

Full Length Research Paper

A Review of Physical Facilities Design Settings: Standard for Hospital Building Performance in Southwest, Nigeria.

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Abstract: Healthcare physical facilities come in various shapes, sizes and configurations in southwest Nigeria. Some of these structures are bewildering to discerning professionals, especially architects, who recognize that the design and configurations of these facilities are not conducive to optimal healthcare delivery services. That challenge is what this study sets out to contribute to resolve by pushing the case for evidence-based design of hospital physical facilities. Relying on the review of cognate studies carried out in both developed and developing nations, this study identifies and documents the important hospital physical facilities with special focus of the inpatients facilities (in-patient ward, consulting and examination, treatment room, Laboratory and diagnosis, staff work stations, staff rest room, equipment store room teaching hall and administrative area) that are globally considered standard for the provision of sensitive, compassionate, user-friendly and safe care for patients. The result points to clear-cut design settings that would be useful to architects, healthcare researchers, facility administrators, policy-makers and healthcare managers in enhancing building performance by ensuring the efficient resolution of the design issues affecting health institutions', especially Teaching Hospitals' physical facilities in southwest Nigeria.

Keywords Hospital, Physical Facilities, Design Settings, Building performance

Introduction

The orthodox medical system inherited from Britain by Nigeria concentrates healthcare delivery services in urban centres. For whatever reason, southwest Nigeria benefitted most from the healthcare system, leading to the emergence of the first western orthodox hospital in Nigeria, the Lagos General Hospital, in 1873; followed by the Sacred Heart Hospital, established by the Roman Catholic Mission, in Abeokuta in 1885. The first University Teaching Hospital in the Southwest, the University College Hospital (UCH), Ibadan, was established in 1957 (Coker & Sridhar, 2010). By 2019, the number of Federal University Teaching Hospitals in the region has increased to four, serving some 32.5-million people (National Population Commission, 2006). The Southwest has more healthcare facilities than any other region of the country and, so, likely to produce more complex healthcare cases than other geo-political zones in Nigeria (Coker & Sridhar, 2010). Evidence from literature shows that southwest Nigeria has probably the largest human resources for health in Nigeria (Coker & Sridhar, 2010); paradoxically, it is faced with limited healthcare physical facilities to cater for the growing population (Population Reference Bureau, 2010). The World Health Organization (WHO) identified this as a major threat to achieving sustainable development goals (SDG Summit, 2019) because of the resulting poor working conditions and infrastructure as well as sub-optimal key healthcare indicators across the country (WHO, 2010). Although these facts have wide-ranging negative implications, the country's US\$50 total per capita expenditure on health is among the lowest globally. This means there is little to spend on health physical facilities. One consequence of this is the extensive and widespread level of deterioration of healthcare physical facilities, especially in the Southwest where the authorities have adopted a piecemeal improvement approach by adding more buildings to existing hospitals or rehabilitation and renovation of the facilities. It is doubtful if these piecemeal efforts are guided by evaluation from the dynamic and complex points of view of the present users. The most appropriate type of evaluation recommended for use in the overall evaluation of building design is post-occupancy evaluation which is a systematic evaluation of opinions about buildings in use, from the perspective of users (Watson, 2003). Evaluation instruments are used for both the feedback and feed forward for any design improvement by the actual users of the facilities. Piecemeal improvement of healthcare physical facilities in southwest also suggests an absence of evidence-based framework for physical designs incorporating the documentation of proper spaces provided in a hospital setting in

Nigeria. Hence, there is a gap in knowledge about how the physical facilities setting should look like in southwest Nigeria. Failure to discuss these problems will affect the physical facilities performance which in turn could negatively affect the staff performance, patient's well-being, increase mortality and morbidity rate and decrease users' satisfaction.

Classification of the Hospital Physical Facilities

The physical facilities of the hospital are generally classified into two: the clinical and nonclinical physical facilities (Akinluyi, Awe, Adeleye & Ogunraku, 2019). The Clinical Facilities refer to the spaces used to carry out medical activities, such as operating theatre and

surgical procedures, children ward, orthopaedic clinics, gynaecology, ante-natal, post-natal, visual acuity for ophthalmology, among others (Santiago, 2016). The clinical facilities can further be classified to two, namely the inpatient and outpatient's physical facilities (Dinesh, Sanjeev, Prem & Remya, 2013; Akinluyi, Awe, Adeleye & Ogunraku, 2019). This study is limited to the study of in-patient physical facilities which include the all types of ward spaces, consulting, examination, laboratory and diagnosis and treatment room. Also, non- clinical spaces such as

staff work stations, staff rest room, equipment's store , teaching hall and administrative facilities were vibrantly examined.

The In-patient physical facilities

These refer to medical treatment facilities that are provided in a hospital and require at least an overnight admission(Santiago, 2016) at the hospital, primarily to allow further close observation, treatment and monitoring before, during and after a medical procedure (Phiri, 2003); with continuous general nursing services (Bayramzadeh,, 2016). Wards remain the most popular in-patient hospital physical facilities(Alalouch, Aspinalland Smith, 2016)) due to the fact that patients on admission spend most of their time in hospital wards where they are usually weak, vulnerable and experiencing little control over their environment. Examples of inpatient physical facilities that are discussed in this study include; all types of wards such as gynaecology, ante-natal, post-natal, labour, neonatal, orthopaedic and paediatric, among others (Santiago, 2016; Fawole, Okunlola&Adekunle, 2008). Also, consulting, examination, laboratory, diagnosis and treatment room were discussed.

