

Evidence-Based Design to Create A Sophisticated Therapeutic Environment

Ahmed Elhussein Tohlob

Jeddah International College¹

Misr Higher Institute of Engineering and Technology in Mansoura

(a.hussein@jicollege.edu.sa)

ABSTRACT

Many architectural trends have emerged during the past period dealing with the design of healthcare buildings and one of the most important of these trends was the design based on evidence-based design, which is initially based on research and studies dealing with a specific element that is tested and studied according to specific levels and know its usefulness within the healthcare environment.

As a result of this new trend, which deals with the built environment surrounding users within health care buildings and its greatest usefulness in improving the results and outputs of users of the care building, whether satisfactory, crew, family or workers, as will be shown through research, Because patient rooms are one of the most important elements within health care environments, many research has been directed to study the most important measures and treatments that help create and provide an upgraded treatment environment, which improves the patient's health, reduces the duration of his stay and increases his general satisfaction with the services provided, by studying many of the determinants and elements that can be relied upon and monitored during study and research..

Keywords: *Hospital design; Developed environment; Mansoura*

1. Introduction

The healthcare sector is undergoing a major transformation in terms of the characteristics of buildings and the physical environment surrounding users worldwide, as the construction of modern hospitals in the countries of the world is undergoing a period of development and noticeable prosperity due to the poor and outdated state of the population transformation, and as a result of the current technological revolution and the growth and innovation of new medical technologies.

This development and growth includes not only modern buildings but also the renovation and development of existing buildings, in addition to the need to create highly efficient environments, so it must take into account that these buildings will remain in place for several decades and this opens up a great deal of room for healthcare designers to create well-thought-out and efficient spaces, including patient rooms, Which is one model during the life of the building, which allows the opportunity to re-evaluate the hospital to reach the best design to help improve the condition of the patient and the crew, so following the methods of designing and constructing care buildings helps to create new trends in design decision-making. Therefore, we find the emergence of the design based on evidence and research

(referred to as EBD) through scientific research that highlights the physical characteristics of the building and how it affects the patient, the family, and the treated team and the impact on outputs, the main objective on which the design based on the guide is the design decisions related to the safety of the patient and the team and the outputs and results as well as the general satisfaction of the users.

1. Research problem:

The scarcity of local architectural studies covering the architectural problems facing the architect when designing patient rooms in health care buildings, where most of these studies addressed the design of hospitals in general without focusing on creating a sophisticated care environment within the patients' rooms, as well as the scarcity of medical studies and research that focus on the impact of the internal environment on the treatment and healing of patients most of the previous studies focus on behaviors and practices to implement the required quality and the lack of research that is interested in studying the area common between the medical and architectural aspects while The design of patient rooms as in (Figure 1) also concerns the lack of sufficient practical experience of medical practices by some architects, and the shortcomings of research studies that address the foundations and standards to be

observed when designing patient rooms to conform to modern medical methods and methods of care and treatment.

2. Objectives

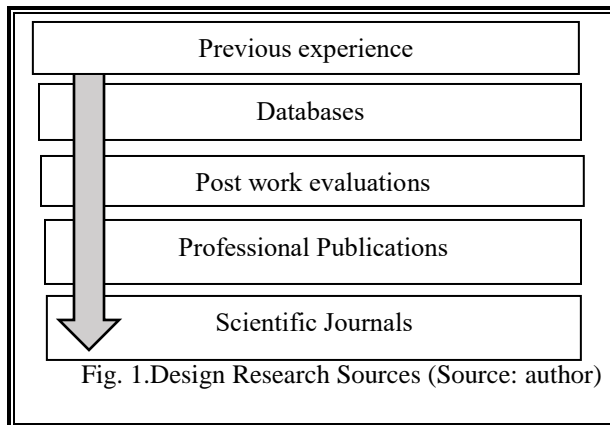
Trying to reach a range of criteria for the design of patient rooms helps create a sophisticated treatment environment through evidence-based design

3. Research methodology

The study means studying the design based on the guide and research and its applications in the field of health care, especially patient rooms, and then reaching the most important determinants and elements to be taken into account when starting the design of patient rooms which will have an impact on the results and outputs of the healthcare environment and its reflection on users.

4. Evidence-based architectural design concept from scientific research

Evidence-based design is a deliberate attempt to establish a healthcare building by making design decisions based on the best evidence available based on reliable scientific research, in order to achieve the best health service for patients, medical care workers and the community as a whole. Sources of the Design Guide (Fig. 1) include academic scientific journals, professional publications, post-work evaluations, databases, and previous experiences



The Center for Health Design has defined evidence-based design as: "Trying to reach design decisions based on the best available research evidence, to improve output while continuing to monitor the success or failure of post-decision-making processes." This is achieved in accordance with a research plan that covers aspects related to the health care of patients within the in-patient environment.

The design based on scientific research evidence may be treated with a narrow view as focusing solely on the research of the built environment or with a broader view by focusing on any research that contributes to improving the built environment of

patients and concerns various areas such as psychological or medical sciences that are interested in improving the results of health and medical care services.

