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# Dentists' Assessment of the Influence of Music on Their Own Behavior in Dental Practice During Treatment

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## Abstract

**Introduction**: The dental environment often represents a stressful space for both patients and the team, with the office atmosphere, enhanced by musical decor, potentially reducing tension significantly. Music has a beneficial impact by improving the mood and efficiency of both patients and medical staff, facilitating concentration and accuracy in professional tasks, and enriching the workplace environment.

**Materials & Methods**: Between May 1, 2022, and January 31, 2024, a cross-sectional study was conducted in the country using an anonymous questionnaire among legally registered and practicing dental physicians within the 28 district colleges of the Bulgarian Dental Association (BgDA). The data concerning dental physicians are distributed across six regions of the country, divided according to EUROSTAT data.

**Results**: Dental doctors participants in the survey are 46.50% male, and 53.50% female. Age data indicates that 23.40% are under 30 years old, 27.00% are between 31 and 40 years old, 25.40% are between 41 and 50 years old, 16.80% are between 51 and 60 years old, and 7.40% are over 60 years old. A large portion of dental practitioners, 63.30%, indicated that they constantly work with musical background.

**Conclusions**: In conclusion, most dental practitioners prefer to work with music "always" during treatment. Classical music is confirmed as the most preferred genre among dental practitioners.

***Keywords: dental office, music, music therapy***

## Introduction

The dental environment often represents a stressful space for both patients and the team, with the office atmosphere, enhanced by musical decor, potentially reducing tension significantly. Music has a beneficial impact by improving the mood and efficiency of both patients and medical staff, facilitating concentration and accuracy in professional tasks, and enriching the workplace environment.
Integrating music into dental practices helps engage patients and boosts staff motivation, facilitating a smoother transition through various procedures in a calmer setting.
Choosing the right musical background is critical for optimizing the clinical atmosphere. Dentists must recognize not only the positive impact of music on work and patient comfort but also select an appropriate musical genre. There are hundreds of musical styles, yet certain genres, such as pop and show musicals, enjoy widespread popularity[1].
In dental clinics, both staff and patients are exposed to a variety of sounds [2]. The auditory environment can be perceived negatively as noise [3], or positively in the presence of pleasant music [4] Moreover, sound sources in the dental office, including external and internal noises from the equipment and operations, can be partially limited.
Noise in dental practice affects not only patients but also dentists and support staff, becoming the subject of numerous studies in the dental field [5]. As a result of prolonged exposure to noise in dental practice, medical professionals may experience problems such as hearing damage, tinnitus, and other auditory disorders [6] .
Introducing music into the dental office can effectively mask unwanted sounds, offering protection for the hearing of dental staff. Thus, music becomes a crucial element in creating a favorable and less stressful atmosphere for all participants in the dental process, enhancing the quality of the provided healthcare.
Maria Antoniadou and her team found that music has a positive effect on the mood and behavior of dental staff, who prefer its presence during work. This makes the process more enjoyable without affecting the efficiency of surgery, either positively or negatively [7]
Tyson Downs notes in Dentistry Journal that music provides a soothing effect by masking unwanted noises. It creates a favorable environment for employees, improving their concentration and mood at work with playlists from Spotify or satellite radio stations, enhancing focus and reducing stress.



Regarding the choice of music genre, the following styles are recommended for dental practices:

- Classical music
- Jazz
- Acoustic music
- Instrumental covers of popular songs
- Nature sounds and white noise [8].

**Pop music**, with its catchy melodies and optimistic rhythms, creates an exciting and stimulating environment, facilitating relaxation and generating a positive mood. Additionally, folk music, with its soothing nature, provides tranquility, especially when performed instrumentally, maintaining a quiet and peaceful atmosphere.

