



Effectiveness of background music for noises in hospital wards

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ABSTRACT

This study explored the effectiveness of background music for improving the sound environment in hospital wards. Participants were 21 female and 9 male Japanese college students. They were presented both noises in hospital wards and 10 kinds of music simultaneously and asked to evaluate the degree of annoyance and the degree of uncomfortableness of the sounds. Participants were also asked to rate both the degree of annoyance and the degree of uncomfortableness of noises when presented alone, and to rate them for each kind of music when presented without noises. It was found that participants were not particularly annoyed by the noises, but the noises made them feel uncomfortable. With respect to the music (for example, healing music and music with affective characteristics, such as elation, lightness, or affinity) presented with the noises, participants were not particularly annoyed by them and felt less uncomfortable than when the noises were presented alone. These results suggest that background music could be useful for improving the sound environment in hospital wards.

Keywords: Noises, Background music, Hospital wards
63.2

I-INCE Classification of Subjects Number(s):

1. INTRODUCTION

Understanding the problems in the design of hospital wards is essential for improving their sound environment ^[1-3]. One way in which medical professionals have attempted this is reducing noises in hospital wards ^[1, 4-5]. One of the more useful approaches for reducing noises in hospital wards is using background music, and this approach is effective in masking noises. However, how music affects the noises in hospital wards has not been examined systematically. In this study, we explored the effects of background music on noises in typical hospital wards, and examined the effectiveness of music for reducing discomfort associated with these noises.

2. METHOD

2.1 Participants

Participants were 21 female and 9 male Japanese college students (mean age = 21.87 years, $SD=3.38$, range = 19-33 years).

2.2 Stimuli

For the noises, we selected sounds commonly heard due to activity in a hospital ward. These sounds were: closing the cover of a mercury-type sphygmomanometer, moving a nursing cart, and drawing a curtain. The noises were recorded on campus in a nursing practice room that mimics an actual hospital room. Background music was selected from an assortment of CD-ROMs. We used 10 different music excerpts: Delibes's 'Coppelia Ballet Suite', Stolz's 'Adagio', Grieg's 'In the Hall of the Mountain King', Sibelius's 'The Swan of Tuonela', Handel's 'The Arrival of Queen of Shiba', Albinoni's 'Adagio', Chopin's 'Revolutionary', Anderson's 'PLINK, PLANK, PLUNK!', J.S. Bach's 'Air from Orchestral Suite No.3', and one excerpt from the 'Ultimate sleeping CD'. We chose 'Coppelia Ballet Suite' as music with positive and arousal affective characteristics, Stolz's

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‘Adagio’ as music with positive and non-arousal affective characteristics, ‘In the Hall of the Mountain King’ as music with negative and arousal affective characteristics, and ‘The Swan of Tuonela’ as music with negative and non-arousal affective characteristics [6]. We also chose ‘The Arrival of Queen of Shiba’ as music with elation, Albinoni’s ‘Adagio’ as depressive music, ‘Revolutionary’ as music with strength, ‘PLINK, PLANK, PLUNK!’ as music with lightness, ‘Air from Orchestral Suite No.3’ as music with affinity [7], and the excerpt from ‘Ultimate sleeping CD’ as healing music [8].

2.3 Measurement

We designed a questionnaire to assess the degrees of subjective annoyance and uncomfortableness for each sound. Both annoyance and uncomfortableness were measured using seven-point rating scales anchored by not annoying at all (1) and very annoying (7), and by very comfortable (1) and very uncomfortable (7).

2.4 Procedure

Participants were asked to listen to the noises (as a single stimulus) and ten music excerpts presented by speakers and to rate the degrees of annoyance and uncomfortableness for each of them. Moreover, the noise stimulus was combined with each music excerpt for 10 new stimuli. All sound stimuli were presented for 1 min, and participants rated annoyance and uncomfortableness for each stimulus after its presentation. Experiments were performed individually. The total experiment time for each participant was approximately 25 min.

