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RESEARCH ARTICLE

EVALUATION FRAMEWORK TO DETERMINE THE IMPACT OF NURSING STAFF MIX DECISION IN TANTA HOSPITALS

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ABSTRACT

Today, managers of health human resources in nursing face an enormous challenge. Operating within a context of rising demand for health services, cost containment and shortages of nurses and other health workers, determining the most effective mix of staff and the skills needed by each category of staff to ensure safe, quality and cost effective patient care.

Aim: This study aimed to evaluation framework to determine the impact of nursing staff mix decisions in different hospitals; Health Insurance Tanta, Main University and Menhawy Hospitals.

Design: descriptive study was be used.

Sample: convince sample all 128 head nurses working in different hospitals study.

Tool: The data of the study was collected by tool (evaluation framework questionnaire to nursing staff mix decision) includes 2 parts; subject data about the sample and structured. Questionnaire consists of three subscales to evaluation framework structure, process and outcomes.

Result: The result indicate that the Health Insurance Hospital follow framework of staff mix evaluation that contribute to best use of the staffing than El-Menshawy and Tanta University Hospital. Also, there is a significance difference found between the three hospitals study related to elements of evaluation for structure, process and outcomes.

Recommendation: The study recommended that the different hospital should be follow framework staff-mix decision making to optimal use of nursing care resources and combination or grouping of different categories of workers that is employed for the provision of care to patients.

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INTRODUCTION

To meet challenges of continuing change in the health care industry and maintain organizational viability in increasingly competitive markets, the use of the registered nurse- unlicensed assistive personnel model is an undeniable reality that fills the void created by the current shortage of nurses and decreases the costs of providing patient care. However, they must determine the most effective mix of staff and the skills needed by each category of staff to ensure safe quality and cost effective patient care achieving safe appropriate staffing mix within nursing and the relation to other health workers is a concern in developed (Thung Jaroen Kul *et al.*, 2007). Quality which defined as evidence-informed care, which includes meeting their client's needs across the continuum of care and bringing about positive health outcomes for them. Researchers and decision-makers have long recognized the role of nurse staffing in the delivery of safe and competent client care and many individuals and organizations are actively re-evaluating staff mix to optimize the use of human resources so as to respond to

the changing health-care context. Determining a suitable mix of staff education, competencies and experience in order to optimize client, staff and organizational outcomes continues to be a complex and challenging process (Mark and Stanton, 2004). Hospital nurse staffing is a matter of major concern because of effects it can have on patient safety and quality of care. Although hospitals with low nurse staffing levels tend to have higher rates of poor patient outcomes, increasing staffing levels is not easy (Spinks and Moore, 2007). The nurse workforce consists of registered nurses (RN) and licensed practical nurse (LPN) and nurses' aides (NAs). Both registered nurse and licensed practical nurse are employed by the state. RNs assess patient needs develop, patient care plans, and administer medication and treatments, LPN carry out no specialized duties under direction of RN, nurses' aides typically carry out non specialized duties and personal care activities (Canadian Nurses Association, 2003).

Staff mix is a component of nursing care delivery models that currently includes greater emphasis on teamwork and collaboration (Mcg *et al.*, 2003). Staff or skill mix is broadly defined as the examination or grouping of different categories of workers that is employed for the provision of care

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to patients. The unique knowledge and skills that individual health care providers bring to their role distinguish the skill mix within staffing. There are a number of data elements that should be considered when making decisions regarding skill mix, including identifying the problem that a change in skill mix is addressing, determining any constraints on capacity to carry out changes to the mix, understanding the resources available to support identifying and implementing an approach for skill mix change (Advisory Committee on Health Human Resources, 2000).

The staff mixes Decision-Making Framework for quality-nursing care is comprehensive and evidence-informed resource presenting systematic approach to staff mix decision-making that can be used in all clinical practice settings. Decisions concerning staff mix must reflect nurse's scope of practice and unregulated care providers (UCP) scope of employment and must conform to legislation, professional standards and organizational policies (Canadian Nurses Association, 2005). Administrators and researchers are encouraged to use outcome measurement data in rigorous manner to inform decision-making regarding safe and effective staffing practices. Health-care teams often comprise numerous providers, however, the aim of this framework is to support evidence-informed decisions when the staff mix for the specific practice setting is composed of various categories of nurses working together and/or various categories of nurses working in conjunction with UCP. The framework also supports decisions regarding staff mix in which nurses may belong to the same category but possess differing levels of education and experience (Hall and Doran, 2001). This framework is intended to guide decision-making about staff mix through four phases: assessment, planning, implementation and evaluation (Canadian Nursing Association, 2005).

Staff mix decision-making is an ongoing process and the evaluation of outcomes will continually provide new insights and possibly the need for adjustments. The framework outlines key client factors, staff factor, organizational factors and outcome indicators to be considered when assessing, planning, implementing and evaluating staff mix decisions. The list of factors and outcomes is not exhaustive, and not every practice setting will include all types of care providers that are identified (American Nursing Association, 2000). The framework is useful for variety of stakeholders, including nurse managers, direct care staff and others involved in making staff mix decisions. The framework is also informative for nurse executives, health-system executives and policy-makers. And may serve as a source for a broad range of education and staff development initiatives (Harris and Megillis, 2012). Nurses and UCP work together to optimize their client's health outcomes. Collegiality, trust and mutual respect are vital components of all staff mix configurations and help to foster healthy work environment, which influence clients, staff and organizational outcomes. On a more tactical level, when developing target staff mixes for units and facilities, the evaluation framework offers pragmatic resource for identifying key areas related to structure and processes that require planning consideration. In turn, those issues help to guide the implementation of new staff mixes (Registered Nurse Association of Ontario). The framework and tools support nurses to incorporate new

developments into their practice in a planned and structured way. Also, give nurses a mechanism that can be used to influence health workforce planning by providing a unified and coherent way to describe nursing practice and dismantle the barriers to expanding scopes of practice. They assist nurses to determine their own practice according to professional grade principle and escape unnecessary restrictions imposed by employers (Canadian Nursing Association, 2012).

The evaluation framework also supports the ongoing evaluation and corollary adaptation of staff mix plans, all aimed to achieving positive client, staff and system outcomes. By using the evaluation framework in our study, we were able to monitor and adjust our plans according to emergent staff mix problems.

Aim of the study

The aim of this study is to evaluate the framework to determine the impact of nursing staff mix decisions in different hospitals.

Research questions:

- 1- How the nursing staffs are mix decisions effectively using their nursing resources.
- 2- Is anticipated that this framework will enable employers to determine how effectively they are using their nursing resources?

MATERIALS AND METHODS

Materials

• Design

Descriptive research design will be used among Tanta Hospitals.

• Setting

The study will be conducted at Tanta Main University Hospital, Health Insurance Hospital and El-Menshawy Hospital which Affiliated To Ministry Of Health.

• Subject

The study subject will include all available head nurses, which were:

28 head nurses in Health Insurance Hospital.