**Nature sounds** stand out among the most calming and therapeutic audio elements. Their soothing effect makes them an ideal choice for musical accompaniment in wellness and spa centers, hospitals, and dental practices. Comparable to being in nature, listening to sounds like rustling leaves, babbling brooks, beach waves, bird songs, or crackling fire aids in stress relief and reduces fight-or-flight responses. These natural

sounds not only decrease feelings of anxiety, irritation, and disappointment but also have health benefits, improving the functions of the nervous system and behavior.

**Classical music** is ranked among the most relaxing genres, supported by scientific research that highlights its numerous health benefits, particularly in dental practices [9].

## Materials and Methods

Between May 1, 2022, and January 31, 2024, a cross-sectional study was conducted in the country using an anonymous questionnaire among legally registered and practicing dental physicians within the 28 district colleges of the Bulgarian Dental Association (BgDA). The data concerning dental physicians are distributed across six regions of the country, divided according to EUROSTAT data. Data collection was mixed: 500 survey forms were distributed both physically by interviewers on-site and electronically. A link to an electronic form was provided. A total of 265 questionnaires were collected, yielding a response rate of 53.00%. The surveyed dental physicians were analyzed based on gender, age, geographic sign, whether they work with music, and the type of music. Statistical methods: Data were summarized using absolute (n) and relative (%) frequencies. The Chi-square method was used to analyze the examined dependencies. Statistical significance was assumed at $p<0.05$. Data from the study were processed using SPSS 20.

## Aim

The aim was to determine whether music acts as a distractor or a calming agent and how this affects the work process, either confirming or refuting previous hypotheses.

## Results

The results showed that of the surveyed dental practitioners, 46.50% are male, and 53.50% are female (Fig. 1) .

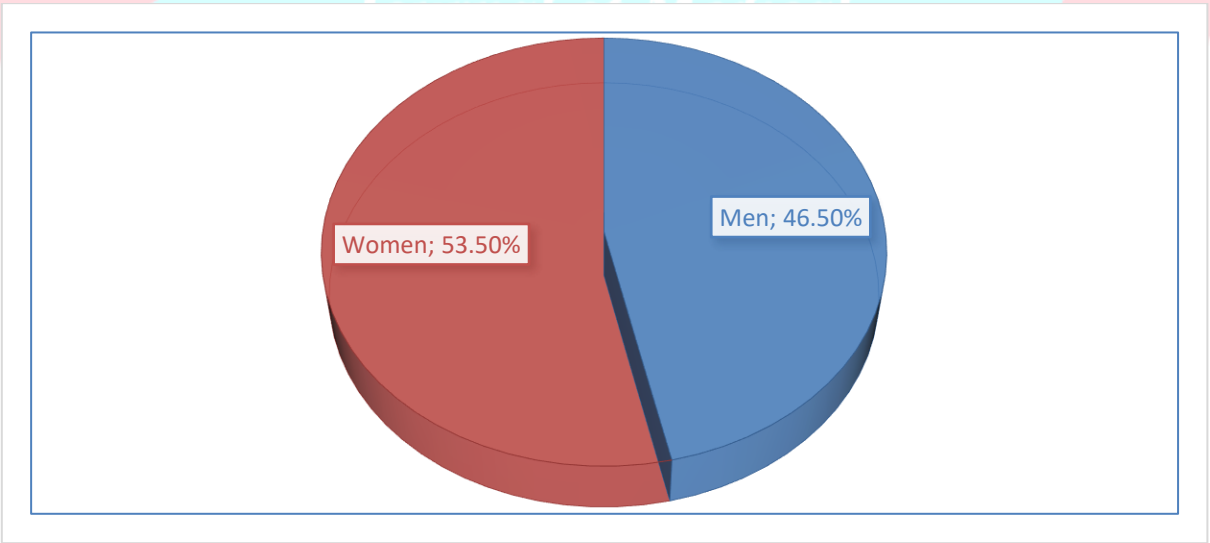


**Fig. 1 Distribution of the Doctors of Dental Medicine in gender**

Age data indicates that 23.40% are under 30 years old, 27.00% are between 31 and 40 years old, 25.40% are between 41 and 50 years old, 16.80% are between 51 and 60 years old, and 7.40% are over 60 years old. The most numerous age group is between 31 and 50 years old, representing practitioners with established practices who spend significant time in their offices ( Fig. 2).