3. RESULTS AND DISCUSSION

3.1 Annoyance and Uncomfortableness for the Noises and Music

The mean score of annoyance for the noises was 4.20 ($SD = 1.42$). The mean scores of annoyance for the noises and the music are shown in Figure 1. A one-way ANOVA with response type as a repeated measure factor revealed a significant main effect for the sounds [$F(10, 290) = 22.71$, $p < .01$]. Post-hoc tests indicated that the hospital noises were more annoying to the participants than Stolzel’s ‘Adagio’, ‘The Swan of Tuonela’, ‘The Arrival of Queen of Shiba’, Albinoni’s ‘Adagio’, ‘PLINK, PLANK, PLUNK!’, ‘Air from Orchestral Suite No.3’, and ‘Ultimate sleeping CD’ ($Mse = 1.05$, $p < .05$).

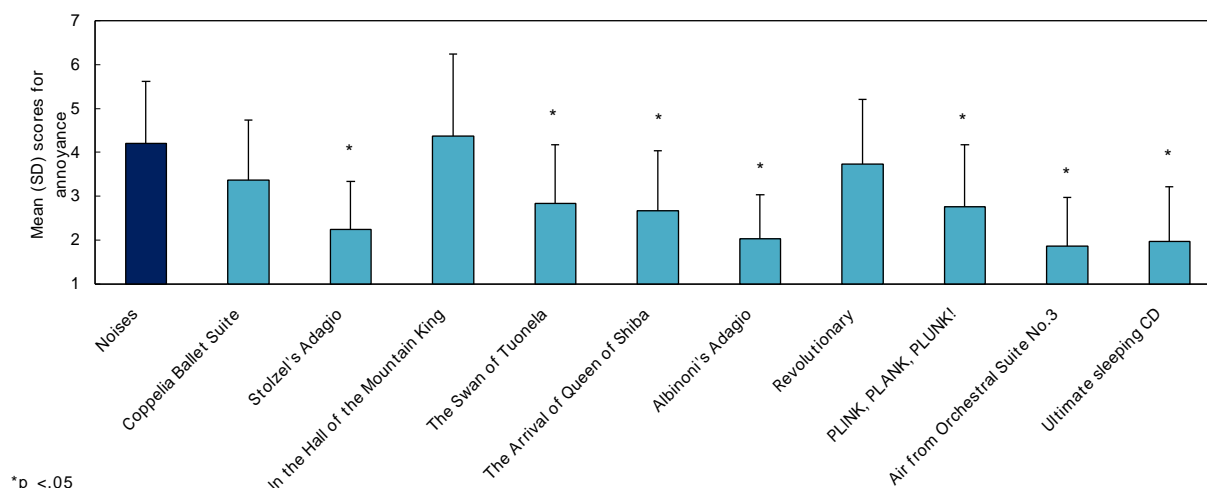


Figure 1 – Mean scores and SD s of annoyance for the noises and music

The mean score of uncomfortableness for the noises was 5.07 ($SD = 1.11$). The mean scores of uncomfortableness for the noises and the music are shown in Figure 2. A one-way ANOVA with response type as a repeated measure factor revealed a significant main effect for the sounds [$F(10, 290) = 25.02$, $p < .01$]. Post-hoc tests indicated that the hospital noises were more uncomfortable for the participants than ‘Coppelia Ballet Suite’, ‘Stolzel’s ‘Adagio’, ‘The Swan of Tuonela’, ‘The Arrival of Queen of Shiba’, Albinoni’s ‘Adagio’, ‘PLINK, PLANK, PLUNK!’, ‘Air from Orchestral

Suite No.3', and 'Ultimate sleeping CD' ($Mse = 1.28, p < .05$).

These findings indicated that, although hospital noises did not necessarily annoy the participants, they made them uncomfortable.

