Music and communication in the operating theatre

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Abstract

Aims. To observe the extent and the detail with which playing music can impact on communication in the operating theatre.

Background. According to the cited sources, music is played in 53-72% of surgical operations performed. Noise levels in the operating theatre already exceed World Health Organisation recommendations. There is currently a divide in opinions on the playing of music in operating theatres, with few studies conducted and no policies or guidance provided.

Design. An ethnographic observational study of teamwork in operating theatres through video recordings. Quantitative and qualitative data analysis approaches were used.

Methods. This study was conducted between 2012–2013 in the UK. Video recordings of 20 operations over six months in two operating theatres were captured. The recordings were divided into music and non-music playing cases. Each case was logged using a request/response sequence identified through interactional analysis. Statistical analysis, using a \( \chi^2 \), explored the difference between the proportion of request repetitions and whether music was playing or not. Further interactional analysis was conducted for each request repetition.

Results. Request/response observations (\( N = 5203 \)) were documented. A chi-square test revealed that repeated requests were five times more likely to occur in cases that played music than those that did not. A repeated request can add 4-68 seconds each to operation time and increased tensions due to frustration at ineffective communication.

Conclusions. Music played in the operating theatre can interfere with team communication, yet is seldom recognized as a potential safety hazard. Decisions around whether music is played and around the choice of music and its volume, are determined largely by surgeons. Frank discussions between clinicians, managers, patients and governing bodies should be encouraged for recommendations and guidance to be developed.

Keywords: anaesthetists, communication, distraction, music, nurses, operating department practitioners, operating room, operating theatre, surgeons, teamwork
Introduction

Music has a long history in the operating theatre (OT). In 1914, Evan O’Neill Kane first brought music to the OT to be used as an anxiety-relieving measure for patients undergoing anaesthesia (Kane 1914). Music became more commonplace in the OT’s during the 1930s and its main purpose was to benefit patients. Surgical teams were advised to avoid playing jazz and sentimental tunes; instead soft, soothing, melodious music was regarded as acceptable (McGlinn 1930).

Around this time, music in the OT was supplied by a ‘special self-playing automatic record-changing instrument’ (British Medical Journal 1931, p. 108) – the gramophone. Over time, music playing technology has become smaller and more convenient to use (Waddington 2006). Portable devices, such as iPods, have now entered the OT’s where music is regularly played, although the induction of anaesthetics no longer takes place in the (European) OT’s, but usually in the induction room (Bromhead & Jones 2002, Sieber & Leibundgut 2002). (However, in the United States, OT’s are mainly built without induction rooms and therefore may continue the induction of anaesthetics inside the theatre [Torkki et al. 2003].) Many new theatre suites include inbuilt music players, such as radios or docking stations, implying that music is played for the clinical staff, rather than the patient (Waddington 2006). The role of music in the OT has not gone unnoticed by the media. For example, background music is often played as surgeons operate in Scrubs a medical television series. In a recent news article, the BBC (Dec 12th 2014) published a ‘tongue-in-cheek’ playlist for the OT, as developed by Cardiff’s University Hospital of Wales: ‘Stayin’ Alive’ by The Bee Gees and ‘Smooth Operator’ by Sade were included.

Music is now routinely played. In a recent BMJ Christmas Editorial, Bosanquet et al. (2014) noted that many surgeons have adopted music as part of their daily practice and also surveys have indicated this: Hawksworth et al. (1997) reported that 72% (n = 104) of consultant anaesthetists in the UK heard music in the OT on a regular basis. In India, 53% (n = 53) of OT personnel reported that listening to music was commonplace during operations and nearly all had heard music being played at some point in the OT (George et al. 2011). In Israel, 63% (n = 108) of doctors and nurses reported hearing music played regularly in the OT (Ullmann et al. 2008). With such a high percentage of operations now being performed under these conditions globally, it is paramount that more studies examine whether music benefits or hinders the operative environment and if so, how.

