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Research Article

RESTORATIVE DESIGN FACTORS FOR POSTNATAL HOSPITAL ENVIRONMENT: A SURVEY OF TWO HOSPITALS IN NIGERIA

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Abstract

In many developed countries and increasingly in developing countries, birth occurs in hospitals. Research in the childbirth environment suggests that the physical hospital environment affects a woman's labour and birth including postnatal recovery experiences. Healthcare facilities with softer, peaceful environments such as artwork displays in the interiors and noise-proof spaces can influence patients' healing process and offer support to new mothers during the postnatal phase. Existing childbirth environments studies have been mainly from developed countries; they have been least investigated in developing countries. Additionally, most studies are focused on the labour and birth rooms not on the postnatal hospital environment. Research also suggests a need to explore physical childbirth environments that are valued by women from culturally diverse backgrounds to gain insights into design features in the environment that enhance a positive labour and birth, and especially postnatal recovery experience. This study examined the design factors in the hospital environments for postnatal recovery experience using a survey questionnaire among 140 postnatal women who gave birth at two Nigerian hospitals. The findings of this empirical study support the need for a restorative postnatal hospital environment and spaces that potentially contribute to physical recovery of women and their wellbeing experiences after childbirth.

Keywords: Design factors, Experiences, Postnatal hospital environment, Recovery, Wellbeing.

INTRODUCTION

Around the world, healthcare facilities (HCF) and hospital environments affect decisions that patients, family members, staff and visitors make during illness and care. Research has shown that improvements in healthcare settings can contribute to positive health outcomes and the healing process, thus improving the hospital environment may potentially impact the lives of patients, patients' family and staff who work in the healthcare spaces (1). In the 1960s and 70s, efforts aimed at creating therapeutic and humanistic hospital environments were first recorded in the maternity setting through consumer-led movements in the UK and USA which led to improvements in birthing environments (2,3). In the childbirth environment, women's feelings of safety and satisfaction with their experience of birth are influenced by the physical environment for labour and birth (4) especially having features of hominess. Hominess has been described as the spatial quality that makes a birth environment feel residential (5). A more homely atmosphere and features for women giving birth, making birth environments more relaxing and comfortable, have been shown to promote physiologic birth and positive experience of birth (6,7). Additionally, providing spaces with features of domesticity within the birth setting not only contributes in shaping the experience of women by promoting positive experience of birth (8), but also shaping midwifery practice by creating cognitive and emotional responses for midwives in the spaces (9,10). In the Nigerian context, improvements in childbirth environments may have been either too slow or receiving little attention despite the importance of improving the childbirth experience for new mothers (11). Improvements in the birth and postnatal settings enhance a safe birthplace and in return contribute to promoting a positive childbirth experience for women (12). An enhanced birth and postnatal unit design can contribute to improved health outcome for a birthing woman prior to going home. Eliminating negative visual and psychosocial factors in the immediate postnatal period and in the postnatal environment could also prevent the occurrence of postnatal emotional disorders in women (13). Physiologically and emotionally, the postnatal period is a vulnerable and private moment for women. It requires an understanding of the factors in the hospital environment that could foster a smooth recovery and quality postnatal care for women. During the postnatal phase, women require adequate sleep and rest and vitality to nurture their infants. In a postnatal survey of what mothers want in the immediate postnatal period, they indicate the value of rest was the most important thing before parental skills; mothers felt lack of rest could affect their wellbeing or hinder positive outlook (14). Lack of conducive maternity spaces and ambience, attributed to the busy and noisy hospital environment, has been found to have negative impact on the recovery experiences of new mothers (15). It has been suggested that planning of healthcare facilities should take into cognisance specific aspects of the physical environment and facilities to meet the needs of specific groups (16). Postnatal women are no exception as they have unique needs following the birth. For example, the need for adequate rest and sleep and the learning of parental skills and education, which require supportive spaces to facilitate their effectiveness including wellbeing experiences of new mothers. Changing or improving the physical design of built environment and healthcare spaces, especially in the maternity setting, to support the health and wellbeing of women may contribute to slowing down the high maternal mortality rate in sub-Saharan African countries, and for Nigeria women (17). While the effects of birth environment on satisfying and positive experiences of birth for women have been much investigated, mostly in the developed countries, and often concentrating in

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the labour and birth rooms (18,19, 20), there are few studies in the developing contexts and in particular in the postnatal settings. As a result, the key design elements for a restorative experience of women in postnatal environment are not known. In order to identify the design factors that support the restoration of women and wellbeing in the postnatal hospital environment, a survey was conducted.

