THE UNIVERSITY OF NAIROBI

School of the Arts and Design

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B05/0414/2009

EFFECTIVE USE OF USER CENTRED DESIGN TO
CREATE A CLEAN AND EDUCATIVE ENVIRONMENT
FOR CHILDREN IN HOSPITALS:

Case Study of Children’s Department, Kenyatta National
Hospital, Nairobi.
EFFECTIVE USE OF USER CENTRED DESIGN TO CREATE A CLEAN AND EDUCATIVE ENVIRONMENT FOR CHILDREN IN HOSPITALS:

Case Study of Children’s Department, Kenyatta National Hospital, Nairobi.

BY
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B05/0414/2009

A Research Paper Submitted In Partial Fulfillment Of The Bachelors Degree In B.A Design

SCHOOL OF THE ARTS AND DESIGN
UNIVERSITY OF NAIROBI
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DECLARATION

I, Adeka Christine Nabyonga, declare that this research paper is my original work and has not been presented for the award of any degree in any other university.

Signed…………………………………………

Date…………………………………………

Adeka Christine Nabyonga

This project is submitted as a partial fulfillment of the University Examination for the award of the degree of Bachelor of Arts and Design at the University of Nairobi

Supervisor: Dr. Walter Onyango

 Signed…………………………………………

Date…………………………………………
Dedication

To:

My parents. Mr. and Mrs. Andrew M. A. Edebe

May the Lord grant you your hearts desire. All my love.
Acknowledgement

I would like to acknowledge the Lord almighty for bringing me this far and for granting me the ability to type through this whole project.

My parents, Mr. and Mrs Adeka have also helped me financially and psychologically. Being there for me in all my brain freezes.

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Definition of terms

A *hospital* is an institution for health care providing patient treatment by specialized staff and equipment, and often, but not always providing for longer-term patient stays. Today, hospitals usually are funded by including by direct charitable donations.

*Pediatrics* is the branch of medicine that deals with the medical care of infants, children, and adolescents. The upper age limit of such patients ranges from age 12 to 21, depending on the country. A medical practitioner who specializes in this area is known as a pediatrician. The word pediatrics and its cognates mean healer of children; they derive from two Greek words: (pais = child) and (iatros = doctor or healer).

*Healing* is the act or process of curing or of restoring to health. Assessed physically, healing is the process by which the cells in the body regenerate and repair to reduce the size of a damaged or necrotic area. Healing incorporates both the removal of necrotic tissue (demolition), and the replacement of this tissue. Healing is a most important function of neo-Paganism and neo-Pagan Witchcraft. It is considered a very important practice by many, and some even consider it a gift. This is as it should be because healing has played a dominant part in the evolution of humankind. Within neo-Paganism there are variety methods of healing which involve magic; herbal and folk remedies; Eastern techniques which involve the changing of the body’s energy field; Native American and shamanic techniques; and Western approaches to medicine and psychology. While some neo-Pagans are professional healers trained in Eastern and/or Western medicine and psychology, others prefer holistic and natural healing methods involving healing by sound, breath, color, touch and movement.
This is a study on the effective use of user centred design to create a clean, healing and educative environment for children through integration of various disciplines in design, to produce efficient color schemes, art pieces, furniture and lighting, that will bring physical, psychological and spiritual well being to patients and individuals in a hospital environment.

The researcher will aim at determining how fields of communication and psychology can inform design to develop color schemes and art pieces that heal and bring about happiness. A field study will be carried out to determine the existence and conscious use of the color schemes and art pieces, their relevance to the targeted audience and the limitations that can be rectified. Based on the data collected on site, the researcher shall draw conclusions on the beneficiary measures that should be taken in order to develop effective healing color schemes in Hospitals in Kenya. In this case the reference is based on suggestions to Kenyatta National Hospital, Pediatric Unit.

The research will be in five major chapters, where by each chapter will handle a major segment of the study Chapter one will have the basic introduction and guidelines into the whole research. It will contain the introduction, objectives and justifications of the study plus the scope of the study. Chapter two will critically analyze other pediatric clinics and investigate methods of making hospital environments fun and therapeutic. Also highlighted will be aspects that contribute to the healing of humans as cited by other researchers.

Chapter three outlines the methodologies used by the researcher to get the objectives of the study, which will include data collection methods and analysis. Chapter four will account for the site analysis of the case study, whereby the researcher shall base her data collection to the interior architecture, furniture design, exhibition and display and landscaping. Chapter five will entail the findings, major conclusions and recommendations stated on the basis of research.
CHAPTER 1

1.0 INTRODUCTION

Photo 1: Children playing - The greatest healing therapy is friendship and love

1.1 Introduction

Interior design as a communicative tool has been used for a long time to adorn interior environments for many reasons e.g. for educational purposes, entertainment, recreational purposes, etc because of its power in solving critical problems. In this case interior design as a field and healing as a science come together by way of incorporating scientific and design knowledge to solve a problem.

Healing having been left to the doctors, God, magicians and many more, there is also need for it to receive help from the designers. This will be achieved by the designer, by seeking to investigate how the power of color schemes and art can be harnessed to bring about the physical, mental and spiritual well being to individuals in a hospital environment, in terms of the general appearance, interior design and landscaping.

