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Observational Study

Factors influencing postoperative anxiety and depression following Iodine-131 treatment in patients with differentiated thyroid cancer: A cross-sectional study

Ying-Rui Su, Xiao-Peng Yu, Li-Qun Huang, Long Xie, Jin-Shun Zha

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Abstract

BACKGROUND

Differentiated thyroid cancer (DTC) often seriously impacts patients' lives. Radionuclide Iodine-131 (¹³¹I) is widely used in treating patients with DTC. However, most patients know little about radionuclide therapy, and the treatment needs to be performed in a special isolation ward, which can cause anxiety and depression.

AIM

To explore anxiety and depression status and their influencing factors after ¹³¹I treatment in patients with DTC.

METHODS

A questionnaire survey was conducted among postoperative patients with DTC who received ¹³¹I treatment at our hospital from June 2020 to December 2022. General patient data were collected using a self-administered demographic characteristics questionnaire. The self-rating depression scale and self-rating anxiety scale were used to determine whether patients were worried about their symptoms and the degree of anxiety and depression. The patients were categorized into anxiety, non-anxiety, depression, and non-depression groups. Single-variable and multiple-variable analyses were used to determine the risk factors for anxiety and depression in patients with thyroid cancer after surgery.

RESULTS

A total of 144 patients were included in this study. The baseline mean score of self-rating anxiety and depression scales were 50.06 ± 16.10 and 50.96 ± 16.55 , respectively. Notably, 48.62% (70/144) had anxiety and 47.22% (68/144) of the

patients had depression. Sex, age, education level, marital status, household income, underlying diseases, and medication compliance significantly differed among groups ($P < 0.05$). Furthermore, multivariate logistic regression analysis showed that education level, per capita monthly household income, and medication compliance level affected anxiety ($P = 0.015, 0.001, \text{ and } 0.001$ respectively). Patient's sex, marital status, and underlying diseases affected depression ($P = 0.007, 0.001, \text{ and } 0.009$, respectively).

CONCLUSION

Nursing interventions aiming at reducing the risk of anxiety and depression should target unmarried female patients with low education level, low family income, underlying diseases, and poor adherence to medications.

Key Words: Iodine-131; Thyroid gland; Neoplasms; Anxiety; Depression; Prognosis

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Core Tip: Differentiated thyroid cancer (DTC) seriously impacts the patient's life and induces more adverse emotions. This study investigated anxiety and depression in 144 patients with DTC. Sex, education level, family factors, and basic diseases were the risk factors for anxiety and depression. Better intervention nursing measures can be proposed for clinical practice by observing and proposing indicators that affect patients' mood risk factors and by comparing them with previous studies, thereby reducing the risk of developing anxiety and depression and improving their prognosis.

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INTRODUCTION

Thyroid cancer is a common malignant head and neck tumor, and its incidence has been annually increasing in recent years[1]. According to the International Agency for Research on Cancer, the worldwide incidence of thyroid cancer is approximately 6.7/100000, and the number of new cases in China is 190000 in 2022[2]. Among them, differentiated thyroid cancer (DTC) accounts for approximately 90%. Currently, DTC is treated with a three-step comprehensive treatment approach consisting of surgery, Iodine-131 (¹³¹I) treatment and thyroid hormone suppression[3], which can significantly reduce the tumor recurrence rate and improve disease prognosis. However, the complications of tumor surgery and lack of understanding of ¹³¹I treatment, especially the fact that ¹³¹I treatment is a type of internal radiotherapy, may result in patients experiencing anxiety, fear, depression, and other negative emotions[4]. In clinical practice, several patients with DTC exhibit anxiety or poor mental state before radiotherapy, which leads to poor compliance with radiotherapy and ultimately affects the clinical treatment effect[5]. Therefore, it is crucial to analyze the anxiety status and related influencing factors of patients with thyroid cancer after surgery. This analysis can guide the formulation of clinical preventive nursing strategies and improve patient outcomes. Along those lines, this study aims to explore the anxiety states and associated risk factors in patients with DTC after ¹³¹I treatment.

