

Original Article

Postoperative Evaluation of Fatigue and Anxiety in Patients with Oral Cancer: A Study Based on Nursing Intervention

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Abstract

Background: Oral cancer and its treatments can cause various psychosocial symptoms, including fatigue and anxiety, which negatively impact the patient's quality of life.

Objective: The purpose of this study was to evaluate the postoperative fatigue and anxiety levels of patients with oral cancer following nursing intervention.

Methodology: We examined the degree of fatigue, anxiety, and quality of life in 240 postoperative patients with oral cancer who were randomized into 120 experimental and 120 control groups. The degree of fatigue and anxiety were measured using the multidimensional fatigue inventory (MFI-20) and Beck anxiety inventory (BAI) scale tools, respectively, after the nursing intervention.

Results: After the nursing intervention, the experimental group showed a significant reduction in fatigue ($p < 0.02$), but no significant decrease was found in anxiety ($p < 0.08$) compared to the control group. There were no significant differences in the sociodemographic or clinical characteristics between the groups.

Conclusions: According to our research, comprehensive nursing interventions can remarkably enhance the quality of life for patients with postoperative oral cancer by reducing and controlling postoperative related fatigue and anxiety. It is recommended that these kinds of therapies be used to assist patients with oral cancer in managing the short-term decline that follows surgery.

Keywords: Oral cancer, postoperative patients, nursing intervention, fatigue, anxiety

Introduction

The exponential increase in non-communicable diseases in the twenty-first century is considered a serious public health threat that jeopardizes the health of its residents as well as the economic well-being of their communities. The four non-communicable disease types that are most common are diabetes, cancer, cardiovascular disease, and chronic respiratory disorders.

One of the most common forms of cancer is head and neck cancer (Khani Jeihooni, & Jafari, 2022). Head and neck squamous cell carcinoma (HNSCC) is the collective term for the majority of head and neck (HNC) malignancies, which originate from the mucosal epithelium of the oral cavity, pharynx, and larynx (Johnson et al., 2020). Oral Squamous cell carcinoma (OSCC) represents more than 90% of all malignant

neoplasms of the oral cavity and is the 17th most common cancer globally. In India, it is the most common cancer among men, but when both sexes are combined, it ranks third most common in all cancers. Additionally, it ranks third out of all cancer types that result in death in the country (Nethan et al., 2022).

Based on the most recent predictions provided by the American Cancer Society, there will be about 12,230 deaths and 58,450 new cases of oral cavity and oropharyngeal cancer in the United States in 2024. Most commonly, these cancers affect adults 64 years of age or older, while they can also affect younger persons. Of all incidents, people under the age of 55 are involved in less than 20% (1 in 5). Most occurrences of oral cancer are caused by squamous cells, which can be found in the tongue, lips, gums, inside of the cheeks, floor, and roof of the mouth. According to GLOBOCAN 2020, 28% of cases in men and 7% of cases in women in India are related to HNC. Male and female HNC frequencies were highest in the northeastern region of India. In India, mouth and tongue cancer is a common HNC that affects people of all sexes (American Cancer Society, 2023).

The risk factors for OSCC are location-specific and include alcohol and smoking, chewing different foods (such as betel quid, gutka, pan masala, etc.), and having high-risk HPV infections (Anwar et al., 2020). Several therapeutic techniques can be used to treat oral cancer, such as radiation, chemotherapy, and surgery. Surgery is the most dependable and early final therapy option for the majority of oral cancers. The two primary factors influencing the choice of therapy are the patient and the tumor. Numerous factors, such as the primary site's location, size, proximity to bone, and degree of infiltration, influence a surgical technique (Shah & Gil, 2009).

Fatigue is a typical symptom that cancer patients deal with. "Distressing, persistent subjective sense of physical, emotional, and/or cognitive tiredness or exhaustion related to cancer or cancer treatment that is not proportionate to recent physical activity and that interferes with usual functioning" is referred to as cancer-related fatigue (CRF) (Berg et al., 2023). About half of cancer patients experience fatigue during or after

treatment. In comparison to patients who are not afflicted, these cancer-related symptoms may result in a decrease in treatment adherence, a worse quality of life (QOL), and an even lower likelihood of survival (Lundt et al., 2019).

