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COGNITIVE BEHAVIORAL APPROACH TO THE RELATIONSHIP BETWEEN TINNITUS AND DEPRESSION AFTER COVID 19

İbrahim KARAM
Near East University Vocational School of Health Services, Nicosia, Northern Cyprus
ORCID: https://orcid.org/0000-0003-3187-9524
ibrahim.karam@neu.edu.tr

Kardelen RUSO
European University of Lefke, Doctorate Program, Lefke, Northern Cyprus
ORCID: https://orcid.org/0000-0003-0499-6602
kardelenruso_07@hotmail.com

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Öz

Tinnitus is defined as auditory perception without external sound. There may be more than one cause of tinnitus. for this reason there is no single type of treatment. Cognitive behavioral therapy (CBT) is a tinnitus treatment that addresses the affected person's response to tinnitus. This study provides an overview of tinnitus, depression, which is among the psychological effects of tinnitus, and cognitive behavioral therapy for its treatment. It was also to emphasize that these approaches should be added to the rehabilitation methods in the Covid-19 pandemic. The treatment approach described in this study includes hands-on relaxation, daydreaming and distraction techniques, advice on environmental sounds, sleep management, cognitive restructuring of tinnitus-related thoughts and beliefs, and relapse prevention. The literature on CBT approaches to treat tinnitus was reviewed and concluded that CBT shows promise as a treatment for tinnitus-related distress. Due to its structure, tinnitus varies from person to person during the rehabilitation process. Progression of audiological and psychological rehabilitations together can help people more. Because tinnitus negatively affects the psychology of people, both in Covid-19 and in other cases, its treatment should not be put in the background.

Keywords: Cognitive behavioral therapy, tinnitus and depression**,** Covid-19.

1.INTRODUCTİON

Tinnitus has a very heterogeneous structure, so there is no clear treatment protocol. Tinnitus classifications have helped to group this structure (Baguley, McFerran, & Hall 2013). Before starting tinnitus treatment, a record of the patients anamnesis should be taken. There may be more than one cause of tinnitus. For this reason, the anamnesis of the people should be taken well and their rehabilitation should be started immediatly. Covid-19 emerged in the last months of 2019 and is considered a pandemic by WHO (World Health Organisation's). The fact that it is produced adequately in vaccinations and not distributed homogeneously in the world has not reduced the contamination related to Covid-19 to the desired extent (Beukes et al. 2021c). Especially in countries where the socio-economic structure is not well developed, vaccination rates have remained quite low and the cases have continued to increase. After the declaration of Covid-19 as a pandemic, social isolations and lockdown were made in many countries. It has been reported that perceptions of people with tinnitus who caught Covid-19 was increased during and after the Covid-19 process. Non-urgent health problems have been put in the back ground in many countries due to the focus of all the health personnel in the countries because of Covid-19 where the pandemic has begun it's the treatment for this disease (Serin & Gülcan, 2022; Beukes et al. 2020). Since tinnitus is a condition that affects people psychologically, rehabilitation should be started without delay with people whose tinnitus started after the Covid-19 pandemic. In a study conducted with 3400 people in 48 countries, a study investigating Covid-19 symptoms, social restrictions, medications and coping strategies with Tinnitus Handicap Inventory, 32% of the

participants stated that their tinnitus perceptions increased due to social isolation and sleep quality. While 40% of people experiencing Covid-19 symptoms stated that their tinnitus appeared after the Covid symptoms, 7 people reported that their tinnitus was unbearable (Schlee et al.2020)

