

*Review article*

## The Impact of the COVID-19 Pandemic on the Quality of Life of Laryngectomized Patients

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### SUMMARY

**Introduction:** Quality of life is a state of complete physical, mental and social well-being. Due to the COVID-19 pandemic, which led to changes in the daily routine, there was a change in the psychosocial functioning of individuals. Given that laryngectomized patients belong to a vulnerable group that requires psychological support after surgery, specific epidemiological measures during the COVID-19 pandemic could only further increase the fear and reluctance that is especially pronounced after surgery.

**Aim:** The aim of this study was to investigate whether there was a link between the quality of life of laryngectomized patients and the COVID-19 pandemic.

**Method:** The literature review was performed through the Google Scholar Advanced Search search engine and the Consortium of Libraries of Serbia for Unified Acquisition - KoBSON.

**Results:** The first wave of the COVID-19 pandemic significantly disrupted the emotional well-being of patients with head and neck cancer. These patients became even more anxious due to the high mortality from the COVID-19 viral infection, hospital occupancy and missed therapeutic examinations. The need for togetherness, impaired concentration and attention, irritability and fear that family members might suffer from a deadly disease were the most common behavioral problems identified during the COVID-19 pandemic.

**Conclusion:** The psychological burden associated with the direct and indirect effects of the COVID-19 pandemic should not be overlooked, given the fact that laryngectomized patients have twice the risk of suicide compared to patients who have undergone other types of cancer. Assessing the quality of life in laryngectomized patients is very important because it enables the timely identification of mental disorders and suggests the necessary support measures.

**Keywords:** COVID-19 pandemic, quality of life, patients with laryngectomy

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## INTRODUCTION

The World Health Organization (WHO) defines quality of life as a state of complete physical, mental and social well-being (1). Quality of life is seen as a multidimensional concept consisting of a range of social, environmental, psychological and physical values. By evaluating an individual's emotional reactions to life events, we contribute to understanding the concept of quality of life (2).

Due to the COVID-19 pandemic, which led to changes in the daily routine, there was a change in the psychosocial functioning of individuals. Exposure to reporting on crisis events in the mass media and unverified information circulating on social networks contribute to the deterioration of people's mental health (3). The impact of current measures to combat the COVID-19 pandemic, such as the closure of educational institutions, postponement of exams, ban on public gatherings, a sharp rise in the number of infected and dead, home isolation, fear of infection and social distancing from friends have created uncertainty and anxiety (4).

The COVID-19 pandemic has profoundly changed our lives, infecting more than 116 million people worldwide (5). The viral pathogenesis of COVID-19 has changed the way hospital and outpatient care is provided, and limited or reoriented access to many medical and surgical services to the provision of counseling services (6). The field of oncology has not been spared, and almost every third patient with cancer has felt the consequences of the new situation both in terms of treatment and clinical care (7).

Cancer patients are at high risk of COVID-19 viral infection. Laryngectomy patients in particular may be susceptible to adverse effects not only of COVID-19 viral pathogenesis, but also of long-term psychosocial consequences due to changes in intensive clinical care because of the introduction of specific epidemiological measures. This patient population is described as a population with two times higher risk of suicide compared to other cancer patients (8).

Laryngectomized patients are often unable to verbally express their feelings as people without voice disorders, but the social circumstances they currently find themselves in can impair their quality of life and negatively affect their mental health. They are not able to physically and mentally avoid the consequences of this situation, because at the time of

the COVID-19 pandemic, due to the introduction of specific epidemiological measures, they have limited coping strategies. Therefore, their response to the crisis situation in these conditions largely depends on the support they receive in the family and the state of preserved physical and mental health (9).

Anatomical-functional changes negatively affect the quality of life of patients, and the registered psychological trauma is often more intense and significant than that found in patients with tumors of other localizations (10, 11). In this context, patients undergoing laryngectomy present a unique challenge for clinical treatment due to the interruption between the upper respiratory tract and trachea and complete respiratory dependence through the tracheostomy. The non-passage of air into the nasal cavities and the consequent loss of filtration function put such patients at a higher risk of inhaling harmful particles and developing respiratory infections. This implies the need for greater caution during the current epidemic (12). In addition, the risk of poor outcomes of COVID-19 viral infection is higher in patients who have undergone laryngectomy due to the frequent presence of medical comorbidities (i.e. chronic lung disease, peripheral vascular disease, heart disease, cerebrovascular disease and diabetes), smoking history and impaired mucociliary functions by inhaling cold and dry air (13, 14).

