

# A Study on the Music Genre for Relieving COVID-19 Depression

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**Abstract** - As the COVID-19 situation prolongs, especially young people who should be far more active than adults, it is very difficult to endure being controlled and repressed. According to reports from relevant ministries, the number of depressed patients and patients with psychotic symptoms suffering from anxiety and anxiety has increased significantly compared to previous years. There are reports that the number of patients who eventually lead to suicide has increased significantly. In this paper, for those suffering from psychotic diseases such as depression, anxiety, and anxiety due to COVID-19, we studied how much can be solved through the natural method of listening to music. In addition, we studied which music genre among music has a greater help in relieving depression caused by COVID-19. The music genre selected for the study was used to compare the calm classical music and exciting dance music, which are opposite music genres, to compare the results. As a research method, the EEG test and MOS test were conducted by dividing into when not listening to music, listening to calm classical music, and listening to exciting dance music. As a result of the brainwave test, it was found that listening to exciting dance music results in a relatively high proportion of alpha and beta waves generated when excitement or concentration, bringing a positive mind, active motivation, and joyful mood. In the MOS test results, it was found that when I listened to music than when I was not listening to music, I felt better, and the exciting dance music relieved my depression and was able to change my mood for a while. Two results show that listening to music is recommended to relieve depression and anxiety and anxiety caused by COVID-19, and exciting dance music is more effective than calm classical music.

**Keywords** — COVID-19, mask, isolation, depression, music genre, classical music, dance music, brainwave

## I. INTRODUCTION

The coronavirus, which is known to have occurred in Wuhan, China, is called COVID-19 and is causing anxiety worldwide. It has already been over a year since it caused a disaster caused by the COVID-19 virus, and it is prolonged. As a result, the aviation, shipping companies, and tourism industry suffered the biggest blows. The common people's economic situation is becoming the worst as they control visits from domestic tourist destinations and shopping malls

to small stores such as cafes and restaurants. Entrance ceremonies, graduation ceremonies, weddings, and funerals were not properly performed, and religious activities, assembly, and freedom of association were also under control. As the industry contracted, the job market was paralyzed, and sales performance deteriorated, resulting in many retirees. Also, people's feelings of anxiety and anxiety are rising to an extreme as it is in a situation where the virus may sensitize me. The prolonged COVID-19 situation is struggling both physically and mentally for us all. Corona depression is a case in which COVID-19 causes mental stress and physical symptoms. The biggest cause of COVID-19 depression is a mental state of being frustrated and unable to endure the stress caused by incompetence and oppression. They cannot travel freely and mainly do indoor activities such as the house or room. In severe cases of depression, hospital treatment is required, and even drugs are taken. Still, those in the immediate stage are comforted through various folk remedies such as movies, reading, eating, and drinking. One of them is that many people enjoy listening to music and relieve depression. In this paper, we studied which music genres help relieve COVID-19 depression for those who relieve COVID-19 depression by listening to music. The study's music genre used classical music with a calm atmosphere and dance music with a fast and cheerful tempo as experimental elements. We tested which music genre is more helpful in relieving COVID-19 depression by using the brain waves of people who listened to each music genre and the MOS test in the form of a questionnaire.[1][2][3]

## II. COVID-19

Coronaviruses were first discovered in the mid-1960s and are known to be seven types of viruses that can infect humans and various animals. The crown-like spikes give the name coronavirus on the surface. The Coronaviruses are the type that causes colds and

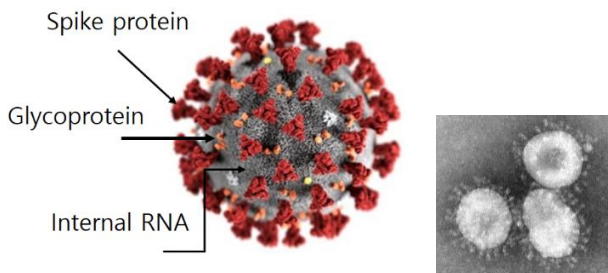
It is a type that can cause severe pneumonia. COVID-19, which originated in Wuhan, China, is also a type of coronavirus. The assumptions that it originated from animals and the inferences produced and leaked during the research process are mixed. COVID-19 virus is transmitted by means of protein spikes and glycoprotein spores on the surface that penetrate and decompose into the human body, and the viral RNA inside transmits the virus.[4][5][6]



