An In-depth Study on Impact of Health scape towards Patients' Health

Ms. K. C. RAJA SHREE

Research Scholar

Faculty of Management Sciences

Sri Ramachandra Institute of Higher Education and Research

Chennai – 77.

Dr. A. Bhooma Devi

Associate Professor

Faculty of Management Sciences

Sri Ramachandra Institute of Higher Education and Research

Chennai – 77.

Dr. Prasanna Sivanandam

Professor & Dean

Saveetha School of Management

Saveetha Institute of medical and technical sciences

Chennai – 77.

Abstract

Hospitals play a vital role in rendering healthcare services to patients. The critical role played by hospitals are very essential for patients to recover at a faster rate. When concerned about the health care services, the environment which is the place where health services are delivered plays a major role. The health environment or the atmosphere where the healthcare services takes place is mentioned as Healthscape. Healthscape helps in numerous aspects. This helps in improving the satisfaction of patients, assessing the quality, speedy recovery, etc. The health environment has a direct relationship on patient choice towards hospitals. Always a clean and pleasant environment makes patients feel better. So, healthscape thereby provides better opportunities for hospitals to deliver services. Healthcare providers must make sure that they are giving importance for a better healthscape in their hospitals. Facilities with updated medical technology and well established infrastructure will enhance the patient satisfaction thereby improving indoor environment quality.

Introduction

There are many factors that have an impact on healthcare services provided to patients in hospitals setting. Some of them are patient co-operation, quality of service provided, facilities available, Timely services provided, empathy shown by healthcare professionals, etc. As an individual whenever we choose a hospital for treatment other than emergency situations , its purely based on not only the quality of services provided but also the uniqueness and comfort level we get in those hospitals. Although, aesthetics will not be the only element that determines quality healthcare, this remains as an decisive component in patient preferences. Geomatics allows for employment of amalgamated approach for analysing specific spatial as well as temporal operations. The place-based horizons play a vital role in health research. The challenges relating to geographical representation remains as a major issue in patient preferences towards hospital choice. (Rainham et al. 2010).The features provided by hospitals also play a major role. The variety of services provided will attract the patients. For example in-house pharmacy with all the medications, in-house scan and other support services will make the patient feel more comfortable , as they need not run around for some type of services. When some of the services are not available, during emergency situation the patients and the attenders will feel exhausted and this might lead to higher stress level. This may also eventually result in deteriorating Patient satisfaction towards the hospital. Overall patient satisfaction is the key success factor for any healthcare provider. This will bring about patient loyalty also at longer periods.

Implementation of digital advancements in healthcare sector guarantees to bring about radical changes in the delivery of patient care services at global level. Some of the cyber tools such as blockchain, augmented reality, artificial intelligence, visual realty are some of the contemporary trends available in healthcare industry. Cyber healthcare system is also employed in healthcare sector in order to maximise the outcomes in patient care services. (Trenfield et al. 2019). The healthcare professionals such as doctors, nurses, paramedical staffs, etc should treat the aperients with respect. In businesses, always customer is considered as the king, likewise in a hospital 'patient is the king'. This should be strongly adhered by the healthcare professionals. This study attempts to investigate the impact of Healthscape on patient health. The study was undertaken in the form of questionnaires and semi-structured interviews to understand the factors that impact the patient health pertaining to healthscape aspects. The components employed are Appearance, Environment. Hygiene, Signage Boards, Canteen, Safety, Spacious, Accessibility, Parking and Temperature.

Review of Literature

Faridah et al. (2021) experimented about patient safety with respect to hospital setting. This research explains that the utmost challenge in maintaining patient safety is creation of safety. This study explains the correlation between characteristics of nurses , work environment in hospitals and patient safety. Descriptive correlative study along with cross sectional approach is employed in this research.

Smith et al. (2021) examined the perception of nurses about hospital environment in small rural hospitals at Australia. Descriptive method with cross section type of survey is implemented in this research. The results indicate that a good hospital environment will help in improving the staff satisfaction and thereby retention rate will go higher. This will also support in providing excellent patient service.

