WAYFINDING IN HOSPITALS

A CASE OF NAIROBI AND KIAMBU COUNTIES

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Declaration

This Thesis Is My Original Work And To The Best Of My Knowledge It Has Not Been Presented For An Award Of A Degree In Any Institution.

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This Thesis Is Submitted In Part Fulfilment Of The Examination Requirements For The Award Of The Bachelor Of Architecture Degree, Department Of Architecture And Building Science, University Of Nairobi.

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To the Almighty and Family...

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Abstract

Wayfinding in hospitals: A case of Nairobi and Kiambu counties.

Many hospitals have developed over a number of years in a piecemeal fashion. This has resulted in complex environments made up of long and confusing corridor systems with bends, turns, and confusing signs. Such settings challenge and frustrate those who visit them.

The importance of wayfinding to building use, costs and safety and the growth in terms of theories, principles, guidelines, and methodologies over the years does not appear to have made an impact on wayfinding performance in complex hospital environments. Thus, there remains a need to find more effective wayfinding solutions to the problems that continue to occur in complex hospitals. This research aims at developing wayfinding strategies in complex hospital environments.

Huelat (2007), presents her wayfinding principles in graphical form showing building blocks (Facility Amenities, Graphics, Signage, Architecture, Interior Architecture, Interior Design, Landscape and Master Plan) which, she asserts rely on each other to form a solid wayfinding system. This study outlines the findings from two Level 5 Hospitals in Kiambu and Nairobi counties. These hospitals have been chosen purposively with emphasis on size of the facilities. The hospitals are the Thika Level 5 hospital and Mama Lucy Kibaki Level 5 hospital. The parameters investigated to support wayfinding process in hospitals are zoning, route complexity, landmarks, color and lighting , graphics and signage and edges.

The research was carried out through the case study method. Findings revealed that the hospitals lack a distinct and coherent image and therefore it is almost impossible to navigate. This is as a result of a highly complex circulation network, weak typological definition of structures and lack sufficient locational aids that would support the wayfinding process. Getting lost in these facilities was a comon occurence which causes an already stressful environment to become even more stressful for the visitors and patients. Recommendations have been drawn in the last chapter of these study which include: landmarks need to be unique in terms of size, texture, shape and color so as to be effective and they should be placed at decision points and perceived from as many directions as possible thus the ones located at intersections work best. These provide direction in terms of designing hospitals with effective watyfinding for the future.

Chapter 01: Introduction

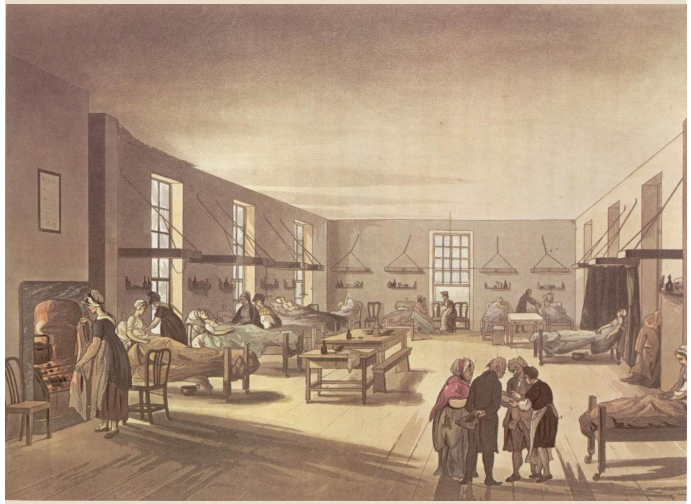


Fig 1.01: A ward in Middlesex hospital in London (1808).

Source: www.londonlives.org/, 2019.

