KEYWORDS: MUSIC / OPERATING ROOMS / ATTITUDE OF HEALTH PERSONNEL / TASK PERFORMANCE AND ANALYSIS / EFFICIENCY

LISTEN WHILE YOU WORK?

The Attitude of Healthcare Professionals to Music in the OR

AUTHORS:

Adnan Abdilmajeed Faraj FRCS (Orth) Consultant Orthopaedic Surgeon, Airedale NHS Trust, Keighley, UK.

P. Wright Specialist Registrar in Trauma and Orthopaedics, The Yorkshire Deanery, University of Leeds, UK.

J.H.S. Haneef, Senior House Officer in Trauma and Orthopaedics, Airedale NHS Trust, Keighley, UK

Adrian Jones RGN, ENB 176/998, Cert SCP Surgical Care Practitioner, Orthopaedic Department, Norfolk & Norwich University Hospital, Colney Lane, Norwich, UK.

No competing interests declared

ABSTRACT

Although the playing of music is commonplace in the operating theatre, there is nothing in the literature examining whether staff feel this is beneficial. Questionnaires were distributed amongst a random selection of staff in practice at a district general hospital: medical staff from a range of surgical specialities, anaesthetists, and all grades of perioperative staff (nurse/operating department practitioners/healthcare assistants) were encouraged to participate.

There were 121 health professionals in total working in the operating theatres. The authors compared the responses to each question amongst the respondents, to check for the tendency to correlate. Out of the 52 health professionals who responded, 36 stated that music is played in their theatre either every day, or two to three times a week. Only five respondents felt that this was too often. Fifteen percent of medical staff were of the opinion that the nursing staff controlled the choice of music. Nursing staff were almost evenly split in thinking that nursing staff, surgical staff and the whole theatre team controlled the choice of music. The majority of both nursing and medical staff felt that they enjoyed their work more and performed better when music was played in theatre. The study concluded that the majority of theatre staff found listening to music while they work a positive experience. The potential for music to have a distracting or detrimental effect on a minority of individuals should always be considered.

INTRODUCTION:

Music has historically been an integral part of the workplace environment. Songs, now known as folk songs, were sung by the people doing the work and told stories of work (Korczynski 2003). Often these songs were functional in that they could set the pace and rhythm of work. A labourer would scythe to the rhythm of the song being sung. At sea, the type of shanty being sung would change according to the task being performed by the singer. It is only relatively recently that music has been a less prominent feature in the workplace.

Music has historically been an integral part of the workplace environment.

This study was designed to explore the practice of listening to music during work in the operating theatres.

Studies on the effect of music in surgery have focused, almost exclusively, on its actions on the patient: preoperatively as an anxiolytic (Winter et al 1994, Robb et al 1995) and intra and postoperatively as an adjunct to analgesia (Nilsson et al 2005).

Although the opinion of anaesthetic, surgical, perioperative staff and patients on the role of music in theatre has been previously reported (Hawksworth et al 1997, Oliver 1999, Makama et al 2010), to our knowledge this is the first survey to address the opinions and concerns of the whole theatre team. Personnel working in the operating theatre have a variety of ages, academic and professional backgrounds and participate in a diverse range of roles and responsibilities within the team. It seems unlikely, therefore, that such a heterogeneous team would have homogeneous views on if, how often and what kind of music should be played whilst they work. The aim of this study was to canvass their views on the current practice of playing music in theatre.

METHODOLOGY:

This study was designed to explore the practice of listening to music during work in the operating theatres. In order to obtain an overall view of the team including medical and nursing staff, both sets of professionals were included in the survey. The researchers were orthopaedic surgeons, however, the study involved different surgical specialities, who were randomly selected. The study was conducted in Airedale NHS Foundation Trust hospital. Ethical approval was obtained.

A questionnaire (Appendix 1) was composed of fourteen questions, which were designed and developed in-house by members of orthopaedic department. The first author designed the questionnaire after reviewing papers written on the topic (Allen & Blascovich 1994, Winter et al 1994). There was no conflict of interest, this however was not validated before the study. The questionnaires were circulated to all 121 perioperative and medical staff who worked within the operating theatre department of a small district general hospital, which included five operating theatres.

