INFRASTRUCTURE AND ITS RELATION TO QUALITY OF NURSING CARE AND PATIENT SATISFACTION AT PORT SAID SETTING HOSPITALS

Rasha Ibrahim El-Sayed [1], Hadeer Mahmoud Mohamed Elzagawy [2], Takwa Rashwan Mohamed Abd-El hady[3], Mohamed Gamal El-Sehrawy[4]

Assistant Professor of Nursing Administration [1], B.sc nursing [2], Lecturer of NursingAdministration [4, 3] - Faculty of Nursing Port Said University Egypt.

ABSTRACT

Background: Satisfaction of patients is a watchword for organizational success. The hospital infrastructure has been associated with health care quality and associated with the satisfaction of clients. **So**, **the aim** of this study is to assess infrastructure and its relation to patient satisfaction With the quality of nursing care at Port Said setting hospitals. **Subjects and Methods: Design :** A descriptive correlational. **Setting:** As-Salam hospital and El-Zohor hospital at Port Said. **Subjects**: included 121 from As-Salam hospital (20 males and101 females) and 79 from El-Zohor hospital (15 males and 64 females) they selected randomly and Convenient Sample of patients in all inpatient units from study setting for two months (100 from Al- Salam hospital (40 male and 60 femal) and 100 (50 male and 50 female) from El- Zehour hospital). **Tools**: Quality Standard for Hospital Infrastructure, Quality of Nursing Care and Patient Satisfaction Questionnaire. **Results:** It shows that, a significant positive correlation between the quality of nursing care and patient satisfaction in As-Salam hospital and El-Zohor hospital. Finally, there was no statistically significant difference between the studied hospitals in the quality standards for hospital infrastructure except the inpatient quality standard. **Conclusion:** it was concluded that there was a significant positive correlation between total patient satisfaction and overall quality of nursing care in As-Salam hospital and El-Zohor hospital. **Recommendations** it is necessary to perform a continuous evaluation of the hospital infrastructure and also continuous measure patients' satisfaction with the nursing service provided.

Key words: *Hospital Infrastructure - Patient Satisfaction- Quality of Nursing Care*

INTRODUCTION

Healthcare organizations present a vital function in determining the community perception regarding governmental health systems performance. Hospital is an organization that patients can goes aiming to get emergency, medical and surgical care. The restoration of wellbeing and physical health have a progressive effect on the physical science. The principles of financial, societal and environmental sustainability cannot be obtained without maximizing the functions of the hospital building using the appropriate balance of physical features (i.e. day lighting, window design, thermal condition and others) (Elbadry, Ghadiry & Sayed, 2019).

The good hospital infrastructure must have an effect on the rapid recovery of sicknesses. Institute of Medicine (IOM) recognized the structural components that disturb quality improvement, which include: quality analysis improvement, an acceptable and well-organized personnel, clinical communication support, information systems for data collection and organizational ability to support evolving systems of care, cultural competence in services, and continuing improvement practices (Norazam, 2018).

Hospital infrastructure was defined as constructions which elevate and enhanced the healthcare quality, consequences and practices of clients (patients) and healthcare provider (Sakallaris, Macallister, Voss, Smith & Jonas, 2015). Lee and Scott (2018) also defined hospital infrastructure as the structural features of a working environment that enable or support professional nursing practice, while Zhang, Tzortzopoulos, and Kagioglou (2019) defined it as building design features that influence health outcomes.

nowadays a novel view appears to highlight the importance of quality interventions during improving the construction of the hospital building. Quick technological development has concreted way for the growing of intelligent infrastructural designing causing stronger infrastructure and efficient practice within resources that in turn included in providing quality care services (Zhao, & Akkadechanunt, 2011). In the light of quality definition, quality is a challenging perception, the greatest vital description of a quality product is one that encounters the expectation of the client (Loraine, 2011).

Patient satisfaction defined as the opinion and general assessment of the healthcare or medical service quality, as well as clients' judgements about the provided healthcare and nursing management. Concerning marketing theories, many of them focusing on client positive opinion that have been achieved through providing the proper service.

(Kondasani and Panda, 2015; Donabedian, 2005). Donabedian, 2005 recommend that client perception regarding quality is an important factor for successful healthcare process and overall organization due to the role played in achievement of patient satisfaction and increasing hospital productivity.

Nurse's work was focusing on achieving acceptable level of standards, which can aide in obtaining the desired level of practice causing delivering professional healthcare which perceived by the patients and families as a quality of healthcare. The prospects of patients to staff nurses contain mainly proficient and qualified service, the delivery of information, respect for dignity, and a feeling of security, as well as quick help in managing various symptoms of a disease (George & Bhila, 2019).

Significance of the study:

The hospital infrastructure strongly effects on the quality of nursing care and also on patients' satisfaction. So, the effective infrastructure is most important to patients, relatives, nurses, nursing directors, and society in general (Aboshaiqah, 2015).

Karaca, and Durna (2019) recommended that the quality of nursing care is the most important components of healthcare services. Patients' satisfaction about quality nursing care has become an established as the most important predictor of the overall satisfaction with hospital care and an important goal of any healthcare organization. Measuring patients' satisfaction about quality of nursing care could be effective in improving nursing service quality by facilitating the creation of standards for care while monitoring both results and patients' perceptions of quality

The findings of this study might assist the hospital directors and nurse managers to recruit plans and programs that can increase the quality of patient care, attracting and retaining nursing staff, and supporting healthy hospital infrastructure in the Egyptian healthcare system. So, the present study aims to determine the relation between hospital infrastructure, quality of nursing care and patients' satisfaction in Port- Said selected hospitals.

