Effect of the use of Clinical Pathway for Patients with Unstable Angina on Nursing Performance and Patient's Outcomes

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Abstract
A clinical pathway is essential to outline the main clinical interventions that are carried out by a group of professionals. **Aim:** to investigate effect of using clinical pathway for patients with unstable angina on nursing performance and patient's outcomes in coronary care unit at University Hospital. **Study design:** Quasi experimental design **Study subjects:** includes all available nurses working in coronary care unit, (n=25) and all available patients admitted to the unit, (n= 100). **Study tools:** 1. Observation checklist: consists of part one: personal data for the nurses and second part is the observation checklist 2.Patients' outcomes tool: consists of part one: personal data of the patients and second part is the patients' outcomes tool; it was developed by the researcher. **Result:** there were statistical significant differences between control and study groups in patient's complications items and there was statistical significant difference between nurses' performance pre and post application of clinical pathway during study periods**. Conclusion:** nurses' performance improved and the undesired patient's outcomes decreased after clinical pathway application at study group. **Recommendation:** apply the clinical pathway for unstable angina patients rather than the hospital routine care and organize training workshops for nurses about implementation of clinical pathway.

Key words: Clinical Pathway, Nurses' performance & Patient's Outcomes.

Introduction
Clinical pathway refers to tool or guideline that direct care by identifying expected outcomes and care strategies that developed by the collaborative practice team. Clinical pathway provides guideline for managing the care of specific patients during a specified time period **(Sullivan & Decker, 2005).**

Clinical pathways are developed through collaborative efforts of clinicians, case managers, nurses, and other allied healthcare professionals with the aim of reducing variation in patient care, reduce delays in discharge through more efficient discharge planning, and improve the cost-effectiveness of clinical services **(Cheah, 2000).**

The benefits of clinical pathway were emphasized by **Tastan et al., (2012)** as improvement of patient and family satisfaction with care by providing information on the treatment process, which enhances collaboration; promotion of job performance and the satisfaction of care team members via multidisciplinary communication and teamwork; reduce hospital stays and costs by focusing on continuity of care and systematic and qualified patient care; and estimation of treatment costs**.**

The use of clinical pathways appears to have a favorable impact on patient's outcomes, and professional practice. In under-resourced settings, an important obstacle to the use of clinical pathways could relate to their development and/or adaptation to the specific circumstances of each site **(Haddad, 2010).**

Expected outcomes for the care outlined in the clinical pathway tool may relate to physiology, patient activity level, learning, self-care, pain and symptom management, and readiness for transition or discharge. The pathway is very helpful for the novice nurse; by describing the standard of expected outcomes for a given time frame, it helps the nurse to assess the patient's progress toward a timely discharge and to detect any variances from the normal **(Barbara, 2009).**

Significance of the study
From clinical observation in the coronary care unit (CCU), it was observed that the number of patients with coronary diseases have increased over the last years . It was found that 415 patients with unstable angina admitted to coronary care unit between 1\3\2014 to 31\3\2015. These patients require intensive collaborative care to save their lives, and they are at risk for several complications. These complications in turn may have negative impact on the patient's physical and psychological condition and prolong their hospital stay. That is why there is an interest to conduct such type of study by using clinical pathway which, might safeguard this

category of patients against serious complications and improve nursing performance.

Aim of the Study

To investigate the effect of using clinical pathway for patients with unstable angina on nursing performance and patients' outcomes in coronary care unit, cardiology department at University Hospital.

Study hypothesis

To fulfill the aim of the present study, the following research hypotheses are formulated:

H1: There is change in the performance of nurses who learn how to use clinical pathway.

H2: There is change in the unstable angina with the patients' who exposed to clinical pathway.

Subjects & methods

Technical design

Study design.

Quasi experimental design was used for this study.

Setting.

This study was conducted in the coronary care unit at Assuit University Hospital. The unit started to work at 2009. The bed capacity of the unit was (n=24) beds and the total number of the nursing staff was (n=25) staff nurse.

