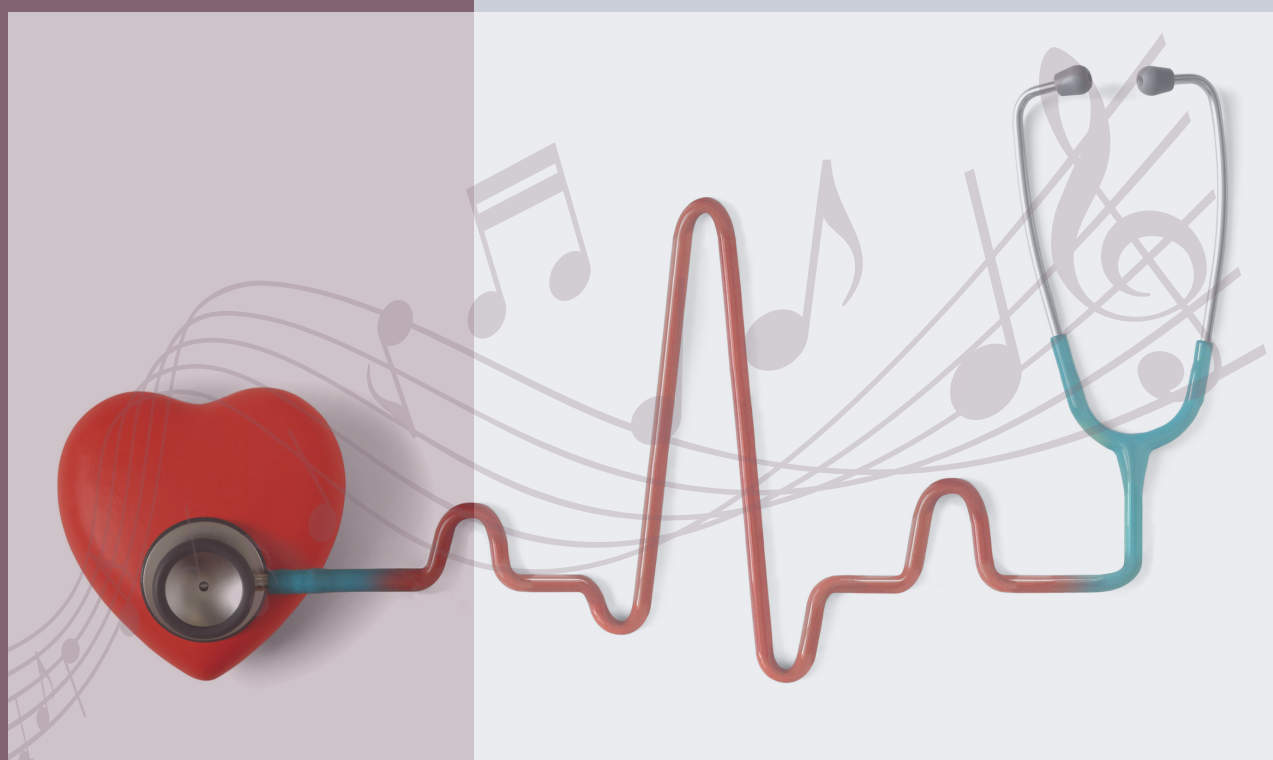


Music as Medicine:

The evidence so far

Whitepaper



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Introduction

All around the world much effort has been put into the research of the benefits of music on the health and wellbeing of patients.

Thousands of studies with hundred thousands of patients have produced thousands of publicized and peer reviewed articles on the subject. Not in the least of which are several meta-analysis papers written by esteemed researchers of the Dutch Erasmus University MC in Rotterdam who we work closely together with.

So, what knowledge based on all this research do we use in our Music4five system? We give you a brief summary below.

Pain and anesthesia

Several benefits of the use of perioperative music, which includes music played before, during and after surgery, to combat pain have been found.

The first is a significant effect on the amount of opioids required, both intraoperative as anesthesia as well as after the surgery as pain relief (1,2). Perioperative music reduces opioid consumption after surgery. A meta-analysis by Fu et al found an average reduction of 4,4mg of morphine equivalent in the 24 hours following surgery and a reduction of 9,82 mg in the 72 hours following surgery. (1)

Secondly, less propofol and midazolam is needed to be administered during surgery to reach the same sedation level (1).

Thirdly, music played before, after and during surgery reduces postoperative pain in the patient. (2,3,5) There is a reduced need for the use of analgesics, such as benzodiazepines, after surgery (3). Music played after surgery is most likely to reduce postoperative pain (3).

Lastly, listening to music during procedures under local anesthesia also has a pain reducing effect (3).

Anxiety and Stress

Anxiety and stress is a big issue that effects the wellbeing of patients undergoing hospital treatments. There is much evidence that listening to music can reduce the amount of anxiety and stress a patient experiences in the healthcare.

Firstly, Listening to music before, during and after surgery leads to a significant reduction in anxiety around surgery. (2,3,5) The reduction of anxiety is the largest when music is played before the surgery (3).

Further, music before surgery has been found to be more effective in reducing preoperative anxiety than midazolam (3).