Background

The impact of music is under-researched. Only 19 studies were found on music in an extensive search by the present authors. A total of 3829 citations were retrieved, 3827 citations from the electronic search and two from a reference list hand-search. After removal of duplicates and papers that did not meet the initial inclusion criteria, 45 articles remained. Application of the second screening criteria resulted in the inclusion of 19 studies and the exclusion of 26. Of these studies, 10 were cross-sectional (Hawksworth et al. 1997, Sarmany et al. 2006, Ullmann et al. 2008, Makama et al. 2010, Zienaly et al. 2010, George et al. 2011, Chen et al. 2012, Kumar et al. 2013, Lee et al. 2013, Way et al. 2013) four laboratory-based experiment (Allen & Blascovich 1994, Conrad et al. 2010, 2012, Siu...
et al. 2010), four laboratory-based experiment and survey (Hawksworth et al. 1998, Moorthy et al. 2004, Sanderson et al. 2005, Puyter et al. 2010) and one randomised controlled trial (Miskovic et al. 2008). A variety of theatre staff healthcare professionals were observed across studies, with surgeons dominating. The combined studies included a minimum of 1874 research participants, between the ages of 25-76. Studies were undertaken across the globe including low, middle and high-income countries, with the majority being from the USA, followed by the UK and India. These studies mainly focused on surgeons’ performance during skills-based tasks in simulated settings. For example, Allen and Blascovich (1994) studied the effects of surgeon-selected and experimenter-selected music on performance and autonomic responses of surgeons during a standard laboratory psychological stressor. They found that speed and accuracy was better in surgeon-selected music than experimenter-selected and no music ($P < 0.0001$) therefore suggesting the importance of individual taste and selection of music. However, the other members of surgical teams, such as nurses, have received less attention with respect to music.


A divide in opinion exists whether music is to be considered as distractive noise. Ullmann et al. (2008) argue that music can have a calming impact on teamwork and is therefore different from other noise considered irritating. Indeed, Bosanquet et al. (2014) feel that the best musical choices must resonate with the theatre environment. In casual conversations and interviews, many surgeons express being in favour of music in the OT. One consultant surgeon highlighted the importance of music in ‘masking white noise and people talking’ in the theatre (personal Dictaphone recorded communication, 7th November 2013). Surgeons playing music often report doing so to relieve stress, reduce white noise and enhance performance and concentration during surgical procedures (Conrad et al. 2010, Wong et al. 2010, Vouhe 2011).

Staff experience music differently: what is relaxing for some might be antagonising for others. In some studies, anaesthetists and nurses have reported less desirable impact of music, notably impaired communication, conflict with rhythmic signals from monitoring equipment, pushing noise limit boundaries and decreasing auditory process functioning (Hawksworth et al. 1997, Nott 1999, Riley 2006, Hasfeldt et al. 2010, Moris & Linos 2012, Way et al. 2013). Indeed, one systematic review showed that music facilitated higher speed and accuracy for surgeons, but reduced the ability to cooperate and coordinate for the rest of the surgical team, being ultimately distracting (Moris & Linos 2012). This indicates that music can have a negative impact on teamwork, therefore raising legitimate questions about its link with the quality and safety of patient care.

To date, no guidance or policies exist on playing music during surgical operations (personal communication, Royal College of Surgeons of England (RCS) (personal communication, 4th October 2013) Royal College of Nurses (RCN) (personal communication, 7th October 2013), Royal College of Anesthetists (RCA) (personal communication, 10th October 2013). In casual conversations, nurses often express mixed feelings about music played in the OT, with some being outright against it (personal Dictaphone recorded communication, 7th & 9th November & 12th December 2013). There appears to be little negotiation in individual teams about playing music, although some might find it hinders their work. Clearly, many members of surgical teams, who do not want music playing, often have it imposed on them (Hawksworth et al. 1997), as formal negotiations are not currently taking place.