5. Design variables for the healthcare-built environment based on evidence-based design

environment based on evidence-based design

The field of design based on research evidence has witnessed remarkable development since 2000, through the combination of systematic theoretical research and focus on the ways of its application, and thus a large knowledge base has emerged that enhances the role of designers interested in construction and the nature of the healthcare environment that improves the rates of healing patients and construction in a safe and satisfied environment and helps users perform their tasks efficiently and quality. Health care cannot be separated from its built environment. Healthcare buildings, tools, fittings, colors, artwork, site coordination and other elements of the built environment affect the provision of required medical and health care and its outputs and find many solutions to increase the efficiency of the building. We find that in the field of evidence-based design (EBD) there was a development during the last quarter of the last century with the aim of applying scientific methods and research in order to help healthcare officials reduce the stress on users, improve safety and outputs, reduce waste sources and apply aspects of sustainability and provide a great deal of comfort and satisfaction to patients and their families, and achieve long-term economic return and reach the best design that can be implemented.



Fig. 2. A conceptual framework for the domain of evidence-based design, Ulrich, R., Texas A&M University, Texas, USA, 2010

6. The Research Literature on Evidence-Based Healthcare Design

6. The Research Literature on Evidence-Based Healthcare Design

Over the past few years there has been a rapid development in the field of evidence-based design research and evidence-based design research, which shows that the importance of this approach has increased as a required need for the design of health care facilities, and it is now recognized that the good design of the built environment plays a role in reducing risks and stresses within the hospital and encourages the healing of patients and the provision of suitable vacuums for the crew

Therefore, it is important to know and determine the quality and efficiency of the guide and the research presented, in the medical field the evidence and research is taken through conduct or through a set of random samples to reach a strong guide and research that can be used and relied upon later, and by reviewing many researches we find that there are relatively few researches related to the impact of design features and variables on medical outcomes

and results, This is not surprising because most changes in the physical environment of health care change many environmental variables at the same time and this happens to overlap and makes it difficult to separate the effects from each other as an example:



Fig. 3Peter Forest, Implementation of Evidence Based Design, Centre for Healthcare Architecture, Chalmers University, Sweden, 2014.

When renovating and developing within the ICU and making it individual rooms for patients (fig 3) rather than double, the effect will not only be on the change in the number of patients for each room, but also in the number of hand washing basins in relation to the number of beds, as well as in room ventilation and air quality (fig 4), where we find in the proposal to develop the intensive care unit and make it individual rooms the possibility of providing a good environment for work, healing and family support, There is also the possibility of constant cleaning and sterilization and the possibility of closing the room without the need for bed movement, yet there are design variables and overlaps that can have an impact



Fig. 4Peter Forest, Implementation of Evidence Based Design, Centre for Healthcare Architecture, Chalmers University, Sweden.

7. Case Study: Patient rooms in Mansoura University Hospitals (MUH)

There was an urgent need to carry out these field studies to study the practical reality of the theoretical study and the need to link the theoretical aspect of existing design supported by evidence and research to the patients' rooms and what is happening on the ground in hospitalsplace, so the field already in studies were taken care of this research as a

natural result because there are precise requirements for the research point of study related to the design of patient rooms and the need to identify them only those providing health care services, In addition, this type of field studies contributes to reaching design foundations linked to the local environment and conforms to the customs and traditions of the various users of the building.

The study of the condition of patient rooms in some hospitals of Mansoura University and its architectural elements is a fundamental and important requirement for the study and identification of architectural design requirements that are applied in practice as part of the methods of designing the developed therapeutic environment, where this study and documentation of the status quo contribute to clarifying the extent to which the theoretical study relates to the local actual reality of some local hospital buildings.

7.1. Field study objectives

The field study aims to achieve a major goal, which is to evaluate and analyze the status of patient rooms in a sample that includes a variety of forms of patient rooms in mansoura university hospitals, by studying the current design of patient rooms and components and architectural elements and the extent to which they are compatible with the idea of evidence-based design to find out the local situation through mansoura university hospitals because of the presence of many different hospitals serving the delta area and neighboring provinces and then starting towards improving the status quo and linking the results The theory of the process, with the identification of the foundations, design principles and architectural elements to be available in the patients' rooms, which have a role in the completion of the healing of the patients

7.2 Mansoura University Hospital

The university hospital was established in 1947 with the self-efforts and donations of the sons of the province and was the twin of a similar hospital in San Francisco, USA, and began with its middle structure and represents the sun and rays represented by the five wings of the hospital (fig 5) and there was no management building now based on Republic Street, It belonged to the Ministry of Health and was named after The Palace of Al-Aini, like the Palace of Al-Aini in Cairo, and it included 500 beds, and at the start of the clinical phase at mansoura medical college in 1963, the beds were shared between Doctors of the Ministry of Health and university doctors, and in 1968 the hospital became subordinate to the Ministry of Higher Education, followed by the establishment of facilities within the hospital including outpatient clinics, radiology building, private internal building, MRI building, doctors'

residence, gastrointestinal surgery building (currently heart and chest surgery building), fertility unit, nursery and workshops for the hospital and the building of convalescence and critical cases, which was designed by the Center for Engineering Studies and Consulting at Mansoura University



