



## THE IMPACT OF MUSIC ON OPERATING ROOM PERSONNEL

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## ABSTRACT

**BACKGROUND:** Music has also been linked to improved performance in stressful situations. It is important to understand the level of awareness and prevalence of its use in hospitals.

Our research is to assess the general understanding of music's influence in the workplace among anaesthesiologist, surgeons and OT staff.

**OBJECTIVES** To determine how surgeons, anesthesiologists, and nurses in our hospital perceive music's effects in the operating theatre.

**MATERIALS & METHODS** A cross-sectional prospective study was done using a questionnaire in our hospital's surgeons, anaesthesiologists, and nurses completed the questionnaire. The questionnaire consisted of 15 questions that were used to assess their perceptions of music's influence in the OT. The study was done over 1 month. A total of 94 people were included.

**RESULT** In our study, 75% of participants play music during surgery. Rap music is more preferred (48%) with medium volume. Senior surgeon were more likely to listen to music in our study, and in stressful procedures, music reduced the autonomic reaction of theatre personnel in 73%

**CONCLUSION:** The positive advantages of playing music in the OT exceed the negative consequences. Music has a favorable effect on the operating room crew, according to our research.

**KEYWORDS :** Music, Operating room personnel (OR)

## INTRODUCTION:

Inside operating rooms, music is frequently played. Music has been demonstrated to reduce the surgical team's tension. On the other side, it has been discovered that music might cause distraction in surgical procedures due to the harmful effects of split attention.

As a result, preventive strategies should be developed to assist health professionals in coping with current pressures. Many techniques, such as music therapy have been proposed. The American Music Therapy Association defines this non-pharmacological practice as "the clinical and evidence-based use of music interventions to attain specific goals within a therapy relationship by a trained professional."<sup>5</sup>

Our research is to assess the general understanding of music's influence in the workplace among anaesthesiologist, surgeons and OT staff.

## METHODOLOGY:

## Study type and setting

A questionnaire based cross sectional prospective study conducted in R. L. Jalappa Hospital and Research centre, Tamaka, Kolar during the period from July 2021 to August 2021.

- Study Design: Cross sectional prospective study
- Sample Size: 94
- Duration of study: From July 2021 to August 2021

## Analysis &amp; Statistical Methods

## Samplesize

- Taking prevalence as 62% from the study done by George S et al<sup>2</sup>, the sample size was calculated using the formula  $4pq/l^2$  with a precision of 10%

$$p=62\%$$

$$q=38\%$$

$$n(\text{required sample size})=94$$

## METHOD OF COLLECTION OF DATA:

- Informed consent was taken from the participants.
- Result values recorded using a Proforma.

The questionnaire was answered by surgeons, anesthesiologists and nurses of our hospital. The questionnaire consisted of 15 questions that were used to assess their perceptions of music's influence in the OT. The research took place over a month period. A total of 94 people were included in the study.

## STATISTICAL ANALYSIS

Descriptive and inferential statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean SD (Min-Max) and results on categorical measurements are presented in Number (%). Significance is assessed at 5 % level of significance. The following assumptions on data is made,

## Assumptions:

1. Dependent variables should be normally distributed,
  2. Samples drawn from the population should be random,
- Cases of the samples should be independent Chi-square/ Fisher Exact test has been used to find the significance of study parameters on categorical scale between two or more groups, Non-parametric setting for Qualitative data analysis. Fisher Exact test used when cell samples are very small.

## Significant figures

+ Suggestive significance (P value:  $0.05 < P < 0.10$ )

\* Moderately significant (P value:  $0.01 < P < 0.05$ )

\*\* Strongly significant (P value:  $P < 0.01$ )

## STATISTICAL SOFTWARE:

The Statistical software namely SPSS 22.0, and R environment ver.3.2.2 were used for the analysis of the data and Microsoft word and Excel have been used to generate graphs, tables etc.

## Ethical consideration and confidentiality

All participants were informed regarding the purpose of study and confidentiality of the research study. The study was undertaken after getting informed consent from the participants.