30 head nurses in El- Menshawy Hospital

70 head nurses in Main Tanta University Hospital

Tools

To fulfill the purpose of the study Evaluation Framework Questionnaire will be used to determine the impact of nursing staff mix decisions in different hospitals. Based on Canadian Nurses Association (2003) (Jawad *et al.*, 2003) evaluation framework staff-mix decision.

This tool will consist of two parts:

Part 1:

Demographic characteristics of the subject as age, work experience and education, qualification, hospital name etc.

Part 2:

Evaluation Framework Questionnaire to nursing staff mix decision, it consists of three evaluation framework scales as follows:

- 1- Structure components questionnaire, it composed of 11 questions. These questions concerned with
 - Clients needs acuity, complexity and variability
 - Legislation
 - Organizational culture, organizational policies, physical environment.
 - Nursing resources.
 - Administrative and technical support.

- 2- Process components questionnaire it composed of 12 questions. These questions concerned with:
 - Nursing leadership
 - Policy influence
 - In-service education program.
 - Skills and abilities of unregulated care providers.

- 3- Outcome components questionnaire, it composed of three subscales related to-clients, nurses and system.

A. outcome composed of 4 questions concerned with:

- Nursing care according to patients needs
- Appropriate length of stay, client safety
- Increased Client satisfaction and continuity of care.

B. Nurses outcome composed of 6 questions concerned with:-

- Nursing staff measure client acuity, complete and variability.

Improved quality of nursing care

C. System outcome composed of 9 questions concerned with:

- Recognition of the health care organization and healthy work environment.

Scoring system

Each item under the three components were monitored by three point likert scale provides range for evaluation framework to determine the impact of nursing staff mix decisions the (structure, process and outcome) items components will take score of (2) for yes completely done, (1) for incomplete done and (0) for not done. Yes completely, yes incompletely done, no not done, range from (0-2)

Methods

- 1- An official permission clarifying the purpose of the study was obtained from the executive directors of the hospitals to conduct the study and collect the necessary data.

- 2- Ethical consideration legal consent of head nurses will be obtained to participate in the study, also head nurses will be informed about the privacy of the information, nature of the study.
- 3- Tool of the study will be developed in Arabic language presented to jury of five experts in nursing field to check content validity and clarity of the tool.
- 4- Suitable statistic test will be used to test tool reliability.
- 5- Pilot study was carried out on 10% of nurses from the previously mentioned setting who were excluded from the study subjects to test the clarity of the study tool.

Tools were submitted to five experts from field of nursing administration. The experts were asked to evaluate tools individual items in relation to its relevance and appropriateness on 4 point scale as follows:

1= not relevant

2= little relevant

3= relevant

4= very relevant

The content validity was measured for the study tool it was 97% internal consistency reliability = 0.97066 Test retest was computed and found to be for tool.

- 6- Data will be collected from the subject within three months.

RESULTS

Table 1 The table shows that the distribution of head nurse's in different hospitals. The table reveals that the highest percent of head nurses (54.7%) in Tanta Main University Hospital and followed by EL-Menshawy Hospital (23.4%) and Health Insurance Hospital (21.9%).

Table 1. Head nurses ratio in different hospitals (Health Insurance, EL-Menshawy and Tanta Universality Hospitals)

Hospital	No	%
Health insurance	28	21.9
El-Menshawy	30	23.4
Tanta University	70	54.7
Total	128	100%

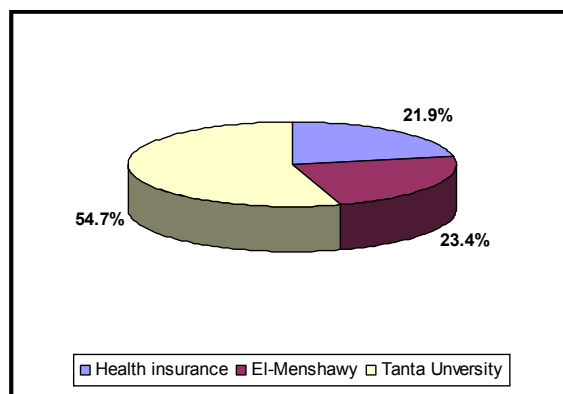


Fig. 1. Head nurses ratio in different hospitals (Health Insurance, EL-Menshawy and Tanta Universality Hospitals)

Table 2 The table Shows that the highest percent of head nurse (40.0%) were had age range from 26 to 35 in El-Menshawey Hospital and follow its (28.6%, 5.7%) in Health Insurance and Tanta University Hospitals respectively. Also the age of head nurses above 36y was found that the highest percent (88.6%) were in Tanta University hospital and followed it (33.3%, 21.4%) in El-Menshawey and Health Insurance respectively. As regards the year of experience of head nurses, it was found that the head nurse were had ≤1-10years of experience in health insurance hospital represent (50.0%) more than Tanta university Hospital and El-Menshawey (25.7%, 13.3%) respectively.

Also the years of experience of head nurse ranged from (11 to 20 years) were highest percentage (86.7% in El-Menshawey Hospital and followed its Tanta University and Health Insurance Hospital (74.3%, 25.0%) respectively. Only in Insurance Hospital it was found that the head nurse above (21) years of experience were resembled 9 25%). As regards to qualification of head nurse it was found that all head nurse in El-Menshawey hospital (100%) were had bachelor degree while 96.4%, (95.7%) were had in health insurance and Tanta university hospitals respectively.

Table 2. Distribution of subject characteristics of head nurses that includes (age, years of experiences, and qualification) in the Health Insurance, EL-Menshawey and Tanta University Hospitals

Items	Health insurance (No=28)		El-Menshawey (No=30)		Tanta University (No=70)	
	No	%	No	%	No	%
Age:						
≤ 25	14	50.0	8	26.7	4	5.7
≥26-35	8	28.6	12	40.0	4	5.7
36≤	6	21.4	10	33.3	62	88.6
Range	22-36		23-38		25-42	
Mean±SD	22.25±0.24		24.32±0.78		27.54±0.38	
Years of experience:						
≤ 1-10						
≥11-20	14	50.0	4	13.3	18	25.7
≥ 21	7	25.0	26	86.7	52	74.3
	7	25.0	0	0.0	0	0.0
Range	8-23		7-19		6-20	
Mean + S.D	11.25±0.12		9.26±0.68		7.39±0.58	
Qualification						
Bachelor	27	96.4	30	100.0	67	95.7
Diploma	0	0.0	0	0.0	3	4.3
Master	1	3.6	0	0.0	0	0.0

Table 3. Distribution of the total evaluation elements of framework related to structure in different hospital study

Structure	Completely done		Incompletely done		Not done		X ²	P
	No	%	No	%	No	%		
Health insurance	23	82.1	0	0.0	5	17.9		
El-Menshawey	13	43.3	7	23.3	10	33.3	26.45	0.001*
Tanta University	18	25.7	14	22.8	38	54.3		