In the early 20th century, a medical professional, Doctor Dinshah, developed and promoted a system of Color Healing which was used by hundreds of Doctors and Surgeons all over the US and Europe. He even defended and won lawsuits pressed by the FDA and the AMA in the late 30's, whom attempted to shut him down. Although he was later forced into bankruptcy due to the legal fees, his system is still used by many hospitals and clinics throughout Europe and Asia today.
1.2 Background Information

The Kenyatta National Hospital

Kenyatta National Hospital (KNH) is the oldest hospital in the country having been founded in 1901 as the Native Civil hospital and then King George VI in 1952. It is currently the largest National referral, teaching and research hospital in Kenya and it was built to fulfil the role of being a National Referral and Teaching Hospital, as well as to provide medical research environment. It was established with a bed capacity of 40, it became a State Corporation in 1987 with a Board of Management and is at the apex of the referral system in the Health Sector in Kenya. It covers an area of 45.7 hectares and within the KNH complex are College of Health Sciences (University of Nairobi); the Kenya Medical Training College; Kenya Medical Research Institute and National Laboratory Service (Ministry of Health). KNH has 50 wards, 22 out-patient clinics, 24 theatres (16 specialised) and Accident & Emergency Department. Out of the total bed capacity of 1800, 209 beds are for the Private Wing. There is a Doctors Plaza consisting of 60 suites for various consultant specialities. The hospital offers a wide range of diagnostic services such as Laboratories, Radiology/Imaging and Endoscopy among other specialised services. Sometime, the average bed occupancy rate goes to 300%. In addition, at any given day the Hospital hosts in its wards between 2500 and 3000 patients. On average the Hospital caters for over 80,000 in-patients and over 500,000 out-patients annually. Pediatrics is one of the clinical departments in the Hospital. It attends to children below the of age 12 years. The department provides inpatient, outpatient, filter and emergency services. The department collaborates with the KMTC and UON, college of Health Sciences to offer facilities for training and research to the medical students. The department organizes programmes such as Kangaroo Mother Care, held at New Born Unit. It also offers refresher courses to its staff such as Lactation management course and Emergency Triaging Assessment and Treatment (ETAT). The department has a staff capacity of 11 medical specialists, 18 clinical officers, 250 nurses and 59 supportive personnel.

The department offers services through nine clinical areas viz:

Four General Wards (3A,3B,3C and 3D), located in 3rd floor of the Tower Block. One Oncology (ward 1E), located in the 1st floor of the old hospital.

This is a specialized pediatric cancer ward. New Born Unit.
This offers specialized care for sick and low birth weight new borns. It is located at the first floor the Tower block. Pediatric Emergency and Filter Clinic.

This is the casualty or gateway of pediatric patients to the hospital. It is located at the clinics block No 22. Pediatric Demonstration Unit (PDU)

This is a well-baby clinic. Services offered includes vaccination, health education, personal hygiene, pre- vention of diseases, nutritional advice on supplementary diet as well as participating in outreach programmes.

Pediatric Out Patient Clinic (POPC No. 23)

This is a consultant clinic, where patients requiring specialized follow-ups are seen.

1.3 Problem statement
Lack of effective design is a characteristic of a good number of hospitals in Kenya. The researcher seeks to see how design can be utilized to create a clean, educative and healing environment for children visiting the A.C.T.S clinic at Kenyatta National Hospital, by bringing in furniture for the children, introducing exterior design through landscaping, use of exhibition and display, interior design and landscaping.

Hospital environment has not been taken seriously into account as a factor that can inhibit the quick recovery of patients for example if an environment is gloomy the stimuli picked up by the nerves is bound to be negative. About 80% of the information that we assimilate through our senses is visual then what we see plays a big role in how we feel. The external and internal environments determine the psychological set up of the mind of a patient when he/she gets into the hospital’s environment. It is in this light that the researcher recognized the potential of interior design as a healing power and it led to the identification of the ACTS clinic at the Kenyatta National Hospital whereby she would like to discover and bring into realization healing into the facility. She also seek to identify the various factors that contribute to the development of interior design that satisfy the need.
1.4 Objectives of the study
   i. To come up with effective and relevant color schemes and art work that promotes healing by understanding the effect of the hospital environment to human psychology.
   ii. To suggest solutions through design concepts for the creation of a healing environment by studying various fields that can be integrated into design practice.
   iii. Study the target group thus providing the basis for recommendations and proposals.

1.5 Research questions
   i. What are the first impressions a patient gets when entering a hospital.
   ii. How does color influence the mood and psychology of a patient in a hospital’s environment?
   iii. How does the external environment affect the healing process of a patient?

1.6 Aim of the study
   i. To explore how color can be used to harness healing in a hospital.
   ii. To propose possible means on how art pieces can be used to create an effective healing environment.
   iii. To create a fun filled environment to patience visiting the institution.
   iv. To make the hospital a fun filled, friendly and healing environment
   v. To enhance the hospital environment and help create places which are beautiful, welcoming, inspiring, thought-provoking and easy to use.
   vi. To provide a map that shall aid in finding ones way and brighten up the hospital environments

1.7 Justification
There’s a need to integrate design practice with other fields in order to bring about a new way of solving problems. Health facilities are reinventing the hospital concept and reviving the spirit of hospitality in patient care setting thus information collected from other fields can be integrated with interior design as a tool to bring about physical mental and spiritual well being. As days advance, where forms of administering medicine are immerging medical practitioners are noting that it’s not only through the administering of modern drugs that sickness is healed but also through other forms of therapeutic forms of healing. Increase in consumerism leads to
the improving of the environment since the sick seek to be in a place where their security is guaranteed, healing is deemed faster and care is assured through the tending of the environment

1.8 Scope of the study
The study will be based on the pediatric department at the Kenyatta National Hospital. The researcher will delve in healing concepts adapted in international hospitals which will be obtained by interviews and research from available secondary resources. She will also research on how people design their environment and their space planning concepts.
CHAPTER 2

2.0 LITERATURE REVIEW

Image 2: Nature is my medicine.

