RELATIONSHIP BETWEEN HEALTH CARE ORGANIZATIONAL CHARACTERISTICS AND NURSES' INNOVATIVE BEHAVIOR

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Abstract: Nurses need management support, resources, supportive work environment, and autonomy to make decision, gain knowledge about innovation, and engage in role related to innovative behavior. Aim: to examine the relationship between health care organizational characteristics and nurses' innovative behavior. Methods: A descriptive, correlational research design was conducted at Fever, Chest and Kafr El-Dawar General Hospitals, at EL-Beheira Governorate- Egypt. Subjects: All staff nurses, who are working in the previously mentioned settings and who were available at the time of data collection, with at least one year of experience, were included in the study (N=220). Tools: Organizational Characteristics Scale and Nurses Innovation Behavior scales. Results: There was significant relationships between health care organizational characteristics and nurses' innovative behavior, where (p-value ≤ 0.05). Moreover, there were highly statistical significant differences between health care organizational characteristics and its dimensions; management support, where (P ≤ 0.01). Also, there was statistically significant difference between staff nurses' innovative behavior and idea generation. Conclusion: nurses' innovative behavior is the outcomes of health care organizational characteristics. Recommendations: Enhance nurses' innovative behavior through participation in the application of health care organization strategies, such as: decisions making; delegation and problem solving…etc

Keywords: organizational characteristics, innovation behavior.

1. INTRODUCTION

The health care system is facing huge challenges with its retiring workforce, increasing number of elderly patients, and cost-efficiency demands, combined with expectations of high quality care that exploits all the latest advances in technology and related knowledge. [1, 2] Nurses' innovative behavior is a cornerstone of organizational innovation, which is important in addressing some of the problems present within the current system. So, it is very important for the nurse managers to recognize nurses' work and provide them with opportunities to grow and to look after their comfort. [3] Nurses need

management support, resources, supportive work environment, and autonomy to make decision, gain knowledge about innovation, and engage in role related to innovative behavior. [4,5]

Organizational characteristics are defined by Amo [6] as: "the process of renewal or the revitalization of the organization t hrough innovation initiatives from the nurses". Organizational characteristics encompass four factors that have the most significant influence on nurses, namely: (1) *work discretion*, which is defined as managers' commitment to tolerate failure, provide decision-making latitude without excessive oversight, and to delegate authority and responsibility; (2) *time availability* that is evaluating workloads to ensure having the time needed to pursue innovation and that their jobs are structured in ways that support efforts to achieve short and long-term organizational goals; (3) *management support,* described as the willingness to facilitate and promote entrepreneurial behavior including the championing of innovative ideas and providing the resources required to take entrepreneurial actions; and finally, (4) *rewards and reinforcement*, concerned with developing and using systems that reward are based on performance, highlight significant achievements, and encourage pursuit of challenging work. [7]

Innovation in nursing practice could be seen as the encouragement of professionals to utilize their acquired knowledge and skills in order to generate and develop new ways of working creatively and drawing on technologies, systems, theories and associated stakeholders that may further enhance and evaluate nursing practice. [8] Innovative behavior is defined by Weberg [9] as: "something new or perceived new by the population experiencing the innovation, which has the potential to drive change and redefine health care's economic and/or social potential". Moreover, Janssen [10] viewed it as: "recognition of a problem, generation of ideas, mobilization of support, and realization of the ideas related to the initial problem". Nurses innovative behavior includes three stages, as follows: (1) *idea generation;* by creating new ideas for improvements, searching out new working methods, techniques or instruments and generating original solutions to problems; (2) *idea promotion*; by mobilizing support for innovative ideas acquiring approval for innovative ideas and making important organizational members enthusiastic for innovative ideas; and lastly, (3) *idea realization;* by transforming innovative ideas into useful applications, introducing innovative ideas into the work environment in a systemic way and evaluating the utility of innovate ideas. [11]

Nurses' innovative behavior has become an extremely significant basis for the development of nursing performance and organizational achievement. Their innovation behavior is important for increasing nursing care quality, improving nursing practices conditions, attracting new groups to health care and essential measure for addressing some present health care problems. [12, 13]

AIM OF THE STUDY

Examine the relationship between health care organizational characteristics and nurses' innovative behavior at Kafr El-Dawar General hospital, Fever hospital and Damanhour Chest hospital.

RESEARCH QUESTION

What is the relationship between health care organizational characteristics and nurses' innovative behavior?

2. MATERIALS AND METHODS

1. Research design: A descriptive, correlational research design was used.

2. Setting: The study was conducted at all Intensive and critical Care Units at Fever hospital, Damanhour Chest hospital and Kafr El-Dawar General hospital (n=11); their bed capacity (n=105, 278 and 160), respectively. These hospitals are affiliated to the Ministry of Health and Population (MOHP); containing the largest general ICUs, at El-Beheira governorate. Kafr El-Dawar General hospital includes all Intensive Care Units (ICUs) (n=9), Fever hospital (n=1): General ICU and Damanhour Chest hospital (n=1): General ICU.

