

Original Article

The process of reacquiring new vocalization in total laryngectomy patients with head and neck cancer: A qualitative study

Miyoko Iwai^{a,*}, Shoko Ando^b, Kazuki Sato^a^a Nursing for Advanced Practice, Department of Integrated Health Sciences, Nagoya University Graduate School of Medicine, Nagoya City, Aichi, Japan^b Department of Nursing, Ichinomiya Kenshin College, Ichinomiya City, Aichi, Japan

ARTICLE INFO

Keywords:

Head and neck cancer
Voice prosthesis
Quality of life
Psychosocial adjustment
Supportive care
Qualitative research

ABSTRACT

Objective: Speech rehabilitation significantly contributes to the enhanced quality of life for patients who have undergone laryngectomy due to head and neck cancer. The initiation of tracheoesophageal speech early in the rehabilitation process has been associated with improved speech quality. Despite this, voice changes can carry a stigma due to communication challenges, even after successful voice restoration, potentially limiting the overall improvement in quality of life. Thus, our aim was to gain a profound understanding of the transition process from the selection to the adaptation of tracheoesophageal speech in patients with head and neck cancer.

Methods: Participants, who had undergone laryngectomy for head and neck cancer, were recruited from peer support groups in Japan, resulting in the identification of thirteen tracheoesophageal speakers. The data were analyzed using grounded theory methodology, incorporating open, axial, and selective coding. Semi-structured interviews delved into tracheoesophageal speakers' perceptions of their voices and the adaptive strategies employed for their preferred alternative communication methods.

Results: During the adaptation process, participants underscored the importance of communicating with their own voices. However, they also experienced anxiety about losing their natural voice, confronted the reality of living without a voice, and coped with their new voice. Eventually, participants came to recognize the changed voice as their own.

Conclusions: The personal conviction associated with the notion of "communicating with one's own voice" is integral to the adaptation process for patients with head and neck cancer who undergo laryngectomies and utilize tracheoesophageal speech. Some aspects of tracheoesophageal speech can evoke feelings of hopelessness, emphasizing the importance of comprehensive support for professional speech rehabilitation.

Introduction

The standard treatment for advanced laryngeal and hypopharyngeal cancers is tumor excision via total laryngectomy. The 5-year survival rate for laryngeal cancer in Japan is 81.8%,¹ and patients may have to live with functional disabilities after treatment. Particularly, patients who have undergone total laryngectomy may suffer from depression and anxiety owing to a loss of social roles, financial difficulties, and a reduced scope of interaction,² resulting in a decreased quality of life.^{3,4} The suicide rate among patients with head and neck cancer is one of the highest among patients with various cancer types.⁵ After laryngectomy, patients have reported persistent problems with communication and swallowing.⁶ Therefore, support for these patients is essential.

Despite the availability of several speech rehabilitation options following laryngectomy, including electro-laryngeal speech (ELS), esophageal speech (ES), and tracheoesophageal speech (TES), clinical practice guidelines fail to offer clear criteria for choosing the most suitable adaptation option.⁷ Therefore, the decision is left to the patient's preference. Several studies⁸⁻¹¹ have consistently demonstrated that voice-focused quality of life is better among TES speakers than among ES and ELS speakers. TES relies on lung exhalation as its driving force via a one-valve voice prosthesis (VP) inserted into a surgically created tracheoesophageal fistula.¹² TES is associated with superior vocal quality and longer enunciation time compared to other alternative communication strategies when initiated early in the rehabilitation period.¹³

* Corresponding author.

E-mail address: miko.iwai39@gmail.com (M. Iwai).<https://doi.org/10.1016/j.apjon.2023.100362>

Received 12 October 2023; Accepted 3 December 2023

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TES differs significantly from other alternative voice recovery methods owing to its distinct limitations¹⁴ and the need for tracheoesophageal puncture (TEP). While ES has been extensively studied due to its complexity, there are no studies on the adaptation process limited to TES. However, voice restoration with TES requires adapting to daily cleaning and the periodic replacement of their VP. Additionally, voice changes trigger the challenges of vocalization in communication, and they are stigmatized.¹⁵ Therefore, the mere fact that a laryngectomized patient can vocalize again with TES is insufficient to improve quality of life.