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Fawole, Okunlola, Adekunle, (2008) examine the clients' perceptions of the quality of antenatal care of obstetrics & gynaecology department in private and public health facilities in Ibadan; investigating design factors such as amenities and attached facilities, adequate spacing, cleanliness of the environment, good toilet facilities, adequate ventilation and availability of running water and electricity. The findings showed that physical facilities determined the quality of antenatal care in both private and public health sectors in Ibadan. In addition, Erim, Kolapo, Resch, (2012) examine the physical facilities in an Obstetrics & Gynaecology department, focusing on design issues in facilities such as ambulance, labour ward, delivery room, operating room, neonatal ward, uninterrupted electricity supply and staff availability. The findings showed that facilities provided were not sufficient and standard. The authors, therefore, concluded that reducing maternal deaths in Nigeria will require attention to both increasing the standard and number of facilities provided.

Also, Steinke, (2015) determines the attributes of the physical setting that are important for developing a positive service in an emergency department in Canada by focusing on design component factors of the physical setting such as Ambience (variety, interesting, colour, calming and light), User-friendly (furnishings, relax, technology, spacious and privacy), Layout (layout, proximity, security, way finding), Amenities (outdoors, media), cleanliness (interior tidy, exterior tidy) and adaptability. The author found a low rating for all these, particularly for flexibility/adaptability, user-friendliness and ambience, with amenities rated averagely. The result showed that the design of the physical setting in the emergency departments is not beneficial for the users.

Similarly, Lambert, Coad, Hicks, Glacken, (2013) shared young children's perspectives of what constituted ideal physical design features across three children's hospitals in Ireland, focusing on personal space (individual and family space, privacy, Storage, Noise and Light), physical environment (creative use of space, imaginative décor and bringing the outside in) and accessibility. The findings also revealed that young children want a hospital environment that is bright, cheerful, warm, colourful, comfortable, spacious, creative, imaginative and contemporary

Non-clinical physical facilities

This second classification of medical facilities refers to attached facilities and amenities that provide support and services to both the inpatient and outpatient physical facilities. Fawole, Okunlola and Adekunle, (2008) point out that amenities and attached facilities such as adequate spacing, cleanliness of the environment, good toilet facilities, adequate ventilation, availability of running water and electricity are factors that determine the quality of antenatal care in both private and public health facilities. LaVela, Etingen, Hill and Miskevics, (2015) list attached facilities to include the administrative structures such as office spaces, engineering and environmental services facilities, staff rest and changing room, teaching and training facilities, security post, dirty utility/disposal room, parking facilities and conveniences as well as amenities in the hospital environment comprising commercial and entertainment centre, catering and restaurant, religion facilities, ATM points and banking, and public facility. LaVela et al posit that the physical environment to which health care is delivered may be improved through the redesign of existing physical facilities or by adding nurturing attached amenities. The study suggests that profit-oriented facilities are in general closer to the main physical facilities while public facility tends to be situated far from hospital activities. The study is limited to non-clinical spaces such as staff work stations, staff rest room, equipment's store, teaching hall and administrative facilities were vibrantly examined.

Post Occupancy Evaluation of the Physical Facilities Design Features

Evaluation is a multi-disciplinary endeavour, and as such each discipline defines evaluation based on its disciplinary perspective. This means that evaluation is used in diversified fields in answering a wide range of questions about human activities, habits, policy interventions, programmes and projects (Hatry, 1980). The above view on evaluation, particularly with respect to addressing questions on hospital physical facilities design features in terms of their morphological configuration and design psychosocial characteristics adopted for this study.

Post Occupancy Evaluation (POE) is an important process in the planning cycle as it provides decision makers justified decision making for immediate and future facility planning and design (Nawawi, 2016). It also facilitates the recommendations that could be made to planners,

designers and policy makers of hospital facilities for learning and observing the social and cultural aspects of their main users (Nawawi, 2016).

Post Occupancy Evaluation is an internationally accepted approach to gaining experience from the use of hospital facilities (VoordtVan der & Van Wegen, 2005). Evaluative research was developed as a systematic methodological process giving better scope and rigor to hospital physical facility studies. According to the Centre for Health Design (2015), evaluation and

feedback are key components of the continuous improvement of the healthcare physical facilities. Preiser, Rabinowitz, and White, (1988) defined post occupancy evaluation of the physical facilities in use as the process of systematically and rigorous evaluation of buildings after construction and occupation which provide feedbacks for design improvement.

POE of hospitals is, thus, essential to elicit the perceptions of the users and correlate these with their satisfaction level POE of buildings in use can provide relevant information about the performance of a hospital from an end-user point of view (VoordtVan der & Van Wegen, 2005).The broad understanding of POE is that it evaluates the performance of the building based on user experiences, but also considers a more holistic, process-oriented evaluation (Preiser and Schramm, 2002).The hospital's evaluations form a key literature addressing user experience from the perspective of both patients and healthcare professionals such as their subjective view on physical facilities in term of spaces available, function, technology, usability and aesthetics.

POE and usability appraisal in hospital buildings are focused on the technical building performance, function/usability or form/beauty. For example; Post Occupancy Evaluation was typically measured by VoordtVan der & Van Wegen, (2005) on three dimensions such as technical, functional and behavioural scales using hospital physical facilities. The author was significantly concerned with the technical issues relating to the capability of the building and its engineering services systems as well as functional aspects such as the ability to achieve operational and clinical tasks efficiently and effectively. The author also focused on the behavioural characteristics such as the psychological and social aspects of user satisfaction with better understanding of the general wellbeing of hospital physical facilities users that had not previously been considered in the more typical areas of evaluation. In addition, Volker (2010) believes that POE tools are developed to obtain data on the physical facilities design and

they are limited in terms of their contribution to the design stages. POE seeks to learn how physical facilities performed and influence the users of the facilities (Vischer, 2001; Dahl, 2008).