2.Chronic Tinnitus And Human Psychology

Related psychological problems of tinnitus patients include sleep problems, concentration difficulties, anxiety, depression, suicide, stress and personality traits (Erlandsson, 2000). Tinnitus has been associated with numerous psychological, psychosomatic and psychiatric disorders, especially mood disorders (Mazurek, Boecking, & Brueggemann 2019; Salazar et al. 2019). Depression symptoms are common in people with tinnitus and increase the discomfort caused by tinnitus (Geocze et al., 2013). The mechanisms by which depression interacts with tinnitus are not fully understood, but a strong association with depression has been found in patients with tinnitus (Geocze et al., 2013). Depressive state increases hopelessness due to tinnitus, and it is seen as a factor that increases sensitivity in the development of chronic diseases such as tinnitus, as negative thoughts about tinnitus increase and lead to a decrease in quality of life (Şereflican et al., 2016). Depression causes loss of ability in more than one way, such as emotional depression, physical and mental fatigue in the individual (Anlayışlı & Serin, 2021; Işık, 2022). The changes that cause this disability last for at least two weeks and cause a negative impact on the person's work and family relationships (Belmaker & Agam, 2008). Depression is generally seen in all chronic diseases and causes worsening of the quality of life and complicates compliance with treatment (Teng, Humes, & Demetrio, 2005). The symptoms of depression are discussed as follow: sadness, melancholy, loss of interest, boredom, increased irritability, hopelessness, insomnia or increased sleep, loss or increase in appetite, aversion to pleasure, anhedonia, ideas of death, pessimism, thoughts of regret and guilt, suicidal actions or thoughts, lack of attention, memory deficit, difficulty making decisions, feeling of inadequacy, slow thinking, psychomotor slowing, negativity, ideas of ruin, auditory or visual delusions (Zhang et al., 2022). Cognitive behavioral therapy is used when depression is observed in patients with tinnitus complaint. In particular, cognitive-behavioral approaches have been repeatedly shown to significantly reduce distress, anxiety, and depression as a result of tinnitus, and improve quality of life and daily functioning in patients with tinnitus (Andersson, 2002; Martinez-Devesa et al., 2010; Hesser et al. ., 2011; Hoare et al., 2011). Evidence shows that cognitive misinterpretations, negative emotional reactivity, and dysfunctional attentional processes are of fundamental importance in the dysfunctional tinnitus habit that causes severe tinnitus distress (Erlandsson & Hallberg, 2000; Kröner-Herwig et al., 2003; Zachriat and Kröner-Herwig, 2004; Andersson & McKenna, 2006). People with tinnitus describe it as the perception of ringing or buzzing in one or both ears when there is no external sound stimulation. Tinnitus treatments usually include elements aimed at managing adverse reactions to sound, not eliminating or changing the tinnitus signal (Jastreboff & Jastreboff, 2000). If tinnitus persists for more than 1 month, it is called chronic tinnitus. Chronic tinnitus negatively affects people psychologically. If people's access to tinnitus rehabilitation is delayed, their chances of experiencing maladaptive adaptation in chronic tinnitus increase and this affects the well-being of the patients (Lo Re et al. 2021). The stress levels of people with tinnitus increases and their level of pleasure from their daily life decreases. This situation is directly proportional to the severity of tinnitus and when this happens, a vicious circle occurs in people. The population with tinnitus and the population at risk for Covid-19 intersect. When people in the risk group catch Covid-19, their stress and anxiety levels increase, and this creates the necessary conditions for the tinnitus symptom to manifest itself. If the tinnitus symptom is not treated, it may cause an increase in tinnitus severity. People should be informed and relieved about tinnitus (Lo Re et al. 2021). If this is done, people can actually cope with their tinnitus perceptions and develop strategies to cope with tinnitus severity as long as they are positive for Covid-19 or stay in lockdown. Rehabilitation methods that people can access online can overcome this situation.

3.Tinnitus Rehabilitation

Various treatments have been offered for tinnitus using medications such as sound therapy, tinnitus retraining therapy, anxiolytics, and antidepressants (Parrino et al. 2022). However, none of these treatment modalities has proven to be an effective and satisfactory treatment for patients. All of the treatments aimed at reducing the discomfort caused by tinnitus include psychological or educational components (Dobson, 2010). Tinnitus treatment is divided into two parts in order to reduce the distress and anxiety caused by tinnitus. The first of this treatment is the treatment of tinnitus perception on eliminating or reducing the perception of tinnitus, while the other is the treatment of the tinnitus response, which focuses on the impact of tinnitus on the person's life. These treatment methods include cognitive behavioral therapy, commitment and acceptance therapy, and mindfulness therapy (Anderson, 2002; Cima 2014; Milerova 2013; Westin et al., 2011). Cognitive behavioral therapy is the approach used in the intervention of tinnitus by addressing the response of the individual affected by tinnitus (Westin et al., 2011; Philippot et al., 2012). CBT is a time-limited, structured therapy method developed by Beck, which aims to transform negative thinking into a more realistic and positive thought by defining belief or automatic thought based on the ABC model (Beck et al., 1979). Beck, CBT was first used to treat depression, but later it was used for other disorders such as insomnia, chronic pain, anxiety, panic attacks, and tinnitus (Anderson et al., 2005; Kröner-Herwig et al., 2003). There are some factors that create the source of automatic thoughts. Individuals both themselves and their future it is stated that having negative thoughts about themselves can make them vulnerable to depression and the resulting psychological problems can lead to negative automatic thoughts and depressive schemas (Serin & Aysan, 2021; Bozkurt, 2000; Aysan &Bozkurt; Sözlü & Serin, 2019).