Despite being widely recognized as the gold standard for speech restoration in Europe, TES rehabilitation using a tracheoesophageal prosthesis is not common in Asia.¹⁶ In fact, the number of TEP procedures after laryngectomy in Japan is about 1/5 of the eligible patients, even at the medical institutions that treat the greatest number of head and neck cancers, reflecting the small number of TES speakers in Japan. It is because, in an international comparison of laryngeal cancer incidence rates, the incidence rates in Italy and France are about four times higher than those in Japan and around two times higher than those in the United States. In addition, these countries have higher incidence rates than other Asian countries.

To expand the opportunity for individuals with laryngectomy to undergo voice restoration in Japan and other Asian countries, it is crucial to provide patients with comprehensive guidance on the suitability of TES based on their preferences and information on how to manage TEP. Therefore, it is necessary to identify factors that may help TEP speakers adapt to their voice changes. As such, we aimed to identify the processes by which people with laryngectomy choose TES and adapt to their altered voices.

Methods

Design

We used semi-structured interviews to understand what TES speakers think of their voices, their preferred alternative communication strategies, and how they have adapted to their voices. This research is to identify their behavior and thoughts about their voice that change under the influence of society and others in the process, from their awareness of the need for laryngectomy to their acquisition of a new voice and adaptation to it. The Strauss and Corbin version of grounded theory¹⁷ is a theory that addresses the proactive role of humans in interpersonal interactions and helps clarify the process up to psychosocial adaptation to voice.

Participants and setting

Participants were recruited by representatives of peer support groups for TES speakers from four branches in Japan. Informed consent was obtained from all participants. The inclusion criteria were a diagnosis of head and neck cancer, treatment via laryngectomy, and having undergone TEP surgery for at least 6 months but not more than 6 years. Inclusion criteria were period limited to avoid periods of reduced quality of life due to illness or treatment¹⁸ and to reduce recall bias. Those who were currently undergoing cancer treatment, as well as those whom the researchers determined would have difficulty responding to the interview due to mental problems, were excluded.

Because of the COVID-19 epidemic, it was difficult for the researcher to recruit study participants while participating in a peer support group. The researcher connected with participants recommended by patient group representatives and obtained informed consent from study participants. The purpose of this study was to determine the process of adaptation to voice change among TES speakers. Therefore, in addition to the eligibility criteria for the study, the representatives were informed of the requirement that the subjects be conversant with TES on a daily basis.

Data collection

Individualized audio-recorded semi-structured interviews lasting for 40–95 min were conducted by the first author either face-to-face ($n = 12$) or via virtual meeting ($n = 1$). The number of interviews for all participants in this study was limited to one because of the consideration of the fact that the participants were subjects with vocalization difficulties. To protect the privacy of the participants, the interview was scheduled in a private room. They are guided by a preplanned interview guide.

Prompts included the following: “How did you obtain information on speech rehabilitation?”; “Why did you choose TEP?”; “What process led to speech after TEP?”; “How do you feel about your speech?”; “What are your thoughts on complication prevention and prosthetics?”; and “How do you take care of yourself?” Data were collected between June and November 2021. All interviews were conducted by the first author, a certified nurse specialist with extensive head and neck cancer nursing experience, and transcribed in full for analysis.

Data analysis

Transcripts were initially coded sentence-by-sentence using an “open-coding” strategy to identify and label important words and concepts within the data. Using a constant comparative analysis, concepts were grouped to form more abstract categories. Axial coding was used to identify and outline the proposed relationships between concepts. Data were reviewed to validate relationships among concepts, and categories were identified. One integrated core category was identified that was related to all categories. The researchers performed theoretical coding under the supervision of two external auditors during the analysis and presentation of the results. Theoretical sampling was conducted within the range of the recruited participants.

