Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.6 No. 6 (2025): June 2025 Issue
https://doi.org/10.51168/sjhrafrica.v6i6.1690
Original Article

EFFECT OF HABITUAL MUSIC LISTENING ON ATTENTION, LEARNING, AND MEMORY: AN OBSERVATIONAL CROSS-SECTIONAL STUDY AMONG STUDENTS IN VIJAYAWADA.

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Abstract

Background
Music has long been considered a tool for enhancing focus and cognitive performance, yet its effects on academic performance, particularly attention, learning, and memory, are still debated. This study explores the habituation of listening to music during study sessions among students in Vijayawada and evaluates its influence on academic engagement and cognitive function.

Objective
To determine the prevalence of listening to music while studying and assess its perceived impact on attention, learning, and memory.

Methods
An observational, cross-sectional, descriptive study was conducted among 142 undergraduate students aged 18–30 from various colleges around Siddhartha Medical College, Vijayawada. The sample included 58.5% females and 41.5% males. Data were collected through a structured questionnaire comprising multiple-choice questions regarding music preferences, reasons for listening to music, and its perceived effects on academic tasks. Descriptive statistics were used for analysis, and findings were presented in tables and charts.

Results
Most (92.3%) of students reported listening to music while studying, with 46.8% stating it improved concentration. Bollywood music was the most preferred genre (70%), and music was most often used during assignments (65%) and least favorite subjects (67.3%). About 79% felt that music helped relax their brain, and 39% reported extended study time with music. Moderate volume and speed were preferred by 63.6% of students.

Conclusion
Listening to music while studying is a prevalent practice among students, with most reporting positive effects on concentration, learning, and motivation. Music may be an effective cognitive aid, particularly during monotonous academic tasks.

Recommendations
Based on the findings, it is recommended that educational institutions consider integrating music as a potential tool for improving student focus and engagement during study sessions.

Keywords: *Music, Academic Performance, Attention, Learning, Memory, Study Habits, Habituation, Student Engagement, Cognitive Function.*
Submitted: *2025-02-26* ***Accepted:*** *2025-03-30* ***Published:*** *2025-06-08*

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Introduction

Music has been an integral part of human culture for centuries, serving as both a source of entertainment and a tool for emotional expression. Over the years, music's role in education has garnered significant attention, particularly in terms of its potential effects on cognitive functions such as attention, learning, and memory. The relationship between music and academic performance has become a topic of considerable interest among researchers, educators, and students alike 2,3. Many students listen to music while studying, believing that it helps them focus and enhances their cognitive performance4,5,6,7. However, the impact of listening to music on academic performance remains a subject of debate, with some studies suggesting positive effects, while others indicate possible distractions.

One of the most well-known concepts in this area is the "Mozart Effect," a term coined after studies in the 1990s suggested that listening to classical music could enhance spatial-temporal reasoning and improve academic performance. However, subsequent research has shown mixed results, leading to the hypothesis that the type of music, its volume, and the context in which it is played may all influence its effects on learning and memory. In today's fast-paced, technology-driven world, many students multitask by listening to music during study sessions, raising questions about how music affects concentration, task performance, and overall cognitive functioning.

Aim

The aim of this study is to explore the prevalence of music listening habits among students in Vijayawada and examine the impact of habituation to music while studying on attention, learning, and memory.

Objectives

To assess how commonly students in Vijayawada develop the habit of listening to music during their study sessions.

To analyze the reasons for listening to music while studying.

To examine the role of music in enhancing or hindering attention, learning, and memory during study sessions.

To estimate the proportion of participants listening to music during different study tasks.

To assess the impact of listening to music on study time and academic performance.

Methodology

Study Design

This was an observational, cross-sectional, descriptive study designed to assess the impact of habitual music listening on attention, learning, and memory among college students.

Study Period

The study was conducted over two months, from November to December 2022.