Marghmalek et al. (2021) explored the importance of hospital environment towards patient experience in hospitals. About 388 samples were collected and analysed about the spread of bacteria in hospital setting. The results show that environmental micro-organisms remain as a major source of infections and gets transferred from clinical isolated areas towards general hospital setting.

Zhang et al. (2021) demonstrated about the ongoing challenge that arises for hospitals with respect to spill over of corona virus into outdoor environment. This results in transmission of virus for people surrounding the hospital setting. It is detected that there is high spread of virus in the receiving area of cover 19 patients and also in waste water treating areas. This study recommends for proper fumigation treatment in the areas where the virus spread is of high prone in order to reduce the transmission risks.

Raval et al. (2021) evaluated the machine learning methods for hospital choice and the role of environment in patient choice. According to this research, it is explained that changes in the hospital environment will affect the patient choice to a greater extent. The econometric models employed in this study also explains about the changing choice of patients towards hospitals due to the environment.

Wiltshire et al. (2020) revealed that experiences of patients affected with cancer are contingent towards material environment in hospital setting. This study explains that materiality occurs due to direct interactions of patients. Also this has a greater impact through providing of shared spaces within human assemblages. So, this remains as a component of getting treatment and experience in patients minds.

Johannessan et al. (2021) evaluated the clinic learning environment of nursing students in Norwegian hospitals with respect to placements. The results show that there exist a positive relationship between the learning and good environment. If the supervisory relationships are healthy, then there exists higher chances for a well maintained learning environment. This research recommends for future studies.

Kwan et al. (2021) explained about the relationship between hospital admissions and environment in developing countries of Asia. Road junction density plays an important role in hospital admissions with respect to cardiovascular diseases. But recreational density reduces the hospital admissions with respect to cardiovascular diseases across all quartiles. Land use mix reduced the admissions of female patients.

Zhang et al. (2020) experimented the perceptional and influencing factors in general hospitals of winter cities. According to this study, for the air environment, air stuffiness is an influencing factor. Crowd density and waiting time differs between different corridors and halls. The air quality reduces where the crowd density is high. This

study depicts that younger participant possess high levels of environment satisfaction.

Lisi et al. (2021) exhibited the interdependence of institutional environment in hospital setting. This research is done in Italy. An economic framework is proposed that incorporates local and global levels of quality competition in hospitals. Graphical methods are implemented in this study to estimate local rivals and global interdependence for each hospitals in that area. This study recommends for implications of strong health care policies.

Scordino et al. (2019) studied about the impact of hospital environment in patient recovery. A high level of diversity is found from this study. The hospital environment plays a greater role in patients with neurological problems. The reduced level of infections results in faster recovery of patients. The changing conditions in environment will help the patients to respond to the external stimuli.

Tang et al. (2019) investigated about the quality of indoor environment in the street of semi closed hospital. This was measured using subjective surveys which are conducted simultaneously. The results shows that constant heating and humidity level of outpatient rooms and the adjacent street of hospital causes discomfort to patients. The vibration is caused during rains due to poor hospital environment.

Edelsburg et al. (2018) demonstrated about the importance of maintaining hygiene in hospitals environment. According to this study, the results show that 24% of patients passed comments about hospital hygiene aspects to medical personnel. 31-38%

patients didn't give attention to hospital hygiene. The study also depicts that religious and gender differences also influenced the patients to comment about hygiene.

Nurain et al. (2015) explored about the level of nosocomial infections in patients who are recovered from cancer and was hospitalised for a long time. This study determines the prevalence of pathogen isolation in hospital environments. A sample of about 1503 is collected and examined for identifying the infection level. About 29.7% samples were found with infections, therefore hospitals should work on providing healthy environment to patients.

Lin (2011) explained the perception of women towards hospital environment and how it has an impact on satisfaction level of patients. Around 200 questionnaire were circulated and female patients were asked to fill. The results show that hospitals have to work on the environment to reach the expectations of female patients. This study depicts that female patients expect a hospital environment which is female friendly.

Fernando and Dawson (2014) illustrated about the hospital environment built naturally. According to this study physical environment brings better outcomes than a virtual environment which is being stimulated. Electronic healthcare results in increased concern towards security and privacy matters. Also respondents perceive than a natural environment would help them in their healing process.