Fig. 5 The location of the university hospital in Mansoura, Source: Google Maps, <https://www.google.com/earth/>

The main entrance to the hospital is located on the main street of Al-Jamahiriya (Fig. 6), and back to the design of the main building found that the terraces and solar of the patients were cancelled and replaced by rooms for doctors and the patient, and below we present the most important features and elements monitored through visits and field observations of the hospital and questions of its users through which shows an analysis of the features of the design of the room inside the convalescence building and critical situations in the university hospitals



Fig. 6 The entrance and main façade of the university hospital. Source: <http://muh.mans.edu.eg>

8. Patient Room Design Features in MUH

8.1 Patients' rooms

The patients' in-hospital accommodation system depends on the presence of multi-family wards or double sick rooms and can be made an individual room with facilities due to the patient's need and desire to have facilities with him but the value of booking the Chamber of Finance increases, so there are still many problems to differ between the patients and their requirements within the common room.

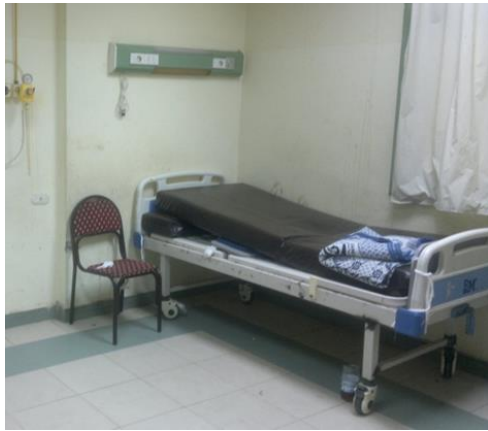


Fig. 7 Patients' rooms Source: <http://muh.mans.edu.eg>

8.2 Handwashing Sinks

There is no hand wash inside the patient's room, while there is only a hand wash inside the bathroom, the bathroom is accessed when the laundry is needed to use the sink.



Fig. 8 Handwashing Sinks Source: researcher

8.3 Mirrored Rooms

The layout followed in the landscape are the reflexology, confined and service rooms next to the bathroom of each room and a skylight next to the bathroom of each common room.



Fig. 9 plan - Mirrored Rooms Source: <http://muh.mans.edu.eg>

8.4 Patient room Type

The image was used in the room adjacent to the bathroom, including the image inside the en-suite bathroom at the patient's head, which leads to seeing the image and following it.

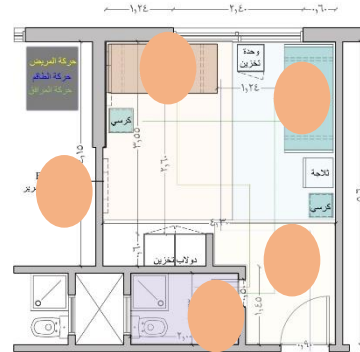


Fig. 10 Patient room Type. Source: : author

8.5 Connect with Out and Nature light

Next to the patient's bed there is a large window with a width of 2.4 m that allows the entry of natural light as the room is directed towards the north, and a sitting height of 1.00 m is 40 cm higher than the patient's bed, which makes it difficult for the patient to communicate with the outside. The window height is 1.60 m, and there is also a curtain on the window in case of desire Users block light and external vision and use artificial lighting through a fluorescent lighting unit with reflectors on the ceiling or using the lighting above the bed unit, but it was noticed that many remnants of medical solutions and blood collected on the curtain, which makes it a source of transmission of infection, the window looks outward to the rest of the hospital buildings and there A green area next to the convalescent building overlooking the patients' rooms, but the presence of a covered corridor - connecting the parts of the building - obscures the view of the entire green area

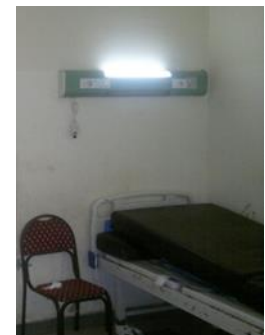


Fig. 11 Connect with Out and Nature light . Source: Author

8.6 Finishing Mat-

The use of plastic paint in the wall and ceiling, and ceramics in the floors and cabinets, finding dividers and corners that collect dust and microbes



Fig. 12 Spacers in finishing materials. Source: Author

8.7 Toilet-shower zone

The bathroom is located on the inner wall on the side of the wall behind the patient directly after the entrance to the room, at a distance of more than 3.50 m from the patient, and with an area of 3.00 m², the bathroom door opens inward and its width is 50 cm. It is made of aluminum and fiber, and the bathroom has a hand wash basin, a toilet and a foot basin for showering, there is no separation Between the shower area and the toilet, there is no handrail inside the bathroom, drainage is through a sink next to the toilet, reliance on ceramics in finishing, and there is an air extractor next to the window on the service skylight.