MATERIALS AND METHODS

Patient characteristics

A questionnaire survey was conducted among postoperative patients with DTC who received ¹³¹I treatment at our hospital from June 2020 to December 2022.

Inclusion criteria were as follows: Pathological diagnosis of DTC; clinical indications for surgical treatment and completed surgical treatment; age ≥ 18 years; ability to read and independently complete the questionnaire, the patients were informed, cooperated well, and had complete clinical pathological data. Comply with medical advice, regular postoperative review at our hospital.

The exclusion criteria were as follows: Previous or concurrent malignant tumors combined with anxiety; depression; history of dementia; history of drug abuse; alcoholism; failure of the heart, liver, kidney, and other important organs; hearing and language dysfunction; and inability to cooperate.

A total of 144 patients met the inclusion standard. The patients were divided into anxiety, non-anxiety, depression, and non-depression groups based on their reported anxiety or depression status.

General information collection

General patient data, collected using a self-administered demographic characteristics questionnaire, mainly included age, sex, cultural background, marital status, family per capita monthly income, presence or absence of underlying diseases, and medication compliance. At the same time, the anxiety self-rating scales (SAS) and the self-rating depression scale (SDS) were used to evaluate the anxiety and depression of the patients one month after operation.

Anxiety status assessment

Trained healthcare professionals used SAS to assess anxiety in all patients. The SAS includes 20 items, of which 15 are scored positively, and 5 are scored negatively. Twenty entries add up to a total score of 20. The integer part of the total score was multiplied with 1.25 to obtain the standard score. The threshold was set to 50 points based on the Chinese scoring standard. The degree of anxiety was categorized as mild (50–60 points), moderate (60–80), and severe (80–100).

Depression status assessment

SDS was used to evaluate the depression status of the patients. All patients were evaluated by a professional medical staff member who had undergone systematic training. The SDS includes 20 items, and each item was evaluated using a 4-point Likert scale, with a score of 1–4 points. The rough score was obtained by adding the scores of each item (the reverse item is the reverse score); the coarse fraction was multiplied with 1.25 and the integer part was considered as the standard score. The threshold of the standard SDS score was 53 points, and the normal score was 53 points. Depression was classified as mild (53–60 points), moderate (60–70), or severe (70–100).

Statistical Methods

Descriptive analysis, and single-factor and multi-factor analyses were performed. Descriptive analysis was performed on the number of samples and their compositions. The histogram shows the basic characteristics of anxiety and depression. Univariate chi-square tests and single-factor logistic regression analyses were used to evaluate the influencing factors of anxiety and depression. Anxiety and depression (yes = 1; no = 0) were assigned as the dependent variables. All statistical tests were two-sided, with a statistically significant difference of $P < 0.05$. The data obtained were statistically analyzed using SPSS26.0 (IBM SPSS Inc., Chicago, United States).

RESULTS

Survey population

A total of 144 participants were included in this study, comprising 70 men (48.61%) and 74 women (51.39%). Their age was 18–60 (34.81 ± 4.92) years; and education level was 68 (47.22%) above high school, 76 (52.78%) below high school. **Table 1** presents additional basic information collected in this study.

Anxiety and depression

The baseline mean scores of SAS and SDS were 50.06 ± 16.10 and 50.96 ± 16.55 , respectively. Further, 51.38% (74/144) of the patients were in a non-anxiety state and 48.62% (70/144) were anxious. The proportions of mild, moderate, and severe anxiety were 21.52%, 24.30%, and 2.78%, respectively. Moreover, 52.78% (76/144) of the patients were non-depressive and 47.22% (68/144) experienced depression. The proportions of mild, moderate, and severe depressive loops were 20.83%, 22.92%, and 3.47%, respectively (**Table 2**).

Influencing factors of anxiety

Single-factor analysis of anxiety symptoms: The results of single factor showed that there were significant differences between the two groups in education level, family monthly average income and medication rule ($P < 0.05$) (**Table 3**).

