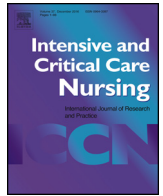




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Nursing staff's experiences of working in an evidence-based designed ICU patient room—An interview study

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ABSTRACT

Introduction: It has been known for centuries that environment in healthcare has an impact, but despite this, environment has been overshadowed by technological and medical progress, especially in intensive care. Evidence-based design is a concept concerning integrating knowledge from various research disciplines and its application to healing environments.

Objective: The aim was to explore the experiences of nursing staff of working in an evidence-based designed ICU patient room.

Method: Interviews were carried out with eight critical care nurses and five assistant nurses and then subjected to qualitative content analysis.

Findings: The experience of working in an evidence-based designed intensive care unit patient room was that the room stimulates alertness and promotes wellbeing in the nursing staff, fostering their caring activities but also that the interior design of the medical and technical equipment challenges nursing actions.

Conclusions: The room explored in this study had been rebuilt in order to create and evaluate a healing environment. This study showed that the new environment had a great impact on the caring staffs' wellbeing and their caring behaviour. At a time when turnover in nurses is high and sick leave is increasing, these findings show the importance of interior design of intensive care units.

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Implications for clinical practice

- Nursing staff need to be included in the process of designing intensive care units.
- Improve sound environment with sound absorbents when building or refurbishing and install cyclic lighting in intensive care units patient rooms.
- Include nature in the process of designing intensive care units.
- Offer adjustable mobile solutions for technical equipment and provide space around the patient bed.

Background

The intensive care unit environment

It is known that health care environment and lived space are important aspects of care. As early as in the nineteenth cen-

ture [Nightingale \(1859\)](#) described the importance of the health care environment on health and wellbeing. She acknowledged the importance of aspects in the patients' environment such as noise, light, ventilation and cleanliness as assisting the healing. But instead of embracing Nightingale's philosophy, hospitals and intensive care units (ICUs) were built like industries with production as their goal. Hospitals today are full of elements of crowding, noise, too much or too little light, odours and mazes; all these elements increase stress in patients, visitors and staff ([Norlyk et al., 2013](#); [Sternberg, 2009](#)).

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The working environment of the staff is defined by the technical equipment that is needed when providing patient care. The technology facilitates nursing activities and creates safety but is also seen as taking too much time away from the patient and creating stress as it restricts the patient care because the nurses feel hindered in their work (Olausson et al., 2014; Price, 2013; Tunlind et al., 2015). The work environment for critical care nurses (CCNs) is reported to be unhealthy (Breau and RhÉAume, 2014). Epp (2012) found that CCNs are particularly vulnerable to developing burnout due to the chronic occupational stressors, which include high patient acuity, high levels of responsibility, working with advanced technology and caring for families in crisis. The work in ICUs is carried on around the clock and the staff are often forced to work in narrow spaces and expected to interact with machines frequently without being able to influence their functions. There is a lack of evidence regarding the comfort issue in relation to staff. Previous research claims that further research is needed to determine what staff require of their work environment (Huisman et al., 2012).