The Evidenced-Based Design (EBD) in Hospital Settings

Evidence-based design refers to design decisions that are based on the best available research and knowledge on that topic (Hamilton, 2009). From the literature, the concept of “Evidenced-Based Design” (EBD) is the architectural analogue of the concept, “Evidence-Based Medicine” (EBM), and it refers to the scientific justification that can endorse the importance of certain aspects of the physical setting for health and healing (Hamilton, 2004). One of the principles of EBD is that the scientific evidence resulting from post occupancy evaluation of existing buildings is used in the design decision process for new buildings. Evaluation of a building in use can make provide significant insight into how the building is actually used and appreciated.

This knowledge can then be exploited for new design projects (Zeisel, 1984). A literature review conducted by the Centre for Evidence-Based Design Health Systems and Design at Texas A&M University and the College of Architecture at Georgia Tech (Ulrich et al., 2008) came up with 600 studies on how hospital design can impact clinical outcomes. The review covers design issues such as single rooms versus multi-bed rooms, wayfinding, noise effects, sunlight, exterior views, mechanical installations and ergonomics. The authors encouraged the use of EBD as a

means to create healthcare buildings informed by the best available evidence regarding how the physical environment can interfere with, or support, the activities of patients, families, and staff (Ulrich et al., 2008). The study built on scientific evidence that the physical setting in which medical care is provided can play a considerable role in patients’ health and well-being (Ulrich & Zimring, 2004) and various works that had revealed congruence between the perceived quality of the physical-spatial features, the social and functional aspects of hospitals using Evidence-Based Design (Fornara & Andrade, 2012; Varni, et al., 2004). The design and space organization are very important for different users and can be decisive in environmental, economic and social development of the whole building facilities.

RESEARCH METHODOLOGY

Nigeria is divided into six geo-political regions (South-south, South-east, South-west, North-central, North-west, and North-east regions (Figure 1.0). This study will be carried out in South-western Nigeria because the zone is in the forefront of healthcare development in Nigeria and, therefore, harbours the first generations of Federal University Teaching Hospitals in the country. The southwest part of Nigeria consists of six states Oyo, Osun, Ekiti, Ogun, Ondo, and Lagos states. The study areas selected are basically the states where the first-generation Federal University Teaching Hospitals are situated; namely Lagos, Oyo and Osun states (Figure 2.0). Therefore, University College Hospital, Ibadan, Lagos University Teaching Hospitals, Lagos and Obafemi Awolowo University Teaching Hospital, Ile-Ife, emerged as the Federal University Teaching Hospitals in Southwest Nigeria.

Through the literature review, the prominent in-patient physical facilities for healthcare performance identified in these hospitals include the in-patient ward, consulting, examination and treatment room, laboratory and diagnosis facilities. Also, Non-clinical facilities identified are staff work stations, staff rest room, equipment store room, teaching hall and administrative facilities. Below are the recommended design settings and organization for hospital spaces. The standard for these spaces is analysed based on evidence from the literature review.

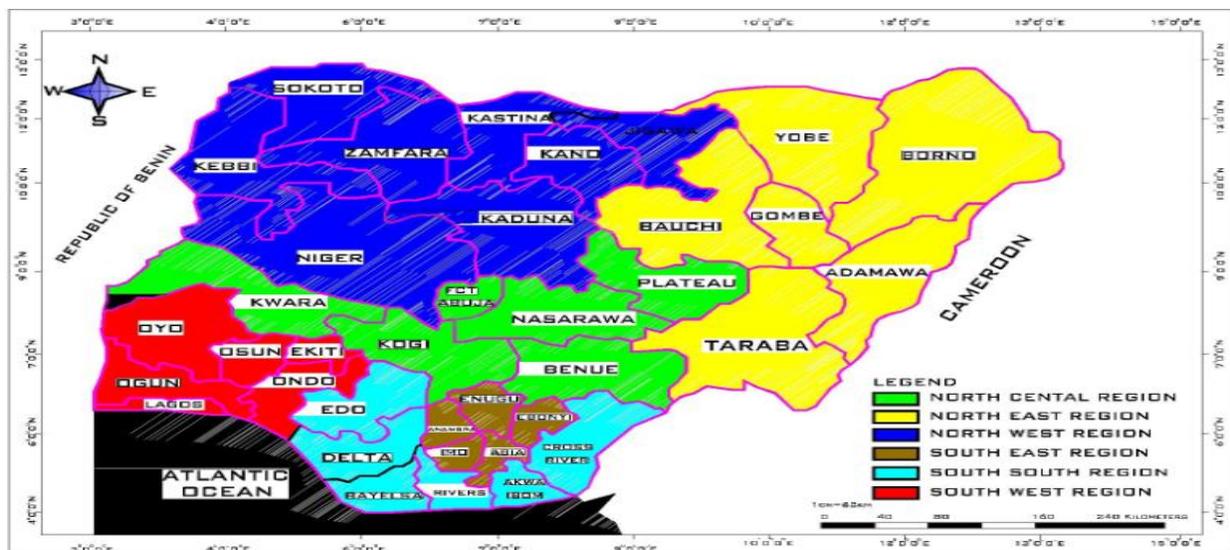


Figure 1.0; Map of Nigeria Showing the Six Geopolitical Zones
Sources: <http://www.nigerinmuse.com> (Digitalized by the Author, 2019)