Previous interview and survey studies have been useful for providing insight into reasons why music is so often played in the OT. However, the focus has been mainly on surgeons’ experiences (also evident in Bosanquet et al.’s 2014 Editorial) and less is known about how music impacts the work of nurses. One limitation of the self-report method is the over-reliance on participants’ recollections, opinions and narratives constructed in an interview context. In the same way, the performance-measuring studies conducted in simulated contexts provide a limited access to the lived ‘here-and-now’ experience as music is played in the actual OT during real operations. Ethnographic observation, including video recording, provides an alternative...
approach to study teamwork and how music might impact communication. Yet, observational studies using video in the OT environment have been relatively scant and only a few have been ever published in health care (as opposed to social science) journals (Weldon et al. 2013).

Video provides access to the events less often documented in interview-based accounts, for instance, whether music has an impact on nurses working in the OT in real time. The present paper draws on a recent ethnographic project exploring teamwork in the OT’s of a London teaching hospital. Video recordings were central to the study design, to understand collaborative work in OT teams as organised through verbal and nonverbal interactions. Music was routinely (but not always) played during the operations observed, indicating a fairly salient feature of the theatre environment. To understand the extent and the detail of the impact music had on communication between nurses and surgeons, we examined and compared operations where music was either played or not played at all.

The study

Aims

This study aims to explore whether playing music during surgical operations have an impact on communication. We aim to objectively observe problematic instances of communication and to identify if music plays a role in these issues and if so, to what extent and how.

Design

An exploratory observational study using ethnographic observation and video recording was conducted of the operating theatres of a London teaching hospital. Data analysis used quantitative (statistical) and qualitative approaches (interactional analysis) [see Data analysis].

Sample/participants

The sample consisted of thirteen laparoscopic operations, total duration 1296 minutes (21 hours 6 minutes); and seven open operations; duration of 773 minutes (12 hours 8 minutes). The operations were a mixture of general, upper GI and bariatric surgery across two hospital sites. The cases were recorded at random through opportunistic sampling and included fourteen cases (70%) that had music playing (at some point during the operation) and six (30%) that did not have any music playing. The music cases consisted of two different surgeons undertaking surgery across two different sites and the non-music cases also consisted of two different surgeons operating across both sites. One surgeon was included in both music and non-music playing cases. In total, 34 hours and 48 minutes of video data were analysed.

Data collection

Data collection proceeded as previously reported in Korkiakangas et al. (2014): Video recordings of 20 operations were conducted over 6 months during 2012–2013 in two theatres, representing a mixture of open and laparoscopic procedures. In total, the data corpus involved over 69 hours of video recordings of four consultant surgeons (attending surgeons), five registrar surgeons (resident surgeons), five scrub nurses, six circulating nurses, four consultant anaesthetists and five Operating Department Practitioners (ODPs). The two researchers, who jointly observed operations, recorded data with two tripod-mounted wide-angle HD Sony camcorders. The cameras were positioned so as to capture different viewpoints of the theatre. Two inconspicuous RevoLabs xTab wireless microphones were used when the camcorder microphones alone were not sufficient for audio recording. However, these microphones were only required for surgeons and scrub nurses (under sterile gowns) to better capture their spoken interactions when wearing masks.

Ethical considerations

The project was granted NHS Research Ethics Committee approval, and a Site Specific Assessment (SSA) approval at the participating NHS Trust. All study participants have given informed consent. Operating theatre professionals were recruited from a UK teaching health institution. Surgeons working in the institution were opportunistically approached about participation in the observational study examining teamwork. Once consent was gained, two researchers (a social interaction researcher and a research nurse) commenced a period of observation in the OT’s, liaising with the appropriate surgeons, nurses and theatre managers beforehand. Theatre nurses, anaesthetists and operating department practitioners (ODP’s) were opportunistically selected and consented, depending on who was working in the selected theatre that day. The researchers spent a month (pre-video-recording) observing operations during which they familiarised themselves with the theatre staff and schedules. Video recording was gradually introduced into the observational period with informed consent of each team member and visitor in the theatre.
Data analysis

