

**ORIGINAL ARTICLE**

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**The impact of background music in reducing stress during preclinical dental laboratories**Sudhir Rama Varma<sup>1</sup>, Shibu Thomas<sup>2</sup>, Ahmed Al Radaideh<sup>3</sup>, Suleiman Ergieg<sup>4</sup>, Esraa Fayez<sup>5</sup>, Lubna Malik<sup>5</sup>,<sup>1</sup> Department of Periodontics, Ajman University, Fujairah, UAE<sup>2</sup> Department of Prosthodontics, Ajman University, Fujairah, UAE<sup>3</sup> Department of Statistics, Ajman University, Fujairah, UAE<sup>4</sup> Department of Paediatric Dentistry, Ajman University, Fujairah, UAE<sup>5</sup> General Dentist, Ajman University, Fujairah, UAE**Correspondence Address:**Dr. Sudhir Rama Varma  
Po Box 20381, Dubai  
UAE**Abstract**

**Objective:** The reported high level of stress among dental students and its consequences, considering the known benefits of background music (BM). This study was designed to evaluate students' level of stress and impact of BM on their efficiency of work, performance, and learning ability during preclinical laboratory. **Materials and Methods:** In this cross-sectional questionnaire study, 61 preclinical students from the College of Dentistry, Ajman university-Fujairah campus who met the defined inclusion criteria participated. After a semester of the normal laboratory without BM, various genres of BM were introduced in the laboratory. Psychological stress assessment was done using the perceived stress scale. Students were asked to fill up a written feedback questionnaire at the end of 6 weeks of BM. Descriptive statistics and Chi-square test were used to study the statistical relationships among groups. **Results:** About 100% male and female students were found to be highly stressed due to exams and tests, 98% were stressed due to lack of time in the laboratory. About 82.5% females and 76% of males sample population expressed passion for music and also reported BM to be helpful to reduce stress in the preclinical laboratory and also to increase their concentration level. **Conclusion:** A strong positive relation has been shown in the reduction of stress with the BM in the preclinical laboratory.

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**Available from:** <http://www.jispcd.org/text.asp?2019/9/1/77/252260>**Full Text****Introduction**

Dental education has been observed to have a higher level of stress among dental students compared to the general populace. A large body of literature looking at stress in undergraduate dental students has revealed an increase in stress that intensifies with students' year of study.[1],[2],[3]

Preclinical laboratories in the 3rd year pose a serious challenge to most of the dental students. The transition from the basic science of the first 2 years of dentistry to preclinical dentistry of the 3rd year is not well handled by all students.

This has been traced to exhaustive schedules, inability to manage time, low academic performance, family, and peer pressure.

Stress is a product of some external or mental factors that affect an individual's physical and psychological status. Examination, grades, and performance are frequently reported to be stressful factors, along with little time for relaxation.[2],[3]

Research has found that stressors are not globally uniform and are influenced by local factors.

Chronic stress has been linked to the development of various disorders. El Ansari et al.[4] conducted a survey on 2100 undergraduate students and found depression to be positively and significantly correlated with anxiety. The most prevalent symptoms were headaches, depressive mood, difficulties to concentrate, and sleep disorder/insomnia that have been reported by 50%–60% of the students.

Learning environment has a powerful effect on the student's performances for accomplishing chores.[5] These are modified by visual, color, and sound.[5] Modifying the learning structure using sound as a form of music has been researched by many investigators.[6],[7],[8]

Creating a relaxed atmosphere in the laboratories have been proven to form an ambience and has a profound role in creating a varied learning environment.[9] Generation Z students have tapped the immense potential of music to create a serene environment.[10],[11] Music has improved learning by the way of focus and stilling the mind.[12]

Background music (BM) is commonly heard. Studies relate it with students' performance in academics.[13],[14],[15]

Although BM has reported to show better learning potential, reduction of stress level associated with preclinical dental laboratories has yet to be studied.

Therefore, our aim was to measure the correlation between BM with stress in the 3rd year dental students in Ajman University - Fujairah campus during their preclinical laboratory.