Ansmann et al. (2014) explored the impact of hospital environment on physician support in cancer centres. This study determines the relationship between patients and physicians in a hospital setting. The results of this study

show that there are some stressors that enable a healthy support between physicians and patients. The associations show a positive association between hospital structure and physician support.

Leclercq et al. (2014) experimented the movement disturbances in hospital environment. The hospital environment creates movement disturbances and also occupational accidents in poor setting. Therefore, this results in occupational hazards for employees. This also highlights the contributing scenarios that leads to accidents in hospital setting. The results of this study stresses the importance for proper hospital setting to avoid accidents.

Mellikeche et al. (2018) evaluated the information systems models in two hospitals with respect to their environment. The results of this study shows that a strong collaboration between the information systems and hospital work environment helps in getting good results and patient satisfaction. This can be achieved to a larger extent through proper deployment of clinical information systems.

Derrick et al. (2015) illustrated the impacts of using a proper nutrition systems in hospital setting. This research explains about the association between nutrition environment stablished in hospitals and how it helps in achieving patient satisfaction. The researchers highlights that this type of health initiative can be implemented in all hospital settings in order to achieve a better result and healthcare delivery.

Impact of Healthscape on patient health

The ultimate purpose of the present study is to investigate the impact of Healthscape on patients' health from a patients' perspective. This comprises of health environment, support services and other factors in a hospital. This is carried out by using a questionnaire which includes numerous aspects pertaining to impact of Healthscape on patients' health from patients side. The respondents for this study are 114 patients. The responses were collected from patients of three different hospitals. The patients demographic profile such as gender, age, marital status and annual income are displayed in the below mentioned table.

Table 1: Patients Demographic Profile

Gender	Frequency	Percent
Male patients	53	46.5
Female patients	61	53.5
Total	114	100.0
Age	**Frequency**	**Percent**
< 25 years	12	10.5
25- 35 years	24	21.1
> 35 years	78	68.4

Total	114	100.0
Marital Status	**Frequency**	**Percent**
Unmarried	35	30.7
Married	59	51.8
Separated	20	17.5
Widow/Widower	0	0
Total	114	100.0
Income/Yr	**Frequency**	**Percent**
< 1 Lakh	20	17.5
1 - 5 Lakhs	58	50.9
> 5 Lakhs	36	31.6
Total	114	100.0

It is obvious from the calculated frequency summary that our respondents are female patients (53.5%) , above 35 years of age (68.4%) , who are married (51.8%) and gaining annual income between 1 to 5 lakhs (50.9%) per annum. Table 2 provides details about mean analysis to find out the impact of Healthscape on patients' health from a patients' perspective. Likert's scale is employed to measure this.

Table 2 : Impact of Healthscape on Patients' Health using Mean Analysis

S.No	Impact of Healthscape on Patients' Health using Mean Analysis	Mean	Rank
1	I prefer hospitals which has an appealing appearance (Appealling)	3.51	10
2	I believe that health environment will help in speedy recovery (Recovery)	4.30	2
3	Hospital environment must be maintained with proper hygiene (Hygiene)	4.39	1
4	The signage boards must be kept at every space to make it more convenient for patients (Signage)	3.83	8

5	Canteen services provided in hospitals influences hospital choice (Canteen)	3.62	9
6	Hospital environment should ensure Patient Safety (Safety)	4.26	3
7	Spacious waiting hall should be there in the hospitals to avoid congestion (Spacious)	3.88	6
8	The Hospital layout should be easy to access by the patients (Access)	3.90	4
9	Parking lots should be available (Parking)	3.89	5
10	The temperature maintained in the hospital was acceptable (Temperature)	3.87	7

Table 2 describes analysis of mean regarding impact of Healthscape on patients' health from a patients' perspective. It is interpreted form mean table that mean value is highest for Hygiene followed by Recovery, Safety, Access, Parking, Spacious, Temperature, Signage, Canteen and Appealing. Therefore, the results imply that hospital environment must be maintained with proper hygiene according to patients perspective . Table 3 discloses the impact of Healthscape on patients' health from a patients' perspective through factorisation.

