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Soundscape optimization with MoSART+ in dementia nursing home wards

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1. INTRODUCTION

Nursing homes are full of unexpected, repetitive, loud or droning noises produced by staff, household appliances, and other patients. People with dementia are highly sensitive to detrimental auditory environments, due to diminished cognitive functions and often limited sensory abilities [1]. Poor soundscapes may lead to sleep disorders, agitation, apathy, and wandering. Further, nursing staff reported being irritable, anxious, and having difficulties concentrating. Yet, there is a lack of studies about soundscape improvement in nursing homes [1].

Recent soundscape research has produced a smartphone application called "Mobile Soundscape Appraisal and Recording Technology" (MoSART) [2]. It requires nursing staff to record sounds at random moments during a shift and judge the (perceived) soundscape quality. The environment can be classified on four dimensions: unpleasant – pleasant, uneventful – eventful, high complexity – low complexity, and many affordances – few affordances. [3].

The MoSART app was pilot-tested in nursing homes for patients with dementia. The app was then expanded to include ambassadors: staff members specially educated about sound in the nursing homes. This improved intervention is called MoSART+.

A stepped-wedge cluster-randomized controlled trial was set up to evaluate the effectiveness of the MoSART+ on problem behaviour in patients with dementia in five nursing homes. This abstract reports the effect of the intervention on the soundscape.

2. METHOD

We used the MoSART+ intervention to optimize the sound environment in four nursing homes with four or five dementia care units each. In each nursing home, we selected two or three "ambassadors" who were enthusiastic about the topic and authoritative.

After training the ambassadors and informing the nursing staff, the nursing staff was asked to use the MoSART app for two weeks. The app makes a 30 -120 seconds audio recording while the nurse assesses the auditory environment on a scale of 0-100 on the four soundscape dimensions. This was done during 3 to 4 random moments per shift. After these two weeks, a meeting was organized to discuss the measurements and determine which micro-interventions would be implemented in the following two weeks. Subsequently, measurements with the MoSART app were resumed for another two weeks. Finally, the ambassadors discussed with staff the differences between the first and second measurement period and ways to consolidate the improvements.

Differences between pre and post-implementation measurements on the four soundscape dimensions were assessed with t-tests. Differences between and within nursing homes were also analysed.

3. RESULTS

Four of five randomized homes implemented MoSART+. 1882 measurements with the MoSART app were made. The number of measurements differed between the nursing homes (range 236 – 790) and differed between the before and after measurements.

The MoSART+ intervention had a statistically significant effect on all four soundscape dimensions ($p < .01$). Mean scores showed that the nursing homes were already quite pleasant, calm, not very eventful, and moderate lively before implementation of the micro-interventions. After implementation, the soundscapes in the nursing homes became more pleasant, more, less eventful, and less lively ($p < .01$).

There were however differences between the homes. In three nursing homes pleasantness and calmness increased, and liveliness declined, while in the fourth nursing home the effect was the other way around ($p<.01$). Analysis showed that the intervention increased eventfulness in two nursing homes, and decreased in the two other nursing homes ($p < .01$).

4. DISCUSSION

Overall, it can be said that the MoSART+ intervention created an improved soundscape in the nursing homes. In general, pleasantness increased, and calmness, liveliness, and eventfulness decreased. It can be implied that raising awareness among nursing staff on dementia wards leads to improvement of the soundscapes on the wards.

However, one nursing home showed different results than the other three nursing homes. These deviant results might be ascribed to the fact that the MoSART+ intervention was implemented in the summer vacation period when permanent staff had been replaced by temporary flex workers.

The flexibility and freedom in choosing ambassadors and micro-interventions that fitted the nursing home best is a strength of the intervention. This flexibility makes it possible to adapt the auditory environment to different patients and situations. In addition, MoSART+ empowers the nursing staff to make the necessary adaptations.

5. REFERENCES

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