Anxiety is an unpleasant emotional state that can cause excessive and subjective discomfort, fear of the future, as well as both voluntary and involuntary bodily changes, such as alterations in the chemical and biological systems (Firmeza et al., 2016). Depression and anxiety are common mental health problems among cancer patients. Anxiety has been associated with cancer patients for several reasons. Studies have revealed a substantial correlation between patients' depressive symptoms and several variables, such as age, gender, educational level, and others. There is a substantial and constant correlation between stigma and poor mental health among cancer patients, including depressive symptoms, anxiety, and demoralization (Yuan et al., 2020).

In recent times, there has been a sharp rise in the incidence of oral cancer. To address this condition and preserve the patient's QOL, more advanced techniques have been developed. Thus, to comprehend the reasoning behind choosing and tailoring specific nursing interventions according to patient needs, accurate assessments are crucial.

There is a paucity of studies that describe the degree of fatigue and anxiety experienced by postoperative oral cancer patients in India when nursing intervention is provided. The study aimed at postoperative evaluation of fatigue and anxiety in patients with oral cancer following nursing intervention. As far as we know, this is the first study of its sort to evaluate postoperative fatigue and anxiety after nursing intervention.

Methodology

Study design and setting: The study was conducted at the Atal Bihari Vajpayee Regional Cancer Centre, Agartala, Tripura, India and it was designed as an interventional study.

Comprehensive nursing intervention: The comprehensive nursing intervention includes teaching postoperative patients with oral

cancer how to use thyme honey, as well as dental care, counseling, and relaxation techniques. Patients were assisted with mouth opening exercises, active and passive range of motion, stretching exercises, maintaining proper posture, chin tucks, and shoulder blade squeezes. For the experimental group, a PowerPoint presentation and video are used to accomplish this. The educational interventions were given for 30 minutes and nursing interventions were given for 10-15 minutes, and the control group was instructed to adhere to the hospital's standard of care. It was followed 9-10 times a day for 5 days continuously, and the patient worked out when needed.

Assessment of fatigue: The MFI-20 is a self-administered questionnaire consisting of 20 items that measure fatigue in five subscales of four items each: general fatigue, physical fatigue, reduced activity, reduced motivation, and mental fatigue. A balanced mix of positively and negatively phrased items with 5-point Likert scale ratings can be found in the MFI-20. The sum of item ratings is used to produce subscale scores (range 4–20), and the sum of subscale scores is used to calculate the total fatigue score (range 20–100). A higher level of weariness is indicated by higher scores. Internal consistency of the MFI-20 using Cronbach's alpha has been evaluated. The overall Cronbach's alpha for the entire instrument was 0.89, indicating good reliability. For the individual subscales, the Cronbach's alpha values were as follows, general fatigue (0.85), physical fatigue (0.83), reduced activity (0.79), reduced motivation (0.76) and mental fatigue (0.81). These values suggest that the MFI-20 and its subscales demonstrate acceptable to good internal consistency in our sample.

Assessment of anxiety: A Beck Anxiety Inventory (BAI) questionnaire consisting of 21 items rated on a 4-point Likert scale with a 0–3 scoring system was used to measure the severity of anxiety. A score of 0 means "Not at all," while a score of 3 means "Severely—it bothered me a lot." The total score for each patient ranges from 0 to 63 points. A range of 0-7 indicates very little anxiety, 8-15 indicates mild anxiety, 16-25 indicates moderate anxiety, and 26 to 63 indicates severe anxiety. The overall Cronbach's alpha for the entire

instrument was 0.89, indicating good reliability.

Statistical Analyses: Data analysis was conducted using version 24 of the Statistical Package for Social Sciences (SPSS). The variables' percentages and frequency distributions were calculated. For continuous variables, the mean and standard deviation (SD) were calculated. The Fisher's exact test or the Chi-square tests were used to analyze the descriptive data. The data were analyzed using a Wilcoxon's test and an independent t-test. For every analysis, a p-value of less than 0.05 was deemed statistically significant.