Multivariate analysis of anxiety symptoms: Logistic regression analysis was performed with the dependent variable anxiety. Independent variables included age, sex, marital status, educational level, family income, basic diseases, and medication compliance. The detailed variables assignments are listed in **Table 4**.

Multivariate analysis showed that education level, monthly average family income, and medication compliance were factors influencing patients' possible anxiety ($P < 0.05$; **Table 5**). Patients with a high educational level were 0.28 times more likely to experience anxiety than that those with a low educational level. Patients with high family income were 0.09 times more likely to experience anxiety than those with low family income. Patients who took medications regularly were 0.03 times more likely to be anxious than those who missed medications occasionally.

Influencing factors of depression

Single-factor analysis of depression: The results of single factor showed that there were significant differences between the two groups in gender, marital status and basic diseases ($P < 0.05$) (**Table 6**).

Multivariate analysis of depression: Logistic regression analysis was performed with depression as the dependent variable. Independent variables included age, sex, marital status, educational level, family income, basic diseases, and medication compliance. The variables assignments are listed in **Table 4**.

Table 1 Characteristics of the survey population

Category	Variable	Number of samples	Percentage (%)
Age	< 30	66	45.83
	≥ 30	78	54.17
Sex	Male	70	48.61
	Female	74	51.39
Education	High school or above	68	47.22
	High school and below	76	52.78
Marital status	Have a spouse	69	47.92
	no spouse	75	52.08
Monthly household income	≥ 5000	70	48.61
	< 5000	74	51.39
Underlying medical conditions	Yes	71	49.31
	No	73	50.69
Medication adherence	Regular	67	46.53
	Irregular	77	53.47

Table 2 Overall status of anxiety and depression in patients undergoing ¹³¹I treatment after surgery for differentiated thyroid cancer

Category	Normal	Mild	Moderate	Severe
Anxiety	74 (51.39)	31 (21.52)	35 (24.30)	4 (2.78)
Depression	76 (52.78)	30 (20.83)	33 (22.92)	5 (3.47)

Table 3 Single factor analysis of anxiety in survey participants

Category		Anxiety (n = 70)	Non-anxiety (n = 74)	χ^2	P value
Age	≤ 40	31 (44.29)	35 (47.30)	0.131	0.717
	> 40	39 (55.71)	39 (52.70)		
Sex	Male	33 (47.14)	41 (55.40)	0.983	0.321
	Female	37 (52.86)	33 (44.59)		
Education	High school or above	48 (68.57)	20 (27.03)	24.911	0.001
	High school and below	22 (31.43)	54 (72.97)		
Marital status	Have a spouse	38 (54.29)	35 (47.30)	0.703	0.402
	No spouse	32 (45.71)	39 (52.70)		
Monthly household income	≤ 5000	51 (72.86)	19 (25.68)	32.065	0.001
	> 5000	19 (27.14)	55 (74.32)		
Underlying medical conditions	Yes	37 (52.86)	34 (45.95)	0.687	0.407
	No	33 (47.14)	40 (54.05)		
Medication adherence	Irregular	56 (80.00)	11 (14.86)	61.342	0.001
	Regular	14 (20.00)	63 (85.14)		

Logistic multivariate regression analysis showed that the factors influencing depression were sex, marital status, and basic diseases ($P < 0.05$). Female patients were more likely to have depression than male patients. Patients without a spouse were more likely to experience depression than those with a spouse. Patients with underlying diseases were more likely to have depression than those without. Detailed data analysis is presented in [Table 7](#).