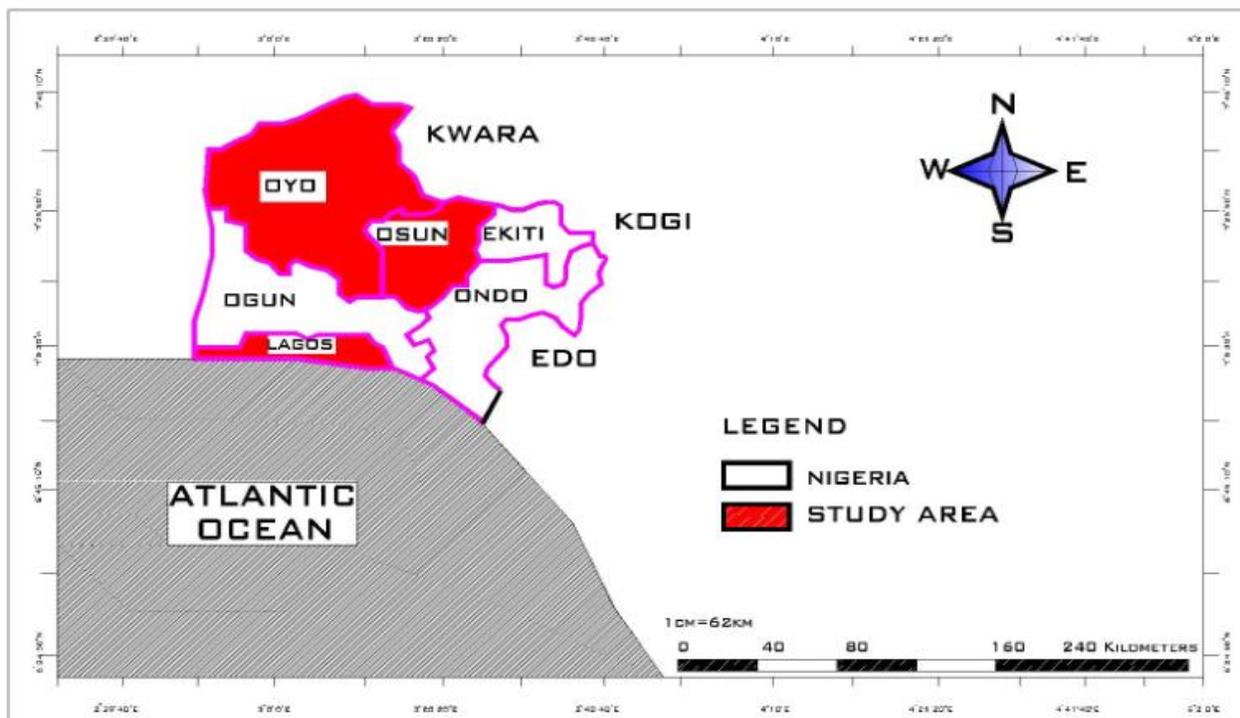


Figure 2.0; Map of the Southwest parts of Nigeria Showing the study Area
Sources: <http://www.nigerinmuse.com> (Digitalized by the Author, 2019)

Presentation of Design Standard for Hospital Physical Facilities Environment in Southwest Nigeria

The In-patient Wards

A ward is usually a large accommodation in a hospital with beds for people to stay for observation purposes. It is shared by patients who need similar kinds of care. Different departments in the hospitals are usually provided with wards. These include maternity/labour ward, emergency ward, children and adult wards, psychiatric ward, dental ward, physiotherapy and ophthalmology, and medical/surgical wards. Patients accommodated in a ward are In-patients. Ulrich et.al. (2004) showed that well-designed architectural ward spaces have an impact on patients' recovery time, wellbeing and satisfaction. In addition, wards occupy more floor area than the other departments combined.

Designing a hospital ward requires special attention from the early stages to meet the wide range of issues involved in ward design. These include users' psychological needs which are less often considered though of vital importance. Alalouch, Aspinall, and Smith (2016) identify

privacy as the major criterion for a hospital ward, noting that patients 'privacy was ranked the most important criterion of ward design. However, participants acknowledged the difficulties associated with fulfilling patients' needs for visual and acoustics privacy through the spatial design of hospital wards. One of the main reasons for this difficulty appears to be the unclear link in the available documents between how architectural design contributes to the achievement of the required level of patient's privacy.

Ward design criteria include architectural design, interior design in term of ward arrangements which affects the spatial structure of the ward. This also includes physical aspects in wards such as colour scheme, texture and lighting. Hospital ward design must meet up with adequate workflows & logistics, flexibility & adaptability, sufficient space, security & supervision, space utilization storage space, access to nature, toilet & bathroom, natural & artificial lighting, staff access to IT, relaxing and changing place & lockers, staff station, legibility of place & way-finding, acoustic design and noise, fire planning strategy. Ulrich et.al. (2004) posits that the top priority of architects designing hospital wards is to create a view to a landscape, followed by good surveillance from nurses and easy access to sanitary facilities.