AIM OF THE STUDY

This study aimed to assess infrastructure and its relation to quality of care and patient satisfaction at Port Said setting hospitals.

Research questions:

1. What is the infrastructure at hospitals in the study?
2. What is the quality of nursing care at hospitals in the study?

3. What is the patient satisfaction at hospitals in the study?

4-Is there a relation between infrastructures and quality of nursing care and patient satisfaction at hospitals in the study?

SUBJECTS AND METHOD

I. Technical design:

Research Design: -The design the design utilized in this study was a descriptive correlational research design.

Study Setting: The present study was conducted at AS-Salam Hospital and El-Zohor Hospital.

Subjects: The subjects of this study included two groups: the staff nurses` group, and the patient group.

Sample size: The staff nurses` group: the study sample included 200 staff nurses (males and females) that's divided into (121 nurses from AS-Salam hospital and 79 nurses from El-Zohor hospital) according to the propration of nurses' number in each hospital and calculation of sample size equation:

Sample Size Equation: *According to the equation of Daniel (1999). Mentioned that,*

$$n= \frac{N\times P(1-P)}{N-1\times(d^2 \div z^2)+P(1-P)}$$

$$n= \frac{328\times 0.5(1-0.5)}{328-1\times(0.05^2 \div 1.96^2)+ 0.5\ (1-0.5)} = 200$$ (simple random sample).

The patient group: Convenient sample of patients who are receiving direct nursing care services in all inpatient units at the study setting for period of two months (100 patients from AS- Salam hospital and 100 patients from El- zohour hospital)

Tools for Data Collection: Data collection tools included three tools namely:

the tool I: Quality Standard for Hospital Infrastructure

This scale was developed by the ministry of Health Program (MOHP) (2014), aimed to assess hospital infrastructure. It's consisted of five standards: the first standard was intensive care unit standard (infrastructure) consisted of 12 items. The second standard was an operation room standard consisting 33 items, the third standard was a dialysis standard (infrastructure) consisting of 34 items, the fourth standard was an emergency

room standard (safety environment) consisted of 20 items and the fifth standard was an Inpatient quality standard consisted of 17 items.

Scoring system: All standards items were scored on a three- point Likert scale ranging from 0 “not met”, 1 “partly met” and 2 “met”.

<60% “not met”, 60-80% “partly met”, >80% “met” (MOHP, 2014).

Tool II: Quality of Nursing Care Questionnaire (observation checklist)

This scale was adopted from Ibrahim (2002), and based on sale (1991), aimed to assess the quality of nursing care provided to the patients during their hospitalization from the first hours of admission. It consisted of 79 items classified into two main parts:

1- Patient center's activities categorized as:

- Orientation on admission (5 items). Physical needs (hygiene 2 items, comfort & rest 5 items, and feeding 2 items). Carrying out Nursing Procedures (Vital signs 5 items, medication 7 items, dressing 3 items, Preparation for investigation 2 items). Health teaching (7 items). Listening & conversation with the patient (6 items). Evaluation of patient needs 6 items, Protect patient from injury and hazards (7 items). Keeping privacy (3items). Exchange of information (4 items). Oxygen and ventilation (4 items).

2- Unit centered activities are classified into two parts:

- Equipment and supplies (3 items). Environment (8 items).

Scoring system: the patient centered activities measured with Likert scale ranging from 0 “not done” & 1 “done”, the unit centered activities with Likert scale ranging from 0 “not satisfied" & 1 "satisfied" (Ibrahim, 2002).

Tool III: Patient Satisfaction Questionnaire

This scale was developed by Hegazy and Hesham (2016**),** aimed to evaluate patient satisfaction level, it consisted of six dimensions: 1) Tangible health service provided consisted of 5 items, 2) reliability of the health service provided consisted of 5 items, 3) health service response provided consisted of 5 items, 4) confirmation of health service provided consisted of five items, 5) emotional reintegration of the health service provided consisted of 5 items and 6) accessibility and availability of health service provided consisted of 5 items.

Scoring system: All standard items are scored on a five - point Likert scale ranging from 1 “strongly disagree”, 2 “disagree”, 3 “not sure”, 4 “agree”, 5 “strongly agree”. The

levels for the arithmetic community have also been divided into three levels (high score, degree Medium, low score), by the following formula:

Category Length = Range / Number of Categories

Range = upper category - lower category

Category Length = (1-5) /3=1.33

Therefore, the following scale was used to judge arithmetic mean

The levels are classified as follows:

Likert scale	Degree scale
Less than or equal to 2.33	Low
From 2.34 - 3.67	Medium
5.00-3.68	High

(Hegazy & Hesham, 2016**).**

II. Operational design: The operational design includes the preparatory phase, validity and reliability, pilot study, and field work

A various field works.

Preparatory phase: It included reviewing of literature, different studies and theoretical knowledge of various aspect of hospital infrastructure, quality of nursing care and patient satisfaction using books, research articles, The internet, periodical, magazines and the related web sites.

Content validations of the tools: Revision of all tools ascertained by seven nursing experts to ensure content validity, experts to review compression of statement. Content validity using statically test as confirmatory fact analysis if one and more conform less than one not conformed excluded,

●**Reliability:** Cronbach's alpha coefficient was calculated to assess the reliability of all tools.