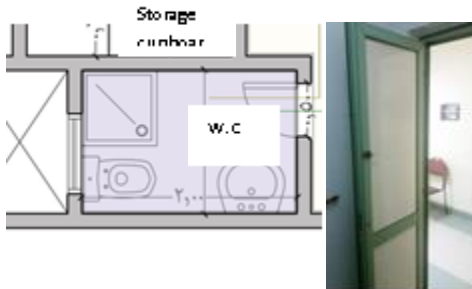


Fig. 13 Patient Room Design Features. Source : Author

8. Using suspended basins and toilets in order to avoid the accumulated bacteria

It is best to use suspended toilets and suspended docks to reduce bacteria, especially in hospitals, and not to move as much infection as possible.



:Fig. 14 Patient Room Design Features. Source //www.duravit.com.eg

9. Prototype for Patient Room Design Based on Evidence

The proposed model uses international and local studies and research and architectural books to determine some of the elements, dimensions and components of the room, and the model is an idea for designing the patient's room according to the design based on evidence and research, so that there is a clear reason and scientific and research evidence Evidence that has been tested or published and reviewed by those interested in the field of health care On the other hand, there is a diligence from the researcher in terms of design so that a model of the patient's room can be obtained with a contribution and a conception of the room, and it should be noted here that the patient's room model may be presented in more than one other different design method, but it must be subject to the standards and requirements for the design based on Evidence and research in order to reach the best care environment in which the patient can spend a shorter and faster treatment period.

10. Patient Room Prototype PRP

The relationship between design and research has been revealed in a number of conferences since 2003 in the conference organized by the American Institute of Architects, and seminars organized by the Center for Health Design CHD, and a group of international journals such as HERD Journal and books such as Wang and Groat 2002, and studies cited in The first chapters indicate that the care environment inside the patient's room can positively or negatively affect the users in terms of stress and tension, injuries, patient safety, operational efficiency, general satisfaction, and medical errors (Fig. 14).

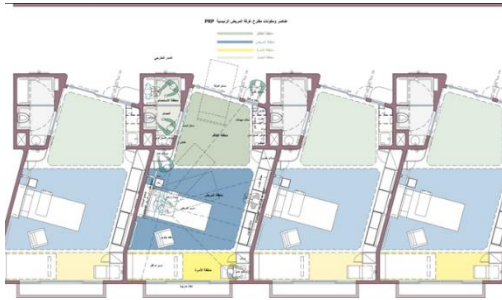


Fig. 14 Patient Room Model Proposal Source: : author

Design issues and tasks inside the patient room may affect users and may increase errors, and among the limitations and elements associated with these issues: providing the necessary lighting , the presence of daylight, individual accommodation rooms, the presence of standardized patient rooms, materials used and the configuration of the room .

11. Objectives of the proposed PRP patient room model

The new model of the patient room aims to try to design a patient room that is compatible and compatible with the patient in which the patient can spend his treatment and recovery period without moving from one room to another due to the lack of flexibility in the design. Providing new and diverse concepts for the future patient room in line with the development in hospital buildings and their features. For workers and reduce medical errors, falls and infection, and the room is capable of cleaning, maintenance and reconfiguration if necessary by reducing the bedding in it.

Patient room model elements

Family AreaA set of design elements have been installed for the proposed model (Fig. 15), which are as follows: Assuming the structural structure of 7.40 * 4.50 m, so that it is uniform and repetitive for new buildings. The distance between the patient's head wall and the opposite wall of the patient's footwall is 4.25 m. The distance allotted to the beds is equal to 1.00 m from the patient's area border. Leave a distance of 1.25 m around the bed before there is any fixed object. Leave a distance of 1.00 m around the bed before any moving object is present. Leave a distance of 1.00 m above the suspended ceiling for connections

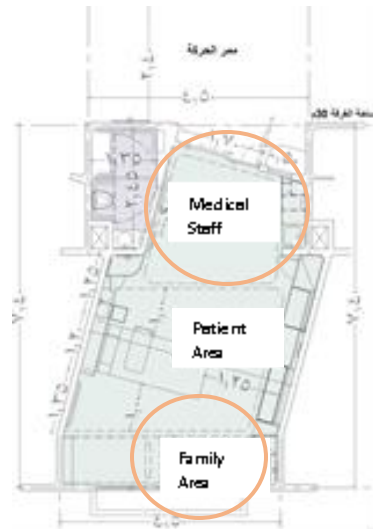


Fig. 15 Room configuration according to the proposal Source: : author

12. Explanation of model-based design

The design was based primarily on making the user the main element by enhancing and improving its use (through the ability to use the surrounding environment, systems and elements effectively and quality, and then reach the highest levels of satisfaction). To be able to accommodate a suitable treatment and care environment for multiple types of patients and for different levels of care through the flexibility of the design and the room's ability to change and configure so that the room can be used easily and the combination of activities and tasks inside the room, which depends on the advanced care needs and the patient's period of stay, the available patterns of the patient's room were studied Until reaching the submitted proposal and this was achieved through a number of design details

