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### RESEARCH

# The Effects of Single-Family Rooms on Parenting Behavior and Maternal Psychological Factors

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#### ABSTRACT

**Objective:** To examine the relationships among special care nursery design, parental presence, breastfeeding, psychological distress, hospital-related stress, and maternal parenting self-efficacy at the infant's discharge from hospital and at 4 months postdischarge.

**Design:** We used a causal comparative design to compare two special care nursery designs: open ward nursery (OW) and single-family room (SFR) nursery.

Setting: Special care nurseries of two tertiary hospitals on the Gold Coast, Australia, with the newly built second hospital replacing the first.

Participants: Fifty-six mothers of infants cared for in the special care nurseries (OW, n = 31; SFR, n = 25).

**Methods:** Participating mothers completed parental presence records during their infants' stays in hospital and completed two surveys, one at discharge and the other at 4 months postdischarge, to measure their psychological distress, hospital-related stress, parenting self-efficacy, and infant feeding method.

**Results:** Mothers with newborns in SFR nurseries spent markedly more time with their newborns, without any more visits or fewer visits, than mothers of newborns in OW nurseries during the first 2 weeks of their newborns' lives. For mothers with low levels of presence, parental role alteration stress was significantly greater for mothers in OW compared with SFR nurseries. Compared with mothers of infants in OW nurseries, mothers of newborns in SFR nurseries were significantly more likely to exclusively breastfeed their newborns at discharge from the hospital and at 4 months postdischarge.

**Conclusion:** Compared with mothers with infants in OW nurseries, mothers with infants in SFR nurseries were more likely to be present and to initiate and maintain breastfeeding. Likewise, the SFR nursery was protective against stress related to changes in the parenting role for mothers who had low levels of presence.

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or a mother, to have a newborn cared for in a special care nursery (SCN) and/or NICU is a stressful event with immediate and long-term challenges for mother and neonate (Davis, Edwards, & Mohay, 2003; Davis, Edwards, Mohay, & Wollin, 2003; Douchette & Pinelli, 2000). Newborns cared for in NICUs have greater medical acuity and require more complex medical intervention than newborns cared for in SCNs. The strain experienced by mothers of premature infants is generally greater than that of mothers of full-term infants (Carter, Mulder, Bartram, & Darlow, 2005). Mothers reported that they felt unprepared for their infants' births, unprepared to cope with their infants' medical conditions, and distressed by the technology-

heavy environment of the NICU (Whitfield, 2003). Evidence indicated that the appearance of their fragile and sick newborns, fear for their newborns' survival, alteration in their parental roles, communication difficulties with nursing staff, sights and sounds of the nursery environment, and separation from their infants because of hospitalization contributed to mothers' stress (Bouras et al., 2015; Diffin, Sheilds, Cruise, & Johnson, 2013; Miles, Funk & Carlson, 1993; Nyström & Axelsson, 2002).

It has been argued that a mother's experience is affected by the physical design of the neonatal nursery (SCN and NICU; Lester et al., 2011), and Lester et al. (2011) developed a model in which they examined the ways in which physical

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## The single-family room nursery design promotes privacy, closeness, and an inward focus on the family unit.

environment influences outcomes. They identified five factors, including family-centered care, developmental care, parenting and family factors, staff behavior and attitudes, and medical practices. In the current study we examined parenting and family factors that included parent behavior (described as parental presence in the nursery), maternal psychological factors, and maternal participation in the infant's care through breastfeeding. Maternal psychological factors include the development of stress, anxiety, and depression symptoms (Lester et al., 2011).

Single rooms are a recent design development in hospitals generally, and in neonatal nurseries specifically (White, 2003). Single-family room (SFR) neonatal nurseries allow for the care of one family per room. In the case of a singleton, this means one newborn per room, and for multiples this means more than one newborn from the same family in a room. Researchers suggested that the private rooms create a more appropriate environment for neonatal development, with better noise and light control, and a more inviting space for mothers than open ward (OW) designs (White, 2003). To date, SFR nurseries have been implemented in the United States, Turkey, Sweden, Taiwan, Denmark (Shahheidari & Homer, 2012), and Australia (location of the current study).

Research findings suggested that SFR nurseries provide more benefits for the mother and newborn than the traditional OW layout and allow the mother and father to be more involved in their newborn's care (Domanico, Davis, Coleman, & Davis, 2011; Ortenstrand et al., 2010; Pineda et al., 2012). Mothers reported that in the SFR nursery they were able to spend more time with their newborns because the SFR nursery gave them more privacy and space for their personal items, was quieter, and left them feeling better supported by the entire team than mothers in an OW nursery (Carlson, Walsh, Wergin, Schwarzkopf, & Ecklund, 2006; Carter, Carter & Bennett, 2008). To our knowledge there has been no research in Australia to test these assertions, and internationally there is a dearth of research on the relationships among SFR nurseries, parenting, and family factors.

There is also a paucity of research on the effect of the SFR nursery design on mothering behaviors

such as breastfeeding rates at discharge and postdischarge, and the findings to date have been mixed. Mothers' participation in newborn care through breastfeeding and skin-to-skin holding and more general involvement is beneficial for mothers and newborns (Lester et al., 2011). It is reasonable to expect that mothers who have the increased privacy afforded in an SFR nursery may have increased opportunities to provide skin-toskin holding, pump breast milk, and breastfeed. They may also be more likely to continue to provide breast milk for their infants after discharge.

Domanico et al. (2011) conducted a study in a facility that transitioned from an OW (n = 72newborns) to an SFR (n = 71 newborns) nursery with the same staff. These investigators found that more mothers in the SFR nursery sustained lactation 14 days postpartum and that newborns in the SFR nursery spent 90% of their hospital stays fed with breast milk compared with only 66% in the OW nursery. They suggested that the increase in breastfeeding rates observed in the SFR nursery was the result of the close proximity maintained between mother and newborn. Unfortunately, Domanico et al. (2011) did not examine whether these differences in rates of breastfeeding were maintained beyond 14 days postdischarge.

Erdeve et al. (2008) sought to understand the effect of admitting mother and newborn together in the NICU rather than the newborn only on breastfeeding uptake and maintenance. In their study of 60 preterm infants, they found no significant difference in uptake or maintenance of breastfeeding at 3 months postdischarge between mothers who were able to share a room with their newborns and those who were not. However, this study was conducted at two different hospitals where care practices and staffing differed.

To date, two research groups systematically investigated how SFRs affected rates of depression and stress in mothers (Erdeve et al., 2009; Pineda et al., 2012). Erdeve et al. (2009) conducted a study across two tertiary hospitals in Turkey, one with an OW nursery (with 26 newborns and 21 mothers) and the other with an SFR nursery (with 31 newborns and 26 mothers) to examine parental stress and depression. They found a nonsignificant trend in which mothers in SFRs had lower rates of depression than mothers in the OW nurseries (SFR = 15.4%, OW = 39.1%; p < .06) as measured with the Edinburgh Postpartum Depression Scale. In this study, parental Q1

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