●**Pilot study:** A Pilot study was carried out on 10% of the nurses and patients to test applicability, feasibility, and objectivity and to estimate the needed time to fill the data collection sheets, and then necessary modification was done according to the result of the pilot study. The staff nurses and patients they were included in the pilot study excluded from the main study sample. The result of pilot study revealed a confidence interval between 85-90%.

Field work: Data have been collected during 6 months throughout the period from beginning of March 2020 to the end of August 2020. The field work has been performed in the following sequence:

The first tool sheet filled in by the researcher at the selected hospitals (Al-Salam and El-Zohor hospitals) by observation checklist on four departments (emergency department, intensive care department, operation department, inpatients departments). The second questionnaire sheet was filled in by by the researcher while the nurses performing the patient care on three different shifts to assure and verify the results. The third tool sheet were were previewed with patients who received nursing care inpatient room in inpatient unites and then filled these tools by researcher, and the purpose of the study was explained prior to get the questionnaire sheets and the confidentiality of the data filled by patients were ensured.

III. Administrative design: - Before the conduction of the study, official letters were taken from the Dean of the Faculty of Nursing in Port Said university sent to the selected area of the study. The director of each setting contacted and informed in order to obtain permission to include the nurses and patients in the present research after an explanation of the purpose of the study, a written permission was secured. On data collection, a verbal agreement was taken from every subject (nurses and patients from each hospital), after a clear and simple explanation of the purpose of the study. also. the researcher assured the respondents about the anonymity of their answers for patient questionnaire and observational items for nurses, and that the information used for scientific research only and treated as confidential.

Ethical Considerations: This study was approved by the scientific ethical research committee at the faculty of nursing, Port Said University. A written consent was obtaining from hospital managers and nursing managers after explaining the purpose and the nature of the study.

RESULTS

Table (1): presents the demographic data of the studied nursing groups at AS-Salam and El-Zohor hospitals. The major group was female (82.5%). According to age, the studied hospitals are relatively equal in all percent's including age groups and less than half of total nurses were between 27-35 years (46%). 63.5% of the total studied group have a diploma of nursing degree, 80% were married. Also, 51% of them have more than 10 years of experience in the nursing field. 87% of this studied group has got training courses in quality. Finally, there was no statistically significant difference between nurse's demographic characteristics studied hospitals.

Table (2): presents the demographic data of the studied patients in the study setting. According to results, the studied patients are relatively equal at the studied hospitals in the demographic characteristics. More than half of the patients were female (55%), one third of them were between 36-44 years old. Less than half of them have technical institute education (42.5%), 41.5% of patients have A family history of diabetes. Also, 28.5% diagnosed hypertension. Finally, there was no statistically significant difference between demographic characteristics between patients in the studied hospitals.

Table (3): shows the demographic data of patients in the study setting. According to results, 52% of patients have only one day accommodation, approximately half of them was coming for surgery, 49% of them have the first time for admission. At AS-Salam hospital, 57% of patients experienced slow response of nursing care and 44% of them experienced two three hours of waiting time, while at El-Zohor hospital 62% of patients experienced intermediate response of nursing care and 64% of them experienced less than one hour of waiting time. Finally, the overall patient satisfaction was satisfied with (56%), but in AS-Salam hospital 77% of the patients were not satisfied.

Table (4): presents the quality standards for hospital infrastructure. It shows that all quality standards at El-Zohor hospital are met, and the highest standard was the "reception department" (98.21%) at El-Zohor and As-Salam hospitals, while the lowest standard was the "intensive care unit" (79.17%) at AS-Salam hospital. and the lowest standard in operation unit at El-Zohor hospital. According to the results, the overall infrastructure is met for both hospitals and El-Zohor hospital achieves high score than AS-Salam hospital in all infrastructure standards and total infrastructure quality standard. Finally, there was no statistically significant difference between the studied hospitals in the quality standards for hospital infrastructure except Inpatient quality standard ($p=0.047$).

Table (5): illustrates the quality of nursing care according to patient centered activities for both hospitals. According to the results, El-Zohor hospital has higher, mean scores than Al-Salam hospital in all dimensions. Also, there is a statistically significant difference between both hospitals for all patients centered activities dimensions, it's also showing the quality of nursing care according to unit centered for both hospitals. According to the table, El-Zohor hospital has highier mean scores than AS-Salam overall quality of nursing Care. Finally, there is only a statistically significant difference between both hospitals in the overall quality of nursing care ($t=17.928$ & $p=<0.001^{*}$).

Table (6): shows scores of patient satisfaction dimensions and overall satisfaction level. According to the results, hospitals have a high level of patient satisfaction in all dimensions and total of patient satisfaction. A finally it noticed that there is a significant statistical difference between two hospitals in all dimensions of patient satisfaction in all dimensions except confirmation of the health service provided & emotional health service provided dimensions.

In univariate analysis, **table (7)** demonstrates that overall quality of nursing care and infrastructure were the only statistically significant independent positive predicator for high patient satisfaction. This model explains only 5% (from patients) of the variation from this score. While in multivariate analysis, this table represents that overall infrastructure in both hospitals was the only statistically significant independent positive predicator for high patient satisfaction.