Ethical issues: The study was conducted in accordance with the Declaration of Helsinki, and this research was approved by the Institutional Review Board of Desh Bhagat University's (DBU/RC/2023/2338). Between July 2022 and March 2024, a total of 240 (143 males and 97 females) postoperative patients voluntary were enrolled, after giving to them sufficient information about the research and their participation. An interventional methodology was used in the study to evaluate the patients' fatigue and anxiety levels after surgery. **Figure 1** displays the flowchart for the patient enrollment selection process. The characteristics utilized to describe the participants included age group, sex, religion, educational attainment, profession, income per month, marital status, surgery types, cancer stage, tumor metastasis, and primary site.

Results

The socio-demographic and clinical characteristics of the experimental and control groups are described in **Table 1**. This study included a total of 240 participants. Of these participants, 59.6% (n = 143) and 40.4% (n = 97) were male and female for each group, respectively resulting in a male-to-female ratio of 1.47:1. Between the groups, there were no significant variations among the sociodemographic or clinical features. **Tables 2 and 3** summarize the mean and standard deviation of the pre-and post-test levels of fatigue and anxiety, respectively in postoperative patients. After the nursing intervention, the experimental group experienced a remarkable decrease in fatigue (p<0.02) and anxiety (p<0.08) compared to the control group.

