

Patient-centred improvements in health-care built environments: perspectives and design indicators

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Abstract

Objective To explore patients' perceptions of health-care built environments, to assess how they perceived health-care built facilities and designs. To develop a set of patient-centred indicators by which to appraise future health-care designs.

Design Qualitative and quantitative methodologies, including futures group conferencing, autophotographic study, novice-expert exchanges and a questionnaire survey of a representative sample of past patients.

Setting and participants The research was carried out at Salford Royal Hospitals NHS Trust (SRHT), Greater Manchester, UK, selected for the study because of planned comprehensive redevelopment based on the new NHS vision for hospital care and service delivery for the 21st century. Participants included 35 patients who took part in an autophotographic study, eight focus groups engaged in futures conferencing, a sample of past inpatients from the previous 12 months that returned 785 completed postal questionnaires.

Results The futures group provided suggestions for radical improvements which were categorized into transport issues; accessibility and mobility; ground and landscape designs; social and public spaces; homeliness and assurance; cultural diversity; safety and security; personal space and access to outside. Patients' autophotographic study centred on: the quality of the ward design, human interactions, the state and quality of personal space, and facilities for recreation and leisure. The novices' suggestions were organized into categories of elemental factors representing patient-friendly designs. Experts from the architectural and surveying professions and staff at SRHT in turn considered these categories and respective subsets of factors. They agreed with the novices in terms of the headings but differed in prioritizing the elemental factors. The questionnaire survey of past patients provided opinions about ward designs that varied according to where they stayed, single room, bay ward or long open ward. The main concerns

were limitation of private space around the bed area, supportive of privacy and dignity, ward noise and other disturbances.

Conclusions Patients perceived sustainable health-care environments to be supportive of their health and recovery. The design indicators developed from their perspectives and from their considerations for improvements to the health-care built environment were based on their visions of the role of the health-care facilities. These were homely environments that supported normal lifestyle and family functioning and designs that were supportive of accessibility and travel movements through transitional spaces.

Introduction

According to the new modernizing approaches to health put forward by the Department of Health,¹ and the NHS Plan² service provision and health-care built environments must develop a patient-centred strategy and focus upon the things that really matter to patients. This fits well with notions of sustainability in its application to patient-centred hospital building designs and facilities provision. This is supported in the 2004 NHS improvement plan,³ which sets out the key commitments that the NHS will deliver to transform the patient's experience. In terms of health-related aspects of the sustainable development paradigm, the built environment of health-care is crucial to the well-being of current and future patients and other stakeholders. Much of the literature on patients' perceptions of factors that affect their health relates to standards of care.⁴⁻⁶ There is little research into patients' perceptions of hospital built environments specifically, the nature of the range of factors that they consider important to their health and well-being and how health-care built design appraisals can incorporate their considerations into the design briefing and evaluation process.

The research was carried out at Salford Royal Hospitals NHS Trust (SRHT), a large acute teaching hospital in Salford, Greater Manchester, UK. Planned comprehensive redevelopment of the hospital under the Salford Health Investment for Tomorrow (SHIFT) project involves substantial redevelopment of the main

hospital site and the provision of four primary care and social centres at locations across the City of Salford designed for seamless delivery of health-care. This research was commissioned in light of these planned developments to ascertain patients' perceptions about the built environment of hospitals so as to influence the design process and the planning stages.

Enhancing value by design appraisal

Design appraisal relates to the process of examining a project, of whatever built form, against an agreed set of criteria that reflect a range of considerations, perspectives and interests. Its purpose is to identify critical area during the design stage, increase confidence across the stages of development and operational services and thereby enhance the value of project, product or service to clients and users. Within the property development and construction industry it involves the assessment and evaluation of a project at the design stage for conformity against standards, technical specifications and codes. Thus, such appraisals address issues relating to quality, health and safety, regulatory compliance, environmental considerations and specified operational requirements of efficient operational applications. Nevertheless, by looking beyond technical conformity and compliance indicators to consider the added value of community and personal perspectives of the stakeholders of interests, including the developer, client and end user, further value can be added and utility enhanced during the operational phase. The

research carried out for the Commission for Architecture and the Built Environment (CABE) and the Department of the Environment and the Regions supported the view that good designs produce economic and social and environmental values.⁷