Source: Sara Moss-Wolfe, internet

2.1 Interior Architecture

Before the advance of the scientific age, healing was commonly practiced or performed by the village witch or wizard, often called the wise woman or man. These individuals often were born having the mysterious gift of healing by touch, and many were adept in herbal lore that had been passed down through generations of their families. They diagnosed both human and animal ailments. This was because in the early history of humankind, where animals were very important to human survival. Even today some practitioners still practice animal and plant healing because they consider all life as coming from the gods. Throughout history many healing methods have been practiced. These include a Renaissance remedy for fairy-caused illnesses by the recitation of Christian prayers; measuring the patient’s girdle to see if a fairy had departed the body; diagnosing the patient’s urine; using prescribed charms which consisted of both Christian and pagan elements; casting spells; and other folk-magic remedies such as requiring the patient to boil an egg and bury it in an anthill saying the disease or condition would disappear when the ants consumed the egg. Other remedies were more realistic such as using gems and semiprecious stones, which have a long history of medicinal value, to heal.
2.2 Healing Techniques

Many holding neo-Pagan beliefs, as well as others, believe in and practice the technique of healing by touch. The technique combines Eastern and Western beliefs. The basic concept behind this and other healing techniques is that everything, animate and inanimate, is enveloped in an aura. This aura can be seen by the adept, especially those possessing clairvoyance. They claim illness show up in the person’s aura as weak, cloudy, or discolored spots. Many practitioners attempt to help these people through auric healing, color healing and pranic healing. Many practitioners involved in healing by touch are trained in diagnosing the person’s illness and the ability of channeling and transferring vital energy without absorbing the person’s illness.

Other healing techniques include herbal healing and gem healing. These are two other special areas of healing where some knowledge is required, especially in herbal healing. The practitioner should have some knowledge of psychology in order to study the character and symptomology of the patient or subject. Some knowledge of anatomy and physiology should also be known so to know the functioning of the body. The person should also have some dietitian knowledge which aids in the nourishment of the patient. The practitioner must have sufficient knowledge of plant and herbs and their curative properties. This includes knowing when and how to administer the herbs and in what amount. The wrong application of a herb can be harmful. Many practitioners grow and produce their own herbs. Similar knowledge in required in gem healing or therapy that is required in herbal healing. The curative properties of each stone must be known. The application is based on a color pattern similar to the one used in color healing.

Another technique associated with herbal healing is aromatherapy. Besides candle magic and puppet healing magical spells are another technique of healing used especially by neo-Pagan Witches. They are never cast without the person’s consent because doing so would be going against the Wiccan Rede, "An’ it harm none, do what ye will." They most often encompass the technique of visualization. Such spells are various and often are tailored to meet the specific circumstances. Spells are used in association with sympathetic magic, thus while performing the spell the practitioner may have in her or his possession something personal of the person for whom the spell is being cast for. Sometimes another person will substitute for the
person in the spell, but this is thought at times to be hazardous because the substitute can be exposed to the other person’s illness.

Other methods of healing include exorcism; spirit exorcism, shamanic healing techniques which do include exorcism and sucking the illness from the body various. Native American healing techniques; bodywork techniques, in which healing energies are said to be released through movement and deep muscle massage.

2.3 Color Healing
In Western culture the different classifications used in dealing with colors are: hue, value and chroma. Non-Western cultures may determine their color concepts by different means. Hue refers to the position in the spectrum of visible light. Each of the seven primary has a position on the spectrum measured in angstrom units.

Value represents the amount of light reflected, or the brightness of the color. The range of reflected goes from "white," where all the light is reflected to "black," where there is no reflection of light. But, it must be noted that no true color has been found. White even has grays to black in it. There are no true orange or green, but a mixture of other colors. The same holds true for the next classification of color, chroma, the "purity," "saturation," or "intensity" of a color. No color is pure, but an combination of other colors, although one particular hue is dominant.

The body selects from sunlight whatever colors it needs to maintain balance, and these colors are ab- sorbed by vibrations. Lacking colors is called chromopathy, from the Greek words kroma, color, and pathos, suffering. The treatment for this condition is chromotherapy, which supplies the body with colors that it is lacking. The application of chromotherapy is very practicable and can be done without danger to anyone because the natural element of color is being dealt with.

The primary colors of the spectrum and their healing properties:

Violet is at the opposite end of the spectrum from red. Good for mental disorders, the nervous system, baldness and female complaints.

Indigo is a slight narcotic removing fears and reassures those afraid of the dark. Good for emotional problems, deafness, and especially good for the eyes, even cataracts.
Blue acts as an antiseptic and cooling agent. Excellent for inflammations including those of internal organs. Good for cuts and burns, also for rheumatism.

Green is the great healer. It is neutral to the other others. It serves as a general tonic and neutralizer. When in doubt, use green. Excellent for heart problems, neuralgic headaches, ulcers, head colds and boils.

Yellow is excellent in treating bowel and intestine problems. It can act as a mild sedative to relieve many fears and give a mental uplift. It is good for treating indigestion and heartburn, constipation, piles, also menstrual problems.

Orange is not as harsh of a color as red, but has many of the same properties. Very good for illnesses of the respiratory system such as asthma and bronchitis; also good as a tonic and laxative.

Red is at one end of the spectrum. It is a warm color which invigorates, excellent when used for treatment of persons having heat diseases, anemia, and liver diseases.

Improving hospitals layouts and looks can translate into better health for their patients, as done by Barbara Ann Karmanos Cancer Institute in Detroit, which was gutted and renovated two years later. Before the overhaul, it had the institutional feel of hundreds of hospitals across the country: dingy beige walls, fluorescent lighting and cramped patient rooms. It was redesigned by introduction of softer colors like pastel blues and greens on the walls which are warmer, indirect lighting; wider hallways and doors; and pullout sofas for visitors. After the refurbishing it was established that the patients gave themselves 45% less self-administered pain medication, and to show that the redesigning of the institution had worked, a group of patients with prostate cancer, that were admitted after the redesign, cost the hospital an average of 23.5% less than others who had checked in beforehand -- again, largely because of the reduced use of pain medication. A physician at the hospital said “There is no question in my mind that a calming, healing environment helps patients deal more effectively with their pain.”