Survey questions addressed the individuals' opinions on:

- how often music is and should be played,
- whether medical, surgical or perioperative team members (scrub or circulating practitioners) or any others should control its use, and
- what effect music has on the whole team and their practice environment – the operating theatre.

The survey questions were closed ended with ordered response categories as described by Dilman (Dilman 2000). Questionnaires were distributed via medical secretaries to the medical staff, and in person to the perioperative staff.

Completed responses were anonymous, and collected via the hospital's internal mail. The questionnaires were analysed. The responses to each question were compared amongst the respondents, to check for the tendency. This was then correlated with the professions and other confounding factors, in order to be able to draw conclusions. Follow up of non-responders was not performed.

RESULTS:

There were 52 respondents (58% response rate).Thirty three (63.5%) of the respondents were medical staff and 19 (36.5%) were perioperative staff. The distribution of medical specialties and nonmedical roles is shown in Table 1.

Amongst the medical staff there were 12 consultants, 10 specialist registrars, 11 senior house officers (SHOs) and one clinical observer.

The thirty three health professionals reported that, in their experience, music was played in theatre either every day, or two to three times a week. Five

members of the medical staff felt that music should be played less often, although this represented only 17% of medical respondents and 10% of all respondents (Figure 1).

Fifteen of the medical staff were of the opinion that the choice of music was controlled by non-medical staff (Figure 2). In contrast, the nursing staff were divided in that five (24.2%) felt that the operating surgeon controlled the music, seven (36.8%) felt that it was the nursing staff and six (31.6%) thought that the whole theatre team made the decision.

With regard to who should be in control, 15 (45.5%) of medical staff felt it should be the surgeon, 10 (57.9%) of nursing staff felt the decision should be shared between all theatre staff (Figure 3). A minority of respondents chose the response 'other' for who does or should control music but declined to provide further details.

Overall both medical and nursing staff had a positive opinion of music in theatre.

Both medical and nursing staff (78.9% and 66.7% respectively) enjoyed their work more when music was played (Figure 4). Only 27% of respondents found music distracting, especially when the stage of the procedure being performed was at its critical stage or when the staff were undertaking tasks that required focus and a quiet environment e.g. swab and instrument counts (AfPP 2011), undertaking surgical safety checklist (WHO 2009) or during anaesthetic or surgical emergencies (Oliver 1999).

Eight (42.1%) nursing staff members felt that music had no negative influence on their performance, and that in contrast it had a positive effect. Seventeen (52.9%) of medical staff felt that it had a positive influence (Figure 5). Sixty six percent of medical and 57% of nursing staff either strongly or slightly agreed that the theatre team performed better when music was played. Most respondents (63%) felt that music had the potential to increase the total volume of background theatre noise, and 17 (51%) of medical staff felt that workers would be more likely to discuss non-work related matters. This compared with 39% of nursing staff. Only one nursing respondent (5%) felt that music would increase the chances

Table 1 Demographics of respondents

Staff Type	Number of respondents	Percentage of the total number of questionnaires returned
Surgeon (27)		52
Orthopedic	14	14
General surgery	6	6
Urology	1	1
Gynaecology	5	5
Unspecified	1	1
Anaesthetist	6	6
Nurses	8	8
Operating department practitioner	6	6
Healthcare assistant	5	5