Data analysis involved quantitative and qualitative approaches to examine the video data. Both approaches were deemed necessary to fully answer the research question about the extent and the detail of the impact music had on communication. The quantitative component, influenced by content analysis, began with a careful review of the video recordings, documenting interactional events of nurses, surgeons and anaesthetists (e.g. request, question, repetition, response [verbal or nonverbal], other bodily actions) in a log table. The video recorded operations were played from start to finish and the interactional events were systematically logged and time coded using InqScribe software (InqScribe 2012). Each logged event was also coded for whether music was playing or not during the event (e.g. when a request was issued). This allowed for examination of how music was associated with certain types of interactional events, such as repetitions of earlier requests. All logged requests and repeated requests (cases) were subtracted from the data in association with whether music was playing or not (exposure). A chi-square test was performed in STATA (2011) version 12.1 to analyse whether there was a difference between the frequency of repeated requests when music was playing and when music was not playing.

The qualitative component was used to examine the logged events in detail. The aim of interactional analysis, drawing on the techniques of Conversation Analysis (CA, Schegloff 2007), is to describe in detail the actions that people perform through different forms of conduct, such as speech, gesture and gaze. These are represented with transcriptions from the original video data. Interactional analysis renders visible what people say and do and where in the organisation of their interactions problems emerge. For example, the majority of communication events between surgeons and nurses are organised around a request–response sequence: surgeons request something (e.g. an instrument or supplies) and nurses respond to these requests. In interactional terms, requests are ‘initiating actions’ that make ‘responsive actions’ relevant (Schegloff 2007). If a response is delayed or missing altogether, this is oriented to and interpreted as an interactional trouble and often results in reparative actions, such as repeating what was said earlier. Through logging each request, response, absent response and repeated request, alongside the playing of music, it was possible to build a detailed picture of how music can impact on interactions in the OT.

The noise levels of the interactional fragments were measured by Orban Loudness Meter Technology (Orban 2008–2012) (a software). These were used to provide a visual illustration of how noise levels rise with music in the OT and are to be considered indicative only.

Validity and reliability/rigour

Reliability of the quantitative component was ensured by cross checking the data logs. Three researchers were involved in the data logging. The first case was logged together to ensure consistency and all researchers checked each other’s case logs to further ensure the consistency of the extracted data. A consensus on discrepancies was reached through discussion.

Rigor of the qualitative component was achieved through detailed transcription of the logged events. This ensured that interpretations were grounded in the data and produced a degree of transparency in the interactional analysis conducted. Transcribing the actual events (i.e. spoken and bodily actions) attends to details that might otherwise escape an observer’s attention and enables third parties to have access to these and check the interpretations made. The examples were also checked with members of the nursing and surgical community in the research site and beyond.

Results

Quantitative analysis of music and communication

A total of 5303 request/response observations were made from 20 operations. Of these observations there were a total of 69 repeated requests, six of which were from cases that had no music played at all and 63 were from cases that had music playing.

Table 1 displays the numbers of repeated requests for music and non-music playing cases, alongside their proportions, the risk difference and its confidence intervals and the P value. This was calculated using a chi-square test; $P < 0.0001$ provides strong evidence that playing music in the operating theatre during procedures is associated with

<table>
<thead>
<tr>
<th>No. of repeated requests with music playing (%)</th>
<th>No. of repeated requests with no music playing (%)</th>
<th>Risk difference % (95% CI)</th>
<th>2-sided P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>63/3585 (1.7%)</td>
<td>6/1649 (0.3%)</td>
<td>1.4% (0.008, 0.2)</td>
<td>$P &lt; 0.0001^*$</td>
</tr>
</tbody>
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*A $\chi^2$ test was the statistical test performed.*
significantly more repeated requests (5X) between team members than when there is no music. Neither confidence intervals overlap, suggesting a real difference in the effect of playing music in the operating theatre vs. not playing music (Figure 1). The risk difference (1.4% – CI’s 0.008, 0.2) reveals that this difference is highly significant and unlikely to be due to chance.