Results

One of the 14 TES speakers that were included in the study did not respond. The final group of participants consisted of 13 TES speakers (three women). Participants’ characteristics are presented in [Table 1](#). The participants had previously been diagnosed with cancers of the larynx, hypopharynx, or cervical esophagus and thyroid. The mean time from TEP surgery to interview was 39.6 (SD: 19.7) months, ranging from 1 to 6 years and 9 months. Two of the 13 patients underwent primary TEP. Notably, only two participants underwent professional speech rehabilitation.

Explanatory theoretical model of voice restoration with tracheoesophageal speech

Based on the conceptual categories that emerged from the data, we developed an interpretative model to answer the research question, “What happens from the point of diagnosis, to the loss of one’s voice through surgery, to the point of TES selection, and finally to adjustment to life with one’s voice restored?” When diagnosed with voice loss, patients must choose TES from among the multiple voice restoration methods available. The model describes how TES speakers adapt to their postsurgery lives by implementing various coping strategies to re-establish their voice and become accustomed to using it as their own. This theoretical model also helps us to describe the psychosocial processes that occur as persons with laryngectomy adjust to TES, progressing through the following stages: “anxiety related to signs of the loss of one’s natural voice,” “confronting the reality of living without one’s voice,” “coping with the new vocalization strategy” and “recognizing the changed voice as one’s own.” The model also incorporates the role of “hopelessness” during this transitional period. Together, these phases comprise the theoretical model we have termed “Communicating with one’s own voice” ([Fig. 1](#)).

Table 1
Participant characteristics.

No./Gender	Age (years)	Cancer site	Cohabitant	Occupation	TEP timing/Time to TEP (m)	TES period	Professional speech rehabilitation	Residence
A/Male	65	Hypopharynx	No	Yes	Secondary/7	6yr 9m	No	Urban
B/Male	61	Hypopharynx	Yes	Yes	Secondary/9	4yr 4m	No	Rural
C/Male	75	Larynx	Yes	No	Secondary/7	1yr 2m	No	Urban
D/Male	79	Hypopharynx	Yes	No	Secondary/2	5yr 6m	No	Urban
E/Male	62	Larynx	Yes	Yes	Primary	3yr 1m	No	Urban
F/Female	67	Larynx	Yes	No	Secondary/6	3yr 1m	No	Rural
G/Male	71	Cervical esophagus	No	Yes	Secondary/16	1yr 1m	No	Urban
H/Male	61	Hypopharynx	Yes	Yes	Secondary/7	4yr 3m	No	Rural
I/Female	66	Larynx	Yes	No	Secondary/4	1yr	Yes	Urban
J/Male	67	Hypopharynx/Cervical esophagus	Yes	Yes	Secondary/10	3yr 1m	No	Urban
K/Male	76	Hypopharynx	Yes	Yes	Secondary/1	3yr 9m	No	Urban
L/Female	66	Thyroid	No	No	Primary	2yr 7m	No	Urban
M/Male	73	Larynx	Yes	No	Secondary/19	2yr 6m	Yes	Rural

TEP, tracheoesophageal puncture; TES, tracheoesophageal speech.