Subjects

The study subjects included:-

- All the available nurses working in coronary care unit, at Assuit University Hospital their size was 25. The sampling technique is the convenient one.
- All the available patients admitted to the coronary care unit with unstable angina throughout data collection were included in the study control group (n=50) and study group (n=50).

Tools.

I -Observation checklist: This tool consists of two parts. Part one is concerned with collecting information about personal data for the nurses involved in the study such as sex, age, qualification, and years of experience. The second part is the observation checklist, it was developed by the researcher based on the content of clinical pathway to assess performance of nurses which include nursing care for patients with unstable angina ranging from (1) for done and (0) for not done .The scores percent of nurses' performance were ≥ 60% this means adequate practice while ≤60% which means inadequate practice. The researcher measure nursing performance pre and post using clinical pathway. Clinical pathway (CPWs) (structured multidisciplinary care plans which detail essential steps in the care of patients with unstable (Unstable Angina Clinical Pathway _ ER Medical affairs - www.hospital-forms.com/185.pdf), includes: activity,

test specimens, diet, medications, consults, IV solution, treatments, vital signs, discharge planning, teaching and evaluation . Those activities have started from the first 15 minutes of admission to the third day.

Patients' outcomes tool: This tool consists of two parts. Part one is concerned with collecting information concerning personal data of the patients involved in the study such as name, sex, age, occupation, marital status, date of admission, date of discharge and date of previous readmission if available. The second part is the patients' outcomes tool, it was developed by the researcher to be used for patients with unstable angina to assess the outcomes that includes: complications (severe arrhythmias, heart attack, post infarction, stable angina, heart failure, myocardial rupture, sudden cardiac death), hospital readmission and hospital mortality the possible response for the items of this tool it was Yes (1) and No (0).

II- Administrative design

An official permission had been obtained to collect necessary data from directors of University Hospital, department head of coronary care unit, cardiology department at University Hospital.

Ethical consideration

- Oral agreement was obtained from nurses who will participate in the study at coronary care unit.
- Written consent was obtained from patients that are willing to participate in study, after explaining the nature and purpose the study.
- Research proposal was approved from Ethical Committee in the faculty of nursing.
- There is no risk for study subject during application of research.
- The study was following common ethical principles in clinical research.
- Confidentiality and anonymity were assured.
- Study subject have the right to refuse to participate and / or withdraw from the study without any rational any time.
- Study subject privacy was considered during collection of data.

III-Operational design

These include three phases

1) Preparatory phase.

This phase took about three months from May to June 2015 to review the available literatures concerning the topic of the study and translation of the study tool from English to Arabic and develop patient's outcomes tool.

A pilot study

A pilot study was carried out to assess tool feasibility and applicability. Took about two months from June to August 2015 and carried out on 10% of study sample (10) patients and (10) nurses which included

in the study sample. Data collected from pilot study were analyzed and there were no necessary modifications done for the study tools.

Validity and Reliability of the study tools

- Validity of the study tools was done by jury composed of 5 expert professors in nursing administration and critical nursing department and correction was carried out accordingly.
- Reliability of the study tools was done by Cronbach's Alpha coefficient was equal (α = **86.3**).

Data collection phase

- The researcher in this phase took 50 patients as a control group &50 patients as a study group, then observe the nurses when provide nursing care for patients with unstable angina (control group) by using an observation checklist this phase took about three months from September to November 2015.
- The researcher gave an educational session about (definition, risk factors and sign & symptom of unstable angina and definition of clinical pathway, its benefits and how to apply it) for all available nurses (n=25) for five consecutive days, (divided nurses into five groups; every group was (5) to avoid shortage of nurses at unit) and teaches them

how to apply clinical pathway from the time of admission till discharge.

- The researcher used teaching aids (PowerPoint and photographs), for illustrations and gave them booklets for unstable angina and clinical pathway.
- The researcher observe the nurses performance and their application to the clinical pathway when providing nursing care for patients with unstable angina (study group) after assuring their knowledge, using observation checklist this phase took about three months from March to May 2016.

