

Vocal health and stress: the occupational voice users' perspective during the COVID-19 pandemic

Salud vocal y estrés: la perspectiva de los usuarios ocupacionales de la voz durante la pandemia COVID-19

Andrés Carrillo-González¹ , Ángela Patricia Atará-Piraquive¹ 

¹ *Department of Collective Health; Nursing Faculty; Universidad Nacional de Colombia; Bogotá; Colombia.*

 **Correspondence**
 acarrillog@unal.edu.co

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The authors have declared that no competing interests exist.

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All relevant data is in the article. For more detailed information, write to the Corresponding Author.

Abstract

The coronavirus disease 2019 (COVID-19) pandemic has created a new scenario for vocal and psychological morbidity among the entire population. Occupational voice users have had to adapt to these unique circumstances, confronting brand-new risks that increase the odds of developing and exacerbate vocal and mental health disorders. This paper addresses some of these challenges during and after COVID-19 pandemic. As a major outcome, we identified that work-related factors in online environments could be altering the vocal and mental health among occupational voice users. Interventions should focus on a comprehensive assessment of risk factors, including poor mental health previous to a crisis, life-threatening circumstances, separation from family, panic and bereavement. Similarly, this type of worker must receive instructions in voice training, muscle relaxation and mindfulness techniques, and educational technology.

Keywords

Vocal health; vocology; stress; occupational voice users; COVID-19; occupational health; working conditions; work environment; communication; occupational risks.

Resumen

La pandemia del coronavirus 2019 (COVID-19) ha creado un nuevo escenario para la morbilidad vocal y psicológica entre la población mundial. Los usuarios ocupacionales de la voz se han tenido que adaptar a estas circunstancias únicas, enfrentando nuevos riesgos que aumentan las probabilidades de desarrollar y agravar desórdenes vocales y mentales. Este documento aborda algunos de estos desafíos durante y después de la pandemia del COVID-19. Un resultado sustancial que fue identificado fue la incidencia de los factores relacionados con el trabajo online sobre la salud vocal y mental de los usuarios ocupacionales de la voz. Las intervenciones deberían enfocarse en la evaluación exhaustiva de los factores de riesgo, incluyendo el estudio de la salud mental previo a una crisis, circunstancias que amenacen la vida, separación

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de la familia, pnico y duelo. De forma similar, este tipo de trabajador debe recibir instrucciones en entrenamiento vocal, tcnicas de relajacin muscular y mindfulness, y tecnologa educativa.

Palabras clave

Salud vocal; vocologa; estrs; usuarios ocupacionales de la voz; COVID-19; salud laboral; condiciones de trabajo; ambiente de trabajo; comunicacin; riesgos laborales.

Introduction

The COVID-19 pandemic has shaped a new and unusual condition for people around the world. As a highly contagious viral disease, the success of containment depends on effectively limiting social contact [1]. Most countries have adopted “stay-at-home” policies which appear to have slowed the COVID-19 dissemination speed, despite the fact that these social interventions may have a deleterious effect in both people’s physical and mental health, as observed in previous epidemics like the 2003 SARS outbreak [2,3]. The critical disruption produced by the COVID-19 in daily life has also led industry and other economic sectors to find several new ways to keep functioning. A vast number of workers have had to adapt to these new circumstances, facing new challenges that might add up extra pressure, which hinders their performance and facilitates harmful health outcomes.

Although it is completely understandable that most of the attention nowadays lies on health-care workers, there is another working sector that has not been as noticed and also has been highly impacted during the COVID-19 pandemic, they are the occupational voice users.

The occupational voice users –defined as those who depend on a consistent, special or attractive quality of voice to carry out their activities, and represent between 25% and 35% of the entire working population only in the United States [4]– need to be addressed as well, especially considering how wide and significant its range of action is within the society. Thus, this segment includes (but is not limited to) teachers, priests, salespeople, telemarketers, telephone operators, actors, singers, radio/TV announcers, lawyers, and others. Prior to the COVID-19 outbreak, this population was well-known for primarily reporting hoarseness, loss of voice, weak voice, vocal fatigue, dyspnea, dry throat, and itchy throat feeling [5]. These disorders have been highly associated with psychogenic causes [6] among other factors.

Psychological stress has been linked to both direct and indirect consequences for voice functioning [7]. In teachers, for instance, stress was found as one of the most relevant factors related with the onset and development of voice disorders [8,9] even when compared to aspects such as voice load or classroom acoustics [10]. Moreover, a recent published meta-analysis showed that teachers who reported having suffered stress at work were more than twice as likely to report voice disorders [11].