Research has also shown that listening to music before, after and during surgery lowers the concentration of the stress hormone cortisol in the body (7).

Listening to music in a variety of settings, including hospital stay and surgery, reduces blood pressure, stress hormone (cortisol) levels and heart rate, which are physiological stress symptoms. (6)

Moreover, listening to music in a variety of settings, including hospital stay and surgery, also reduces psychological stress related symptoms such as state anxiety, nervousness, restlessness and feelings of worry.(6)

Lastly, anxiety before surgery has been linked to a greater level of pain after surgery. (2,3). Reducing anxiety before surgery helps the patient reduce pain after the surgery.

Sleep

Research shows that the sleep quality of patients in the ICU and CCU benefits significantly from music, with an increase of 27% sleep quality on average.(4) Some studies also show a significant increase of sleep duration and a better ratio of deep sleep to light sleep. (4)

There are even indications that music has a better effect on sleep than treatment with benzodiazepines. (4)

Delirium

Although there are few meta-analysis results available on the effect of music on the reduction of delirium there is evidence available that shows that music has a significant effect on the risk factors for delirium.

We can argue that by reducing the risk factors music can play an important part in the reduction of delirium.

Risk factors for delirium:

- Poor sleep (4)
- Anxiety before surgery (2)
- Use of benzodiazepines before, during and after surgery (2, 1)
- Use of opioids around surgery (1)

What type of evidence have we used

We have used two main types of evidence.

The first type is evidence found in random controlled trials. These contain the results of one study. The results of these studies have not necessarily been reproduced in other studies.

The second type of evidence that we use is the results of meta-analysis studies. These studies pool all the information of multiple random controlled trials together and use data analysis to come to conclusions on the effects of music as medicine.

This second type of evidence carries the most weight in the scientific community and is therefore the evidence that we mostly base any decisions for the Music4five system on.

Evidence on other benefits

Less postoperative complications

Postoperative pain is a risk factor for postoperative complications as well as is the use of medications to combat this pain.(1)

Reducing pain and reducing the medication needed can help combat postoperative complications.

Less chronic use of opioid and benzodiazepines

The higher the dosage of opioid that is prescribed, the higher the chance that a patient will become a chronic opioid user. A longer duration of use also increase the chance of chronic opioid use (1). If the amount of opioid prescribed can be reduced by the use of music (1) then it can be argued that the use of music as medicine can contribute to the reduction of chronic opioid use.

Similarly, the use of benzodiazepines to combat anxiety stress or to improve sleep also includes the risk of dependency on the drug (4). Using music to combat the anxiety and stress or to improve sleep instead of benzodiazepines helps to reduce the amount of chronic benzodiazepine users.

Shorter hospital stay

Although there is no consensus whether postoperative music directly shortens the length of hospital stay, reduced use of opioids can be linked to a shorter hospital stay after surgery. (1)

Postoperative pain is also a risk factor for a longer hospital stay(1) Therefore, it can be argued that reducing postoperative pain has an effect on the length of hospital stay. Both of these risk factors can be reduced by using music (1,2,3).

Further, preoperative anxiety is also a risk factor for a longer hospital stay (3) and which can be reduced by listening to music. (2,3, 6)

Lastly, the use of music may reduce postoperative complications which in turn can lead to a longer hospital stay (1)

Reduction of healthcare costs

Healthcare costs can be reduced in numerous ways. Several of these may be affected by the use of music as medicine.

One way is by keeping the hospital stay as short as possible.

Secondly the costs can be affected by reducing postoperative complications.

A third way in which music can help reduce hospital costs is by reducing the amount of opioids, anesthesia and benzodiazepines prescribed around surgery and procedures.

Patient satisfaction

Overall there is a high patient satisfaction with the use of music during surgery and hospital stay.

A great number, 88%, of 2390 patients found perioperative music to be an enjoyable experience. (1)

Furthermore, the vast majority of these patients would choose for music during surgery again in the future. (1)

No Side Effects!

One of the greatest powers of music as medicine is that unlike with traditional drug based therapies, there have been no reported side effects of the use of music.

Music Type

Analysis of the importance of the music type on the effectiveness of music as medicine on anxiety, stress and pain has shown that the personal choice of the patient is important(2,3).

When the patient has some control over the choice of music, the effect is greater. Two different meta-analysis' found that the effect is the largest when the patient can choose from several lists that had been preselected by the researcher, even larger than when the patient uses their own music (2, 3).

Conclusion

All the evidence so far points towards the great effectiveness of using music as medicine to combat the big five issues affecting patient wellbeing in hospitals and without any known side effects. The big five being pain, anxiety, stress, sleep issues and delirium.

Using music as medicine does not only increase patient wellbeing, which is the main goal, but it seems that in reducing the big five there are further benefits to be had such as reducing length hospital stay, postoperative complications and the (extra) use of medication which in turn leads to reduced hospital costs.

While a lot of the evidence presented here is geared towards the use of medicine around surgery, there is no reason to believe that music wouldn't be as effective in other healthcare settings.

Music4five is a complete solution for administering specialized music in a healthcare setting to increase patient wellbeing. Please go to www.music4five.com for more information.

Sources

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