Until recently, most hospitals were designed almost by accident, with new wings sprouting without much thought to how they fit with what had been built before. But
now, there’s a boom in new building. Hospitals are anticipating explosive growth in demand from baby boomers, and health-care facility, all that building is giving hospitals the opportunity to rethink how they want their wards to look and function. Naturally lit atriums and meditative gardens are turning up more frequently, driven by studies that show exposure to nature reduces stress and speeds healing. Many hospitals are breaking up nursing stations into smaller pods and moving them closer to patients’ rooms, with some hospitals installing computers outside many rooms so that nurses and doctors can check charts and fill out paperwork electronically. One company, Catalina Curtain Co. in Catalina Island, Calif., has even begun selling curtains covered with beach and garden scenes for hospitals to install around patient beds.

2.4 Landscaping
Studies have shown that a person’s presence within a living environment can reduce stress and speed up the healing process. By stimulating the senses with color, sound, scent, and touch, healing gardens can rejuvenate humans that posses physical and cognitive disabilities or diseases.

Using a variety of native plants and strategically placing them in round pathways and gathering places, a visitor’s sense of touch, smell and sight will be stimulated. A series of water features with a dry stream bed and tiered plantings will help create a holistic sense of presence and well being in the mountains among native plants and water and also adding personal sanctuaries like a healing garden can reconnect hospital patients with their innate therapeutic abilities.

As the researcher browsed the internet in search of material for her project, she came across Jackie Stewart’s website www.marghanita.com where she has an article titled “Children absorb healing from nature”. In her article she says “Our children are naturally so much more connected to nature than we are, so they are naturally more sensitive to healing from nature than we are too. Every single day when they are playing outside they are soaking up energy from the sun and healing from the plants that are around them whether they realise it or not.”

Bach Flower Remedies are 38 natural remedies made predominantly from wild flowers and trees. They were discovered in the 1930s by Dr Edward Bach, a Harley
Street doctor who devoted his life to developing an effective and natural form of healing which could be used and understood by everyone.

Now over 80 years later, Bach Flower Remedies are used by thousands of people all around the world to restore wellbeing and happiness.

Children respond very quickly to the natural healing of Bach Flower Remedies because they have an affinity with nature and their emotions are close to the surface so it doesn’t take much to balance them. If you’ve ever spent much time with a 2 year old, you’ll have witnessed the raw power of a forceful wave of rage passing through a little body and you’ll know how close to the surface their fury can be! Children haven’t yet learnt all the polite ways to hide their feelings that we adults know.

However this means that sometimes they get overwhelmed by the force of their emotions and need gentle nurturing to come back into balance. Often they will know on an intuitive level what they need to restore their natural state of wellbeing. They might feel drawn to play beside a particular tree in the forest one day or to pick particular flowers another day. Notice how they turn to nature instinctively – they are finding their own healing and allies in nature. Notice their favourite places to play and the plants that grow there.

2.5 Outdoor landscaping
Sculptures by Jesus Moroles who is an internationally known stone sculptor have been placed in gardens, public plazas, memorials and religious spaces and used as pieces are reminders of life all around people and their responsibilities to respect the past, to manage the present, and to build their future, as seen in the picture below.

The Healing Garden at Kernan Hospital provides a unique environment for patients, families, staff and visitors. It is designed as a therapeutic tool for teaching patients how to deal with physical challenges as they transition into the community. The unique therapy opportunity enhances patients' cognitive and physical skills for maneuvering around their home and community environment once they leave the hospital. The visitors and families are offered a space to relax in a beautiful, quiet, natural setting and where by even the employees explore personal needs for relaxation.

Studies have shown links between patients' physical environments and their ability to manage pain and heal. Utilizing this harmonious balance between body and mind, the garden stimulates one's visual, auditory and olfactory senses through the choice of plants, sound and color. Designing a therapeutic/adaptive garden takes careful planning. Considerations include: sitting areas, kneeling benches, container gardens, raised beds, water features. Creating and maintaining a garden requires the nurturing hands of a gardener along with some essential gardening tools. Healing Garden stimulates the physical, mobility, endurance, muscle tone Coordination in a person. a well designed healing garden allows people to have a higher attention thus they concentrate which is done in a sequence of tasks which range from name and color identification, in a social setting or a group activity it help’s alleviate depression sweeping in a feeling of accomplishment, self esteem thus motivating one this is known as Cognitive memory.

2.6 Garden Paths
Paths are indispensable in landscape design says Hosea Omole who is a landscaping architect, this is be- cause they provide a means of moving from one part of the landscape to the other but they do much more, they can be exciting elements by leading users on a journey full of interesting focal points and discoveries this is done by leading the eye and the mind through the gardens spaces, progressively revealing the garden and stimulating the senses. Paths require careful planning both as functional and aesthetic elements thus they should be located on natural lines of travel so that people do not cut corners.
2.7 exhibition and display

Playing Toys

Circle Express Magnetic Maze is a unique educational toy and guaranteed to keep great interest in children. A true magnetic learning experience. Maze toy is great for house use or as a pediatric waiting room toy, dental clinic toy or as a daycare toy, with 'no-loose-parts' design.

The educational magnetic maze toy challenges eye-hand coordination, visual tracking, and logical thinking. This wooden educational game is a perfect travel toy and keeps child entertained and busy. All colored parts of this educational wooden toy are coated with child-safe lead-free paint.

Image: children’s maze

The exhibition, Masks of Hope and Healing, showcases photographs of masks created by 31 patients at the children’s hospital in 2012.

The children painted their masks from hospital beds, adding titles to describe the emotions behind each stroke and color. Masks painted in hues of blue carry names like “My World of Blues,” while another patient called her colorful mask the “Hope Mask.” One patient covered her mask with algebraic formulas to express the numbers running through her mind as she worked to carry on with her studies, while sick.