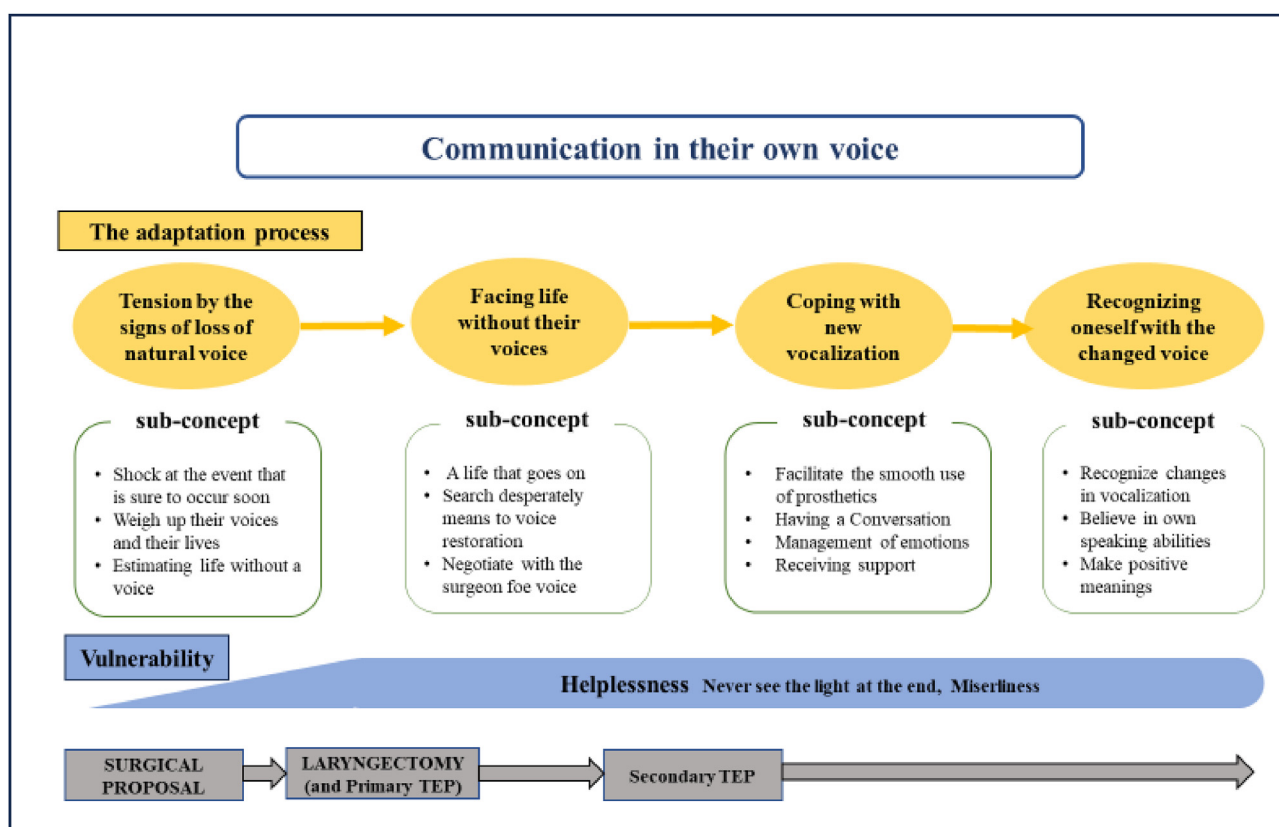


Fig. 1. A model of voice restoration with TES. TES, tracheoesophageal speech.

Core category: communicating with one's own voice

The conceptual framework of the current model is structured around the core category of “communicating in one's own voice.” For TES speakers, one's “own voice” is defined based on the patient's preoperative voice and the strategy used to produce vocalization. Our interviews revealed that TES speakers emphasized the need to be able to use their “own voice” to communicate their intentions to others with the appropriate emotion when choosing voice rehabilitation. The key concept in this category is the importance of accurately conveying one's intentions via TES. For example, one participant expressed the following: *I again realized voice is important.... It's not just about getting my words across to the other person... It's the timing of the conversation. It conveys my humanity to the other person. (D)*

Principal category: anxiety related to signs of the loss of one's natural voice

The process of “communicating with one's own voice” as a TES speaker begins with feelings of anxiety that develop after diagnosis, as the signs that one is losing their natural voice become more recognizable. Several patterns related to this experience emerged. Patients reported feelings of shock related to the impending loss of one's voice. Further, as surgery leading to voice loss was recommended to participants around the time of cancer diagnosis, they were confronted with fears regarding a situation that they had not even imagined at that point: *I gave up.... stop the surgery. I thought it would be hard to lose my voice. I did not want to admit it. Well, I struggled very hard. (H)* Patients also tended to take stock of their voices and lives, eventually accepting that they would have to sacrifice their voices to save their lives, with the time required for this realization

being considerable in some cases. *When I was diagnosed with cancer, I looked into the possibility of not removing the larynx... even undergoing the latest treatments. (G)* Another patient expressed the following: *Sure, you know, my doctor explained that my disease was progressing by the minute... I recognized that I had to lose my voice because I felt it myself. (C)*

