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Futuristic Healthcare Facility Shaping Better Patient Experience: An Overview of KSA Facility

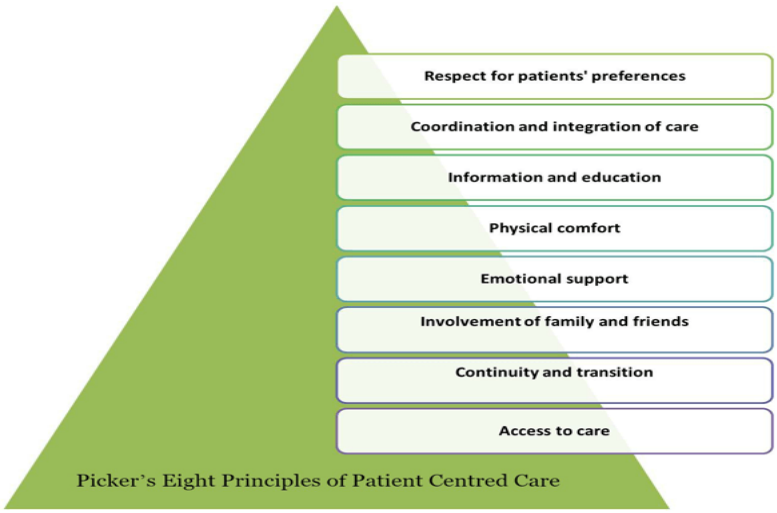
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Abstract: ***Patient is the most important stakeholder of any healthcare facilities. Gone are the days when we used to design a healthcare setup based on our perception of what the patient could expect. Now we are living in a competitive environment where the patients' expectation should not be guessed but have to offer the patient room as a space that let the patient customize as per their comfort during the stay in the facility. In a Healthcare facility designing, an Inpatient unit is very crucial because its physical infrastructure & built environment not only affect patients' recovery but also Healthcare staff & facility outcome. IoT enabled healthcare facility helps the doctors to be more watchful of the patients' activity and how their body responds to based on the data collected. However, integration of IoT in a healthcare facility is proving to be equally challenging. This paper shall cover overview of the technical considerations of planning and designing of Patient Room Unit in context of future emerging trends as well as implementation of IoT and patients experience. The Methodology shall be engagement of various techniques to gather information of healthcare facilities through observation, Literature review of published journals, academic papers, also Data collection in this qualitative study and basic concept background are investigated through online media and observation to work for qualitative analysis.***

Keywords: Healthcare Design, Patient Room, Emerging Trend, Infrastructure, Person Centred Care & Patient Experience, IoT.

I. INTRODUCTION

Understanding and respecting patients' value, preferences, and expressed needs is the foundation of patient centred care – Harvey Picker [1]. Addressing the patient experience and the parameters that effect this is a significant step in providing person centred care, it is not just about ensuring patient happiness during the care but ensuring comprehensive assessment of patient journey through out the care process. Healthcare providers strongly believed that "Patient-Centred Care is the core of a high quality health care system and a necessary foundation for safe, effective, efficient, timely and equitable care" [2]. Patient-centred care is the practice of caring for patients (and their families) in ways that are meaningful and valuable to the individual patient. It includes listening to, informing and involving patients in their care [3]. Picker's principle of patient centred-care is based on the need and preferences of the patients and their family.



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To meet the diverse needs of today's patients and their families, patient room design will need to address future technological & new medical demands. Through an interdisciplinary approach, design strategies that consider the physical, emotional & social needs of users in a way that promotes safety, efficiency and flexibility for change will result in more integrated solutions. A better understanding of the issues facing healthcare, consumer perceptions, expectations.