In this environment, patients undergoing laryngectomy present a particularly difficult task for speech rehabilitation due to the higher potential risk of mortality due to concomitant respiratory comorbidities and transmission of viral particles due to direct aerosolization from the tracheostomy. In particular, patients who underwent rehabilitation with a vocal prosthesis represent a unique subgroup given their need for continuous treatment. The guidelines for laryngectomy of the British Association of Head and Neck Oncologists during the COVID-19 pandemic recommend avoiding the primary therapeutic procedure, preferring the secondary one, which is performed later (15). According to Longobard and associates, delaying the start of rehabilitation is not the solution, especially because the path of this pandemic is uncertain, which imposes the need for all of us to prepare to live with it. It follows that in these conditions, adapting the rehabilitation of laryngectomized patients to the COVID-19 pandemic is the best solution (14).

Laryngectomy patients who do not have the anatomical and functional ability to learn esophageal

speech must use a vocal prosthesis (16). Vocal prosthesis enables these patients to acquire fluid, sonorous voice with good prosody and intelligibility (17, 18). The use of vocal prostheses obliges these patients to report to the clinic periodically due to malfunctions or natural wear and tear over time. In the context of the COVID-19 pandemic, these visits pose a security risk to health. Because of all of the above, a patient undergoing laryngectomy is generally considered a "fragile" or "demanding" patient at the time of the COVID-19 pandemic (19).

Ignoring the immediate and long-term psychological effects of the COVID-19 pandemic would be counterproductive, especially for those in need of additional support (8), including laryngectomized patients. Their regular therapies can be interrupted and they are more likely to show problematic behaviors such as irritability, aggression and social withdrawal (7). The American Speech and Hearing Association (ASHA) believes that one of the tasks of speech therapists is to improve the quality of life of an individual by reducing functional and structural deficits that limit communication during daily activities (20).

During the COVID-19 pandemic, the psychological reactions of the population play a key role in the occurrence of inappropriate behavior, emotional stress and defensive reactions. Despite this fact, insufficient resources are still provided to manage or mitigate the effects of the pandemic on the mental health and well-being of children and adults (21). Given that laryngectomized patients belong to a vulnerable group that requires psychological support after surgery, specific epidemiological measures could only further increase the fear and reluctance that are especially pronounced after surgery (22, 23).

## AIM

The heterogeneity of clinical manifestations and complications that accompany the rehabilitation of laryngectomized patients require periodic multidisciplinary evaluations in order to better answer the question of the appropriateness of the diagnostic-therapeutic program. The process of voice and speech therapy based on understanding the psychosocial functioning of laryngectomized patients enables adequate categorization of a person's strengths and challenges for planning individually tailored interventions. Having in mind the fact that the COVID-19 pandemic disrupts the daily activities of

all of us, the question arises as to how the COVID-19 pandemic affects the process of rehabilitation and resocialization of laryngectomized patients. Analyzing what has been said so far, the aim of this research is to present the link between the quality of life of laryngectomized patients and the COVID-19 pandemic.

## METHOD

The literature review was performed through the Google Scholar Advanced Search engine and the Consortium of Libraries of Serbia for Unified Acquisition - KoBSON. The following keywords and phrases were used in the search: pandemic COVID-19, quality of life, laryngectomy patients, laryngeal cancer and quality of life, mental health and COVID-19. The literature was searched in Serbian and English. Papers were collected in which the effects of the COVID-19 pandemic on the mental health and quality of life of people were presented, with special emphasis on the quality of life of laryngectomized patients. The papers published from the beginning of the 21<sup>st</sup> century to 2021, with special reference to the period of the COVID-19 pandemic, from December 2019 to the end of 2021, were taken into account in order to compare previous knowledge about the quality of life of laryngectomized patients. Criteria for the synthesis of papers included clinical research, observational studies and interventional studies from the time of the pandemic to the present. Studies of adult respondents who had clinical data on the quality of life at the time of COVID-19 pandemic were analyzed. The criterion for excluding the findings from the analysis included the results of laryngectomized patients with an associated cognitive deficit. The analysis included about 80 papers and 10 monographs, but for the purposes of this paper, 40 review and research papers and 5 monographs were selected in which biopsychosocial aspects of the quality of life of laryngectomized patients were presented.

## RESULTS WITH DISCUSSION

An overview of the most important parameters of the analyzed papers is presented in Table 1.

In most of the analyzed studies, the authors did not examine the relationship between the socio-demographic characteristics of the subjects and different aspects of the quality of life of laryngec-

tomized patients, or at least did not report these findings.