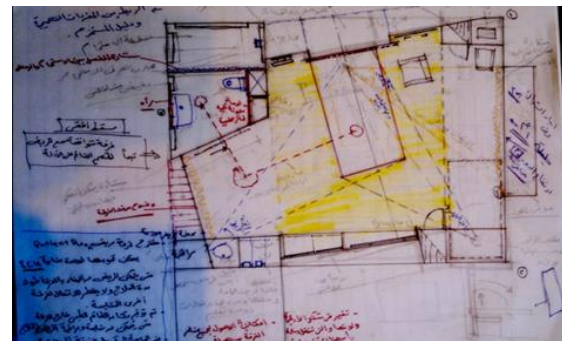


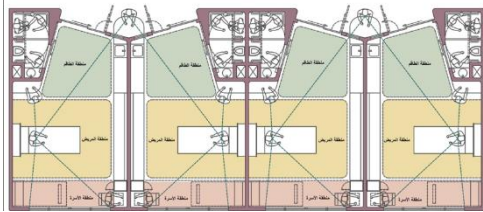
Fig. 16 One of the initial stages of the proposal, source: researcher

13. Patient Room Prototype

Similar single patient rooms



Reflexology single patient rooms



Single patient rooms identical (suggested model)



The presence of an estimated distance of 2.40 m in front of the room (the corridor) allows the possibility of having more than one configuration and shape for the door of the room and allows easy movement and identification of the entrance, providing different locations for the work of the crew either from inside the room or from outside, the designated location outside the room is located next to the room door so that it can be seen and observed the patient at any time if necessary (Fig. 17), the work area inside the room is divided into a wet area next to the hand washing basin located directly after the entrance to the room and a dry work area located near the patient's bed, the bathroom and the wall at the patient's head headwall Design them flexibly as will come later

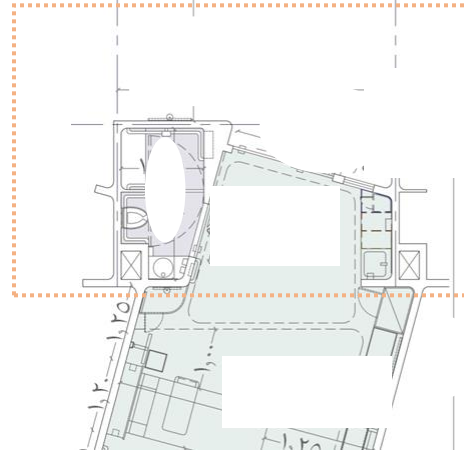


Fig. 17 The entrance to the room and easy access to it, and monitoring and follow-up from the outside.

Source: : author

2 - The door of the room has been placed in its location to facilitate the provision of service and care to the patient quickly and easily and to reach the bathroom door as soon as possible, the width of the room door is 1.70 m to allow the entry and exit of a moving bed easily and it is equipped with a glass part that allows vision through it and can be shaded from the inside if necessary, as well The proposed model of the room took into account the organization and presence of the necessary health care items inside the room (such as soap dispenser, toilet paper, alcohol dispenser, separate trash cans, a board and notebook for writing notes, all the necessary electrical and medical connections, sockets and outlets) and these items are ready, usable and visible to the patient For the family on the inside.

3-The direct line of sight between the staff from the outside and the patient was maintained and accessed quickly in critical cases, by reducing staff steps and the location of the bathroom inward, the width of the external corridor provides good lines of sight to the patient's head and from the work area outside the

room, the bathroom was designed to reduce space Used by arranging and configuring the bathroom elements (toilet raised from the floor, sink, shower area, bathroom door), the design of the bathroom aims to take advantage of the space behind the door.

4-The goal of having a bathroom inside the room is to reduce the need for a toilet seat or a bedside package inside the room, as is common in existing hospitals. The location of the bathroom inside the room is on the inner wall towards the wall at the patient's head. The patient is very close to him and is more effective from the point of view of nursing, as it reduces the

risk of falling as a result of moving from the bed to the bathroom (Fig. 7-8), reduces time, effort and movement, and reduces the interaction between the patient and staff to reach the bathroom and between the mattresses that may It hinders movement, as well as with family members who tend to gather at the patient's feet and next to the window, as is common, the total area of the bathroom has been reduced as much as possible to improve the visibility of the external corridor.

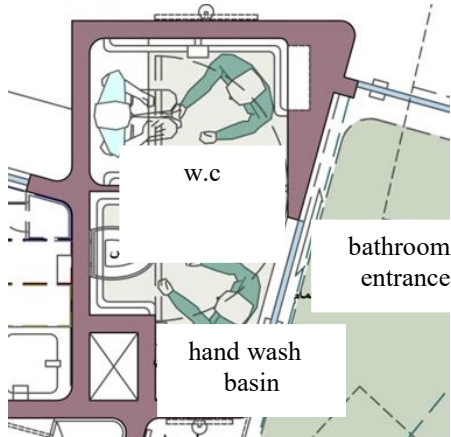


Fig. 18 bathroom proposed model Source: : author

5-The composition and arrangement of the bathroom from the inside depends on the movement pattern and tasks inside it, taking into account the preservation of the security and safety of the users through the use of non-slip materials and the provision of appropriate distances between the elements of the bathroom such as the sink, toilet and shower place, in addition to taking into account the proximity of the toilet to the patient and the use of double sliding doors, and among the factors Safety is also the use of a bed for the patient equipped with the alarm feature when the patient leaves the bed and the measurement of the period of exit from the bed, which alerts the nurse when the patient is out of bed .