According to Lucy Barbera, PhD, a medical art therapist at Golisano, every one of these artists, or patients, was on what can be considered a “hero’s journey” and each had a story to tell. Painting of the masks provided a symbolic way for the artists to tell their stories of pain and healing.
“When they take their art home, the masks serve as a bridge between the patient’s experience in the hospital and home,” said Barbera. “Even though some of them look scary, creating them was liberating because the patients were able to release negative emotions and fears. The masks carry a positive healing message and a record of self.”

Mask-making can be an art therapy tool that offers an alternative form of communication through which the artist can express his or her feelings and experiences. According to Barbera, creating art expands the skills and abilities, re-builds their confidence and self-esteem, and helps patients adapt to new conditions and surroundings. In many cases, painting masks provided the artists with an enjoyable distraction from pain, stress and anxiety, and allowed them the opportunity to confront fears.

For all the patients, the masks created a bridge between their inner feelings and outer expression, giving the viewer glimpses of their brave journeys.

Image: child painting a mask

Source: internet (upstate medical university, 2012)

2.8 Furniture
Hospital furniture is a term addressing all types of furniture’s that facilitate comfort and relief to ailing pa-tients in hospital settings. Ranging from beds and accessories, chairs, benches, tables, and stools to wheel- chairs, racks, and trolleys, hospital furniture involves a spread of items which cater to individual needs. Discomfort, pain, and nauseating medications have long been
synonymous with "hospitals". Whenever hospitals are mentioned, an unpleasant thought grips our minds. Hospitals and their poor infrastructure present an uncomfortable picture---just not the kind of place one would want to go for any treatment. With distinctive progress in medical sciences, today hospitals are not frowned upon and as a result, hospital’s administration in India are striving hard to provide world-class services to patients. With care and man-agement of patients becoming the top priority of the staff, hospitals are now a home away from home.
CHAPTER 3

3.0 RESEARCH METHODOLOGY

Image: One touch of nature makes the whole world kin.

Source: William Shakespeare

This chapter introduces the research design, research method and the tools and the instruments the researcher used in his research. It also states the methods the researcher used to collect data. The researcher took fifteen weeks to complete the entire study.

The main reasons for the study is understanding children’s experience of hospital environments and what constitutes their ideas of a fun and supportive environment in a hospital setting and this can only strengthen the capacity of designers, healthcare professionals and policy makers to create hospitals which support’s the use of the environment to make the hospital a great place. However the challenges of completing healthcare design research with children and adolescents in hospital environments means that not much of it exists.

Participatory research with children has been embraced by many disciplines. This is in response to the recognition that children have critical and unique perspectives on their experience, which have the capacity to challenge adult assumptions about their lives and to ground them in the reality of children’s lives. This paper discusses a participatory qualitative case study, completed with children in children in Nairobi city. The participants involved in the study were aged between five and ten years and had been resident in the city for at least a year.
3.1 Research structure
This was be guided by the aims of the researcher’s study. So first of all she had to understand what constitutes a supportive pediatric setting from the children’s perspective. Secondly, she describe the roles of the physical environment in children’s feeling of wellbeing. Thirdly, she illustrated the value of participatory research to healthcare design.

3.2 Research design and methods

3.2.1 Sampling frame
This study consists of a single qualitative case study. Qualitative research offers children an opportunity for them to give direct accounts of their experience and reveal their competence as critics and commentators on their own lives.

The case centered on the experience of patients in Nairobi city – The Children’s Unit at Kenyatta National Hospital in Nairobi, Kenya. Participants had to have been to a hospital in the city for at at least three months before the time they were being interviewed. The study was completed in four stages involving 20 children aged 5-10 years. The researcher interviewed those that had been to the hospital for treatment. She did not get them from the site because sick children may not be in a position to fill a questionnaire.

Stages one consisted of a series of pilot studies designed to refine the questions for research and methods of data collection. This stage provided the children with the opportunity to shape the development of the study.

3.3 Data collection
Stage two is the data collection phase for the main study. The researcher used the following data collection methods

3.3.1 Questionnaires: the researcher came up with a series of questions that helped to understand the state of the existing site.

3.3.2 Observation: she then visited several hospitals and have a general look of the situation on the ground

3.3.3 Interviews: the researcher talked in length to the children about their experiences in the hospital’s environment so as to understand their expectations.
3.3.4 Discussions: the researcher held several brainstorming sessions with the children to understand their color psychology and what they would like to see be done in the hospital’s environment.

3.3.5 Photography: the researcher took photographs of various artworks in different hospitals to determine their importance to the hospital’s environment.

3.4 Data Analysis
The methods the researcher used to analyse data included: typology, comparison, logical analysis and semiotics. Typology will be the first step where the researcher divided the data in groups i.e. questionnaire feedback and interview answers. The researcher then did a comparative analysis where she assessed data from the different groups to see if there was any relationship. From some of the feedback got, the researcher did a logical analysis to come up with tentative reasons possible for certain outcomes. The researcher then did a semiotics analysis where data was analysed from behaviour i.e. mostly data collected from observation.

3.7 Limitations
There are three notable limitations of current research into children’s experience of hospitalization.

i. The current understanding does not provide a holistic picture of their experience

ii. Many of the findings do not supplement the identification of an important attribute within children’s experience with an understanding of why it is important and what role it is playing.

iii. Not all of these studies were completed with children who were in, or had experienced, a hospital environment.

To be able to assemble the key attributes in a hospital environment effectively, there has to be a greater understanding from children themselves of how they use them and what for. To reach this understanding, research needs to be carried out with children in
the context of healthcare environments, or with those who have experienced hospital settings.
CHAPTER 4

4.0 ANALYSIS

Nature cures, not the physician
By Hippocrates

4.1 Site analysis

4.2 Landscaping

The main entrance also serves as parking entrance it passes through the open gardens to the clinic. The path is usually used by patients to the parking lot from the clinic. It serves the pediatric clinic and the offices located on the first and second floor. Patients have also formulated alternative shortcut to evade the long foot paths.