2. **Subjects of the study:** All staff nurses, who are working in the previously mentioned settings and who were available at the time of data collection, with at least one year of experience, were included in the study (N=220).

3. **Tools of the study:**

In order to collect the required data, the following two tools were used in this study:

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 10, Issue 3, pp: (28-42), Month: September - December 2023, Available at: www.noveltyjournals.com

Tool (I): Organizational Characteristics Scale:

This scale consisted of two parts:

Part 1: demographic characteristics data sheet:

It was developed by the researcher, and included data, namely: age, gender, educational qualification, years of nursing and unit experiences, and marital status.

Part 2: **Organizational Characteristics Scale:**

It was developed and adapted by the researcher based on Hornsby et al. and Buamann [14, 3] to measure health care organizational characteristics. It consisted of 20 items, classified into four dimensions, namely: (1) work discretion (7-item); (2) time availability (5-item); (3) management support (5-item); and (4) rewards/reinforcement (3-item). Responses were measured using 5-point Likert rating scale ranging from (1) strongly disagree to (5) strongly agree. The highest score indicates higher level of organizational characteristics. The total scores for health care organizational characteristics were generated by summing up the scores from all subscales and ranges from 20 to 100; where from 20 to less than 47 indicate low score, from 47 to less than 74 indicate moderate score and from 74 to 100 indicate high score.

Tool (II): Nurses Innovation Behavior Scale:

It was developed by Janssen (2005), [15] to measure nurses' innovative behavior. It consists of 9 items divided into three subscales, as follows: (1) idea generation (3-item); (2) idea implementation (3-item); and (3) idea realization (3- item). Responses were measured on a 7-point Likert rating scale ranging from (1) never to (7) always. Scores ranged from 9 to 63, where from 9 to less than 27 indicate low score, from 27 to less than 45 indicate moderate score and from 45 to 63 indicate high score.

2.5 Methods:

1. An official permission was obtained from the Dean, Faculty of Nursing, Damanhour University and the administrators of the identified hospitals to obtain an approval for collecting the necessary data from the selected units.

2. The two tools were translated into Arabic language and tested for its content validity and translation by five experts in the field of the study. Accordingly, some modifications were done.

3. Reliability of the tools was tested statistically using Cronbach's alpha coefficient test to measure internal consistency of the items composing each dimension of the tools. The result of Cronbach's alpha coefficient test was as follows: Organizational Characteristics Scale: ($\alpha = 0.774$); and Nurses' Innovation Behavior Scale: ($\alpha = 0.826$), indicating adequate and good reliability.

4. A pilot study was carried out on (10%) of total sample size; staff nurses (n=22), who were not included in the study sample; in order to check and to ensure the clarity and feasibility of the tool and to identify obstacles and problems that may be encountered during data collection. Then, no modification was done.

5. Data collection for this study was conducted by the researcher through hand-delivered, self-administered questionnaire. An individualized interview with each staff nurse was conducted to explain the aim of the study and the needed instructions were given before the distribution of the questionnaire in their settings.

6. The questionnaire was completed by staff nurses at their work setting; it took about 20-30 minutes to fill out the two tools. The data was collected in a period of three months, starting from the first of January 2020 to the end of March 2020.

Ethical considerations:

• The research approval was obtained from the ethical committee at the Faculty of Nursing, Damanhour University, prior to the start of the study.

• An informed written consent was obtained from the study subjects after explanation of the aim of the study.

• Privacy and right to refuse to participate or withdraw from the study were assured during the study.

• Confidentiality and anonymity regarding data collected was maintained.

Statistical analysis:

The collected data were organized, coded and analyzed by using Statistical Package for Social Sciences (SPSS), version 22. The reliability tests were confirmed by using the Chronbach Alpha Coefficient tests. P value ≤ 0.05 was considered statistically significant, and P value ≤0.01 was considered highly statistically significant. Data were presented using: (1) descriptive statistics: in the form of frequencies and percentages for qualitative variables, mean and standard deviation for the quantitative variables; (2) analytical statistics: Deferential analysis was done for quantitative variables using chi square test in cases of two independent variables with parametric data.

3. RESULTS

Demographic characteristics of staff nurses, working at Fever, Chest and Kafr El-Dawar General Hospitals.