Study Setting

The study was conducted at Siddhartha Medical College**,** a premier government medical institution located in Vijayawada, Andhra Pradesh, known for its undergraduate and postgraduate medical education. The participants were drawn from several colleges in and around Vijayawada to ensure diversity in academic backgrounds. These included:

Siddhartha Medical College, Vijayawada

SRR & CVR Government Degree College, Vijayawada

PB Siddhartha Arts and Science College, Vijayawada

Andhra Loyola College, Vijayawada

Sample Size

A total of 142 students participated in the study. The sample size was determined using a prevalence-based estimation formula for cross-sectional studies. Assuming a conservative prevalence of 50% for habitual music listening among students (due to limited prior data), a 95% confidence level, and a 10% margin of error, the minimum required sample size was calculated to be 96. Accounting for non-response and data exclusion, the sample was increased to 142 to enhance validity.

Participants

Participants were randomly selected from the above-listed colleges. The distribution of participants was as follows:

Siddhartha Medical College: 40 students

SRR & CVR Government Degree College: 36 students

PB Siddhartha Arts and Science College: 34 students

Andhra Loyola College: 32 students

Inclusion Criteria

Participants aged 18-30 years with an interest in music were randomly selected for the study. These students were willing to share their experiences related to listening to music while studying.

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Exclusion Criteria
Students with hearing impairments or those who were deaf were excluded from the study.

Data Collection
Data was gathered using a pre-structured, closed-ended questionnaire developed after an extensive review of the literature and consultations with experts. The questionnaire was distributed through various platforms such as the Internet, social media, and manually to students, with prior consent obtained from each participant.

Data Analysis
Data was entered into an MS Excel spreadsheet, and the results were analyzed using percentages. Tables and graphs were used to present the data for clear understanding.

Bias
To minimize potential sources of bias, the study employed random sampling across multiple colleges to ensure diverse representation. A pre-validated, structured questionnaire was used to standardize data collection. Anonymity and confidentiality were maintained to encourage honest responses. Additionally, the inclusion and exclusion criteria were clearly defined to avoid selection bias. The survey was self-administered without interviewer influence, reducing the risk of response bias and ensuring that students provided their perceptions independently and without external prompting.

Ethical Considerations
The study was approved by Siddhartha Medical College under ethical approval number IECSMC/22M205/5/11/1022. Informed consent was obtained from all participants, ensuring that they were fully aware of the study's purpose, procedures, and potential risks. Additionally, the study adhered to strict confidentiality protocols, ensuring that participants' identities and responses remained anonymous throughout the research process.

Results
Participants
A total of 180 students were approached across four colleges in Vijayawada. Of these, 165 students responded to the invitation and completed the initial eligibility screening. 150 students were confirmed eligible based on the inclusion criteria (age 18–30 years, interest in music, no hearing impairments). 142 students provided informed consent and were included in the final study. All 142 students completed the questionnaire in full and were included in the final analysis. The primary reasons for non-participation were incomplete responses (n=8) and unwillingness to participate (n=15). Of the 142 participants, 58.5% were female and 41.5% male.

Prevalence of Listening to Music
A significant majority of participants (92.3%) reported that they preferred to listen to music while studying. A smaller percentage of participants (2.2%) did not listen to music while studying, and 4.9% indicated occasional music listening during study sessions. These findings are illustrated in Figure 1.

