

Healthy Workplace Design for Healthcare Staff

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Abstract

The National Health Service in the UK has been dealing with massive change; changing technologies, change in working methods, and change in stakeholder expectations. Consequently, staffs are under increasing pressure to adapt to these changes. The NHS has focussed on patient-centred care (DoH 2000). It is argued that, while this is obviously an important driver, there has not been adequate attention directed towards staff wellbeing. The healthcare environment is one which can be enormously stressful for both patients and staff. As such, the environment must be designed to alleviate that stress. To enhance productivity and to redress

the recent trend in high absenteeism, poor retention of staff and difficulties with recruitment, the NHS must address staff morale and satisfaction. Healthcare workers need to be accorded dignity and respect through provision of a decent workplace environment.

The paper describes a nationwide study of the design of maternity facilities in the UK. The research seeks to establish to what extent environment affects the performance and satisfaction of maternity unit staff and how this impacts on patient wellbeing. The hypothesis is that there is a strong correlation between staff and patient satisfaction levels.

The methodological approach is derived from Environmental psychology and post-occupancy evaluation. The paper describes the quantitative and qualitative methodology used and the initial results which have been obtained.

The preliminary findings indicate staff dissatisfaction with their work environment. Privacy, security, provision of spaces for respite, and lack of visual contact with exterior space are the prime issues of concern. The paper makes suggestions for built spaces which designers and the procurers of new maternity units need to consider.

Key words: Healthcare workers, interior design, work environment

Introduction

The National Health Service in the United Kingdom has focussed on patient-centred care (DoH 2000). Although this is an important driver, it

could be argued that there has been insufficient attention directed towards staff well-being. The hypothesis of this research is that there is a strong correlation between staff and patient satisfaction levels. The importance of 'quality of care received' rates consistently highly in all patient satisfaction and patient experience surveys (Reeves, R. Coulter, A; et al 2001, Press Ganey, 2003), therefore the relationship of the patient with the caregiver is obviously of vital importance. Staff morale and satisfaction with their work environment will impact on the care provided. Consequently, the needs of healthcare staff must be acknowledged and catered for in the design of healthcare facilities.

This research study explores the effect of interior environment on the users of maternity units in the U.K. To date, very little research has been conducted into the wellbeing of healthcare staff with specific relation to workplace environment, although a recent study by PricewaterhouseCoopers (2004) was one of the first in the UK that focussed on the role of design of the environment on the retention, recruitment and performance of NHS nurses. This study concluded that the design of hospitals impacted on nurses' performance more than retention and recruitment. In the UK, figures indicate that there is difficulty in retaining and recruiting midwives, and in July 2004, 76% of maternity units across the UK were reporting a staffing shortage (Royal College of Midwives 2004). Factors which were cited as attributing to retention and recruitment difficulties were stress and heavy workloads.

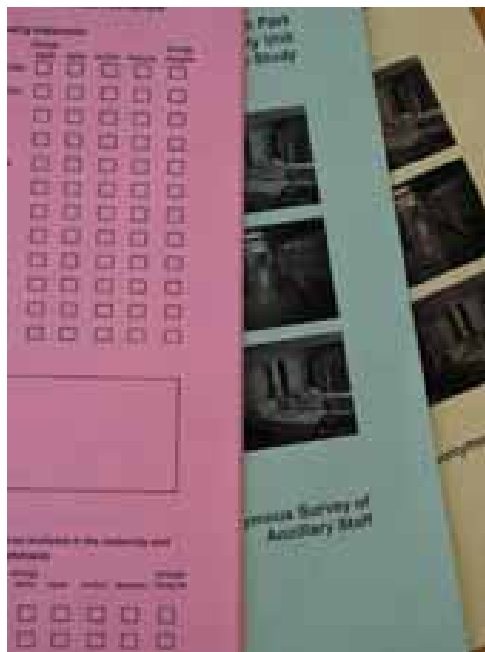
This paper discusses an ongoing study which aims to determine the environmental factors that are of particular importance to healthcare staff in the unique setting of maternity units. It seeks to identify various factors related to the design which impact on the psychological and physiological health and wellbeing of staff and patients through the examination of existing and accepted design models in maternity units. This evidence based research will be used to inform

future design models for maternity units.

Methodology

The research is investigating seven maternity units throughout the United Kingdom. The sample was selected to give an evenly distributed geographical spread and variation in population, covering both large conurbations and small towns providing maternity care for rural areas. The sample also includes the spectrum of different organisational structures within maternity care: Midwife-led units, Obstetric units, Labour/Delivery/Recovery and Post-partum units.