Design and architecture of intensive care units

The role of healthcare facilities is to provide stable environmental conditions that avoid disturbing the patients' healing process (Codinhoto et al., 2009). Over the decades advances in intensive care medicine and technology have been impressive, this has not, however, been matched by adjustments to the buildings. Sophisticated technology are characterising for ICUs (Almerud et al., 2007; Meriläinen et al., 2013). New equipment is often placed in the patient room where there is a free space rather than being integrated into the design of the patient's room. Obviously this places new demands on the design of the ICU and shows the current need for quality development (Rashid, 2011). Ulrich (1984) reported that patients cared for in surgical wards and assigned to rooms with windows looking out on a natural scene had shorter postoperative hospital stays and needed fewer potent analgesics than the patients assigned to rooms with windows facing a brick building. This study led to the development of the evidence-based design (EBD) concept. By designing and decorating the ICU room according to EBD framework many of these problems may be eliminated or moderated. The conceptual framework of EBD includes audio and visual environments; safety enhancement: a wayfinding system; sustainability; the patient room; and support spaces for family, staff and physicians (Ulrich et al., 2010). With focus on the impact of architecture on health environments, EBD has evolved as a new research field. It offers a guide to healing environments and a way in which to integrate knowledge from various research disciplines, in order to improve decision-making about health surroundings and architecture based on the best available knowledge (Hamilton and Watkins, 2009; Ulrich, 2012). Any country or hospital that is in the planning stages of building new, or reconstructing existing ICUs, need a well-tested basis on which to build and design an optimal care environment for patients, their loved ones and staff (Rashid, 2014). Despite their expertise in design and construction, architects alone cannot create the ultimate ICU room (Rashid, 2011; Redden and Evans, 2014; Thompson et al., 2012). In the process of designing an ICU it is necessary to take into account the experience and knowledge of healthcare professionals (Hamilton and Watkins, 2009; Redden and Evans, 2014). Such integration and multi-disciplinary collaboration is often missing today. The healthcare environment is an important but a recognized aspect of healing in ICU care. The development of medicine and technology has led to ICU patients being more aware of their surroundings and the increased stressors in their already critical state. The work environment is full of stressors for the staff, resulting in a high turnover and burnout syn-

drome in CCN. This leads to the question, could an EBD-designed patient room be a way to reduce these problems?

Aim

The aim of this paper was to explore the experiences of nursing staff working in an Evidence-based designed ICU patient room.

Method

This study is explorative and data were collected through qualitative research interviews and analysed using inductive content analysis (Elo and Kyngäs, 2008). The method aims to achieve a condensed but broad description of the actual phenomenon under scrutiny and the outcome of the analysis is in form of concepts or categories that describe the phenomenon (Elo and Kyngäs, 2008; Polit and Beck, 2016).

Setting – a refurbished intensive care unit patient room

The study was carried out in an eight-bed general ICU in Sweden caring for about 800 patients each year. One patient room was renovated and furnished in 2010 (Lindahl and Bergbom, 2015), according to the principles of EBD and the guidance available for complex intervention research (Craig et al., 2008). The room was designed for two beds, equipped with acoustic panels on the walls and ceiling and new flooring. In addition prototype pendulums were installed, equipped with lights, electrical sockets and medical gas supplies. Cyclic light was installed (Engwall et al., 2014) and the medical and technical devices were placed where the patients could see them and not, as is usual, behind the headboard. The walls were painted in soothing shades, organic textiles and decorations and comfortable furniture for visitors placed in the room. The room has a window and door leading onto a patio with furniture and seasonal plants outside the room which is accessible to patients and their relatives (Lindahl and Bergbom, 2015).

The unit is located on the ground floor with windows in all rooms, half of the patient rooms have doors leading directly to the outside. The unit uses light sedation regimens, which means that the estimated level for the Motor Activity Assessment Scale (MAAS) is 2–3 (Devlin et al., 1999). Staff are always present at the bedside. The nursing staff comprises CCNs (60%) with further qualifications in intensive care and assistant nurses (ANs) (40%). The nurse-patient ratio is 1:1 or 1:2 and generally a CCN and an AN work together on each shift.

Participants

The interviewees of comprised eight CCNs and five ANs (n = 13) and were recruited using purposive sampling (Polit and Beck, 2016). The study was introduced at a staff meeting where information was given that we wanted participants with various views and perspectives. As the aim was to reflect the constitution of the staff, more CCNs were interviewed than ANs. The participants were aged from 39 to 59 and had been working in the ICU for 4–38 years. All the CCNs worked all shifts (day, evening and night) as did ANs except two (who did not work night shifts). Both CCNs and ANs worked in all rooms in the unit and no staff was allocated solely to the refurbished room.

Data collection

Data were collected between April and September 2015. General information about the study was given on two occasions during staff meetings. All CCNs and ANs then received a letter inviting

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