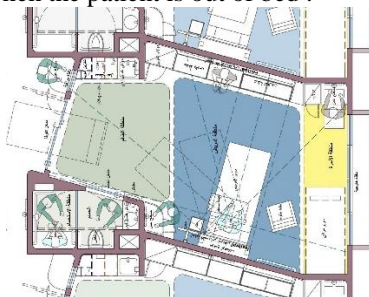


Fig. 19. Patient Room Features Source: author



Fig. 20 Features of designing a patient room according to evidence-based design Source: : author

6-The main objective of the design of the wall opposite the patient's Footwall is to identify it and clarify its role and extent of its importance within the patient's room, as it is the primary and focal point of the patient's visual. Footwall design to accommodate a number of elements that have a vital role in care and entertainment for users, especially the patient, so that he can carry out the activities he needs while he is in bed, through the presence of a TV screen through which he can connect to the Internet and watch TV, using a remote control placed next to the patient on the help table next to The bed where different types of activities and daily events are displayed and the possibility of external communication, as well as there are side seats for visitors to sit, and there is a painting as an element of therapeutic art.

13.1Section headings

Section headings should be left justified, with the first letter capitalized and numbered consecutively, starting with the Introduction. Sub-section headings should be in capital and lower-case italic letters, numbered 1.1, 1.2, etc, and left justified, with second and subsequent lines indented. You may need to insert a page break to keep a heading with its text.

13.2 General guidelines for the preparation of your text

Avoid hyphenation at the end of a line. Symbols denoting vectors and matrices should be indicated in bold type. Scalar variable names should normally be expressed using italics. Weights and measures should be expressed in SI units. Please title your files in this order conferenceacronym_authorslastname.pdf

13.3 Footnotes

Footnotes should be avoided if possible. Necessary footnotes should be denoted in the text by consecutive superscript letters. The footnotes should be typed single spaced, and in smaller type size (8pt), at the foot of the page in which they are mentioned, and separated from the main text by a short line extending at the foot of the column. The 'Els-footnote' style is available in this template for the text of the footnote.

Action:

Using the room as a private room, rearranging and reconfiguring it, and dividing it into three areas for the patient, the family and the treating team, the patient can spend the stages of care in it without the need to move to another place and without another patient in the room, and the direction of the patient's bed is fixed so that the medical staff is to the right of the patient to reduce noise during Transferring the patient and to facilitate the work of nursing

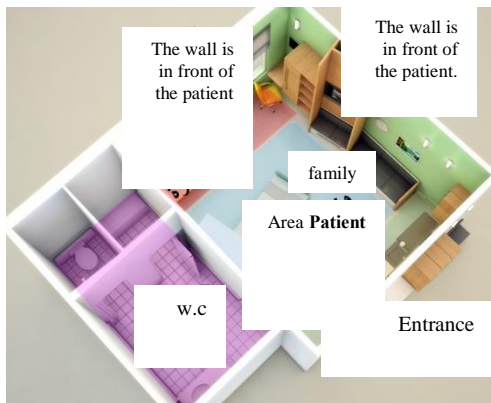


Fig.22 Features of designing a patient room according to evidence-based design Source: : author

14.2 Hand wash basin

There is a hand washing basin inside the room equipped with a mirror and directions for washing, but the basin is far from the entrance to the room where users pass through the elements of the room first until they reach the basin.

Action:

Moving the hand washing basin at the entrance to the room on the right in the area of the treating team, where there is an untapped area, and therefore the basin is close and clear to the users, and next to it there is a sterilization unit and a glove distribution unit next to a cupboard for storing medicines. There is an inverse relationship between the rate of compliance with hand washing and the transmission of infectious diseases through the way of touch.

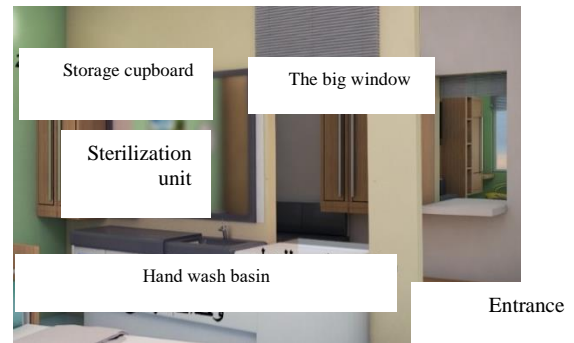


Fig.23 New model hand washing basin Source: : author

14.3 Patient Room Prototype: The family area in the new model. Providing the presence of the family and social support next to the patient has an important role in the healing process, and reduces tension and stress on the patient and relieves pain and reduces the number of times the patient falls inside the room, and enhances the safety of patients, so international health care institutions tended to allocate special areas for the family equipped and prepared Well, looking at the patients' rooms in the center, we find that there is no room for beds.