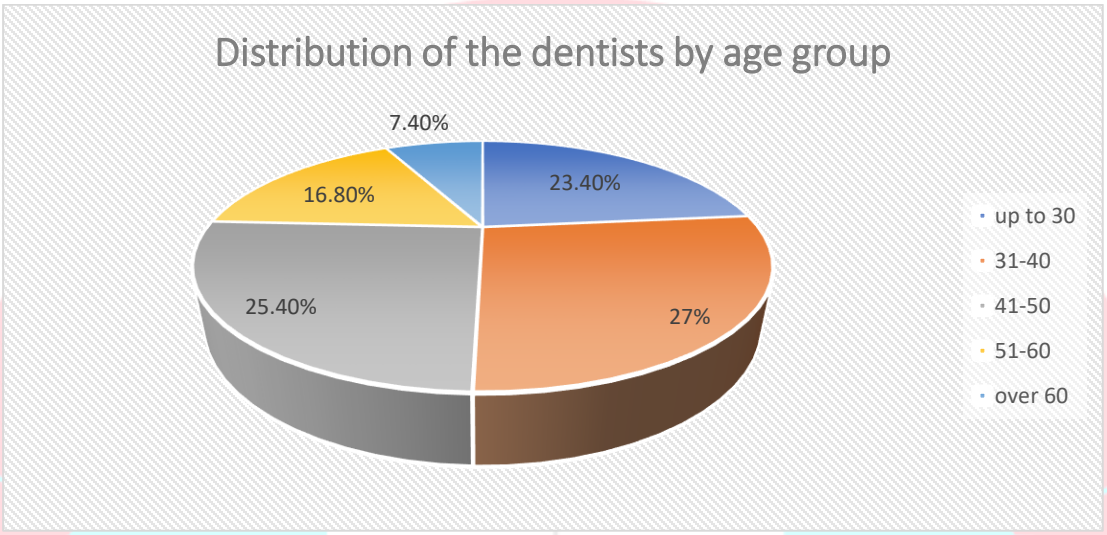


**Fig.2 Distribution of the Doctors of dental Medicine by age groups**

The distribution of the respondents by the six statistical regions, according EUROSTAT, is shown in figure 3. The largest share of the participants are from the South-Western region, which includes the administrative regions of Kyustendil, Blagoevgrad, Pernik, Sofia and Sofia region: 60.90%, followed by the North Central region, in the borders of which include the regions of Gabrovo, Veliko Tarnovo, Ruse, Razgrad, Silistra - respectively 13.70%. The least represented are the Southeast Region - 4.70% and the Northeast with a result of 3.50%.