**Table-1 Coronavirus Infectious Disease-19 (COVID-19) Information**

|                     |  |
|---------------------|--|
| Definition          | A respiratory syndrome caused by SARS-CoV-2 infection  |
| Propagation path    | Propagation through droplets (saliva), aerosols, and contact   |
| Incubation period   | 1-14 days (average 4-7 days)   |
| Symptom             | Fever, malaise, cough, dyspnea, and pneumonia appears that various respiratory infections in mild to severe More sputum, sore throat, headache, hemoptysis and nausea, diarrhea appears also |
| cure                | Isolation in negative pressure room, supplementation of fluid, administration of antipyretic and antiviral   |
| Risks               | The elderly, patients with underlying diseases, patients with reduced immunity, and severe lung-related patients are more likely to die.   |
| preventive          | Use your mask well, keep people away, wash your hands,<br>Do not touch objects or touch your face, eyes, nose, mouth, etc.<br>Disinfect and ventilate the surrounding environment frequently |
| Vaccine development | Pfizer (90% prevention effect) & Moderna (94.5%)in the U.S. , AstraZeneca (62%) in the UK  |

Symptoms are a situation in which respiratory symptoms accompanied by fever, cough, and dyspnea are worsened to pneumonia. It is reported that human-to-human transmission rises in the form of water vapor when breathing with secretions and droplets generated during the conversation and propagates in the form of aerosols through the gas. Since the incubation period of the pathogen develops within 2 to 14 days after exposure to the virus, the spread of the disease is prevented by quarantining suspected patients or their contacts for 14 days because there are many transmissions, asymptomatic patients, before the diagnosis is confirmed. The governments of some countries, such as Taiwan, Vietnam, and Mongolia, which have completely blocked entry from China, the origin of the country, are receiving favorable responses from the people as they do not suffer from serious situations due to quick response from COVID-19.[7][8]



**Fig. 1 COVID-19 virus**

However, countries that did not properly recognize the severity or did not block entry from China without knowing why have suffered several pandemics and have not escaped from the risk of Corona even more than a year later. In Korea, as COVID-19 patients, a novel coronavirus infectious disease from Wuhan, China, has gone through several pandemics. The public's concern is growing even more as they have reached a more serious stage in recent years.

**III. Corona Depression**

Depression is a type of mental illness, a brain disease that can lead to serious consequences of suicide in severe cases. In psychiatry, depression refers not to a state in which the only mood is temporarily lowered but refers to a state in which overall mental and physical functions such as thought content, thought process, motivation, interest, behavior, sleep, physical activity, etc. . When these symptoms appear almost every day, almost all day long, they are called depression and require specialized treatment, not just a change of mood. Fortunately, depression can be cured

with counseling and psychiatric treatment, and even severe cases can be improved with antidepressants. In particular, recently developed antidepressants can improve depression symptoms by increasing serotonin in the brain and safely improving depression with almost no side effects. Depression was mainly caused by stress, such as the death of a loved one, separation, loneliness, job loss, and financial anxiety. However, these days, patients with special causes of depression are continuing to become a social problem. It is a patient with corona depression. As COVID-19 is prolonged, even those who have complied with some behavioral

quarantine restrictions show symptoms of depression while feeling frustrated and stressed. In particular, constant control is adding tremendous stress for active young people, and even a new word for corona depression is occurring. A person who experiences depression due to COVID-19 refers to Corona Blue or Corona Red if it gets worse, and Corona Black, a corona panic state. All paragraphs must be indented.[9][10]

**Table-2 New words for each COVID-19 symptom**

| stage   | New words    | Causes and symptoms   |
|---------|--------------|---|
| Stage 1 | Corona blue  | Anxiety about sudden disaster situations and feeling frustrated while staying indoors                     |
| Stage 2 | Corona red   | A phenomenon in which a feeling of depression from prolonged infectious diseases explodes into anger      |
| Stage 3 | Corona black | The peak state of loss of motivation, loss of appetite, helplessness, negative viewpoint, pessimism, etc. |

**A. Stage 1 Corona Blue**

COVID-19 and blue, which represents depression, are a new term that means that you are experiencing depression or lethargy caused by the spread of COVID-19. Symptoms include anxiety about sudden disasters caused by COVID-19, the frustration that occurs while staying indoors while refraining from outside activities, anxiety that you may be infected with Corona 19, and fear that you may have Corona even with small symptoms.