Table 1 Shows that staff nurses had approximately the same Mean±SD at Fever, Chest and Kafr El-Dawar General Hospitals (27.1±2.8, 26.2±3.1, 27.4±4.1), respectively. About three quarters of staff nurses (74.5%) had from 20 to less than 30 years old. Pertaining to gender, the highest percentage of staff nurses was female (82.3%). Regarding educational qualification, above half of staff nurses (56.1%), who were working at Fever Hospital, were holding Diploma of Technical Nursing Institute; whereas at Chest and Kafr El-Dawar General Hospitals, around half of staff nurses were holding Bachelor degree of Nursing Sciences (49.4%, 50.6%), respectively.

According to years of nursing experience, above half of total staff nurses (50.9%) had from 1 to less than 5 years of this experience; compared to less than three quarters of them (70.9%), who had the same number of years of unit experience. Concerning marital status, above half of them was married (54.4%, 77.3%), at chest and Kafr El-Dawar general hospitals, consecutively; compared to 56.1% of them, who were single at Fever hospital.

Table (1): Demographic characteristics of staff nurses, working at Fever, Chest and Kafr El-Dawar General Hospitals. (N= 220)

Demographic Characteristics	Hospital's name						Total (N=220)	
	Fever (N=66)		Chest (N=79)		Kafr El- Dawar General (N=75)			
	No.	%	No.	%	No.	%	No.	%
Age								
20 -	50	75.8	66	83.5	48	64.0	164	74.5
>30	16	24.2	13	16.5	27	36.0	56	25.5
$\bar{x}$±SD	27.1±2.8		26.2±3.1		27.4±4.1		27.2±3.2	
Gender								
Male	19	28.8	19	24.0	1	1.3	39	17.7
Female	47	71.2	60	76.0	74	98.7	181	82.3
Educational Qualification								
Diploma of Secondary Technical Nursing School	1	1.5	2	2.5	2	2.7	5	2.3
Diploma of Technical Nursing Institute	37	56.1	38	48.1	35	46.7	110	49.9
Bachelor of Nursing Sciences	24	36.4	39	49.4	38	50.6	101	46.0
Post Graduate Degree	4	6.0	0	0	0	0	4	1.8
Years of Nursing experience								
1 -	40	60.6	41	51.9	31	41.3	112	50.9
5 -	19	28.8	28	35.4	26	34.7	73	33.2
>10	7	10.6	10	12.7	18	24.0	35	15.9
$\bar{x}$±SD	4.5±3.7		5.3±3.9		6.2±4.4		10.4±9.9	
Years of unit experience								
1 -	47	71.2	60	75.9	49	65.3	156	70.9
5 -	19	28.8	16	20.3	21	28.0	56	25.5
>10	0	0	3	3.8	5	6.7	8	3.6
$\bar{x}$±SD	3.3±2.1		3.4±3.1		3.6±2.9		10.3±8.1	

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 10, Issue 3, pp: (28-42), Month: September - December 2023, Available at: www.noveltyjournals.com

Marital Status								
Single	37	56.1	36	45.6	17	22.7	90	40.9
Married	29	43.9	43	54.4	58	77.3	130	59.1
Divorced	0	0	0	0	0	0	0	0
Widow	0	0	0	0	0	0	0	0

Mean distribution of health care organizational characteristics among staff nurses, working at Fever, Chest and Kafr El-Dawar General Hospitals.

Table (2) reveals that there were highly statistical significant differences between staff nurses working at the three hospitals (Fever, Chest and Kafr El-Dawar General Hospitals) and total health care organizational characteristics and management support dimension, where (P=0.003, 0.000), respectively. However, no statistical significant differences were found between the three hospitals and the other dimensions. The first dimension was management support at Fever, Chest and Kafr El-Dawar General Hospitals, (26.33±3.20, 21.04±5.80, 25.66±4.20), respectively; compared to time availability, which was the last dimension at Fever, Chest and Kafr El-Dawar General Hospitals, (16.18±2.06, 15.87±3.10, 15.28±2.70), consecutively.

Table (2): Mean distribution of health care organizational characteristics among staff nurses, working at Fever, Chest and Kafr El-Dawar General Hospitals. (N=220)

Health care organizational characteristics dimensions	Fever Hospital (N=66)	Chest Hospital (N=79)	Kafr El-Dawar General Hospital (N=75)	F P
	Mean ± SD	Mean ±SD	Mean ± SD	
Work Discretion	17.03±1.90	16.80±3.50	16.20±2.80	0.686 .710
Time Availability	16.18±2.06	15.87±3.10	15.28±2.70	1.951 .377
Management Support	26.33±3.20	21.04±5.80	25.66±4.20	44.09 .000**
Rewards/Reinforcement	16.24±2.40	16.06±4.10	15.42±3.10	2.347 .309
Total health care organizational characteristics	75.78±7.20	69.83±12.90	72.66±10.80	11.951 .003**

**highly significant at $P \leq 0.01$ *Significant at $P \leq 0.05$

Mean distribution of nurses' innovative behavior among staff nurses, working at Fever, Chest and Kafr El-Dawar General Hospitals.