A multi-method approach was adopted, which relies on a combination of quantitative and qualitative methods to confirm the validity of the results. Self-completion questionnaires were issued to all healthcare staff (midwives, healthcare assistants, doctors, cleaners/ domestic staff and porters).



The questionnaire was presented using a five-point Likert scale and staff was asked to respond to questions requesting an evaluative assessment of variables of the architectural en-

vironment including ergonomic factors, layout, size and relationships of spaces, temperature, heating, ventilation, lighting, etc. Questions were also asked about psychological perceptions of environmental variables such as privacy, security and personal space and other work process factors including organizational structure and inter-personal relationships within the workplace. The Perceived Stress Scale (Cohen et al. 1983) was used in conjunction with the staff questionnaire to ascertain whether there were any extraordinary life circumstances which might be influencing their satisfaction with the job.

The postal questionnaires were substantiated with focus groups that sought to explore some of the most important issues raised in the responses to the questionnaires and to obtain further qualitative data. Face-to-face structured interviews were carried out with individual healthcare managers, facilities managers, and when possible, the domestic services managers. In addition to obtaining further information, this investigative process allowed comparison of perception across different working groups.

The healthcare work environment was also assessed using the NHS Estates Achieving Excellence Design Evaluation Toolkit (AEDET). This Toolkit seeks to assess the quality of various at-

tributes of healthcare buildings under three categories: Functionality, Impact and Build Standard with ten subcategories that include Access, Citizen Satisfaction, Internal Environment, Performance and Construction.

It was considered important in this research that the functionality of the maternity units should be analysed from a user perspective, because has been demonstrated that architects' and designers' evaluations of quality in buildings differ significantly from those of lay people (Gifford, Hine et al 2002). The AEDET was therefore adapted to a more ethnographical approach whereby the questions and categories were re-ordered to facilitate the researchers in performing a walkthrough analysis of a typical staff journey and the different user experiences encountered on this journey. This walk-through analysis supplemented the information obtained from the questionnaires, interviews and focus groups, providing an integrated evaluation assessment.

Although the research is investigating the effect of the design of maternity units on all users, this paper will focus specifically on the results related to midwifery staff.

Preliminary findings

Because the research is ongoing and will not

Situation of unit	Type of unit	Birth rate annum
Large teaching hospital in a major city	Consultant Unit	5500
General hospital serving a series of small towns and a rural population	Consultant Unit	1920
Birth center forming part of a community hospital in a major city	Midwife Led Unit	420
Maternity unit within a women and children's hospital in large city	Consultant Unit	4900
Birth Center attached to outpatients' hospital in suburb of large city	Midwife Led Unit	500

Table 1 *Maternity unit sample*

be completed until April 2006, the preliminary findings discussed here pertain to only five of the maternity units being investigated. The units which are included in the findings to date are categorised as follows: Maternity staff often have different shift patterns and working practices compared to other ward based staff. It has been determined through the focus groups and interviews that many midwives choose to work “long shifts” of twelve hours at a time. In addition to giving them more days away from the unit, this shift pattern also allows them a longer period in which to supervise a mother throughout labour and delivery. However, the implications of this are that staff are exposed to a potentially stressful environment for longer periods of time.

In the questionnaire, staff was asked to indicate any aspects of the interior environment which they felt might contribute to personal health problems. They were also given the opportunity to explain their response in the open comment box after the question. The response to this question indicated the following:

Aspects of the interior environment which staff perceived might contribute to personal health problems	Percentage perceiving a problem %
Noise levels	16.3
Lighting	42.5
Air quality	53.5
Access to rest areas	36.1
IT or telecommunication equipment	12.8
Suitability of clinical equipment	15.7
Suitability of office furniture	21.0
Other	14.0

Table 2 Staff response to personal health problems attributable to environment

The relationship between job satisfaction and perceived health problems was investigated us-

ing Spearman’s rho. There was a negative correlation between the two variables showing an association between low satisfaction ratings and reported health problems. It can be seen from Table 2 that the factors which were the cause of greatest concern were air quality followed by lighting and access to rest areas.

i) Air quality

The quality of air was found to be a significant problem for many midwives and was rated higher than the other factors in terms of causing personal health problems.