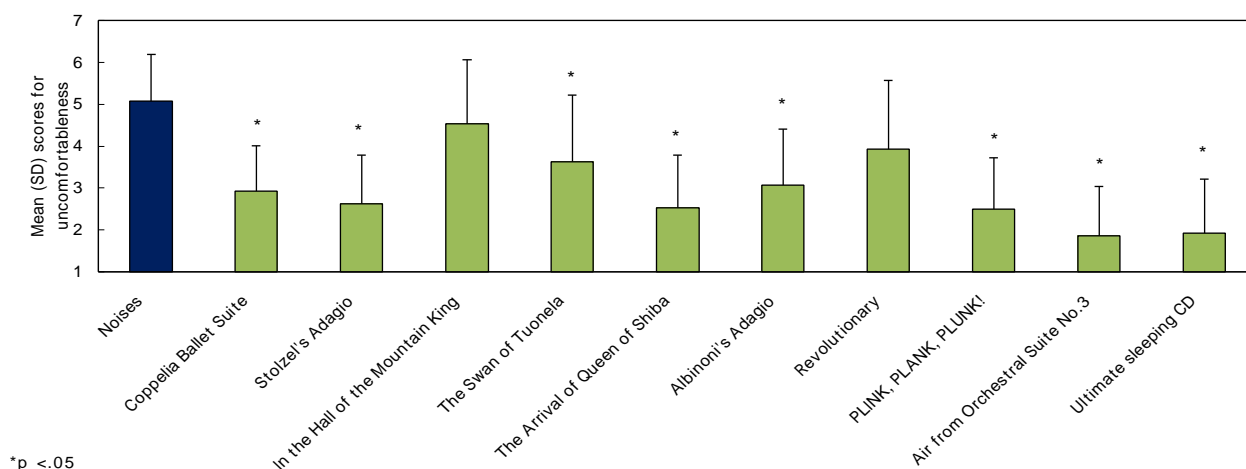


Figure 2 – Mean scores and SDs of uncomfortableness for the noises and music

3.2 Annoyance and Uncomfortableness for Combined Noises and Music

The mean scores of annoyance for the combinations of noises and music are shown in Figure 3. A one-way ANOVA with response type as a repeated measure factor revealed a significant main effect for the sounds [$F(10, 290) = 8.34, p < .01$]. Post-hoc tests indicated that the combination of hospital noises and 'In the Hall of the Mountain King' annoyed the participants more than the noises alone ($Mse = .66, p < .05$).