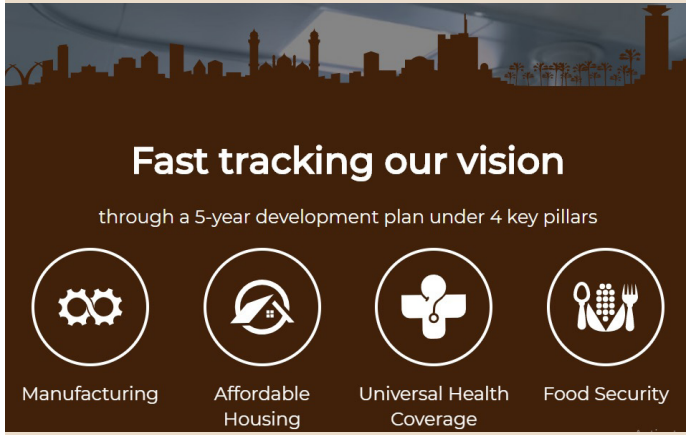


Fig 1.02: Universal health services is a mandate set by the Kenyan government.

Source: https://big4.president.go.ke/, 2019.

1.1 Background Study

Wayfinding is the process of reaching a destination, whether in familiar or unfamiliar environments (Arthur and Passini, 1992). Good architectural wayfinding design is important to universal design because it facilitates user access, increases satisfaction, and reduces stigma and isolation of users with disabilities. It reduces the confusion of visitors and mistakes by employees, saving time and money and preventing accidents. It also reduces stress, boosting health, and productivity (Evans and McCoy, 1998).

The evolution of hospitals in the western world from charitable guesthouses to centres of scientific exellence has been influenced by a number of social and cultural developments. Tese influences have included changing meanings of disease, economics, geographic location, religion and ethinicity, the socioeconomic status of clients, scientific and technological growth, and percieved needs of populations (Risse, 1999) (Fig 1.01). The origin of hospitals as an independent institution for the care and treatment of the sick can be dated back to the fourth century AD. Throughout the middle ages, but notably the 12th century the number of hospitals grew rapidly in Europe. Arab hospitals also grew in number and were special because they admitted patients regardless of their race, beliefs or social order.

Universal health services is a goal set by the Kenyan government in 2018 (Fig 1.02). According to the World Health Organization in 2015, “Universal health care refers to a health care system that provides health care and financial protection to all citizens of a particular country.” The thesis contribution to this would be from a wayfinding in hospitals perspective. The building design and complex nature of hospitals often add additional sources of problems. For example, Many hospitals tend to be large, with incremental and uncoordinated growth patterns, environmental characteristics that often create wayfinding difficulties (Rousek and Hallbeck, 2011).

Fig 1.03: Image illustrating a visitor in deep confusion and stress in a complex hospital environment.

Source: Author, 2019.

1.2 Problem Statement

Major events such as births, deaths and diagnoses occur daily within a hospital environment. It could be argued that wayfinding may be more difficult for hospital visitors than for those visiting other unfamiliar buildings such as airports and malls because the stress occasioned by the hospitalization event may already reduce visitors' information processing abilities (Cohen, 1978). For first-time visitors and patients, this heightened state of anxiety is multiplied.

Patient stress from hospital visits can be further compounded by issues of poor wayfinding, lack of personalization and privacy. The frustration that comes from getting lost is ranked among the top complaints by visitors to healthcare facilities. This is because, many health facilities (spaces) in Kenya, have been designed with little acknowledgement of the differing needs of patients, visitors and care-givers. Also facilities undergoing construction and renovations, changes in patient flow and temporary accommodation may add to this stress and confusion related to poor wayfinding. Ineffective wayfinding in hospitals can result in indirect cost of lost productivity as concerned staff members take time away from patient care to give directions or walk lost visitors to their destination. Patients end up being late to medical appointments or in patient admissions. There are safety risks for friends and family who are unable to find the patients they are visiting, as poor wayfinding can lead them into restricted areas that can pose either security problems or, worse, hazards to their health and the health of others (Cooper, 2010). Patients also end up spending less time with their visitors. Ineffective wayfinding can leave patients and visitors with a bad impression of the hospital (Larsen and Tatarka, 2008). Lastly, Injuries and death during emergencies may occur due to poor wayfinding.