*Significant P<0.05

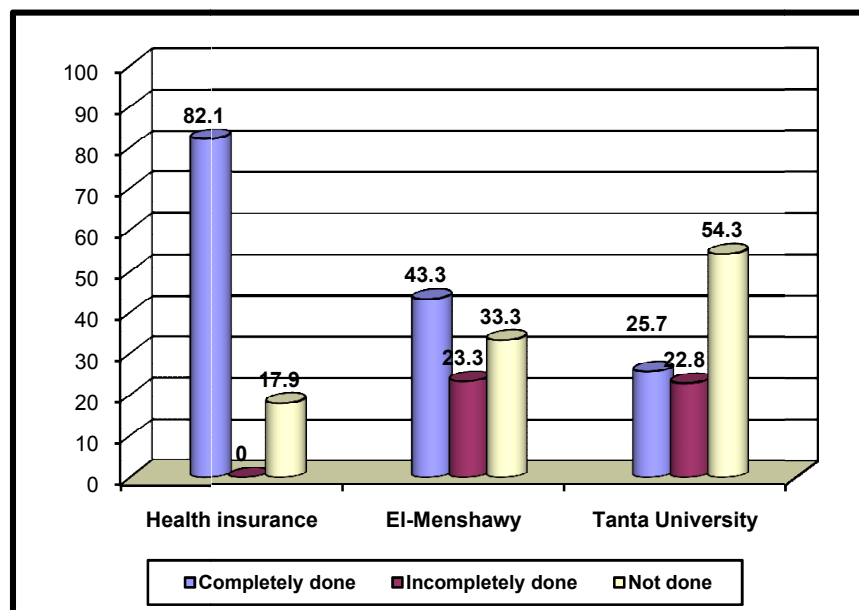


Fig. 2. Distribution of the total evaluation elements of framework related to structure in different hospital study

As regard to diploma degree of head nurse it was found that 3 only of head nurse had diploma degree in Tanta University hospital while only one head nurse have master degree in health insurance hospital as comparing to other hospitals.

Table 3, The table Shows that the highest percentage were completely done 82.1% in health insurance hospital related to evaluation elements of framework and followed by 43.3%, 25.7% in El-Menshawy and Tanta Main University hospital respectively. However, the highest percent incompletely done in El-Menshawy hospital (23.3%) and followed Tanta University (22.8%). Also the table reveals that there is a statistical significant positive correlation among three hospitals.

Table 4, The Table shows that the distribution of the total evaluation elements of framework related to process in different hospitals. The table reveals that the Health insurance hospital was resemble the higher percentage that completely done (85.7%) than EL-Menshawy and Tanta University hospitals (40%, 31, 4) respectively. Also the table shows there is a significance difference among them.

resemble the higher percentage that completely done (85.7%) than EL- menshawy and Tanta University Hospitals which resembles (43.3%, 38.6%) respectively. Also the table reveals that there is a statistical correlation significance difference among three hospitals.

Table 6, The table shows Distribution of the total evaluation elements framework related to structure, process and outcomes in Health Insurance Hospital. The table reveals that the highest percentage that completely done were had (85.7%) related to process and outcome for elements of evaluation and follow its (82.1%) related to structure. Also there is significance deference found in the element of outcome evaluation in Health Insurance Hospital.

More over the table show that the total evaluation elements percentage that completely done (82.1 %) related structures process and outcome while the lowest percentage that not completely done (14.3%)

Table 4. Distribution of the total evaluation elements of framework related to process elements of evaluation in different hospital study

Process	Completely done		Incompletely done		Not done		X ²	P
	No	%	No	%	No	%		
Health insurance	24	85.7	0	0.0	4	14.3	22.56	0.002*
El-Menshawy	12	40	4	13.3	16	46.7		
Tanta University	22	31.4	6	8.6	42	60.0		

*Significant P<0.05

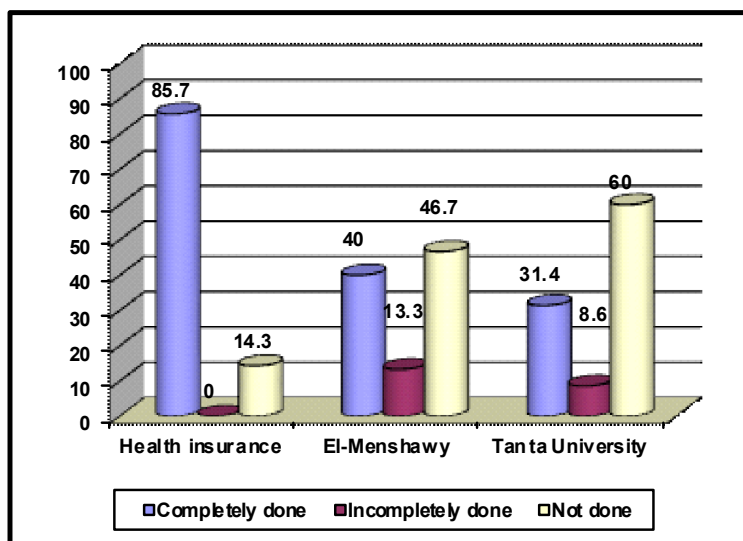


Table 3. Distribution of the total evaluation elements of framework related to process elements of evaluation in different hospital study

Table 5. Distribution of the total evaluation elements framework related to outcome in different hospital study

Outcome	Completely done		Incompletely done		Not done		X ²	P
	No	%	No	%	No	%		
Health insurance	24	85.7	0	0.0	4	14.3	32.42	0.001*
El-Menshawy	13	43.3	17	56.7	0	0.0		
Tanta University	27	38.6	43	61.4	0	0.0		

*Significant P<0.05

Table 5 The table shows the distribution of the total evaluation elements framework related to outcome in different hospitals. The table reveals that the Health Insurance Hospital was

Table 7, The table reveals the distribution of the total evaluation elements framework related to structure, process and outcomes in El-Menshawy Hospital. The table shows that

the highest percentage that completely done (43.3%) for the structure and outcome elements evaluation but the process element resemble (40%). Also there is a significance difference for process elements evaluation in El-Menshawy Hospital. In addition the table reveals that total elements evaluation that completely done (40%) in El-Menshawy Hospital where as (13.3%) that incompletely done.

Table 8, The table shows that the distributions of the total evaluation elements framework related to structure, process and outcome in Tanta University Hospitals. The table reveals that the highest percent (38.6%) was had related to outcome elements and follow it (31.4%), (25.7%) related to both elements of process and structure respectively.

