



KEY POINT SUMMARY

OBJECTIVES

The purpose of the study was to examine the effects of two types of music (activating and deactivating music) on the performance of surgical tasks in a simulated experimental setting in UK.

DESIGN IMPLICATIONS

Music, if provided in the operating rooms, should be controllable by surgeons and other staff so the content, loudness and other elements of music can be adjusted to best support work performance in different situations.

Randomized Controlled Trial Investigating the Effect of Music on the Virtual Reality Laparoscopic Learning Performance of Novice Surgeons

Miskovic, D., Rosenthal, R., Zingg, U., Oertli, D., Metzger, U., Jancke, L.
2008 / Surgical Endoscopy
Volume 22, Issue 11, Pages 2416-2420

Key Concepts/Context

The acoustic environment in operating rooms has significant impact on the performance of surgeons, anesthetists, and other staff who need high cognitive attention on the tasks they are performing. Music is often played in operating rooms during surgical procedures even though mixed results have been reported from research around music's effects on healthcare work performance. Research from other settings showed that certain type of music might help improve human cognition. Some research around music in operating rooms showed benefits of music in improving surgeon performance while other research indicated that staff generally preferred silence and found music distracting. The effects of music may vary depending on many environmental and personal factors, such as the loudness, presence of other distractors, music style, and listener's personal preference and familiarity of certain music type.

Methods

In this experimental study, 45 junior surgeons without previous laparoscopic experience were randomly assigned to three groups. Each group was instructed to perform a same laparoscopic task (clipping and cutting cystic duct and artery) five times (trials) on a surgical simulator in one of three conditions (music, activating or arousing music, deactivating or soothing music). Surgeons with pervious laparoscopic or similar experience were excluded to avoid bias caused by different experience levels. Three measures automatically generated from the integrated software in simulator—global score (i.e. accuracy of clipping minus error score), total task time, and right and left hand travel distances—were collected. In addition,



The Center for Health Design:
Moving Healthcare Forward

The Center for Health Design advances best practices and empowers healthcare leaders with quality research providing the value of design in improving patient and performance outcomes in healthcare facility planning, design, and construction, optimizing the healthcare experience and contributing to superior patient, staff, and performance outcomes.

Learn more at
www.healthdesign.org

participants rated the pleasantness of music on a visual analog scale. Their heart rates were also recorded. Two-way analysis of variance tests were conducted to examine the effects of music on task performance. Other potentially confounding factors (including music preference, video game experience, dexterity, handedness, hand preference, and pretest mood state) were also examined to detect possible differences on these variables between the three groups.

Findings

The data showed a strong leaning effect. All three performance measures (total task time, global score, and right hand travel distance) improved significantly over time (i.e. better performance on fifth trial than previous ones). The global score showed a non-significant trend that the group listening to activating music performed worse than the other two groups. The difference was significant in the first trials but not in subsequent ones. Participants who rated music as pleasant performed better and faster than participants who rated music as unpleasant in the first three trials (but not in the last two trials). Participants in activating music group had significantly higher heart rate than the other two groups.

Limitations

There were several limitations of this study:

- A strong learning effect was shown in the data. It seemed that the training may reduce the variation in performance across groups over time. Even though the participants were randomly assigned to the three groups, it was probable that the three groups might have performed differently in the first several trials because of some other unknown factors. Therefore, the significant difference observed in the first several trials might not reflect the true difference caused by activating music, deactivating music vs. music).
- The experiment was conducted on junior surgeons with no previous experience in laparoscopic procedures in a simulated environment. The results may not be readily applied to more experienced and better trained surgeons (who possibly have different reaction to music) in real-life operating rooms.