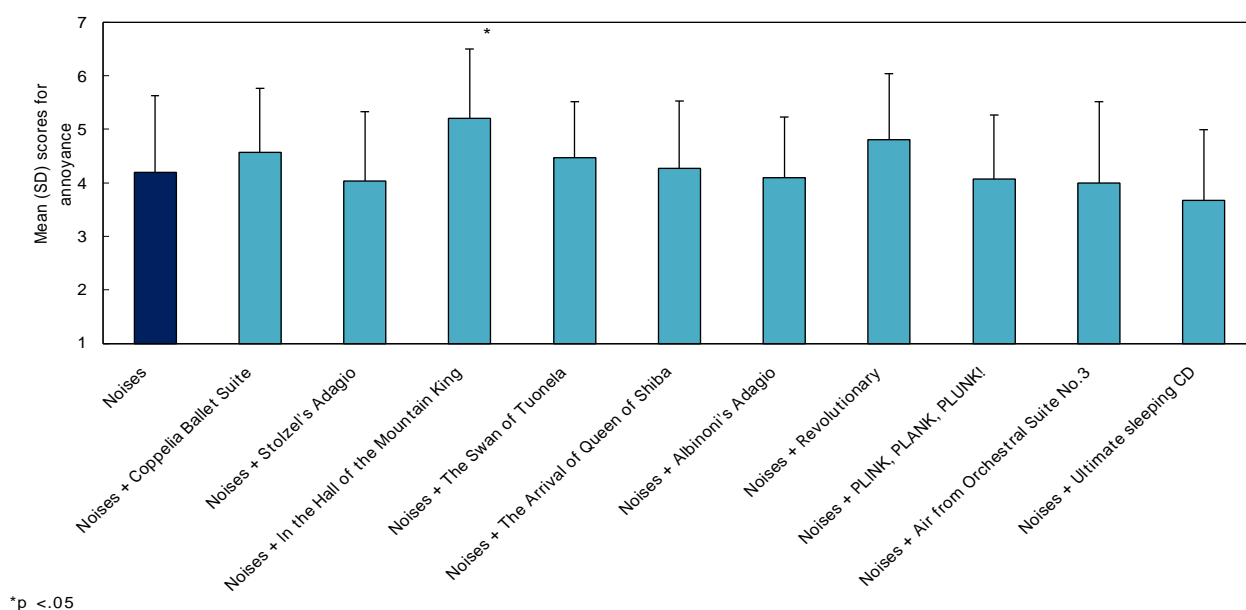


Figure 3 – Mean scores and SDs of annoyance for the noises and the combinations of noises and music

The mean scores of uncomfortableness for the combinations of noises and music are shown in Figure 4. A one-way ANOVA with response type as a repeated measure factor revealed a significant main effect for the sounds [$F(10, 290) = 11.15, p < .01$]. As indicated by post-hoc tests, the six stimuli comprising combinations of hospital noises with 'Coppelia Ballet Suite', 'Stolzels Adagio', 'The Arrival of Queen of Shiba', 'PLINK, PLANK, PLUNK!', 'Air from Orchestral Suite No.3', or 'Ultimate sleeping CD' were less uncomfortable to the participants than the noises alone ($Mse = 1.09, p < .05$).

These results suggested that combining the noises with particular kinds of music with positive affective characteristics make participants feel more comfortable than the noises alone.

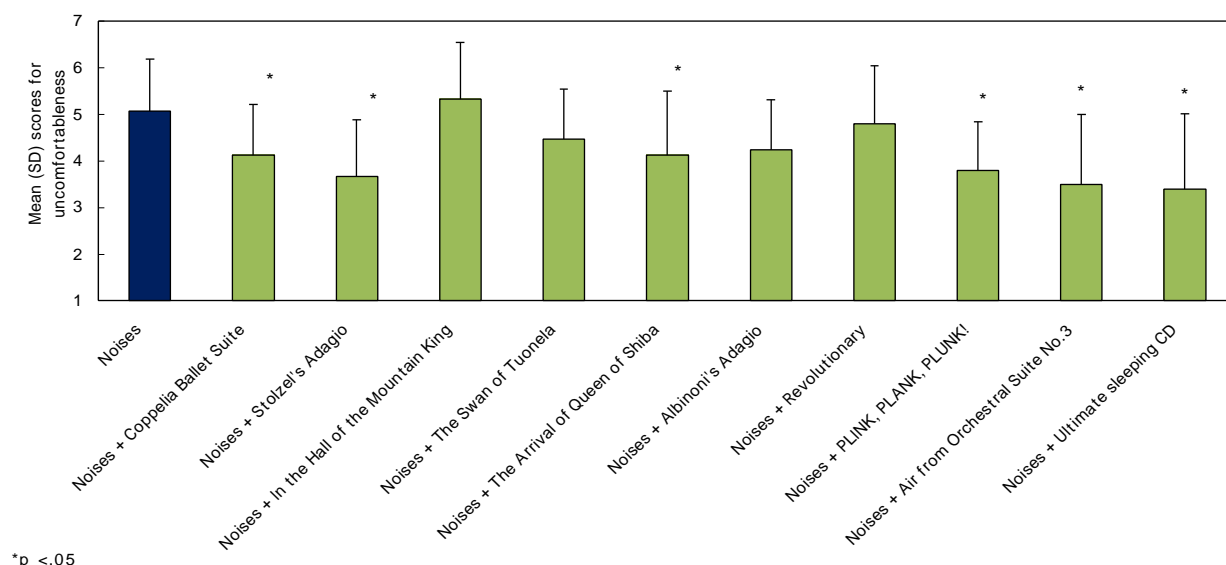


Figure 4 – Mean scores and SDs of uncomfortableness for the noises and the combinations of noises and music

4. CONCLUSIONS

Particular kinds of music with positive affective characteristics may improve the sound environment in hospital wards. However, only a few hospital noises were tested in the present study. Further studies should examine the effects of background music on other peculiar noises encountered in hospital wards.

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