LITERATURE REVIEW

The 2005 report of national survey of women's childbirth experiences published by the National Childbirth Trust in the UK, raised the question: "are women getting the birth environment they need?" (21). The surveys of childbirth experiences of women, including efforts by midwifery researchers and architect practitioners, significantly contributed to an understanding of the design factors in the childbirth environment (22,23,24,25). Importantly, key findings from the surveys indicate most women felt the physical environment had an effect on their labour and birth and they would prefer to stay in the same room throughout labour and birth (21). This suggests that single room occupancy can offer women emotional support, including their wellbeing experience in the immediate postnatal period. When it comes to satisfaction with birth and postnatal experiences, accommodating women in a single-room maternity care unit rather than the traditional shared rooms can improve emotional and psychological health outcomes. A study of single occupancy found that single rooms were correlated with significant women's satisfaction and fostered continuity of care (26). Benefits associated with single-bed rooms in healthcare settings include prevention of errors, and permitting increased presence of family members (27,28).

Many studies have examined the benefits and weaknesses of single rooms for patients and staff in mainstream healthcare research as well as in childbirth settings. For example, a single-bed room was found to have moderate effect on satisfaction with care, reduces noise levels and enhances sleep, although with mixed results when it comes to infection rates (29). Similarly, a study of nurses' perceptions of care in a single private room (SPR) after a move from an old unit found a 6 dB reduction in noise levels in the SPR and reduction in nosocomial infection, with staff feeling that SPR design had more benefit than an open room (30). Using innovations to change the institutional and bio-medical focus of the conventional traditional labour and birth rooms has found a positive impact on the experience of women's birth. One study described the experiences of labour of sixteen women who were assigned to a "Snoezelen room" (20). A Snoezelen room is a specialised indoor environment with a range of soothing nature colours on the walls and floors which exposes users to several sensory stimulations. The findings indicated the Snoezelen environment can offer a woman in labour distraction, relaxation, environmental control, choice of complementary therapies, and safety in an archetypal non-clinical atmosphere. The research found that the effect of distraction impacted women in a positive way. Another study (19) explored a modified labour room by randomly assigning sixty-two women to either the standard labour room or the "ambient room." The ambient room had specific types of auditory, visual and tactile stimuli and received positive evaluations from the women and caregivers including less use of artificial oxytocin infusions by women in the room compared to the standard labour room. Conversely, single-bed occupancy rooms work least well for some patients and staff. These relate to some patients' experience of loneliness, these sets of patients were recommended the option of shared rooms (31). All-single room accommodation may also offer staff an impoverished experience of caring for patients and of working with each other (32). Research also indicates noise can cause physiologic changes and detrimental healing and recovery for patients including postnatal women who require adequate rest. Noise levels (generated from medical equipment routine and medical activities including multiple disruptions from staff) affect patient outcomes. Noise can interfere with the healing process, triggering lack of sleep and rest and disrupting the patient's experience (33). Strategies and interventions such as quiet time in the hospital units (34) and adoption of Hospital's Ultimate Silence for Healing (HUSH) as a nursing action for mental respite and quiet restful environment in the hospital wards facilitate women's and staff hospital experience and wellbeing (33,35). Important findings in a review of studies in the childbirth environment (36) are the identification of important building-related factors including unit layout configuration, midwives' hub, social room, configuration of the birth room, and sensory elements, needing further exploration from interdisciplinary studies focused on architectural design to enrich the knowledge of the physical environment required to support women throughout childbirth phases (36). The implication lies with how to design the physical environment to foster factors such as stimulation, coherence, control, and restoration as an integral part of the interior design elements for women after childbirth.