57.9% of staff either disagreed or strongly disagreed that the temperature in the ward was comfortable and, in response to further questions, 43.4% did not believe that the air in the rooms was fresh. It was commonly considered that spaces were overly warm, particularly in staff rooms and offices which often did not have windows. In conjunction with the high temperatures, some complained of high humidity in rooms occupied by a large number of people, but the majority of complaints referred to the air being excessively dry, resulting in dry skin, eyes and throat. A regular comment was that staff had little control over the air quality and temperature. Many spaces suffered from having no windows and those that did often could be opened no more than 75-100mm owing to security precautions. Some staff expressed concern that the high temperatures combined with the lack of ventilation created an environment where ailments such as the common cold flourished. Comments included:

“Unable to control air quality, must be done by maintenance personnel, no control switch.”

“Working a 12 hour shift with the heat and lighting often gives me headaches, particularly if I have been too busy to drink enough.”

		Job Satisfaction	Health
Job Satisfaction	Correlation co-efficient	1.000	-.153
	Sig. (2-tailed)	.	.050
	N	164	164
Health	Correlation co-efficient	1.153	1.000
	Sig. (2-tailed)	.050	.
	N	164	171

Table 3 Correlation between job satisfaction and health

ii) Lighting

Lighting was the second highest source of dissatisfaction in terms of factors contributing to health problems. In a further question asking specifically about natural daylight and artificial light, 29% of staff either disagreed or strongly disagreed that the amount of natural light (i.e. daylight) was adequate. Some described this as “depressing” while artificial lighting was reported as causing headaches.



Comments included:

“Poor and unnatural lighting can make reading or clinical work more difficult.”

“No direct light is depressing.”

“Due to poor light in office, get headaches when using p.c.”

Staff commented that they felt happier working in the wards which had large windows as opposed to those with small windows or without windows and, if possible, enjoyed views, preferably of natural scenes. (This is verified in research carried out by Kaplan (1987 cited Hildebrand 1999, p.1) and Ulrich (1983). Midwives complained that while the labour rooms and wards often had good natural daylight, staff offices suffered from lack of windows and natural ventilation.

iii) Access to rest areas

This research has evidenced that it is rare to find a maternity unit that provides satisfactory spaces for staff respite on the ward. This is stressful for staff and psychological stress can potentially lead to health problems. Staff was asked whether access to rest areas contributed to personal health problems. 28% indicated this to be the case. The results show that this factor was third highest in potentially contributing to midwives’ health problems. In a further section asking for an assessment of staff facilities, 93.5% indicated that the quality of staff rest areas was important to them, but 70% either strongly disagreed or disagreed that the facilities aided rest and relaxation.

“There is nowhere to go in the maternity unit to eat that is nearby but not on the ward. I am continually disturbed on my break by queries from other staff. I usually end up going outside.”

“Need area to rest, to get away from work environment.”

“On antenatal ward, the break area is little more than a cupboard with no windows.”



iv) Noise

In addition to the question asking for factors impacting on personal health, 43% either strongly agreed or agreed that noise levels were a problem on the ward. The research has determined that there are a number of irritating sounds which can affect concentration levels. Within the units surveyed, the noises which were perceived as causing a nuisance were:

- Telephones ringing
- Printers and computer equipment
- Noise from the buzzer on the secure door entry system
- Noise created by cleaning and kitchen staff
- Noise from lifts

Although midwives commented on the fact that birthing mothers in labour often generate substantial noise, this type of noise was not raised as a problem in the questionnaires. As the Nurses Station is also the area commonly used by staff to complete clinical records, there is a danger that concentration levels are affected. The consequent need to adapt their behaviour to this noisy work environment is stressful. This is supported by research carried out by Topf and Dillon (1988) and reported by Ulrich and Zimring (2004) which states that “nurses often have to complete charting and fill medication orders in crowded noisy makeshift areas which can lead to errors and increase staff burnout.”

v) IT equipment

This was the factor which was perceived as being least likely to cause health problems, with only 8.5% citing this as problematic.

“My eyesight is not fantastic and I am sure the more time I spend on the computer the worse it gets.”

Judging by the comments from staff in the open comments box, the problems were less to do with the IT equipment itself and more often related to where the equipment was positioned. For example, staff complained of lack of space to access the IT equipment (see paragraph vii below).

vi) Clinical equipment

There were comments regarding heavy clinical equipment having to be moved by staff contributing to health problems. It was observed also by some staff that they often had to walk a long distance along corridors to access clinical equipment. A further complaint was that “not finding clinical equipment is stressful.” Through interviews and on-site evaluation, it was established that storage is generally a problem, more particularly for large items. As a result, equipment is left lying around in corridors or corners of rooms, thus rendering it difficult for staff to locate.

vii) Office Furniture

Some midwives indicated dissatisfaction with what they termed “non ergonomic furniture.”