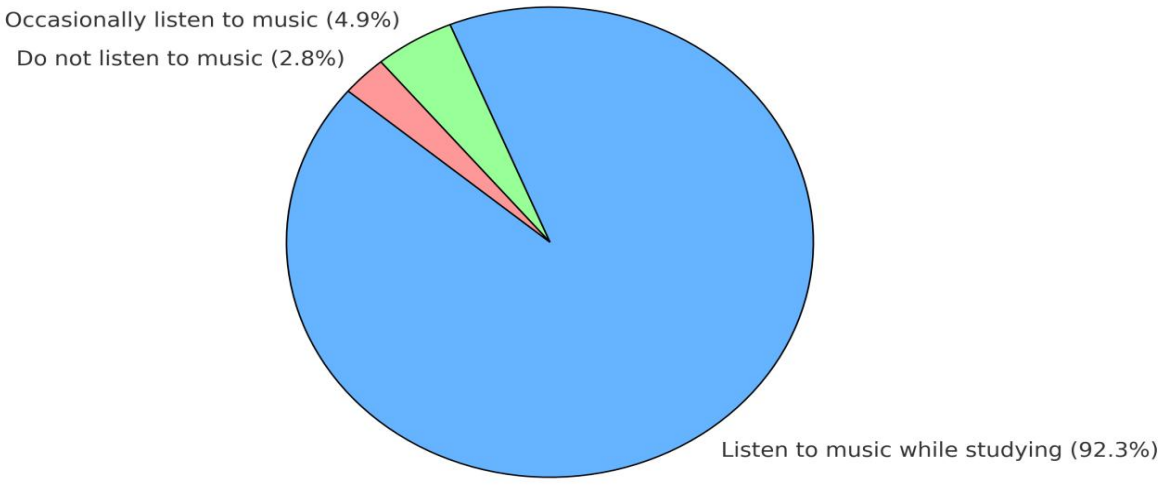

Figure 1. Prevalence of Music Listening During Study Sessions Among Participants

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Reasons for Listening to Music

The reasons students chose to listen to music while studying varied. The primary reason was to improve concentration, with 46.8% of students agreeing with this statement. Music was also seen as a means to prevent sleepiness (44.7%), block external noise (44.7%), and make reading less boring (37%). Additionally, 31.4% of students reported that music helped keep them energized, and 27% felt happier while studying with music, as shown in Figure 2.

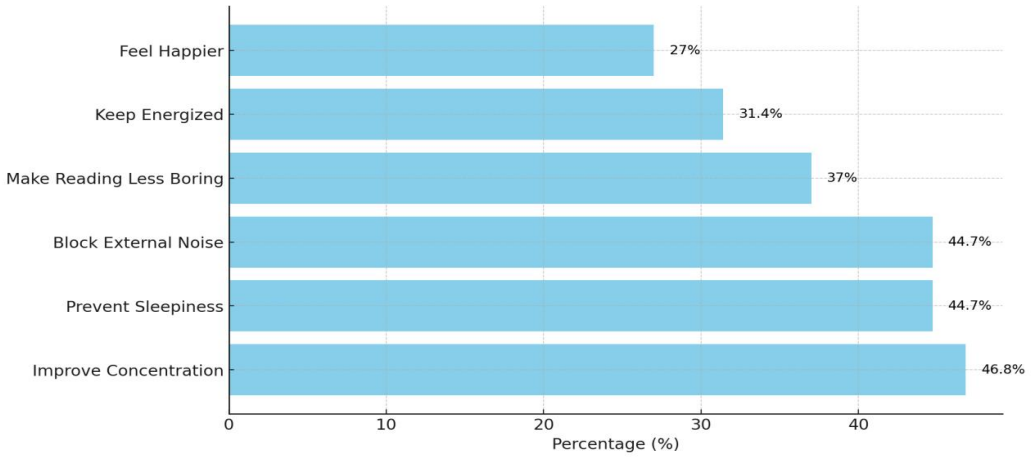
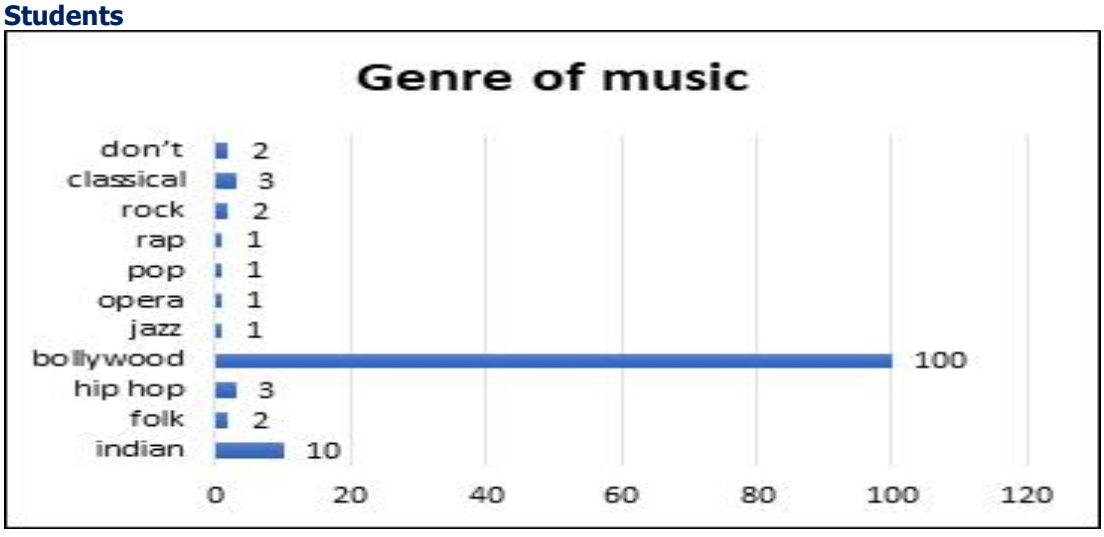