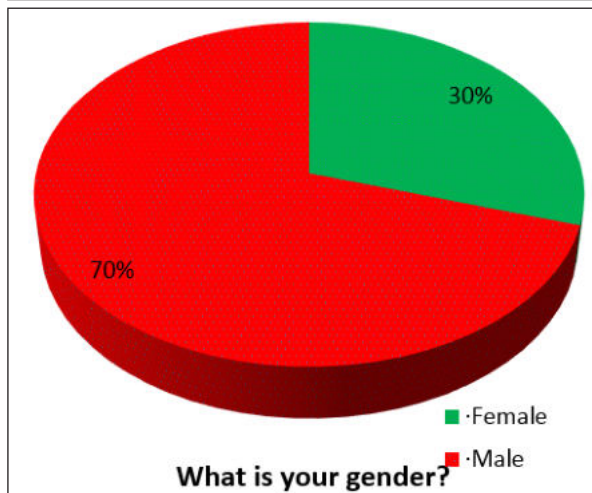
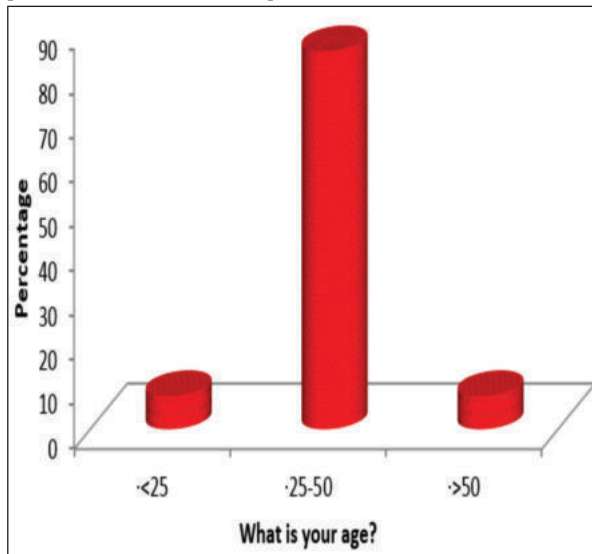
## RESULTS:

**Study Design:** An observational non-clinical study

**Table 1: baseline variables**

| Variables                                   | No of subjects | %            |
|---|----------------|--------------|
| <b>What is your age?</b>                    |                |              |
| • <25                                       | 7              | 7.4          |
| • 25-50                                     | 80             | 85.1         |
| • >50                                       | 7              | 7.4          |
| <b>What is your gender?</b>                 |                |              |
| • Female                                    | 28             | 29.8         |
| • Male                                      | 66             | 70.2         |
| <b>What is your profession?</b>             |                |              |
| • Junior resident –Surgery                  | 29             | 30.9         |
| • Junior resident-Anaesthesiology           | 14             | 14.9         |
| • Operating surgeon                         | 27             | 28.7         |
| • Anaesthesia consultant                    | 8              | 8.5          |
| • Nurse/ot technician                       | 16             | 17.0         |
| <b>Which subspecialty do you belong to?</b> |                |              |
| • NIL                                       | 15             | 16.0         |
| • Anaesthesia                               | 22             | 23.4         |
| • General surgery                           | 25             | 26.6         |
| • Orthopedics                               | 17             | 18.1         |
| • ENT                                       | 10             | 10.6         |
| • Neurosurgery                              | 4              | 4.3          |
| • Plastic Surgery                           | 1              | 1.1          |
| • Urology                                   | 0              | 0.0          |
| <b>Total</b>                                | <b>94</b>      | <b>100.0</b> |

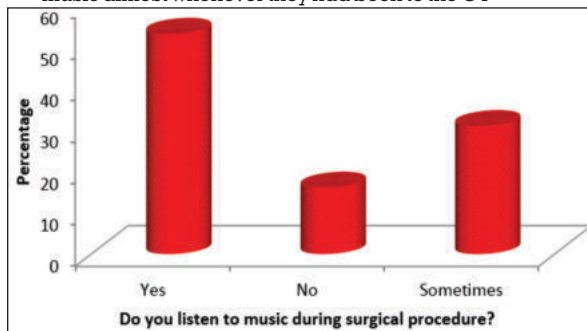
The mean age of our study population was 37.8 ± 7.7 years(85.1%). A male predominance was noted(70%). The study population was divided between 78 medical professionals (83%) and 16 paramedics (17%).