In the next phase, participants reported trying to imagine life without a voice, after learning that this would be inevitable due to cancer treatment. *By the way, I know what it means to go under the knife because of cancer, but... I could not think of it as my own thing. (M)*

Principal category: confronting the reality of living without one's voice

Over time, participants generally reported progressing to a phase in which they had no choice but to confront the reality of life without a voice. In this study, most participants experienced a life of voice loss after undergoing cancer treatment. They considered voice restoration while continuing their lives using alternative communication strategies. Among the subcomponents in this phase, TES speakers come to recognize that life goes on—that they are surviving in their careers and daily lives using alternative strategies: *I cannot speak, so I write, and it was inconvenient, but I was doing it somehow or the other. (A)*

During the “anxiety” phase, there were some individuals who could not imagine the loss of their natural voice, “which led them to desperately search for alternative voice recovery methods: *TES was in the back of my mind, but I never thought it would go that far. So, I bought a tapir artificial larynx. But... it was not cool, you know. So, I stopped right away. (H)*. Another theme that emerged was that patients often negotiated with surgeons regarding the possibility of TEP, as they were eager to regain their voices. Most participants in this study belonged to this category: *My primary surgeon said he would not do it (TEP) for a year... So, every time... I asked to do it at every visit. (H)*

Principal category: coping with the new vocalization strategy

Participants in this study were able to achieve voice restoration through TES and adjust their lives to the new speech method. They described being able to cope with voice rehabilitation and the complex emotional processing of their altered speech and their new voices. In the first step, patients must adjust to and facilitate the smooth use of prosthetics as they are dealing with these devices for the first time. Over time, patients developed a sense of mastery: *Maintenance is now performed only twice a day, in the morning and at night. After drinking a lot of alcohol or coffee, it comes out from here (VP). It improves with an air wash device. (K)* Another important step in acceptance and adjustment is encouraging patients to speak in their new voices, both at work and in their daily social lives. *In the morning, when I go to my apartment to pick up the newspaper, I hold this place and say, “Good morning,” to strangers... That is how I practice... (C)*

However, participants also emphasized the importance of managing their emotions. Although many were initially comfortable with their voice restoration, each had to deal with emotional changes related to their speech state in diverse ways. *Now, if something seems like it's going to be painful, at night, when I go to bed, I tell myself no, no, no. Otherwise, I wonder why I became like this. (G)* Participants also emphasized the support of their peers in helping them to cope with their new voices. Notably, very few participants in this population felt supported by their health care providers. *I am still embarrassed. Everyone who comes here (the peer support group) has a fear of speaking. But if I were here, I would not have that fear. No one laughed. No one... (A).*

Principal category: recognizing the changed voice as one's own

Participants gradually gained confidence by focusing on the fact that they could maintain their daily lives despite their altered voices. At the same time, they viewed the changes in voice caused by TES positively. In

the initial stages of this process, participants must recognize and evaluate the changes in their voices themselves. *Indeed, many TES speakers are even less successful than I am. There are many TES speakers who are not good, even though I listen to them. So, I guess I can do it to some degree. (I)* A crucial element of adjustment for patients was the development of a belief in their own speaking abilities.

Participants reported going about their daily lives believing that their altered voice would be understandable to their conversational partners: *I still have some concerns, but I believe that I'll be understood, including crash and burn. (B)* Similarly, participants progressed to a stage in which they derived positive meaning from the experience and viewed their altered voices positively. *It is a strange way of putting it..., but I think there are several others who are more severely sick than I am, so sometimes I wonder why things turned out so well for me. (J)*