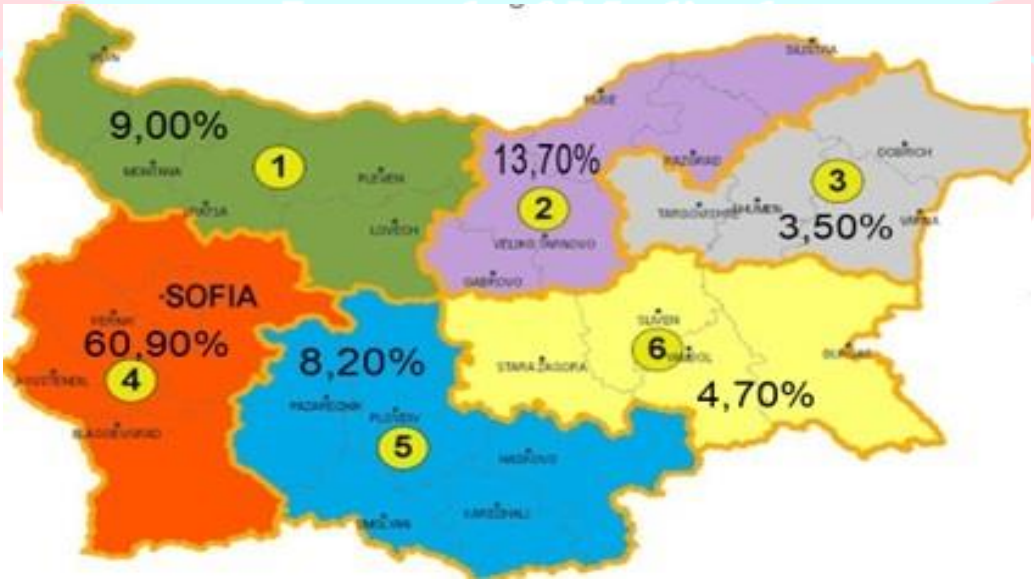


**Fig.3 Distribution of respondents by statistical region, EUROSTAT**

A large portion of dental practitioners, 63.30%, indicated that they constantly work with musical background. Adding the percentage of those who listen to music occasionally (28.90%) shows that only 7.30% prefer to work in silence (fig.4).

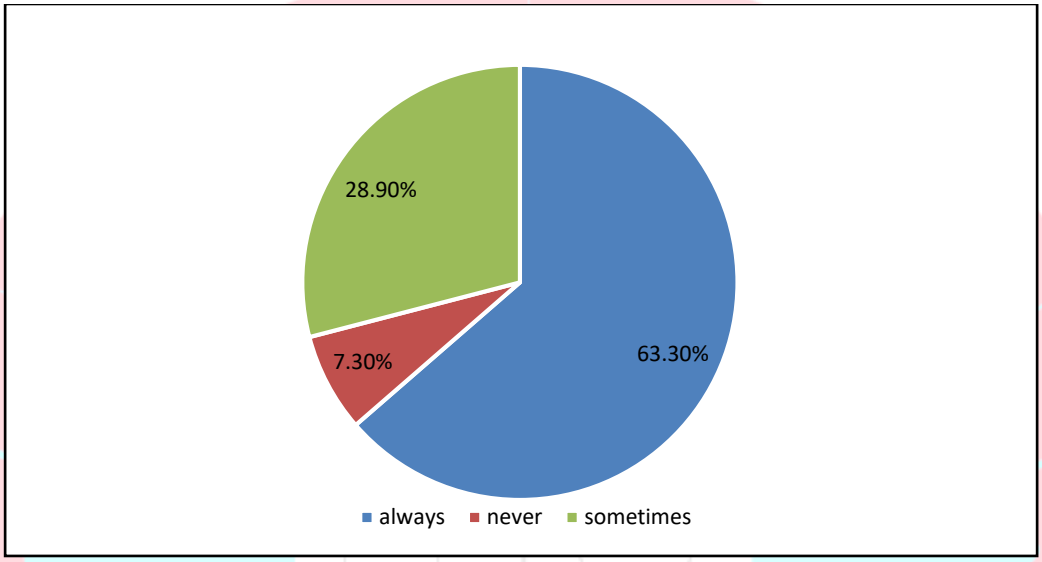


**Fig.4 Distribution of the DDM, working with musical background**

The distribution by age groups and the presence of music during work shows that dentists under 30 years old most frequently listen to music (70.00%), followed by those between 31-40 years old (66.70%) and 41-50 years old (67.70%). Among dentists aged 51-60 years, 51.20% constantly work with music, while 42.10% of those over 60 always use music during work. The highest percentage of practitioners working without music is observed in the 51-60 year age group (16.30%), with the lowest in those over 60 years (5.30%). In the latter age group, 52.60% mention that they sometimes listen to music, which can be attributed to long-term practice, fatigue, and the risk of professional burnout.

Observations indicate that most dental practitioners, regardless of age, prefer to listen to music (always or sometimes) during work, with a decreasing trend as age advances. (Fig. 5).