Researchers in landscape design and the architecture disciplines emphasize that people are sensitive and responsive to the environmental information that they receive from the built environment and provide useful insight into the need for planning responsive humane design.^{8–12} Research in the USA and the UK has begun to identify the contribution of patient environments to health and well-being and patients' recovery from illness; thus, well designed health-care environments can positively influence health outcomes.^{13–15} Lawson and Phiri's study of architectural health-care environments compared the outcomes of patients referred and treated in new or refurbished hospital wards with that of similarly referred and treated patients in older hospital environments.^{16,17} The designs of the internal areas and transitional spaces within health-care facilities should be appraised to ensure that they satisfy the needs of patients and their families. Poor design has been linked to negative health effects, including increased anxiety, greater need for analgesic medications, sleeplessness and higher rates of delirium.^{18–20} Various design appraisal tool kits of procedures and step-by-step checks by which to carry out project design appraisal are available to the architectural profession and the construction and property development industry. Nevertheless, there has been a paucity of UK evidence-based research that relates specifically to patients' views and design appraisal indicators that reflect their perceptions of the built health-care environments.

Aims and objectives

The main aim of this research was to investigate how patients and their families perceived the built environments of NHS Trust hospitals. Its purpose was to explore their perceptions and

their views about different areas within a hospital and their requirements for quality improvements in the internal hospital areas and its external areas, including landscape and aesthetic considerations. The aim was to identify and evaluate their considerations for sustainable future designs as they envisaged them and from this to develop a set of patient-centred appraisal indicators to supplement existing tool kits used in the sector. Key objectives of the research were:

- to develop an understanding of patients' experience within the hospital built environment;
- to explore patients' considerations of sustainable design for built health-care environments;
- to identify factors that influenced their experience within that environment;
- to identify and evaluate the attributes that they considered contributed towards a sustainable patient-friendly environment; and
- to develop a patient-centred indicator set for appraising built health-care designs.

The built environments in the case study hospital

The SRHT, an acute teaching Trust in Salford in the north-west of England provides local, regional and national services and has approximately 900 beds and employs 3500 staff. It was established in 1994 after the relocation of Salford Royal Hospital onto the existing Hope Hospital site in 1993. This was followed by further expansion to include the nearby Ladywell Hospital onto the site in 1999. Thus, SRHT became a predominantly single-site Trust. The overall quality of the built environment of the hospital reflects its current infrastructure, which comprise a mixture of Victorian buildings, outmoded ward stock and piecemeal development of new blocks and facilities following the major relocations to the site. These factors influence patients', visitors' and stakeholders' perceptions, their experiences and their subsequent views and opinions of the built environments of the hospital and how it affects them.²¹

The hospital was selected for the research because of the planned comprehensive redevelopment of the site under the SHIFT project. This came out of a visionary approach in the UK health-care sector based on the notion of a 'whole systems' model of care that puts the NHS Plan into practice in transforming local health and social care infrastructure. This involves a complete redesign of services to improve patients' experience and to deliver more accessible, effective and responsive care. The investment project of approximately £200 million comprises separate aspects of physical redevelopment and a shift in service provision.^{21,22} The built environment aspect of the project should thereby reflect a patient-centred focus in its design and function to meet the sustainability objectives of the health service plan.

Methodology

The research method was based on separate strands of qualitative and quantitative research designs. The qualitative strand used four interpretative methodological approaches. The first comprised 50 one-to-one personal interviews, reported in a separate paper.²¹ The second involved an autophotographic study in which a sample of 35 patients were asked to take photographs of situations that represented their own interpretations and impressions of what they found good or bad about the hospital environment. The methodology was based on frameworks used previously in social science research.^{23–25} One digital camera was used and it was passed from one patient to the next as required. Several patients who were confined to bed took photographs from their beds. Most were able to walk around their wards and some walked further away, along the corridors, into day and utility rooms and sometimes around the wider hospital site.