Principal category: hopelessness

Participants described living with a feeling of hopelessness after losing their voices, even after regaining them. Participants who underwent cancer treatment without considering voice restoration felt hopeless until they found the means to regain their voices. Many still felt inadequate, considering their speech inferior to normal vocal function. Several participants described not being able to “see the light at the end of the tunnel.” Feeling hopeless due to the inability to use their voices, that is, until gaining access to information regarding TES: *Until TEP, I was living in degradation. I had really given up on life already. So, I was just drinking alcohol. I was having boring days. I could not express myself. For example, I had no hope for the future. (H)* Additionally, many were conflicted when they had difficulty producing ideal speech. Several participants resented the idea of not knowing how to rehabilitate their voices: *I want to have a high voice, but I cannot seem to get the hang of it. I do not know what to do. It is like walking through a tunnel with no way out. (C)* In addition, many participants had concerns about continuing with TES: *(VP care and orthotic changes) I do this as needed, but... This is good enough while I can do it myself. But when I get sick, I won't be doing it... When I think I must continue, I feel indescribably sad at least once a day. (I)* Even after voice restoration, participants still reported misery, feeling inadequate and ashamed of their vocal function, which they considered abnormal: *I am easily cracked by my voice. That makes me feel self-loathing toward myself. I think to myself, “If I have a voice like this, I might as well not speak anymore. (G)*

Discussion

To the best of our knowledge, this study is the first to examine how patients who use TES with head and neck cancer perceive and adapt to their new voices. Beginning with the stage at which they learned about the inevitability of voice loss due to cancer treatment, they continued through the process of voice restoration with TES, as chosen by them. The sequence of processes by which TES speakers adapted to social life with their new voices was similar to that described in a previous study investigating other alternative voice recovery methods,¹⁹ in that by accepting their new personalities, participants were able to continue life as normal.

Meaning of voice as perceived by the tracheoesophageal speech speakers

Participants considered it valuable to use their own voices to communicate their words. Participants considered it valuable to use their own voices to communicate their words. This personal conviction was the most important finding in this study and the factor that facilitated the choice of communication means for voice adaptation. This is similar to ES speakers in that they are interested in acquiring a natural voice. However, the personal conviction of “communicating with one's own voice” revealed in this study differs from that in previous studies of ES

speakers²⁰ in that it is already clear when the choice of vocalization method is made, a result unique to this study. This is a result unique to this study.

This personal conviction was influenced by attitudes toward conversations developed through previous experiences and the need to express their ideal self-image during communication.²¹ In the destruction and reconstruction of self-identity after laryngectomy,²² the central desire of participants in this study was to regain their voice, but in addition they may be more aware of the alterations in the tone and tempo of their voice.²³ Thus, our study provides insights into the reasons patients desire to regain their voices based on the need to accurately convey their intentions and emotions.

Adaptation to altered vocalizations

The TES speakers in this study made efforts to become accustomed to speaking and maintaining their devices in response to the new skills, orthotic management, and changes in vocalization methods. Furthermore, they worked on emotional management during the adjustment period. However, they held onto their sense of inadequacy surrounding conversation and voice quality, both in response to others and in comparison to their past selves,²⁴ fighting to suppress their desire for perfect vocalization. Additionally, they recognized that they did not know how to manage their vocalizations and equipment.

Self-care and emotional management are essential elements in the process of accepting change.^{19,25} However, individual coping skills are also important.²⁶ Enhancing patients' coping skills requires social and medical support,²⁷ especially professional speech rehabilitation interventions such as TES orthotics management.^{28,29} However, most TES speakers in this study received advice, recognition, and emotional empathy from peer support groups to reduce their anxiety and isolation, owing to the lack of medical resources.^{30,31}

The demographic characteristics of this study suggest that the presence or absence of a job has an impact. This result is similar to previous studies. Additionally, the presence of a family member living with them was found to be an important factor in practicing conversation. Three participants in this study who were less than two years post TEP had more voice discomfort than the others. It is possible that the passage of time also affects voice adaptation.

Vulnerability to speech continuity

Our study also highlighted the vulnerability of TES speakers in the context of speech continuity, as they navigate a delicate balance between acceptance and feelings of hopelessness. In Japan, professional voice rehabilitation is still in its infancy, and systematic and effective rehabilitation, including the handling of orthotics, has not yet been implemented. Although most of the participants in this study were self-adapted and actively engaged in voice rehabilitation, it was also clear that they experienced repeated failures in the process. Communication is influenced by the vocalization state and surrounding environment,³² and a negative response³³ from one's conversational partner can easily lead to feelings of hopelessness. These findings suggest that the lack of specialized speech rehabilitation may have negative consequences for the continuation of TES.