## Materials and Methods

Sixty-one 3rd year dental students from the College of Dentistry of Ajman University, Fujairah campus were selected as a stratified sample. From both female and male students, it was decided to take the weight of each group, and a sample was selected to have 80% as statistical power, for each selected student a written consent was obtained.

Approval for the study was done by the Ethical Committee of the College of Dentistry of Ajman University [Ref.RDF-2015/16-01]. The study is registered at ClinicalTrials.gov (NCT03725488).

A short medical history from the students revealed that there was not any medication for anxiety, depression, and systemic illness; and they had no aversion toward music.

These students were involved in the preclinical prosthodontic laboratory. Participation in these laboratories was mandatory, and it involved crown and bridge preparations on typodont models. There were two sessions of these laboratories per week, one for each gender. Each session lasted for 3 h.

The study was conducted in two phases. At the beginning of the first phase of the study, the laboratories were conducted without any BM for 4 weeks. Perceived stress scale (PSS), a international test which is standardized and self-validating was used for measuring the level of stress was given to all participants. The PSS scale is a widely used psychological instrument to measure perception of stress, in which the subjects have to answer 10 questions (items) related to feelings and thoughts experienced as stress during the past 1 month. The score for each item ranges from 0 = Never, 1 = Almost never, 2 = Sometimes, 3 = Fairly often, and 4 = Very often. The total score ranges from 0 to 40. The subjects with high PSS score are considered to have stress. The responses were summed up so that higher scores indicated more perceived stress. Cronbach's Alpha was 0.74, which can be considered a good indication of the internal consistency of the questions presented in our questionnaire. Points were calculated according to the calculation system of the scale proposed by Cohen et al.[16]

Along with PSS, a written questionnaire in English Format containing 23 questions were given to the participants before the BM was introduced. The questionnaire was about the stress level and causes of stress among the subjects and the factors that increase the stress, their coping mechanisms its efficiency, basic personal data, and nature of laboratory work. A pilot study was carried out on a small sample of students to test the validity of the self-developed questionnaire and needed amendments were made.

In the second phase of the study, the researcher played a calming type of BM for the next 4 weeks. Songs were randomly selected from the students' choice list that was collected upfront. Different genre of music (R&B, classical, jazz, country, Arabic) was played.

Students were given a questionnaire at the end of the 4th week containing 12 questions for feedback on BM, favorite genre of music, their opinion about the effect of BM on work in the laboratories and any suggestions to the university to reduce the stress during the laboratory sessions.

Data were compiled and descriptive and comparative analysis was carried out using SPSS (version 15.0, SPSS, Chicago, Illinois, USA) Statistical relationships among groups were assessed using the Chi-square test.

## Results

A stratified sample was used to select 61 students for the study, 20 were male and 40 were female, the results were compiled and used in the analysis [Figure 1].{Figure 1}

The response to the questioner after playing the BM showed a significant positive response from both males and females [Figure 2], [Figure 3], [Figure 4].{Figure 2}{Figure 3}{Figure 4}

[Table 1] and [Table 2] shows values rated by students, with regard to affinity for music and its usefulness in increasing learning in preclinical lab exercises.{Table 1}{Table 2}

About 82% of males and 75% females indicated a profound liking for music as shown in [Table 3], 83% and 76% of the sampled female and male population, respectively, selected BM as a very useful tool in bettering learning in preclinical laboratories [Table 4].{Table 3}{Table 4}

A Pearson correlation showed it was directly proportional between affinity for music and perception as a helpful tool for learning in the preclinical laboratory at the significant level ( $\alpha = 0.005$ )\* [Table 5].{Table 5}

[Table 6] shows the favourite type of music students prefer to listen to, during laboratory sessions. It was found as 95% with classical music and almost 0.6% listen to Arabic, Indian and Turkish music.{Table 6}

The statistical analysis in the previous table shows a positive correlation between the student's concentration by muting the background noise and their efficiency of the work.

It can be seen that the 66% of student suggested that there should be a full time or part-time student counselors, 56% of the students they did not agree with the recreational and the cultural activities; moreover, 53% of the students agree for playing BM in all the laboratories, and 62% of them they are asking for reducing the requirements.