The third approach used a 'novice-expert' cohort technique. This approach, based on an adapted qualitative Delphi approach,²⁶ facilitated engagement between selected groups of 'novices' and 'experts' about their respective

views and their rankings of nominated elemental attributes necessary for patient-friendly environments. Novices were people, who may have been a patient in a hospital or may have visited a family member, friend or colleague but who did not work in or have direct links with a hospital. Forty novices were asked to nominate the initial elemental attributes that they considered necessary for a patient's friendly hospital environment. Experts were professionals with expertise in areas of the health-care built environment. They were randomly selected from a sample drawn from the membership lists of the Royal Institute of British Architects (RIBA) and the Royal Institute of Chartered Surveyors (RICS) and from staff at SRHT. The fourth of the qualitative method themes involved a series of futures conferences in which rapid appraisal workshops were held with focus groups that were both linked to, and independent of, the hospital. The groups that were linked with SRHT comprised patients' support and voluntary workers who met periodically at the hospital to discuss present and future health-care concerns with the hospital's executives. The independent group had no direct link with SRHT and comprised groups of local residents drawn from across the City of Salford. Five conference groups were undertaken with the linked groups at SRHT and three with the independent group.

The quantitative strand of the research comprised a postal questionnaire survey to 2200 past patients of SRHT. A stratified sample was drawn from a sample frame of patients who had been discharged during the first week of each calendar month from December 2000 to August 2001 inclusive. Approximately 500 patients were discharged each week but because of the exclusion criteria set by the hospital and the Ethics Committee patients that were seriously ill, those with certain specified illnesses, treatments or situations, and those going onto hospices were excluded from the sample. The survey was carried out over two mailshots, which together generated 785 completed useable returns giving a response rate of 37%.

Results

Perspectives from the qualitative themes

Autophotographic study

The photographs that were taken show that there was much similarity in the issues and factors that patients captured on camera across the four departments. Patients took pictures that centred mostly on the quality of ward design (36.5%), types of human–environment interactions (23%), the state and quality of their personal space (17.4%) and facilities for recreation and leisure (15.8%). The views reported in ensuing discussions with researchers were that the environment of the internal areas of the hospital affected their feelings of well-being. Their likes of the environment, items, situations and activities as represented by the photographs reflected the factors and influences that made them feel comfortable and able to keep a sense of normality (Table 1). The photographs that represented their dislikes were reflections of the things that they found annoying and in many cases those which compromised their privacy (Table 2).

Novice-experts

The novices provided an extensive range of suggestions, which were analysed using an itemized theme analysis approach similar to that of the thematic framework suggested by Miles and Huberman.²⁷ The common elements were

extracted into 25 categories, all with their principal elemental factors. Experts from the architectural and surveying professions and staff at SRHT considered these elemental factors, which were in turn discussed by both novices and focus groups. The principal factors that emerged from these prioritizing interactions were: good signage and way finding; controllable lighting for a natural and homely environment; privacy for patients' dignity, confidence and assurance; reduced noise levels in internal and external areas; temperature control for personal comfort and relaxation; access to the natural environment, including views of nature; safety and security in internal and external areas; internal and external children's play areas; accommodation for visitors and relatives; shops and personal services; good around the clock catering facilities; and good landscape designs with seating and garden areas.

The futures conference groups

At each of the eight focus group meetings, in order to encourage free and open discussions, a representative set of photographs taken by the researchers to show the hospital's internal and external areas were shown in a presentation and were also mounted around the room in which group discussions took place. Each group reported specific difficulties with way finding, difficulties experienced with long corridors which did not offer places to rest or access to outside, inappropriate ward designs giving

Areas/activities photographed	Reasons given for selecting and taking particular photographs
The bay	Liked the layout and the company
Space around their bed	Gave privacy, accessibility to get around and space for families and visitors
TV	Had something to do, was occupied
Shower	Modern, private and spacious
Windows	Being able to see outside
The cafe	Gave a feeling of normality and somewhere to go with families and visitors
The shopping mall	Gave a feeling of normality and somewhere to go with families and visitors
Nursing staff	Cheerful staff members were an important part of the environment

Table 1 Photographs representing patients 'likes'

Table 2 Photographs representing patients' 'dislikes'