Figure 1 Frequency of music played in the operating theatre

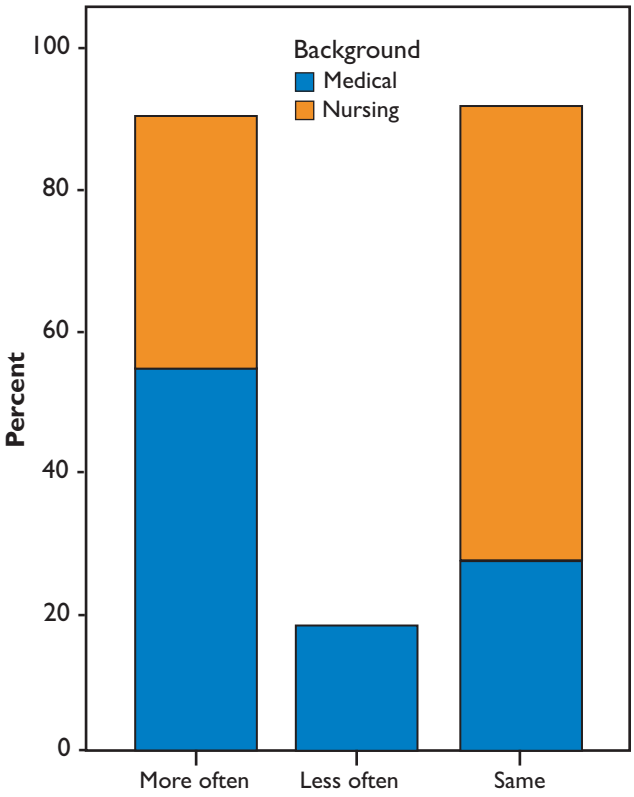
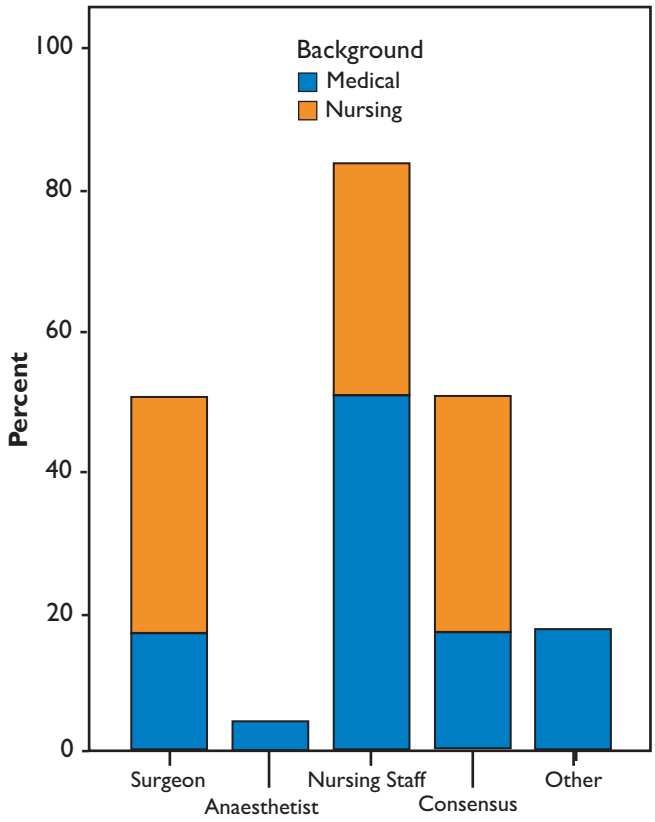


Figure 2 Who controls the choice of music?



of theatre lists overrunning, whereas 18% of medical staff felt that this was a risk.

DISCUSSION:

For the majority of staff in our operating theatre department, music was an almost ever-present part of their working day. The majority of our staff were satisfied with this, indeed a sizeable minority would like it played more often. One similar survey of theatre staff in Israel (Ullman et al 2008), found a 68% prevalence of music being played in operating theatre.

Performance:

The questionnaire used in the current paper enquired about the participant's perception of whether their performance had become better when music was played in the operating theatre. Seventy one percent of respondents in our study felt that music had a positive influence on efficiency in theatre. If music were to influence working patterns in theatre, it could do so by affecting:

- Morale i.e. an individual's enjoyment of work,
- Vigilance, by either distracting or improving concentration,
- Productivity,
- Stamina (Hawksworth et al 1997).