*Image: footpath created by patients

A poorly maintained pavement that cuts through the gardens to the hospitals it has grass growing in between the pavement slabs.

*Image: pavement

*Source: author

The rooftop overlooking the pediatric clinic entrance has been left unattended overlooking the possibility of it being utilized as a source of fresh fragrance and clean
air to the clinic, provide an aesthetically pleasing-environment to the clinic, personal leisure effect to the patients, reduce carbon dioxide impact in the air, reduces noise where by the plants will act as noise breakers to the noise from the parking lot, provides songbird habitat and provide a relaxing mood.

Image: rooftop overlooking clinic entrance

Source: author

The rooftop overlooking the parking lot and the gardens from the clinic view has also been left unattended to hence underutilize.

Image: rooftop overlooking parking lot

Source: author

The interior landscaping is not up to standard, the potted plants have been left unattended and some have been placed in dark corners hence being deprived of light leading to death to most of them.

Potted plants and flowers have been put haphazardly along the corridor with no particular order giving the corridor a weird appearance and some sort of disorganization
Some of the potted plants are not meant for interior landscaping thus they find it hard to survive inside the clinic. They have been put randomly in the hallway making it look clumsy.

Image: flowerpots placed randomly

4.3 Interior architecture

4.3.1 Lighting
The reception area has a huge window that allows in natural light during the day. This saves on electricity during daytime. Artificial light may be used at night.

Image: reception area

Source: author

The entire lighting of the clinic was not considered creatively. The long corridor is deprived natural light- ing thus it has dark corners which do not favour the children owing to the fact that children are very playful. Its fitted with fluorescent light bulbs that are fixed into the ceiling facing inwards. these are harmful due to their glare effect especially to a patient’s who are spending most of the time on the bed facing upwards.
image: a section of the poorly lit hallway

Source: author

4.3.2 partitioning
The room is to be divided into a pharmacy, check-up rooms, doctors consultation offices and a reception. This is an empty room that needs space organization where by it should be divided/organized into the above named areas. The room is mainly painted in cream which is not an appealing color to patients in a way that it doesn’t foster a fun and healing environment to the patients owing to the fact that it’s a pediatric ward.

Image: non partitioned room source: author

4.4 Exhibition and display
The corridors have been underutilized in terms of what goes up as exhibition and display. It being a pediatric clinic it is natural to expect cartoon murals and colourfull paintings on the wall. However, that’s not the case at the Pediatric Unit at Kenyatta National Hospital. What is seen on the walls are boring framed articles.
Image: existing exhibition and display

4.4.1 Signage
Image: overhead signage. Letters engraved in perpex

Colourful signage could aid in locating rooms in the pediatric unit. Keeping in mind that the purpose of this is to create a clean, learning, fun and healing environment for children.

Image: poor signage

Source: author
4.5 Furniture
The clinic’s beds are not ergonomically designed for children, they are too high for them to climb on top. Also, the beds are hazardous because they lack barriers for keeping the child from falling over.

_image: dangerous beds_

_Source: author_

The reception has only one type of chairs though they may be right for parents, children might not appreciate them. Children need colourful small chairs that stimulates their urge to move about and play.
5.0 SUMMARY OF FINDINGS AND RECOMMENDATIONS

5.1 Findings and recommendations
As stated, the researcher had limited information with children in hospital environments. Which provides an incomplete patchwork of considerations relevant to children’s experience of hospitalization. However, the researcher found that evidence that exists on children’s experience of hospitalization is formative, which identified aspects of the experience that children and adolescents consider supportive in a health-care context. From the research on children’s experience of hospitalization, or with children in hospital environments, the researcher found a number of persistent themes. The researcher revealed that personal considerations included the need to provide opportunities for self-care management, confidentiality, competence, control and choice.

- Social considerations include the need for social support and social contact with friends and families.
- Organizational considerations involve the need to provide adequate cognitive stimulation, and access to recreational and learning activities.
- Physical environmental considerations include the need for personal space, privacy, independent movement and comfort within the environment.
More recent research has supplemented these findings and added further considerations for all domains including physical environmental considerations, such as the need for age-appropriate spaces and interiors, respecting the importance of having personal possessions for patients and being able to personalize their bed area; identifying a preference for color and artwork in the environment; and identifying the importance of having access to gardens in the hospital environment.

Social considerations such as understanding the importance of having access to school; understanding the importance of good provision for families and their needs; and the need for active support, professionalism, respect and friendliness from staff have also been established in recent research. Organizational considerations include the need for the provision of age-appropriate activities, and the need for information that supports children’s understanding of their own situation and their capacity to participate in their own healthcare management.

The findings from this study provided a preliminary definition of a supportive pediatric environment which includes:

- An environment that supports children’s feelings of wellbeing by addressing their need to feel comfortable in the environment, maintain a positive frame of mind and remain positively engaged.
- An environment that facilitates children’s goodness of fit by supporting individual choice, control and self-help and by minimizing unwanted distractions (such as noise, light and unsolicited social contact).
- An environment that maximizes the opportunities to include features which are identified by the study as indicating child-friendliness. These include maximizing the volume of age-appropriate activities in the environment, and providing a bright and colorful environment and a welcoming and friendly social environment.

5.2 Children’s feeling of wellbeing in hospital: 
The study also revealed that the concept of feeling wellbeing is a subjective and fluctuating self-assessment that encompasses three principal components:
• children’s capacity to feel comfortable in the environment where comfort is understood to be comprised of physical, social and emotional considerations;
• children’s capacity to maintain a positive frame of mind that encompasses their capacity to minimize the impact of difficulty and boredom, and maximize the opportunity of having positive and entertaining experiences; and
• children’s capacity to remain positively engaged, which encompasses children’s active involvement and participation in their experience of hospitalization, enabling them to exert control and to experience competence and empowerment.