Figure 2: Reasons for Listening to Music While Studying

Genre of Music

When it came to the genre of music, 70% of students preferred Bollywood music, followed by minimal preference for classical (0.2%) and folk music (0.14%) as depicted in Figure 3.

Figure 3. Preferred Genreof Music Among Students



Music Preference for Study Tasks

Students reported varying preferences for listening to music while engaging in different study tasks. The highest incidence of music listening occurred during reading their least favorite subjects (67.3%) and completing assignments (65%). Music was less frequently used while revising for exams (16%) or memorizing subjects (14%), as shown in Figure 4.

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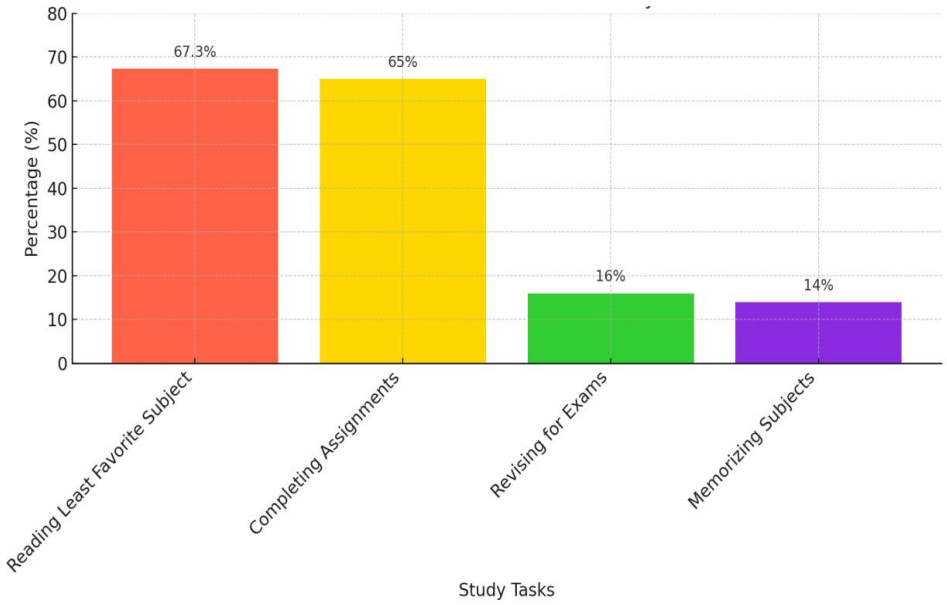

Figure 4: Music Preference about Study Tasks

Adaptation to Music Listening

Regarding habituation to music while studying, 55% of students had been listening to music during study sessions for many years, while 26% had adopted this practice recently. The remaining 34% of students decided whether or not to listen to music based on the situation (Table 1).

Table 1: Adaptation to Music Listening While Studying

Category	Percentage (%)
Listening to music during study sessions for many years	55%
Recently adopted the practice	26%
Listen based on the situation	34%

Perceived Benefits of Music While Studying

A significant proportion of students (79%) reported that listening to music helped relax their brains. Other perceived benefits included alleviating boredom (74%), facilitating faster learning (69%), and increasing motivation to continue studying (61.5%), as illustrated in Table 2.

