steadily decreased during the last three years. In 2015, the incidence of thyroid cancer was 31.2 per 1000 women, it increased to 48.2 in 2018 and in 2022 it was 35.6. Also, it is crucial to mention that mortality per 1000 women has been reduced from 1.1 (2015) to 0.6 (2022). The share of thyroid cancer among all types of cancers has increased steadily among reproductive-age women (15-49 years old) and reached 61.8 % in 2022, which is 7% higher compared to 2015 (54%). The vast majority of thyroid cancer that is registered in Georgia is papillary thyroid cancers. However, the five-year survival rate of thyroid cancer patients is the highest among all cancers - 96.2% [17].

To address the burden of thyroid cancer, the municipality of Tbilisi introduced a program for the management of thyroid gland pathologies. The program is free for 25- and 70-years old women including IDPs and offers the following services: thyroid ultrasound examination (thyroid U/S); blood test to assess thyroid function (TSH - thyroid stimulating hormone) when necessary; taking a biopsy and conducting cytological

studies; An endocrinologist is responsible for overseeing the patient's management in cases of pathology. The municipalities of Tbilisi and Zugdidi are the only providers of the thyroid cancer management program; it is not a state-run initiative [18].

The criteria for inclusion in the program and to access free thyroid U/S are very broad and include the following: familial history or personal history of cancer, diabetes or metabolic disease, BMI>25, lymphadenopathy, thyroid disease or abnormal TSH and dysphagia. It appears that self-referral is possible, however only women presenting with the above criteria can access the thyroid U/S for free. After the implementation of the thyroid cancer management program, the incidence of thyroid cancers increased among women, not men. Such a difference is very likely attributable to the increased practice of U/S of thyroid examination among women compared to men (thyroid U/Ss reimbursed for women only) [18].

During this period, the rate of thyroid surgery has also increased. Thyroid surgery is commonly recommended by general practitioners and other physicians as a basic and the best treatment methodology. Most of the patients with thyroid cancer had surgical operations, 93% and 86.2% in 2021 and 2022, respectively. Notably, thyroid surgery is better reimbursed than other type of thyroid treatments [17]. It should also be mentioned that the quality assurance or quality control mechanism of disease management is not fully implemented in the country.

All above mentioned clarify that the burden of thyroid cancer is explored in Tbilisi mostly as the program implemented only in capital. This paper aims to expose the stakeholders' opinions causes of this burden which is presented below.

Methods.

To understand the context regarding the trend of thyroid cancer epidemiology in Georgia qualitative study was done.

Desk research is conducted to explore the burden of thyroid cancer and the State's actions to deal with such a challenge in Georgia. All published and unpublished documents about thyroid cancer were reviewed and analysed. For the analytical appraisal, the following keywords and word combinations were used: thyroid gland, thyroid cancer, Georgian cancer registry, State cancer program and Tbilisi municipal healthcare program. The publications with the above-mentioned keywords are searched in the following databases and websites: PubMed, ScienceDirect, Medline, Minister of IDPs from the Occupied Territories, Labour, Health and Social Affairs of Georgia, National Center for Disease Control and Public Health of Georgia. Literature was searched from September 2022 to February 2023. The language of publications is limited to English and Georgian. Grey literature studies and informational papers are also captured. Publications are identified as relevant if they present empirical evidence and original analysis results.

To explore the opinion of key stakeholders about the factors causing the increased trend of thyroid cancer incidence and prevalence in Georgia a qualitative design was used. The guides for the in-depth interviews were prepared based on the literature review. The study was conducted from March to August 2023 in the capital Tbilisi. Women and men who had thyroid cancer and survived, women and men who are suffering from thyroid cancer, healthcare providers, policymakers, and national

professional bodies were the respondents in this study. Ethical approval of the study was obtained from the IRB committee of the National Center for Disease Control and Public Health of Georgia.

A qualitative study was conducted and collected data from twelve main stakeholders; namely, in-depth interviews were performed with two policymakers, three private health facility representatives, two representatives of the Ministry of Health, one representative of a national professional organization and two service providers (physicians). Data from six female and six male patients with papillary thyroid cancer and who survived thyroid cancer was obtained by conducting face-to-face in-depth interviews. The patients with papillary thyroid cancer were selected for the study as this is the most prevalent among thyroid cancers. Patients were selected using the snowballing method.