5.3 Participatory research and healthcare design:
Participatory research with children in healthcare environments challenges the way children are conceptualized and therefore the way they may be accommodated in design. The researcher found out that children should be conceptualized as active shapers, managers and negotiators of their experience in hospital. In a healing garden plants with grassy foliage tend to give one the impression of walking in the wilderness conceptualization of children as social agents in their own lives. This breaks from a more traditional conceptualization of patients as passive recipients of care at the mercy of stressful,

5.4 Overbearing healthcare environments:
The researcher found the concept that encompasses children’s preference for inclusion and participation in all aspects of their experience and their expectation of active self-management as far as possible. In particular participatory research challenges adult assumptions about children’s lives and challenges adult’s depictions of them. This in turn challenge’s the way they conceive the way of accommodating children within any design. It also has the capacity to ground adult understanding in the reality of children’s experience rather than the imagined reality of children’s experience. This identifies the importance of completing research with children in the contexts in which their experience is taking place.

A specific example of how information from children themselves may challenge trends in healthcare design, if they were allowed to, concerns the configuration of ward rooms. Currently there is an increasing trend to support the design of wards
which consist entirely of single rooms, which is driven largely by a medical agenda to improve infection control, although this is not well substantiated in research at present. Partitioning

The researcher found out that, half of the sample preferred single rooms and half preferred shared rooms, sharing was preferred by participants because it provided company and prevented them from being alone and feeling lonely. Shared rooms consisting of two people were considered the optimum. Single rooms were preferred because they gave the participant control over the social contact they would have with other patients, as well as more privacy with their families. In light of the current trend for single rooms, the experience of a modern hospital for many of the participants in this study would be without the social support and contact that they need and it may even give rise to new fears of being alone. If children’s views on this subject and children’s holistic needs were allowed to influence the final design preference and solution adopted, a very different design trend may be advocated.

The researcher sought to identify attributes of the physical environment that were involved in children’s feeling of wellbeing in a hospital environment. The three main design recommendations that resulted from this study included environmental aesthetics, spatial variety and the need for adaptability and flexibility in the environment.

The roles of environmental aesthetics: The environmental aesthetic features that children discussed in this study included artwork, color and brightness. Through these three aesthetic elements, the researcher will be able to help children and adolescents perceive messages of welcome, comfort, appropriateness and fun. The researcher combined these three elements to help children and adolescents to sustain a positive frame of mind and to remain positively engaged, both of which directly contribute to their feeling of wellbeing. The key features in relation to each of the three elements include:

The researcher recommends use of art work on the walls which will be age-appropriate and without the simplistic images associated with young children. Some of the artworks will include artwork completed by other children and adolescents, as this artwork in particular will convey messages of support and welcome. The researcher will also get murals done by other kids on the walls, have the walls painted
with illustrations of kids most liked cartoons, wild animals and landscapes to bring in a home setting that they are familiar with. The whole room will get a facelift by way of sponging to give it a rough-like but smooth texture then animal prints of different colors will be painted on the walls to give it a more adventurous feel.

The researcher recommends use of Color as a means of bringing a lively mood into the clinic and its environment: the environment should include a large amount of color – preferably bright color – and this should vary around the environment. The researcher will recommend soft colors that are inspired by nature that play well together and don’t show wear and tear as easily. Save the bolder colors for accents that can be easily updated. For example, neutral tan walls play well with leafy green, sunny yellow and bright orange or turquoise accents. The researcher will use apple green because it’s a neutral and warm color and it’s the most preferred among the children and since he will be doing sponging on the walls the different hues of green will bring about a perfect texture on the walls.

Brightness: brightness is a nebulous concept that represents a composite assessment of a range of envi- ronmental features, potentially involving many different aspects of the environment, including the need for a lot of color, artwork, light and plants in the environment. Anything in the environment can contribute to the assessment of brightness, ranging from the social attitudes of the hospital community to the color of skylights.

The importance of spatial variety and function: Spatial variety encompasses the need for non-medical places and spaces offering a range of different activities, atmospheres and spatial qualities, including outdoor and natural areas. This spatial variation plays a key role in enabling patients to meet their needs for environmental contrast, emotional self-regulation and self-restoration and to exercise control and self-management.

Specifically, these recommendations include:

providing facilities which enable children to carry out normal routines with their friends and family, such as cafes, shops, common room areas, play areas and age-appropriate areas for socializing. Among these the researcher recommends a
playground and a healing garden in the gardens where both the parents and their children can have a place to rest, have fun and relax.

It will also be a place providing access to outdoor areas and natural environments for contrast and to en- able patients to escape and to experience a restorative environment. ‘Natural’ green places (gardens, in this study) are preferred areas and play a key role in patients’ emotional self-regulation and self-restora- tion and their ability to access privacy, as well as providing greatly appreciated environmental contrast with the indoor environment of the hospital.

**Image:** suggestion for children’s playing ground

![Image](www.gardening.com)

**Source:** internet www.gardening.com

The value of flexibility and adaptability

The researcher recommends use of flexible and adaptable environments or environmental where the pa- tients will have the capacity to alter their immediate environment. Which translates into providing patients with the capacity to experience control, express their identity and reveal their interests, to alter the environment aesthetically and to personalise it with familiar and valued objects.

By being able to personalise their bed area in their own capacity, patients feel more comfortable in the environment and less removed from their lives outside of hospital. It also reduces the strangeness of the environment and the experience of hospitalisation.