Table 3: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.802
Bartlett's Test of Sphericity	Approx. Chi-Square	277.962
	Df	45
	Sig	.000

Table 3 demonstrations KMO and Significance value. If the KMO value is > 0.6 and significant level is at 1%, it indications that the given data is satisfactory for conducting factor analysis. Here KMO value is 0.802 and therefore, provided data is satisfactory for conducting factor analysis.

Table 4: Total Variance Explained

Component	Rotated Sums of Squared Loadings		
	Total	% of Variance	Cumulative %

1	3.646	27.666	27.666
2	1.240	16.932	44.598
3	1.016	14.413	59.010

It is evident from the table 4 that with the help of factor analysis ten variables have been grouped into two factors and they all together explain 59% of variance.

Table 5: Grouping of Components

Impact of Healthscape on Patients' Health	Component		
	1	2	3
Spacious	0.792	-	-
Access	0.765	-	-
Signage	0.725	-	-
Parking	0.610	-	-
Safety	0.576	-	-
Recovery	-	0.835	-
Hygiene	-	0.668	-
Temperature	-	0.506	-
Canteen	-	-	0.818
Appealing	-	-	0.624

It is observed from the table 5 that the variables are categorised into three components and they are named as Physical Space, Medical Improvement and Value Additions. The Physical Space component comprises of Spacious, Access, Signage, Parking and Safety variables. The Medical Improvement component comprises of Recovery, Hygiene and Temperature variables. The Value Additions component comprises of Canteen and Appealing variables. Table 6 demonstrates the cluster analysis.

Table 6: Cluster Analysis

Final Cluster Centers			
Criteria	1	2	3
Physical Space	3.58	2.10	4.31
Medical Improvement	4.15	1.83	4.30
Value Additions	2.82	3.00	4.19
SAMPLE	**50**	**2**	**62**

From table 6, it is evident that, the cluster 1 consists of 50 patients and they think that medical improvement is important with respect to Healthscape; cluster 2 consists of 2 patients and they have no strong opinion all the three factors and cluster 3 consists of 62 patients and they think that all the variables such as physical space , medical improvement and value additions are important in a Healthscape.

Conclusion

According to the surveys, casting spent on environmental sustainability will serve as an strong insurance policy with respect to health and other related human well being. The deterioration of environment such as polluting the nature will result in harmful effects. As we breathe the air in nature, drink the water provided by nature and through the ecosystems only the environment gets sustained. If at all, the environment is disturbed there will be increase in the diseases prevailing and it will be very much difficult for the human population to lead a healthy life. The 2020 SDGs is to create a health environment for people where they will have complete rights to life, food, health, water , sanitation as well as quality of life. Therefore, hospitals should keep this as a goal and help in creating healthy environment by maintaining an excellent Healthscape in all aspects.

References

1. Faridah, I., Setyowati, S., Lestari, F., & Hariyati, R. T. S. (2021). The correlation between work environment and patient safety in a general hospital in Indonesia. *Enfermería Clínica*, *31*, S220-S224.

2. Smith, S., Halcomb, E., Sim, J., & Lapkin, S. (2021). Nurses' perceptions of the practice environment in small rural hospitals. *Collegian*.

3. Marghmalek, S. A., Valadan, R., Gholami, M., Nasrolahei, M., & Goli, H. R. (2021). Survey on antimicrobial resistance and virulence-related genes in Enterococcus faecium and Enterococcus faecalis collected from hospital environment in the north of Iran. *Gene Reports*, 101233.

4. Zhang, D., Zhang, X., Yang, Y., Huang, X., Jiang, J., Li, M., ... & Qu, J. (2021). SARS-CoV-2 spillover into hospital

outdoor environments. *Journal of Hazardous Materials Letters*, 100027.

5.   Raval, D., Rosenbaum, T., & Wilson, N. E. (2021). How do machine learning algorithms perform in predicting hospital choices? evidence from changing environments. *Journal of Health Economics*, 102481.

6.   Wiltshire, G., Pullen, E., Brown, F. F., Osborn, M., Wexler, S., Beresford, M., ... & Turner, J. E. (2020). The experiences of cancer patients within the material hospital environment: Three ways that materiality is affective. *Social Science & Medicine*, *264*, 113402.