Table 2: Perceived Benefits of Music While Studying

Perceived Benefit	Percentage (%)
Helps relax the brain	79%
Alleviates boredom	74%
Facilitates faster learning	69%
Increases motivation to continue studying	61.5%

Impact of Music on Study Time

When asked about the impact of music on study time, 39% of students felt that music enhanced their study sessions, while 37% reported no significant impact. These findings are displayed in Figure 6.

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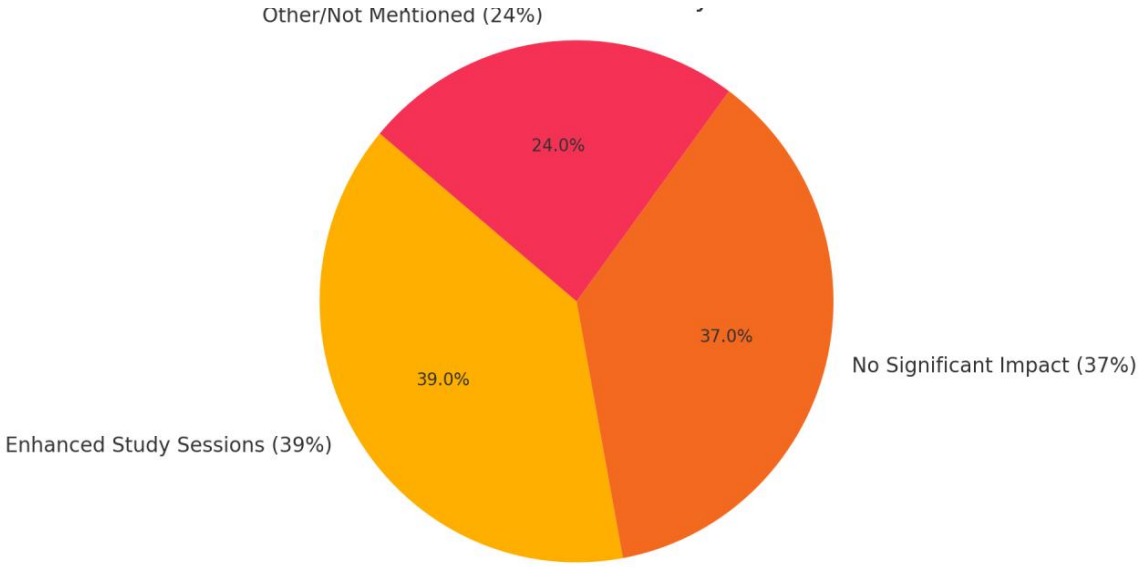

Figure 6: Impact of Music on Study Time

Music Preferences in Terms of Volume and Speed

Regarding the volume and speed of music, 63.6% of students preferred moderate volume and speed, while 57% chose music primarily for its tune, regardless of the genre. These preferences are shown in Figure 7