Evaluation phase

The researcher measured nursing performance and patients' outcomes before and after using clinical pathway.

IV-Statistical design

Collected data were verified prior to computerized data entry and analysis by using (SPSS) 20 Statistical Soft Ware Package. Data were presented using descriptive statistics in the form of percentages, also mean and standard deviations were calculated. For relation between variables (chi – square test, fisher exact test, independent samples t- test, paired t- test and Pearson correlation) were used, statistical significance was considered at P- value $\leq$ 0.05.

Results

Table (1): Percentage distribution of personal characteristics of the studied nurses (n= 25).

Items	No.	%
1- Age:(years)		
- 20 - < 25	9	36.0
- 25 - < 30	11	**44.0**
- ≥ 30	5	20.0
Mean ± SD (Range)	26.72 ± 3.31 (21.0 – 35.0)	
2- Qualification		
- Secondary Nursing School Diploma	13	**52.0**
- Technical Nursing Institute	12	48.0
3- Years of experience in this department		
- < 5	9	36.0
- 5 - < 10	6	24.0
- ≥ 10	10	**40.0**
Mean ± SD (Range)	6.92 ± 5.33 (6 m – 20 y)	
4- Marital status		
- Single	4	16.0
- Married	17	**68.0**
- Divorced.	3	12.0
- Widow.	1	4.0

Table (2): Percentage distribution of personal characteristics of the studied patients (n=100).

Items	No.	%
• **Sex**		
- Male	73	**73.0**
- Female	27	27.0
• **Age**		
- < 55 years	16	16.0
- 55 - < 60 years	25	25.0
- ≥ 60 years	59	**59.0**
Mean ± SD (Range)	64.17 ± 11.86 (46 – 66)	
• **Occupation**		
- Employee	39	**39.0**
- Farmer	18	18.0
- Housewife	20	20.0
- Professional	7	7.0
- Retirement	10	10.0
- Worker	6	6.0
• **Marital status**		
- Married	77	**77.0**
- Single	2	2.0
- Widow	20	20.0
- Divorced	1	1.0
• **Hospital stay**		
- < 3 days	52	52.0
- ≥ 3 days	58	**58.0**
Mean ± SD (Range)	2.78 ± 1.08 (1 – 6)	

Table (3): The total mean scores of nurses' performance to care for studied patients with unstable angina:

Items	Score	Groups of patients		P-value
		Control (n=50)	Study (n=50)	
		Mean ± SD	Mean ± SD	
-< 15 min	18	9.04 ± 3.47	17.44 ± 0.73	0.000**
- 15 – 60 min	18	7.60 ± 3.48	17.58 ± 0.57	0.000**
- 1 – 3 hours	17	7.32 ± 2.44	16.50 ± 0.86	0.000**
- 3 – 6 hours	12	6.24 ± 1.38	11.84 ± 0.37	0.000**
- 6 – 10 hours	12	5.72 ± 1.44	11.74 ± 0.44	0.000**
- 10 – 24 hours	12	6.44 ± 1.75	11.60 ± 0.49	0.000**
- Day 2	15	5.94 ± 1.77	13.94 ± 0.91	0.000**
- Day 3	9	4.74 ± 0.94	8.86 ± 0.35	0.000**

Table (4): Percentage distribution of patient's outcomes with unstable angina through the study groups.

Items	Groups of patients				P-value
	Control (n=50)		Study (n=50)		
	No.	%	No.	%	
A- **Complications**					
- Severe arrhythmia	41	**82.0**	7	14.0	0.000**
- Heart attack	22	**44.0**	1	2.0	0.000**
- Post infarction	2	4.0	0	0.0	0.495