**B. Stage 2-Corona Red**

It can be seen as a term that emerged from the prolonged various controls and restrictions caused by COVID-19 beyond the first stage of Corona Blue. It refers to the exploding into anger, such as depression or anxiety, resulting from a prolonged infectious disease situation. During the Corona Red stage, symptoms of being irritable or angry with even small things become more frequent.

**C. Stage 2-Corona Red**

It is a situation beyond the Corona Red situation and refers to a situation where everything is considered dark due to COVID-19. The number of depression treatments and deliberate self-harm in their 20s increased by more than 50% compared to before COVID-19. Compared to Corona Red's symptoms, they reach their peak of loss of desire and appetite, helplessness, negative views, and pessimism.

The COVID-19 situation is even more serious for teenagers so that the word Corona blue or red or black is prevalent. In the United States and the United Kingdom, it is

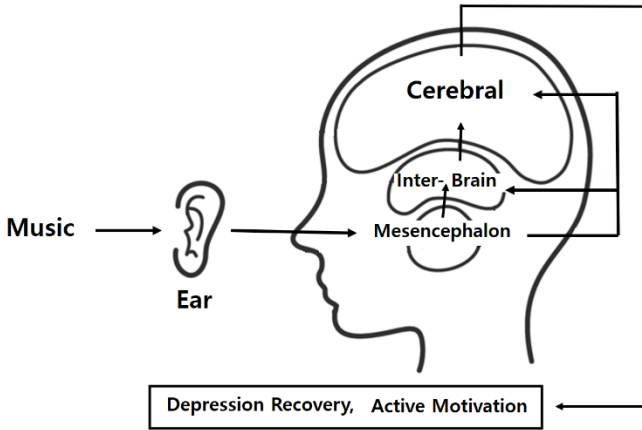
said that the new term 'Covidivos', which means corona divorce, has even appeared. This is due to the increased social distancing and telecommuting due to the spread of

Corona 19, increasing the amount of time that family members stay together. It reflects how the divorce rate is increasing rapidly as more and more things hurt feelings, even with small things. It is very important in the medical community to maintain a rhythm of daily life, such as regular sleep and wake up time, to prevent and overcome such corona blue. Of course, it will also help to make an active effort to lower the risk of infection, such as washing your hands, not touching your nose and mouth, distancing yourself from person to person, and avoiding going where possible where many people gather.

**IV. Research on music genres that help relieve COVID-19 depression**

I dare say that music is the best artistic masterpiece created by humanity using sound. Man makes music, but music dominates the Human's mind. Soft classical music relaxes our minds, and fast, strong dance music excites us. Seeing that even a three-year-old child dances to dance music, it seems that humans instinctively can make and feel the music. From that point of view, this study decided to determine what genre of music has a positive effect on COVID-19 depression. As a research method, EEG and MOS tests were conducted in parallel to analyze the human body's response and psychological changes. For the experiment, Bach's "Aria on the G Line" was prepared as classical music, and Psy's "Gangnam Style" as dance music,

and brain waves and MOS tests were performed.



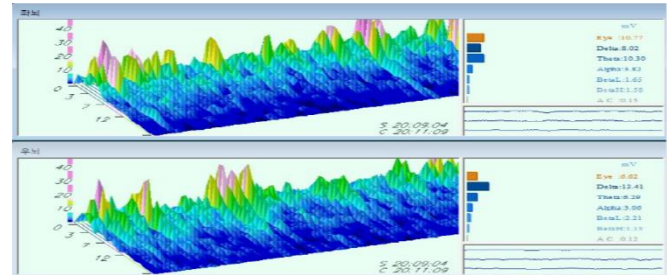
**Fig. 2 Human body reaction process of music**

Figure 2 shows that music is transmitted to the middle brain's auditory control center through the ear, is regulated and analyzed in the midbrain through the auditory nerve, operates the autonomic nerve center through the midbrain, and affects the body's activities through the cerebrum. The music delivered to the brain and analyzed recalls the memory of the experience through the cerebral memory and the thought center, and the musical genre delivered through the auditory nerve is analyzed through the autonomic nerve center of the inter-brain and raises the neurotransmitter in the brain called serotonin to raise the mood. It can convert and improve depression.[11][12][13]

