

# **Being critically ill and surrounded by sound and noise**

## **Patient experiences, staff awareness and future challenges**

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This thesis is based on the following papers, referred to in the text by their Roman numerals.

- I            Johansson L, Bergbom I, Persson Waye K, Ryherd E, Lindahl B. The sound environment in an ICU patient room - A content analysis of sound levels and patient experiences.  
*Intensive Crit Care Nurs* 2012; 28(5):269-279.
  
- II           Johansson L, Bergbom I, Lindahl B. Meanings of Being Critically Ill in a Sound-Intensive ICU Patient Room - A Phenomenological Hermeneutical Study.  
*The Open Nursing Journal* 2012; 6:108-116.
  
- III          Johansson L, Knutsson S, Bergbom I, Lindahl B. Noise in the ICU Patient Room - Staff knowledge and clinical improvements.  
*In manuscript*
  
- IV          Johansson L, Lindahl B, Knutsson S, Ögren M, Persson Waye K, Ringdal M. Feasibility of a Complex Sound Environment Intervention in ICU.  
*In manuscript*



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# **BEING CRITICALLY ILL AND SURROUNDED BY SOUND AND NOISE PATIENT EXPERIENCES, STAFF AWARENESS AND FUTURE CHALLENGES**

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## **Abstract**

The sound environment in the ICU patient room is known to be poor and demanding. However, little is currently known about how patients recall and experience the sounds that surround them. Furthermore, staff knowledge of the field and their suggestions for improvements are of interest. Therefore, the overall aim of this thesis was to illuminate how critically ill patients experience being surrounded by sound and noise. In addition, its aim was to explore ICU staff's knowledge and suggestions for improvements regarding the sound environment and to investigate the feasibility of a complex sound intervention in an intensive care context. A multiple-method approach was used in this thesis. In Study I, sound measurements for 13 patients were taken, while, at the same time, early signs of delirium were identified. Qualitative research interviews were conducted after discharge, and all data were analyzed using content analysis. Study II involved the same interviews; however, they were analyzed using the phenomenological hermeneutical method. Study III consisted of statistical analysis of a questionnaire answered by 305 ICU staff from nine ICUs. Furthermore, qualitative research interviews with 20 ICU staff were performed and analyzed using content analysis. Study IV was conducted in the context of an intervention project consisting of two two-bed ICU patient rooms which were originally identical. One of the rooms was equipped with sound-absorbents and the other remained in its original condition. Sound measurements were performed continuously, and ICU delirium was estimated daily using the CAM-ICU instrument. Observations were performed during the entire data collection time to assess feasibility before a full-scale study.

Sound measurements in the ICU patient room showed that critically ill patients are exposed to high levels of sound and intermittent noise day and night. Despite critical illness, patients remembered many sounds from their ICU stay, and while some sounds were perceived as positive, others were experienced as disruptive and caused feelings of helplessness and fear. Sounds came suddenly and unexpectedly, which meant that they were completely unpredictable. Staff working bed-side have little knowledge regarding sound and noise and the adverse health effects they can have. However, staff also made suggestions for improvements. Conducting an RCT with continuous sound measurements in an ICU setting is complicated and time-consuming, but it is feasible.

**Key words:** critical illness • noise • vulnerability • experience • caring • care environment • intensive and critical care • knowledge