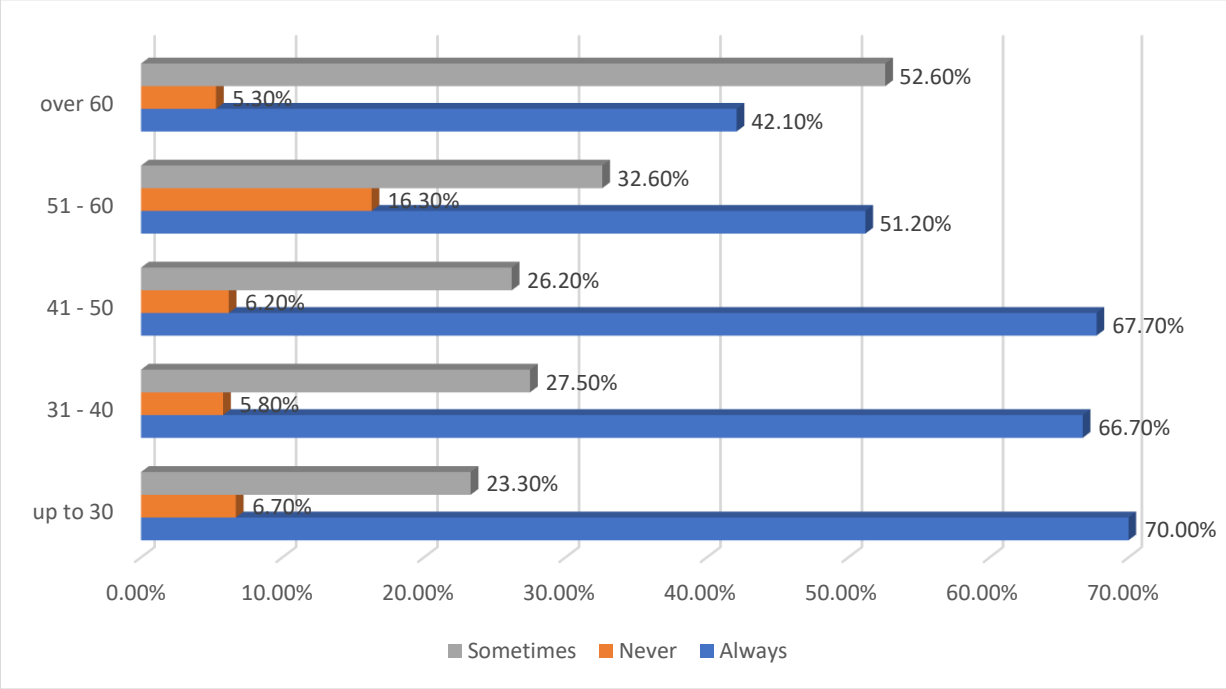


**Fig.5 Distribution of the DDM by age group depending on music background**

The analysis of the dependency between the gender of dental practitioners and their attitude towards listening to music during treatment reveals statistically significant differences. The data show that 6.7% of men and 8.8% of women prefer silence, while significantly more men (72.3%) compared to women (55.5%) prefer to constantly work with music. On the other hand, among those who listen to music occasionally, a larger percentage of women (35.8%) compared to men (21.0%) are observed (Tab. 1).

**Table 1 Is there a music in the dental office during treatment?**

| Is there music playing in the dental office where you work? | | Gender | | Total | p |
|---|---|---|---|---|---|
| | | men | women | | |
| Yes, always | N | 86$_b$ | 76$_a$ | 162 | 0,019 |
| | % | 72,3% | 55,5% | 63,3% | |
| No, never | N | 8$_a$ | 12$_a$ | 20 | |
| | % | 6,7% | 8,8% | 7,8% | |
| Sometimes | N | 25$_b$ | 49$_a$ | 74 | |
| | % | 21,0% | 35,8% | 28,9% | |
| Total | N | 119 | 137 | 256 | |
| | % | 100,0% | 100,0% | 100,0% | |

p<0.05

The study does not establish a statistically significant connection between weekly workload and the impact of music on the behavior of dental practitioners. Regardless of their workload, most participants frequently indicate that music cheers them up. Fewer listen to it as background because they cannot hear it well when focused on work. Responses indicating that music interferes with concentration are the least and are mostly

from doctors who work six days a week, which is related to their overall fatigue rather than the music itself (Tab.2).