***A. A Study on the Relationship between EEG Changes and COVID-19 Depression Symptoms According to Music Genre***

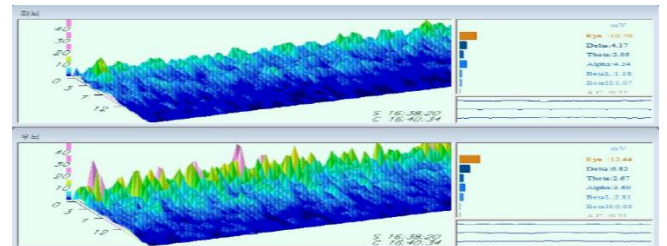
EEG is measured sensitively enough to change even when the eyes are closed. Even when listening to music, the brain waves change, and the music will change the brain waves in various ways depending on the genre. In this paper, by listening to music by genre and analyzing brain waves changes, we studied which genre of music affects COVID-19 depression symptoms and how. The music genre to be used for EEG measurement was selected as quiet classical music and exciting dance music with strong beats. The reason is that the music genre is so diverse that it is impossible to measure all of the music of various genres, so the music of the genre with a large difference in musical characteristics was chosen. These two EEG models are used as criteria for inferring how the EEG results measured by listening to calming classical music and the EEG results measured by listening to fast-tempo dance music affect COVID-19 depression relief. . The EEG test was used to measure and compare EEG of COVID-19 depression symptoms who do not listen to any music, COVID-19 depression symptoms

who listen to classical music, and COVID-19 depression symptoms who listen to dance music. After listening to music by genre, the EEG that responds according to the music genre was studied by analyzing the distribution of specific frequency bands of EEG according to their reaction characteristics.



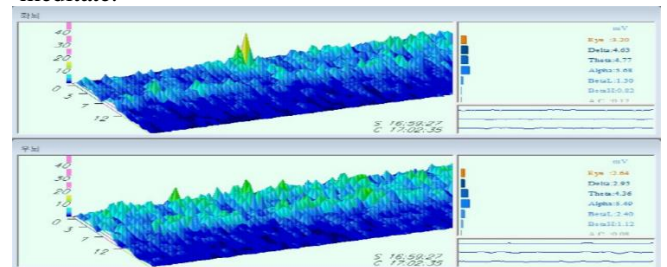
**Fig. 3 EEG of a person with COVID-19 depression who is not listening to any music**

Figure 3 is an EEG graph of a person with COVID-19 depression who does not listen to any music and shows the EEG status of a typical person with a typical depression who feels an anxiety, anxiety, and frustration.



**Fig. 4 EEG measured while listening to classical music by a patient with COVID-19 depression**

Figure 4 shows the EEG measured while listening to classical music by a patient with COVID-19 depression. It can be seen that the delta and theta waves, which cause comfort, are relatively higher than those of a person with COVID-19 depression measured without listening to any music. It can be seen that the delta and theta waves, which bring comfort, are relatively higher than the brain waves of COVID-19 depressed people measured without listening to any music. It can be inferred that this is the same phenomenon: you become drowsy when listening to classical music and become inactive when you meditate.



**Fig. 5 EEG measured while listening to Dance music by a**

### patient with COVID-19 depression

Figure 5 shows the brain waves of a COVID-19 depressed person listening to dance music. The delta and theta waves, which are relatively prominent in meditation or sleep, are reduced when listening to classical music, and the

beta that appears when feeling good and active. The ratio of wave or alpha wave is high. Beta waves or alpha waves are brain waves that appear when you are resting, concentrated, or active in a pleasant mood. It can be inferred that you forget your depressed mood and are satisfied with other tasks.[14][15]

**Table- 3 Change of EEG when listening to music by genre**

| Music genre   | division | DELTA | THETA | ALPHA | BETA-L | BETA-H |
|---------------|----------|-------|-------|-------|--------|--------|
| No Music      | L        | 8.2   | 10.30 | 3.82  | 1.65   | 1.58   |
|               | R        | 13.41 | 6.29  | 3.00  | 2.21   | 1.15   |
| Classic Music | L        | 4.17  | 2.05  | 4.24  | 1.18   | 1.09   |
|               | R        | 6.82  | 2.67  | 3.60  | 2.81   | 0.99   |
| Dance Music   | L        | 4.63  | 4.77  | 5.08  | 1.30   | 0.82   |
|               | R        | 2.95  | 4.36  | 5.49  | 2.40   | 1.12   |