Areas/activities photographed	Reasons given for selecting and taking particular photographs
Long corridors with lots of obstacles	Difficult to find way and to get outside
Long, open wards	Too little privacy
The bay	Busy and noisy at night
Window with high sills	Can only see sky, need a view of outside
Day room	Cold empty spaces
Lockers	Insufficient space to keep belongings
Curtains	Drab, poor design, do not allow privacy
Washrooms	Too cramped and poorly kept

insufficient personal space, poor views of the natural environment from the bed and unsympathetic lighting and decor. The linked hospital groups discussed the patients' journey, considered experiences of such journeys, and considered futuristic scenarios for improved health-care built environments across other NHS hospitals.

Perspectives from the quantitative theme

Of the postal survey returns, 31% of respondents had been in hospital between 1 and 3 days, 19% stayed 4–5 days, 35% stayed between 6 and 14 days and 15% more than 2 weeks. In terms of the type of ward in which they stayed during their hospitalization periods, 36.9% stayed in a two to four bed bay, 28.8% stayed in a long, open ward, 21.8% stayed in small bay wards that were clustered around a nurses' station and 12.5% had a single room. Nearly half the patients (48%) were admitted to the hospital for surgery; the next largest group

(39.1%) were referred for medical care. Only a small number had been admitted to the maternity and elderly care wards (0.5% and 2.7% respectively), and 9.4% declined to record reasons for admission.

The results of the quantitative strand of the research complemented the qualitative theme. The respondents' views about the hospital were positive and they were generally satisfied with the facilities provided. Opinions about whether the design of their rooms/bays was patient-friendly varied according to the type of ward in which they stayed. Patients in single rooms and those who stayed in small bays clustered around a nurses' station reported being most satisfied with their environment. Nearly one-third of those respondents who had stayed in a two to four bed bay and a long, open ward were fairly satisfied as opposed to completely or very satisfied (Table 3). Negative responses were chiefly in relation to the room/bay at night. Respondents frequently reported annoyance with the level of noise and disturbances during the night.

Table 3 Levels of satisfaction with room/bay design in meeting patients' needs according to ward type

Level of satisfaction	Single room, <i>n</i> (%)	2–4 bed bay, <i>n</i> (%)	Open ward, <i>n</i> (%)	Small bay, <i>n</i> (%)
Completely satisfied	47 (49.5)	81 (29.0)	58 (26.6)	53 (32.5)
Very satisfied	18 (18.9)	64 (22.9)	55 (25.2)	45 (27.6)
Fairly satisfied	22 (23.2)	90 (32.3)	73 (33.5)	42 (25.8)
Neither satisfied nor dissatisfied	4 (4.2)	17 (6.1)	10 (4.6)	10 (6.1)
Fairly dissatisfied	1 (1.1)	16 (5.7)	14 (6.4)	6 (3.7)
Very dissatisfied	3 (3.2)	5 (1.8)	4 (1.8)	5 (3.1)
Completely dissatisfied	–	3 (1.1)	2 (0.9)	1 (0.6)
Cannot say	–	–	1 (0.5)	–
Total	95 (100.0)	276 (100.0)	217 (100.0)	162 (100.0)

The greatest level of night-time disturbance was reported by patients who were in the small bays clustered around a nurses' station (20.2%), followed by those in long, open wards (18.3%) and two to four bed bays (16.8%). One in 10 of those who had stayed in a single room were dissatisfied with this during the night. By far the largest issue mentioned by respondents who felt that the environment was not patient-friendly was space, and particularly the lack of space between patients' beds. Limited space affected the amount of privacy that they enjoyed and it was also seen as an issue in accommodating their visitors. Additional comments were made about the poor facilities for visitors, which included the lack of sufficient seating and the inability to get light refreshments on the ward. In addition, respondents viewed their inability to control the temperature around their bed as a restriction.

