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ADVERSE EFFECTS OF RADIOACTIVE IODINE THERAPY IN THYROID CANCER SURVIVORS: IMPLICATIONS FOR QUALITY OF LIFE

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REVISÃO INTEGRATIVA DA LITERATURA

ABSTRACT

Objective: This study aimed to analyze, through an Integrative Literature Review, the adverse effects of radioactive iodine (I-131) therapy in thyroid cancer survivors, with emphasis on psychosocial repercussions and quality of life after treatment. Method: The research was conducted in the PubMed, SciELO, Web of Science, LILACS, and Scopus databases, using controlled descriptors and free terms related to the topic. Articles published between 2015 and 2025 were included, in Portuguese, English, or Spanish, addressing physical and psychosocial effects of I-131 in thyroid cancer patients after medical discharge. The study selection followed PRISMA guidelines, and the data were systematized through a synthesis table, with methodological classification based on the Joanna Briggs Institute criteria. Results: Eleven articles were selected to compose the review corpus. The studies revealed a range of side effects associated with radioiodine therapy, such as salivary and lacrimal gland dysfunction, altered taste, chronic fatigue, and risk of secondary neoplasms. In the psychosocial domain, feelings of anxiety, insecurity, changes in body image, social isolation, and a perception of prolonged medicalization of life were highlighted. These findings indicate that surviving cancer does not necessarily equate to full well-being, requiring broader attention from healthcare services. Conclusion: Although effective from an oncological perspective, radioiodine therapy imposes long-lasting repercussions on patients' lives. Recognizing the functional and subjective impacts as part of the therapeutic process is essential to ensuring quality of life, autonomy, and dignity throughout the thyroid cancer survivorship journey.

Keywords: Radioiodine Therapy; Thyroid Cancer; Cancer Survivorship.

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1- INTRODUCTION

Thyroid cancer is the most prevalent endocrine malignancy, with increasing incidence worldwide, especially among young and middle-aged women. Among its subtypes, differentiated carcinoma, including papillary and follicular carcinomas, accounts for over 90% of cases. The standard treatment combines thyroid surgery with the administration of radioactive iodine (I-131), aiming to eliminate thyroid remnants and micrometastases (Liu et al., 2023; Carvalho et al., 2024).

Although I-131 therapy has been established as an effective resource for reducing recurrence and mortality, attention has increasingly turned to the medium- and long-term side effects that compromise the quality of life of cancer survivors. Reported complications include salivary gland dysfunction, xerostomia, altered taste, nausea, infertility, persistent fatigue, and psychosocial impacts such as anxiety, fear of recurrence, and social stigmatization (Li et al., 2024; Hiromasa et al., 2025).

Beyond the physical effects, coping with the disease and treatment can result in significant emotional consequences. Despite the high survival rate, the absence of suffering is not guaranteed. Therefore, understanding the adverse effects of I-131 therapy and its implications for quality of life is fundamental for enhancing oncology care practices (Banihashem et al., 2020).

This study aims to analyze, through an integrative literature review, the main adverse effects of radioactive iodine therapy in thyroid cancer survivors, with emphasis on the physical, emotional, and social repercussions related to quality of life.

2- METHOD

This study is an Integrative Literature Review (ILR), a comprehensive methodological approach that allows for the collection, critical evaluation, and synthesis of research results with diverse designs, enabling a deeper understanding of a specific phenomenon. Grounded in the assumptions of Evidence-Based Practice, this methodology enables the production of knowledge with both theoretical and practical applicability, contributing to the enhancement of oncological care and the development of support strategies for cancer survivors (Lemes et al., 2021; Ganong, 1987).