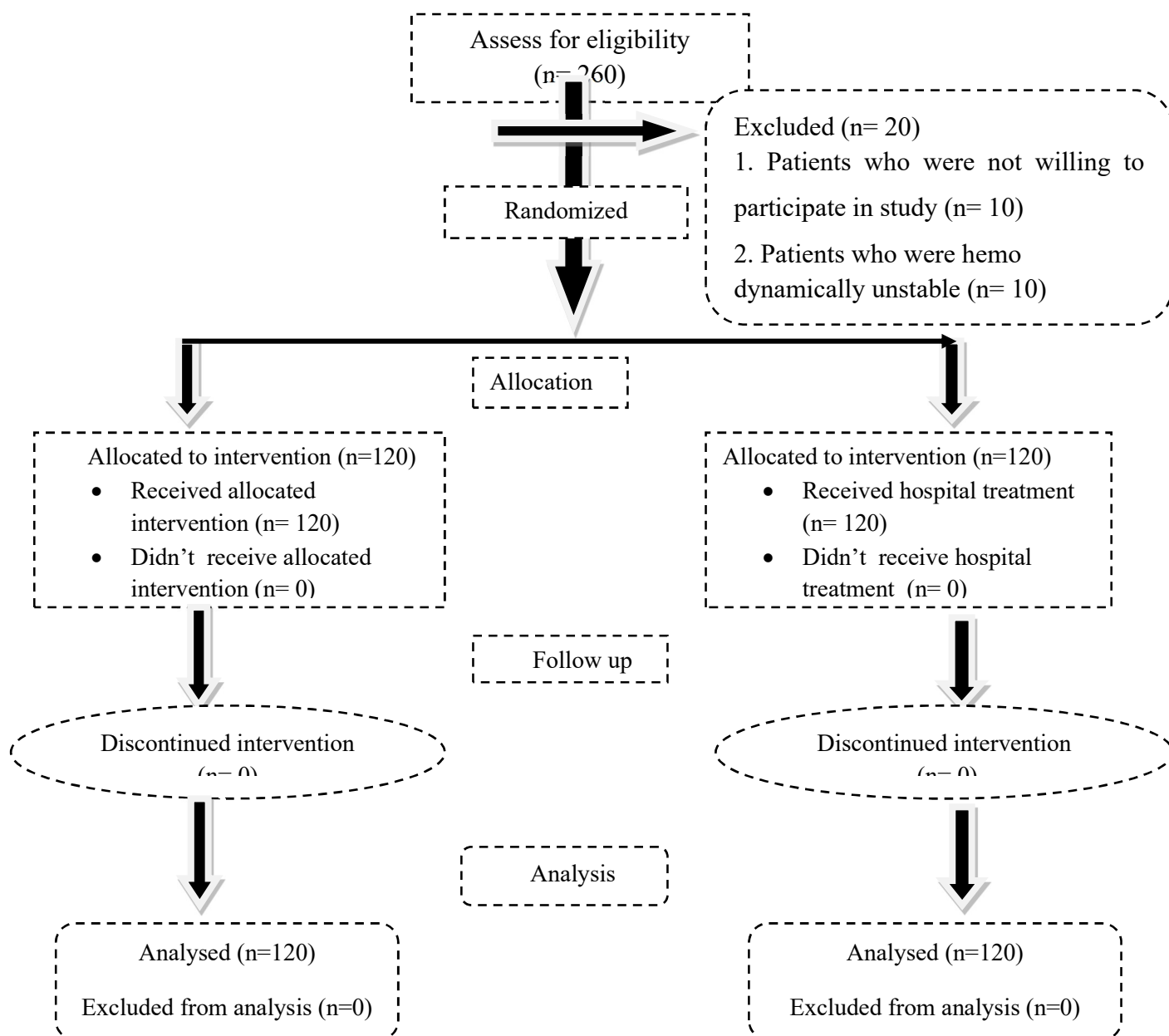


Figure 1: Flowchart showing the selection process of patient enrolment

Table 1: Socio-demographic and clinical characteristics of the participants (n=240).

Variables	Characteristics	Experimental group (n=120) n (%)	Control group (n=120) n (%)	p-value
Age group (Years)	21-30	1 (0.85)	4 (3.4)	0.22
	31-40	11 (9.2)	9 (7.5)	
	41-50	38 (31.7)	25 (20.9)	
	51-60	41 (34.2)	42 (35)	
	61-70	29 (24.2)	40 (33.4)	

Sex	Male	68 (56.7)	75 (63.5)	0.15
	Female	52 (43.4)	45 (37.5)	
Religion	Hindu	95 (80)	102 (85)	0.21
	Muslim	10 (8.5)	4 (3.4)	
	Christian	9 (7.5)	14 (11.7)	
	Others	6 (0.5)	0	
Educational attainment	No formal education	19 (15.9)	34 (28.4)	0.10
	Primary	56 (46.7)	44 (36.7)	
	Secondary	43 (35.9)	29 (24.2)	
	Higher secondary	2 (1.8)	8 (6.7)	
	Graduate and above	0	5 (4.2)	
Profession	Govt	2 (1.8)	0	0.18
	Private	17 (14.2)	11 (9.2)	
	Self employed	24 (20)	51 (42.5)	
	Daily wager	28 (23.4)	35 (29.2)	
	Unemployed	49 (40.9)	23 (19.2)	
Income per month (Rs)	≤Rs.10, 000	47 (39.2)	27 (22.5)	0.13
	10, 001-15,000	56 (46.7)	67 (55.9)	
	15, 001-20,000	15 (12.5)	23 (19.2)	
	>20,000	2 (1.8)	3 (2.5)	
Marital status	Single	3 (2.5)	4 (3.4)	0.27
	Married	105 (87.5)	111 (92.5)	
	Widow	10 (8.5)	5 (4.2)	
	Divorced	2 (1.8)	0	
Surgery types	Tumor Resection	8 (6.7)	2 (1.8)	0.24
	Micrographic surgery	4 (3.4)	2 (1.8)	
	Glossectomy surgery	27 (22.5)	32 (26.7)	
	Mandibulectomy surgery	59 (49.2)	64 (53.4)	
	Maxillectomy surgery	19 (15.9)	19 (15.9)	
	Neck Dissection	3 (2.5)	1 (0.85)	
Cancer Stage	I	40 (33.4)	53 (44.2)	0.07
	II	35 (29.2)	40 (33.4)	
	III	31 (25.9)	15 (12.5)	
	IV	14 (11.7)	12 (10)	
Tumor metastasis	Yes	76 (63.4)	38 (31.7)	0.09
	No	44 (36.7)	82 (68.4)	
Primary site	Lip	6 (0.5)	9 (7.5)	0.12
	Buccal Mucosa	61 (50.9)	51 (42.5)	
	Hard Palate	3 (2.5)	11 (9.2)	
	Posterior molar Region	4 (3.4)	7 (5.9)	
	Tongue	24 (20)	26 (21.7)	
	Floor of mouth	3 (2.5)	3 (2.5)	
	Angle of mouth	5 (4.2)	3 (2.5)	
	Submandibular gland	2 (1.8)	2 (1.8)	
	Base of tongue	3 (2.5)	2 (1.8)	
	Maxilla	3 (2.5)	3 (2.5)	
	Cheek	2 (1.8)	2 (1.8)	
	Alveolus	4 (3.4)	1 (0.85)	

Table 2: Mean and SD of pre test and post test level of fatigue among postoperative patients with oral cancer (n=240).