**Table 2 Relationship between the number of working days per week and the importance of the pinky during clinical work**

| Do you think that music affects the dentist in any way? | | 8. How many days a week do you do direct clinical work? | | | | | Total | p |
|---|---|---|---|---|---|---|---|---|
| | | 4 days | 5 days | 6 days | 7 days | Other | | |
| Yes, it cheers you up | N | 40 | 104 | 24 | 8 | 5 | 181 | 0,822 |
| | % | 80,0% | 68,9% | 66,7% | 72,7% | 62,5% | 70,7% | |
| You hardly hear her because you are focused on the treatment | N | 7 | 25 | 5 | 2 | 2 | 41 | |
| | % | 14,0% | 16,6% | 13,9% | 18,2% | 25,0% | 16,0% | |
| For most of the treatment time, the music is drowned out by the noise of the equipment | N | 2 | 16 | 5 | 1 | 0 | 24 | |
| | % | 4,0% | 10,6% | 13,9% | 9,1% | 0,0% | 9,4% | |
| It interferes with your concentration | N | 1 | 6 | 2 | 0 | 1 | 10 | |
| | % | 2,0% | 4,0% | 5,6% | 0,0% | 12,5% | 3,9% | |
| Total | N | 50 | 151 | 36 | 11 | 8 | 256 | |
| | % | 100,0% | 100,0% | 100,0% | 100,0% | 100,0% | 100,0% | |

P<0,05

The data highlight the significance of music as a positive factor, with over 70% (70.70%) of dental practitioners feeling that it cheers them up, while only about 4.00% (3.90%) perceive it as a distractor (Tab.3).

**Table 3 Does music affect dentist during dental treatment**

| Do you think that music affects the dentist in any way? | N | % |
|---|---|---|
| Yes, it cheers you up | 181 | 70,7 |
| You hardly hear her because you are focused on the treatment | 41 | 16,0 |
| For most of the treatment time, the music is drowned out by the noise of the equipment | 24 | 9,4 |
| It interferes with your concentration | 10 | 3,9 |
| Total | 256 | 100,0 |

Regarding the impact of music, there is no statistically significant difference between men and women. Nearly equal percentages of men (69.30%) and women (72.30%) believe that music cheers them up. There is also a close percentage between the genders regarding those who do not notice the music because they are focused on the treatment or feel that the music interferes with their concentration, as indicated in (Tab. 4).

**Table 4 Dependency between the gender of dental practitioners and music affect during dental treatment**

| Do you think that music affects the dentist in any way? | | Gender | | Total | p |
|---|---|---|---|---|---|
| | | women | men | | |
| Yes, it cheers you up | N | 95 | 86 | 181 | 0,925 |
| | % | 69,3% | 72,3% | 70,7% | |
| You hardly hear her because you are focused on the treatment | N | 22 | 19 | 41 | |
| | % | 16,1% | 16,0% | 16,0% | |
| For most of the treatment time, the music is drowned out by the noise of the equipment | N | 14 | 10 | 24 | |
| | % | 10,2% | 8,4% | 9,4% | |
| It interferes with your concentration | N | 6 | 4 | 10 | |
| | % | 4,4% | 3,4% | 3,9% | |
| Total | N | 137 | 119 | 256 | |
| | % | 100,0% | 100,0% | 100,0% | |

P<0,05

The data from this table highlight that music has a cheering effect on dental practitioners, regardless of their age. However, with advancing age, the positive impact of music slightly diminishes. An initial fluctuation in the cheering influence of music is observed, strongest in the age group of 31-40 years, after which the positive effect gradually decreases, reaching 57.90% in individuals over 60 years old. The percentage of dental practitioners who do not notice the music due to work focus also increases with age – from 15.00% under 30 years old to 21.10% over 60 years old. The least disruption of concentration by music is observed in the 31-40 year age group (1.4%), while in the 51-60 year age group, the percentage is highest (9.30%) (Tab.5).