The objective of the study was to explore the factors causing the increased trend of thyroid cancer in Georgia from the perspective of different stakeholders. The guides for the qualitative study were developed in the Georgian language by the principal investigator based on a literature review. In-depth interview guides were pre-tested and adapted accordingly. Informed written consent was given by all respondents before each interview. The Principal Investigator conducted all in-depth interviews. Confidentiality of the collected data was maintained. Each session was audio-taped. The need for audio taping of each in-depth interview was explained to all respondents and permission for recording was obtained. All in-depth interviews were conducted in the Georgian language. Data was collected from March to August 2023. Two research assistants independently coded the data based on the key attributes of factors causing the increased trend of thyroid cancer as outlined above and consensus on any discrepancies was built through discussions. The results were synthesized narratively.

Results.

To reveal stakeholders' opinions about the factors causing the increased trend of thyroid cancer in Georgia a qualitative study was conducted. Almost all stakeholders agreed that the number of cases of thyroid cancer has been increased during the last decades. Some of them think that new diagnostic methods and changes in case detection revealed more cases of thyroid cancer.

Other respondents stated that the development of the cancer registry improved the reporting system. Some of them expressed concerns that the prevalence of thyroid cancer in Georgia is the highest in the world and the second leading cause of cancer among women. Some of them mentioned that the situation needs more in-depth studies as it may be related to overdiagnosis. The issue of over-diagnosis also supported by the fact that according to the stakeholders, as they mentioned during in-depth interviews there are no national guidelines or protocols for the diagnosis or treatment of thyroid gland pathologies or cancer. The absence of a unified approach to the management of disease leads to overdiagnosis. Some respondents - service providers mentioned that they are treating their patients based on the USA guidelines and protocols, while others are applying European experience.

As policymakers and service providers indicated, the thyroid cancer management program improves patient financial access to essential services. However, the service providers mentioned that some citizens of Tbilisi are utilizing services provided by the program without a referral. According to the study participants, the lack of systematic quality control and quality monitoring of the usage of the national/international guidelines and protocols creates an environment for the overdiagnosis and overutilization of services.

A representative of the Ministry of Environmental Protection and Agriculture of Georgia stated that the burden of disease associated with environmental factors is significant in Georgia. According to the respondents, it is estimated that more than 10 thousand cases of diseases are associated with environmental factors and bigger share of these cases are non-communicable diseases. Among them is cancer. International evidence shows that the deficiency of selenium and vitamin D- and radiation play a role in the development of autoimmune diseases. However, this type of evidence is not proven in Georgia. Moreover, there is not any information system in the country about the effect of chemicals on the population. Thus far the surveillance of only one heavy metal - lead is established in Georgia. It should be considered that lead poisoning is not related to thyroid gland pathology.

The representative of the Ministry of Environmental Protection and Agriculture of Georgia clarified that the radiation levels in the environment are within the range of natural background radiation for Georgia. The country has a centralized system for the management of radioactive waste. According to the stakeholders, depending on the solar radiation, certain zones are affected, particularly in the high mountains. It was also revealed that there was a problem with Radon exposure in the country in the late 90s of the last century. After the collapse of the Soviet Empire, various sources of radiation were found in the country because of leftovers from the Soviet Army. During the same period, Gamma radiation was found in gas heaters imported from abroad. The country investigated the phenomenon, and the products were removed from the market. At the beginning of this century, radioactive waste was found in the forest in Imereti, according to the scientists it was a waste from the Chernobyl disaster. As mentioned above, radioactive waste was eradicated due to active monitoring.

Transportation fumes have also been identified by experts as the main cause of urban pollution. Study participants mentioned that challenges related to transportation fumes are regulated by the government by the new legislation. However, the correlation between transportation fumes and thyroid cancer is not defined, therefore this topic was not further discussed.