Action:

The new model of the room has been equipped with the family area next to the external window so that it is equipped to receive the escorts and has a bed for the overnight stay in a direction parallel to the patient's bed, an office to carry out special tasks and a cupboard for storing belongings so that they can face situations and overcome bad feelings



Fig.24 Family area with the new model. Source: : author

14.4 Bathroom location

Research indicates that care institutions prefer to have the bathroom inward to preserve the outer wall, the presence of a large window, the entry of the largest amount of daylight and the provision of a suitable space for the presence of the family. To the patient's room bathroom, we find that it is located next to the room in the wall opposite the patient, which increases the chances of the patient falling

Action:

The presence of the bathroom next to the room gives an opportunity for observation from the outside, but this increases the walking distance of the staff, and this does not match the features of the evidence-based design, which indicates the advantage of having the bathroom from the inside, so the new model, in which the position of the patient's bed was changed so that the bathroom becomes Close to the patient while keeping him next to the room.



Fig.25 New model patient room bathroom Source : author:

14.5 The wall behind the patient and the wall in front of the patient

The wall at the patient's head is a headwall that has a bed unit with upper and lower lights and a set of switches, while in the opposite wall of the patient's footwall there is a bathroom door in addition to a TV screen and 2 chairs next to a hand washing basin equipped with a mirror and an alcohol dispensing unit to sterilize hands.

Action:

For the wall in front of the patient: The arrangement and configuration of the room in the new model has changed, making it accommodate a number of elements that have a vital role in care so that the patient can carry out the activities he needs while in bed, through the presence of a TV screen through which he can connect to the Internet and watch it, as different types are displayed From the daily activities and events, there are also seats for visitors to sit and an artistic painting that simulates nature, there is also a wall clock, and there is a storage unit for the family and the patient at a high level from the ground, and there are a number of lighting units in the places where visibility is desired, as well as in the lower part of the seats Air extractor for movement of air inside the room and to maintain room pressure.



Fig.26 Vocabulary art therapy in the new model Source : author

Try to reach a proposed model for the PRP patient room through which to rely on the new trend in the design based on evidence and research, and try to design a patient room that is compatible and compatible with the patient in which the patient can spend his treatment and recovery period without moving from one room to another due to the lack of flexibility in the design, the model also aims to Attempting to find a standard model for the patient room that can be referenced when starting the design of the hospital, providing new and diverse concepts for the future patient room in line with the

development in hospital buildings and their features, and a number of parties interested in studying the health care environment, especially the patient room, and relying on its results have been referred to And taking them into the design on the basis that they are practically galvanized, and therefore compiling them into a unified model must positively affect the care environment, and the model relied on installing some of the constituent elements of the room, such as: the structural structure, the spaces between the walls, the spaces left around the patient's area, the family area, and the width of the corridor in front of The rooms and the location of the bathroom inside the room, and a model has been reached that can be referenced and used as a guide for initiating any health care project It is intended to reach the best results through previous studies. The real value of researching the design of a proposed patient room model is the ability to know and evaluate the patient's room and the care environment in which it is located, and to improve and address the overlapping design goals, and this in turn works to bridge the gap between research activities and architectural design, and the model needs To a period of time for study and application before relying on it in general in hospitals, and the positive aspect of starting to think about such a model is to provide the opportunity to know how to apply research design based on evidence and research and to face creative challenges during design that will not exist in traditional design, the model allows experiment And testing new effective ideas before applying them on the ground, which avoids many errors and risks, and access to the best possible care environment for the patient.

Conclusions:

The research tried to reach a proposed model of the patient's room PRP through which you can rely on the new direction in the design based on evidence and research, and try to design a patient room compatible with the patient that the patient can spend the period of treatment and healing without moving from room to room to room because of inflexibility of design, as well as the aim of the model to try to find a standard model of the patient's room that can be consulted when starting the design of the hospital, Introducing new and diverse concepts for the patient's future room in line with the development in hospital buildings and their features, and has been referred to a number of interested parties in studying the health care environment, especially the patient's room, and relying on its results and taking it in the design on the basis that it is practically galaxyzed and therefore assembled in a unified model must positively affect the care environment, The model relied on the

installation of some of the components of the room such as: structural structure, the distances between the walls and the distances left around the patient area and the family area and the width of the corridor in front of the rooms and the place of the bathroom inside the room, and reached a model that can be consulted and guided by the initiation of any health care project intended to reach the best results through previous studies, the real value of researching the design of the model proposal patient room is the ability to know and evaluate the patient's room and the environment of care in it and improve Addressing overlapping design objectives, this in turn closes the gap between research activities and architectural design , The model needs a period of time to study and apply before relying on it in general in hospitals, and the positive aspect of starting to think about such a model is to provide the opportunity to know how the research design based on the guide and research and meet creative challenges during design that will not exist in the traditional design, the model allows to experience and test new ideas effective before applying them on the ground, which avoids a lot of mistakes and risks and reach the best possible care environment for the patient.