In the African context, case studies of maternity units projects by MASS design group highlighted the importance of a calm and relaxed atmosphere for childbirth. Example includes the maternity waiting village in Kasungu District, Malawi, which accommodates expectant mothers nearing their term, with sleeping units around the courtyards, which offer optimum daylight and ventilation to control the spread of infectious diseases (37). However, studies need to be conducted empirically to gain insight from the perspectives of the users. There is a lack of knowledge relating to specific design factors that assist or hinder quality postnatal care, including the experiences of recovery and wellbeing of women in the postnatal hospital environment. This study sought to contribute information, within the Nigerian context, 1) to understand the design factors relating to specific aspects of postnatal room design and interior environment that impacted on quality of care, recovery, and wellbeing of new mothers and 2) to identify the perceptions of sensory features on a mother's sense of wellbeing and that of her baby. This would assist in creating restorative settings for a woman's physical, physiological, and psychological wellbeing during childbirth-related hospitalisation.

METHODS

Survey design is an ideal strategy for use because of the early discharge of women from hospitals after childbirth (38). A survey enables a fast, easily quantifiable collection of data, which requires less time to analyse (39). It also allows several variables to be studied simultaneously (40). Furthermore, survey design helps to identify individual opinions and perceptions of a particular policy, social or personal event (41), in this study, a restorative postnatal hospital environment that best supports women in recovery and postnatal care giving.

Participants and design

A total of 140 postnatal women who have given birth at two hospitals in Southwest Nigeria agreed to participate in the study. All the participants had given birth within one month of the study. The majority of women in the sample (94.4 percent, n=130) had given birth two or three times. Of these, two women had given birth four times or more. The sample shows that only five percent (n=7) were primiparous. In addition, 41.4% of women had their babies in separate labour, delivery, and recovery (LDR) rooms, while about twenty-eight percent were attended in separate postnatal wards. Moreover, ninety percent (n = 126) of the respondents' births occurred in hospitals and ten percent (n=14) had given birth in primary birth facilities, also referred to as Freestanding Midwifery Units (FMU). Details of the participants' characteristics including information about room types (where women were attended for postnatal care) are shown in Tables 1 and 2 respectively.

Table 1. Survey characteristics of respondents

Women (n=140)	Frequency, n	Percentage, %
Age		
<20	1	0.7
20-24	2	1.4
25-29	2	1.4
30-34	80	57.1
35-39	48	34.3
40+	7	5
Most recent birth		
1 day or less than 1 month	140	100
1-3 months ago	0	0
4-6 months	-	-
7 months – 1 year	-	-
>1year	-	-
Parity level		
Once	7	5
Twice	67	47.9
Three times	64	45.7
Four and above	2	1.4
Level of education		
Secondary school	11	7.9
University	78	55.7
Postgraduate	28	20
Technical/Vocational degree	15	10.7
Other	8	5.8
Place of birth		
Hospital	126	90
Primary birth unit/centre	14	10

Table 2. Participants characteristic by room type (Postnatal care giving)

	Frequency, (n)	Percentage, %
Single postnatal room	33	23.6
Combined labour, delivery, recovery and postnatal (LDRP) room	10	7.1
Separate labour, delivery and recovery (LDR) rooms	58	41.4
Separate postnatal ward	39	27.9
Total	140	100

Written surveys

This study was conducted at two hospitals in Nigeria using a survey questionnaire. The survey questionnaire was initially used with postnatal women in New Zealand hospitals. The same survey questionnaire was employed in this study to see whether cultural differences or backgrounds affect opinions of women from the two countries. A study that assessed the validity of the Birth Unit Design Spatial Evaluation Tool, BUDSET (23,24) found it not to be adequate for different cultures (42). Therefore, there was a need to explore the design factors in the postnatal hospital environment appropriate to diverse cultures and needs, especially in the Nigerian context where there is an urgent need for improved birth outcomes and experiences of women (13).

Survey procedures: Two hospitals were purposively selected. Only the postnatal units and associated facilities were included. Excluded units were antenatal, labour and birth rooms for the two selected hospitals because the study is focused on the design factors *only* in the postnatal environment. A returned questionnaire was taken to be consent to participate. The survey instrument was divided into four categories and addressed aspects of the physical environments comprising perception of the postnatal space/room; interior environment features; sensory comfort and social comfort features. The social comfort domain was excluded from analysis in this study due to restrictions of space and will be reported in another article. This paper reports only the findings about the physical space/room, interior and sensory comfort features. These aspects may be used to get insight about a sense of wellbeing of postnatal women in terms of how they were impacted by the interior environment where they recovered and outdoor features they were exposed to after the childbirth.