**Table 2: Do you listen to music during surgical procedure?**

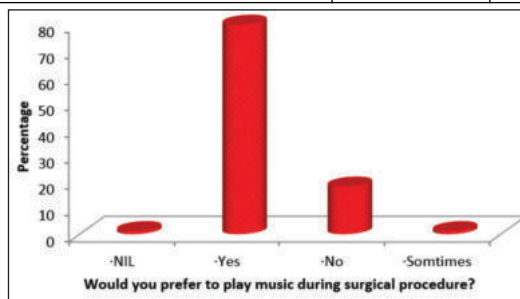
| Do you listen to music during surgical procedure? | No of subjects | %            |
|---|----------------|--------------|
| Yes   | 50             | 53.2         |
| No  | 15             | 16.0         |
| Sometimes   | 29             | 30.9         |
| <b>Total</b>                                      | <b>94</b>      | <b>100.0</b> |

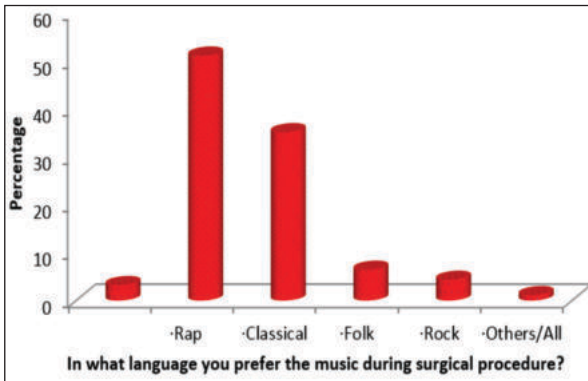
It was found in that 53% of the study group had heard music almost whenever they had been to the OT



**Table 3:Music during surgical procedure?**

| Variables  | No of subjects | %            |
|--|----------------|--------------|
| <b>Would you prefer to play music during surgical procedure?</b>         |                |              |
| • NIL  | 1              | 1.1          |
| • Yes  | 75             | 79.8         |
| • No   | 17             | 18.1         |
| • Sometimes  | 1              | 1.1          |
| <b>Which music do you prefer to listen to during surgical procedure?</b> |                |              |
| • NIL  | 80             | 85.1         |
| • Yes  | 5              | 5.3          |
| • No   | 12             | 12.8         |
| <b>In what language you prefer the music during surgical procedure?</b>  |                |              |
| • NIL  | 3              | 3.2          |
| • Rap  | 48             | 51.1         |
| • Classical  | 33             | 35.1         |
| • Folk   | 6              | 6.4          |
| • Rock   | 4              | 4.3          |
| • Others/All   | 1              | 1.1          |
| <b>Total</b>   | <b>94</b>      | <b>100.0</b> |





In our study 51% prefer rap music and 35% prefer classic music

Table 4: Music in the operating room?

| Variables   | No of subjects | %            |
|---|----------------|--------------|
| <b>At what volume do you prefer the music in the operating room?</b>            |                |              |
| • NIL   | 3              | 3.2          |
| • Low   | 21             | 22.3         |
| • Medium  | 66             | 70.2         |
| • High  | 4              | 4.3          |
| <b>Does the time of the surgery affect your willingness to listen to music?</b> |                |              |
| • Yes   | 53             | 56.4         |
| • No  | 41             | 43.6         |
| <b>Music during surgery makes me</b>  |                |              |
| • NIL   | 12             | 12.8         |
| • Calmer  | 46             | 48.9         |
| • More efficient  | 26             | 27.7         |
| • Disturbed   | 10             | 10.6         |
| • Does not Matter   | 0              | 0.0          |
| <b>Total</b>  | <b>94</b>      | <b>100.0</b> |

70% prefer medium volume and it makes more calmer in 48% of participants also increased duration of surgery causes increased willingness to listen to music in 56%