Morale

Our study demonstrates that music in theatre improves the morale of most staff, as 66% enjoyed their work more when music was played. This agrees with a study of workers in a computer servicing area which suggested that music improved the mood rating of workers, and that the effect was greatest when an attempt was made to match the music to their personal tastes (North & Hargreaves 2000). Music in the operating theatre can also have an anxiolytic effect for patients, however, the likes and dislikes of health professionals and patients are not similar. This has to be paid attention to.

Vigilance

One potential concern is that music in theatre may provide a distraction, and indeed 30% of respondents felt this was the case. Music has been found to affect driving-related tracking and vigilance tasks (Beh & Hirst 1999). Beh and Hirst (1999) reported that response time to centrally located visual signals was improved with both low and high intensity music. The effect of music volume has also been studied by measuring the response time to a randomly activated red light (Turner et al 1996). Participants responded most quickly when music was played at amplitude of 70 dBA rather than at higher or lower levels.

One laboratory based study looked at the response of surgeons to music (Allen & Blascovich 1994). They measured efficiency, accuracy, haemodynamic and autonomic responses. They demonstrated that surgeons performed better when listening to music of their own choosing than when music was chosen by

Figure 3 Who controls the choice of music?

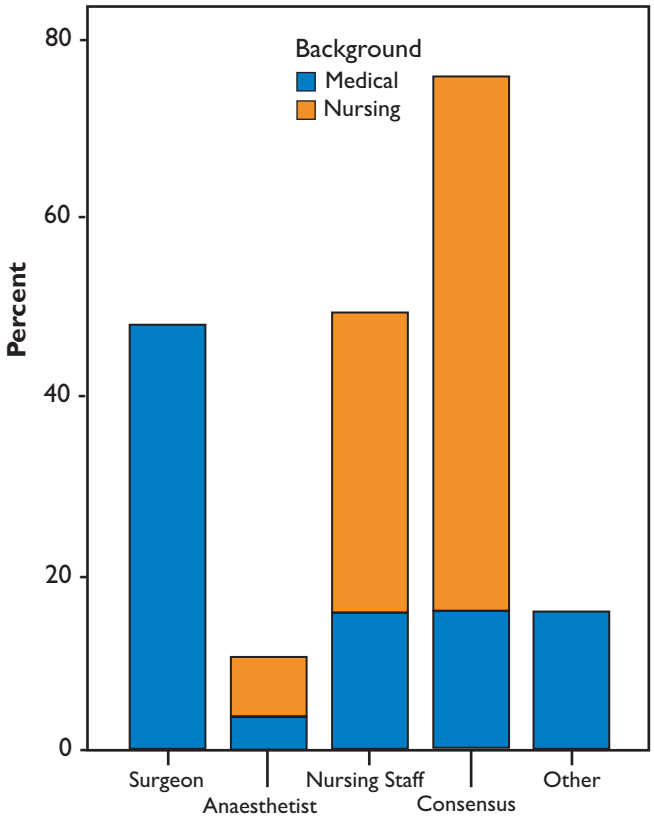
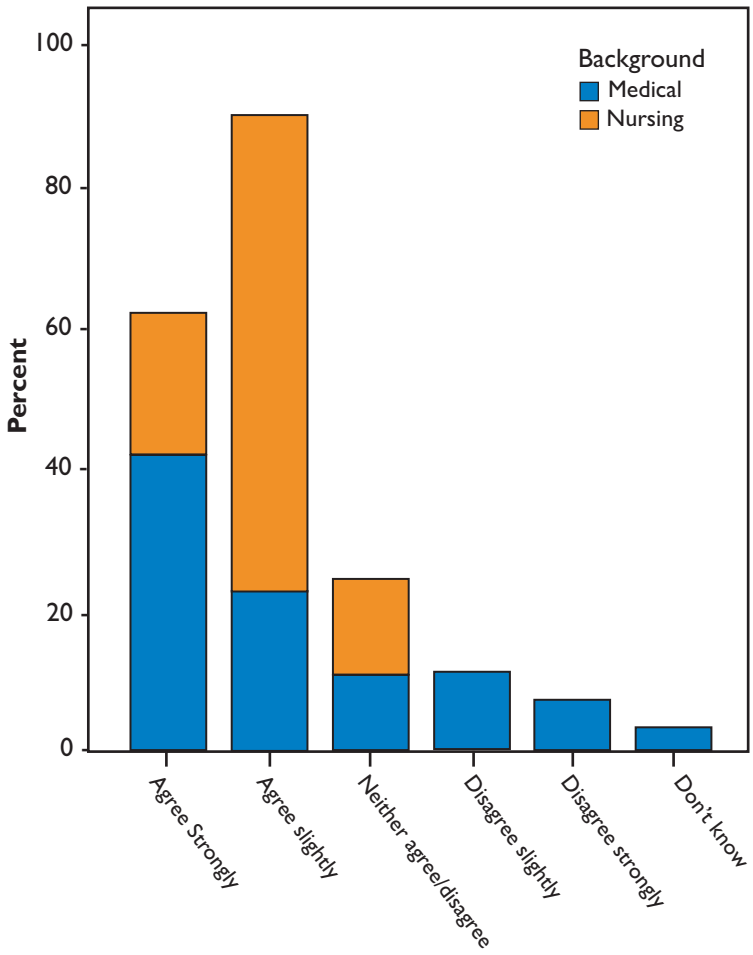