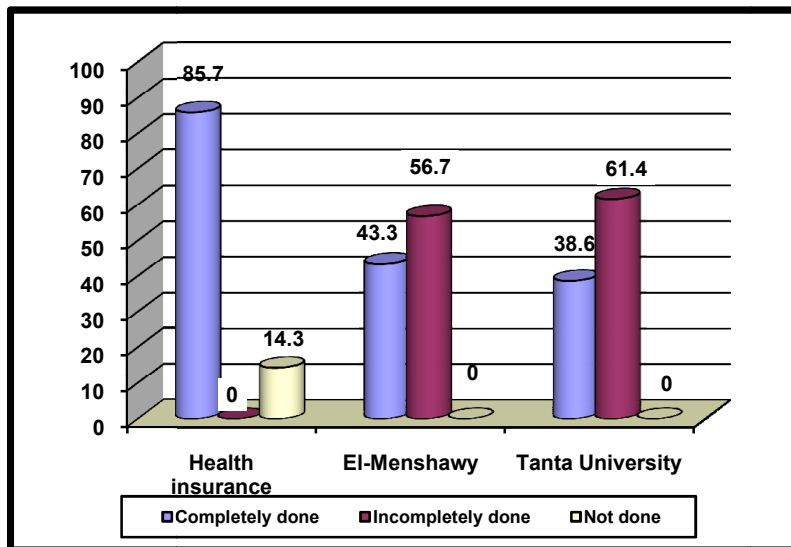


Fig. 4. Distribution of the total evaluation elements framework related to outcome in different hospital study

Table 6. Distribution of the total elements evaluation framework related to structure, process and outcomes in Health Insurance Hospital

Health insurance	Completely done		Incompletely done		Not done		F	P
	No	%	No	%	No	%		
Structure	23	82.1	0	0.0	5	17.9	22.24	0.000*
Process	24	85.7	0	0.0	4	14.3		
Outcome	24	85.7	0	0.0	4	14.3		
Total	23	82.1	0	0.0	4	14.3		

*Significant P<0.05

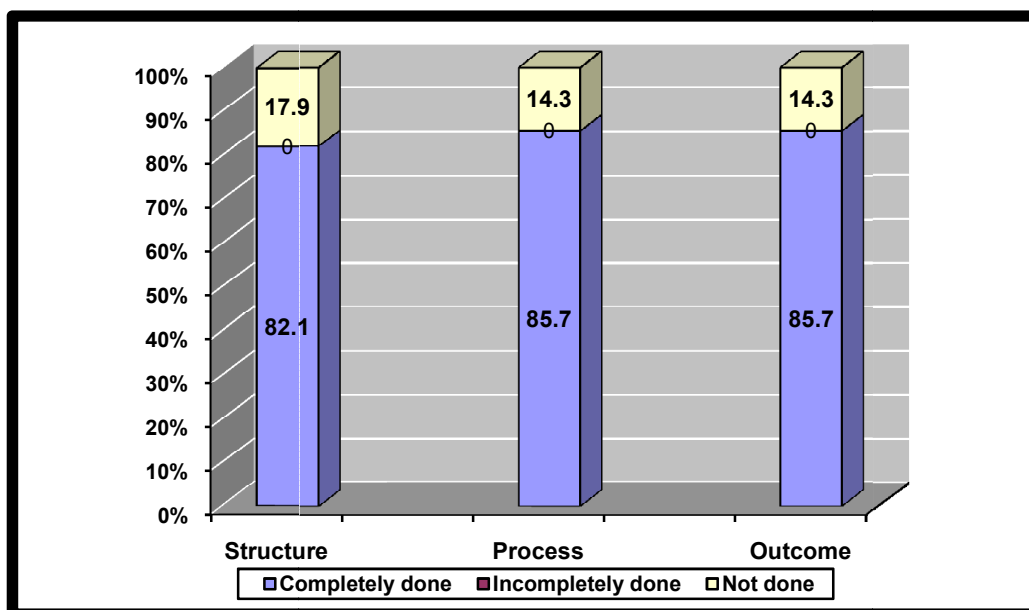


Fig. 5. Distribution of the total elements evaluation framework related to structure, process and outcomes in Health Insurance Hospital

Table 7. Distribution of the total elements evaluation framework related to structure, process and outcome in EL-Menshawey hospital

El-Menshawey	Completely done		Incompletely done		Not done		F	P
	No	%	No	%	No	%		
Structure	13	43.3	7	23.3	10	33.3	18.45	0.001*
Process	12	40	4	13.3	16	46.7		
Outcome	13	43.3	17	56.7	0	0.0		
Total	12	40	4	13.3	0	0.0		

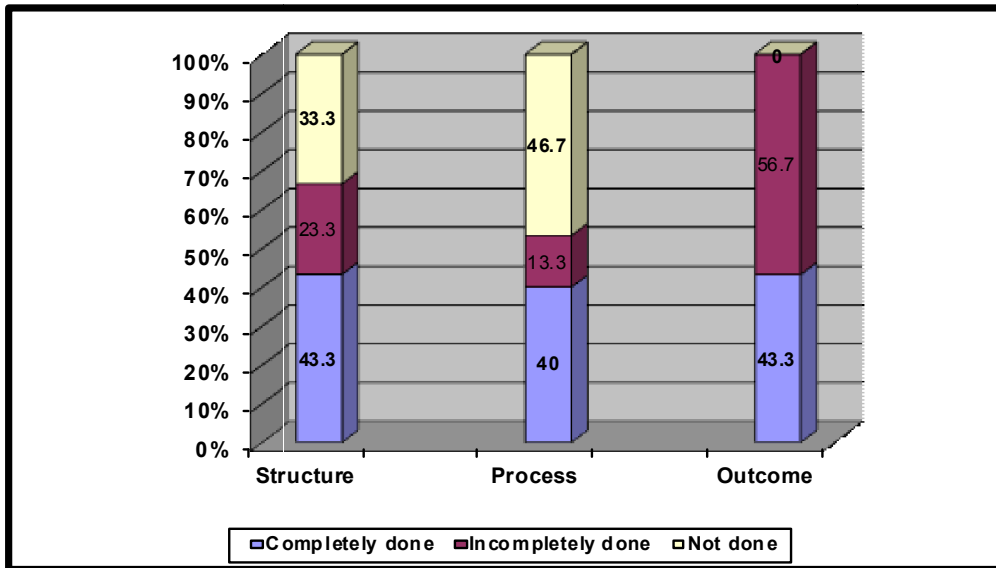


Fig. 6. Distribution of the total elements evaluation framework related to structure, process and outcome in EL-Menshawey hospital

Table 8. Distributions of the total evaluation elements framework related to structure, process and outcome in Tanta university Hospitals

Tanta University	Completely done		Incompletely done		Not done		F	P
	No	%	No	%	No	%		
Structure	18	25.7	14	22.8	38	54.3	24.28	0.002*
Process	22	31.4	6	8.6	42	60.0		
Outcome	27	38.6	43	61.4	0	0.0		
Total	18	25.7	6	8.6	0	0.0		