Consulting and Examination Design Facilities

Consulting and examination rooms in hospitals should be suitable for use by male or female clinic attendees for consultation, interview, clinical examination, collection of specimens, minor treatments, giving injections and dispensing drugs (Department of Health Estates and Facilities Division, 2007). Consulting and examination rooms should, therefore, ideally be provided with double-sided access to the couch, appropriate for male and female general and genital examinations. Couches for female examination may have variable geometry, facilitating internal examination. There should be sufficient space around the coaches to enable them to be converted from a lithotomy style to flat if the attendee needs to be placed in the supine position. A ceiling-mounted examination lamp, clinical washbasin, apron and glove dispenser, waste and sharps bin should be provided. Consideration may be given to providing one room with single-sided couch access and a wall-mounted examination light for some clinical procedures, particularly male examinations. Free-standing examination lights should not be the standard provision, but should be available (See figure 3.0 as described by Department of Health Estates and Facilities Division, 2007)

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Consulting and examination rooms offer the most flexible use of space, and are generally used for most contraception and sexual/reproductive healthcare consultations. The following points should be considered in the design and use of consulting and examination rooms in the hospitals: space is required for equipment; the arrangement of the consulting and examination room should allow sufficient space for training; and one or two rooms should have black-out blinds to allow them to be used for scanning. In the consulting room, there should be sufficient space for an escort, children and also a buggy/push-chair and/or wheelchair. The rooms may be used for teaching purposes, so there should also be space for an observer. The use of interconnecting doors between consultation and examination rooms should be discouraged to maintain acoustic privacy between rooms (See figure 4.0 as described by Department of Health Estates and Facilities Division, 2007).

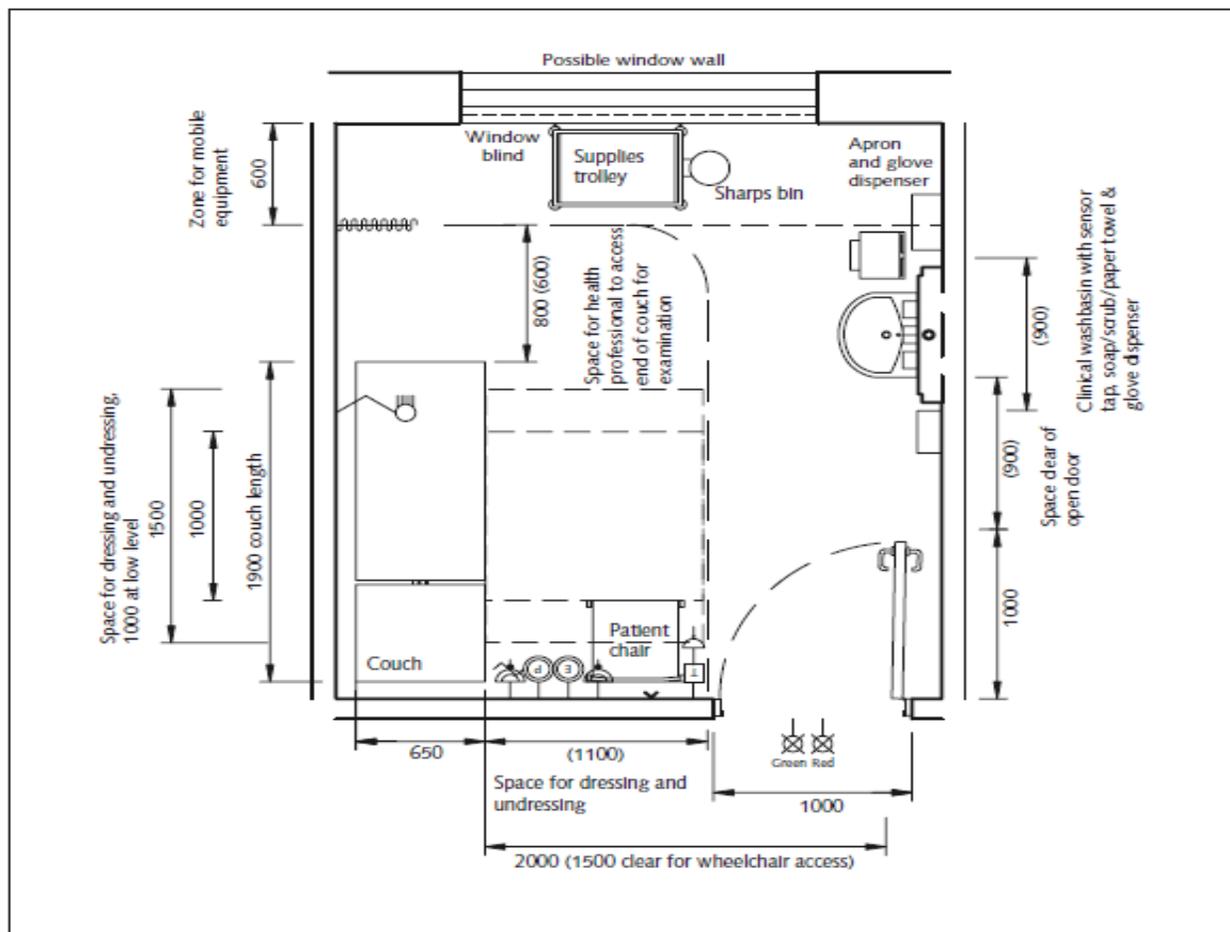


Figure 3.0 : Double-sided couch access examination room Source: Department of Health Estates and Facilities Division, 2007