The purpose of CBT includes changing the individual's attitude towards the disease that affects them in order to reduce the severity of the symptoms by replacing the maladaptive behaviors revealed by negative and unrealistic cognitions (thoughts and beliefs) about certain events or experiences, such as tinnitus, with realistic thoughts (Hofmann et al., 2012; Jun & Park, 2013). Core beliefs are developing during early child-hood experiences, and determine individual'sthoughts, feelings and behaviors. In other words, process starts with thought, and then express itself with emotions and be-haviors. It explains other aim of that study, todetermine the effect of emotional intelligenceon automatic thought (Şimsek, Angelika, & Serin, 2017). Since the main purpose of CBT is not to eliminate auditory perception as sound, but to reduce the distress caused by tinnitus and tinnitus-related behaviors, the patient should consider their fear of tinnitus as a hypothesis to be tested, then define how thoughts related to tinnitus are related and this thought and changing behaviors (Andersson et al., 2002; Rief et al., 2005). In order to achieve this goal, psycho-education about tinnitus, positive imagery, overcoming maladaptive cognitions and fears about tinnitus, as it aims to discuss the positive and negative evidence of the patient's beliefs, change the patient's thoughts, reduce or correct the person's negative reaction to tinnitus. cognitive restructuring of negative beliefs (eg, anxious and depressed mood) (Henry et al., 2005, 2007; Jastreboff, 2007; Tyler et al., 2008; Henry et al., 2009; Cima, Crombez et al., 2011), exposure to sounds both cognitive and behavioral therapy approaches are used, thanks to relaxation techniques used to stay awake, behavioral activation, awareness/attention exercises, and relaxation techniques used to reduce arousal in tinnitus (Andersson, 2002; Dobson, 2010; Greimel & Kröner-Herwig, 2011; Noble, 2008).Techniques used include gradual exposure to feared situations (for example, silence when tinnitus is very prominent or certain sounds are encountered) using a behavioral intervention such as exposure therapy to reduce the impact of tinnitus on daily life, while helping to develop tinnitus habituation (Jun & Park, 2013) is also thought to work through the process of extinction learning and generalization, with tinnitus exposure (Parrino et al. 2022)That is, the person learns that the tinnitus sound is no longer indicative of an emotionally aroused or distressed state, and applies this new knowledge in daily life from what they have learned in the therapeutic setting. In daily life, this means resuming activities that a person previously avoided in fear of worsening tinnitus (Fuller et al., 2020). Based on the specific effects of cognitive and behavioral therapy components, education in the physiology and pathophysiology of hearing and tinnitus is thought to provide a basis from which

patients can begin to understand that tinnitus is not, in itself, a harmful symptom and therefore at least logically nothing to fear. Therefore, it is hypothesized that cognitive behavioral approaches to the treatment of tinnitus influence a reduction in the impact of tinnitus on quality of life through the summarized or synergistic effects of specific intervention components included in an individual therapy. It is also assumed that it has an outcome effect, such as reducing generalized anxiety or depression where it is comorbid, and improving overall self-reported quality of life (Fuller et al., 2020). In short, the aim of CBT is not to reduce the acoustic characteristics of the situation such as noise or curtains, but to help the individual who encounter certain difficulties in daily situations by constructing more positive and realistic thoughts about their situation. CBT does not represent a single form of treatment for tinnitus and clinicians differ in which components they prefer. For example, some clinicians recommend relaxation techniques (Lindberg, Scott, Melin, & Lyttkens, 1988), while others rely on cognitive therapy techniques (Wilson, Henry, & Nicholas, 1993). In general, CBT practice for tinnitus follows standard methods developed for anxiety and other problems such as pain (Philips & Rachman, 1996). Therefore, homework is planned between therapy sessions and a rationale is provided for each treatment component. Additionally, the therapeutic relationship between a therapist and their patient is collaborative in the sense that the outline of each session and the treatment as a whole is negotiated. Motivation is very important to change habits and change behavior, and it is made clear to the patient that work is necessary for the treatment to be effective.

The methods used by CBT in the treatment of tinnitus are as follows (Andersson, 2002);

• In the applied relaxation method, the patient is taught to relax gradually and to control himself through physical and mental sensations (eg stress). The aim here is not to reduce tinnitus, but to gain a balanced state of mind by controlling the effects of tinnitus.

• Visualization techniques are introduced in conjunction with relaxation training (for example, imagining a beach).