* Significant P<0.05

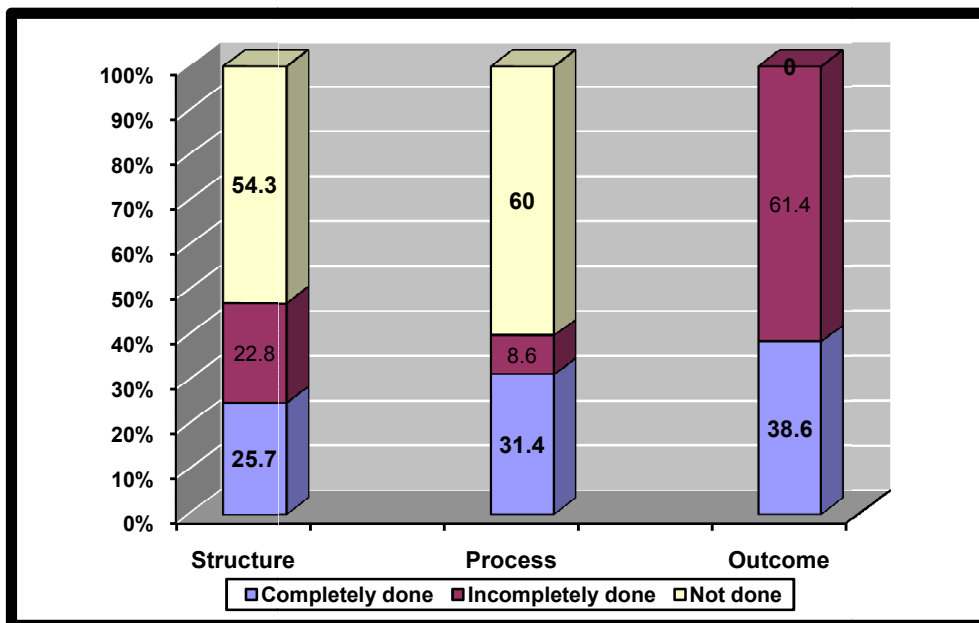


Fig. 7. Distributions of the total evaluation elements framework related to structure, process and outcome in Tanta university Hospitals

Also, the table shows that there is a significant difference between outcome elements and there structure and process elements in Tanta University Hospital. Moreover, the table shows that the total elements of evaluation framework related to structure, process and outcome that completely done were (25.7%) whereas (8.6%) that incompletely done.

Table 9, The table shows the relationship between subject characteristic that includes (age, years of experience and qualification of head nurses) and structure elements that completely done of evaluation among different hospitals. As regards to age of head nurses the table reveals that more than half of head nurses (60%) in health Insurance who were completely done the structure in age less than the age 25y. Also, more than half of head nurses (61.5%) in EL-Menshaway hospital who were completely done the structure in age ranged from (26 to 35 y). While the highest percent (77.8%) of Tanta Universality Hospital were in age of (36 y) with statistical significant among them.

As regards the years of experience, the table reveals that the highest percent (84.6%) of El-Menshaway who were completely done the structure have years of experience from (11 to 20 y). While above fifty percent (55.6%) of Tanta Universality Hospital who were completely done have years of experience (from 11 to 20 y).

On the other hand, less than half percent (39.1%) of Health Insurance who were completely done have years of experience from (1 to 10 y). Moreover, the table reveals that all head nurses(100%) in EL-Menshaway who were completely done the structure have Bachelor degree and followed by both Health Insurance and Tanta University Hospitals (95,7%), (83.3%) who were completely done. On the other hand there is only head nurse have a master degree in health insurance hospital.

Table 10, The table shows the relationship between subject characteristic (age, years of experience) and process elements of evaluation among different hospitals. The table shows. As regards to age the table reveals that the Highest percent of age (86.7%) of EL-Menshaway hospital who were completely done the process in age from (26 to 35y).While fifty percent (50%) in Health Insurance Hospital who were completely done the process in age above (25 years). On the other hand, the lowest percent (13.6%) in Tanta University who were completely done in age from (26 to 35 y). As regarding two years of experience ,the table shows that the highest percentage (83.3%),(72.7%) of EL-Menshaway and Health Insurance Hospital who were completely done the process have experience from (26 to 35 y). While, more than half (58.3%) of Health Insurance who were completely the process have experience ranged from (1 to 10y).

Table 9. Correlation between socio demographic characteristic (age, years of experience, and qualification) and structure element of evaluation among different hospital

Sociodemographic characteristic	Structure Completely done						F	P
	Health insurance (no=23)	%	El-Menshaway (no=13)	%	Tanta University (no=18)	%		
Age								
≤25	14	60.9	3	23.1	2	11.1	18.45	0.000*
≥26-35	8	34.8	8	34.8	2	11.1		
≥36	1	4.3	2	4.3	14	77.8		
Years of experience:								
≤1-10	9	39.1	2	15.4	8	44.4	14.20	0.001*
≥11-20	7	30.4	11	84.6	10	55.6		
≥20	7	30.4	0	0	0	0		
Qualification:								
Bachelor	22	95.7	13	100	15	83.3	-	-
Diplom	0	0	0	0	3	16.7		
Master	1	4.3	0	0	0	0		

*Significant P<0.05

Table 10. Correlation between socio demographic (age, years of experience, and qualification) and process element of evaluation among different hospital

Sociodemographic characteristic	Process Completely done						F	P
	Health insurance (no=24)	%	El-Menshaway (no=12)	%	Tanta University (no=22)	%		
Age								
≤25	12	50	4	33.3	1	4.5	25.42	0.001*
≥26-35	8	35.4	8	66.7	3	13.6		
≥36	4	16.7	0	0	18	81.8		
Years of experience:								
≤1-10	14	58.3	2	16.7	6	27.3	18.36	0.000*
≥11-20	6	25	10	83.3	16	72.7		
≥20	4	16.7	0	0	0	0		
Qualification:								
Bachelor	23	95.8	12	100	19	86.4	-	-
Diplom	0	0	0	0	3	13.6		
Master	1	4.3	0	0	0	0		

Regarding their qualification the table shows that the all head nurses in EL-Menshaway hospital who were completely done the process have Bachelor degree and followed by both (95.8%), (86.4%) in Health Insurance and Tanta Universality Hospital

Table 11, The table shows that relationship between subject characteristic (age, years of experience and qualification) and outcome elements of evaluation among different hospitals. The table shows that more than half (58%), (61.5%) of Health Insurance and EL-Menshaway who were completely done the outcome in age less than (25 y), While the highest percent (77.8%) of Tanta University were in age (36 y) with statistical significant among them. As regards to years of experience, shows that the highest percent (84.6%), (59%) of EL-Menshaway and Tanta University who were completely done the outcome have experience ranged from (11 to 20y). While a above fifty percent (58.3%) of Health Insurance who were completely done the outcome have experience ranged from (1 to 10 y). Moreover above, the table shows that all head nurses (100%) in Menshaway Hospital Who were completely done outcome have Bachelor degree and followed by Health Insurance and Tanta University Hospital (97%), (88.9%) respectively While, the Health Insurance Hospital only have master degree who were completely done the outcome.