Table 3 indicates that there was highly statistical significant differences between staff nurses working at three hospitals (Fever, Chest and Kafr El-Dawar General Hospitals) and total nurses' innovative behavior, where (P=.000). Whereas, a statistically significant difference was found between the three hospitals and idea generation subscale, where (P=.049). On the other hand, no statistical significant differences were found between the three hospitals and idea implementation and idea realization subscales. The first subscale was idea generation at Fever, Chest and Kafr El-Dawar General Hospitals (16.65±1.80, 15.04±7.60, 16.09±2.03), respectively; whereas, the last subscale was idea realization at Fever and Kafr El-Dawar General Hospitals (15.57±7.20 and 15.98±1.70), consecutively; whereas, idea implementation was last subscale at chest hospital (14.90±4.10).

Table (3): Mean distribution of nurses' innovative behavior among staff nurses, working at Fever, Chest and Kafr El-Dawar General Hospitals. (N=220)

Nurses' innovative behavior subscales	Fever Hospital (N=66)	Chest Hospital (N=79)	Kafr El-Dawar General Hospital (N=75)	F P
	Mean ± SD	Mean ± SD	Mean ± SD	
Idea generation	16.65±1.80	15.04±7.60	16.09±2.03	6.55 .049*
Idea implementation	16.37±1.80	14.90±4.10	15.98±1.70	5.27 .071
Idea realization	15.57±2.70	16.13±3.90	15.83±2.19	2.26 .322
Total nurses' innovative behavior	48.78±5.30	35.80±4.46	47.90±5.04	14.82 .000**

**highly significant at $P \leq 0.01$.   *Significant at $P \leq 0.05$.

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 10, Issue 3, pp: (28-42), Month: September - December 2023, Available at: www.noveltyjournals.com

Correlation matrix between health care organizational characteristics and nurses' innovative behavior among staff nurses working at Fever, Chest and Kafr El-Dawar General hospitals.

Table (4) shows that there was statistical significant correlation between total health care organizational characteristics and total nurses' innovative behavior at the three hospitals, where (P=0.024). Furthermore, there were highly statistical significant correlations between total organizational characteristics and its related dimensions namely; time availability, management support and reward/reinforcement, where (P= 0.000), and between total nurses' innovative behavior and all its subscales, namely; idea generation, idea implementation and idea realization, where (P= 0.000). Moreover, highly statistical significant correlations were found between work discretion and time availability dimensions and total nurses' innovative behavior, where (P= 0.002 and 0.000), respectively.

In addition to that, highly statistical significant correlations were found between work discretion dimension and idea generation subscale, where (P= 0.008); and between time availability dimension and both idea implementation and idea realization subscales, where (P= 0.001and 0.007), consecutively. Finally, highly statistical significant correlation was found between management support dimension and idea implementation subscale, where (P= 0.001).

Additionally, statistical significant correlations were found between work discretion and reward/reinforcement dimensions and both idea implementation and idea realization subscales, where (P=0.020, 0.018, 0.011 and 0.012), respectively; and between time availability and management support dimensions and idea generation subscale, where (P=0.015 and 0.012), consecutively. On the other hand, no statistically significant correlations were found between total health care organizational characteristics and work discretion dimension and between Reward/ reinforcement dimension and both total nurses' innovative behavior and idea generation subscale, and lastly, between management support dimension and idea realization subscale, where (P ≥ 0.05).

Table (4): Correlation matrix between health care organizational characteristics and nurses' innovative behavior among staff nurses working at Fever, Chest and Kafr El-Dawar General hospitals. (N=220)

Health care Organizational Characteristics / Nurses' Innovative Behavior		Work Discretion	Time Availability	Management Support	Reward/ Reinforcement	Total health care Organizational Characteristics	Idea generation	Idea Implementation	Idea Realization	Total nurses' innovative behavior
Work Discretion	R	1	.458	.430	.353	.238	.323	.286	.320	.377
	P		.000**	.000**	.001**	.055	.008**	.020*	.011*	.002**
Time Availability	R		1	.571	.744	.707	.274	.389	.310	.486
	P			.000**	.000**	.000**	.015*	.001**	.007**	.000**
Management Support	R			1	.618	.751	.310	.403	.119	.307
	P				.000**	.000**	.011*	.001**	.343	.012*
Reward/Reinforcement	R				1	.799	.180	.266	.346	.166
	P					.000**	.113	.018*	.012*	.143
Total health care organizational characteristics	R					1	.271	.275	.248	.254
	P						.016*	.017*	.043*	.024*
Idea Generation	R						1	.405	.836	.956
	P							.000**	.000**	.000**
Idea Implementation	R							1	.477	.619
	P								.000**	.000**
Idea Realization	R								1	.689
	P									.000**
Total nurses' innovative behavior	R									1
	P									

*Significant at P ≤0.05   **highly significant at P ≤0.01   r = Pearson correlation   Interpretation of r: Weak (0.1-0.24) Intermediate (0.25-0.7) Strong (0.75-0.99)   Perfect(1)

Multivariate regression analysis to illustrate predictors of health care organizational characteristics among staff nurses, working at Fever, Chest and Kafr El-Dawar General Hospitals.