During the analysis of the works, significant dimensions of the quality of life of laryngectomized patients were identified with the help of various quality of life assessment instruments, some of which were specially designed to assess the quality of life of laryngectomized patients during the COVID-19 (Covid-19 Emotional Impact Survey, C-19EIS) pandemic.

Rehabilitation of laryngectomized patients during the outbreak of the COVID-19 pandemic is very challenging (24). Not only are patients diagnosed with head and neck cancer prone to comorbidity and weakness (25, 26), but they may also have specific characteristics that increase the risk of being more severely affected by COVID-19 infection (27). The process of treatment and rehabilitation by speech therapists, which includes the presence of a tracheostomy and the myelosuppressive effect of chemo and radiotherapy, further increases the threat of pandemic to the health of these patients (9). This may be related to the fact that they require more frequent removal of the medical mask compared to other patients due to the need to perform clinical examinations (e.g. oral examination, fibroscopy) thus exposing them to a higher risk of environmental contamination (28).

The presence of an immunocompromised condition and a long history of smoking are common characteristics of laryngectomized individuals and patients with severe COVID-19 (25). Moreover, through a temporary or permanent tracheostomy, viral particles from the air can immediately reach the lower respiratory tract, and in the case of infection, laryngectomized individuals can more effectively spread COVID-19 infection due to altered anatomy and aerosolization of tracheal secretions (29). Due to all the above, Day and co-workers point out that laryngectomized patients resort to social isolation at home during the pandemic period, torn between fear of hospital exposure and anxiety due to missed or delayed follow-up visits (8).

Studies conducted before the COVID-19 pandemic show that laryngectomized patients have a significant deterioration in almost all domains of quality of life immediately after surgery (30 - 33). A study conducted in China, which included 1,590 re-

spondents from 30 administrative provinces, analyzed anxiety in people with head and neck cancer and the typical population. The results of the research showed that the current situation of the COVID-19 pandemic, which is characterized by a large amount of sometimes contradictory information about the risk of infection of cancer patients and the development of severe COVID-19, sent by the mass media, caused only greater confusion and fear among patients, impairing their quality of life (34). Studies of the quality of life of laryngectomized patients during the COVID-19 pandemic show that poor outcomes of the social functioning of laryngectomized patients are manifested by dysfunctional reactions in the family and social environment during these months. Moreover, these patients report a higher perception of the environment due to their condition. We can connect this with the fact that tracheostomy and frequent cough attacks scare people around them. The general population is well aware of the ability of cough to disperse potentially infectious viral particles through respiratory droplets. For these reasons, the general population shows social avoidance of laryngectomized individuals for fear of infection. This can be one of the key elements leading to the creation of a true social stigma (35).

A study of the effects of the COVID-19 pandemic and the mental health of laryngectomized patients conducted in Italy during 2020 shows a deterioration in the social and emotional functioning of laryngectomized individuals during isolation. The study involved 2,524 elderly respondents with and without head and neck cancer. The research sample consisted of 56.4% women and 43.6% men. Research has shown that overall physical activity is reduced during the COVID-19 pandemic. This can be explained by restrictions on movement, which forced the entire population to reduce their daily activities. This situation in which we all find ourselves has limited the psychosocial functioning of all of us, not just laryngectomized patients (22).

A recent study on the quality of life conducted in Poland on 260 patients who were referred for chemotherapy and had different types of stage III and IV cancer showed significant results on the quality of life of laryngectomized patients during the COVID-19 pandemic. Comparing the results on the quality of life of this group of patients before the COVID-19

**Table 1.** Review of analyzed studies

Liang et al., 2020 Research conducted in China	1590 respondents (patients with AS cancer, S - 63.1) patients without AS cancer, S -48.7)  There is no significant difference in gender	Emotional aspect	VHI	The mass media is causing more concern and fear among people with head and neck cancer.
Maugeri et al., 2020 Research conducted in Italy	2524 subjects with and without cancer, F-1426 (56.4%) M-1098 (43.6%) There is no significant difference in age	Physical activity before and during quarantine	PGWBI	Total physical activity is significantly reduced. There are statistically significant differences between men and women in favor of men. There is a positive correlation between physical activity and mental health.
Ciążyńska et al., 2020 Research conducted in Poland	260 patients with stage III and IV cancer of the head and neck. There is no significant difference in gender and age	Cognitive, emotional, social and physical aspects before and during quarantine	EORTC QLQ-C30	The score for cognitive and social functioning is significantly lower during the COVID-19 pandemic. Insomnia, fatigue and loss of appetite are common in patients' behavior.
Longobardi et al., 2020 Research conducted in Italy	73 patients using vocal prostheses There is no significant difference in gender and age	Psychosocial aspect	VHI	Psychopathological symptoms (depression and anxiety) are present in 30% of patients.
Falcone et al., 2020 Research conducted in Italy	137 patients with head and neck cancer Respondents are equal according to gender and age	Emotional aspect	C-19EIS	The COVID-19 pandemic, especially the first wave, significantly impaired the emotional well-being of patients with head and neck cancer. Women show greater concern than men.
Wang et al., 2020 Research conducted in China	6213 cancer patients There is no significant difference in gender and age	Biopsychosocial aspect	VHI	Among 6213 cancer patients, 23.4% had depression, 17.7% anxiety, and 9.3% posttraumatic stress disorder. Only 1.6% requested psycho-oncology counseling during the COVID-19 pandemic.