Table 11. Correlation between socio demographic characteristics (age, years of experience, and qualification and element of evaluation among different hospital

Subject characteristic	Outcome Completely done						F	P
	Health insurance (no=24)		El-Menshaway (no=13)		Tanta University (no=27)			
Age								
≤ 25	14	58.3	8	61.5	2	7.4	25.46	0.000*
≥26-35	8	33.3	3	23.1	4	14.8		
≥36	2	8.3	2	15.4	21	77.8		
Years of experience:								
≤1-10	14	58.3	2	15.4	11	40.7	20.46	0.002*
≥11-20	3	12.5	11	84.6	16	59		
≥20	7	29.2	0	0	0	0		
Qualification:								
Bachelor	23	95.8	13	100	24	88.9		
Diploma	0	0	0	0	3	11.1	-	-
Master	1	4.2	0	0	0	0		

*Significant P<0.05

Table 12, Shows the comparative distribution of total mean score of the evaluation framework related to structure in different hospitals. The table reveals that the highest percent (85.7%) of Health Insurance Hospital who were completely done the structure. While, More than half percent (56.7%) of EL-Menshaway Hospital who were completely done the structure of evaluation. On the other hand, the lowest percent (10%) of Tanta University Hospital who were completely done the structure of evaluation. As regards the Health Insurance Hospital, the table reveals that the highest percent (100%) were completely done the items of structure related to consideration policy in evaluation nursing staff mix, regulation roles and responsibilities, sufficient resources, client and patient safety, and physical environment consideration.

Also in El Menshaway hospital the highest percentage (100%), (90%) (90%) that completely done for structure elements evaluation frame work related to (nursing staff mix decisions made by nurse leader and client needs to all nursing staff mix

decisions and there is sufficient resources to support the implantation of the selected nursing staff mix) respectively. Regarding as, Tanta university Hospitals reveals that the highest percent (94.3%, 91.4% and 85.7%) who were completely done structure related to items of (policy in place for ongoing evaluation of nursing staff mix decisions, nursing staff mix decisions made by nursing leader and client needs central to all nursing staff mix decisions) respectively.

Table (13), The table Shows that the distribution of total process elements of evaluation framework among Health Insurance, El-menshaway and Tanta University Hospitals . As regards to the health insurance hospital it reveals that the highest percentage full hindered percent (100%) were completely done in the process elements of evaluation related to" nursing staff mix decisions consider client outcomes relatives to the model of care delivery and the evaluation conduct in consolation with other members of nursing teams, allow flexibility to changes in client acuity, complexity, variability, recognize competencies and experience of nursing staff, and consider the skills and abilities of unregulated care. In El-Menshaway hospital the table reveals that the highest percentage f (100%) were completely done in the process elements for process that make nursing staff mix decisions open and accountable.

Also, the highest percentage (90%) were completely done for the nursing staff mix decisions consider client outcomes, allow flexibility in response of changes in client acuity, complexity and the results from the an going evaluation used to continuously improve nursing staff mix decisions respectively. On the other hand, the Tanta university hospital resample the highest percentage (85.7%, 80%) that completely done the process for items of nursing staff mix decisions allow flexibility in response to change in client acuity, complexity and the results from the ongoing evaluation used to continuously improve nursing staff respectively .In addition, the table shows that the highest percent of the total process of element that completely done were in EL_Menshaway Hospital (66.7%) and follow by (57.1%), (20%) in Health Insurance and Tanta University Hospitals respectively.

Table (14), Shows distribution total mean score of outcomes elements of evaluation frame work in different hospitals.

Table 14. Distribution comparative total outcomes elements of evaluation frame work in different hospitals.

Outcomes	Health insurance (No=28)						El-Menshawy (No=30)						Tanta University (No=70)					
	Completely done		Incompletely done		Not done		Completely done		Incompletely done		Not done		Completely done		Incompletely done		Not done	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
the nursing staff mix help meet the identified nursing of the client.	28	100.0	0	0.0	0	0.0	27	90.0	3	10.0	0	0.0	50	71.4	20	28.6	0	0.0
the nursing staff mix help clients reach their potential for recovery.	19	50.0	19	50.0	0	0.0	0	0.0	30	100.0	0	0.0	2	2.9	68	97.1	0	0.0
the nursing staff mix optimize nursing _sensitive outcomes.	28	100.0	0	0.0	0	0.0	27	90.0	3	10.0	0	0.0	27	38.6	0	0.0	43	61.4
Clients can express satisfaction care.	19	50.0	19	50.0	0	0.0	0	0.0	30	100.0	0	0.0	2	2.9	68	97.1	0	0.0
regulated nursing groups practicing by their standards.	16	57.1	12	42.9	0	0.0	20	66.7	10	33.3	0	0.0	2	2.9	52	74.3	16	22.8
regulated nursing groups satisfied that their competencies are used appropriately.	26	92.9	2	7.1	0	0.0	10	33.3	19	63.3	1	3.3	50	71.4	12	17.2	8	11.4
regulated nursing groups express an understanding of individual and team roles.	28	100.0	0	0.0	0	0.0	30	100.0	0	0.0	0	0.0	70	100.0	0	0.0	0	0.0
regulated nursing groups express the ability to recognize and manage issues related to role and nursing staff mix.	28	100.0	0	0.0	0	0.0	30	100.0	0	0.0	0	0.0	68	97.1	2	2.9	0	0.0
regulated nursing groups express satisfaction that they are able to meet the clients nursing care needs.	26	92.9	2	7.1	0	0.0	30	100.0	0	0.0	0	0.0	70	100.0	0	0.0	0	0.0
regulated nursing groups function cooperatively and productively to meet client needs.	28	100.0	0	0.0	0	0.0	28	93.3	2	6.7	0	0.0	65	92.9	5	7.1	0	0.0
nursing staff mix decisions contribute to the recognition of the health care organization as equality care provider.	28	100.0	0	0.0	0	0.0	0	0.0	6	20.0	24	80.0	26	18.2	2	2.9	40	
nursing staff mix decisions to the recognition of the health care organization as a healthy work environment.	28	100.0	0	0.0	0	0.0	30	100.0	0	0.0	0	0.0	16	22.9	2	2.9	52	74.2
There is a change in adverse events including errors, linked to nursing staff mix decisions.	10	35.7	0	0.0	18	64.3	0	0.0	0	0.0	30	100.0	0	0.0	0	0.0	70	100.0
nursing staff mix decisions make the best use of resources.	28	100.0	0	0.0	0	0.0	0	0.0	0	0.0	30	100.0	16	22.9	0	0.0	54	77.1
There are cost savings related to reduced turnover, reduced absenteeism and reduced overtime that can be linked to nursing staff mix decisions.	0	0.0	0	0.0	28	100.0	0	0.0	0	0.0	30	100.0	0	0.0	0	0.0	70	100.0
there cost savings related to improved nursing – sensitive outcomes that can be linked to nursing staff mix decisions.	0	0.0	0	0.0	28	100.0	0	0.0	0	0.0	30	100.0	0	0.0	0	0.0	70	100.0
the nursing staff mix support alignment with overall nursing and system goals (e.g., improved population health, sustainable costs).	28	100.0	0	0.0	0	0.0	14	46.7	0	0.0	16	53.3	25	35.7	0	0.0	45	64.3
nursing staff mix decisions allow timely access to appropriate health services.	26	92.8	0	0.0	2	7.2	10	33.3	0	0.0	30	100.0	23	32.9	2	2.8	45	64.3
nursing staff mix decisions increase the stability of the nursing workforce.	24	85.7	0	0.0	4	14.3	20	66.7	0	0.0	30	100.0	21	30.0	2	2.8	47	67.8
Total completely done	76.7%						43.2%						39.1%					

As regards to Health Insurance Hospital The table reveals that the highest percent 100% that completely done the outcome elements for items of the (nursing staff mix identified nursing of the clients, optimize nursing outcomes, regulated nursing groups for individuals, team, express satisfaction to meet the clients nursing care, cooperative and productively to meet clients needs contribute to recognition of the health care organization and make best use of resources) respectively. El Menshawy hospital reveals that the highest percent (90%) that completely done the outcome elements for two items there are (the nurse staff help meet the identified nursing of the client and the nursing staff mix optimize nursing sensitive outcome) respectively.