Table (1): Demographic Data Of Studied Nursing Groups At AS-Salam And El-Zohor Hospitals (n=200)

Personal data	AS-Salam hospital (n = 121)		El-Zohor hospital (n = 79)		**Total** (n = 200)		χ^2	**p**
	No.	**%**	**No.**	**%**	**No.**	**%**		
Gender								
Female	101	83.5	64	81.1	165	82.5	0.025	$^{FE}p=$ 1.000
Male	20	16.5	15	18.9	35	17.5		
Age								
18≤26	7	5.8	7	8.9	14	7	1.219	0.748
27<36	54	44.6	38	48.1	92	46		
36<45	24	19.8	14	17.7	38	19		
≥45	36	29.8	20	25.3	56	28		
Level of education								
Secondary nursing school diploma	78	64.5	49	62.0	127	63.5	0.725	0.696
technical institute of nursing	21	17.4	14	17.7	35	17.5		
Bachelor degree of nursing science	22	18.1	16	20.3	38	19		
Marital status								
Married	98	81.0	62	78.5	160	80	0.499	$^{MC}p=$ 0.819
Divorced	3	2.5	3	3.8	6	3		
Single	20	16.5	14	17.7	34	17		
Year of experience in nursing field								
≤5 years	23	19.0	23	29.1	46	23	2.901	0.234
6years to 10	32	26.4	20	25.3	52	26		
>10 years	66	54.5	36	45.6	102	51		
Training courses in quality of nursing								
Didn't get courses	16	13.2	10	12.7	26	13	0.013	0.908
Got training courses	105	86.8	69	87.3	174	87		

*Statistically significant at $p \leq 0.05$ χ^2= **Chi square test** FE**: Fisher Exact**

Table (2): Demographic Data Of The Studied Patients At The Study Settings.

Personal data	AS-Salam hospital (n = 100)		El-Zohor hospital (n = 100)		Total (n=200)		χ^2	P
	No.	%	No.	%	No.	%		
Gender								
Male	40	40.0	50	50.0	90	45	0.949	0.465
Female	60	60.0	50	50.0	110	55		
Age								
18≤26	20	20.0	15	15.0	35	17.5	1.341	0.124
27<36	5	5.0	16	16.0	21	10.5		
36<45	42	42.0	31	31.0	73	36.5		
≥45	33	33.0	38	38.0	71	35.5		
Level of education								
non -educated	48	48.0	35	35.0	83	41.5	1.993	^{MC}p= 0.107
Diploma	12	12.0	6	6.0	18	9		
Technical Institute	36	36.0	49	49.0	45	42.5		
Bachelor	4	4.0	10	10.0	14	7		
Family History								
Diabetes	35	35.0	48	48.0	83	41.5	1.003	^{MC}p= 0.297
Hypertension	41	41.0	36	36.0	77	38.5		
Heart disease	23	23.0	12	12.0	35	17.5		
Liver	1	1.0	4	4.0	5	2.5		
Diagnosis								
Hypertension	30	30.0	27	27.0	57	28.5	7.832	^{MC}p= 0.091
Diabetes	23	23.0	33	33.0	56	28		
Orthopedic operation	29	29.0	20	20.0	49	24.5		
Appendectomy operation	4	4.0	5	5.0	9	4.5		
Stone destruction	0	0.0	12	12.0	12	6		
Ear and nose operation	14	14.0	3	3.0	17	8.5		

*Statistically significant at $p \leq 0.05$ χ^2= Chi square test MC=Monte

Table (3): Demographic Data of The Studied Patients at The Study Settings "Cont"

Demographic data	AS-Salam hospital (n = 100)		El-Zohor hospital (n = 100)		Total (n=200)		χ^2	P
	No.	%	No.	%	No.	%		
Period of accommodation								
One day	49	49.0	55	55.0	104	52	1.095	$^{MC}p=$ 0.871
6 days to 10 days	36	36.0	25	25.0	61	30.5		
11 days to 15 days	11	11.0	15	15.0	26	13		
16 days to 20 days	4	4.0	5	5.0	9	4.5		
Reason of admission								
Surgery	58	58.0	41	41.0	99	49.5	12.071	$^{MC}p=$ 0.059
Treatment	38	38.0	40	40.0	78	39		
Examination	4	4.0	19	19.0	23	11.5		
Number of admission times								
One time	50	50.0	48	48.0	98	49	0.793	$^{MC}p=$ 0.981
2 time to 4 time	44	44.0	43	43.0	87	43.5		
More than 4	6	6.0	9	9.0	15	7.5		
Response of nursing care								
Rapid response	19	19.0	34	34.0	53	26.5	40.41	$^{MC}p=$ 0.001*
Intermediate respond	24	24.0	62	62.0	86	43		
Slow respond	57	57.0	4	4.0	61	30.5		
Waiting time								
Less than 1 hour	20	20.0	64	64.0	84	42	20.13	$^{MC}p=$ 0.003*
1 hour to 2 hours	36	36.0	32	32.0	68	34		
2 hours to 3 hours	44	44.0	4	4.0	48	24		
Patients' satisfaction								
Patient is non-satisfied	65	65.0	23	23.0	88	44	77.375*	<0.001*
Patient is satisfied	35	35.0	77	77.0	112	56		

MC=Monte *Statistically significant at $p \leq 0.05$ χ^2= Chi square test

Table (4): Total Scores of Accomplishments of Infrastructure Quality Standard For Selected Hospitals