7.   Johannessen, A. K., Barra, M., Vullum, S., & Werner, A. (2021). Nursing students' evaluation of clinical learning environment and supervision in a Norwegian hospital placement-a questionnaire survey using CLES+ T scale. *Nurse Education in Practice*, 103119.

8.   Kwan, S. C., Ismail, R., Ismail, N. H., & Mohamed, N. (2021). An ecological study of the relationship between urban built environment and cardiovascular hospital admissions (2004–2016) in an Asian developing country. *Social Science & Medicine*, *276*, 113868.

9.   Zhang, S., Zheng, J., & Wu, Y. (2020). Field study of air environment perceptions and influencing factors in waiting spaces of general hospitals in winter cities. *Building and Environment*, *183*, 107203.

10.   Lisi, D., Moscone, F., Tosetti, E., & Vinciotti, V. (2021). Hospital Quality Interdependence in a Competitive Institutional Environment: Evidence from Italy. *Regional Science and Urban Economics*, 103696.

11.   Scordino, F., Giuffrè, L., Felice, M. R., Orlando, M. G., Medici, M. A., Merlo, F. M., & Romeo, O. (2019). Genetic diversity of Candida albicans isolates recovered from hospital environments and patients with severe acquired brain injuries. *Infection, Genetics and Evolution*, *76*, 104068.

12.   Tang, H., Ding, J., & Lin, Z. (2020). On-site measurement of indoor environment quality in a Chinese healthcare facility with a semi-closed hospital street. *Building and Environment*, *173*, 106637.

13.   Gesser-Edelsburg, A., Zemach, M., Cohen, R., Salmon, A., Lowenstein, L., & Shteinberg, D. (2018). What variables are associated with the public's willingness to take measures to maintain a hygienic hospital environment?. *American journal of infection control*, *46*(11), 1245-1253.

14.   Nurain, A. M., Bilal, N. E., & Ibrahim, M. E. (2015). The frequency and antimicrobial resistance patterns of nosocomial pathogens recovered from cancer patients and hospital environments. *Asian Pacific Journal of Tropical Biomedicine*, *5*(12), 1055-1059.

15.   Lin, H. C. (2011). A study on women's perceptions regarding the requirements and satisfaction of a hospital environment. *Genomic Medicine, Biomarkers, and Health Sciences*, *3*(2), 63-71.

16.   Fernando, J., & Dawson, L. (2014). The natural hospital environment: a socio-technical-material perspective. *International journal of medical informatics*, *83*(2), 140-158.

17.   Ansmann, L., Wirtz, M., Kowalski, C., Pfaff, H., Visser, A., & Ernstmann, N. (2014). The impact of the hospital work environment on social support from physicians in breast cancer care. *Patient education and counseling*, *96*(3), 352-360.

18.   Leclercq, S., Saurel, D., Cuny, X., & Monteau, M. (2014). Research into cases of slips, collisions and other movement disturbances occurring in work situations in a hospital environment. *Safety science*, *68*, 204-211.

19.   Mellikeche, S., Boussekey, O., Martin, G., Campoy, E., Lajonchère, J. P., & Degoulet, P. (2018). Evaluation of the unified model of information systems continuance (UMISC) in two hospital environments. *International journal of medical informatics*, *117*, 66-81.

23.   *pharmaceutics*, *567*, 118443.

20.   Derrick, J. W., Bellini, S. G., & Spelman, J. (2015). Using the Hospital Nutrition Environment Scan to Evaluate Health Initiative in Hospital Cafés. *Journal of the Academy of Nutrition and Dietetics*, *115*(9), A57.

21.   Rainham, D., McDowell, I., Krewski, D., & Sawada, M. (2010). Conceptualizing the healthscape: contributions of time geography, location technologies and spatial ecology to place and health research. *Social science & medicine*, *70*(5), 668-676.

22.   Trenfield, S. J., Tan, H. X., Awad, A., Buanz, A., Gaisford, S., Basit, A. W., & Goyanes, A. (2019). Track-and-trace: Novel anti-counterfeit measures for 3D printed personalized drug products using smart material inks. *International journal of*