As regards to Tanta university hospital it reveals that the highest percent (100%) who were completely done the outcome of elements for the following items (regulated nursing groups express an understanding of individual and express satisfaction to meet the clients nursing care nursing) respectively. Also, (97.1%) who were completely done for express the ability to recognize and manage issues related to role and nursing staff mix. Moreover, the table shows that the highest percent of total outcome elements of evaluation that completely done (66.7%) of EL-Menshawy Hospital and following (57.1%), (20%) for Health Insurance and Tanta University Hospitals respectively.

DISCUSSION

Within health care today, numerous challenges influence decision making about the appropriate staff mix necessary to provide quality nursing care. Such challenges include an aging population, client acuity, rise in chronic disease, aging of the health care work force, quality of work environments and advances in education (Rotem and Toren, 2004). This is a need for staff mix decision-making resources which will promote the highest quality Client outcomes, staff outcomes and effective organizational outcomes (Rassin and Silner, 2007). The present study result revealed that there is positive relationship between head nurses education whose baccalaureate degree in El-Menshawy, Health Insurance, Tanta University Hospital consequence and three elements that completely done for evaluation framework of staffing that includes structure, process and outcome. Two studies (Hickam, Good) (Hickam and Severance, 2003; Blegen *et al.*, 2003) have suggested that baccalaureate-prepared nurses are more likely to demonstrate professional behaviors important to patient safety. Aiken, Clake and Silber (2002) demonstrated a strong positive relationship between nurse education level and reduced hospital mortality. The best outcomes were found in hospitals where 60 percent of the nurses had baccalaureate degrees or higher. The present study result revealed that nursing experience from (11 to 20 y) in EL-Menshawy Hospital were resemble the highest percent who completely done the three elements of evaluation framework ;structure, process, outcome (84.6%, 86.7%, 84.6%) respectively than other hospital study. This result attributed that the head nurses have more years of experience directly contributed to patient outcome and quality of care. A Canadian study (Tourangeau *et al.*, 2002) found that as years of nursing unit experience increased, the numbers of patient deaths decreased. Also, Morrison *et al.* (2001) found

that nursing staff inexperience directly caused or contributed to 10% of all adverse incidents reported.

The present study results revealed that there is significant difference among the three Hospitals: Health Insurance, El-Menshawy and Tanta University Hospitals related to structure elements of evaluation framework. Above three quarter 82.1% in Health Insurance Hospital follow the framework of structure evaluation, this can be attributed that the organizational factors support nurses to make the most appropriate decisions in their practice. Also, The result showed that the head nurses in health Insurance Hospital, El-Menshawy and Tanta University Hospitals take in their consideration client needs (acuity, complexity) to all nursing staff mix decisions that lead to increase nurse work load and needed high quality of care. Hurst (2003) found that the main nursing workforce planning systems according to acuity level of patients lead to good quality of patients care. Also, the findings of Agency for Health Care Research and Quality (Mark and Stanton, 2012) found that the higher acuity patients and added responsibilities increase nurse workload.

The finding of present study reveals that the three Hospital; Health Insurance, EL-Menshawy, and Tanta Hospitals made nursing staff mix decision by a nurse leader which lead to collaborative work relationships among nurses, physicians and health care team members. This results support by the research that recommended that the organization should link staffing initiatives with leadership and management concepts that create quality practice environment to encourage professional nursing autonomy control over practice (Cherf and Fcrss, 2005).

Findings of present study showed that the Health Insurance Hospital is only consider in staffing the role responsibilities of regulated nursing staff and other care providers articulated in policies and job description. This return that hospital provides unregulated health care workers into the setting one strategy has been to change the mix of registered nurses and licensed practical nurses working in a facility and to introduce unregulated health care workers into the setting (Canadian Nurses Association, 2005). Dellefield (Dellefield, 2000) suggests that using registered nurses to provide direct patient care may not be the best use of resources where the time may be better spent in care planning and case management and providing professional leadership. Dellefield (Rassin and Silner, 2007) further suggests that routine, stable and predictable patients can be cared for by unlicensed workers and licensed practical nurses, leaving the more complex or unstable patients to have a greater registered nurses input into their care. She also, highlights the importance of orientation, in-services education, improved supervisory skills and better care delivery systems for improved use of unlicensed workers.

Nay and Pearson (2001) and Nay (2004) suggest that a more strategic use of the registered nurses and unlicensed worker could assist in addressing nursing shortage, make the roles of each level more attractive be a more appropriate use of resources.

Moreover, the findings of present study revealed that the Health Insurance Hospital, El-Menshawy Hospital are have sufficient resource that support the selected nursing staff mix as

orientation continuing education. The advisory committee on health human resource support these findings by mentioned that individual nurses need to work fully within their legislated scope of practice based on their education, experience and that availability of support system such as programs and professional development (Uscenters For Medicare and Medicaid services, 2001). Queensland health (Queensland Health Business, 2001) stated that they need for nurses to delegate and supervise patient care related activities. So, they academic and clinical educators must find ways to facilitate the development of delegation and supervision abilities as nurses increasingly work with non professional staff. Continuing education is an effective way for nurses to learn the skills required by change models of patient care delivery and evolving professional roles.

The present study mentioned that nursing staff mix decisions support the best use of all nursing resources in Health Insurance Hospital than Tanta University and EL-Menshawey Hospital. This result attributed that the nursing staff mix in Health Insurance Hospital involves the registered nurses, licensed nurses and unregulated workers aimed to at relieving registered nurses of non nursing tasks that can be accomplished by less skilled workers. MicGillis Hall, (2003) support this study who stated that the significant changes have been made in employment patterns. Several new categories of unskilled workers have been developed, aimed to relieving registered nurses of non nursing tasks by less skilled workers. Other study support this finding by emphasize that allowing all nurses to work to their full potential promotes the efficient use of human resources and encourages the retention of nurses (Stanton, 2004).

The present findings revealed that Health Insurance Hospital take in consideration the client and nurse safety in nursing staff mix decisions than Tanta University Hospital, this can be attributed that the health care system of the hospital provides sufficient and appropriately skilled personnel operating within services. So, the nurses able to provide safe and ethical care to a given client include leadership, decision making and critical thinking skills. These findings supports (American Hospital Association Commission on Workforce For Hospitals and Healthy Systems in our Hands, 2002) by that state patient safety is basic to nursing care and is of concern in every setting where nurses work. Patient safety is not just past of what we do, we are committed through the code of ethic for registered nurse to provide safe, competent and ethical care. Canadian Nurses Association (2008) mentioned that the nurses are very familiar with health care system changes that have the potential to affect patient safety.