Table (5) presents the results between health care organizational characteristics dimensions as dependent variables and age, gender, educational qualification, nursing experience, unit experience, marital status and nurses' innovative behavior as predictors. It was found that approximately 39% of nurses' innovative behavior is related to health care organizational characteristics where the model is highly significant (F = 7.660, P = 0.002).

Table (5): Multivariate regression analysis to illustrate predictors of health care organizational characteristics among staff nurses, working at Fever, Chest and Kafr El-Dawar General Hospitals.

	Unstandardized Coefficients		standardized Coefficients	T	P. value
	B		B		
Age	.391		.374	3.453	.018*
Gender	.094		.111	1.564	.077
Educational qualification	.401		.365	5.460	.014*
Nursing experience	.573		.463	8.007	.008**
Unit experience	.621		.710	11.337	.001**
Marital status	.130		.499	1.700	.109
Nurses' innovative behavior	.567		.688	7.032	.009**
	ANOVA				
Model	Df	R^2	F	P. value	
Regression	69.103	0.39	7.660	.002**	

*P value (significant) ≤ 0.05   **P value (highly significant) ≤ 0.01   df= degree of freedom   F= One Way Anova
T=Independent samples t- test   R2= Coefficient of multiple determination

a. Dependent Variable: Organizational characteristics

b. Predictors: (constant) Age, Gender, Educational qualification, Nursing experience, Unit experience, Marital status and nurses' innovative behavior.

Multivariate regression analysis to illustrate predictors of nurses' innovative behavior among the staff nurses, working at Fever, Chest and Kafr El-Dawar General Hospitals.

Table (6) presents the results between nurses' innovative behavior as dependent variables and age, gender, educational qualification, nursing experience, unit experience, marital status and health care organizational characteristics as predictors. It was found that approximately 45% of nurses' innovative behavior is related to health care organizational characteristics, where the model is highly significant (F = 5.678, P = 0.006).

Table (6): Multivariate regression analysis to illustrate predictors of nurses' innovative behavior among the staff nurses, working at Fever, Chest and Kafr El-Dawar General Hospitals. (220)

	Unstandardized Coefficients		standardized Coefficients	T	P. value
	B		B		
Age	.462		.477	6.510	.014*
Gender	.116		.208	1.899	.062
Educational qualification	.567		.717	7.407	.009**
Nursing experience	.454		.559	6.351	.011*
Unit experience	.602		.740	9.011	.006**
Marital status	.021		.105	1.001	.104
Health care Organizational Characteristics	.712		.510	11.164	.001**
	ANOVA				
Model	df	R^2	F	P. value	
Regression	104.263	0.45	5.678	.006**	

*P value (significant) ≤ 0.05   **P value (highly significant) ≤ 0.01   df= degree of freedom   F= One Way Anova
T=Independent samples t- test   R2= Coefficient of multiple determination

a. Dependent Variable: nurses' innovative behavior

b. Predictors: (constant) Age, Gender, Educational qualification, Nursing experience, Unit experience, marital status and Health care Organizational Characteristics.

4. DISCUSSION

Nurses tend to be the most numerous centralization of issues, effective communication and component of medical teams and tend to have the longest and closest contact with patients, [16] as nurses play a crucial role in the management of critically ill patients. [17] Patients in ICU require more testing, monitoring and different kinds of treatment and medications administration than other departments in hospital. Health care organization requires a range of behaviors to make sure that both nurses and organization will succeed in the future. [18] Therefore, the present study aimed to examine the relationship between health care organizational characteristics and nurses' innovative behavior.

Health care organizational characteristics

The findings of the current study revealed that there are highly statistically significant differences between staff nurses working at the three studied settings and total health care organizational characteristics and management support dimension. The first dimension was management support followed by work discretion, then reward/ reinforcement, and lastly, time availability. This may be due to that organization administrations support and empowered their ICU nurses, with enough resources and reinforcement, for better performance. Moreover, any suggestions or recommendations that will beneficial to the work will be highly appreciated because of the working nature at ICUs. The last dimension was time availability this may be due to that there is a nursing shortage at the three hospitals and also works over load.