Quality Standard	AS-Salam hospital	Rank	El-Zohor hospital	Rank	P	Total	Rank
Reception	**89.29%** Met (>80 %)	**1**	**98.21%** Met (>80 %)	**1**	0.087	93.75 Met (>80 %)	**1**
Operation room	**80.31 %** Met (>80 %)	**2**	**84.84%** Met (>80 %)	**4**	0.231	82.57 Met (>80 %)	**4**
Intensive care unit	**79.17%** Partly met (60% -80%)	**4**	**87.50%** Met (>80 %)	**3**	0.098	83.33 Met (>80 %)	**3**
Inpatient quality standard	**79.41%** Partly met (60% -80%)	**3**	**91.18%** Met (>80 %)	**2**	0.047*	85.29 Met (>80 %)	**2**
Overall Infrastructure	**82.05%** Met (>80 %)		**88.78%** Met (>80 %)		0.116	85.41 Met (>80 %)	
χ^2(p)	**5.600 (0.231)**						

χ^2: **Chi square test** p: p value Chi square (2×1 contingency table) (Goodness of fit)

Table (5): Mean Score Of Quality Of Nursing Care Regarding Patient Centered Activities At The Studied Hospital Groups

I: Patient centered activities	**AS-Salam hospital (n = 121)**	**El-Zohor hospital (n = 79)**	**T**	**p**
items	Mean±SD	Mean±SD		
1.Orientation on admission				
Total Score	2.44 ± 1.27	3.20 ± 0.91	4.950*	<0.001*
% Score	48.76 ± 25.42	64.05 ± 18.22		
2.Physical needs				
Total Score	4.83 ± 2.07	7.62 ± 0.91	13.049	<0.001*
% Score	53.63 ± 22.98	84.67 ± 10.11		
3.Carrying out Nursing Procedures				
Total Score	11.69 ± 3.53	15.25 ± 1.09		
% Score .	68.79 ± 20.77	89.72 ± 6.42	10.357*	<0.001*
4. Health teaching				
Total Score .	1.56 ± 2.16	3.38 ± 1.73		
% Score .	22.31 ± 30.85	48.28 ± 24.67	6.581*	<0.001*
5. Listening and conversation with patient				
Total Score	3.22 ± 2.79	5.76 ± 0.79		
% Score .	53.72 ± 46.52	95.99 ± 13.13	9.436*	<0.001*
6. Evaluation of patient needs				
Total Score .	2.61 ± 1.96	4.48 ± 0.89		
% Score .	43.53 ± 32.59	74.68 ± 14.83	9.165*	<0.001*
7. Protect patient from injury and hazards				
Total Score	3.40 ± 2.65	6.77 ± 0.70	13.287*	<0.001*
% Score .	48.64 ± 37.87	96.75 ± 9.96		
8. Keeping privacy				
Total Score	3.0 ± 0.0	3.0 ± 0.0		
% Score	100.0 ± 0.0	100.0 ± 0.0	–	–
9. Exchange of information				
Total Score .	3.13 ± 1.13	4.0 ± 0.0		
			2.429	0.071
% Score	78.31 ± 28.31	100.0 ± 0.0		
10. Oxygen and ventilation				
Total Score	2.30 ± 1.16	3.66 ± 0.48		
% Score	57.44 ± 28.98	91.46 ± 11.93	11.503*	<0.001*
Overall patient centered activities				
Total Score	38.19 ± 13.02	57.13 ± 4.47	14.727*	<0.001*
% Score	56.16 ± 19.14	84.01 ± 6.57		

Table (5): Mean Score Of Quality Of Nursing Care Regarding Patient Centered Activities At The Studied Hospital Groups

II. Unit centered activities	**AS-Salam hospital (n = 121)**	**El-Zohor hospital (n = 79)**	**Total (n = 200)**	**t**	**P**
Items	Mean ± SD	Mean ± SD	Mean ± SD		
Equipment					
Total Score .	2.32 ± 1.10	3.0 ± 0.0	2.59 ± 0.92		
% Score	77.41 ± 36.82	83.0 ± 21.21	80.33 ± 30.66	1.748	0.099
Environment					
Total Score	4.26 ± 3.04	6.95 ± 1.48	5.33 ± 2.86		
% Score	69.31 ± 38.04	86.87 ± 18.44	66.56 ± 35.73	2.321	0.076
Overall Unit centered activities:					
Total Score	6.59 ± 3.32	9.95 ± 1.48	7.92 ± 3.20		
% Score	71.88 ± 30.21	84.45 ± 13.41	71.95 ± 29.08	3.755	0.053
Overall Quality of Nursing Care				17.928*	<0.001*
Total Score	44.78 ± 15.35	67.08 ± 5.25	53.59 ± 16.50		
% Score	51.89 ± 18.62	84.98 ± 6.55	64.96 ± 22.11		

*: Statistically significant at $p \leq 0.05$ **t: Student t-test**

Table (6): Comparison Between The Two Studied Groups According To Levels Of Patient Satisfaction Dimensions