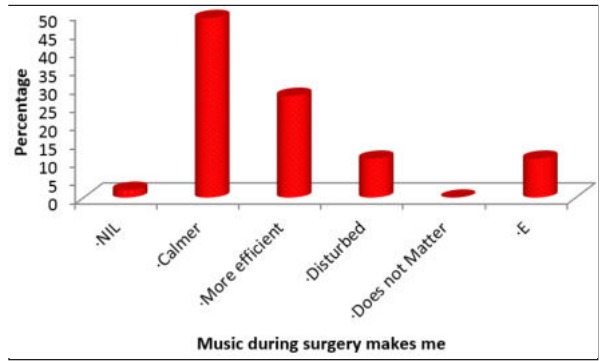
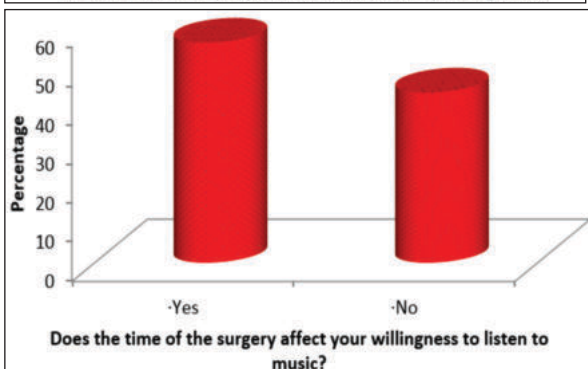
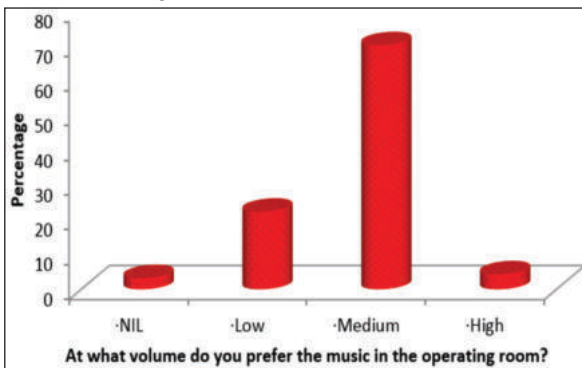
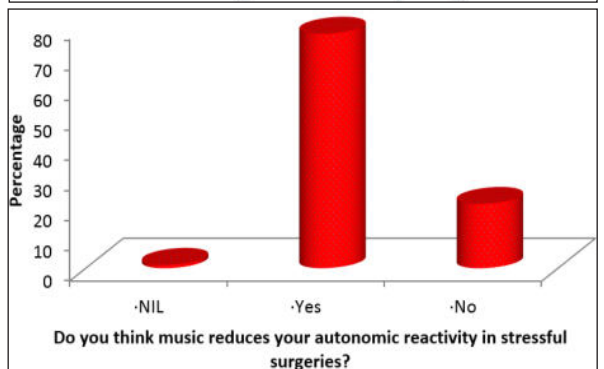
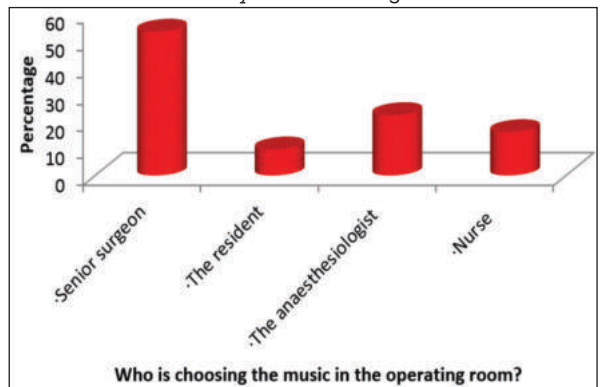
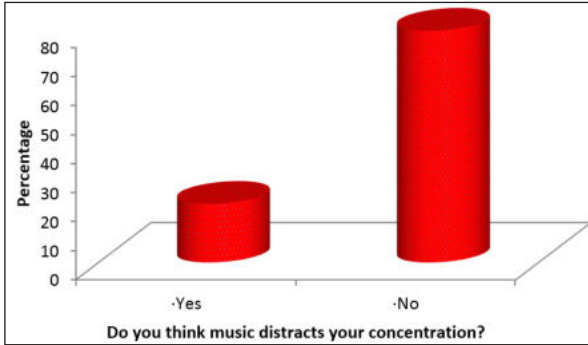
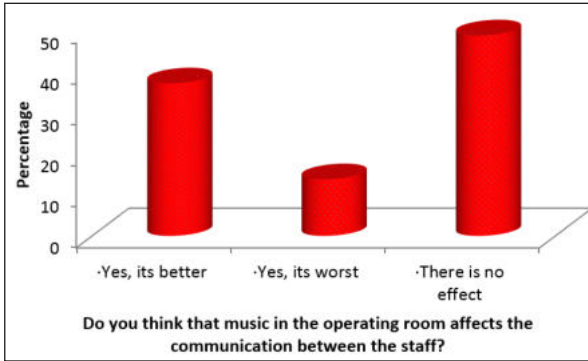


Table 5: Music in the operating room?