As stakeholders mentioned, international support plays an important role in exploring environmental factors that affect the health of the Georgian population. International organizations assist countries in conducting surveys and exploring environmental pollutants as well as establishing monitoring mechanisms. For instance, the latest studies conducted by the National Center for Disease Control and Public Health revealed that access to safe water is a problem in the country. However, only surveillance of safe water on bacterial contamination is

implemented. The study revealed that it is crucial to develop a water monitoring mechanism for chemical contamination.

The stakeholders stated that Iodine deficiency was one of the public health problems in Georgia for decades. Therefore, the State's long-term action plan to tackle the iodine deficiency problem was developed. The latest study done by UNICEF showed the burden of Iodine deficiency disorders decreased in the country. However, as respondents mentioned, the incidence as well as prevalence of autoimmune diseases of the thyroid gland has increased. This issue needs further study and clarification.

The study respondents mentioned that during the last period the referral of the patients and the utilization of services regarding thyroid cancer has been increased. This might be the result of improved awareness of the population about prophylactic measures. It is also notable that among referrals patients with primary and secondary infertility, obesity and overweight are prevalent. Respondents also indicated that information campaigns on harm of environmental factors on human health are essential.

Patients participated in the study were survivors of thyroid cancer, their age ranged from 25 to 68 years. Only a few of them had exposure to one or another risk factor, such as genetic factors, exposure to solar radiation, etc. as they highlighted in the interview. All respondents had atypical symptoms and signs, such as low body temperature, weakness, and insomnia. All respondents have undergone the same steps - they were referred to the specialist (endocrinologist) by the general practitioner and had an ultrasound scan, biopsy, and irritation, and diagnosed with papillary carcinomas and underwent total thyroidectomy. Most of them had not searched for a second opinion from professionals and followed the decision of the endocrinologist and surgeons. None of the respondents was ready to face the final diagnosis as they did not have any information about the disease and their decision to have thyroidectomy was completely taken depending only on the surgeon's recommendation. Almost all of them mentioned that they did not have sufficient information about disease, treatment, rehabilitation, and psychological support.

Most respondents emphasized that the treatment expenses were only partially covered by the central or municipal government or private insurance company.

Discussion and Conclusion.

This paper aims to present an overview of the current burden of thyroid cancer and describes stakeholders' opinions about the causes of this burden in Georgia. All stakeholders indicated that the increase in thyroid cancer incidence is related to the new diagnostic and treatment methods.

There is consensus among the groups that following the national guidelines and protocols is essential. A unified approach to the diagnosis and treatment of patients, with training of the service providers, systematic quality control and evaluation is crucial. That may prevent overdiagnosis or misdiagnosis, which is also stated as a problem by the stakeholders.

The improvement of the health information system, implementation of the cancer registry and thyroid cancer management program was revealed by the stakeholders as a

significant achievement of the country. However, an in-depth analysis of the health data and the service quality monitoring system is also required to maintain a good quality of care and prevent overdiagnosis.

There is information asymmetry as patients lack information about the disease itself and the treatment and rehabilitation periods. Almost all of them mentioned that post-operation period was quite challenging as the reality and expected situation were quite different. The lack of empathy and responsiveness from the doctor side also discouraged them from requesting more clarity and most frequently they avoided asking questions. No multidisciplinary approach exists and resistance to accepting colleagues' opinions also leads patients to avoid searching for a second opinion and to make evidence-based decisions about treatment methods.

For almost all patient respondents who had surgical operations, the thyroid gland was fully removed. As they mentioned during in-depth interviews, after thyroid removal, almost all patients had different types of follow-ups as there is no unified guideline or protocol about disease management based on patient-centered care.

According to the result of this study, we can conclude that the recent sharp increase in thyroid cancer cases might be associated with overdiagnosis and the lack of monitoring and unified diagnostic and treatment methods.

Recommendations.

- Develop mechanisms of clinical audit and clarify the role of different stakeholders regarding the implementation of monitoring mechanisms, guidelines, and quality assurance for the thyroid cancer management program.
- Improve awareness of the population about preventive and health promotional programs.
- Expansion of the thyroid cancer management program throughout Georgia to decrease inequity and ensure equal availability and affordability.
- Establishment of psychological support mechanisms for all cancer patients.

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