**Table 5 Dependency between the age-group of dental practitioners and music affect during dental treatment**

| Do you think that music affects the dentist in any way? | | Age group | | | | | Total |
|---|---|---|---|---|---|---|---|
| | | Up to 30 | 31-40 | 41-50 | 51-60 | over 60 | |
| Yes, it cheers you up | N | 41 | 54 | 47 | 28 | 11 | 181 |
| | % | 68,3% | 78,3% | 72,3% | 65,1% | 57,9% | 70,7% |
| You hardly hear her because you are focused on the treatment | N | 9 | 10 | 9 | 9 | 4 | 41 |
| | % | 15,0% | 14,5% | 13,8% | 20,9% | 21,1% | 16,0% |
| For most of the treatment time, the music is drowned out by the noise of the equipment | N | 9 | 4 | 6 | 2 | 3 | 24 |
| | % | 15,0% | 5,8% | 9,2% | 4,7% | 15,8% | 9,4% |
| It interferes with your concentration | N | 1 | 1 | 3 | 4 | 1 | 10 |
| | % | 1,7% | 1,4% | 4,6% | 9,3% | 5,3% | 3,9% |
| Total | N | 60 | 69 | 65 | 43 | 19 | 256 |
| | % | 100,0% | 100,0% | 100,0% | 100,0% | 100,0% | 100,0% |

According to the data, classical music turns out to be the most preferred by dentists (39.50%), followed by blues and jazz (20.70%). Pop-folk music is the least favored for work in clinical settings, with only 4.30% preference among dental practitioners (Fig.6).