pandemic, it was concluded that their score of cognitive and social functioning was significantly lower during the COVID-19 pandemic. Frequent occurrences in their behavior are insomnia, fatigue and loss of appetite (19).

The need for togetherness, impaired concentration and attention, irritability and fear that family members may suffer from a deadly disease are the most commonly identified behavioral problems

identified in laryngectomized patients during the COVID-19 pandemic (36). The research of Longobardi and associates conducted in Italy, on a sample of 73 respondents, users of vocal prostheses, speaks in favor of that. Research results show that psychopathological symptoms, such as depression and anxiety, are present in at least 30% of patients, which requires special postoperative support from speech therapists and psychologists (14).

The potential threat of COVID-19 to laryngectomized patients has initiated research on the benefits of modifying postoperative rehabilitation, highlighting the possible effects of its risks and benefits. Research shows that clinicians, on a case-by-case basis, consider delaying outpatient activities (14), while patients, on the other hand accept the possibility of delaying hospitalization, thus reducing the risk of infection to a minimum. Falcon et al. point out that this situation can lead to delays in the diagnosis of tumor recurrence, which further impairs the patient's physical and mental health (37). Analyzing the results of these researches, we can conclude that the impact of the COVID-19 pandemic obviously worsened the already present feeling of fragility and the need for exclusion from society, which contributed to the deterioration of the quality of life of these patients. At a time when surgeries, chemotherapy sessions and follow-up visits are delayed due to the difficult functioning of the health system, cancer patients should be reasonably considered a population at risk of significant stress. This psychological burden associated with the direct and indirect effects of COVID-19 should not be overlooked, given the results of previous research showing that laryngectomized patients have twice the risk of suicide compared to patients who have undergone other cancers (24).

The COVID-19 pandemic has been affecting physical and mental health globally for two years (38, 39). Despite the development of several effective vaccines against infection, COVID-19 research on the quality of people's lives predicts further impairment of people's physical health and mental well-being, until a high level of immunity is achieved in society. Vulnerable groups of patients, such as laryngectomized patients, report an increased level of anxiety due to fear of infection and the fact that a large number of people die every day (40). As a result, there is evidence to show that the COVID-19 pandemic, especially the first wave, significantly impaired the emotional well-being of patients with head and neck cancer (19, 37). The results of a study conducted in Italy in 2020, on a sample of 137 respondents equal in gender and age, confirm these results, pointing out that women with head and neck cancer show greater concern about the COVID-19 pandemic than men with head and neck cancer (41).

Psychological counseling is considered a valuable resource during the COVID-19 pandemic. Research conducted in China shows a high prevalence

of mental health problems during the COVID-19 pandemic. In a sample of 6,213 cancer patients, 23.4% of patients had depression, 17.7% anxiety, and 9.3% posttraumatic stress disorder. Despite the high prevalence of mental health problems during the COVID-19 pandemic, research shows that only a small percentage (1.6%) of cancer patients sought help for psycho-oncology counseling during the first months of last year (42). Taking this fact into account, research findings indicate the importance of providing psychological support to all laryngectomized patients despite limited access to health care during the COVID-19 pandemic (43).