This result is in line with, Kuratko et al (2005) [19] and Hornsby et al (2002) [20] concluded that the factor of time availability has got the lowest point. Roberg (2007) [21] also reported Why discretion affects innovativeness is mainly determined by the reason that nurses can freely work on their original ideas. Holt et al. (2007) [22] revealed that the sample perceived reward and fairness as a positive mean. Malhotra et al. (2007) [23] examined that rewards play an imperative role in establishing and sustaining an employee's commitment to ensuring a higher degree of performance and loyalty. Maylone et al (2011) [24] who mentioned in their studies that the majority of intensive care nurses got high scores for professional autonomy. Besides that Ghasemi and Keshavarzi (2014) [25] stated that nurses, who consider their work environments to be friendly and supportive are more appropriate to demonstrate positive behaviors and excellent performance.

Baumann and Stieglitz (2014) [26] asserted that natural rewards can help health care organization to build pleasant and enjoyable features into nurses daily activities. Additionally, Mahmoud and El Sayed (2016) [27] concluded that leader support was applied in the form of: open communication, information provision, and decision making that had great impact on enhancement of commitment and improvement of staff nurses' performance. In addition to that, Yoerger et al. (2015) [28] found that supervisors must show concern for the subordinates, such as taking time to listen or making efforts to be flexible with the work schedule that increase work engagement of staff nurses. Moreover, Altman and Rosa (2015) [29] pointed out that the time available when the nurse is not involved in direct patient care is a significant means to promote innovation.

Moreover, Hayes et al (2015) [30] and Sualiman et al. (2019), [31] found that nurses perceived organizational characteristics and supervisor support positively in relation to achieving the organizational goal. Moreover, Gupta et al. (2016) [32] emphasized that the rewards/reinforcement and motivating nurses are essential to raise new ideas and to develop their creativity behavior at part with national and international requirements. Nazir et al. (2016) [33] states that work discretion give nurses the autonomy and freedom to experiment their idea for process improvement, and even for the development of new products. Abo Gad (2018), [34] who revealed that there are statistically significant differences between staff nurses' perceptions of organizational characteristics in different hospitals and that management support was the highest mean of organizational characteristics. Suifan et al. (2018) [35] indicated that perceived organizational characteristics would generate a sense of duty for nurses in caring about the organization's benefit and strive to achieve its goals in the most creative way. Moreover, Chen et al. (2018) [36] found that studied nurses rated work discretion as positive.

Additionally, Gori et al. (2020) [37] who examined organizational commitment among critical care unit nurses and found that Supervisors and managers can promote commitment and motivation by giving required facilities and rewards. Furthermore, Trépanier et al. (2021) [38] stated that support and recognition for staff efforts within the organization was important to reduce conflict among nurses, by listening, expressing good emotions and helping with work-related problems. Moreover, Abo Gad (2018), [34] Reza and Hossein (2013) [39] and Baumann (2011) [3] illustrated that time availability had the lowest organizational characteristics. This is partially in agreement with Baumann (2011), [3] who conducted that

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 10, Issue 3, pp: (28-42), Month: September - December 2023, Available at: www.noveltyjournals.com

organizational characteristics had positive mean; whereas management support got negative mean. Moreover, Abo Gad (2018) [34] and Baumann (2011) [3] which they found that work discretion and rewards/reinforcement had the highest mean scores of organizational characteristics among the staff nurse.

On the other hand, AL-Meshwet (2011) [40] who found that incentives and rewards dimension was the lowest dimension among work environment dimensions.   Moreover, Xerri (2012) [41] revealed that organizational characteristics was perceived low among nurses. Reza and Hossein (2013) [39] also examined that the studied nurses got the lowest point in the index of management support. Sabra et al. (2021) [42] and Mahgoub (2019) [43] revealed that the rewards/reinforcement had the lowest mean score and clarified that nurses perceived reward unfair and not commensurate with their responsibility.

Nurses' innovative behavior

The findings of the present study illustrated that there is high statistical significant differences between total nurses' innovative behavior and staff nurses working at the three studied settings (Fever, Chest and Kafr El-Dawar General Hospitals); and a statistical significant difference between idea generation subscale; however, no statistical significant differences were found between idea implementation and idea realization subscales at three hospitals. The first subscale was idea generation at three hospitals; whereas, the last subscale was idea realization at Fever and Kafr El-Dawar General Hospitals; and idea implementation was the last one at chest hospital. This may be related to that the majority of staff nurses were highly educated, holding Bachelor of Nursing sciences degree, where they have the ability to take decision, solves any critical problems.

Additionally, their years of experience in critical care units help them to become more creative to deal with any situation. Moreover, nurses in ICU spend most of their time carrying out doctor's order. Consequently, they do not have time to pay attention to problems that occur in their units, as their manager view nursing work as routine work and do not financially support innovative nursing behavior or allow nurses to attend conferences or training; and also, they are assigned to take care of more than two patients and complete their nursing documentation.