Results

1. Evidence-Based Design has emerged as a design trend that is spreading in many sciences, particularly medical and engineering, represented in the field of architecture.

2. There are many who have developed definitions of the modern trend and studied the main themes that make up it.

3. The definition of design based on evidence has been reached that it uses the best current evidence and research resulting from research and practice to benefit from it in making critical decisions, along with the requirements of the client, for each project individually

4. The new trend will only be implemented through a policy pursued by the administration in charge of the medical institution by clarifying the operating policies of the hospitals.

5. The most important previous studies and research related to the evidence-based design and research, especially for health care buildings associated with improving patient safety, were reached by dividing the research study into three main axes: the rate of transmission of infection within the hospital is reduced by controlling airborne microorganisms, by water, by touch or by relying on grouped disease wards rather than individual rooms, Through a range of environmental measures and treatments that are relied upon during the design

stages, second: the occurrence of medical errors is reduced by controlling a range of factors affecting the health care environment represented by noise, lighting, misdiagnosis, operating policies, pharmaceutical errors and the use of individual living rooms for patients, third: patient falls within the hospital are reduced by controlling a range of factors and causes affecting the patient's fall, including lighting, Finishing materials, place door openings, mattresses within the care environment, arrangement and organization of rooms, a barrier on both sides of the bed and a handrail in the perimeter of the room

6. The presence of natural lighting has been found to have a significant factor in the sense of comfort and satisfaction of the workers, there is a relationship between the design strategies and its nine variables and the results of health care variables represented by users.

7. Accommodation rooms within the health care buildings are the most important elements of the therapeutic environment where the patient spends the longest period during his stay in the hospital, and many functions are done from follow-up, observation and observation community communication with the family and watching television and the use of some entertainment and use of the bathroom besides the tasks and functions of the nursing team.

8. Technological progress has a major role in the design and composition of patient rooms, as existing medical tools and equipment did not exist 10 years ago.

9. The model aims to try to find a standard standard model for the patient's room that can be consulted when starting the design of the hospital.

10. Try to design a patient's room that is compatible with the patient and the patient can spend the period of treatment and healing without moving from room to room because of inflexibility of the design.

11. The model relied on installing some of the components of the room, such as: structural structure, between walls and distances left around the patient area and family area, and the width of the corridor in front of the rooms and the bathroom space inside the room.

12. Divide the patient's room into 3 parts divided between the crew, the patient and the family and take care of the design of the wall behind the patient and the wall in front of the patient and the presence of a wash basin of hands inside the room.

13. The clarity of the entrance to the room and the presence of enough space in front of it allows movement and helps to have more than one

specialist, especially in time of need, in addition to attention to the use of elements of therapeutic art.

14. Increasing the offers of openings within the patient's room will have a return on the condition of users, whether by increasing the natural lighting in and direct contact with nature.

15. The presence of a hand wash basin inside the room and in a clear place, other than the sink inside the bathroom of the room led to an increase in compliance with the washing of hands and a decrease in the rate of transmission of infectious diseases by touch

16. Relying on storage wheels distributed near patients' rooms to store the needs of patients has reduced the movement of the nursing team and reduced care time for the patient.

17. Providing a well-equipped family area within the patient's rooms helped to provide social support to the patient.

18. The selection of finishing materials suitable for floors, walls and mattresses inside the room improves the health and safety of patients and reduces the incidence of falls of patients and the occurrence of stress for workers.

Recommendations

1. Architects should understand and understand new trends in architecture, including evidence-based design and research that has begun to spread, and review traditional design methods and methods.

2. Take advantage of the design based on the guide and research and its applications and its most important elements to reach the best designs, and develop new and innovative design models for the different departments within the hospital.

3. The research recommends the need for cooperation from research centers in the country to study modern research, studies and confidence in the field of health care and hold training courses for threatened masters in this field to benefit from this science in the field of healthcare architecture.

4. The research recommends the need to encourage the state and sponsor scientific research and focus on the importance of such research in providing a well-studied architectural product, and establishing advisory expertise houses to strengthen hospitals with expertise and consulting in the field of evidence-based design and research EBD.

5. Attention to the existence of private rather than shared sick rooms.

6. Having a hand wash inside the room right next to the door and be clear to everyone.

7.10. Having a bathroom inside the patient's room will be close to the patient towards the inboard interior.

8. The trend towards the use of patient-friendly rooms Adabtable Rooms is effective despite the high cost of its construction, but it saves a lot of time and effort and reduces the nursing budget and increases the time available to provide care

9 Integrating the elements of therapeutic art into the features of the design of patients' rooms.

10.The state should adopt the recommendations of international institutions specialized in the design of health care and follow up on global projects that come out of the homes of global expertise to benefit from them.

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