The researcher noted that any opportunity to increase the capacity for patients to manipulate their envi- ronment in a hospital design would be appreciated by children and adolescents. Good design can affect outcomes related to privacy, noise, access to nature, lighting and ventilation, wayfinding, and staff stress. For example, patients will typically heal faster when they have a beautiful view and a quiet place to rest. They
may even require reduced pain medication. Patient falls can be reduced by improved lighting and room layout. Staff is less stressed if they are working in an efficient, functional, and appealing space.

5.3 conclusion
The findings reveal that children’s experience of the paediatric setting involves a number of major areas of influence including their personal situation, their social experience, their interaction with the physical environment, the opportunities and characteristics of the organisation, and the effect of time.

The findings also reveal that children’s feeling of wellbeing within this experience is linked to their ability to feel comfortable in the environment, to maintain a positive state of mind and to remain positively engaged with the experience and the environment.

Children reveal that they are active shapers, managers and negotiators of their time in hospital. Completing research in a healthcare context is difficult. However, it is only through children’s participation in research and design processes that we can be sure that we have identified the specific considerations which are formative in their experience as patients. We should not be designing paediatric healthcare settings that do not reflect evidence from children’s lived experience of hospital environments.

5.3.1 Suggestions for a Nature Themed and Colourful Interior design
Vinyl floor helps nurture healing in Maryland hospital

Insets depicting variety of indigenous wildlife and vegetation are used to highlight colorful vinyl tile floor in the new acute care facility by use of animal patterns like the Crab, tortoise, herons, butterflies, frogs, rabbits, and more.

Though they may sound like an assortment of wildlife you would find in a zoo, it’s actually what patients and their families are finding in the new Acute Care Pavilion of the Anne Arundel Medical Center in Annapolis, Maryland. Only in this case, the animals aren’t real they are custom-designed patterns that are inset into the facility’s colorful new vinyl floor.
Located on the outskirts of Annapolis, the new 277,000-square-foot facility replaces a much older facility that was located in the historic area of the city. When it came to the design of the new hospital, they had certain specific goals in mind. “First and foremost, they wanted it to have a warm, nurturing environment that would help the patients get better as well as make their families feel more comfortable.”

*Image: Maryland Hospital  source: internet*
Every patient room in the Anne Arundel Medical Center’s new Acute Care Pavilion has a multi-colored, custom-designed inset in the vinyl floor. Here, a crab was created on the floor.

Nature Theme Featured in Vinyl Floors

The goal was accomplished by deciding to bring nature into the building. “Numerous studies have shown that the use of nature in healthcare environments helps promote healing. It also helps reduce anxiety of both patients and their families.” To implement the design objective, they introduced a colorful, nature theme into all the floors in the hospital. Every patient room, plus the critical care unit, has a multicolored, custom-designed inset in the floor, oriented to the patient lying in bed. Because Annapolis is situated on the Chesapeake Bay, many of the insets depict wildlife that is indigenous to the area, such as crabs, frogs, turtles and fish.

Clinical care corridors are included in the nature theme as well. In these areas, patients will find a variety of leaves or vines inset into the floor. In addition, accent-colored borders are often used to highlight areas, while geometric patterns are used in many staff areas to give them additional visual interest.

First Experience with Custom Insets

The design of the new hospital is not merely patient focused, but patient/family focused.

“It’s important to take into account the impact of the illness on the family”. “From that aspect,

anything that can be done to de-institutionalize the environment is beneficial. The integration of nature into the floor is a good example.”

Custom inset leaves are scattered in a field to convey the nature theme in the corridors of the new facil- ity, the theme is truly universal in the sense that it can be used anywhere because it does not differentiate between male and female, young and old, or race and national origin.”

Blose also notes that one of the main reasons vinyl tile was used in the patient rooms, exam rooms and clinical corridors is because it is easier to maintain aseptic conditions than with most other flooring mate- rials. “When it comes to housekeeping, the ability
to easily clean up liquids is a factor in favor of resilient flooring, experience with this customization technique has proved that pattern and design can be success- fully integrated into the vinyl flooring with both precision and artistry at no sacrifice to the quality of the installation or maintainability of the finished product.”

Healing spaces case study of Grand Rapid Michigan Children’s hospital

Healing spaces case study of Grand Rapid Michigan

Children’s hospital nurtures via natural theme environment

Spectrum Health delivers on their promise, “the comfort of world class care,” in Grand Rapids, Michigan. Their pediatric specialists care for nearly 7,500 inpatients and 7,000 outpatients every year. In addition to using the latest health care equipment and technology, the healing process itself benefits from the design theme chosen for the pediatric areas. vinyl and linoleum merge the excellent sheet floor performance demanded by Spectrum with a nature-inspired environment to create “healing spaces.”
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5.5 appendix: sample questionnaire

Have you ever been to a clinic or hospital?
[ ] Yes  [ ] No

How did you find the hospital's environment?
- welcoming
- playful
- discouraging

Would like to go back to the hospital?
[ ] Yes  [ ] No

Why would you go back?

........................................................................................................................................

Why would you not go back?

........................................................................................................................................

Which two colors would you prefer a hospital to be painted?

........................................................................................................................................

Why would you paint it with the selected color?

........................................................................................................................................

Have ever you noticed artworks in a hospital?
[ ] Yes  [ ] No
Did you like the artworks?
- Yes  - No

What kind of artworks did you prefer?
- Cartoons
- Wild animals
- Abstract Paintings

If cartoons which one would you fancy most?
........................................................................
........................................................................
........................................................................

If animals which one would you like most?
........................................................................
........................................................................
........................................................................

If abstract paintings which one would you like most?

Why did you prefer the selected artwork?
........................................................................
........................................................................

Have you ever gone to a hospital with a garden?
- Yes  - No
What did the garden comprise of?

s

e

a

b

n

c

h

e


after
features
scented
What would you like to do after getting out of the hospital?

play