Figure 4 Is Music Distracting?



another; they also performed better when listening to any music than to no music at all. Woo (2013) suggests that: 'If there is no music playing in the background, it is as if there is a missing component of the 'time out' check list'. Woo believes that this could affect surgical performance.

Background music may affect the performance of certain cognitive tasks (Furnham & Bradley 1997). When testing a group of ten introverts and ten extroverts, music had a detrimental effect on immediate memory recall and reading comprehension. For the introvert group there was also a detrimental effect on delayed recall.

Productivity

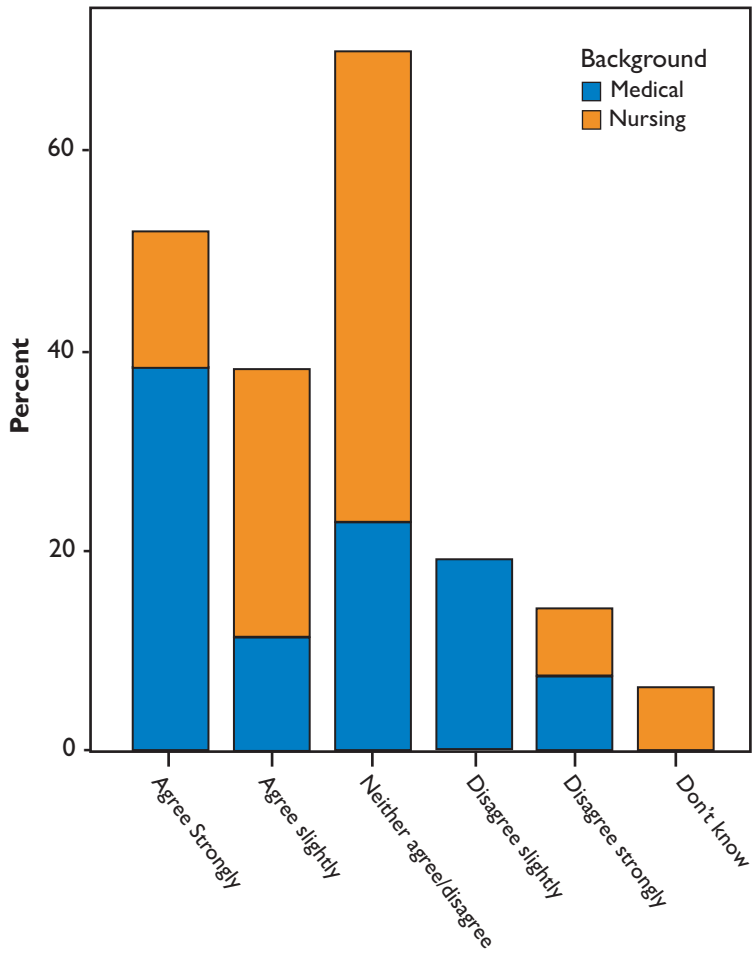
The productivity of theatre staff is difficult to measure objectively, although the likelihood of an elective or scheduled theatre list overrunning could be considered a marker of theatre efficiency. Very few staff questioned in our survey felt that music would reduce the chances of a theatre list overrunning.