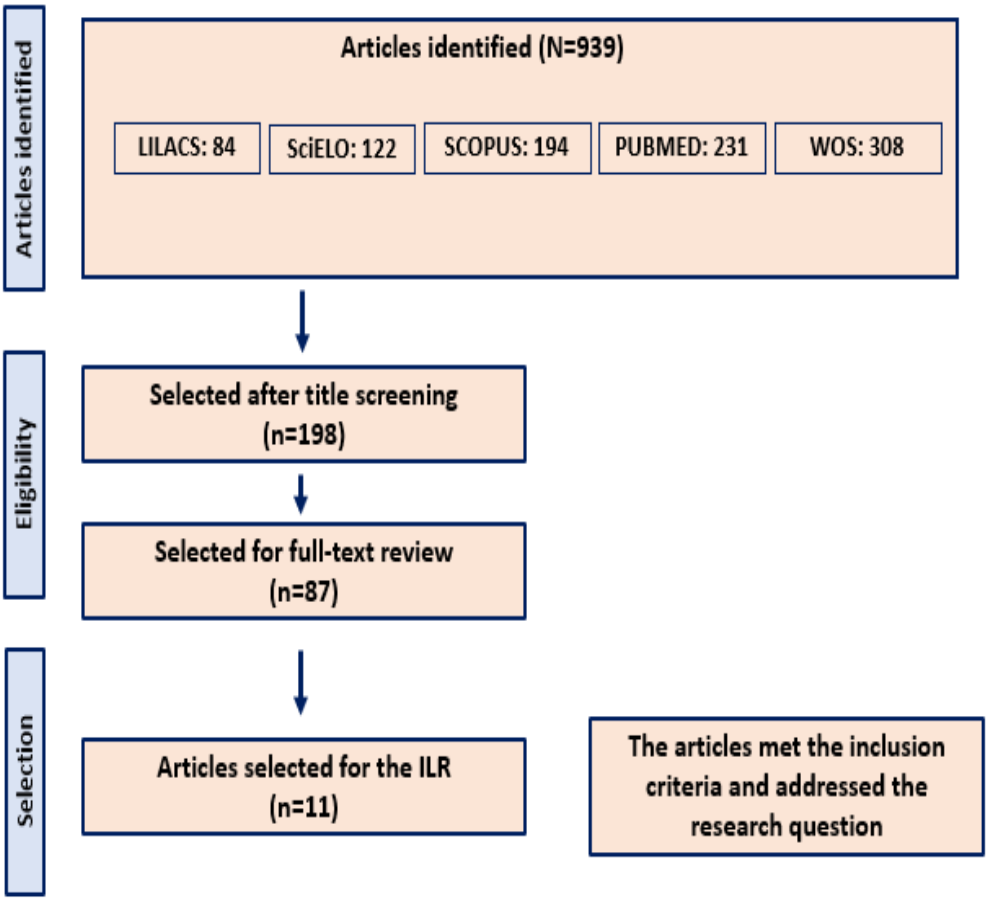
The review process followed the steps systematized by Ganong (1987) and updated by Lemes et al. (2021), namely: (1) identification of the research problem, (2) definition of eligibility criteria, (3) search strategies in the databases, (4) selection and evaluation of included studies, (5) categorization, analysis, and synthesis of findings, and (6) presentation of results. The research question was constructed based on the PICo strategy (Stern; Jordan; McArthur, 2014), considering: P (adult thyroid cancer survivors), I (adverse effects of radioactive iodine therapy), and Co (quality of life after treatment). Thus, the guiding research question was: what are the physical and psychosocial effects of radioactive iodine therapy in thyroid cancer survivors, and how do these effects impact their quality of life?

The study search used controlled vocabularies from Health Sciences Descriptors (DeCS) and Medical Subject Headings (MeSH), as well as free terms related to the object of investigation. The following descriptors were used, combined with Boolean operators (AND and OR): “Thyroid Cancer” OR “Câncer de Tireoide,” “Radioactive Iodine” OR “Iodo Radioativo,” “Side Effects” OR “Efeitos Adversos,” “Quality of Life” OR “Qualidade de Vida,” and “Cancer Survivors” OR “Sobreviventes de Câncer.” The databases selected for data collection were: PubMed, SciELO, Web of Science, LILACS, and Scopus.