Table 4 Assignments

Category	Assignment
Age	≤ 40 = 1; > 40 = 0
Education	High school or above = 1; High school and below = 0
Sex	Male = 1; Female = 0
Marital status	Have a spouse = 1; No spouse = 0
Monthly household income	> 5000 = 1; ≤ 5000 = 0
Underlying medical conditions	Yes = 1; No = 0
Medication adherence	Regular = 1; Irregular = 0
Anxiety	Anxiety = 1; Non-anxiety = 0
Depression	Depression = 1; Non-depression = 0

Table 5 Multivariate logistic analysis of anxiety in differentiated thyroid cancer patients after ¹³¹I treatment and surgery

Factors	β	SE	Wald χ^2 value	P value	OR	95%CI
Education	-1.256	0.518	5.872	0.015	0.285	0.103–0.786
Family monthly income	-2.402	0.587	16.719	0.001	0.091	0.029–0.286
Medication compliance	-3.292	0.585	31.617	0.001	0.037	0.012–0.117

SE: Standard error

Table 6 Univariate analysis of the depression in patients with differentiated thyroid cancer after ¹³¹I treatment and surgery

Catalog		Depression (n = 68)	Non-depression (n = 76)	χ^2 value	P value
Age	≤ 40	34 (50.00)	32 (42.11)	0.901	0.343
	> 40	34 (50.00)	44 (57.89)		
Sex	Male	27 (39.71)	47 (61.84)	7.040	0.008
	Female	41 (60.29)	29 (38.16)		
Education	High school and below	34 (50.00)	34 (44.74)	0.399	0.528
	High school or above	34 (50.00)	42 (55.26)		
Marital status	Have a spouse	22 (32.35)	51 (67.11)	17.341	0.001
	No spouse	46 (67.65)	25 (32.89)		
Monthly household income	≤ 5000	37 (54.41)	33 (43.42)	1.735	0.188
	> 5000	31 (45.59)	43 (56.58)		
Underlying medical conditions	Yes	44 (64.71)	27 (35.53)	7.614	0.006
	No	24 (35.29)	49 (64.47)		
Medication adherence	Irregular	36 (52.94)	31 (40.79)	2.130	0.144
	Regular	32 (47.06)	45 (59.21)		

DISCUSSION

DTC is a common thyroid gland malignancy that occurs in young and middle-aged women[6]. DTC has a serious impact on the lives of patients and also induces more adverse emotions. Radionuclide ¹³¹I has been widely used to treat patients with DTC and has contributed to continuous progress in medical technology in China[7]. However, most patients know little about radionuclide therapy, and the treatment needs to be performed in a special isolation ward, which can easily cause anxiety and depression[8]. Thus, it is important to consider the mental health of patients, which is conducive to better recovery.

Table 7 Multivariate Logistic analysis of depression in differentiated thyroid cancer patients after ¹³¹I treatment and surgery

Factors	β	SE	Wald χ^2 value	P value	OR	95%CI
Sex	-1.096	0.405	7.323	0.007	0.334	0.151–0.739
Marital status	-1.616	0.401	16.210	0.001	0.199	0.091–0.436
Underlying diseases	-1.027	0.396	6.737	0.009	0.358	0.165–1.038

SE: Standard error; OR: Odds ratio.

The findings of this study showed that 48.61% of patients with DTC exhibited anxiety and 47.22% exhibited depression, one month following their ¹³¹I treatment initiation. These elevated percentages could be attributed to patients having concerns about the problems associated with radiation involved in ¹³¹I treatment during isolation, due to a limited understanding of ¹³¹I treatment. These patients are prone to panic, anxiety, and other serious passive moods, which reduce their compliance with treatment and affect the overall treatment outcomes. Therefore, the assessment of anxiety and depression in patients undergoing ¹³¹I treatment facilitates the provision of timely counseling intervention to alleviate these negative emotions, and improve patients' treatment compliance, prognosis, and quality of life[9]. Moreover, these negative emotions in patients with thyroid cancer are reported to be associated to age, educational level, and family income[4,10].

In the present study, the anxiety and depression symptom scores of postoperative patients after ¹³¹I treatment were 50.06 ± 16.10 and 50.96 ± 16.55 , respectively. It has been reported that the main reasons for the high scores of anxiety and depression were the lack of trust in the professional level of the medical staff, lack of understanding of treatment methods, and concerns regarding recurrence and adverse reactions during surgery, as well as the resulting economic burden[11,12]. The superposition of these factors inadvertently leads to high psychological pressure and stress responses in patients, thereby resulting in anxiety and depression[13].