Data analysis

Completed surveys were exported into Microsoft Excel and analysed in SPSS and Excel. Relative importance index and consensus opinions were derived following calculations of the means and weighted means scores from the survey data. This paper reports some of the initial findings which relate to the three categories of the survey questionnaire comprising postnatal room features, interior environment and sensory comfort features.

RESULTS

The descriptive analyses were first conducted on the responses obtained for the postnatal room features. The findings indicated that almost 8 out of 10 women felt that the physical environment can affect quality postnatal care and experience of wellbeing in terms of women's physical and emotional wellbeing (see Figure 1).

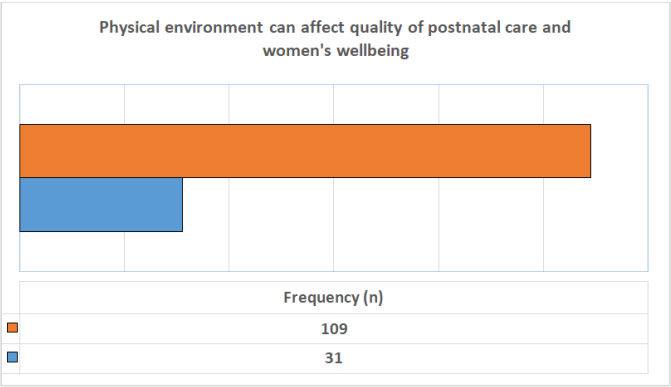

Figure 1.

The survey questions also asked postnatal women to indicate the features in the rooms in which they were attended for their

postnatal care on a range of room features comprising "restful", "busy", "uninviting", "comfortable", "quiet", "lacking natural features", "paintings of natural scenery", "visual display of natural scenes", and "bright colours on walls." More than a third of women said the rooms were comfortable and almost half of women considered their rooms to be restful. Some facilities were not available in rooms of some women. For example, 61.4% of women said their room was lacking natural features and nearly half said their room had no paintings of natural scenery (see Figure 2). Eight analyses were conducted on the survey questions relating to perceptions of the postnatal room design features. Three of eight analyses revealed weighted mean scores of equal or greater than 4. These include "Quiet in room" with a weighted mean score of (M = 4.46); "natural daylight" into the room (M = 4.21); and lastly, "room with colours, rather than a very plain room", received a weighted mean score of (M = 4.00).

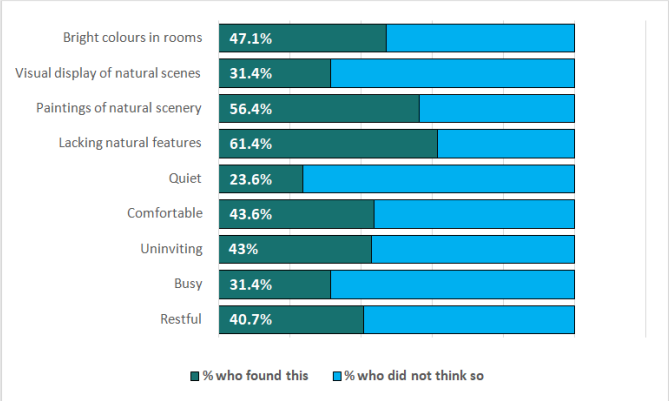

Figure 2.

Additionally, ratings of a "single room for recovery care" indicate an approximately weighted mean score of 4 (M = 3.99). The other two features comprising "room that overlooks a garden or has pictures of natural scenery" and "shapes and forms of natural objects for postnatal room design" were ranked the least with weighted mean scores of (M = 3.22) and (M = 2.64) respectively. Table 3 shows the preference ratings of postnatal room design with their calculated weighted mean scores, indicating the consensus opinions in the order of the ranking for each of the design factors.

The second analysis focused on the ratings of the interior environment features. Nine interior features were subjectively assessed and subsequently ranked in order of their importance. "Cleanliness of room" was topmost with a weighted mean score of (M = 4.86); privacy and dignity, examined by perception of closing a door in a postnatal room or ward, was ranked second with a weighted mean score of (M = 4.49); while perception of "walking outside to experience the outdoor surroundings" received a weighted mean score of (M = 4.21). Table 4 gives the details of the analyses for the interior environment.