Scientific articles published between 2015 and 2025 were included, in English, Spanish, or Portuguese, available in full text, directly addressing the side effects of radioactive iodine therapy in adult thyroid cancer survivors, with emphasis on physical, emotional, or social repercussions. Exclusion criteria included studies focusing exclusively on mortality, non-integrative reviews, dissertations, theses, publications about medullary or anaplastic thyroid cancer, and studies centered on pediatric patients or early treatment phases.

Study screening was conducted by reading titles and abstracts, based on the previously defined criteria. Potentially eligible full texts were read in full to confirm thematic relevance and methodological quality. The process of identification, screening, eligibility, and inclusion of articles followed PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines, with the data represented in an explanatory flowchart (Moher et al., 2009).

Figure 1: Flowchart of the selection of studies included in this Integrative Review



Adapted from: Moher et al., 2009

The data collection stage was systematized through the development of a summary table including the following information: article title and lead author, journal and year of publication, country and language, type of study and level of evidence, as well as the main findings related to the clinical and psychosocial repercussions of radioiodine therapy. The classification of levels of evidence followed the guidelines of the Joanna Briggs Institute (JBI), as described by Lockwood et al. (2020), as follows: Level I – evidence from meta-analyses, randomized controlled trials (RCTs); Level II – evidence from experimental studies with control groups; Level III – evidence from quasi-experimental studies; Level IV – evidence from descriptive, observational, or qualitative

investigations; Level V – evidence based on case reports, case series, or documented experiences; and Level VI – evidence derived from expert opinions, consensus documents, or technical reports (Lockwood et al., 2020).

3- RESULTS

After applying the inclusion and exclusion criteria and conducting the screening process in accordance with PRISMA protocol guidelines, 11 articles were selected to comprise the corpus of the present Integrative Literature Review. Among the investigated contexts, the studies highlighted functional changes resulting from radioiodine therapy, psychosocial dysfunctions, subjective perceptions of stigma and vulnerability, as well as impacts on domains such as mental health, chronic fatigue, body image, and sexual life (Hiromasa et al., 2025).

The analysis of the findings allowed for the organization of content into two analytical categories, which will be discussed in the next section: (1) Clinical and functional repercussions of radioactive iodine in thyroid cancer survivors; and (2) Psychosocial impacts and challenges to quality of life in oncological follow-up. These categories reflect the complexity of adverse effects associated with iodine therapy, revealing multiple dimensions relevant to comprehensive care. Table 1 below presents a synthesis of the included studies, highlighting the title and lead author, journal and year of publication, country and language, type of study and level of evidence, as well as the main findings related to the clinical and psychosocial repercussions of radioiodine therapy.

Table 1: Summary of Included Studies on the Adverse Effects of Radioiodine Therapy in Thyroid Cancer Survivors

Title and First Author	Journal and Year	Country and Language	Study Type and Evidence Level	Main Findings and Implications
Enhancing radioactive iodine (RAI) incorporation in RAI-refractory differentiated thyroid cancer / Hiromasa, T.	European Thyroid Journal, 2025	International / English	Review / Level V	Discusses strategies to enhance iodine uptake in refractory thyroid cancer, focusing on molecular advances and

				combination therapies.
Lenvatinib: role in thyroid cancer and other solid tumors / Cabanillas, M.	Cancer Treatment Reviews, 2016	United States / English	Review / Level V	Explores the role of Lenvatinib as an adjuvant therapy in thyroid cancer, including refractory cases.
The prophylactic antiemetic therapies in management of differentiated thyroid cancer patients with radioactive iodine therapy / Li, X.	Frontiers in Endocrinology, 2024	China / English	Non-randomized clinical trial / Level III	Assesses prophylactic antiemetic therapies in I-131 patients, with improvements in gastrointestinal symptoms.
Pathogenesis and signaling pathways related to iodine-refractory differentiated thyroid cancer / Zhao, S.	Frontiers in Endocrinology, 2023	China / English	Review / Level V	Reviews pathological mechanisms of iodine-refractory thyroid cancer, with emphasis on signaling pathways.
Guiding the postoperative radioactive iodine-131 therapy for patients with papillary thyroid carcinoma / Yang, Y.	Journal of Cancer Research and Clinical Oncology, 2023	China / English	Retrospective observational study / Level IV	Proposes risk stratification to guide I-131 therapy after thyroidectomy.
Outcomes following I-131 treatment with cumulative dose ≥600 mCi in differentiated thyroid carcinoma patients / Kaewput, C.	World Journal of Nuclear Medicine, 2020	Thailand / English	Retrospective observational study / Level IV	Examines effects of high cumulative doses of I-131, reporting glandular complications and long-term functional impacts.
Psychological impact of 131I radioprotection measures on thyroid cancer patients / Barbus, E.	Clujul Medical, 2018	Romania / English	Cross-sectional study / Level IV	Highlights the psychological impact of radioprotection isolation measures, especially anxiety and abandonment feelings.
Distress, anxiety, depression and unmet needs in thyroid cancer survivors: a longitudinal study / Dionisi-Vici, M.	Endocrine, 2021	Italy / English	Longitudinal study / Level IV	Demonstrates prolonged psychological distress among survivors, emphasizing lack of continuous