• Cognitive restructuring of thoughts and beliefs associated with tinnitus. The patient is taught to control erroneous thoughts by helping him identify the content of his thoughts.

• Distraction techniques can be included as well as imagery techniques. In the context of changing beliefs and thoughts, it is important to try to accept tinnitus and nurture the idea that tinnitus is not worth all the attention it receives.

• In the later stages of treatment, it can be valuable to work on reinterpreting the tinnitus into something more enjoyable.

• Emotional responses focus on fear and avoidance, especially in relation to tinnitus. Fear and avoidance not only lead to a negative view of the tinnitus, but strong emotional reactions can occasionally turn into panic-like attacks when the patient tries to escape from the tinnitus. Along with advice on enhancing the sound, it can be important to deal with negative reactions to silence (when that's a problem). On the other hand, some patients develop fear of everyday sounds (hyperacusis) and in these cases it is important to gradually be exposed to environmental sounds.

• Problems with concentration are often a major source of distress for the tinnitus sufferer and are targeted in treatment. Although not very well developed for tinnitus, methods to increase concentration can be used.

• Sleep hygiene, limitation of bedtime and worry time, relaxation and cognitive restructuring in patients with sleep problems (Morin, 1993). These methods are tailored to the specific needs of the tinnitus patient.

According to the results of some studies reviewed, it has been shown that CBT is effective in alleviating the discomfort caused by tinnitus and has some positive effects on other emotional symptoms (Andersson et al., 2002; Zachriat & Kröner-Herwig, 2004). Henry and Wilson (1996) did not observe

significant effects of cognitive behavioral therapy on measures of depression, focus of control or daily subjective loudness, detectability, or tinnitus distress. For this reason, it is always necessary to create a personal program and proceed personally when talking about Tinnitus treatments or Rehabilitation. While creating personalized rehabilitation programs is very difficult in clinical settings, even in patient examination, telehealth models should come first for rehabilitation in socially isolated patients with Covid-19positive, especially in people with long Covid symptoms. Drug treatment is not a very preferred method in the treatment of tinnitus. However, it is known that some drugs used can cause tinnitus, especially ototoxic drugs. Therefore, Covid-19 positive patients are not given medication for their tinnitus. Diet is also not a preferred method among tinnitus treatments. However, it has been reported that it works if there is pulsatile tinnitus due to hypertension. The earlier the rehabilitation of tinnitus symptom started, the easier it is to provide adaptive adaptation in people. Because there is no proven drug treatment for tinnitus, patients are generally not treated with medication. Telehealth comes first to rehabilitate people with Covid-19. The study conducted in Australia, only 11% (N=35/322) were tested positive to Covid-19and those who received audiological help online. When the clinicians' experience of performing online tinnitus rehabilitation was examined, the rate was only 37% (N=13/35). However, when helpers and audiologists were asked about the results of these experiences, they reported that it was remarkably good for everyone to start rehabilitation, and the most commonly used methods were Resound Tinnitus Relief, Calm, and Rain Sleep Sounds. When asked about their experience in using the apps, they were highly satisfied with the apps' effectiveness in masking tinnitus and facilitating sleep and the sound customization features, indicating that they made people feel safer and more comfortable during their Covid-19symptoms (Aazh, Swanepoel, & Moore 2021). However, they were not advanced enough to help people in these methods. Since tinnitus is very complex due to its structure, success may not be achieved with a single rehabilitation method. People who found online help inadequate generally reported that their tinnitus was not in a single frequency but in a wider frequency band. However, developing online help methods and providing these aids not only with audiological but also with psychological support helps people greatly. In this case, an online therapy model in which psychologists and tinnitus rehabilitators can reach patients in a cooperative manner will help people with tinnitus symptoms.

4. Conclusion

The aim of this study is to provide a broader and up-to-date overview of how CBT can be applied in the treatment of depression and tinnitus, which are among the psychological effects of tinnitus. In this context, in addition to taking tinnitus-specific CBT, people with comorbid depression should also receive depression-specific treatment. Overall, the main goal is to improve anxiety or overall quality of life, or to replace negatively biased interpretations of tinnitus (Fuller et al., 2020). Today, although the effect of the pandemic has passed slowly but it has not yet turned into a epidemic by the World Health Organization. Although tinnitus is not one of the most common symptoms among Covid-19, it has been seen that it affects people negatively. We think that the psychological approach is as important as the audiological approach and should be included in current tinnitus rehabilitations. As a telehealth model, approaches need to be arranged and adapted to start rehabilitation in people who are positive for Covid-19.

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