| Variables   | No of subjects | %            |
|---|----------------|--------------|
| <b>Who is choosing the music in the operating room?</b>   |                |              |
| • Senior surgeon  | 50             | 53.2         |
| • The resident  | 9              | 9.6          |
| • The anaesthesiologist   | 21             | 22.3         |
| • Nurse   | 15             | 16.0         |
| <b>Do you think music reduces your autonomic reactivity in stressful surgeries?</b>               |                |              |
| • NIL   | 1              | 1.1          |
| • Yes   | 73             | 77.7         |
| • No  | 20             | 21.3         |
| <b>Do you think music distracts your concentration?</b>   |                |              |
| • Yes   | 19             | 20.2         |
| • No  | 75             | 79.8         |
| <b>Do you think that music in the operating room affects the communication between the staff?</b> |                |              |
| • Yes, its better   | 35             | 37.2         |
| • Yes, its worst  | 13             | 13.8         |
| • There is no effect  | 46             | 48.9         |
| <b>Total</b>  | <b>94</b>      | <b>100.0</b> |

77% of the respondents think that music helped in reducing their autonomic reactivity in stressful surgeries





**Table 6 Association of clinical variables according to Music during surgical procedure**

| Variables                                   | Do you listen to music during surgical procedure? |                 |                 | Total           |
|---|---|-----------------|-----------------|-----------------|
|   | Yes   | No              | Sometimes       |                 |
| <b>what is your age?</b>                    |   |                 |                 |                 |
| • <25                                       | 4(8%)   | 2(13.3%)        | 1(3.4%)         | 7(7.4%)         |
| • 25-50                                     | 45(90%)   | 13(86.7%)       | 22(75.9%)       | 80(85.1%)       |
| • >50                                       | 1(2%)   | 0(0%)           | 6(20.7%)        | 7(7.4%)         |
| <b>What is your gender?</b>                 |   |                 |                 |                 |
| • Female                                    | 11(22%)   | 7(46.7%)        | 10(34.5%)       | 28(29.8%)       |
| • Male                                      | 39(78%)   | 8(53.3%)        | 19(65.5%)       | 66(70.2%)       |
| <b>What is your profession?</b>             |   |                 |                 |                 |
| • Juniorresident -Surgery                   | 16(32%)   | 6(40%)          | 7(24.1%)        | 29(30.9%)       |
| • Junior resident- Anaesthesiology          | 6(12%)  | 3(20%)          | 5(17.2%)        | 14(14.9%)       |
| • Operating surgeon                         | 15(30%)   | 3(20%)          | 9(31%)          | 27(28.7%)       |
| • Anaesthesia consultant                    | 2(4%)   | 2(13.3%)        | 4(13.8%)        | 8(8.5%)         |
| • Nurse/ot technician                       | 11(22%)   | 1(6.7%)         | 4(13.8%)        | 16(17%)         |
| <b>Which subspecialty do you belong to?</b> |   |                 |                 |                 |
| • NIL                                       | 10(20%)   | 1(6.7%)         | 4(13.8%)        | 15(16%)         |
| • Anaesthesia                               | 8(16%)  | 5(33.3%)        | 9(31%)          | 22(23.4%)       |
| • General surgery                           | 16(32%)   | 5(33.3%)        | 4(13.8%)        | 25(26.6%)       |
| • Orthopedics                               | 7(14%)  | 3(20%)          | 7(24.1%)        | 17(18.1%)       |
| • ENT                                       | 6(12%)  | 0(0%)           | 4(13.8%)        | 10(10.6%)       |
| • Neurosurgery                              | 3(6%)   | 1(6.7%)         | 0(0%)           | 4(4.3%)         |
| • Plastic Surgery                           | 0(0%)   | 0(0%)           | 1(3.4%)         | 1(1.1%)         |
| <b>Total</b>                                | <b>50(100%)</b>                                   | <b>15(100%)</b> | <b>29(100%)</b> | <b>94(100%)</b> |

**DISCUSSION**

Although music in the operating room may not always bring joy to the entire crew, it can be beneficial by reducing stress.

The surgeon's efficiency is sometimes improved by reducing stress.

Respondents in one survey felt that music has a positive effect on staff interrelationships and makes them calmer and more efficient. When compared to physicians, nurses claimed that music helped them feel and more productive.<sup>1</sup>

In another study, music was favored by the majority of respondents in the OT because it helped them relax. It increased the listeners' cognitive function and gave them a sense of well-being. Music reduced autonomic response in theatre workers during stressful procedure.<sup>2</sup>

Another study found that residents who listened to music of their choice boosted the effectiveness of wound repair in a simulated wound model. The operation time is cut in half. In the music-listening group, the repair quality improved marginally as well.<sup>3</sup>

Music can be used as a supplement to achieve physical and emotional goals. Slow music performed in the operating room can help to reduce anxiety and make surgeons, staff, and patients feel better.<sup>4</sup> When played at a low to medium volume, classical music can improve surgical task performance by enhancing efficiency and accuracy.<sup>13</sup>