Further multivariate logistic regression analysis showed that patient's education level, family income, and medication regularity were the independent influencing factors of anxiety. Therefore, our results suggest that patients with a low education level, low family income, and irregular adherence to medication were more prone to anxiety. These findings are consistent with those of Yang *et al*[14] and Tsartsalis *et al*[15]. Possible reasons for these results may include the limited knowledge levels among people with low education levels, less access to disease information, a lack of understanding of important stressors, and a difficulty in effectively reducing stress using corresponding methods. Such patients are sensitive to possible threats caused by diseases and operations and are prone to anxiety and depression[16]. Patients with higher education levels have a stronger learning ability and thorough understanding of medical staff's knowledge and educational status. Patients who are able to actively collect information about the disease and its treatment from books, networks, and other means, are better equipped to reduce the psychological burden and eliminate negative emotions. On the other hand, patients with low education levels require repeated explanations, even through the use audiovisual aids to increase their understanding of their diseases, thereby eliminating the uncertainty of the disease or treatment, and improving their confidence in the healing process[17].

Thyroid cancer requires long-term treatment, which is expensive and increases the economic burden of patients. Therefore, family income has also become an independent risk factor for patients' concerns. Patients with thyroid cancer with a family monthly income ≤ 5000 yuan have often face financial difficulties. They experience significant psychological pressure because they worry about becoming a burden on their families, and they may feel anxious about being unable to afford the long-term medical expenses. The consequent uncertainty of follow-up treatment can easily lead to negative emotions, such as guilt and anxiety. Indeed, patients from low-income families can choose effective and low-cost drug treatment to reduce their families economic burden[18].

Occasionally missed medications are also a risk factor for anxiety in patients with DTC after surgery. Long-term and occasionally missed medication increases the fear of disease recurrence, resulting in anxiety symptoms. Therefore, family members should ensure that patients take their medications on time.

In the present study, sex, marital status, and underlying diseases were independent risk factors for depression. The incidence of depression was higher in women than that in men, which is consistent with previous studies[19]. This reason may be related to cyclical fluctuations in female endocrine hormone levels[20]. In addition, women now play multiple roles in social responsibility, leading to increased stress in life; they are relatively more sensitive, tend to have more physical and emotional pain, which may lead to a poor prognosis[21]. More attention should be paid to the feelings of female patients, and their symptoms should be actively improved to enhance their quality of life. Studies[19] have shown that marital status is an independent risk factor for depression. Although unmarried patients are accompanied by their parents, they lack active support from their spouses or children, and consequently experience greater loneliness than married patients. On the other hand, patients with spouses can receive family support to reduce their risk of anxiety and depression. Studies[22] have also reported that patients with cancer undergoing long-term treatments, such as radiotherapy and chemotherapy, are affected by irreversible damage to fertility and reproductive performance, resulting in depression, especially in unmarried and childless patients. In addition, ¹³¹I treatment should be isolated in a separate closed ward for one week. This lack of social connection which has serious consequences, such as social isolation and interruption of important interpersonal relationships[23]. The present study shows that medical staff should pay more attention to such patients and mobilize social and family members to provide them with psychological support and emotional comfort. In addition, compared with patients without underlying diseases, patients with underlying diseases

tend to have higher levels of depression. First, patients with underlying diseases have higher medical costs than those without such conditions, and consequently exhibit a greater economic and psychological burden. Second, patients with underlying diseases often have severe physical pain and functional impairment, which can cause more severe depression than patients without such conditions[24]. In particular, this phenomenon is more common in patients with hypertension [25], cardiovascular disease[26], and brain edema[11]. Therefore, medical staff and family members should provide more care and companionship to such patients.

Notably, this was a single-center study with a small sample size and did not analyze the long-term concerns of the patients. The risk factors associated with anxiety in patients after DTC surgery must be further verified in large multicenter studies.