Analysis of documented repeated requests revealed an increase per repeat to operation time of 4–68 seconds and showed evidence of increased tensions due to frustration at ineffective communication. This was investigated in more detail using interactional analysis.

**Interactional analysis**

Five interactional examples collated in Table 2 illustrate how music impacted on the interactions between surgeons and nurses. In Figures 2 and 3, the Orban noise level recordings were taken during the same case. The following audio recordings provide a sensory demonstration of the difference in interactions when music was and was not playing (Audio Supplemental Digital Content S1, S2 and S3). All three recordings are taken from the same microphone video camera, positioned in the same place during one operation. Audio Supplemental Digital Content S1 is a clip at the beginning of the operation when music was not playing. Audio Supplemental Digital Content S2 and S3 are taken from random different points during the operation when music was playing (Audio File S1; Audio File S2; Audio File S3).

The impact of loud music on communication seems to be clear: it hinders the nurses’ ability to hear the surgeon’s speech. When music masks the audibility of speech, it often results in the surgeons having to repeat themselves and consequently, it takes longer for nurses to respond with assistance.

**Discussion**

This study aimed to examine the extent and the detail with which music can impact on communication in the OT. A significant difference was found between the number of times a request was repeated when music was playing compared with when music was not playing. As more repetitions were needed in operations with music playing, this implies that music may be a barrier to effective communication. The detailed interactional analysis provided insight into how this was happening at the level of verbal interactions, showing that music forced nurses to prompt surgeons to repeat themselves, as their speech was masked under the music.

The importance of hearing colleagues’ speech has been highlighted in previous studies on noise and distractions in the OT. In some cases, there have been serious implications for patient safety. For example, Beyea (2007) described a case where a surgeon requested the anaesthetist to order a spare unit of blood. The request was not heard above the noise levels and therefore never ordered, resulting in a critical safety error. Way et al. (2013) discuss how increased noise levels can result in different kinds of misunderstandings of information heard, for example, confusing medications with similar names, or hearing dosing levels incorrectly.

As new technologies, such as iPods, are regularly used in theatres, these bring specific issues with respect to controlling noise levels. Music played on iPods is not always calibrated and therefore the loudness can change rapidly from song to song. Our observations suggested that team members often increased the volume when a song was particularly liked. When music was very loud (as judged by the research team), communication was clearly disrupted (as noted by the team members themselves). Sometimes it took a while to reduce the volume on the sound system, for instance, when a nurse was trying to find the volume control on an anaesthetist’s iPod. Such delays in minimising noise and rapid changes in volume can become critical for safety, especially during emergencies when hearing and speaking clearly are paramount.

Although some perceive music as a pleasant addition to the OT (Bosanquet et al. 2014), not everyone in surgical
Table 2 Interactional analysis of communication and music in the OT.

**EXAMPLE 1** [Case 6]. In the OT, the clinicians’ focus of attention varies continually. For example, a scrub nurse can be attending to several concerns while assisting a surgeon (e.g. relaying with a circulating nurse; preparing instruments; writing specimen labels). Here the scrub nurse’s gaze was momentarily withdrawn from following the surgeon and the procedure at the moment the surgeon requested a swab. The consultant surgeon was operating, standing side-by-side with a surgical trainee assisting him.

[00:29:53:09] Consultant surgeon: ‘Swab please’ [Retracts camera; gazes at camera]
[00:29:58:10] Scrub nurse: [Writing; shifts gaze to CN] ‘Swab with water (inaudible)?’
[00:29:59:15] [Consultant surgeon reaches for a swab on trolley]
[00:30:01:23] Consultant surgeon: ‘Yeah, that’s what I want. A swab not swap’ [Cleans camera]

The scrub nurse was orienting to the instrument trolley and writing a specimen label with a sterile pen. She failed to notice that the consultant retracted a camera from the patient’s abdomen. The consultant then issued a request (‘Swab please’) while maintaining his gaze at the camera retracted. A short while later, the nurse shifted her gaze from the specimen label to the consultant, apparently noticing that the consultant had wanted. During this stretch of interaction, music was playing loudly in the background. The nurse’s clarification request suggests that she did not hear the consultant properly. The way she gazed at the consultant for a moment indicated her ‘figuring out’ whether the consultant had actually spoken to her (and not to the surgical trainee) before explicitly seeking clarification.