Q	Patient Satisfaction	El Zohor (n = 100)		Al Salam (n = 100)		Total (n = 200)		χ^2	p
		No.	%	No.	%	No.	%		
1	**The tangibility of the health service provided**								
	Low ≤ 2.33	5	5.0	3	3.0	8	4.0		
	Medium (2.34 - 3.67)	19	19.0	40	40.0	59	29.5	20.745*	0.001*
	High(3.68 - 5.0)	76	76.0	57	57.0	133	66.5		
2	**The reliability of the provided health service**								
	Low ≤ 2.33	12	12.0	11	11.0	33	11.5		MCp
	Medium (2.34 - 3.67)	20	20.0	40	40.0	60	30	16.916*	0.001*
	High (3.68 - 5.0)	68	68.0	49	49.0	117	58.5		
3	**The response of the provided health service**								
	Low ≤ 2.33	6	6.0	19	19.0	25	12.5		MCp
	Medium (2.34 - 3.67)	6	6.0	30	30.0	36	18	15.945*	0.001*
	High (3.68 - 5.0)	88	88.0	51	51.0	139	69.5		
4	**Confirmation of the health service provided**								
	Low ≤ 2.33	10	10.0	9	9.0	19	9.5		MCp
	Medium (2.34 - 3.67)	21	21.0	20	20.0	41	20.5	4.951	0.081
	High (3.68 - 5.0)	69	69.0	71	71.0	140	70.0		
5	**Emotional health service provided**								
	Low ≤ 2.33	14	14.0	11	11.0	25	12.5		MCp
	Medium (2.34 - 3.67)	9	9.0	24	24.0	33	16.5	5.336	0.064
	High (3.68 - 5.0)	77	77.0	65	65.0	142	71.0		
6	**Accessibility and availability of the provided health service**								
	Low ≤ 2.33	12	12.0	14	14.0	26	13.0		MCp
	Medium (2.34 - 3.67)	12	12.0	36	36.0	48	24.0	19.883*	0.001*
	High (3.68 - 5.0)	76	76.0	50	50.0	126	63.0		
	Overall satisfaction								
	Low ≤ 2.33	10	10.0	11	11.0	21	10.5		MCp
	Medium (2.34 - 3.67)	15	15.0	32	32.0	47	23.5	59.772*	<0.001*
	High (3.68 - 5.0)	75	75.0	57	57.0	132	66.0		

χ^2: **Chi square test** MC: **Monte Carlo** *: Statistically significant at p ≤ 0.05

Table (7): Univariate and Multivariate Linear Regression Analysis For The Parameters Affecting Overall Patient Satisfaction (n = 200) For Total Sample

	Univariate		**#Multivariate**	
	P	**B (95%C.I)**	**P**	**B (95%C.I)**
Age	**0.571**	-0.518 (-2.316 – 1.280)		
Gender	**0.115**	-3.467 (-7.780 – 0.846)		
Marital status	**0.362**	-0.855 (-2.700 – 0.990)		
Level of education	**0.876**	-0.209 (-2.837 – 2.420)		
History	**0.776**	-0.380 (-3.008 – 2.248)		
Diagnosis	**0.151**	0.950 (-0.350 –2.249)		
Period of accommodation	**0.911**	-0.150 (-2.802 – 2.501)		
Reason of admission	**0.844**	0.379 (-3.408 –4.165)		
Number of admission days	**0.844**	0.379 (-3.408 –4.165)		
Address	**0.928**	0.177 (-3.659 –4.013)		
Response of nursing care	**0.726**	0.678 (-3.135 –4.492)		
Waiting time	**0.787**	-0.526 (-4.362 – 3.310)		
Overall quality of nursing care	**<0.001***	0.395 (0.314 –0.477)	**0.632**	0.016 (-0.051 –0.084)
Overall infrastructure	**<0.001***	3.390 (3.097 –3.683)	**<0.001***	3.330 (2.946 –3.714)

B: Unstandardized Coefficients C.I:Confidence interval r.square = 0.05 LL:Lower limit UL:Upper Limit

#: All variables with p<0.05 was included in multivariate *: Statistically significant at $p \leq 0.05$

DISCUSSION

Hospital infrastructure and physical work environment often influence the outlook of the healthcare service provided by health care professionals and their effectiveness with the capacity to innovate in providing competent services. A positive working environment can enable better health care services and reduce workload. A disorganized working environment weakens the health care team (WHO, 2018). The infrastructure and quality of healthcare organizations can play a crucial role to enhance patients' and their families' happiness and loyalty. Hospital infrastructure reflects the close alignment of work patterns and physical preparation can improve workflow (Makafi & Marfega, 2017).

The present study aimed to assess infrastructure and its relation to the quality of nursing care and patients' satisfaction at As-Salam and El-Zohor hospitals through evaluating the infrastructure, measure quality of nursing care, determine the patient satisfaction at Port Said these hospitals, and identify the relation between infrastructure, quality of nursing care and patient satisfaction at Port Said setting hospitals. Data was collected with three tools namely: quality standard for hospital infrastructure, quality of nursing care questionnaire, and patient satisfaction questionnaire

This study included two study groups; the first study subjects were 200 staff nurses at two hospitals including 121 staff nurses from As-Salam hospital and 79 staff nurses from El-Zohor hospital. The major group of age for nurses ranged between 27<36 years was less than half of the studied group. Moreover, most of them were married. While half of the studied group has more than ten years of experience in nursing field. Also, approximately two thirds of the studied group secondary nursing school diploma of nursing education and most of them were female. Finally, most of the staff nurses have got training courses related to quality.

The second study group was 200 patients in two hospitals, divided into 100 patients from As-Salam hospital and 100 patients from El-Zohor hospital. More than one third of patients aged between 36<45 years. Moreover, more than half of them were female. While less than half of the studied group had technical institute of nursing education. Also, less than half of the studied group had family history of diabetes. Finally, more than one quarter of the patients diagnosed as hypertension.