Now, if we take into consideration the psychological stress derived from the labor itself, along with the social distancing measures and the uncertainty of measuring the danger the pandemic represents for ourselves and people who surround us, there is an imperative need to reflect on the mental and vocal health consequences that might affect occupational voice users as a result of the COVID-19 pandemic. This is the main purpose of the current manuscript.

Relationship between health and work in times of COVID-19

There is a two-way relationship between work and people's health. On the one hand, how well a person performs in its job will depend on its health status and well-being. On the other hand (a probably less intuitive consideration), an individual's physical, mental, and emotional state will be strongly influenced by the working conditions that surround him [12]. Hence, factors such as sociodemographic aspects, physical work environment, organizational conditions, leisure time, commuting time, etc., will play an important role defining the adequate balance between people's health and their work performance. In this sense, the vocal demand of occupational voice users has changed as a result of the home-office modality adopted due to the COVID-19 pandemic. The vocal demand refers to the vocal requirement for a given communication situation, and it is independent of the vocalist's physiology, production technique, or perception of the scenario [13]. For example, the vocal demand of online teaching implies having to speak for long periods, having a large amount of material to transmit orally, unfavorable acoustic conditions, restriction of communicative interaction with their students, and using technological tools: devices such as microphones or headsets. In this scenario, professors may find it difficult to have and keep healthy vocal behaviors and emotional control in stressful situations.

A recent research [14] found that the psychological stress was associated with higher levels of voice symptoms in college professors during the transition to online synchronous education due to the COVID-19 pandemic; especially in subjects who reported high levels of psychological stress during previous periods of teaching. These results provide evidence as to how work-related factors in online teaching environments could be modulating the vocal and mental health among occupational voice users. It is highly likely that working from home generates stressful experiences for these professionals because of the time pressure to perform and finish their activities, the internet failures/outages, the increase of administrative tasks, problems in technological management, and mixed home and work responsibilities. Furthermore, professors have particular vocal behaviors when it comes to virtual lessons such as straining to project the voice without adequate abdominal breath support, speaking with a higher voice (i.e., raising vocal loudness) [14], and using their voice for long periods without resting; which has an impact on stress levels, but it is also affected by it, contributing to develop voice disorders. Thus, voice symptoms themselves could turn into stressors that may craft an ongoing vicious cycle by increasing stress levels that, at the same time, diminish professors' quality of life and end up affecting their mental health [14]. This hypothesis has been previously confirmed [15,16] showing that teachers with voice complaints reported greater numbers of common mental disorder symptoms and vice versa.

Additionally, artistic voice users (e.g., actors, singers and musicians) have also been disturbed by the COVID-19 pandemic, since they are banned from practicing, rehearsing, performing, and expressing themselves in front of an audience. This situation affects them both professionally and economically, causing an increase in concerns and stress levels. Primov-Fever *et al.* mention that at this point singers and actors are using their voices to a lesser extent than they used to do pre-COVID-19 [17]. The professional vocalists are being prevented from interacting with their peers, singing teachers and voice therapists, which may cause additional stress. In a recent research, 53 professional artistic voice users (34 singers and 19 actors), and 53 nonprofessional voice users, participated in a study to examine the effect of COVID-19 pandemic on voice-related behaviors. Compared to the control group, artistic voice users were more concerned about their voice, used it more often, and experienced more

anxiety and stress [17].

Importantly, we did not find any research that has assessed the vocal functioning and stress impact in salespeople, call center operators or broadcasters. Nevertheless, it is quite probable that they are also experiencing the same situation in regard to mental health (produced by increased workload), which can also be reflected in their voice functioning.

Also, literature has reported the positive effects of exercise and physical activity on mental health and the ability to cope with stressful encounters [18,19]. However, as result of the pandemic, there is an intensified sedentary conduct linked to a more permanent sitting position [20,21], that can directly affect occupational voice users by reducing their physical activity, keeping stress levels up and enabling its consequences.

COVID-19 outcomes

Physical distancing, stay-at-home orders, and isolation, have produced drastic social, economic, and health consequences for workers of all ages [22–24]. Also, the opening of workplaces during COVID-19 is happening against a backdrop of heightened levels of psychological distress, and we have much to learn about how workers adapt and function under these circumstances [24]. Returning to an uncertain working environment presents an additional stressor that will further affect the mental health of employees [25]. For this reason, some people have preferred to work from home. Particularly, in most cases, the universities and schools around the world have chosen to keep implementing virtual teaching, despite the fact that in some countries the economic sector has already been reactivated. This crisis presents a unique opportunity for organizations to design programs focused on promoting mental and vocal health in workplaces for occupational voice users.