CONCLUSION

The anxiety scores of patients with DTC were higher after ¹³¹I treatment. Among them, female sex, no spouse, low education level, low family income, basic underlying diseases, and irregularity in taking medicine were influencing factors of anxiety and depression in these patients. In clinical practice, providing patients with targeted nursing interventions according to the aforementioned factors could decrease the risk of anxiety and depression and eventually improve patient prognosis.

ARTICLE HIGHLIGHTS

Research background

Patients were investigated using the self-rating depression scale (SDS) and self-rating scales (SAS). Patients were grouped according to the presence and degree of anxiety and depression. The influencing factors were analyzed, and the appropriate intervention was suggested.

Research motivation

Patients with differentiated thyroid cancer (DTC) after ¹³¹I treatment were more prone to anxiety and depression. Clinically, female patients with no spouse, low education level, and low family income, accompanied by basic diseases, and medication irregularity should receive intervention care, thereby reducing the risk of anxiety and depression and improving their prognosis.

Research objectives

The original mean score of SAS and SDS was 50.06 ± 16.10 and 50.96 ± 16.55 , respectively; 48.62% (70/144) and 47.22% (68/144) of the patients experiences anxiety and depression, respectively. Educational level, average monthly family income, and medication compliance influenced anxiety. Sex, marital status, and underlying diseases influenced depression ($P < 0.05$).

Research methods

We analyzed 144 patients with thyroid cancer after surgery who received ¹³¹I treatment in our hospital from June 2020 to December 2022. The patients were grouped according to their SDS and SAS scores. Single factor and multivariate analyses were used to determine the factors influencing anxiety and depression in patients with DTC after surgery.

Research results

It is crucial analyze the anxiety status and the related risk factors in patients with DTC after surgery, in order to formulate clinical preventive nursing strategies to improve the prognosis of patients.

Research conclusions

This study discussed the anxiety and depression status of patients with DTC after ¹³¹I treatment and analyzed their influencing factors.

Research perspectives

Patients with DTC do not comprehend ¹³¹I treatment, which is a type of internal radiotherapy, and they easily experience anxiety, fear, depression, and other negative emotions.

FOOTNOTES

Author contributions: Su YR designed and performed the study and wrote the paper; Zha JS designed the study and supervised the report; Su YR designed the study and contributed to the analysis; Yu XP, Huang LQ, and Xie L provided clinical advice.