While the general pattern emerging from the questionnaire responses was for respondents to be positive about the facilities on their ward, two issues in particular received strong negative ratings: restricted views of outside from the bed and bedside entertainment (Table 4). In contrast, patients' washroom facilities were generally rated very good. The trend overall was for

the facilities to be rated as good or satisfactory rather than very good. One respondent suggested that using more substantial dividing curtains or repositioning the beds could overcome the issue of lack of privacy. A similar point was also made that the beds could be divided in a corresponding way to that used in open-plan office complexes. There was general agreement that the lack of activities for patients (such as a TV at the end of the bed) tended to mean that patients were more conscious of what was going on around them and that this reduced the amount of privacy patients had. TVs and headphones offered a distraction. There was consensus that patients should have their own bedside TV and entertainment communication system, which was preferred to one central TV.

One area for improvement related to the views outside the ward. Respondents reported that having views helped them to 'relate' to the outside world. One respondent suggested that having a particular view outside the window could greatly affect one's mood. Being able to see, and preferably go outside was seen as very important. A further request was for the provision of more windows within ward designs, not only in terms of the views but also for ventilation.

Table 4 Views on the ward facilities

Facility	Very good, <i>n</i> (%)	Good, <i>n</i> (%)	Satisfactory, <i>n</i> (%)	Poor, <i>n</i> (%)	Very poor, <i>n</i> (%)
Peace/quiet	46 (19.2)	229 (30.1)	251 (32.9)	88 (11.5)	48 (6.3)
Fresh air/ventilation	134 (17.7)	217 (28.6)	261 (34.4)	101 (13.3)	46 (6.1)
General ward design	111 (14.8)	239 (31.9)	288 (38.4)	85 (11.3)	27 (3.6)
Cheerfulness of decoration	75 (10.1)	201 (26.9)	309 (41.4)	106 (14.2)	55 (7.4)
Space around bed	103 (13.5)	198 (26.0)	254 (33.3)	150 (19.7)	58 (7.6)
Patients' recreational facilities	44 (7.4)	125 (21.6)	191 (33.0)	154 (26.6)	64 (11.1)
Access to phone	105 (14.8)	181 (25.6)	276 (39.0)	104 (14.7)	42 (5.9)
Patients' toilets	165 (21.8)	232 (30.6)	241 (31.8)	67 (8.9)	52 (6.9)
Patients' bath	164 (21.7)	224 (29.6)	249 (32.9)	76 (10.0)	44 (5.8)
Patients' showers	128 (19.5)	183 (27.9)	213 (32.5)	78 (11.9)	54 (8.2)
Views outside	28 (4.0)	78 (11.1)	193 (27.5)	261 (37.2)	141 (20.1)
Storage space	42 (5.5)	129 (17.0)	358 (47.1)	179 (23.6)	52 (6.8)
Level of privacy	74 (9.7)	132 (17.4)	314 (41.4)	145 (19.1)	94 (12.4)
Met cultural needs	102 (17.7)	173 (30.3)	277 (48.1)	16 (2.1)	8 (1.4)
Met ethnic needs	90 (18.7)	141 (29.3)	237 (49.2)	8 (1.7)	6 (1.2)
Security on ward	83 (12.6)	169 (25.7)	282 (42.9)	82 (12.5)	42 (6.4)
Seating for visitors	61 (8.1)	135 (17.8)	259 (34.2)	215 (28.4)	87 (11.5)
Bedside entertainment	31 (5.1)	71 (11.7)	162 (26.6)	209 (34.3)	136 (22.3)
Shape/room layout	71 (9.8)	188 (25.8)	342 (47.0)	90 (12.4)	37 (5.1)

Views on admission

All respondents were asked to rate the quality of the facilities on the journey from the admissions area to the ward. The majority of respondents (50.3%) had walked onto the ward, while 29.2% had been taken onto the ward on a trolley and 20.5% had used a wheelchair. Related responses are presented in Table 5.

Rating of other facilities

Respondents identified a number of facilities that catered for patients and their families across the hospital, for example, the children's play area, the shopping areas and the restaurant and

cafe's. Respondents were asked for their views on each of these facilities (Table 6). The shopping area received the most praise. The second most popular facility was the cafe/restaurant. In contrast, most of the other facilities were generally rated as being at best satisfactory.