Jafri (2010) [44] suggested that knowledge can be used to create new ideas, and which can be used as the building blocks from which to develop and provide excellence in service and/or other effective workplace processes. Dul and Ceylan (2010) [45] emphasized that work environment practice promotes nurses' creative behavior. Additionally, Gassmann and Morhart (2012) [46] reported that nurses' innovative self-efficacy beliefs are enhanced through observing nurses, who that successfully are engaged in innovative work behavior.

This result is also supported by the American Association of Critical Care Nurses (AACCN) (2015), [47] which pointed out that nurses, who work in critical areas are creative, support lifelong learning, search for information anywhere, and on the long run become more innovative. Furthermore, Afsaneh Bagher et al. (2017) [48] revealed that idea exploration and generation was highly statistical significant correlated. Bos-Nehles and Veenendaal (2017) [49] also argued that if nurses perceive that innovative ideas are appreciated and rewarded; thus the workplace promotes generating and championing new ideas, they will reciprocate with innovative behavior.

Additionally, Abo Gad (2018) [34] found that there was highly statistical significant relationship between staff nurses and their innovative behavior. Moreover, Elewa and El Banan (2020) [50] and Aladhyani et al. (2020) [51] also showed that more than half of studied nurses have a high average level of innovative work behavior. Moreover, Sari et al. (2021) [52] discussed that innovative behavior is explained as positive outcomes. This result is partially in agreement with kamel and Aref (2017), [53] who found that idea championing and idea implementation was the highest mean score between innovative behavior dimensions. On the other hand, Phan (2004) [54] stated that there are very few meetings between managers and nurses, so nurses have little opportunity to show their ideas. Furthermore, Thanh (2007) [55] revealed that sometimes nurses can generate a new idea, but they do not show a desire to share their ideas and knowledge and convert it to practical implementation due to some obstacles; while implementing their new idea.

Correlation between health care organizational characteristics and nurses' innovative behavior.

The findings of the present study revealed that there was statistical significant correlation between total health care organizational characteristics and total nurses' innovative behavior. Moreover, there were highly statistically significant correlations between total health care organizational characteristics and its related dimensions; and between work discretion

Novelty Journals

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 10, Issue 3, pp: (28-42), Month: September - December 2023, Available at: www.noveltyjournals.com

and idea generation; and between time availability and both idea implementation and idea realization; and lastly, between management support and idea implementation.

Statistically significant correlations were found between work discretion and reward/ reinforcement and both idea implementation and idea realization; and finally between time availability and management support and idea generation. However, no statistical significant correlations were found between total organizational characteristics and work discretion dimension and between reward/ reinforcement dimensions and both total nurses' innovative behavior and idea generation subscale, and lastly, between management support dimension and idea realization subscale.

This result exemplifies that these organizations have an environmental that supports staff nurses' innovation. Rewards/reinforcement did not correlate with innovation behavior. Although nurses in this sample viewed rewards/reinforcement as being positive, it did not correlate with innovation behaviors. May be rewards for innovation behaviors by nurses are probably not prevalent in health care organizations.

This is supported by, Antoncic (2013) [56] and Abukhait (2012) [57] reported a positive, significant relationship between the total organizational characteristics and nurses' innovative behaviors. Hornsby et al. (2008) [14] illustrated that management support is one of the most imperative features that required for fostering participants' innovation. Also, Gassmann and Morhart (2012) [46] and Janssen (2005) [15] were in the line with the present study results and found those participants who have higher levels of innovative behaviors perceived their manager as supportive. This result indicates that those staff nurses who perceived more work discretion in the manner they perform their work, perceived their nurse managers were supportive, possess higher innovation behaviors levels. Moreover, Baumann (2011) [3] explained that there was significant correlation between organizational characteristics and participants' innovation behavior. While time availability and reward/ reinforcement had no correlation with nurses' innovative behavior.

Bjornali and Storen (2012) [58] pointed that to involve nurses in innovative behavior, awareness about innovation, and nurses managers support are considered as one of the significant potential impacts on innovation behavior and it is crucial to generating a supportive environment and providing sufficient resources. Besides that Ghasemi and Keshavarzi (2014) [25] stated that appropriate organizational characteristics helps inspire innovation and has a beneficial function to achieve the goals of the organization. Moreover, Swaroop and Dixit (2017) [59] stated that nurses who perceive higher levels of work autonomy exhibit higher levels of innovative work behavior. Additionally, Abo Gad (2018) [34] and Steiber and Alange (2018), [60] stated that there was positive significant correlation between health care organizational characteristics and nurses innovative behavior. While, time availability had no correlation with nurses' innovative behavior. Choi et al. (2016) [61] argued that perceived organizational characteristics stimulates nurses to participate in innovation and decision-making processes related to innovation through its supportive mechanism.