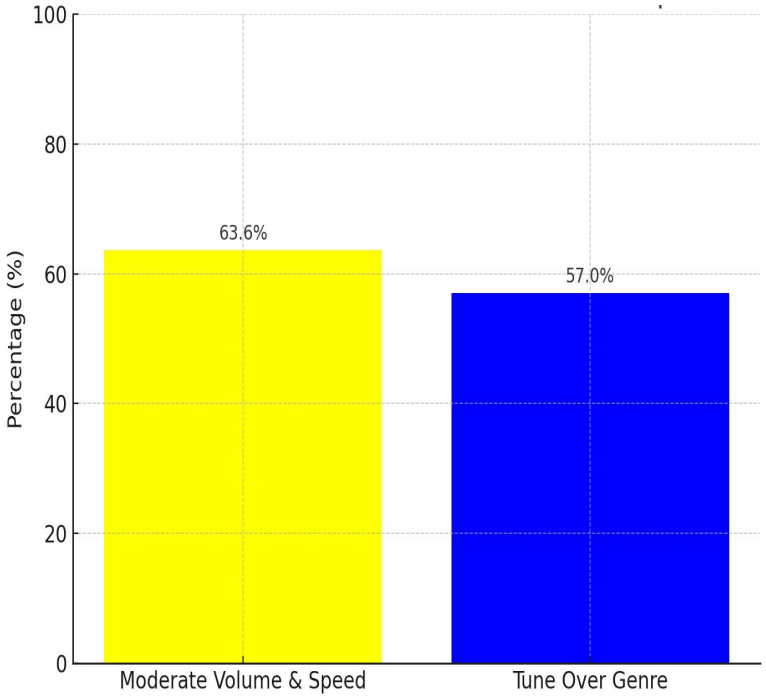

Figure 7: Music Preferences in Terms of Volume and Speed

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Duration of Music Listening

The duration for which students listened to music during study sessions varied. The majority (44.7%) reported listening to music for approximately two hours, followed by 24.4% listening for one hour and 23% for three hours, as illustrated in Figure 8.

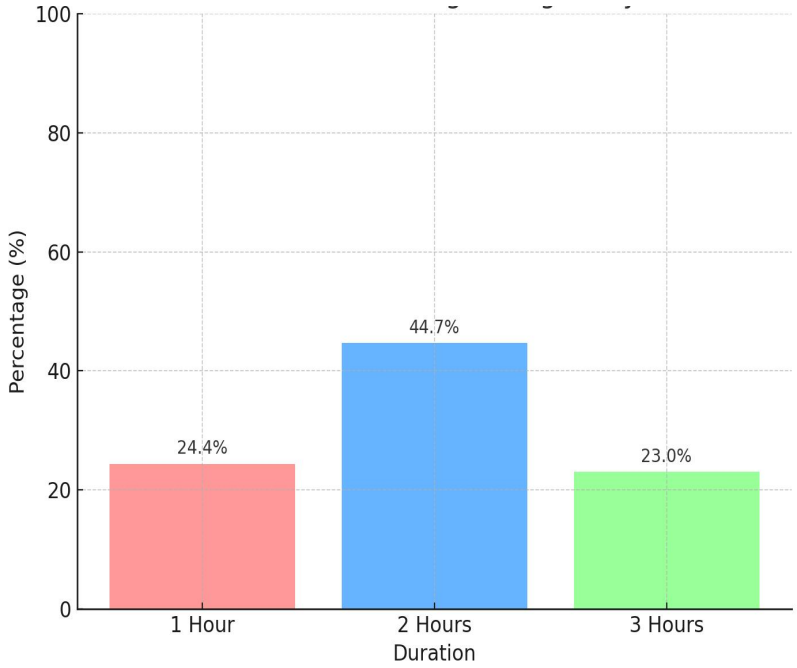

Figure 8. Duration of Music Listening during study sessions

Discussion

This study aimed to explore the prevalence of habituation to listening to music among students while studying and its impact on cognitive functions like attention, learning, and memory. The findings revealed that a significant majority (92.3%) of students preferred listening to music during study sessions. This is consistent with previous research, which noted the widespread practice of listening to music among students while studying[8]. The preference for music during the study was also corroborated by studies highlighting the relationship between music and enhanced cognitive function[8].

In this study, students indicated that the music they listened to while studying helped them concentrate better, prevented boredom, and enhanced their learning speed. These results align with findings that music can positively influence concentration, motivation, and performance during academic tasks[11]. Interestingly, the genre of music played a role in how students engaged with their academic tasks. Bollywood music, for instance, was the most popular choice, possibly reflecting its high engagement among students in India. This preference for Bollywood music over classical or folk genres suggests that music with familiar tunes or lyrics may serve as a motivational tool for students, which also supports the concept of the "Mozart Effect." In this theory, specific types of music, such as classical, are believed to enhance cognitive performance, though the effect may vary based on individual preference[8].