Unit: Hz

Therefore, according to EEG results, classical music makes you forget about the depressive symptoms rather than when you are not listening to any music. Still, it is similar to the brain waves when you are not listening to any music, so it has only a slight effect on relieving COVID-19 depression symptoms. . However, fast-tempo dance music is more likely to be a music genre that can relieve symptoms of COVID-19 depression as it is similar to brain waves when you are more focused or satisfied with something else.

#### B. MOS(Means Opinion Score) test

After listening to music, I investigated how much COVID-19 depression was recovered through a MOS test. For the MOS test, 5 listeners were randomly recruited

regardless of gender and age. Although they are not COVID-19 confirmed or those who have been quarantined because of them, they are recruited as those who feel frustrated, anxious, and feel a little angry or depressed by COVID-19. To obtain a reasonable result, the MOS test was conducted at around 3 o'clock, which was a very active time unless it was a COVID-19 situation. Still, now it is time to become more depressed due to the inability to work. Of course, depending on the person, you may feel more depressed at night or more depressed at dawn or in the morning, but most other people are busy. Still, the thought of being alone and alone leads to more loneliness, which makes the depression more serious during the day.[16][17][18][19]

**Table- 4 MOS test of Mood change after listening to music by genre**

| Listening to music | A Listener | B Listener | C Listener | D Listener | E Listener | AVE |
|--------------------|------------|------------|------------|------------|------------|-----|
| Classic music      | 3          | 1          | 3          | 2          | 2          | 2.2 |
| Dance music        | 5          | 3          | 4          | 4          | 5          | 4.2 |

Highest score: 5 points

Looking at the MOS test results on the degree of COVID-19 depression recovery after listening to music by genre in Table 4, the degree of depression recovery of listeners when listening to classical music was 2.2, which was significantly lower than 4.2 points when listening to dance music. These results show that in a study on the relationship between EEG changes according to the music genre and the recovery of COVID-19 depression, listening to

dance music increased when the EEG activity was stabilized and showed activity and enjoyment compared to classical music. Just as the low-beta wave rose, it was found that fast-tempo dance music was helping to recover from the COVID-19 depression rather than slow, calm classical music. The beat sound mixed with exciting beats and high-frequency sounds increases the cellotinin hormone that calls for well-being, motivation, and happiness, reducing depression symptoms. In addition, when you are concentrating on dance

music, your mood is assimilated to a fast rhythm, and your mood rises happily. Your body is beaten, so your mood rises, and you become happy, so you can instantly forget the depression.

## V. CONCLUSIONS

In this paper, focusing on the fact that music greatly influences humans, we studied music genres' effects on the human body in the COVID-19 depression. In addition, we studied which music genre among music has a greater help in relieving depression caused by COVID-19. The music genre selected for the study was used to compare the calm classical music and exciting dance music, which are opposite music genres, to compare the results. EEG and MOS tests were performed as an experimental method. As a result, when listening to dance music in both EEG analysis and Morse test, results that helped relieve COVID-19 depression were derived. As a result of the EEG test, it was found that the human body changed mood when listening to music regardless of the genre than when don't listen to music at all. Specifically, it can be seen that when listening to calm classical music, the theta waves or delta waves from sleep or meditation increase in a relaxed state and become passive and weak. On the other hand, when listening to exciting dance music, the ratio of alpha and beta waves generated when excitement or concentration is relatively high. It can be seen that a positive mind, active motivation, and joyful mood are evoked. In other words, it was found that when listening to dance music, neurotransmitters that induce happiness are generated in the central nervous system, thereby reducing the symptoms of depression caused by serotonin reduction. In the morse test results, it was found that when I listened to music than when I was not listening to music, I felt better, and the exciting dance music relieved my depression and was able to change my mood for a while. According to the two results, it was concluded that listening to music is recommended to relieve depression and anxiety, and anxiety caused by COVID-19, and that exciting dance music is more effective than calm classical music. Starting with this study, we will continue to research to find a brush that can relieve COVID-19 depression among various sounds and music.[20][21]

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