Review of best practices in patient room design will provide a basis for design guidelines that when applied to a new prototype patient room can better accommodate the need of all stakeholders, including family member. There are many evidences available that the physical environment of hospitals can affect the healing process, e.g.: reducing the level of anxiety and stress; shortening recovery periods following surgery through better views of the surrounding environment; increasing social interaction through improved building layout; positioning of furniture to increase patients' satisfaction [6]

Ideally Patient room can be designed into three zones, first The staff zone should be at the entrance to the room to foster efficiency in performing their tasks, while providing the least impact on occupants, Second Patient amenities should be placed at the centre of the room, and third at the back of the room, place comfortable seating for visitors. Patients using the right-sized smart rooms report a higher satisfaction rate thanks to increased communication and control. Safety is improved when automated data reduces human error in patient care, and providers can spend more time with the patient and less time charting, repeating steps and searching for information. A care provider has bedside access to labs and tests that provide a critical picture of the patient's treatment plan [4].

II. DESIGN CONSIDERATION

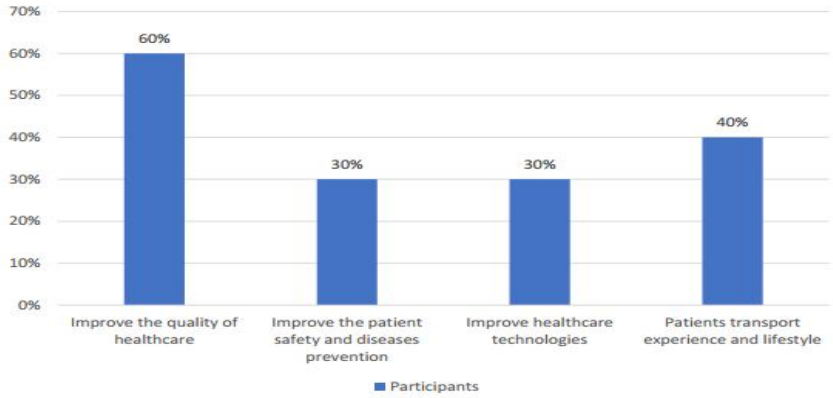
Visualization of easy access, intelligent and smart healthcare facility, integration of different services for Patient rooms, lighting control to automate and manage patient room's lights from central integrated building management system. Some highlighted systems must be there like Infotainment system, Nurse call system, IPTV, IP Camera, white board system, Digital name board system, Digital signage, RFID/RLTS, Access control system, Public address system, Master clock synchronization system, Integrated BMS, Kiosk. Consideration of Data centre, IDF room, dedicated shafts, horizontal, vertical pathways, cable selection, and type of walls and finishes are very important for IT civil and infrastructure planning [7].

Designing patient room size & Layout must compliance with local code with standard space requirements, windows, patient privacy, Hand washing stations, toilet /bath room & Storage facility [8]. Considering safety and quality of patient cares as well as designing facility may help to reduce preventable accident such as patient falls, hospital acquired infection [9].

Design features for the headwall, footwall, nursing support area, and family amenities are important for satisfaction. Also Headwall, defined by the wall behind and the ceiling over the patient's head are the most important spaces for incorporating clinical care elements. And Footwall, defined by displays those items that the patient will directly view, such as the television, clock, and backboard & solidary-erase board for information displays [10]. To create most efficient hospital Patient room there shall be consideration of emerging technological trend such as Virtual reality, 3D Simulation Technology, Information technology, Intelligent environment & personalized atmosphere [11].