Groups	Domains Of Fatigue	Max score	Pre test	Post test	Wilcoxon's Test	
			Mean $\pm$ SD	Mean $\pm$ SD	Z value	p value
Experimental Group (n=120)	General Fatigue	20	11.6 $\pm$ 4.3	11.1 $\pm$ 3.9	-2.4	0.04*
	Physical Fatigue	20	12.0 $\pm$ 4.0	12.3 $\pm$ 4.5	-1.8	0.09
	Reduced Activity	20	11.4 $\pm$ 3.7	11.5 $\pm$ 4.2	-1.4	0.17
	Reduced Motivation	20	12.3 $\pm$ 4.4	12.5 $\pm$ 4.3	-1.5	0.13
	Mental Fatigue	20	11.6 $\pm$ 3.8	11.0 $\pm$ 4.1	-2.6	<0.01*
	Overall	100	59.5 $\pm$ 14.7	58.4 $\pm$ 15.3	-2.5	0.02*
Control Group (n=120)	General Fatigue	20	12.3 $\pm$ 4.4	12.1 $\pm$ 3.9	-1.9	0.11
	Physical Fatigue	20	11.7 $\pm$ 4.1	10.9 $\pm$ 4.0	-2.7	<0.01*
	Reduced Activity	20	12.4 $\pm$ 3.9	12.6 $\pm$ 4.4	-1.6	0.17
	Reduced Motivation	20	11.9 $\pm$ 4.0	11.8 $\pm$ 4.2	-1.1	0.28
	Mental Fatigue	20	12.0 $\pm$ 3.6	12.2 $\pm$ 4.1	-1.3	0.23
	Overall	100	60.9 $\pm$ 15.8	60.3 $\pm$ 14.6	-1.8	0.10

Table 3: Mean and SD of pre-test and post-test level of anxiety among postoperative patients with oral cancer (n=240).

Sl. no.	Groups	Max score	Pre test	Post test	Wilcoxon's Test	
			Mean $\pm$ SD	Mean $\pm$ SD	Z value	P value
1	Experimental Group (n=120)	63	27.0 $\pm$ 6.6	27.4 $\pm$ 6.1	-1.6	0.08
2	Control Group (n=120)	63	30.6 $\pm$ 6.3	30.8 $\pm$ 6.6	-1.3	0.27

Discussion

Head and neck cancer patients have to cope with the negative effects on their confidence and self-esteem in all areas because they are

unable to conceal the functional alterations that occur after treatment. Dramatic scenarios such as a permanent colostomy or vascular shunt for dialysis can be easily managed in public, although physical modifications and

scars are usually concealed during social events. The National Comprehensive Cancer Network's recommendations still state that surgery is the primary treatment for oral cancer, even though there are numerous other choices. On the other hand, surgery is painful, takes a long time, and affects oral function (Wei et al., 2022). Studies show that pain, fatigue, and sleep disturbance are the most prevalent adverse effects encountered by patients with HNC during treatment, particularly following surgery. In seventy percent of HNC patients, pain is the most common symptom. Patients have increased fatigue following increasingly complicated surgical operations, which reduces their QOL and increases their risk of developing mental disorders including anxiety and depression. The reasons behind these postoperative physical and psychological problems are surgical wounds, the stress of the disease, and the interventions (Loh et al., 2022).

Therefore, to understand the reasoning behind the selection and customization of certain medical therapies based on patient needs, reliable evaluation tests are crucial. This study made use of the MFI 20 and BAI questionnaire tools, which are commonly used to assess fatigue and anxiety in oncological settings. These measures have been demonstrated to be accurate and valid tools for measuring fatigue (Wondie et al., 2021; Bakalidou et al., 2022) and anxiety (Garcia et al., 2021; Starosta & Brenner, 2017) respectively, in past research. The malignancy stage, which is generally associated with the extent of the surgical site's expansion, dictates the extent of tissue destruction and the necessary reconstructions. Patients who have complicated surgical operations are more fatigued which lowers their QOL and increases the risk of developing emotional problems including anxiety and depression.