Discussion

Perception of hospital built environment

The above findings point to the importance of a common set of patients' perceptions of the hospital built environments. These are: a sense of

Table 5 Views on facilities on the journey from admissions area to the ward

Facility	Very good, n (%)	Good, n (%)	Satisfactory, n (%)	Poor, n (%)	Very poor, n (%)	Cannot say, n (%)
Location of admissions area	69 (23.5)	269 (37.4)	201 (28.0)	41 (5.7)	8 (1.1)	31 (4.3)
Size of admissions area	92 (13.1)	272 (38.7)	229 (32.6)	65 (9.3)	11 (1.6)	33 (4.7)
General appearance of admissions area	15 (16.1)	259 (36.2)	247 (34.5)	52 (7.3)	9 (1.3)	33 (4.6)
Distance from admissions area to ward	63 (9.3)	193 (28.4)	257 (37.8)	95 (14.0)	27 (4.0)	45 (6.6)
Appearance of walkways/corridors	34 (18.2)	266 (36.0)	252 (34.1)	62 (8.4)	11 (1.5)	13 (1.8)
Level of privacy en-route	62 (8.7)	198 (27.7)	283 (39.5)	104 (14.5)	44 (6.1)	25 (3.5)
Location of waiting areas	53 (7.7)	198 (28.7)	295 (42.7)	84 (12.2)	24 (3.5)	37 (5.4)
Size of waiting areas	54 (7.9)	180 (26.2)	292 (42.5)	96 (14.0)	26 (3.8)	39 (5.7)
Appearance of waiting areas	68 (9.8)	188 (27.1)	284 (40.9)	102 (14.7)	19 (2.6)	34 (4.9)
Signs and directional aids	148 (20.5)	224 (32.1)	231 (32.0)	77 (10.7)	21 (2.9)	21 (2.9)
Location of lifts	106 (15.1)	236 (33.5)	258 (36.6)	55 (7.8)	16 (2.3)	33 (4.7)
Availability of stairs	84 (12.8)	200 (30.4)	271 (41.2)	35 (5.3)	9 (1.4)	58 (8.8)
Access for disabled people	84 (14.2)	148 (25.0)	169 (28.6)	47 (8.0)	15 (2.5)	128 (21.7)
Location of toilets	102 (14.1)	237 (32.9)	257 (35.6)	75 (10.4)	22 (3.1)	28 (3.9)
Appearance of toilets	114 (15.7)	218 (29.9)	238 (32.7)	79 (10.9)	54 (7.4)	25 (3.4)
Ease of access through doors	118 (16.5)	232 (32.4)	309 (43.1)	30 (4.2)	9 (1.3)	19 (2.6)

Table 6 Patients' rating of other facilities at the hospital

Facility	Very good, n (%)	Good, n (%)	Satisfactory, n (%)	Poor, n (%)	Very poor, n (%)	Cannot say, n (%)
Shopping areas	30 (31.7)	293 (40.4)	165 (22.8)	12 (1.7)	4 (0.6)	21 (2.9)
Cafes/restaurant	214 (29.5)	292 (40.2)	168 (23.1)	24 (3.3)	6 (0.8)	22 (3.0)
Children's play areas	23 (5.3)	38 (8.8)	48 (11.1)	62 (14.4)	40 (9.3)	220 (51.0)
Baby-change facilities	15 (3.8)	34 (8.6)	45 (11.3)	36 (9.1)	18 (4.5)	249 (62.7)
Smoking facilities	25 (5.3)	29 (6.2)	50 (10.6)	65 (13.8)	99 (21.0)	203 (43.1)
Prayer facilities	45 (9.7)	85 (18.3)	106 (22.8)	26 (5.6)	7 (1.5)	195 (42.0)
TV facilities	79 (11.7)	128 (19.0)	191 (28.3)	163 (24.1)	60 (8.9)	54 (8.0)
Garden/outdoors	57 (9.6)	105 (17.6)	199 (33.4)	105 (17.6)	29 (4.9)	101 (16.9)
Car parking	88 (12.0)	154 (21.0)	229 (31.2)	121 (16.5)	108 (14.7)	33 (4.5)
Public transport	59 (10.6)	108 (19.4)	133 (23.9)	66 (11.9)	40 (7.2)	50 (27.0)

personal space; a welcoming atmosphere; an environment that meets the needs of visitors; good physical design in terms of usability, accessibility and controllability; access to external areas that promotes a sense of normality; supportive environments for effective communication between patients, staff and relatives; and facilities for recreation and leisure. Patients reported that knowing where they were at any given point during their visit to the hospital was very important. Many reported that they had experienced confusion and difficulties with orientation around the hospital on their first visit during the arrival and then the admittance phase of their hospital experience. This finding supports studies that have reported on individuals' biological needs related to orientation, visual perception and definition of territory.^{11,21,28,29}