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REFERENCES

- 1 Lebbink CA, Links TP, Czarniecka A, Dias RP, Elisei R, Izatt L, Krude H, Lorenz K, Luster M, Newbold K, Piccardo A, Sobrinho-Simões M, Takano T, Paul van Trotsenburg AS, Verburg FA, van Santen HM. 2022 European Thyroid Association Guidelines for the management of pediatric thyroid nodules and differentiated thyroid carcinoma. *Eur Thyroid J* 2022; **11** [PMID: 36228315 DOI: 10.1530/ETJ-22-0146]
- 2 Maomao C, He L, Dianqin S, Siyi H, Xinxin Y, Fan Y, Shaoli Z, Changfa X, Lin L, Ji P, Wanqing C. Current cancer burden in China: epidemiology, etiology, and prevention. *Cancer Biol Med* 2022; **19**: 1121-1138 [PMID: 36069534 DOI: 10.20892/j.issn.2095-3941.2022.0231]
- 3 Basté N, Mora M, Grau JJ. Emerging systemic antitarget treatment for differentiated thyroid carcinoma. *Curr Opin Oncol* 2021; **33**: 184-195 [PMID: 33720068 DOI: 10.1097/CCO.0000000000000727]
- 4 Noto B, Asmus I, Schäfers M, Görlich D, Riemann B. Predictors of Anxiety and Depression in Differentiated Thyroid Cancer Survivors: Results of a Cross-Sectional Study. *Thyroid* 2022; **32**: 1077-1085 [PMID: 35734910 DOI: 10.1089/thy.2022.0067]
- 5 Wu L, Zou Y. Psychological nursing intervention reduces psychological distress in patients with thyroid cancer: A randomized clinical trial protocol. *Medicine (Baltimore)* 2020; **99**: e22346 [PMID: 32957406 DOI: 10.1097/MD.00000000000022346]
- 6 Cabanillas ME, McFadden DG, Durante C. Thyroid cancer. *Lancet* 2016; **388**: 2783-2795 [PMID: 27240885 DOI: 10.1016/S0140-6736(16)30172-6]
- 7 Hung MC. Initial activity-related long-term outcome of iodine-131 treatment for thyroidectomy patients with differentiated thyroid carcinoma. *Hell J Nucl Med* 2020; **23**: 246-250 [PMID: 33306754 DOI: 10.1967/s002449912203]
- 8 Ramim JE, Cardoso MAS, de Oliveira GLC, Gomes ML, Guimarães TT, de Mello RCR, Bergmann A, Pujatti PB. Health-related quality of life of thyroid cancer patients undergoing radioiodine therapy: a cohort real-world study in a reference public cancer hospital in Brazil. *Support Care Cancer* 2020; **28**: 3771-3779 [PMID: 31832820 DOI: 10.1007/s00520-019-05225-x]
- 9 Juweid ME, Rabadi NJ, Tulchinsky M, Aloqaily M, Al-Momani A, Arabiat M, Abu Ain G, Al Hawari H, Al-Momani M, Mismar A, Abulaban A, Taha I, Alhourri A, Zayed A, Albsoul N, Al-Abbadi MA. Assessing potential impact of 2015 American Thyroid Association guidelines on community standard practice for I-131 treatment of low-risk differentiated thyroid cancer: case study of Jordan. *Endocrine* 2021; **73**: 633-640 [PMID: 33772746 DOI: 10.1007/s12020-021-02698-x]
- 10 Haraj NE, Bouri H, El Aziz S, Nani S, Habti N, Chadli A. Evaluation of the quality of life in patients followed for differentiated cancer of the thyroid. *Ann Endocrinol (Paris)* 2019; **80**: 26-31 [PMID: 29571888 DOI: 10.1016/j.ando.2018.01.003]
- 11 Cohen BE, Edmondson D, Kronish IM. State of the Art Review: Depression, Stress, Anxiety, and Cardiovascular Disease. *Am J Hypertens* 2015; **28**: 1295-1302 [PMID: 25911639 DOI: 10.1093/ajh/hpv047]
- 12 Hyde EK, Martin DE, Rieger KL. Factors shaping the provision of sexual health education for adults with acute coronary syndrome: A scoping review. *Patient Educ Couns* 2020; **103**: 877-887 [PMID: 31767244 DOI: 10.1016/j.pec.2019.11.017]
- 13 Javaloyes N, Crespo A, Redal MC, Brugarolas A, Botella L, Escudero-Ortiz V, Sureda M. Psycho-Oncological Intervention Through Counseling in Patients With Differentiated Thyroid Cancer in Treatment With Radioiodine (COUNTHY, NCT05054634): A Non-randomized Controlled Study. *Front Psychol* 2022; **13**: 767093 [PMID: 35282223 DOI: 10.3389/fpsyg.2022.767093]
- 14 Yang Y, Zhang M, Guo J, Ma S, Fan L, Wang X, Li C, Guo P, Wang J, Li H, Li Z. Quality of life in 188 patients with myasthenia gravis in China. *Int J Neurosci* 2016; **126**: 455-462 [PMID: 26000922 DOI: 10.3109/00207454.2015.1038712]
- 15 Tsartsalis D, Dragioti E, Kontoangelos K, Pitsavos C, Sakkas P, Papadimitriou GN, Stefanadis C, Kallikazaros I. The impact of depression and cardiophobia on quality of life in patients with essential hypertension. *Psychiatriki* 2016; **27**: 192-203 [PMID: 27837573 DOI: 10.22365/jpsych.2016.273.192]
- 16 Ignacio KHD, Diestro JDB, Medrano JMM, Salabi SKU, Logronio AJ, Factor SJV, Ignacio SD, Pascual V JLR, Pineda-Franks MCC. Depression and Anxiety after Stroke in Young Adult Filipinos. *J Stroke Cerebrovasc Dis* 2022; **31**: 106232 [PMID: 34875539 DOI: 10.1016/j.jstrokecerebrovasdis.2021.106232]