This is an important finding that is in consonance with studies on the impacts of natural gardens in healthcare environments on health outcomes of patients and elderly population (43, 44) which found exposure to natural gardens was associated with improved mood and reduced signs of stress. Three design factors including having a restful room; a room with furniture made of natural materials and combinations of room with clinical and familiar home features were all ranked above 3. It should be noted that all three have semblance in terms of their closeness of scores. For example, "restful rooms" had a weighted mean score of (M = 3.64); furniture made of natural materials, (M = 3.45); and a room with clinical and familiar home features had a mean score of (M = 3.42). Not surprisingly, bright colours in the room was considered to have a negative impact on recovery and wellbeing. This was rated the least with a weighted mean score of (M = 1.34).

However, the most intriguing finding from the interior environment aspect is the ratings of room/ward decorations with natural art, images or paintings which is least rated after bright colours in rooms. This is unlike other studies, which regarded this as offering positive distractions which were associated with more calm behaviour and as a key contributor to the waiting experience of children (45). Analyses were conducted on a range of "sensory comfort" questions (natural daylight; temperature control; noise control from medical equipment; a quiet room; air quality and room freshness; additional heating for mother and baby; open/close the window to feel comfortable; pleasantness in room; hygienic environment). As can be seen from Table 5, the three topmost ranked design factors are hygienic/clean environment; air quality and room freshness; and natural daylight in the room.

Table 3. Participants ratings of postnatal room design features

Survey item	Weighted mean scores	Consensus opinion
The physical environment can affect a quality postnatal care and wellbeing	4.21	Strongly agree
A single room for a woman's postnatal recovery care	3.99	Agree
Quietness in room	4.46	Strongly agree
A room with colours versus plain room	4.00	Agree
Room that overlooks a garden, or has pictures of natural scenery	3.22	Agree
Natural daylight into the room	4.21	Strongly agree
Architectural forms and natural shapes make a more beautiful postnatal room design	2.64	Indifferent

Table 4. Participants ratings of interior features

Survey item	Total weighted score	Importance index	Rank
Have a restful room	510	3.64	4th
Attended in a clinical-looking postnatal space	418	2.99	7th
Clinical and familiar home features	480	3.42	6th
Decorations in room (natural art, images/paintings)	263	1.88	8th
Bright colours in the room	400	1.34	9th
Cleanliness of room	680	4.86	1st
Room with furniture made of natural materials	483	3.45	5th
Walk to experience the outdoor surroundings	590	4.21	3rd
Door closed for privacy	628	4.49	2nd

Table 5. Participants ratings of sensory features

Sensory comfort	Total weighted score	Importance index	Rank
Natural daylight in room/ward	649	4.64	3rd
Temperature control	529	3.78	8th
Noise control (mechanical,ventilation, medical equipment, etc.)	561	4.01	7th
A quiet room	615	4.39	5th
Air quality and room freshness	670	4.79	2nd
Additional heating for mother and baby	631	4.51	4th
Open or close the windows to feel comfortable	579	4.08	6th
Pleasantness in room (such as aquariums, nature sounds of birds, water, scents and images)	466	3.33	9th
Hygienic/clean environment	674	4.81	1st

Table 6. Some of the features of high importance to women during postnatal period

	Low importance	Medium importance	High importance
Cleanliness of room	3.6%	7.1%	89.3%
Air quality and room freshness	1%	20.4%	78.6%
Natural daylight in room/ward	7.1%	21.4%	71.5%
Additional heating for mother and baby	9.3%	21.4%	69.3%
A quiet room	5%	34.3%	60.7%
Be in a room where the door is closed	9.3%	31.4%	58.6%
Temperature control	12.9%	36.4%	50.7%
Open or close the windows to feel comfortable	18.5%	51.4%	48.6%
Noise control	17.8%	30.7%	30.7%
Pleasantness in room (aquariums, nature sounds etc)	25.7%	42.9%	21.4%

Next to these factors include being able to have additional heating for mother and baby with a weighted mean score of (M =4.51); a quiet room (M= 4.39); opening/closing of the window for comfort (M =4.08); and noise control (M= 4.01). A significant observation from the findings is that all four rankings were above 4, suggesting the importance of these design factors in the postnatal environment and by extension, for the recovery and wellbeing experiences of women. Compared to aspects of postnatal room design factors and interior environment, all the features in the sensory comfort environment were ranked very high and well above 4. The exceptions are temperature control and pleasantness in room which had weighted mean scores of (M = 3.78) and (M = 3.33) respectively. Almost three-quarters of the women said it was highly important for them to have natural daylight in their rooms and half of the women said it was highly important to be in rooms where the door is closed. Two-thirds said it was also important to be in rooms that feel quiet with almost half saying being able to open or close the windows to feel comfortable was highly important. Importantly, about 70% of the mothers had said it was highly important to have additional heating for themselves and their babies. Some of the features of high importance to women in the immediate postnatal period are shown in Table 6.