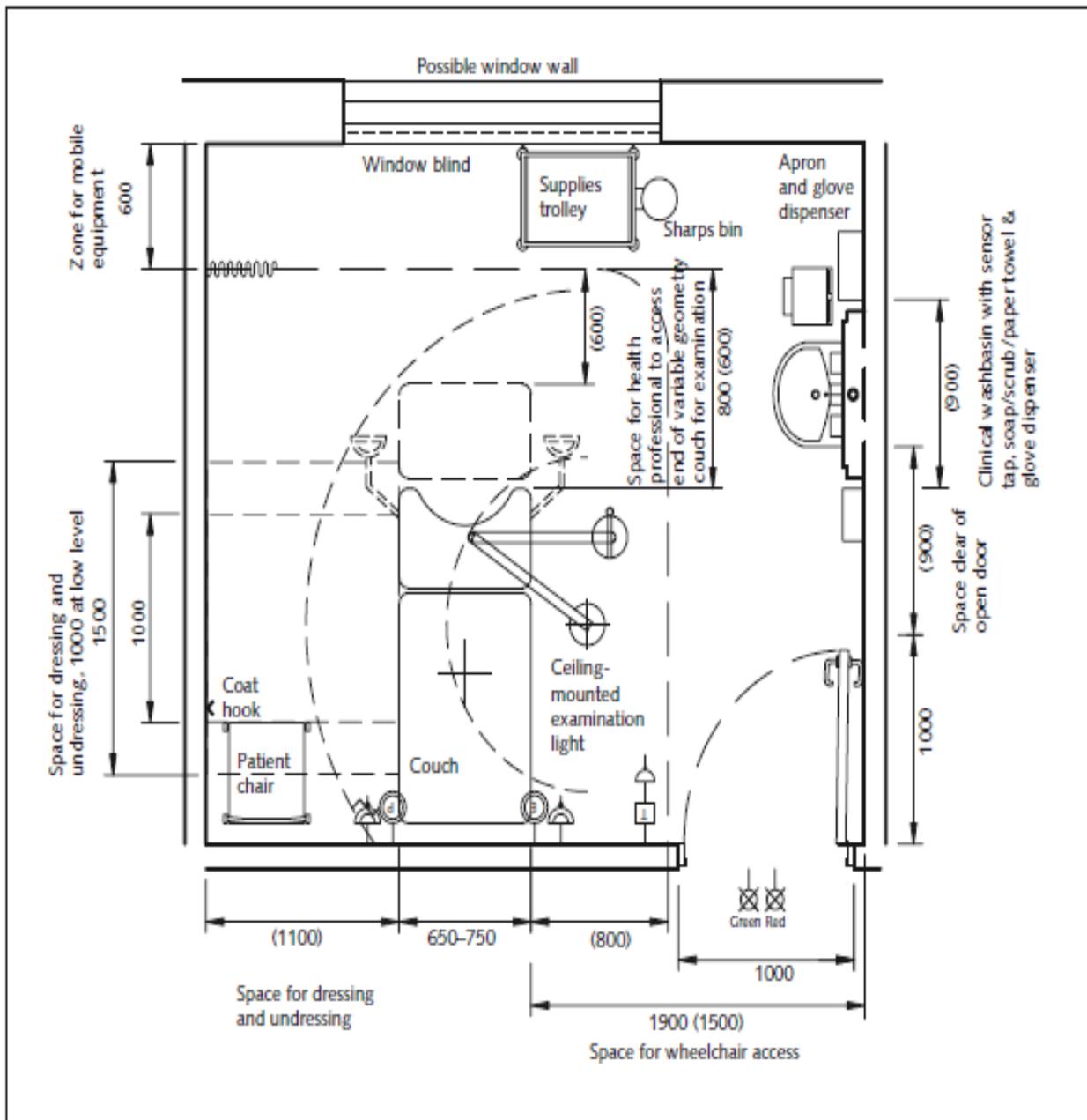


Figure 4.0: Double-sided couch access, single door (Consulting & examination room) (Consulting & examination room)

Source: Department of Health Estates and Facilities Division, 2007

The Treatment Design Facilities

Treatment room refers to the space designed to perform treatment activities in the hospital environment. A treatment room provides facilities for a range of purposes: general procedures

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during a routine clinic, specific procedures such as vasectomy, colposcopy, gynaecological procedures and skin biopsy (Department of Health Estates and Facilities Division, 2007).

Also, additional equipment in a treatment room may include diathermy, cryosurgery, a cold coagulator, a loop coagulator and a colposcope (possibly with a teaching arm or video camera/television screen). Many procedures will generate heat and odours that will need to be removed by means of appropriate mechanical ventilation. However, depending on local requirements, some rooms may be multi-use and may combine treatment and examination procedures.

Laboratory and Diagnosis

Most tests will be carried out within the hospital environment in a space called primary analysis laboratory. However, the service should be supported by microscopy, a comprehensive diagnostic laboratory service and adequate transport arrangements if not provided within the hospital and the results should be available without undue delay. In a primary analysis laboratory, little or no highly technical equipment is required and little or no sophisticated analytical procedures are carried out. Principal activities include staining and microscopy, dark ground and teaching facilities, holding media in a refrigerator and specimens in an incubator, prior to transfer to the hospital laboratory, centrifuging specimens, testing urine reviewing products of conception.

The primary analysis laboratory should be within easy reach of all the examination rooms. It should have a sink, separate clinical hand-washing facilities, worktop, cupboards, power and data for equipment and link to IT network and two refrigerators. Consideration should also be given to detail sink specification, floor and worktop finish to minimize the staining of fixtures and fittings when staining slides. Other considerations include ventilation specification for staining areas and provision of a locked metal cabinet for storage of chemicals (COSHH Regulations, 2002). However, where acetone issued, gas appliances should not be used in the same room. The system for transferring pathological samples to the main laboratory area should be provided. Ultrasound or imaging should be easily accessible as part diagnostic measures to examine patients 'internal organs. Space for radiography is required for HIV management and gynaecology. The HIV attendees may also require computed tomography [CT]/magnetic resonance imaging [MRI] (See figure 5.0 as described by Department of Health Estates and Facilities Division, 2007).