It was also noted that the desk area at the nurses’ stations were “very cramped.” In one unit, the amount of space available for midwives to write up their clinical records was approximately one metre in length and was shared by up to five midwives.



viii) Other

Other factors identified by staff as contributing to health problems included the weight and size of beds and other furniture especially in the delivery rooms.

ix) Further comments

In addition to the health problems highlighted above, the research has revealed that staff have concerns regarding their personal safety and security which creates another stressor in their work environment. Staff has to deal with aggressive birth mothers and their partners and frequently drug users. There was concern that although access was restricted by the entry buzzer system, as the access doors were often located at

a distance from the actual Nurses Station, unauthorised people could enter behind those gaining permitted access. The rooms used as offices were constantly criticised as being of an unsatisfactory standard. Offices were undersized for the number of people required to use them and did not account for the increased amount of administrative work required of staff.



The offices had inadequate ventilation and often no natural light. Overcrowding is recognized as a stressor (Farshchi & Fischer p 61) as is the need for the body to adapt to inadequate thermal and lighting conditions.

Recommendations for designers and procurers of new maternity units

From the research findings to date, a number of issues have been revealed which designers and procurers may consider in the design of new maternity units or refurbishment of existing units.

Nurses Stations

An in-depth analysis of staff working patterns within maternity units is necessary to identify the purpose and location of the nurses station. Traditionally the nurses station was a central desk overlooking a large ward where staff observed patients and wrote up patient notes. With the move towards smaller 2 and 4 bed wards and single rooms, the nurses’ station is now located in the corridor and serves a different function,

with computer terminals, printers, telephones and fax machines. Midwives now spend a large proportion of their time at the nurses station occupied with administrative duties, writing up notes and entering data into a computer. Consideration must be given as to whether the nurses station is the best location for such duties. In the USA, the Health Insurance Portability and Accountability Act (HIPAA) has produced guidance about protection of patient confidentiality which will prevent the storage of patient notes in open files at desks on corridors. As similar moves towards data protection are in place in Europe, it is time to consider the design and layout of the nurses' station.

It has been observed in this research that nurses' stations can also be the source of a great deal of noise. Not only does this affect staff concentration but it was also commented by birthing mothers that they found the noise a problem when they were trying to sleep. Provision of a suitable office/records room and a central handover room where medical staff can meet and discuss care strategies in privacy would address some of the issues pertaining to nurses' stations.

The control of patient entry systems by staff situated at the central nurses' station must also be reconsidered as this is a frequent source of distraction for staff and another source of noise and disturbance for those patients whose rooms are nearby. Where possible, maternity units should consider a dedicated security staff member who will deal with visitor access needs at a separate point from the nurses' station.

Respite and refreshment areas

One of the most important findings of the study so far is the need for staff privacy. Privacy is defined as the ability to control interpersonal behaviours and access to and exposure of the self (Archea 1977). Maternity care requires staff to work together as a community and many work long shifts, attending women throughout the

length of labour. Places of respite where staff can escape from the demands of patients, intercom and telephones are vital to allow staff time to recuperate. According to Westin, emotional release is the "safety valve" function afforded by privacy and he states that "without the aid of such a release...most people would experience serious emotional pressure (Westin 1967)." Some maternity units provided access to a centralised restaurant facility in the hospital. However, staff complained that where no specific area for staff was identified, staff found themselves taking refreshments beside the partners or family of the woman whom s/he was attending and thus never found respite from the job.



In larger hospitals, the restaurant facilities are often too far removed for staff on restricted lunch breaks. In all of the units which have been evaluated so far, nursing managers have adapted spaces designed for other functions to provide "on the ward" break rooms for staff. Most of these are inadequately situated and under-sized. Procurers and designers of new maternity units must consider staff facilities as equal in importance to patient facilities and make provision within the budget for suitable spaces with quality furniture and fittings to ensure that staff feel valued.

Clinical environment

Besides the provision of staff offices/ workspaces suited to the increased number of administrative duties, staff are also concerned about the following factors which hinder their ability to perform clinical duties:

- Natural light was identified as of importance as visual contact with exterior space particularly for maternity staff working long shifts.
- Staff would prefer to have some localized control of heating and ventilation. This is a difficult problem to resolve because different individuals will have individual preferences for ambient temperature and air movement. To compound this difficulty, energy saving controls will impact on a fully controllable system. However, where possible, opening windows should be provided it fitted with security stops.
- More storage is needed, particularly for large items of equipment.