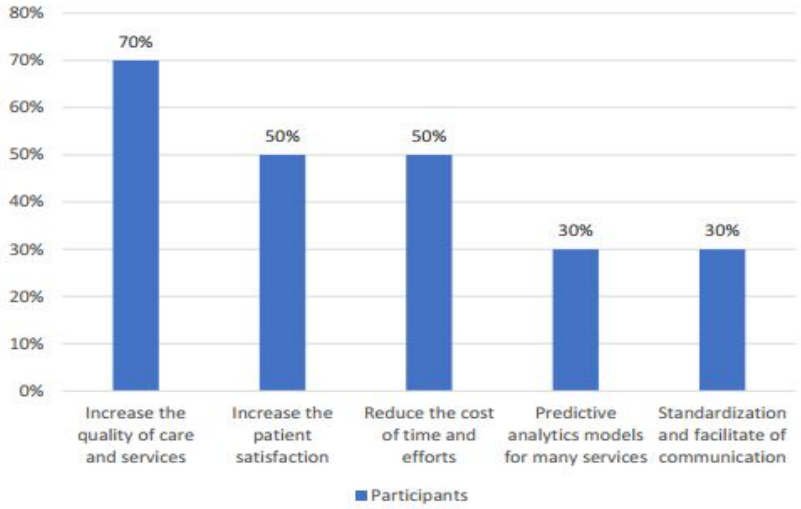
III. ROLE OF IoT & PATIENT EXPERIENCE

IoT enabled healthcare facility helps the doctors to be more watchful of the patients' activity and how their body responds to base on the data collected. However, integration of IoT in a healthcare facility is proving to be equally challenging. The graphs [12] below give a clear sight of the impact, benefits, risk & challenges of IoT in Kingdom of Saudi Arabia's healthcare system.

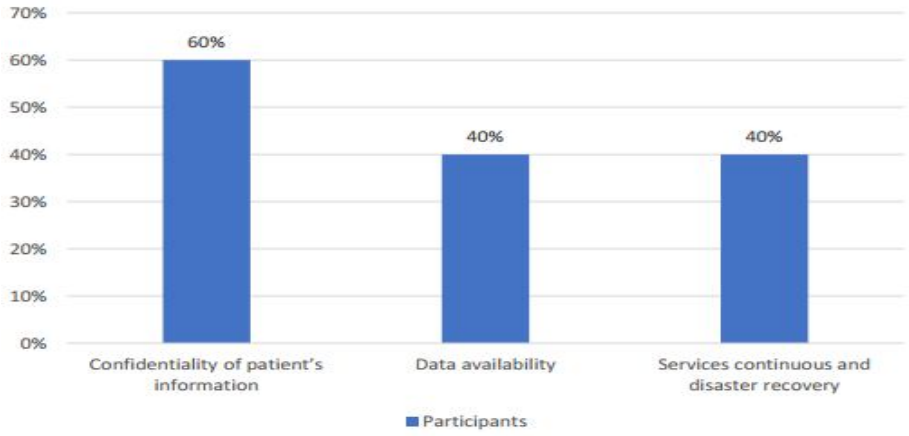


Graph-01: Impact of IoT in Saudi Healthcare System

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Graph-02: Benefits of IoT in Saudi Healthcare System



Graph-03: Risk of applying IoT in Saudi Healthcare System

IV. CONCLUSIONS

Patient experience can only be improved by taking consistent feedback from the end users and implement the same in terms of physical infrastructure and IoT helps in collecting the data based on real experience. The hospital understanding of patient experience is a significant step in providing patient centred care. It is not just about ensuring patient happiness during the care but ensuring comprehensive assessment of patient journey through the care process and ensuring safe, timely, effective, efficient efficacy and patient centred care are met [13].

1- Patient satisfaction rate (Inpatient):

Patient Satisfaction Rate-Inpatient	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	96.14%	97.15%	96.32%	96.33%	95.83%	95.60%	96.33%	95.89%	96.87%	96.03%	96.13%	98.48%