- 17 **Lidal IB**, Lundberg Larsen K. Anxiety, depression, and fatigue in middle-aged and older persons with spina bifida: a cross-sectional study. *Disabil Rehabil* 2022; **44**: 7936-7946 [PMID: [34826231](#) DOI: [10.1080/09638288.2021.2003453](#)]
- 18 **Tang X**, Lu Z, Hu D, Zhong X. Influencing factors for prenatal Stress, anxiety and depression in early pregnancy among women in Chongqing, China. *J Affect Disord* 2019; **253**: 292-302 [PMID: [31077972](#) DOI: [10.1016/j.jad.2019.05.003](#)]
- 19 **Pollo CF**, Miot HA, Matos TDS, de Souza JM, Jorge MFS, Miot LDB, Meneguini S. Prevalence and factors associated with depression and anxiety in patients with psoriasis. *J Clin Nurs* 2021; **30**: 572-580 [PMID: [33258200](#) DOI: [10.1111/jocn.15577](#)]
- 20 **Jiang Y**, Dong W, Mao F, Zhang C, Ding X, Pan X, Zhang Y, Huang Y, Dong J. [Evaluation on the status quo of self monitoring of blood glucose and self-efficacy of diabetes patients in community]. *Zhonghua Yufang Yixue Zazhi* 2014; **48**: 710-714 [PMID: [25388468](#)]
- 21 **Wang L**, Yang N, Zhou H, Mao X, Zhou Y. Pregnant Women's Anxiety and Depression Symptoms and Influence Factors in the COVID-19 Pandemic in Changzhou, China. *Front Psychol* 2022; **13**: 855545 [PMID: [35693497](#) DOI: [10.3389/fpsyg.2022.855545](#)]
- 22 **Hu B**, Yin X, Du C, Zhu H, Gao Z, Zhu X, Wang J. Influencing factors of treatment and prognosis perceptions among advanced cancer patients: a cross-sectional study. *Support Care Cancer* 2022; **30**: 1209-1220 [PMID: [34455482](#) DOI: [10.1007/s00520-021-06516-y](#)]
- 23 **Gao J**, Wang X, Zhang L, Li J, Qin X, Wang L, Zhao J. Prevalence and predictors of psychological distress among patients with thyroid cancer during transitional period in China: a cross-sectional study. *Support Care Cancer* 2022; **30**: 7903-7911 [PMID: [35727374](#) DOI: [10.1007/s00520-022-07225-w](#)]
- 24 **Xu L**, Chen S, Xu K, Wang Y, Zhang H, Wang L, He W. Prevalence and associated factors of depression and anxiety among Chinese diabetic retinopathy patients: A cross-sectional study. *PLoS One* 2022; **17**: e0267848 [PMID: [35482738](#) DOI: [10.1371/journal.pone.0267848](#)]
- 25 **Johnson HM**. Anxiety and Hypertension: Is There a Link? A Literature Review of the Comorbidity Relationship Between Anxiety and Hypertension. *Curr Hypertens Rep* 2019; **21**: 66 [PMID: [31321565](#) DOI: [10.1007/s11906-019-0972-5](#)]
- 26 **Jha MK**, Qamar A, Vaduganathan M, Charney DS, Murrough JW. Screening and Management of Depression in Patients With Cardiovascular Disease: JACC State-of-the-Art Review. *J Am Coll Cardiol* 2019; **73**: 1827-1845 [PMID: [30975301](#) DOI: [10.1016/j.jacc.2019.01.041](#)]



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