Result of present study showed that the total mean score of element process that completely done resembled highest percent (85.7%) in Health Insurance Hospital than EL-Menshawey and Tanta University Hospital. This result attributed that the nursing staff mix decisions consider client outcome relative to model of care, allow flexibility in response to changes in clients acuity and number and recognize the competencies experiences of nursing staff through continues training program. These result support by author who mentioned that it is important for nurses to be aware of the

limits of their individual competence and their practice .Based on individual practice reflection and the current requirements of their practice environments nurses must continually enhance their knowledge and competence through ongoing learning education and experience (Kleinman and Saccomano, 2006). Other research stated that when deciding how best to match the competencies of the care provider with the needs of the patient, it's not enough for managers to consider only the technical skill of the provider; the cognitive aspects practice such as critical thinking decision-making must also be taken into account (Felicity, 2012).

The results of their study revealed that the nursing staff mix help client to reach their potential for recovery in Health Insurance Hospital than Tanta university and EL-Menshawey Hospital. This result can be attributed to that this hospital introduces unregulated health care workers into the setting. As result registered nurse more giving directed care bedside nursing care when patient needed that important impact on patient outcomes. This result support by other studies that mentioned that more than sixty percent of the hospital units utilized a staff mix comprised of both regulated and unregulated staff, with most of these employing RNs and URW in their staff mix (Felicity *et al.*, 2012). An appropriate nurse staff mix should respond to patient diversity, advanced technologies and departmental workload. The ultimate goal is to find the best combination of staff that will respond most efficiently to treatment and better the patient outcomes. Kan (Kane *et al.*, 2006) suggests that should determining optimum nursing staffing levels and skill mix to reach desired patient outcomes. Ensuring that patient is treated like an individual is one of the care principals of total patient care.

The findings of present study revealed that there is no cost saving in the three hospitals of study related to reduce turnover, absentees' and reduce over time that can be linked to nursing staff mix decisions. However the financial cost of the system considerable one important factor effects inadequate staffing levels that place heavy burdens on the nursing staff and adverse event are painful for patient. Bennett and Killinger (2001) mentioned that the important factor to return nurses, overcome of workforce shortages and reduce turnover the need for cost effective strategies must be considered to effective patient outcomes.

The finding of present study showed that the head nurses in Health Insurance and EL-Menshawey Hospitals recognition of the health care organization as a healthy work environment than Tanta Universities Hospital. This result could be attributed that the organization of the hospitals consider the important of contribution the patients, nurses and outcome environments as a healthy work environment. Pearson *et al.* (2006) was designed to weight the evidence for a relationship between nurse staffing levels and healthy working environments . The results of the review suggested strong correlation between the characteristics of patients and work environments and also between nursing workload, staffing levels and the quality of outcomes for nurses, patients and the organization. Lang *et al.* (2004) Found that high nurse staffing ratios were associated with lower in patient mortality and failure to rescue rates as well as reduced length of stay in hospital. Moreover,

Thungjaroenkul *et al.* (2006) suggest that a nursing skill mix with a higher ratio of qualified nurses could reduce the costs of inpatient episodes. They argue that the educational preparation and knowledge of qualified nurses results in the prevention of adverse patient events and an overall reduction in the consumption of hospital resources by patterns.

Other studied finding mentioned that the importance of the environment which nurses work to staff mix and nurse outcomes (College of Nurses of Ontario, 2011, 2009; 2011 Lamond and Thompson, 2000). Almost all of the system quality variables were found to be important predictors of the nurse outcome. The higher the nurses' perception of the quality of the care provided, the higher their level of job satisfaction. In contrast, the lower the nurses' perception of the quality of care provided, the higher their level of job pressure job threat and role tension. This finding is important to consider in the context of the restructuring that has occurred in hospitals and the nursing shortage that has developed since them. The more complex the client situation and the more dynamic the environment, the greater the need for the register nurse to provide the full range of care, assess changes, reestablish priorities and determine the need for additional resources. The technical and cognitive aspects of nursing practice cannot be separated. Decisions about utilizing an register nurse or register practical nurse are made after considering client care requirements and the nurse is cognitive and technical expertise in a given environment. By considering the client, nurse and environment factors, nurses and key stakeholders can determine which category of nursing is appropriate for specific roles in client care. The application of the three-factor framework will help decision makers determine which roles and activities are not appropriate for autonomous registered nurse practice (Maria, 2009).

Evidence-informed staffing and workload best practices in the delivery of safe, competent and ethical care require the engagement of registered nurses in all roles from direct care providers, to managers, administrators, policy makers, professional associations and unions. As coordinators of nursing care, registered nurses possess the knowledge, skill and judgment to prudently assign client care to other regulated or non regulated care providers. This allows them to fully utilize all personnel and implement the primary health care principle of providing the most appropriate level of care by the most appropriate provider. The registered nurse administrator has a primary responsibility to manage health care delivery services and to also represent nursing services. In addition, she focuses on implementing and supporting appropriate care delivery process and workload management practices and ensure that organizational supports such as access to appropriate technologies, education and research are in place along with communication systems that foster positive working relationships and interdisciplinary practice (College and Association of Registered Nurses of Alberta, 2008).

However, in efforts to recruit and retain nurses, it would seem essential that consideration be given to addressing the concerns nurses express regarding the quality of patient care. Moreover, the current health care environment is characterized by a need for cost effective strategies that result in positive outcomes for

clients (College and Association of Registered Nurses of Alberta, 2005), registered nurses and other health professionals and health care organizations. However, it is important the use of best practices to determine implement and evaluate nursing staff skill mix and staffing patterns.

Conclusion

- It was concluded that the Health Insurance Hospital follow nursing staff mix decisions which lead to effective use of all nursing resources than EL-Menshawy and Tanta Universities Hospitals. Also, there is a significance difference found between three hospital related to elements evaluation framework; structure, process and outcomes
- Also Health Insurance Hospital system combination regulated staff nurses and non licensed workers in their work to allow registered nurses to give direct care and supported other services that no needed to skill to un licensed workers. However, this lead to overcome of shortage nurses.
- As the need to plane the deployment of nursing labor carefully has become an essential requirement in the health care system.
- As well, the importance of the environment in which nurses work. Patient complexity and system quality variables were found to be important predictors of the nurse and patient outcome studied.

Recommendation

- Applying evaluation framework of nursing staff mix decisions in our hospitals to effectively using all nursing resources.
- Improve the recruitment and retention of nurses.
- Offers nurses containing programs for job advancement as well as internship.
- Health care providers, administrators, employers, researches, educator, regulators and policy makers have to work together to ensure that clients receive safe and effective care.
- Nurse researches can conduct studies to examine decision-making tools that assist in determining and monitoring the right staff mix must be more systematically used and refined.
- Strategies must be found to deal with brooders issues that have an impact on nursing staff such as the shortages of nurses.
- Appropriate nurse staff mix distribution in the hospital and find the best combination of staff that will respond most efficiency to treatment, quality and service requirements.

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