Benchmarked with Mayo Clinic Arizona: 92%

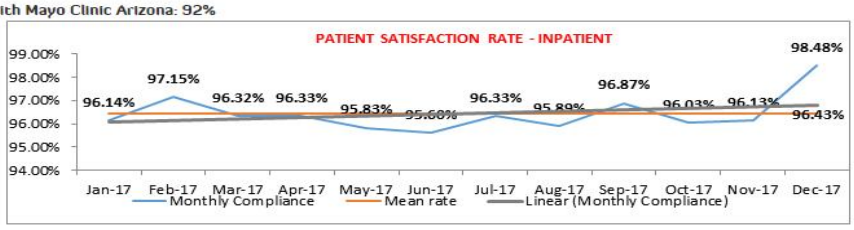


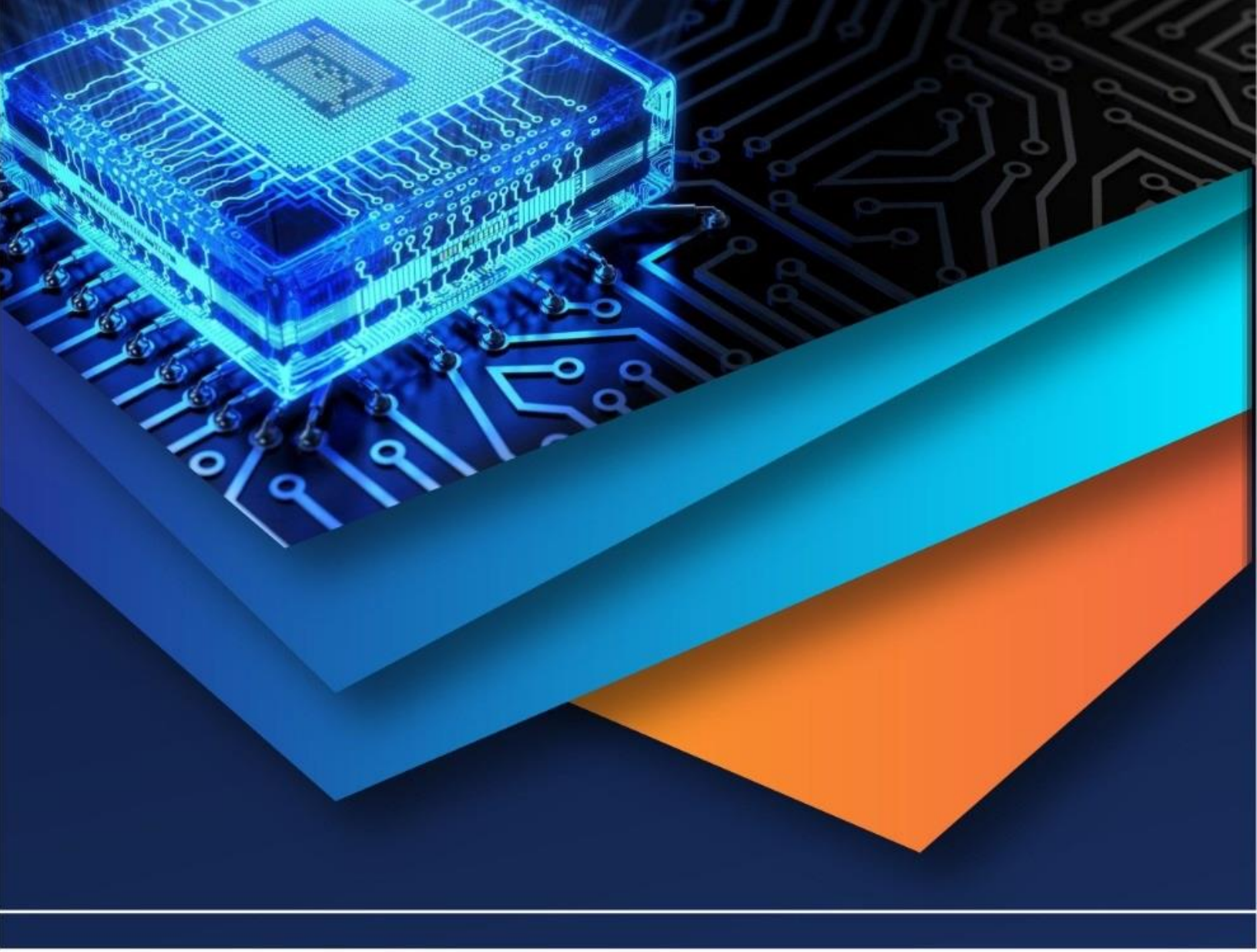
Chart-01: Shows patient satisfaction of Mayo Clinic Arizona & Dr. Sulaiman Al Habib Hospital Riyadh,KSA

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