The loudness level was captured using Orban software for illustrative purposes, see Figures 2 and 3. Figure 2 shows a measurement taken from the theatre when no music was playing. Figure 3 shows the measurement taken at the moment the consultant uttered, ‘Swab please’. It is possible that due to loud music the nurse did not fully hear whether the consultant only wanted a (dry) swab or a wet swab (‘swab with water’). It is also possible that the music interfered with her overall ability to concentrate on multitasking and attend to the consultant’s speech.

**EXAMPLE 2** [Case 6]. Our confidence about the distracting impact of music is underscored by the events that followed the request for a swab. A short while later with the same song playing, the consultant asked for a stack to be moved closer.

[00:30:22:12] Consultant surgeon: ‘I may need someone to bring the thing closer. The stack.’
[00:30:26:02] Scrub nurse: ‘The what?’ [Leans towards Consultant]
[00:30:30:00] [Scrub nurse shifts gaze towards the stack, then starts sorting out wires]

It takes approximately four seconds for the scrub nurse to respond to the request; however, her response is to ask for clarification (‘the what?’) rather than to move the stack. That is, the nurse had heard that a request for something was issued (as indicated by the formulation, ‘the what?’), but not quite what it was. ‘What’ is a routine way to initiate repair in interactions when facing problems of hearing or understanding. Here the issue seems to be of audibility: As the nurse utters ‘the what?’ she simultaneously leans her upper body in and towards the consultant so as to embody her problems of hearing him.

**EXAMPLE 3** [Case 6]. The scrub nurse was not the only colleague who had difficulties hearing the consultant’s speech with the loud music on. The following interaction occurred approximately one second after the request for moving the stack. Here the consultant issues a request for a laparoscopic photograph to be taken of an image on the screen.

[00:31:24:00] Consultant surgeon ‘Can someone take a still image’ [Gazes at a monitor] [Circulator walks past the operating table]
[00:31:25:09] [Circulator turns around, walks up to Consultant, leans in]
[00:31:26:16] Consultant surgeon: ‘Can someone take a photograph please.’
[00:31:28:19] Circulator: ‘Yeah’ [Walks off to computer]

As the consultant called, ‘Can someone take a still image’, a circulating nurse walking past the operating table turned around as she heard the consultant speaking. Rather than walking up to the computer and taking the requested still image, she walked up to the consultant and leaned in with her ear up so as to prompt him to repeat; she had not heard what the consultant asked. As a response to her bodily gesture the consultant repeated himself and only then did the nurse acknowledge hearing him (‘Yeah’).

**EXAMPLE 4** [Case 6]. Sometimes music was directly addressed by team members. During this operation, the anaesthetist misinterpreted the beat of the music for the patients pulse:

[00:47:33:12] Anaesthetist: ‘Whatever you are doing [Consultant’s name], it’s very painful’.
[00:47:45:01] Consultant surgeon: ‘I’m not doing anything’.
[00:47:52:04] Anaesthetist: ‘Heartbeat at this part of the bone? (— a lot) Or was that music? Sorry, it’s the music.’

However loud and whatever type of music (e.g. heavy bass beat) was playing, it was rarely turned down.

**EXAMPLE 5** [Case 1]. In this example, the anaesthetist turned the music up on the sound system just as the surgeon started closing and the scrub nurse and a circulator were recommencing the final swab count. The scrub nurse turned around:

[00:44:46:23] Scrub nurse: ‘Can you turn the volume down, I’m doing the count’. This direct request to turn down the music highlights how music can become a distraction, permeating the room even during critical tasks, such as swab counts.
teams may share this view. The present findings of real-time practice indicated that nurses, in particular, were at the ‘receiving end’ of disrupted communication when they were unable to hear surgeon’s requests directed to them. This implies that music can become not only a distraction but also a strain for the nurses working in the OT. Whether music should be played during operations – and, if so, what type of music, at what volume and when – was seldom the subject of negotiation in our research site. Usually these decisions were made by the senior medical members of the team (most frequently the surgeons and sometimes the anaesthetists), with the views of nurses, ODPs, registrars, students and others receiving less, if any, attention.