Staff Work Stations Design Facilities

Staff work stations are where staff can undertake work that is not performed at patients' bedside. They are used for discussion, for advice and referrals, and for the entry or writing of notes. There is a need for a range of private meeting rooms that will enable confidential discussion and collaboration between staff (Australasian College for Emergency Medicine, 2014). The provision of a staff communications base that can supervise both clinic rooms and sub-waiting areas (if provided) will greatly improve the clinical management of a unit, and should be considered in large units. Where paper notes are used, this area also provides a secure location for the management of notes throughout the attendee's visit. Facilities requirements include individual work desk with minimum area of 1.2m wide by 600mm deep (Hospital Design Guidelines, 2015).

Staff Rest Room

Well-designed staff facilities provide time out, relaxation and add to morale and staff functioning. The staff room is used by staff to consume meals, for social events and the celebration of achievements. The kitchen area may be incorporated within the staff room or immediately adjacent to it. Staff should be able to prepare hot or cold drinks, heat food and prepare beverages for patients in the kitchen. Rest room should be designed with controlled access and comfortable seats for relaxation during breaks. The room should have natural daylight. The kitchen should have beverage-making utensils/ gadgets, fridge-freezer, industrial-grade refrigerator, microwave oven, dishwasher, and storage for some crockery. Secure lockers may be provided for the storage of small items of personal belongings. Other essential requirements include hand-washing facilities, toilets in close proximity, hot and cold water systems, tables and comfortable seating for dining, computer/Wi-Fi access, television and telephone.

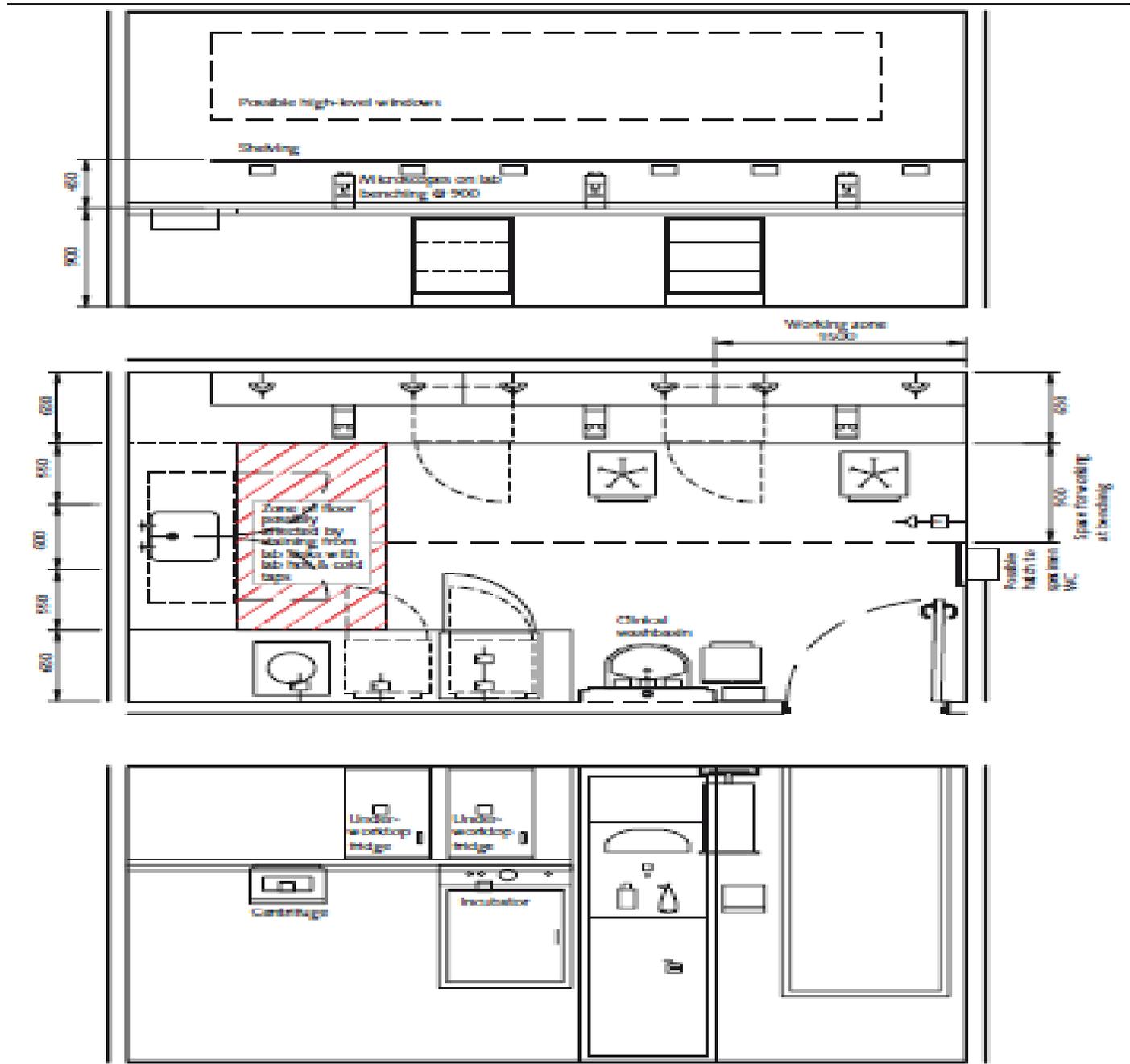


Figure 5.0: Laboratory and Diagnosis Design Facilities Layout: Source: Department of Health Estates and Facilities Division, (2007)