Hospitals in Nairobi such as Mama Lucy Kibaki Hospital are recognizing how difficult it can be for visitors to find their way around the facility. This is due to the high number of visitors who ask for directions. Stress caused by poor wayfinding may result in feelings of helplessness, raised blood pressure, headaches, increased physical exertion, fatigue, depression and suppress immune system (Ulrich, 1991). In addition, patients may be affected by the wayfinding troubles of visitors who, because they got lost, may have less time to spend with patients (Carpman and Grant, 2001).This study therefore seeks to come up with the wayfinding strategies in hospitals which would aid in giving direction to visitors in hospitals without getting lost.

Fig 1.04: Infographic illustrating study's research questions and objectives.

Source: Author, 2019.

1.3 Research Objectives

1. To identify design strategies employed to enhance wayfinding in hospitals.
2. To examine the nature of existing wayfinding strategies in hospitals in Nairobi and Kiambu.
3. To recommend better ways of designing for effective wayfinding in hospitals in Nairobi and Kiambu counties.

1.4 Research Questions

1. What are the standard design strategies employed to enhance wayfinding in hospitals?
2. What is the nature of existing wayfinding strategies in hospitals in Nairobi and Kiambu?
3. Can architects come up with better ways of tackling wayfinding in hospitals in Nairobi and Kiambu counties through design?

1.5 Significance of the Study

In hospital environments, effective wayfinding systems and strategies contribute positively towards healing. Hospital planners, architects and hospital management should endeavour to create such environments. This study therefore seeks to create awareness on the importance of effective wayfinding in hospitals and will also equip hospital planners, designers and other stakeholders in the industry with strategies to achieve effective wayfiinding in hospitals.

Despite it's demonstrated importance to building use, costs and safety, wayfinding receives less than it's due in planning, research and building evaluation. Often the investment in wayfinding systems is less than that devoted to amenities like art and furnishings (Hunter, 2010). This study is highly propelled by the statement above.

The study is a building block in solving the architectural issues in hospitals in Kenya. This study is also in line with one of the goals set by the Kenyan government in 2018 which is universal health services for all Kenyans.

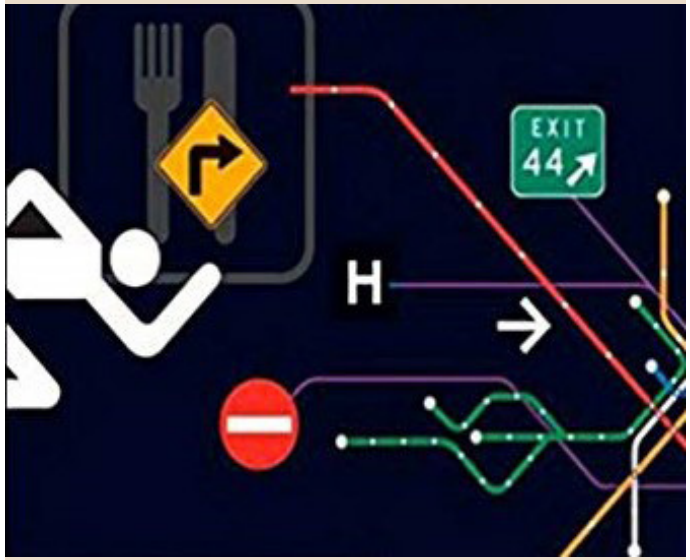


Fig 1.05: Information design for public spaces design cues.

Source: David Gibson, 2019.