Conclusions

In the UK, the recruitment and retention of midwives is an issue of concern. There are numerous variables which may impact on this such as working practices, pay scales, shift patterns etc. However, the workplace environment can have a significant impact on staff satisfaction and

performance. Considered design can eliminate or reduce the environmental stressors which may significantly contribute to reducing the dissatisfaction levels in staff consequently improving performance and staff retention. This is supported by a comprehensive analysis of a large number of research studies which were carried out in the United States by the Robert Wood Johnson Foundation and the Center for Healthcare Design. It indicated that the healthcare environment not only has an effect on patient health but also appreciably affects staff effectiveness, health, and satisfaction (Ulrich & Zimring 2004). This research has identified that, with reference to midwifery staff, there is an association between low staff satisfaction ratings and reported health problems related to interior environment.

Designers and procurers of new healthcare buildings need to address staff needs. In the NHS, staffing accounts for 60-80% of the total costs for new Private Finance Initiative (PFI) healthcare facilities. According to Sir Stuart Lipton, "...for every £1 spent on construction, £5 is likely to be spent on maintenance and £200 on staffing costs (Lipton 2002)." This supports the argument that attending to the needs of staff in healthcare facilities must be placed higher on the agenda.

There needs to be innovation in the way design is perceived, commissioned, and executed; and to do that a clear understanding of users' needs is required through evidence-based research. This research has indicated that a new analysis of staff work patterns to consider the suitability of existing and newly conceived ward layouts, office accommodation, and rest facilities is required. This would lead to the development of new design solutions which truly could be termed as evidence-based design.

References

- Archea, J. (1977). "The Place of Architectural Factors in Behavioral Theories of Privacy". *The Journal of Social Issues*, 33 (3), 116-137.
- Cohen, S., Kamarck, T., Mermelstein, R., (1983) A global measure of perceived stress. *Journal of Health and Social Behavior*, 24, 385-396.
- Department of Health, (2000). *NHS Plan: A plan for investment, a plan for reform* [online]. Norwich, HMSO. Available from: <http://www.dh.gov.uk/assetRoot/04/05/57/83/04055783.pdf> [Accessed 5 February 2004].
- Farshchi, M.A., Fisher, N., (2000). *Emotion and the environment: the forgotten dimension*. In: D. Clements-Croome, ed. *Creating the Productive Workplace*. London: E& FN Spon, an imprint of Routledge, 61.
- Gifford, R., Hine, D.W. et al, (2002). Why architects and lay persons judge buildings differently: cognitive processes and physical bases. *Journal of Architectural and Planning Research* 19:2, 131-148.
- Hildebrand, G., (1999). *Origins of Architectural Pleasure*. Berkeley CA: University of California Press.
- Lipton, Sir S., (2002) *PFI: Failing our Future?* Unison Conference 19 September 2002 [online]. London: CABE. Available from: <http://www.cabe.org.uk/news/press/showspeech.asp?id=26> [Accessed 5 February 2004]
- Press Ganey, (2003). *The Satisfaction Monitor 2003* [online]. Available from: http://www.pressganey.com/products_services/readings_findings/satmon/archive.php?type=articles&issue_id=6 [Accessed November 2004]
- PricewaterhouseCoopers LLP, (2004). *The role of hospital design in the recruitment, retention and performance of NHS nurses in England: executive summary* [online]. London: CABE. Available from: www.cabe.org.uk/library [Accessed 12 July 2004].
- Reeves, R., Coulter, A; et al, (2001). *Development and pilot testing of questionnaires for use in the acute NHS trust inpatient survey programme* Picker Institute Europe.
- Royal College of Midwives (2004) *Staffing Survey 2004*. [online]. Available from <http://www.rcm.org.uk/files/info/documents/130105154114%2D340%2D1%2Edoc> [Accessed 22 February 2005]
- Topf, M., Dillon, E., (1988). Noise induced stress as a predictor of burnout in critical care nurses *Heart Lung* 17.5, 567-574.
- Ulrich R.S., (1983). *Aesthetic and effective response to natural environment*. In: I. Altman, and J.F. Wohlwill, eds. *Behaviour and the Natural Environment* New York: Plenum Press, 85-125.
- Ulrich, R., & Zimring, C., (2004). *The Role of the Physical Environment in the Hospital of the 21st Century: A Once-in-a-Lifetime Opportunity*. Report to the Centre for Health Design. Available from http://www.healthdesign.org/research/reports/pdfs/role_physical_env.pdf [Accessed 18 February 2005]
- Westin, A.F., (1967). *Privacy and Freedom*. New York: Atheneum.