				psychological support.
Review: improving quality of life in patients with differentiated thyroid cancer / Pace-Asciak, P.	Frontiers in Oncology, 2023	International / English	Review / Level V	Proposes psychosocial and physical rehabilitation guidelines post-treatment, focused on quality of life.
The current state and influencing factors of negative social expectations among thyroid cancer patients / Wang, Z.	Frontiers in Psychology, 2025	China / English	Cross-sectional study / Level IV	Analyzes factors related to negative social expectations, such as stigma and impaired self-image among young patients.
Predictors of recurrence after total thyroidectomy in 1,611 patients with papillary thyroid carcinoma / Carvalho, A. Y.	Archives of Endocrinology and Metabolism, 2024	Brazil / Portuguese	Retrospective study / Level IV	Identifies recurrence predictors, aiding therapeutic decisions and follow-up after I-131 treatment.

This table presents a synthesis of the 11 scientific articles included in the integrative literature review, organized by title, author(s), journal and year of publication, country and language, study type and level of evidence (based on Joanna Briggs Institute criteria), and main findings. The selected studies address both physical-functional and psychosocial effects of radioactive iodine (I-131) therapy, with implications for the quality of life, identity reconstruction, and long-term care of thyroid cancer survivors.

4- DISCUSSION

Survival after thyroid cancer, especially following radioactive iodine (I-131) therapy, raises important questions about the psychosocial impacts and rehabilitation challenges faced by patients in the post-treatment period. Although cure rates are high, long-term adverse effects and repercussions on quality of life remain critical issues to be understood. The reviewed literature indicates that although radioiodine therapy is an established therapeutic strategy, its interface with the emotional, functional, and social health of survivors is still underexplored in clinical protocols (Hiromasa et al., 2025; Li et al., 2024; Zhao et al., 2023).

The analysis of the 11 selected studies enabled the construction of two interpretive categories. The first addresses the physical and functional side effects resulting from exposure to radioactive iodine. The second explores the psychosocial impacts and the redefinition of cancer survivor identity in the post-treatment phase. Both categories highlight the importance of a comprehensive approach to oncology

care, considering not only therapeutic efficacy but also the subjective and social consequences of the rehabilitation process.

4.1 Physical and Functional Effects of Iodine-131 Therapy

Several studies describe adverse effects associated with radioiodine therapy, particularly regarding the impairment of exocrine glands. Dysfunction of the salivary glands, such as sialadenitis, hyposalivation, and xerostomia, is frequently reported, directly affecting swallowing, taste, and oral mucosa integrity. These alterations are attributed to the high affinity of salivary tissue for radioactive iodine, which leads to inflammation, fibrosis, and consequent functional loss. Additionally, symptoms such as persistent fatigue, prolonged nausea, and dysgeusia are among the most common complaints after treatment, often overlooked in clinical follow-up protocols (Li et al., 2024; Cabanillas; Habra, 2016).