In simple repetitive tasks, which may not be comparable to the work done in theatre, it has been shown that music may increase productivity. In a study for the Performing Rights Society, Hargreaves & North (1999) tested the notion that fast music would increase the productivity of workers in a voucher processing centre of a bank. They found that when music with a fast tempo was played, 22.3% more vouchers were processed than when slow music was played, and 12.5% more were processed than when no music was played.

Their results imply that slow music had a detrimental effect on productivity. When workers in a large retail office were provided with personal stereo headsets this had a positive effect not only on performance but it also improved employees' mood states (Oldham et al 1995). They noted that the positive effect was more pronounced on employees working on simple tasks than on those with more complex roles. The proposed explanation for this was that for those individuals performing monotonous, repetitive tasks, music counteracts boredom, whereas it is a distraction for those with more difficult jobs. The same principle may apply to the operating theatre, but which members of the team have the simplest and which the most complex jobs may be a contentious issue (Henley 2011).

It may of course be unreasonable to compare operating theatre conditions to

Figure 5 Is music a positive influence?



a bank or a factory. The outcome of a complex operation may rely on the slow meticulous work rather than a hasty procedure which may expose the patient to iatrogenic complications.

Stamina

Tasks performed in theatre are often physically intensive, and although not directly addressed in our survey, there is evidence that stamina may be increased by music (Anshel & Marisi 1978). It has been demonstrated that an individual's physical work capacity is increased when music is played. The effect is more pronounced in male participants.

Preference and Taste:

We have observed that the staff exhibited a wide variety of musical tastes. It may seem obvious that musical preferences differ between individuals or that some have a greater affinity for music overall.

Physiological evidence for this has been provided by studies comparing music and biology students (Vanderark & Ely 1992, 1993). Plasma cortisol and noradrenaline levels and galvanic skin responses were measured in groups of music and biology students. They were exposed to two different music selections, one preferred (liked) by the music students and one disliked by the biology students. Cortisol and galvanic skin responses were significantly higher for the music majors than the biology majors.

Volume Considerations:

Respondents in our survey raised several important issues which should be considered when deciding on the musical environment in theatre. There was a concern among anaesthetic staff that music played at anything other than a low volume may interfere with their ability to hear and respond to monitoring alarms. This concern is supported by a survey of anaesthetists (Hawksworth et al 1997) which found that 26% of respondents felt that music reduced vigilance and 11% felt that it would impede response to anaesthetic alarms. Staff were also anxious that music should not obstruct effective verbal communication between members of the theatre team.

Although not addressed in this study, it is conceivable that there is a greater potential for music to have a detrimental effect if a theatre team has a greater need for communication. For example: if members of the team work together infrequently, if there are many junior members in the team, or if music in theatre would add to an already high level of background noise, as in orthopaedic theatres. It was also suggested that should one genre, artist or track dominate the choice of music, this may irritate those who would be otherwise favourably disposed towards music.

STUDY SUMMARY AND LIMITATIONS:

Our study suggests that most theatre staff find listening to music while they work a positive experience. This is subject to the caveat that all theatre team members should be involved in the choice of music and that should there be concern that music may adversely affect safe communication between staff, its use should be discontinued.

When interpreting these results it should be borne in mind that they are opinions collected from individual team members, not the opinion of the team as a whole. The performance of the team as a whole may be considered to be of paramount importance with respect to patient care. Accepting Oliver's (2009 p460) protocol 'If a compromise regarding choice cannot be reached, then no music should be played' avoids a detrimental effect on

The majority of theatre staff found listening to music while they work a positive experience.

just one member of the team that may outweigh any small, positive effect on other members.