1.6 Justification of the Study

Healthcare in Kenya has encountered various challenges in terms of patient care and cost stemming from planning and environments within hospitals. Aspects of hospital design such as planning and lighting have received lots of attention but wayfinding has been given little scholarly attention. This study therefore seeks to establish exactly how wayfinding in hospitals in Nairobi and Kiambu counties can be achieved successfully.

1.7 Scope and limitations

This study is focused only on level 5 hospitals within Nairobi and Kiambu counties. These hospitals are Mama Lucy Kibaki Level 5 Hospital and Thika Level 5 Hospital.

The limitations of the study are as follows:

+ Time allocated for the study may not be sufficient for a detailed and in-depth documentation of wayfinding in healthcare facilities.

+ Finances available will not allow for conduction of thorough research.

1.8 Literature reviewed

This study employs qualitative and quantitative methods to ensure effectiveness in data collection.

1.8.1.1 Published Materials

1. Gibson, D. (2009). **The wayfinding handbook: Information design for public places.** New York, NY: Princeton Architectural Press. This study examines the practical, fundamental elements of implementing effective wayfinding practices for large, high-traffic facilities such as large hospitals. There are four main categories discussed in the book that are intended to assist with implementing a wayfinding strategy in business: the discipline of wayfinding, planning wayfinding systems, wayfinding design and the practical considerations of wayfinding.

Fig 1.06: Some universal healthcare symbols for wayfinding in healthcare facilities.

Source: www.corbindesign.com, 2019.

Fig 1.07: Signage as an element that contributes towards effective wayfinding in healthcare facilities.

Source: www.journals.com, 2019.

2. Lee, S., Dazkir, S. S., Paik, H. S., and Coskun, A. (2014). **Comprehensibility of universal healthcare symbols for wayfinding in healthcare facilities.** The study notes the importance of considering hospital wayfinding for global citizens who seek medical care within the US. In their research study, the authors tested the comprehension of some existing healthcare graphical images (Fig 1.07).
3. Pati, D., Harvey, T. E., Willis, D. A., and Pati, S. (2015). **Identifying elements of the health care environment that contribute to wayfinding.** Health Environments Research & Design Journal. This journal identifies aspects of the physical environment that inform wayfinding for visitors (Fig 1.08). The author compares and contrasts the identified elements in frequency of use. The author also gains an understanding of the role the different elements and attributes play in the wayfinding process.
4. Ezzat, A. E. M., Hamoud, H. S., and Fadlallah, B. E. (2014, December). **Factors affecting patient flow planning in hospitals.** In this article, the authors seek to explain why it is important to place a heavy focus on wayfinding within the hospital setting. They argue that patient flow represents the ability of the healthcare system to serve patients quickly and efficiently as they move through the stages of care. When there are blockages in the flow of patient care, it can increase the amount of time patients must wait, which creates a negative effect on the quality of service delivery. The authors note that when implementing more effective wayfinding designs within healthcare facilities, patients have shorter wait-times in registration, diagnostic testing, surgery, placement in beds, and discharge.
5. Hashim, M. J., Alkaabi, M. S. K. M., and Bharwani, S. (2014, May). **Interpretation of way-finding healthcare symbols by a multicultural population: Navigation signage design for global health.** The authors note the importance of considering multi-cultural populations when designing and implementing symbols in a hospital's effort to create better wayfinding. The article explores three main points: the comprehension of healthcare symbols decreases with an older and illiterate population. Secondly, symbols for more abstract referents, such as the oncology unit or the diabetes education department, are more difficult to interpret correctly as compared to departments in the hospital such as imaging or surgery. Lastly, those who design healthcare symbols should consider cultural factors of the audience, as these factors may influence comprehension. This article is useful in discovering areas where standardization of symbols may exist.

Fig 1.08: Factors contributing to patient experience in hospitals.

Source: www.journals.com, 2019.