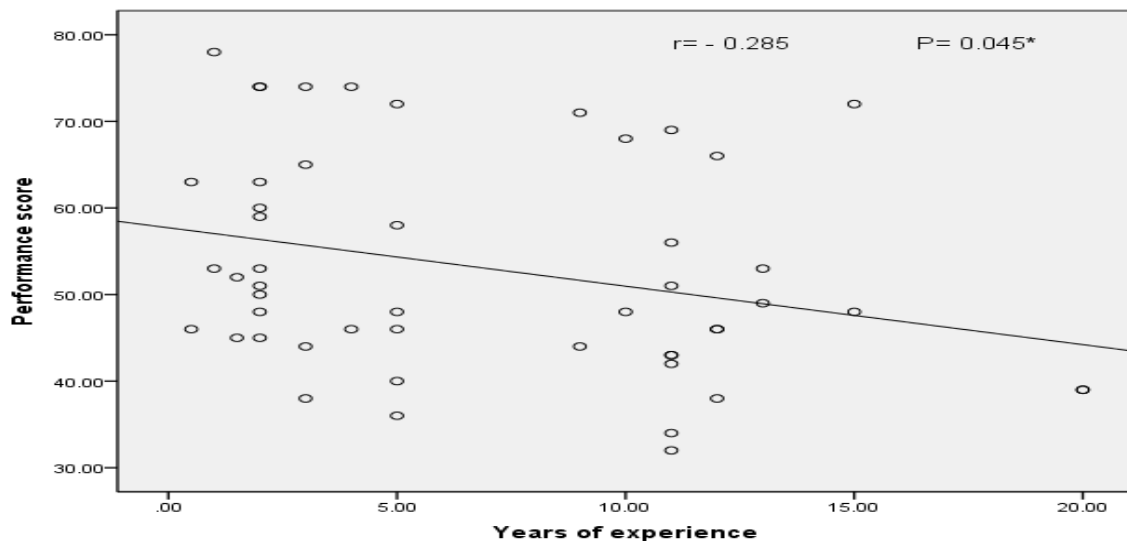| Items	Groups of patients				P-value
	Control (n=50)		Study (n=50)		
	No.	%	No.	%	
- Stable angina	20	**40.0**	0	0.0	0.000**
- Heart failure	9	18.0	0	0.0	0.003*
- Myocardial rupture	1	2.0	0	0.0	0.315
- Sudden cardiac death	4	8.0	0	0.0	0.117
B- Hospital readmission up to six months.	13	26.0	0	0.0	0.000**
C- In-hospital immediate mortality or mortality at 26 week.	3	6.0	1	2.0	0.617

Figure: Correlation between nurses' performance and years of experience.

Table (1): Reveals that 44.0% of nurses' age range from 25 to less than 30 years old, more than half (52.0%) of them were having secondary nursing school diploma, (40.0%) of them are having experience more than 10 years in coronary care unit and the majority of them (68.0%) were married.

Table (2): Illustrates that, the highest percentage of the studied patients (73.0%) were male, 59.0% of them aged more than 60 years old, 39% of them were employee, the majority of them (77.0%) were married and more than half of them (58.0%) stayed in hospital more than three days.

Table (3): Illustrates that the highest mean scores was in study group, as regard to all nurses' performance at all study periods from (0-15 min to Day 3). There were statistical significant differences between control and study groups as regard to nurses' performance at all study periods **(P= 0.000*).**

Table (4): Describes patients' outcomes throughout the study stages, it can be noted that the highest

percentage of complications was sever arrhythmia among 82.0% of patients, and 44.0 had heart attack, and 40.0% had stable angina in the control group. The lowest percentage of all complications was in study group. For hospital readmission up to six months, the highest percentage (26.0%) of patients was in control group.

There were highly statistical significant differences between study and control groups as regard to complication items (severe arrhythmia, heart attack, stable angina and heart failures) and hospital readmission up to six months **(P= 0.000*).**

The previous figure: reveals that, there was a statistical significant difference between nurses' performance and years of experience of nurses (0.045*).

Discussion

The present study confirmed that, regarding personal characteristics of nurses working in the coronary care unit less than half of nurses' age ranged from 25 to < 30 years this might be due to the system followed by the director of nursing transferring old age nurses every five years from intensive care units to general units, more than half of them have secondary nursing school diploma and the majority of them were having experience ≥ 10 **(Table 1)**. The researcher found increase in performance of nurses, this might be due increase their spend and work in the unit. This finding consistent with **Al-Ahmadi , (2009)** who mention that the years of experience was a strong predictors of job performance and work experience influences job performance, also had a strong impact on work attitudes.