The present study finding revealed that, El-Zohor hospital has achieved scores related to infrastructure more than AS-Salam hospital. Also, the total scores of all infrastructure quality standards reflect acceptable degree of achieving standards, the reception department standards and surgical operation department standard were met in both hospitals. The intensive care and inpatient quality department standards were met at El-Zohor hospital, while these quality standards were partially met at AS-Salam hospital. The overall infrastructure quality standards of both hospitals were met.

These study findings could be interpreted as both hospitals consider the importance of achieving most of criteria of the last-mentioned standards and the recently built hospital buildings which built to work under the umbrella of universal health insurance project in Egypt. Also, this finding was occurred due to the quality of medical engineering services, the applied preventive maintenance policy and the evacuation experience practices.

In the same line the research work of Elbadry, Ghadiry and El-sayed, (2019) who study the quality of El-Menshawy general hospital infrastructure among nursing staff, concluded that more than fifty percent of nurses' perception regarding the infrastructure Of the emergency room, intensive care unit, operative room, dialysis infrastructure and the facilities of these departments was high. This result achievb bed due to that these vital units must be well prepared enough to receive the most critical cases and must be designed properly to facilitate the work and save time and effort of healthcare providers.

This result is disagreed with Mirti and Martin (2014) who concluded that, there is a low priority was given in building hospital infrastructure issues related quality standard, compared to the activities that happen inside those hospitals. This indicates a widespread assumption that the Hospital built infrastructure is highly resilient to healthcare events occurred at the hospital during delivering of nursing services.

In the same line a study about infrastructure and patient satisfaction at the governmental hospitals in Saudi Arabia done by Saaty and Ansari (2014) which revealed that low quality of hospital infrastructure facilities including; emergency entrance, waiting area inside the hospital, low cleanliness and hygiene standards, it can be concluded that the infrastructure of the government hospitals in Saudi Arabia needs an enhancement to meet the patients' expectations. The basic facilities such as the parking,

washroom, lobby, refreshment, sitting arrangement, technology and cleanliness are not able to satisfy the patients and visitors to the hospital.

Another study concluded that making hospitals more resilient for future is particularly an important requirement for people. Hospital design should be robust and prepared to be immediately transformed from a day-to-day situation in a hospital that is capable of handling critical situations. Hospital management can enhance the visual and analytical skills of hospital staff that will help generate innovative actions to increase the resilience of the hospital, the hospital workforce will identify hospital physical and built environment that can be used (Norazam, 2018).

Concerning to the overall patient centered activities, the study results show high mean scores in the most of dimensions in both hospitals, the overall patient centered activities mean score was higher at El-Zohor hospital than AS-Salam hospital. Also, the overall unit centered activities results showed average mean scores. The overall quality of nursing care was adequate. The reason of these results may be due to; the effective mentoring of nursing activities and procedures that provided under good managerial control, also staff nurses have knowledge and skills in most of dimensions of quality of care, finally the high experience of staff nurses may be the main reason that responsible in providing proper quality of care.

These results are supported with the findings of a study done by Grosso, et al., (2019) and Freitas, et al., (2014) which stated that patients centered activities had attract the attention of nurses and their mangers, and nurses consider patient care as the core of nursing care which attain the quality of care which lead to acceptable level of patient centered activities Also, the results of Zhao and Akkadechanunt (2011) concluded that patient centered activities had high mean score of quality, one possible explanation for the findings may be the staff nurses characteristics and qualifications that enable them to provide high quality of patients and nursing care.

In contrast with the Last-mentioned results, the findings of Odinino and Guirardello (2013) were revealed decreased degree of patients centered care, the omission of nursing care can be linked with the lack of or deficient organizing and planning of managerial and scientific care demands.

According to the overall satisfaction, the total results showed that two thirds of the studied patients had high level of patient's satisfaction in both hospitals. Also, there was a statistically significant difference in all dimensions of patient's satisfaction except confirmation of the health service provided and emotional health provided between both hospitals. The reason of these results may be due to; the availability of staff all time providing proper healthcare service with kind manner and respond in a short time, staff had the needed requirements and equipment and hospital staff understands needs of patients and provide high attention to solve their problems.

In the same line, Karaca and Durna (2019) found that levels of patient's satisfaction with nursing care was high. These study findings also supported with findings of a study done at two hospitals in São Paulo about patients' satisfaction with nursing care. This study conducted at surgical unit and about gastroenterology service of a teaching hospital from the interior of the State of São Paulo also identified a high level of patient satisfaction with all items and dimensions of patient satisfaction (Haddad & Évora, 2018).

In the other hand, the work of Asamrew, Endris and Tadesse (2020) found that the total patient's satisfaction is very low compared with other health facilities in the nation and compared with the average standard level expected. Majority of variables under patient and health care provider interaction variables and facility amenities have lower prediction capacity for the net overall satisfaction of patients.

According to the present results linear regression analysis between overall quality of nursing care, hospital infrastructure and patients' satisfaction. In univariate analysis, overall quality of nursing care and infrastructure were statistically significant independent positive predicator for high patients' satisfaction. While in multivariate analysis, results represent that overall infrastructure in both hospitals was the only statistically significant independent positive predicator for high patients' satisfaction.

In a good agreement with these findings, a study done to analyse the relation between the evaluation of quality related to nursing care and satisfaction of patients, the study found the emotional needs were correlated with all of the satisfaction domains. The relation between the nursing professional and patients is essential to achieve positive results and satisfaction with care and represents an antecedent to feel safe (Runciman et

al., 2011). Also, the opinions of patients and their families concerning quality of nursing care are reflected in their levels of satisfaction and if considered, contribute to the improvement of quality of services rendered in nursing (Ross, 2015).

