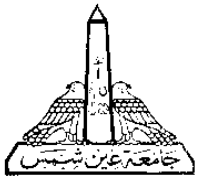

AIN SHAMS UNIVERSITY

FACULTY OF ENGINEERING

Architecture Engineering

The Effect of the Operational phase of Construction on The Physical built Environment in Hospital Facilities

"Road-Mapping the Architectural Design Footsteps to Catalyse the Sense of Healing and Collaborate Operators Vision In Hospital Based-Emergency Departments"

A Thesis submitted in partial fulfilment of the requirements of the degree of Master of Science In Architectural Engineering

By

Bassant Amin Abdel-Wahab
Bachelor of Science In Architectural Engineering
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Cairo - (2020)

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Date : 26 DECEMBER 2019

Statement

This thesis is submitted as a partial fulfilment of Master of Science in Architectural Engineering Engineering, Faculty of Engineering, and Ain shams University.

The author carried out the work included in this thesis, and no part of it has been submitted for a degree or a qualification at any other scientific entity.

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Thesis Summary

A Healthcare Facility (HF) is the most complex environment to design, build and operate. In the one, hand diverse stakeholders are coming along with integrated demands for satisfaction. On the other hand, International design standards tend to define the spatial requirements of HF only. Many details are left for HF operators to define resulting in a gap between Designers and Operators. Having Emergency Department (ED) as an Exemplar, trends like: Room Saturation, Patient Safety, Length of stay and caregivers satisfaction, tend to re-form the concept design of ED. The Research aims to fill in the gap between the designer's knowledge about the elements Physical Built Environment (PBE) and the stakeholders' demands for greater value in ED. Both Qualitative and Quantitative analysis are undertaken in this research.

The Quantitative survey for Post Occupancy Evaluation (POE) is used to define the measures of operational efficiency. Nationally case studies of Emergency department of Dar Al Fouad – Hospital Building (DAF, Giza, Egypt) and the new extension DAF (Cairo, Egypt), were selected. Internationally the post occupancy evaluation (POE) was reviewed for EDs in the United Kingdom National Healthcare services (NHS), utilizing this governmental development recognized POE system. The selection of case studies was based on application of local and global design standards of ED in Hospitals. These selections reflect the outcomes of POE on Healthcare architecture of ED to cover unseen points of on design standards regarding efficiency. Subsequently a Qualitative analysis is undertaken in order to generate a design check list capable to form a conceptual design of ED based on Post Occupancy Evaluation to have higher operational performance.

Mostly, a strong connection between a smooth flow among rates of admission and re-allocation of facilities were observed .The findings were extended to the developed design checklist that managed to cover the patient flow spine, and the same-handed room operational concepts impact on designing room's layout. Briefly, this research proposes a design checklist inducted from end-users experience to promote the physical built environment of an ED towards better performance. It was proven that design guidelines are not enough for performance guarantee. This research is limited to emergency preparedness as key measures of operational efficiency. Further investigations should proceed on design of adjacent departments to ED; Like Imaging, Intensive Care Units, etc... When applying the feedback from post occupancy stage to have a holistic approach to the Hospital Building as one Unit.

The Dissertation is composed of three Units:

Unit 1: Overviewing the Environment of Care: the unit explores the stakeholders of the healthcare industry their claims for the physical built environment and the reasons of choosing the Emergency department.

Unit 2: Identifying the measures of operational efficiency and methods architects have been using to figure out these measures. This section came closer to evidence based design methods and lean design methods to investigate the valid points in stakeholders' claims for changing design concept relatively.

Unit 3: Conducting a design lead checklist after analyzing case studies through diverse types of base plan comparisons to deduce the lessons to be learned from practical experience of currently operated hospital buildings.

Keywords: *Emergency Department ED, Evidence Based Design EBD, Lean Design, Environment of Care EOC, Operational Efficiency, Physical Built Environment PBE, Healing Environment*

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List of Abbreviations

POE	Post Occupancy Evaluation
PBE	Physical Built Environment
EBD	Evidence based Design
PF	Patient Family
FGI	Facility Guidelines institute
HBN	Health Building Notes
HAAD	Heath Authorities Abu Dhabi
EDMH&HF	Egyptian design Measures for hospitals and healthcare Facilities
WHO	World Health organization
ED	Emergency Department
AHRQ	Agency for Health Research and Quality
AHA	American Hospital Association
HERD	Health Environments Research and Design Journal
HAI	Hospital Associated Infection
HIT	Hospital Information Technology
IOM	Institute of Medicine
IHI	Institute for Healthcare Improvement
MOHP	Ministry of Health and Population
CHD	Center of Health care Design
BOO	Build Own Operate

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