Our study is limited in that responses are very much weighted towards medical staff. This may reflect that it is more reliable to distribute questionnaires via medical secretaries than by attempting to deliver them by hand to personnel in theatre. It may also indicate that the medical staff have a stronger opinion than perioperative staff. Unfortunately we do not know whether the non-respondents were medical or nursing staff, and this may have affected the conclusions obtained.

This study does not include the opinions of patients being cared for in the theatre complex, although music is not played in the anaesthetic rooms or post-anaesthetic recovery area and procedures performed under local anaesthesia are in the minority.

Most patients therefore would be unaware of music played in theatre. Our study has the drawback of not including larger numbers of nursing staff. However, there are some conclusions to draw.

CONCLUSION:

The majority of theatre staff found listening to music while they work a positive experience. The potential for music to have a distracting or detrimental effect on a minority of individuals should always be considered, as the climate of music provision through personal phones, intranet access and hospital wi-fi makes music even more accessible.

The different tastes of health professionals and patients have to be taken into consideration to ensure that those who do not like a particular kind of music are not made to feel uncomfortable. This can be prevented by enquiring about individual taste and by providing options.

Further study comparing theatre productivity and adverse events between theatres where music is or is not played may add weight to the purported positive effects of music on the performance of healthcare workers. Future studies should include larger numbers of health professionals working in different specialities in order to answer specific questions.

All members of the perioperative team should ensure that future use of music in the operating theatre environment should not compromise or distract their ability to ensure safe surgical outcomes for the patients in their care (AORN 2104).

REFERENCES:

Allen K, Blascovich J 1994 Effects of music on cardiovascular reactivity among surgeons *Journal of the American Medical Association* 272 (11) 882-4

Anshel MH, Marisi DQ 1978 Effect of music and rhythm on physical performance *Research Quarterly* 49 (2) 109-13

Association for Perioperative Practice 2011 *Standards and recommendations for safe perioperative practice* Harrogate, AfPP

Association of periOperative Registered Nurses 2014 AORN position statement on managing distractions and noise during perioperative patient care *AORN Journal* 99 (1) 22-26

Beh HC, Hirst R 1999 Performance on driving related tasks during music *Ergonomics* 42 (8) 1087-98

Dillman D 2000 *Mail and internet surveys: the tailored design method* New York, Wiley

Furnham A, Bradley A 1997 Music while you work: The differential distraction of background music on the cognitive test performance of introverts and extroverts *Applied Cognitive Psychology* 11 445-55

Hargreaves DJ, North AC 1999 The functions of music in everyday life: redefining the social in music psychology *Psychology of Music* 27 (1) 71-83

Hawksworth C, Asbury AJ, Millar K 1997 Music in theatre: not so harmonious. A survey of attitudes to music played in the operating theatre *Anaesthesia* 52 (1) 79-83

Henley J 2011 *Music for surgery* Available from: http://www.theguardian.com/lifeandstyle/2011/sep/26/music-for-surgery [Accessed July 2014]

Korczynski M 2003 Music at work: Towards a historical overview *Folk Music Journal* 8 (3) 314-34

Makama J, Ameh E, Equma S 2010 Music in the operating theatre: opinions of staff and patients of a Nigerian teaching hospital *African Health Sciences Journal* 10 (4) 386-89

Nilsson U, Unosson M, Rawal N 2005 Stress reduction and analgesia in patients exposed to calming music postoperatively: a randomized controlled trial *European Journal of Anaesthesiology* 22 (2) 96-102

North AC, Hargreaves DJ 2000 Musical preference during and after relaxation and exercise *American Journal of Psychology* 113 43-67

Oldham GR, Cummings A, Mishel LJ et al 1995 Listen while you work? Qasi-experimental relations between personal-stereo headset use and employee work responses Journal of *Applied Psychology* 80 (5) 547-64

Oliver J 1999 Music in theatres *British Journal of Theatre Nursing* 9 (10) 460-63

Robb SL, Nichols RJ, Rutan RL et al 1995 The effects of music assisted relaxation on preoperative anxiety *Journal of Music Therapy* XXXII (1) 2-21