The present study revealed that the majority of patients were male, aged ≥ 60 years old, and they stayed in hospital more than ≥ 3 days **(Table 2)** This finding consistent with **the National Library of Medicine, (2017)** which reported that older age and male gender are at higher risk for unstable angina.

From the findings of the present study it appeared that there was improvement in nurses' performances in caring for patients with unstable angina for all items from the first 15 minutes to the third day were in the study group. There were statistical significant differences between control and study groups as regard to nurses' performance at all periods **(Table 3)**. This might be occur after using clinical pathway and training which lead to improving performance of nurses and increase nurses' satisfaction and autonomy. This finding consistent with **Schrijvers, (2012)** who reported that from the advantage of clinical pathway is increasing the job satisfaction of employees as job descriptions and responsibilities derived from the work process become clearer. Clarity within the set framework offers more autonomy, allowing employees to start a routine act independently without waiting for the approval of superiors. A nurse can start acting independently and work ahead. Dedicated, passionate professionals provide better care for the patient.

In addition, the result was consistent with **Kul et al., (2012)** who mentioned that the pathways are a learning tool for professional individual and organizational team, that define different tasks to be learned, which affects performance of employees. The result was also consistent with **Cheah, (2000)** who mention that the clinical pathways, implemented in the context of an acute care general hospital, is able to significantly improve care processes through better collaboration among healthcare professionals and improvements in work systems.

The current study revealed that the patient's outcomes (complication, hospital readmission, and mortality) were decreased for study group compared to control group **(Table 4)**. This might be occurring after applying clinical pathway which has positive effect on patient's outcomes. This finding consistent with **Timothy, (1999)** who mentioned in his study that no increase in complications (morbidity or mortality) in the pathway patients as compared to other groups. The result was also consistent with **Kingston (2000)** who reported that improvement of patient outcomes is a primary benefit of the utilization of clinical pathways. **Moyer, (2002)** who mentioned that the patient outcomes can be improved by the use of pathways that improve process of care measures. Implementation of pathways focused on improving the quality of care, critical pathways will be useful in improving outcomes of patients.

In addition, the result was consistent with **Dean, (2010)** who reporting that patient complications found lower rates when clinical pathways were used.

Also, the finding was in the same line with **Herck et al, (2004)** who asserted that the use of care pathways has been associated with reduced hospital complications and strong positive effects on safety and quality of care. Moreover, **Kul et al, (2012)** mentioned that the implementation of CPs can achieve a reduction in some of the patient outcomes such as mortality rate, readmission rate, and costs of hospitalization, CPs reduced hospital mortality. Also readmission rate decreased in the care pathway groups.

From the findings of the present study it was clear that, there was a significant negative correlation between nurses' performance and years of experience of nurses **the pervious figure (1).**This finding inconsistent with **Chung et al., (2015)** who mentioned that the positive relationship between work experience and job performance.

Conclusion

- The highest mean scores of nurses' performance were in study group from (0-15 min to Day 3). There were statistical significant differences between control and study groups as regard to nurses' performance at all study periods.
- The patient's outcomes (complications) had decreased after applying the clinical pathway at study group. There were highly statistical significant differences in control and study groups as regard to all complications items and hospital readmission up to six months.

Recommendation(s)

- The manager of coronary care unit should use the clinical pathway as an audit tool in their periodic assessment of nurses" competency skills.
- Organize training workshops and courses for nurses about implementation of clinical pathway according to patient's diagnosis in all intensive care units.
- Development and application of clinical pathways in other areas of clinical specialties.
- Study the staff satisfaction and cost effectiveness after implementation of the clinical pathway.
- Study the effect of using the clinical pathway on nursing students" educational achievement in simulation labs and clinical settings.

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