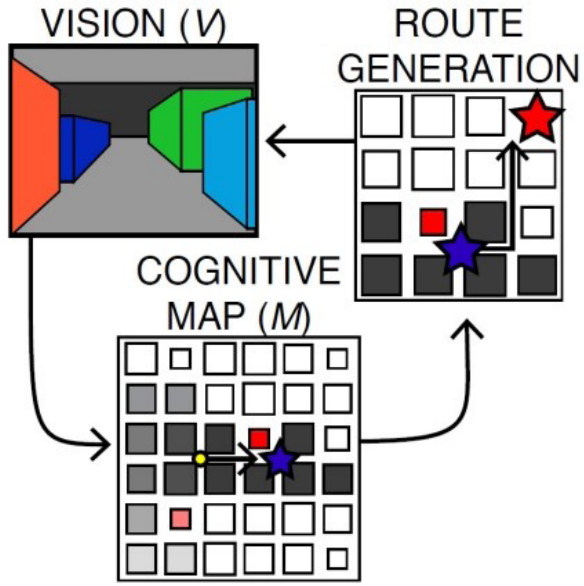


Fig 1.09: Vision, cognitive mapping and route generation is a repetitive process in wayfinding.

Source: www.onlinelibrary.com, 2019.

6. Chaudhury, H., Mahmood, A., and Valente, M. (2009). **The effect of environmental design on reducing nursing errors and increasing efficiency in acute care settings: A review and analysis of the literature.** This article is important for this study because it highlights areas where improved wayfinding and the design of healthcare facilities correlate to cost savings. These cost savings are a result of reductions in staff turnover and increases in patient and visitor satisfaction. Staff turnover is reduced when there are fewer interruptions due to lost patients, visitors, and new staff members. Patient and visitor satisfaction scores also rise when better wayfinding improves movement through the hospital, positively impacting the staff and reducing turnover (Fig 109). Finally, better design that facilitates a healthier, happier environment for staff helps to increase staff satisfaction.
7. Carlson, L. A., Hölscher, C., Shipley, T. F., and Dalton, R. C. (2010). **Getting lost in buildings.** This article illustrates the tension in architecture between aesthetic and functional features. It concentrates on three contributing factors of why people get lost in buildings: the spatial structure of a building, Secondly, the cognitive maps that users construct as they navigate the building and lastly, the strategies and spatial abilities of the building's users (Fig 1.10). The study concluded that the degree to which these architectural features of buildings impact wayfinding may depend upon the completeness of the cognitive maps that individual users construct. This article provides a unique view into possible reasons users experience difficulty in wayfinding, including the notion of a cognitive map.
8. Jerrod S. Potter (2017). **Best Practices for Wayfinding in a Hospital Setting.** This book gives a clear picture of the background of wayfinding. The author also provides benefits of effective wayfinding and best practices in wayfinding.

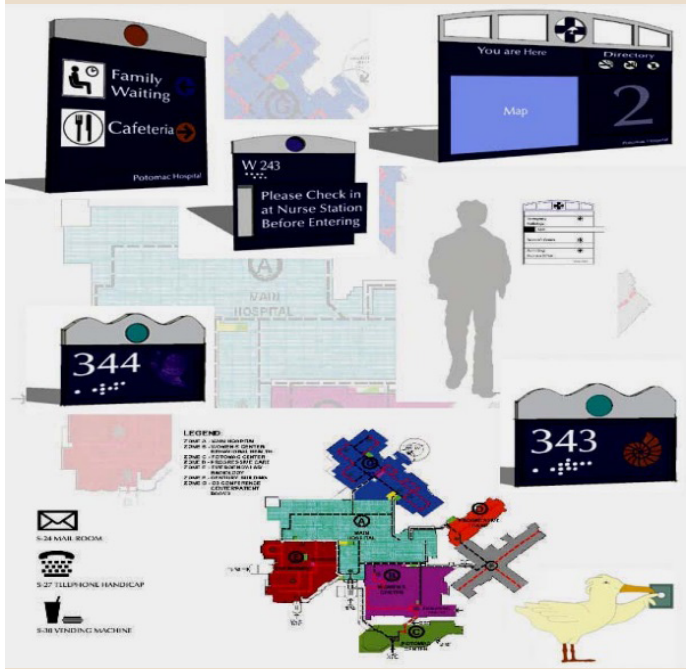


Fig 1.10: Potomac Hospital wayfinding system.