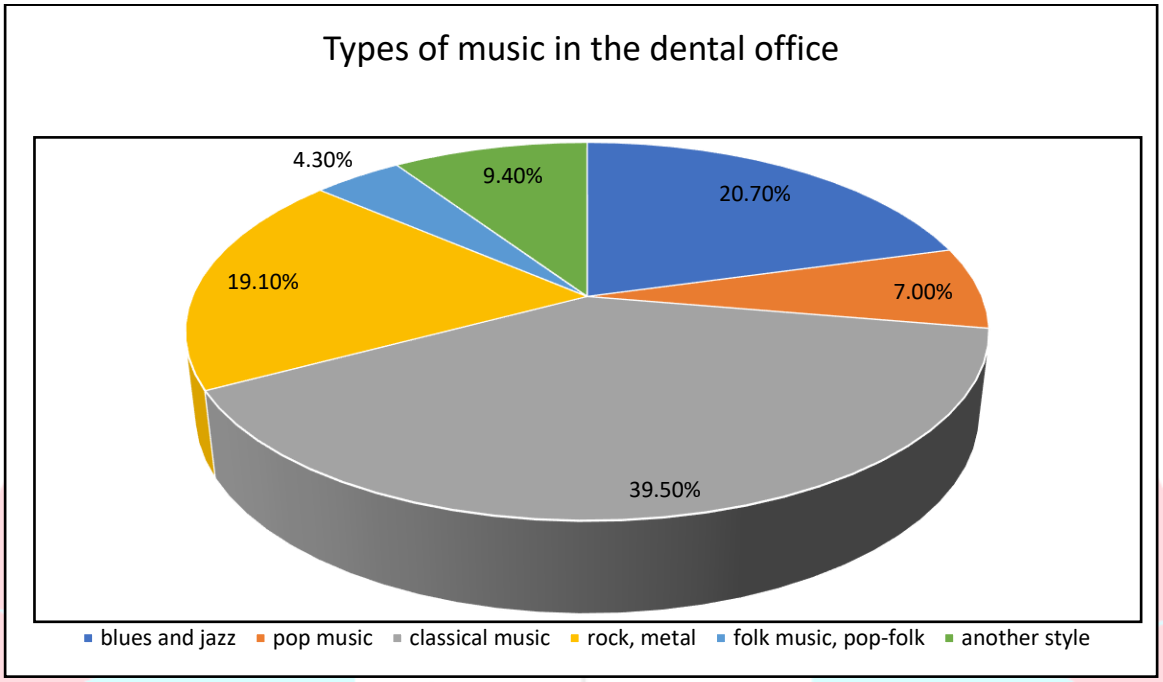


**Fig.6 Types of music listened in the dental office during clinical procedures**

## Discussion

The discussion focuses on the uniqueness of the operating room's work environment, where conditions are often stressful, and the team includes medical specialists from various disciplines. Precision, speed, and efficiency are critical for this dynamic and diverse staff. Effective communication and maintaining a calm atmosphere play a key role in the successful interaction within this setting. The study aimed to explore how music affects work efficiency and atmosphere in the operating room, suggesting that it can significantly improve both the team's functioning and the overall sense of well-being among those working in this demanding environment.

In the study, it was noted that 63% of the surveyed routinely incorporate musical accompaniment in the operating room, with 58% favoring classical music. Interestingly, the choice of music often does not depend on the specifics of the surgical procedure. Nurses show a greater inclination towards listening to music, a trend more pronounced among women in the study. As age advances, the preferred volume of music decreases, but a significant portion of respondents, 78.9%, affirm that the presence of music in the operating room contributes to their tranquility and enhances their work efficiency [10].

The choice of musical genres can have varying effects on professionals in the operating room, potentially increasing surgeons' efficiency but possibly having a negative impact on anesthesiologists and nurses. According to our study, 45% of participants prefer classical music, while fewer lean towards folk music (29.8%), rock (12.3%), jazz (10.5%), or blues (9.4%). Research conducted by Hawksworth indicates that reggae and pop music are the most distracting, while Corham finds that rock music can improve workplace performance. These findings are presented in the study "The sounds of music in the operating room" by Yehuda Ullmann and colleagues, published in the journal "Injury, International Journal of Care Injured" [11].

Only a small percentage (3.90%) of the dental practitioners in our study perceive music as a distracting factor. In contrast, a study conducted by Maria Antoniadou and her team shows that 20% of the operating room

staff find music to be distracting, which is a significantly higher percentage. In another study by Ullmann, Y., and colleagues, 63% of participants report a positive impact of music on communication during work, while 77% state that it makes them calmer and more efficient. These findings are supported by our study, in which 70.70% of the surveyed claim that music cheers them up during treatment [7, 11].

Regarding musical preferences, Kühlmann's research finds that various musical genres can have anxiolytic and analgesic effects. Accordingly, in Ullmann's study, 58% of respondents prefer classical music. In our study, classical music is the most popular among dental practitioners at 39.50%, followed by blues and jazz at 20.70%.

The meta-analysis by Pietschnig, J. establishes that listening to Mozart has a small but statistically significant positive effect on task performance [12]. However, a similar beneficial effect can be found in other musical genres [13], raising interest in selecting the appropriate musical style for the dental office. Music preferences are individual and often shaped by the sound environment one was surrounded by in the early stages of development.

In our study, the percentage of dental practitioners who listen to rock music (19.10%) is comparable to that in the study by Y. Ullmann et al. (16.00%). Regarding blues and jazz, our research shows that 20.70% of participants favor these genres, significantly higher compared to the literature data, where this percentage is between 12-13%.

## Conclusion

In conclusion, most dental practitioners prefer to work with music "always" during treatment. The study's findings indicate that a significant portion of the dental staff perceives music as a factor that positively affects their work environment. Only a small fraction of practitioners believe music can be distracting, while the vast majority consider it uplifting.

Classical music is confirmed as the most preferred genre among dental practitioners, followed by blues and jazz, aligning with literary observations. The least favored in clinical practice is pop-folk music. Additionally, women tend to listen to classical music more than men.

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