Patients' perceptions of the environment once they had been admitted to the ward were influenced by factors that affected their normal lifestyle functioning, such as their ability to eat and sleep; feelings of security or insecurity and the situation arising out of the amount of privacy and dignity that the design of the ward allowed them. Further factors suggested related to their ability to control the environment and loss of empowerment in simple day-to-day actions such as switching lights on and off as required by changing conditions, adjusting the central heating, making a cup of tea, looking out through the window and entertaining a visitor. These findings support the results of previous studies that stressed the importance of the healing environment in patients' experience and recovery.^{9,14,17}

Patients and the groups involved in the research expressed the importance of being able to have a sense of independence. This, for example, can be facilitated by good design to enable them to have enough space to move around the ward area, to allow them privacy with both medical staff and their family and visitors. They also wanted to be able to view everyday activities from all internal areas when it was impossible to go outside. This hindrance was captured in the photographs of inadequate building design in which long corridors without

external access and with poorly positioned lifts and stairs often made views and access to outside difficult.

Supportive staff and service facilities

Patients placed importance upon the contribution made by supportive staff and other patients to the experience of the hospital environment. This was reflected, for example, in the number of photographs that patients took of the nursing staff to represent what they found to be good about their environment. In some instances, patients reported that they found it difficult to photograph what they disliked – for example, the noise in the bay at night, which stopped them from sleeping, and the lack of facilities such as having TVs near their bedside and space, chairs and basic catering provision that were unavailable for their visitors comforts. These findings support previous studies, which have reported how functional environments that have patient-focused, or supportive characteristics assist patients in dealing with the stress of illness and aid their recovery.^{20,30,31} Patients expressed their desire to be supported and to be able to have a sense of control of their actions through the provision of well-designed facilities which support social interaction and feelings of normality.

In identifying the preferences of stakeholders regarding the type of facilities they wanted the hospital and the wider NHS to provide, the study found that respondents identified the notion of a supportive environment and a basic need for a sense of space encompassing private and public territories. To be supportive, physical space and social space needed to be flexible and negotiable. The key element was that the individual should have ownership and control over their space and others should not be able to invade it without prior agreement. Social space was considered to encompass communal areas either within bays or between wards. It encompassed the provision of areas where patients could eat, drink and interact with others to maintain a sense of normality. The evidence suggests that this need was not met by day

rooms, which were poorly used and perceived as sparse, insular and ‘empty places’.

Patient-centred appraisal of built health-care designs

The patients’ views, considerations and their suggestions from each of the various areas of the research provided a large number of itemized criteria for design evaluation. Each indicator element was developed from the findings by extracting the principal considerations from the range of views expressed from each area of the qualitative and quantitative themes of the research. In this way, qualitative factor and

content analysis allowed these considerations to be broken down into 23 internal categories and 12 external categories. Thus each category, presented as separate indicator elements in Tables 7 and 8, was itself compiled from detailed subsets, each of which provided greater detail to reflect the range of considerations put forward by patients. For example, as shown in Table 7, the entrances and reception areas indicator set comprised 18 elements. The patients’ privacy and dignity subset comprised nine elements, catering 11 elements and accessibility eight.