Yet, the potential dangers of instructions going unnoticed or being misheard, the implications of avoidable noise on team members with hearing or attentional problems and the possibility that music is perceived by some as an irksome distraction rather than a relaxing mood enhancer, point to an urgent need to address music at practical and policy level. The study recommends frank discussions with team members and clinical managers about playing music during operations. The ‘time-out’ period during the WHO Surgical Safety Checklist could provide an excellent opportunity for staff to voice concerns about music and to disclose possible hard-of-hearing or sound sensitivity problems that might accentuate with music playing. If music will be
played, teams should ensure that the music does not over-ride the sensory environment but remains at a low volume in the background to create an enjoyable working environment for all. Indeed, surgeons such as Bosanquet et al. (2014) acknowledge the importance of ‘[reaching] a (preferably harmonious) consensus’ (p. 2) in each theatre when music is played.

The present study raises concerns on behalf of the nursing community. However, we also wish to draw attention to the patient community and the general public, who are perhaps receiving a one-sided media portrayal about surgical teams always working like ‘smooth operators’ under relaxing music. In reality, the music played in the OT ranges from classical to heavy metal, depending on personal preferences. In the operations we observed, dance music and drum and bass were often played fairly loudly, whilst patients were anaesthetized. Music played during awake surgery is likely to be different when music is played to relax the patient. However, if music can become distracting even during one operation, it is one too many and awareness has to be raised among clinical managers but also the general public who are cared for under these circumstances. Leape (1997) reminds that ‘most errors result from defects in the systems in which we work’ (p. 213). Knowing that music can complicate verbal interactions, it is imperative that policies are put in place to monitor how music is played behind the close doors of the OT.

Limitations

This was an exploratory study and therefore randomised controlled trial conditions and blinding were not possible. However, the approach used revealed real-time issues that may not have been identified in such conditions. We were limited with respect to the number of operations (n = 20) we could video record at the research site. However, the ratio of music playing in the sample was consistent with the estimate provided in literature that music is played in 53-72% of surgical operations performed (Hawksworth et al. 1997, Ullmann et al. 2008, George et al. 2011).

Conclusion

This study has identified serious patient safety issues that cannot be ignored. Regardless of whether music can increase surgeons’ concentration and mask extraneous noise (Siu et al. 2010), anything that might impair team communication might place patients safety in jeopardy. Further research is needed to gain a better understanding of the effect music has on team communication and how to develop the policies and guidance needed. Any factor potentially affecting patient safety should be taken seriously and this study among several others suggests that music could impact safety through ineffective communication, increased operative time and at times unacceptable noise conditions. Playing music during surgery could be easily negotiated at the start of every case, forming part of each operation’s routine checklist.

The paper draws attention to a timely issue in surgical practice. We recommend that nurses join the discussion and debate around this topic that is currently heavily represented by the views of surgeons. It is important that the discussion is taken seriously so as to ensure that a ‘tolerance of stylistic practices’ (Leape 1997, p. 213) in the healthcare system, such as playing loud music in the OT, does not hamper communication during surgical care.

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Conflict of interest

The authors declare no conflict of interest.

Author contributions

All authors have agreed on the final version and meet at least one of the following criteria [recommended by the ICMJE (http://www.icmje.org/recommendations/)]:

- substantial contributions to conception and design, acquisition of data or analysis and interpretation of data;
- drafting the article or revising it critically for important intellectual content.

Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher’s web-site.
Audio S1. Audio of working operating theatre with no music

Audio S2. Audio of working operating theatre with music (Same operation and camera position)

Audio S3. Audio of working operating theatre with music (Same operation and camera position)

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