## Discussion

The purpose of this investigation was to provide an examination of the effect of BM in reducing stress during preclinical dental laboratories. Our study reinforced the general impression that dental students have considerable stress and anxiety which is consistent with similar studies;[17] moreover, students are under great stress than the overall public.[18],[19],[20],[21]

It was observed that stress was higher with our students with no difference in gender. Dental career is accompanied with high-stress level, and mental disorders are the third among dentists.[17]

Academic factors were the predominant stressors for students. Multiple examinations, daily assessments in the laboratory, lack of time in the laboratory to complete the work adds up to the stress faced by students along with living away from home and financial apprehensions.

"Mozart effect" a theory proposed by Rauscher et al.[8] overwhelmingly ignited the role of music in bettering performance in academics of students who use music.

Spatial-temporal reasoning abilities were immediately enhanced after listening to Mozart.

On the same areas, other studies have been proposed on the same likes of music.[14],[22]

The impact of BM and its impact on stress was the focus of the present study during the dental preclinical sessions.

The first hypothesis that students will absorb BM as a useful tool supported the results of the study. This will reduce stress and enhance learning in the preclinical laboratories.

The sampled students showed a positive association between affinity for music and its role as a tool in reducing stress. It was further translated as a positive perception in enhancing learning in laboratories.

Statistically significant number of students in the population under evaluation was of the opinion that the use of BM is helpful in the laboratory. These dental students showed the same kind of attitude toward music compared to adolescents in the other parts of the world.[23],[24],[25]

The most popular activity of many adolescents has reported being music.[26]

North American studies show that the duration of time they spend on listening to music ranges from 4 to 6 h/day or 56.6 h/week; [25] English studies estimated 2.5 h/day.[23] This shows the strong affinity for music by the youth and it is reported as most meaningful and popular among youths[24] as the most favored way of spending indoor time.[27]

The above positive perception of music both during private studies and in the laboratories shows a positive correlation.

The students that use BM for studies and the number that recommended for its use in the laboratory, there was an increase with significance statistically. Worth to note that few students who recommended BM in the laboratory were not using BM during their private studies.

It can be understood from the results that the students want to use BM to increase the learning atmosphere in the laboratory. Preclinical laboratory seems to be a difficult course, and it is needed to use tools like BM, which will increase learning skills.

The results of the study support that there was an improvement in efficiency in the laboratory which contributed to factors as relaxation and attentiveness. This can be attributed to BM which was able to create a better noise reduction, producing a stress-free environment, time utilization, alertness, and enhancing students' interest as this can be inferred from the overwhelming response from the students recommending to play the BM in the laboratories.

Various reports on the use of BM have indicated that it affects state of mind, alters time orientation, boosts physiological changes, reduces apprehension, soothes the mind, reduces distraction, enhances concentration, and aids performance.[8],[14],[28],[29]

Our data showed significant number of students had a view that use of BM helps to reduce stress in the preclinical dental laboratory. This is congruent with the study done by Ghasemi et al.[17] in Iranian dental students, which showed that music practice can reduce anxiety and depression of dental students.

#### Limitation

Perhaps the most salient limitation to this investigation is that the BM was not played in all preclinical laboratories; PSS test was not conducted after the BM was played to avoid bias. Response from the participants in this study can be taken as a general advice to play BM in laboratories as shown in [Table 7].{Table 7}

Despite these limitations, our results provide a foundation on which more research can be conducted with more students and music being played in all the preclinical laboratories and PSS test done once the music is being played.

## Conclusion

As a substantial portion of students suffers from stress[18],[19],[20],[21] and dental education is not an exception.[17]

Our study suggests that there is a need to make the students aware about the adverse effects of stress and intervention program such as counseling and stress management programs should be provided to excessively stressed students to decrease depression. Indeed, music can be an inexpensive, powerful tool without adverse effect and has a broad range of potential application. We being an academicians it is our duty to utilize all available means to relieve stress in our students.

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#### Conflicts of interest

There are no conflicts of interest.

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