Turner ML, Fernandez JE, Nelson K et al 1996 The effect of music amplitude on the reaction to unexpected visual events *Journal of General Psychology* 123 (1) 51-62

Ullmann Y, Fodor L, Schwarzberg I et al 2008 The sounds of music in the OR *Injury* 39 592-97

Vanderark SD, Ely D 1992 Biochemical and galvanic responses to music stimuli by college students in biology and music *Perceptual and Motor Skills* 74 (3:2) 1079-90

Vanderark SD, Ely D 1993 Cortical, biochemical and galvanic skin responses to music stimuli of different preference values by college students in biology and music *Perceptual and Motor Skills* 77 227-34

Winter MJ, Paskin S, Baker T 1994 Music reduces stress and anxiety of patients in the surgical holding area *Journal of Post Anaesthesia Nursing* 9 (6) 340-43

Woo H 2013 *No classical music in my operating room please* Available from: www.bjuinternational.com/bjui-blog/no-classicalmusic-in-my-operating-room-please/ [Accessed March 2014]

World Health Organisation 2009 *Surgical safety checklist* Available from: www.who.int/patientsafety/safesurgery/tools_resources/en/index.html [Accessed March 2014]

Reprinted from Journal of Perioperative Practice, Volume 24, Issue 9, 199-204. Listen while you work? The attitude of healthcare professionals to music in the operating theatre, AA Faraj, AP Wright, JHS Haneef and A Jones

ORNAC Standards pertaining to this article can be found in the Operating Room Nurses Association of Canada (ORNAC) (May 2013) Standards, Guidelines, and Position Statements for Perioperative Registered Nursing Practice (11th edition) Section 4, pg(s) 210 -211, Standard 4.3.

Appendix 1 Questionnaire circulated to theatre staff

1. **Position**
   Surgeon: consultant/associate specialist/StR/staff grade/SHO/PRHO
   Surgical specialty: general/urology/orthopaedics/obs & gynae
   Anaesthetist: consultant/associate specialist/StR/staff grade/SHO
   ODP/ODA
   Sister/staff nurse/HCA
   Other (please specify)

2. **Gender**
   Male/female

3. **How often is music played in the operating theatre?**
   Once a day or more/two or three times a week/rarely (less than once a month)/never

4. **How often do you feel music should be played in the operating theatre?**
   Once a day or more/two or three times a week/rarely (less than once a month)/never

5. **When music is played in the operating theatre, who usually controls it (the volume or the choice of music/radio station)?**
   Surgeon/anaesthetist/scrub nurse/ other theatre staff (please specify)

6. **Who should control it?**
   Surgeon/anaesthetist/scrub nurse/other theatre staff (please specify)

7. **Please rate how you feel about the following statements by circling the relevant response**

i) **I find music played in the operating theatre distracting:**
   Agree strongly Agree slightly Neither agree nor disagree Disagree slightly Disagree strongly Don't know

ii) **I feel I perform better when music is played in the operating theatre:**
   Agree strongly Agree slightly Neither agree nor disagree Disagree slightly Disagree strongly Don't know

iii) **I feel the overall performance of the theatre team is better when music is played:**
   Agree strongly Agree slightly Neither agree nor disagree Disagree slightly Disagree strongly Don't know

iv) **I enjoy my work more when music is played in the operating theatre:**
   Agree strongly Agree slightly Neither agree nor disagree Disagree slightly Disagree strongly Don't know

v) **Theatre lists are less likely to overrun if music is played in the operating theatre:**
   Agree strongly Agree slightly Neither agree nor disagree Disagree slightly Disagree strongly Don't know

vi) **When music is played in theatre, this is likely to increase the overall volume of background theatre noise:**
   Agree strongly Agree slightly Neither agree nor disagree Disagree slightly Disagree strongly Don't know

vii) **When music is played in theatre, staff members are more likely to discuss non-work related matters:**
   Agree strongly Agree slightly Neither agree nor disagree Disagree slightly Disagree strongly Don't know