In the other side, Mirti and Martin, 2014 stated that there is a limited focus on the building material in our hospitals indicates that despite a close link in recent researches between the quality of health care delivered to societies and the quality of built infrastructure, compared to the activities that happen inside those hospitals. The study done in Australia indicates a widespread assumption that the hospital-built infrastructure is has a minor relation to quality of healthcare services and an ignorance of the relationship between hospital facilities and the healthcare activities that goes on inside them. Clearly this finding reinforces the health facilities management and infrastructure may support but doesn't affect the quality of care which has consistently found over a long period that hospital is the forgotten resource in the health care system.

Healthcare provided to clients is dependent on a number of factors such as the hospital's organizational capabilities to learn from their past experiences and develop appropriate policies in consultation with the range of stakeholders identified earlier and hospital facilities and infrastructure. The strength of the building material and its related services and content also contribute toward hospital facility resilience. Additionally, findings of this thematic content analysis are significant in drawing more attention towards holistic planning in hospitals in promoting their facility resilience. (Cimellaro et al., 2010)

Mavalankar, Ramani, Patel and Sankar, (2011) stated that, availability, efficiency, equity and quality of health care provided depend on the distribution and quality of infrastructure. Physician service, laboratory and radiology services, pain management, inpatient pharmacy service, cleanliness of the toilet, room accommodation, and dietary service of the hospital were significant predictors of net overall satisfaction of hospitalized patients. (Asamrew, Endris, Tadesse, 2020).

CONCLUSION

In the light of the main study findings, it was concluded that there was a significant positive correlation between total patients' satisfaction and overall quality of nursing care in both hospitals. Also, the overall quality of nursing care and infrastructure were the only statistically significant independent positive predicator for high patients' satisfaction. While in multivariate analysis, results concluded that the overall infrastructure in both hospitals was the only statistically significant independent positive predicator for high patients' satisfaction.

RECOMMENDATIONS

Based on the finding of this study, the following recommendations are suggested:

- Evaluate hospital infrastructure a continuous based on strategic plans that is developed by hospital administrators in cooperation with the engineering department in the hospital.
- Ensure that the infrastructure in hospitals is adequate with the services provided and flexible to meet future needs.
- Evaluate healthcare quality of care (specially nursing care) based on a checklist, and on the basis of making an operational plan in the department to improve the level of the nursing service provided.
- Continuous training for the health team by the training department in the hospital based on a specific timetable so that all nursing staff are covered with all shifts in the hospital
- Continuous evaluation to measure patients' satisfaction with the nursing service provided.
- The necessity of following up the attendance and presence of hospital staff throughout the shift period.

Conflict of Interest: conflict of interst

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البنية التحتية وعلاقتها بجودة الرعاية التمريضية ورضا المرضى في مستشفيات بورسعيد

رشا ابراهيم السيد [1] هدير محمود محمد الزغوى [2] تقوى رشوان محمد [3] محمد جمال السحراوي [4]

[1] أستاذ مساعد في إدارة التمريض ، [2] بكالوريوس تمريض ، محاضر في إدارة التمريض [3] ، - كلية التمريض جامعة بورسعيد.

الخلاصة

الخلفية: إرضاء المرضى هو شعار النجاح المؤسسي. ارتبطت البنية التحتية للمستشفى بجودة الرعاية الصحية والمرتبطة برضاء المرضي. لذا ، فإن الهدف من هذه الدراسة هو تقييم البنية التحتية وعلاقتها برضاء المرضى وجودة الرعاية التمريضية في مستشفيات بورسعيد. عينات الدراسة :تصميم بحث وصفي ارتباطي. عينات الدراسة: حسب دانيال (1999) اشتملت العينات على 121 من مستشفى السلام (20 ذكور و 101 إناث) من 217 ممرضة و 79 من مستشفى الزهور (15 ذكور و 64 إناث) من 111 ممرضة تم اختيارهم عشوائياً وعينة ملائمة من المرضى. في جميع الاقسام بالمستشفيات لمدة شهرين (100 من مستشفى السلام (40 ذكر و 60 أنثى) و 100 (50 ذكر و 50 أنثى) من مستشفى الزهور). البيانات التي تم جمعها باستخدام الأدوات: معايير الجودة للبنية التحتية للمستشفى ، وجودة الرعاية التمريضية واستبيان رضاء المرضى. النتائج: أظهرت وجود علاقة ارتباط موجبة معنوية بين جودة الرعاية التمريضية ورضاء المرضي في مستشفى السلام ومستشفى الزهور. أخيرًا ، لم يكن هناك فرق ذو دلالة إحصائية بين المستشفيات الخاضعة للدراسة في معايير الجودة للبنية التحتية للمستشفى باستثناء معيار جودة رعايةالمرضى بالقسم الداخلى. الخلاصة: تم الاستنتاج بأن هناك علاقة ارتباط موجبة معنوية بين الرضا التام للمرضى والجودة الشاملة للرعاية التمريضية في مستشفى السلام ومستشفى الزهور. التوصيات من الضروري إجراء تقييم مستمر للبنية التحتية للمستشفى وكذلك القياس المستمر لرضاء المرضى عن الخدمة التمريضية المقدمة.

الكلمات المرشدة : البنية التحتية للمستشفى - رضاء المريض - جودة الرعاية التمريضية