Studies have noted that TES speakers have unmet needs regarding VP³⁴ especially in Japan, where TES is used by only 10%–20% of the individuals with laryngectomy and the number of physicians and speech-language pathologists skilled in performing TEP is limited. Consequently, there is a lack of information about TES, leading to voice rehabilitation delays. In other words, TES speakers have difficulty receiving information about voice rehabilitation and are likely to experience feelings of hopelessness. As individuals with laryngectomy, coping behaviors significantly affect their quality of life.³⁵ Based on this, we predict that the vulnerability of TES speakers observed in this study may be associated with a lower quality of life. Therefore, enhancing

professional speech rehabilitation strategies, including psychological support, may help to promote adaptation and acceptance.

In this study, two of the 13 patients underwent primary TEP. These two participants differed from the other participants in that they did not experience a period of "confronting the reality of living without one's voice". However, they are similar to the other participants in the process of reacquiring their voices and may be at risk for vulnerability.

Shared decision-making on communication methods

To provide the appropriate support for the choice of communication means, clinicians must clarify the value of the voice from the perspective of the patient, in addition to providing objective procedural information. Participants acquired information related to voice reacquisition and negotiated TEP with their physicians in hopes of finding relief from the stress of voice loss. Patients even consider sacrificing their lives³⁶ due to the combined impact of the cancer diagnosis³⁷ and voice loss. Additionally, physicians often focus their efforts on convincing patients of treatment,³⁸ and patients may become frustrated because they are less informed about alternative voice restoration methods.^{39–41} Few participants in this study also felt supported by their health care providers in the same way. One factor was the lack of information provided about TES. Even if information about voice rehabilitation was provided to them at the time of their cancer diagnosis, they may not have properly accepted the information because they have just received the critical pronouncement of losing their voice. The role of nurses in head and neck cancer multidisciplinary team care is expected to provide emotional support to patients who have received a serious diagnosis and to serve as a bridge to communicate the patient's wishes to the surgeon, and it is possible that the participants in this study did not receive such support in addition to specialized voice rehabilitation. Patients undergoing laryngectomy should be provided with information that can allow them to consider alternative voice restoration methods before surgery while receiving emotional support even at the time of diagnosis.

Giordano et al.⁴² emphasized that TES is selected by motivated persons with laryngectomy. The participants in this study were able to cope with the demands of orthotic management after TEP, supported by the personal conviction value they assigned to their voices. We believe that this personal conviction is essential in promoting coping and adaptation following TEP and that this should be a selection requirement for persons with laryngectomy wishing to undergo TES.

Speech rehabilitation problems in Japan

Most of the participants in this study did not receive professional speech rehabilitation but received assistance through peer support, revealing the current lack of development of speech rehabilitation in Japan. It is due to several factors. One is the lack of surgeons who perform TEP surgery. While the number of medical institutions with otorhinolaryngology departments in Japan is 1962 in 2020, the number of institutions performing TEP is quite limited to only about 300 in 2020.

Second, there is a shortage of speech-language pathologists in Japan. The number of speech-language pathologists per 100,000 population is 16.9, of which very few are involved in cancer rehabilitation.⁴³ As a result, very few medical institutions have a speech-language pathologist as a member of the head and neck cancer multidisciplinary team.

Third, the very particular traditional customs regarding speech rehabilitation for laryngectomy patients have had an impact. In Japan, a peer support group for laryngectomy patients was established in 1949 and has developed as a place for ES rehabilitation. The large number of ES speakers in Japan is due to the fact that vocal instruction by experienced speakers is provided throughout the country. We consider that one of the factors preventing the development of professional speech rehabilitation is the persistence of these uniquely Japanese traditional customs in the consciousness of medical professionals.

Fourth, there are adverse effects of the medical system. Within the scope of the Japanese medical system, it is not possible to receive rehabilitation by a speech-language pathologist on an outpatient basis after TEP. It is expected to be influenced by the problems mentioned above. As an alternative, there is a service that allows patients to receive rehabilitation from a speech-language pathologist in a peer support group setting, but this service is limited to certain areas and is left to the wishes of the patient.