Preliminary data on the impact of the current pandemic on the quality of life of people with active cancer are becoming more and more available. A study from Poland recently analyzed 238 patients with stages III and IV of various types of cancer undergoing chemotherapy using the EORTC QLQ-C30 questionnaire (EORTC QLQ-C30 questionnaire). Comparing their results with reference values on quality of life, these authors point out that the cognitive and social functioning of these patients is significantly lower during the COVID-19 pandemic, while insomnia, fatigue and loss of appetite are the most common symptoms (19). Similarly, other studies have analyzed the psychological status of COVID-19 in specific cancer subpopulations (gynecological and hematological tumors), confirming deterioration of quality of life and frequent occurrence of symptoms of anxiety and distress (44 - 47). Falcone et al., using the EORTC QLQ-C30 questionnaire (EORTC QLQ-C30 questionnaire) to assess the quality of life of patients with thyroid malignancies during the COVID-19 pandemic, reached results that were not significantly different from reference values. They also found no intraindividual significant changes in terms of global health and functional status (37). Such negative findings may be explained by the fact that thyroid cancer is a particularly indolent tumor, and therefore these patients may feel less at risk of infection compared to the laryngectomy patient population who have laryngeal squamous cells and who have a lower quality of life during the COVID-19 pandemic (48).

## CONCLUSION

Quality of life assessment is becoming an increasingly integrated criterion in the therapeutic evaluation of clinical trials. This study was under-

taken to more objectively investigate the direct and indirect psychosocial effects of the COVID-19 pandemic on the quality of life of laryngectomized patients. Understanding their emotions and needs is essential to maintaining their mental health during the COVID-19 pandemic.

As we stated in our paper, many studies have shown that the COVID-19 pandemic impairs the physical and mental health of laryngectomy patients, and thus their emotional state. Findings from these studies suggest that these patients have become even more anxious because of the high mortality from viral infections of COVID-19, hospital business and missed therapy appointments. The need for companionship, reduced concentration and attention, irritability and fear that family members

may contract a fatal disease are the most common behavioral problems identified during the pandemic. The psychological burden associated with the direct and indirect effects of the COVID-19 pandemic should not be underestimated, given the fact that laryngectomy patients have twice the risk of suicide compared to patients who have undergone other types of cancer. Because of all of the above, the assessment of the quality of life of laryngectomy patients is especially important for speech therapists in this period in order to spot problems in time and take the necessary support measures.

The results of these studies suggest the need for further research into the relationship between psychological factors, the quality of life of laryngectomized patients and the COVID-19 pandemic.

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## Uticaj pandemije virusa COVID-19 na kvalitet života podvrgnutih laringektomiji bolesnika

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### SAŽETAK

**Uvod.** Kvalitet života je stanje potpunog fizičkog, psihičkog i socijalnog blagostanja. Usled pandemije virusa COVID-19, koja je dovela do promena u dnevnoj rutini, došlo je do promene u psihosocijalnom funkcionisanju pojedinaca. Imajući u vidu da se bolesnici podvrgnuti laringektomiji ubrajaju u vulnerabilnu grupu, koja zahteva psihološku podršku nakon hirurške intervencije, specifične epidemiološke mere za vreme pandemije virusa COVID-19 mogle su samo dodatno pojačati strah i bezvoljnost koji su posebno izraženi nakon operacije.

**Cilj.** Cilj ovog istraživanja je da se analizira postojanje veza kvaliteta života bolesnici podvrgnuti laringektomiji i pandemije virusa COVID-19.

**Metode.** Pregled literature obavljen je preko pretraživača *Google Scholar Advanced Search* i Konzorcijuma biblioteka Srbije za objedinjenu nabavku – KoBSON.

**Rezultati.** Prvi talas pandemije virusa COVID-19 značajno je narušio emocionalno blagostanje bolesnika sa karcinomom glave i vrata. Ovi bolesnici postali su uznemireni zbog visoke smrtnosti od virusne infekcije izazvane virusom COVID-19, zauzetosti bolnica i propuštenih terapijskih pregleda. Potreba za zajedništvom, poremećaj koncentracije i pažnje, razdražljivost i strah od toga da članovi porodice mogu oboleti od smrtonosne bolesti su najčešći identifikovani problemi u ponašanju tokom pandemije virusa COVID-19.

**Zaključak.** Psihološko opterećenje povezano sa direktnim i indirektnim efektima pandemije virusa COVID-19 ne sme se zanemariti, imajući u vidu činjenicu da bolesnici podvrgnuti laringektomiji imaju dvostruko veći rizik od samoubistva, u poređenju sa bolesnicima koji su operisali druge vrste karcinoma. Procena kvaliteta života kod bolesnika podvrgnutih laringektomiji bolesnika veoma je važna, jer omogućava da se blagovremeno identifikuju psihički poremećaji i predlože potrebne mere podrške.

**Ključne reči:** pandemija virusa COVID-19, kvalitet života, podvrgnutih laringektomiji bolesnici