Only a few studies have provided an insight as to what to expect once the COVID-19 pandemic has finished in terms of mental and vocal health and working population. A Chinese study [26] reported three major outcomes in health and wellbeing one month into the disruption caused by confinement measures to contain the COVID-19 outbreak. In the first place, adults who stopped working during this period were in worse physical and mental health, showed signs of distress and felt less satisfaction with their lives. Also, physically active people proved to be more emotionally susceptible during the lockdown. Moreover, the severity of COVID-19 in an individual's home city predicted their contentment. Similarly, a research done in the United States pointed out that social distancing was linked with more acute stress, and intrusive thoughts. These associations occurred despite peoples' levels of perceived social support, suggesting that even collective resources known to protect mental health do not eliminate the impact of obligatory physical distancing [1].

In the same way, the mandatory and continuous use of a face mask during the workday can negatively affect vocal health in occupational voice users. The masks muffle the sound, making speech and some higher-pitched voices difficult to understand [27]. They serve as a low-pass filter, attenuating the high frequencies (2000-7000 Hz) spoken by the wearer, with the decibel [dB] level of sound mitigation ranging from 3 to 4dB for a simple medical mask and close to 12dB for the N95 mask [28]. In consequence, the prolonged use of the mask could represent a risk for developing voice disorders due to vocal misbehavior, such as speaking very loudly or with poor intelligibility, having to constantly repeat messages, and consuming fewer glasses of water as a result of having the mouth region under restraint. In Chile, Heider *et al.* [29] conducted a study on healthcare workers to determine the associated risks for voice disorders in high-risk hospital care units in the middle of the COVID-19 pandemic. They

found that nearly 33% of healthcare workers reported having trouble with their voice during the last month. The main vocal symptoms reported by participants were related to vocal fatigue, vocal effort and difficulty being heard. Interestingly, the vocal signs increased augmented with longer wearing of the mask [29] regarding demographic data, clinical activity, the pattern of usage of personal protective equipment, medical and vocal history, vocal symptoms, and Spanish validated Voice Handicap Index (VHI). In addition, vocal effort or discomfort might be connected to muscle fatigue due to difficulties in the respiratory level resulting from a reduction in the inspiratory flow [30].

Recommendations

In times like these, mental health and psychological distress focused interventions need to be addressed explicitly, targeting the role of social disruption in emotional and cognitive responses. Specifically, these approaches must rely on a comprehensive assessment of risk factors, including poor mental health before a crisis, life-threatening circumstances, separation from family, panic and bereavement, the disease course, severity of clinical symptoms, and place of treatment [31]. In order to manage and reduce stress levels, occupational voice users should be constantly checking their workload, and taking enough rest when needed. Also, practices focused on mindfulness, have shown great results reducing both stress and psychological distress in work settings, and increasing well-being in general and the perception of social support [32].

Taking into consideration the vulnerabilities and risk factors among occupational voice users, promoting good vocal health is crucial during homeworking in COVID-19 pandemic. Employees can access telehealth services to find support and guidance to train their voices, and also using mobile applications to monitor daily progress. Likewise, the adoption of new behaviors and strategies to reduce vocal tension can be focused on including physical activity, relaxation exercises and periods of vocal rest throughout the workday. Additionally, it is imperative to control and adequately distribute the time invested in work activities and personal life.

Finally, there is also a need for increasing the access to telehealth modalities that may allow clinicians to reach those most vulnerable to both mental and vocal health impact derived from the pandemic. Health-workers could be intensifying their own vocal demand as a result of extended phone or videoconference meetings. Similarly, face-to-face interactions need to be addressed carefully as these workers have to wear masks that jeopardize an effective communication (i.e., masks muffle the voice and hide facial expressions). Different types of masks and barriers (e.g., masks with clear panels, face shields made of clear plastic, and clear barriers like plexiglass) can help people communicate more easily and reduce the vocal symptoms in occupational voice users [27]. Likewise, the use of amplification can be a good strategy to avoid increasing vocal intensity during activities with high vocal demand and also keeping the recommended social distance.

Conclusions

Currently, workers are facing the challenges of homeworking, and there is a complexity of multi-level factors that will influence vocal and mental health. The COVID-19 crisis has created new workplace hazards that will be a significant source of stress and anxiety for many [24].

Nowadays, there is a challenge for occupational safety: reducing the negative impact on workers' health during the COVID-19 pandemic. It is necessary to take into consideration

the changes concerning the workplace of call center operators, salespersons and broadcasters; in order to ensure the health of workers.

Therefore, we suggest paying attention to workers' health, especially to those who were not infected by the virus, had to interrupt their activities during the outbreak, and were in cities with a higher transmission rate. Also, occupational voice users must receive training support [14], instructions that help them speak slower during communicative interaction [33], muscle relaxation and mindfulness techniques [34], and educational technology [33].

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