This study also explored the task-specific use of music, and it was found that most students preferred listening to music while completing assignments (65%) and while dealing with their least favorite subjects (67.3%). This indicates that music may act as a form of cognitive aid, helping to mitigate the negative emotions or boredom associated with more challenging or monotonous tasks. These findings are consistent with the theory that music can serve as an emotional and cognitive enhancer, providing the necessary stimulus to maintain focus and engagement[9 10].

The role of habituation to music listening was also evident in the responses, with 55% of students reporting that they had been listening to music while studying for many years. This suggests that the positive effects of music on study habits may become more pronounced over time as students adapt to using it as a tool to improve focus and motivation. Furthermore, the moderate volume and tempo of the music appeared to optimize students'

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concentration, a finding supported by previous studies that noted moderate volumes of music enhance cognitive performance while minimizing distractions[12]. Another study explored the impact of music on attention and short-term memory, revealing that moderate-tempo music helped improve cognitive performance, supporting the role of music as an attention enhancer[13].

Additionally, a recent study on children's cognitive performance during recreational listening further corroborated the positive impact of music on cognitive abilities. It found that listening to music during recreational activities helped improve cognitive performance, especially when the music was played in the afternoon[14].

Generalizability

The findings of this study are moderately generalizable to urban undergraduate students with similar educational settings and cultural contexts; however, caution is needed when applying results to rural populations or students with different academic or musical exposure.

Conclusion

This study supports the notion that listening to music while studying can enhance concentration, motivation, and learning efficiency. However, further research with a larger and more diverse sample is needed to confirm these findings and to explore the long-term effects of music habituation on academic performance. Music remains an essential part of many students' study routines and may offer a simple, effective method to enhance cognitive function and improve academic success.

Limitations

Despite the overwhelming positive perception of music's impact on academic tasks, the study also had limitations. The sample size of 142 students may not fully represent the larger student population, limiting the generalizability of the findings. Moreover, the study was conducted in a specific geographical area (Vijayawada), and future studies should explore a broader demographic to capture a more diverse range of perspectives on the use of music in study routines.

Recommendations

Based on the findings of this study, it is recommended that students be encouraged to evaluate the impact of music on their focus and learning outcomes. Institutions could promote awareness regarding the potential benefits and drawbacks of listening to music while studying, offering guidance on when it may be helpful and when it might hinder academic performance. Furthermore, students should be advised to experiment with different study environments to determine their individual preferences for music or silence. Finally, further research is needed to explore the long-term effects of music listening habits on memory retention and cognitive development in students.

List of abbreviations

IEC- Institutional Ethics Committee
SMC- Siddhartha Medical College

Source of funding

The study has received funding from DR NTRUHS under the UGSRS Project

Conflict of interest

The authors declare no conflict of interest.

Acknowledgment

The authors express their sincere gratitude to the management and faculty of Siddhartha Medical College, Vijayawada, for their continuous support and guidance throughout the study. Special thanks to the Department of Physiology for their valuable input in the design and execution of the research. This study was supported by Dr. NTR University of Health Sciences (Dr. NTRUHS) under the Undergraduate Student Research Scheme (UGSRS) Project.

Author contributions

SK- Concept and design of the study, results interpretation, review of the literature, and preparation of the first draft of the manuscript. Statistical analysis and interpretation, revision of the manuscript.**LDY- Concept** and design of the study, results interpretation, review of the literature, and preparing the first draft of the manuscript, revision of the manuscript.**Review** of literature and preparing the first draft of the manuscript. Statistical analysis and interpretation. **WM-**Concept and design of the study, results interpretation, review of the literature, and preparing the first draft of the manuscript. Statistical analysis and interpretation, revision of the manuscript.**Concept** and design of the study, results interpretation, review of the literature, and preparation of the first draft of the manuscript.

Data availability

Data Available

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Publisher Details:

Student's Journal of Health Research (SJHR)
(ISSN 2709-9997) Online
(ISSN 3006-1059) Print
Category: Non-Governmental & Non-profit Organization
Email: studentsjournal2020@gmail.com
WhatsApp: +256 775 434 261
Location: Scholar's Summit Nakigalala, P. O. Box 701432, Entebbe Uganda, East Africa