DISCUSSION

This present study was conducted to investigate which physical design factors in the postnatal hospital environment lend support to physical recovery of women including their experiences of wellbeing during postnatal hospital stays. This is needed because of the lack of knowledge of the spatial physical design indicators to foster health, restoration and wellbeing and also to support quality postnatal care by midwives, particularly for the Nigerian context. Data analyses show a range of environmental/design factors that can have significant effects as well as an enhanced restoration and wellbeing experience for new mothers. This study asserts the legitimacy and suitability of the survey questionnaire instrument for usage in other contexts, especially in Nigeria just as it has been used in New Zealand with postnatal women.

As expected, the study participants perceived hygienic cleanliness of room as the most important factor and judged bright colours in the room the least regarding a restorative postnatal environment. Closely following hygienic cleanliness of room are air quality and room freshness. The findings are noteworthy for two reasons: first, hygiene is a physical attribute perceived through seeing and represented an indicator of a safe environment. Second, colours may aggravate moods, leading to emotional stress and irritants to the wellbeing of new mothers, although the perception of rooms with colours rather than a very plain room was ranked higher (Mean = 4.00) suggesting that soft earthy colours of green, light brown and yellow are strongly linked with birth and nature and have important correspondence with a Snoezelen room for potentially rich sensory stimulations (20). Similarly, the provision of green colour symbolises healing, recovery and love (46). In mainstream healthcare service delivery, cleanliness/hygiene is an optimal clinical goal and has the potential to improve care quality, patients' wellbeing, and staff satisfaction. Cleanliness is also indirectly linked to sources of air flow (air quality and freshness) and ventilation systems in hospitals which can be effective in the prevention of hospital-acquired infection in patient rooms (47). The findings also indicate that aspects relating to having natural daylight in the room or ward (M = 4.21 vs 4.64); privacy and dignity measured by perception of closing door; and the factor of quiet in room were strongly ranked suggesting their importance for restoration, confidentiality in the room and an enhanced wellbeing of women. Indeed, it should be noted the same questions on perceptions of natural daylight and a quiet room were asked to women twice: in the questions on physical postnatal room design and in those on sensory comfort environment. The latter two findings had very similar mean scores (M= 4.46 vs 4.39). Importantly, the study found that having additional heating for mother and baby in the postnatal hospital environment can contribute to a sense of wellbeing. This factor was ranked with a weighted mean score of 4.51. In the immediate postnatal phase, physiological changes proceed with the birth of a baby and the body needs healing, usually through heating and special forms of routines. Babies also require warmth akin to the uterine environment.

The single room accommodation received a weighted mean score of approximately 4 (M= 3.99), meaning that the participants strongly considered it an influencing factor for postnatal recovery care. Choice of hospital bed accommodation plays a crucial role in care and wellbeing of patients, including new mothers and their families. This finding showed that single-private rooms are associated with a patient's psychological and physical recovery and wellbeing (48).

Conclusion

This survey provided insight into the design factors in postnatal hospital environments from the viewpoint of women from different backgrounds and in particular, Nigeria. The study established the effectiveness of usage of the same survey questionnaire used in New Zealand hospitals about the design factors that contribute to recovery and wellbeing of women in the immediate postnatal period. The findings from the study indicate several important design factors and architectural spaces, similar to findings in other childbirth environment studies from developed countries, which can contribute to an enhanced restoration, emotional wellbeing of new mothers and also assisting caregivers to deliver quality and effective postnatal care. The study findings, the first in the series of findings from a Nigerian context, have implications for healthcare organisations and policy makers. Further research might explore spaces and features that support family members' presence and the learning of parental skills during the immediate postnatal period.

Statement of competing interests: No competing interests.

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