Moreover, Sameer et al (2017) [62] showed a significant correlation between organizational characteristics and nurses' innovation behavior. kamel and aref (2018) [52] concluded that there was a significant association between nurses' awareness related to organization characteristics and their innovative work behavior. Vithayaporn and Ashton (2019) [63] also revealed that engagement and innovation reinforce each other, especially an innovation behavior influenced by an engaged nurses, and an engaged nurses were likely to behave innovatively. So it is retroverasl relationship. Additionally, Siengthai et al. (2019) [64] confirmed that the overall organizational characteristics and organizational commitment are positively and significantly related to nurses innovation. Moreover, Brunetto et al. (2020) [65] studied healthcare nurses and confirmed that organizational characteristics in manager–subordinate relationships fosters innovative work behavior. Furthermore, Abd El-Aliem and Hamouda (2020) [66] also revealed that there was highly statistically significant positive correlation between organizational characteristics and nurses' innovative behavior. Sabra et al. (2021) [42] showed that there was positive significant correlation between health care organizational characteristics items and nurses innovative behavior.

This is agreement with, Dy Bunpin, et al. (2016) [57] and Boston-Fleischhauer (2016) [68] mentioned that nurses manager have a crucial role in offering the opportunities and building work environment practice that reinforces and supports nurses' innovation. Scott and Bruce (2017), [69] who found that there was statistically significant positive correlation between management support for innovative behavior. In contrast with, Holt et al. (2007), [7] who not detect any significant correlation between time availability and subjects' innovation behavior. Kim and Shin (2015) [70] found that nurses were to respond more innovatively when they perceived their efforts were equally rewarded by the institution, and emphasized that workplace environment has an influence on innovation.

Furthermore, the findings of the present study revealed that educational qualification, years of unit experience and health care organizational characteristic were highly significant predictors of nurses' innovative behavior; whereas, age and years of nursing experience were significant predictors of nurses' innovative behavior. Additionally, The findings stated that years of both unit and nursing experience and nurses' innovative behavior were highly significant predictors of health care organizational characteristics; whereas, age and educational qualification were significant predictors of health care organizational characteristics. Anwar et al (2017) [71] explained that work discretion and reward are a significant predictor of innovative behavior. Moreover, mudallali et al (2011) [72] revealed that no relations founded between work environment and staff nurses gender. Bumann (2011) [3] contradicted the present findings and found that there were no significant correlations between participants' age, years of experiences and their innovative behavior. Sabra et al. (2021) [42] stated that nurses' innovation behavior was positively correlated with their years of experience in current position and with their age. Furthermore, Mahgoub et al. (2019) [43] revealed that educational qualification, Female gender was knowing as a positive predictor of organizational characteristics.

5. CONCLUSION

The result of the present study concluded that there was statistically significant positive relationship between health care organizational characteristics and nurses' innovative behavior at Fever, Damanhour and Kafr El-Dawar General Hospitals. Furthermore, the present study showed that there were highly statistical significant differences between staff nurses working at the three hospitals and total health care organizational characteristics and nurses' innovative behavior. Moreover, there were highly statistical significant correlations between total health care organizational characteristics and its related dimensions; except work discretion dimension; and between total nurses' innovative behavior and its related subscales.

6. RECOMMENDATIONS

Based on the findings of the present study, it is recommended that:

1. Hospital administrators should:

▪ Conduct workshops on innovative thinking and design strategies to improve and facilitate innovative behavior among staff nurses.

▪ Introduce reward programs that motivate staff nurses to continuously share knowledge to improve the quality of patient care and that encourage innovation as a job requirement and reward for good work.

▪ Establish training programs for nurse managers to enhance their leadership skills through dealing with their staff nurses' innovation in a supportive way (i.e. fairness, and enthusiasm to provide information and resources).

▪ Foster a positive work culture for nursing staff to participate in decision making process and problem solving in order to promote healthy working environment.

▪ Disseminate hospital policies, rules, rewards system and any administrative process to promote their innovative behaviors.

2. **Head nurses should:**

▪ React positively to the innovative efforts of staff nurses by providing them time and resources to carry out innovative efforts and support innovation as a job requirement and give more attention to needs of their nursing staff and how to satisfy and reward them.

▪ Conduct regular meeting with staff nurses to discuss ways of improvement of quality of work life, fairness of rewards, give authority and responsibility to take decisions.

3. Staff nurses should:

• Attend training program to become aware of organizational policies, resources, rules and regulation, to improve their abilities and skills to work effectively and enhance their responsibility to solve problems.

• Enhance their innovative behavior through participation in the application of administrative strategies, such as: decisions making and problem solving; delegation and leadership skills …etc.

Future studies:

- Impact of leadership style on nurses' innovative behavior.

- Relationship   between nurses' innovative behavior and patient satisfaction.

- The relationship between nurses and organizational characteristics and innovation behavior.

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