The focus of health measurement has shifted recently, moving beyond traditional metrics like mortality and morbidity. To establish how disease and impairment affect everyday activities and behavior, subjective health, disability or functional status, and other factors, markers must be included in holistic treatment planning. The hypothalamic-pituitary-adrenal (HPA) axis is disrupted by

anxiety, which increases cytokine production and consequent fatigue, aggravating cancer-related fatigue (CRF). While some interventions are useful in lowering fatigue, more targeted, sophisticated, and efficacious interventions are needed to address postoperative symptoms. It helps to uncover underlying physiologic mechanisms and develop appropriate interventions at the appropriate times when one is aware of when severe fatigue develops, which symptom domains are most affected, and who is most at risk for fatigue (Ramalingam et al., 2023).

Patients stated on the questionnaire how general work-related tasks and daily life were impacted by fatigue and anxiety. According to our research, nursing interventions significantly reduced oral cancer patients' postoperative anxiety and fatigue (in the experimental group as compared to the control group). Additionally, it was found that nursing interventions were successful in enhancing patient understanding and self-care. The comprehensive nursing intervention method can assist patients with postoperative oral cancer and cancerous pain in recognizing and understanding their condition, shifting their perspective, gaining confidence in their ability to heal, accepting and actively participating in the treatment, reducing subjective pain and fatigue, lowering negative emotions, lowering anxiety, and improving their QOL and sleep. In contrast to conventional nursing, comprehensive nursing systematizes the nursing approach, puts the patient first, delineates the nursing philosophy and duties, provides patients with high-quality, scientifically-based nursing care, and adjusts the "customized" nursing plan to the patient's evolving needs to provide a comfortable nursing service that facilitates the patient's recovery.

Numerous investigations have demonstrated the importance of nurse interventions in reducing fatigue (Patterson et al., 2013) and anxiety (Bayrak et al., 2023). Studies examining the impact of nursing interventions on patients with postoperative oral cancer are scarce, nonetheless. Our research demonstrated the importance of thorough nursing intervention in reducing patients' post-operative fatigue and anxiety following oral cancer surgery.

The study's huge sample size, high participation rate, and non-competitive recruitment approach are only a few of its advantages. Using validated questionnaires to assess fatigue, and anxiety was another strength. There are a few limitations to the study, though. There was only one centre for the study. The fact that there was a five-day follow-up period could have an impact on the outcomes. Treatment groups may not fully represent all cancer patients, particularly those with more advanced stages of the disease. Furthermore, as we were unable to find any comparable studies conducted in India for comparison, it is advised that the current study be conducted in different parts of the country, as the outcome may vary based on lifestyle and support choices.

In conclusion, a patient's QOL defined as the perceived gap between their actual condition and their ideal expectations—is greatly impacted by surgical therapy for oral cavity cancer. Healthcare professionals can effectively achieve patient outcomes by using audio-visual communication, which is very beneficial in providing patients with relevant and individualized information while also lessening their psychological burden. Nurses and other healthcare professionals may use non-pharmacological interventions, such as behavioral or mindfulness-based stress therapies, comprehensive nursing interventions, psychosocial therapies, sleep therapy, physical therapy programs (such as exercise, yoga, and massage therapy), and acupuncture, which has been demonstrated to be useful in reducing anxiety and fatigue.

Implementing these strategies into practice can help patients feel less fatigue and anxiety, improve their QOL, and raise the standard of healthcare as a whole. The low-cost, time-efficient intervention from the study can be implemented into clinical practices by clinicians and other health professionals. However, it should not be considered a therapeutic replacement. The consequences of the researcher's findings have a substantial impact on nursing practice, nursing administration, nursing education, and nursing research. Nurses and other healthcare professionals can assess their needs through practice- and evidence-based staff development programs. Educational

institutions might set up skill laboratories, symposiums, and workshops to alleviate postoperative fatigue and anxiety. In addition to strengthening hospital policies, nurse administrators should offer funds to maintain respectable work conditions and a joyful work environment. Replication of the study enables generalization of its findings. The research findings will be implemented as effectively as possible if they are published in online and professional publications.

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