Music appears to improve task speed and accuracy in surgeons. Music, on the other hand, has the potential to cause miscommunication amongst OR personnel or distract anesthesiologists from the different monitoring equipment alerts. Regardless of personal preferences, it is general knowledge that loud and raunchy music can hinder conversation, whereas low-volume, low-tone music can elicit mental vigilance.<sup>6</sup>

The effects of music on the production of salivary immunoglobulin A (s-IgA), a first line of defense against bacterial and viral infections and a reliable indication of the functional condition of the entire mucosal immune system, have been studied in a number of research.<sup>7-9</sup>

The effects of music on the hypothalamic-pituitary-adrenal axis appear to be predominant, according to various research. The neurohormonal pathway mediated by adrenocorticotropic hormone (ACTH) and cortisol, as well as a large drop in blood pressure and heart rate, are attributed to the effects.<sup>10-11</sup>

Although the majority of operating room staff believe that background music is beneficial, those who are less aware of the positive association between such music and stress hormones have a lower preference for it.<sup>12</sup>

The majority of research found that music has a good influence on the surgical team during operation. These findings suggest that by playing controlled music during surgery, the surgical team's performance may be improved.<sup>14-16</sup>

**CONCLUSION:**

The positive advantages of playing music in the OT exceed the negative consequences. Music has a favorable effect on the operating room crew, according to our research.

**REFERENCES**

- Ullmann Y, Fodor L, Schwarzberg I, Carmi N, Ullmann A, Ramon Y, The sounds of music in the OR. *Injury* 2008;39:592-7.
- George S, Ahmed S, Mammen KJ, John GM. Influence of music on operation theatre staff. *J Anaesthesiol Clin Pharmacol.* 2011;27:354-7.
- Lies, SR, Zhang, AY. Prospective Randomized Study of the effect of music on the Efficiency of Surgical Closures. *Anaesthetic Surgery Journal* 2015; 35:858-863.
- Ahmad M. Role of Music in Operating Room. *J Anesth CritCare* 2017;7:00279.
- I. Kacem, M. Kahloul, S. El Arem, S. Ayachi, M. Hafsia, M. Maoua, et al. Effects of music therapy on occupational stress and burn-out risk of operating room staff. *Libyan journal of medicine* 2020;15:1

6. Kalyvas A V, Linos D, Moris D. Concerns about evaluating the effect of noise and music in the operating room. *J Am Coll Surg.* 2014;219:1097-8.
7. Woof JM, Kerr MA. The function of immunoglobulin  $\alpha$  in immunity. *J Pathol.* 2006;208:270–82.
8. Hucklebridge F, Lambert S, Clow A, et al. Modulation of secretory immunoglobulin  $\alpha$  in saliva; response to manipulation of mood. *Biol Psychol.* 2000 ;53(1):25–35.
9. Knight WE, Rickard NS. Relaxing music prevents stress-induced increases in subjective anxiety, systolic blood pressure, and heart rate in healthy males and females. *J Music Ther.* 2001;38(4):254–72.
10. Scher J, Höhmann U, Anthenien L, et al. Music during gastroscopy. *Schweiz Med Wochenschr.* 1993;123 (26):1354–1358.
11. Claudius C, Hanno N, Karl-Walter J, et al. Overture for growth hormone: requiem for interleukin-6? *Crit Care Med.* 2007;35(12):2709–13
12. Ljah RFOA, Elenwo SN, Joy O, Friday E, Jaja REO , Vitalis O. Ofuru. The Role and impact of Operating Theatre Background Music on Users and Patients :Opinion of Theatre Staff. *European Journal of Clinical Medicine.* 2021;2
13. Michael El Boghdady, Beatrice Marianne Ewalds-Kvist. The influence of music on the surgical task performance: A systematic review. *Int J Surg* 2020; 73:101–112
14. JG Makama, EA Ameh, SA Eguma. Music in the operating theatre: opinions of staff and patients of a Nigerian teaching hospital. *Afr Health Sci.* 2010 Dec; 10(4): 386–389.
15. Sarmany J, Kalman R, Staud D, Salacz G. The role of music in the operating theatre. *Oryhetil.* 2006;147(20):931–936.
16. A. Yetasook, J. Terrell, C. D. de Virgilio. *Creating a Harmonious Operating Room: The Role of Music and Other Sounds.* 2021