Studies also indicate lacrimal system dysfunction, including epiphora and dry eye syndrome, as well as hormonal changes that may temporarily affect fertility, especially in young women. Another noteworthy point is the risk - albeit low - of developing radiation-induced secondary neoplasms (Zhao et al., 2023), particularly in patients exposed to high cumulative doses or undergoing multiple Iodine-131 applications. The literature suggests that such side effects may emerge months or even years after therapy, requiring long-term monitoring and multidisciplinary preventive approaches (Kaewput; Pusuwan, 2020).

In this context, it becomes imperative that the therapeutic efficacy of Iodine-131 not be assessed in isolation, but rather in correlation with its functional and systemic consequences. The absence of specific guidelines for managing these complications reveals a significant gap in patient care. Therefore, developing clinical protocols aimed at preventing and rehabilitating these adverse effects should be a priority for oncology and endocrinology services, especially from the perspective of ensuring long-term quality of life and functionality for thyroid cancer survivors (Yang et al., 2023).

4.2 Psychosocial Impacts and Identity Reconstruction Among Survivors

In addition to physical repercussions, thyroid cancer survivors face significant

challenges in reconstructing their personal and social identity after treatment. Studies highlight recurring feelings of fear, anxiety over recurrence, changes in self-image, and difficulties reintegrating into work and everyday life (Li et al., 2024). These subjective impacts are especially intense among young patients and women, who report greater emotional vulnerability in dealing with the marks left by the disease and Iodine-131 therapy (Wang et al., 2025).

Social isolation imposed by radioprotection measures, combined with the lack of qualified listening and psychological support in the post-treatment period, contributes to the worsening of emotional symptoms. Many patients report feeling alone and helpless even after medical discharge, experiencing a prolongation of suffering amidst social invisibility. The perception that “the treatment ends, but the consequences continue” is a recurring theme in patient narratives, highlighting a rupture between biological cure and the full restoration of overall health (Changchien, 2024; Barbus et al., 2018).

Another relevant aspect concerns the prolonged medicalization of life. Many survivors remain in continuous follow-up, undergo frequent tests, and maintain indefinite use of thyroid hormone replacement therapy, reinforcing a sense of “silent chronic illness” and hindering the feeling of closure regarding the illness process. This chronic surveillance compromises psychological well-being, fostering states of hypervigilance, insecurity, and loss of symbolic autonomy over one's own body (Dionisi-Vici et al., 2021; Pace-Asciak et al., 2023).

In this scenario, the literature recommends implementing person-centered care strategies, including integrative practices, psychosocial support, and oncology rehabilitation groups. These strategies acknowledge that biological cure alone does not ensure the restoration of the individual’s subjective and social well-being. Active listening, emotional support, and the reconstruction of support networks are essential for patients to reframe their journey and fully reintegrate into social and affective life, overcoming the marks left by the disease and its treatment (Carvalho et al., 2024).

5- FINAL CONSIDERATIONS

This study aimed to analyze, through an integrative literature review, the adverse effects of radioactive iodine therapy in thyroid cancer survivors, with an emphasis on psychosocial repercussions and post-treatment quality of life. The findings reveal that although this therapeutic approach has consolidated oncological efficacy, the functional, emotional, and identity impacts resulting from radioiodine therapy remain underestimated in care guidelines.

Persistent physical side effects, challenges in social reintegration, and the absence of structured psychosocial support constitute barriers to the comprehensive rehabilitation of patients, requiring the expansion of care strategies beyond the biomedical dimension. The literature highlights the need for multidisciplinary action and public policies that ensure qualified listening, continuous support, and long-term follow-up for survivors.

Although this review followed rigorous criteria, its main limitation lies in the scarcity of longitudinal studies and methodological gaps in some of the analyzed articles, limiting broad generalizations. Nevertheless, the findings provide relevant input for improving clinical practice and redirecting care protocols for this population.

In conclusion, the effects of radioactive iodine therapy go beyond the clinical and biological scope, requiring healthcare systems to adopt a more comprehensive, humanized, and patient-centered perspective. Recognizing psychosocial impacts as an integral part of the therapeutic process is essential to ensure that thyroid cancer survivorship is accompanied by dignity, subjective autonomy, and quality of life.

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