Tables 7 and 8 present the separate internal and external environment design appraisal indicator sets. They comprise individual elements by

Table 7 Principal internal indicators of patient-friendly environments

Indicator elements to examine from patients perspective	Patients health status						Total score
	Patient’s age and gender sympathies		Patients’ health sympathies		Patients’ socio-cultural sympathies		
	Gender	Age	Genetics/physical abilities	Emotional distress and anxiety	Social and family circumstances	Cultural considerations	
Way finding – internal signage							
Rooms: consulting, diagnostics							
Rooms: treatment, utility							
Lighting, levels, ambience and control							
Noise levels and acoustics							
Temperature control and ventilation							
Access to and from transitional spaces							
Entrances, reception, social spaces							
Ward environment							
Surfaces and floors							
Views and natural outlook							
Washrooms/hygiene facilities							
Personal space and ownership							
Privacy and dignity							
Nurses’ station/staff contact							
Spiritual and pastoral care areas							
Safety and security							
Homely facilities							
Accommodation for relatives							
Catering facilities							
Leisure and recreational facilities							
Shops and personal services							
Telephone, television and Internet							

Guidelines for scoring the design elements for patient’s friendly environments. Award a score based on consideration of the types of patients, giving due consideration to patients’ health status represented by age, gender, health, social and family circumstances and cultural sympathies. 1, poor; 2, fair; 3, good; 4, very good.

Table 8 Principal external indicators of patient-friendly environments

Indicator elements to examine from patients perspective	Patients health status						Total score	
	Patient's age and gender sympathies		Patients' health sympathies		Patients' socio-cultural sympathies			
	Gender	Age	Genetics/physical abilities	Emotional states, distress and anxiety		Social and family circumstances		Cultural considerations
Accessibility and transport								
Integrated public transport								
Parking facilities: staff								
Parking facilities: patients/visitors								
On-site traffic and pedestrian movements								
Way finding: directional aids based on named roads and buildings								
Landscaping and green areas with access from internal areas								
Noise reduction services								
Safety and security in and around hospital grounds								
External recreational areas								
External secure children's play areas								
External smoking areas								

1, poor; 2, fair; 3, good; 4, very good.

which designs can be appraised from the patients perspectives so as to give due considerations to their particular characteristics. The evaluation method suggested in the tables develops from the health impact assessment carried out on the SHIFT project and elsewhere, which emphasized the importance of the role of existing health status.^{22,32,33} Thus, each indicator can be used to appraise a proposed design so as to give due consideration to the patients health status represented in Tables 7 and 8 by the column headings, age and gender sympathies, health sympathies, including patients biological, genetics/physical abilities and emotional states also socio-cultural sympathies such as social and family circumstances and cultural considerations. The patient health status can be extended in carrying out an appraisal by including further biological factors, family circumstances and lifestyle factors including impairments, compromised hearing, vision and bodily functions, and patient characteristics, whether neonates, children, adolescents, adults or elderly. In appraising

health-care designs on the basis of these indicators, a score of between 1 and 4 should be awarded on the basis of contributory potential to patient health status and sympathies.

The project commissioners, design team and patients from representative clinical pathways should discuss and agree upon the specific indicator elements and health status categories to apply during the design planning and development briefing stages. As an appraisal tool, the indicators allow flexibility in its application allowing selected elements and health status categories to be applied with respect to patient requirements for specific healthcare projects. A good patient focussed design should score over 90% of the aggregate score for the agreed indicator elements and health status categories.

Conclusion

This paper explored patients' perceptions and their attitudes to hospital environments and to the factors that contributed to their experience.

Patients were found to have full understandings of the range of factors that affected them, especially bearing in mind their existing health status, independent of the specific health condition that led to their hospitalization. Patients across the four departments of the case study hospital provided an extensive range of health influencing considerations. Principal indicator sets were extracted to form internal and external indicator sets, each with individual element by which to evaluate a design. Such an approach provides for an increased focus around the interest of the patient and allows their normal health status to be taken into account during the design process and planning stages. By this the design of hospitals' internal and external areas, including transitional spaces for access and patients flows, should provide for sustainable supportive environments, which minimize anxiety and promote healing through the creation of an overall inviting, calming and engaging effect. Health-care environments exist within the broader context of human-centred demand from organizational and physical development. Patients require environments that support homely normal lifestyle and family functioning. They require designs that are supportive of privacy and dignity, ownership of territory, accessibility needs and travel movements through transitional and public spaces. In light of the visions stated in the NHS Plan, these are timely considerations and provide an opportunity for health-care decision-makers to apply and incorporate patient-centred considerations into all built environment designs for current and future health-care programmes.

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