Equipment Store/Room

The equipment store/room is used for storing equipment and disposable supplies. Portable equipment may also be stored and recharged in this room. The total area of dedicated store rooms must take into account central and decentralized storage of equipment and disposables, in conjunction with the presence of equipment at the bedside. The room should be secure with access limited to authorized personnel. There should be sufficient space and power sockets to store and charge battery-powered equipment (e.g. infusion pumps); space should be provided for decentralized storage solution, including separate storage for disposables, trauma resuscitation equipment, mobile equipment, and stationery. A separate room for equipment servicing should be considered and bar-coded systems should be considered to allow for the top up of supplies on a daily basis which can reduce the need for larger amounts of stock.

The Teaching Hall

Hospitals and teaching hospital in particular, require dedicated facilities for formal education, tutorials/mannequin simulation, and meetings. This area may be used by medical, nursing, or other staff and undergraduates. It should be a private, non-clinical area with noise attenuation, often near the staff room and offices, and with access to toilets and amenities. A seminar room should be provided with audio-visual equipment, plug in mobile devices/laptop and lockable store cupboard(s). The seminar room may be used for educational purposes, multidisciplinary team meetings, case reviews and library. Tables and stackable chairs, projection screen (ceiling mounted recommended), bookshelves for written reference materials and journals, teaching aids and equipment, X-ray viewing facilities/digital imaging system (electronic whiteboard preferable) (Hospital Design Guidelines, 2015). The size of the room should be calculated based on the maximum number of people likely to use it at any one time e.g. a combined medical and nursing meeting or a network teaching session. Facilities should be provided for photocopying and shredding.

Administrative Design Facilities

Offices are the most important space in the administrative section, providing accommodation for administrative, managerial, safety and quality, teaching and research purposes. Office facilities are required for diverse levels, categories and descriptions of staff. Clinical administrative

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spaces should be provided in a flexible environment with a mixture of continuous use and hot-desk spaces. Hot desks require associated quiet and breakout spaces. (Health Building Note, 2006). The spatial and functional requirements include: offices located close to each other and close to secretarial services, Wi-Fi availability all over the area; access to printing and scanning/photo copying; if possible, offices with natural light and ventilation. However, the administration area should be accessible by authorized staff only and be provided with room(s) in which private meetings may be held. Staff areas should be secure, and consideration should be given to the use of key pad/proximity sensor locks (or similar devices) to control access to staff areas.

Administrative staff changing room should have full-length lockers for the storage of clothing, uniforms and personal items; space for changing and changing cubicle for use requiring privacy; secure storage of wet clothes; a shower, hand-wash basins; and separate male and female staff water closets (workplace Health, Safety and Welfare, 2000; Health ; Health Building Notes, 2006).

In addition, a staff rest room should be provided to allow easy release of staff for refreshments in communal facilities with controlled access, sitting and relaxation during breaks. The room should have natural daylight and semi-easy chairs, beverage-making, fridge-freezer, and microwave. The area may also include washing-up facilities and storage for a small amount of crockery. Finally, the administrative areas also, include engineering and environmental services.

Conclusion

This study reviewed the related literature on a range of issues in the evaluation of hospital physical facilities and their design qualities and settings in general. Finding shows that such evaluations were based on subjective and objective issues, with the majority of studies focusing more on aspects of design relating to the physical facilities.

The above studies reflect a significant change in the way design researchers, architects, health care planners, and facility administrators undertake health care facility design by linking health care building design strategies with key desired outcomes that will increase users' satisfaction. This study is a reflection of a positive trend that will affect the quality of health care physical facilities in the years to come in south-west, Nigeria. It was also noted from the empirical studies gathered that most previous research work evaluated hospital buildings using different criteria at different levels of hospital physical facilities

which include noise reduction design issues, architectural design features, external environment design issues, psycho-social design issues and psychological design issues.

Researchers and designers working in this field should put more effort in enhancing users' experience in the hospital environment. Especially, they should carry out further research on healthcare facilities incorporating spatial design standard for different types of spaces from users' perspectives.

In addition, the existing situation of the physical facilities in the southwest Nigeria demands urgent attention from both the government and private organization. However, the ongoing situation of widespread corona virus popularly known as COVID-19 in the world adequately exposed the chaotic situation of healthcare physical facilities in Nigeria. In fact, the southwest Nigeria recorded the highest number of corona virus patients in Nigeria without adequate and standard physical facilities provided to control the situation.

It has now become imperative to rethink facility design as a critical element in bringing about change in the way health care is provided and experienced in healthcare settings in Nigeria. This study, however, advocated further investigation into the mutual interaction between people's behavioural experiences and the physical facilities design environment to provide concrete evidence to guide design decisions in Nigeria. Hence, this study becomes vital because it employed evidence-based design which is the process of basing decisions about the built environment on credible research to achieve the best possible outcomes.

This will help the transformation of design and construction strategies needed to reach our goal of providing compassionate, safe care for patients while respecting and supporting the needs of the health care professionals and workforce. It will also help to improve the hospital design performance, staff performance, patient's well-being, decrease mortality and morbidity rate in Southwest, Nigeria.

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