Strengths and limitations

The data in this study are representative of Japan as it included a sizable number of participants who received treatment at a leading TEP facility in Japan, and the sex ratio was similar to the Japanese statistical data. However, there were some limitations. First, participants were members of self-help organizations and were recommended by the organization's president. Therefore, there may have been a bias that more adaptive participants were selected. Nevertheless, the participants of this study may have felt embarrassed by their inadequate vocal function and may have experienced anxiety related to the continued demands of orthotic management. Thus, we inferred that TES speakers who are not in contact with their support groups may discontinue TES. Second, the data may have been influenced by a theoretical sampling issue; because of the COVID-19 pandemic, the recruitment methods were limited. However, we conducted a theoretical sampling in the recruited range and achieved theoretical saturation in terms of age, occupational status, and family background.

Implications for nursing

The study explores the perceived personal conviction of voice among TES speakers and their potential impact on voice substitution preferences after laryngectomy. Understanding this personal conviction will play a crucial role in determining the patient's inclination toward voice substitution.

By implementing TEP by selecting patients who desire to use their own voice to communicate words after laryngectomy, we can anticipate that fewer patients will stop using TES. This proactive approach will undoubtedly improve the quality of life of head and neck cancer survivors after laryngectomy.

The elements of adaptation to TES identified in this study, which include orthotic management, emotional management, and coping with changes in speech production methods, are also crucial elements of TES continuity. It is important to consider these elements in support of continuity.

Conclusions

The value assigned to the need to “communicate with one's own voice” is integral to the adaptation process for patients with head and neck cancer who undergo laryngectomy and attempt to regain their voices through TES. The health care provider plays a vital role in assisting the patient with choosing a new voice that aligns with the patient's perceived personal conviction for voice and communication. However, some aspects of TES can easily lead to feelings of hopelessness, suggesting the importance of enhancing multifaceted support in professional speech rehabilitation among TES speakers, such as coping behaviors related to vocalization, orthotics, self-care of vocalization, and emotional management of the difference from the original vocalization.

Future research should explore factors related to the personal conviction of voice and satisfaction with alternative voice recovery methods substitution in patients who have undergone laryngectomy for head and neck cancer to improve quality of life by using alternative voice recovery methods that patients prefer.

CRedit author statement

All authors contributed to the study conception and design. Material preparation and data collection were performed by Miyoko Iwai, and analysis was performed by Miyoko Iwai, Kazuki Sato, and Shoko Ando. The first draft of the manuscript was written by Miyoko Iwai. Review was performed by Kazuki Sato, and Shoko Ando, commented on previous versions of the manuscript. All authors read and approved the final manuscript. All authors had full access to all the data in the study, and the corresponding author had final responsibility for the decision to submit for publication. The corresponding author attests that all listed authors meet authorship criteria and that no others meeting the criteria have been omitted.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Funding

This work was funded by SPRING of Japan Science and Technology Agency (Grant No. JPMJSP2125). The funders had no role in considering the study design or in the collection, analysis, interpretation of data, writing of the report, or decision to submit the article for publication.

Ethics statement

This study was performed in accordance with the latest principles of the Declaration of Helsinki. Approval was granted by the author's university ethics review board (Date 2020.8.11/No. 20-119). To ensure anonymity, each participant was assigned an alphabet, and all identifiable data were securely stored in a locked cabinet. The researcher obtained informed consent from all participants to record the interview, which were kept private. All participants provided written informed consent. All electronic data were password-encrypted. The study adhered to the Integrated Standards for Explicit and Consolidated Criteria for Reporting Qualitative Research (COREQ) Checklists.⁴⁴

Data availability statement

The data that support the findings of this study are available on request from the corresponding author, M. I. The data are not publicly available due to restrictions their containing information that could compromise the privacy of research participants.

Declaration of Generative AI and AI-assisted technologies in the writing process

No AI tools/services were used during the preparation of this work.

Acknowledgments

We would like to thank Ryota Ochiai for their assistance with data analysis, as well as the representatives of the TES peer support groups and all the other members who participated in this study.

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