Source: www.journals.com, 2019.

1.8.1.2 Unpublished Materials

1. Barbara J. Huelat, AAHID, ASID, IIDA. (2007, October). **Wayfinding: Design for understanding.** This dissertation investigates the various components that make up a good wayfinding system (Fig 1.11). The author also discusses the benefits of good wayfinding.
2. Eden Jayne Short, Stephen Reay and Peter Gilderdale (2017). **Wayfinding for health seeking: Exploring how hospital wayfinding can employ communication design to improve the outpatient experience.** This project explores how a design-led approach can be used to improve health seekers' wayfinding experiences within a public hospital. The designed wayfinding solutions demonstrate the importance of cohesive and staggered information that reflects the health-seeking journey.
3. Jason Brandon Abrams (2010). **Wayfinding in Architecture.** The dissertation is focused on improving wayfinding at the Rietveld Academie in Amsterdam, which is an institution of higherlearning,

1.8.2 Internet sources

This is useful in sourcing information that has not been published yet and particularly that which is not available unpublished literature.

a) Researchgate, https://researchgate.net/

b) Google Scholar, https://scholar.google.com/

c) Jstor, https://www.jstor.org/

d) Ncbi, https://www.ncbi.nlm.nih.gov/

e) Archdaily, https://www.archdaily.com/

1.8.3 Case Studies

The research selects hospitals within Nairobi and Kiambu that best showcase various wayfinding strategies in the facilities. These case studies include;

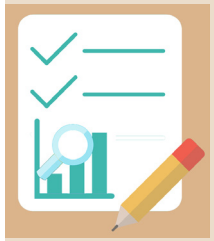
a) Mama Lucy Kibaki Level 5 Hospital, Nairobi county.

b) Thika Level 5 Hospital, Thika town, Kiambu county.

Chapter 1 - Introduction.

Chapter 2 - Literature Review.

Chapter 3 - Research Methods.



Chapter 4 - Findings and Analysis.

Chapter 5 - Conclusion and Recommendations.

Fig 1.11: Illustration showing author's study organization.

Source: Author, 2019.

1.9 Structure Of The Study

Chapter I of this study gives a brief introductory background to healthcare and wayfinding in paediatric hospitals so as to give the reader a better grounding as to what exactly the author intends to research on.

Chapter II consists of the review of both published and unpublished works on the topic of study. It investigates design strategies employed to enhance wayfinding in hospitals, what exactly is meant by the term wayfinding and the benefits of wayfinding in hospital environments. This is achieved via studying the works of authors of different times in order to give a more informed understanding as to how wayfinding in hospitals was done in the past, and how it is done today. The authors focused on are Architect and Researcher Arthur, Passini, Carpman, Grant, Cooper and Cohen. The parameters obtained from this chapter will hence govern the 4th chapter study as it will entail documenting the presence or lack there of said parameters.

Chapter III delineates the techniques that will be used in carrying out this research. It also indicates the methods of data collection, analysis and presentation that shall be utilised in order to further deepen the understanding of the topic of study.

Chapter IV of this study entails the critical analysis of the chosen case studies i.e. Mama Lucy Kibaki Level 5 Hospital and Thika Level 5 Hospital. It is however important to note that the case studies selected will not be studied in their entirety. Rather, the specific point of focus will be their response to wayfinding. This shall then be corresponded with the parameters outlined in Chapter II of this study.

Chapter V will give the lessons learnt from the case studies and how they can be utilised, or added onto, in order to give the best way forward with regard to wayfinding in hospitals.