

Evaluate the Effectiveness of Nurses' Professional Competence Approach on Their Productivity in Medical-Surgical Units

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Abstract

Background: Professional competence increases productivity. Nursing competency is generally viewed as a complex integration of knowledge skills, values and attitude. In clinical practice, nurses are required to apply their acquired knowledge, skills and individual traits to each situation and be able to adapt in different circumstances. **Research aim:** Evaluate the effectiveness of nurses' professional competence approach on their productivity in medical-surgical units. **Research Design:** A quasi-experimental design was utilized to achieve the aim of this study. **Setting:** The study was conducted at Benha University Hospital, Egypt in general medical-surgical units. **Sample:** consisted of convenient sample of (100) nurses who are responsible for providing direct nursing care activities to patients. **Tools:** three tools were used for data collection; 1- nurses' knowledge questionnaire (50 items), 2- nurses' observational checklist (60 items), and 3- nurses' productivity questionnaire (60 items). These tools were used pre, post, and flow-up three months later. **Result:** The study indicated there were improvement in nurses' total level of knowledge, performance, and productivity after interventions of professional competence approach both immediately post and follow-up. More than three quarters of nurses their knowledge was unsatisfactory, while in the immediate post and follow-up most of nurses their knowledge improved and became satisfactory. Moreover, more than half of nurses' performance were poor practice in pre-intervention, while after implementation it was improved to and become good in both immediately post and follow-up. Furthermore, most of nurses' productivity level was low in pre-intervention, while it was improved, increased and become high in both immediate post and follow-up. **Conclusion:** The study concluded that the designed approach illustrated statistical significant improvement in nurses' professional competence knowledge & performance, and increasing of nurses' productivity. The mean scores of all categories slightly decreased in the follow-up after three months of the approach in comparison to immediately post. Also there were statistical significant positive correlation among nurses' knowledge & performance and productivity. **Recommendation:** the study recommended that the In-service training and education programs must be a continuous process for refreshing and increasing nurses' knowledge and skills about the concept of professional competency approach as well as to emphasize nurses' productivity.

Key words: Approach, medical-surgical nurse, productivity, and professional competence.

Introduction

In these days of evolving health care system, increasing global competition, rising

health care costs, and labor shortages. Since improving clinical nurse work environments is a major issue faced by nurse executives and administrators, also health care

institutions strive to set a path towards an excellent professional practice and employers are constantly striving to increase productivity. One of the best ways to increase productivity is to make sure that staff are effectively manage their times and must be professional competent at work that are linked to quality patient outcomes. Training all new and retraining current staff in the principles and techniques of effective professional competence is essential (*Munyisia, et al., 2012*).

Competence has been used in the references to describe clinical skills related to nurses' performance, including quality of care and productivity (*Tzeng and Ketefian, 2009*). Nursing competency has been extensively addressed in literature in terms of safety and quality of nursing care, though still lacks worldwide consensus in definition (*Nilsson, et al., 2014*). Competence in nursing refers to the acquisition of appropriate skills for performing a task, or the ability to decide, using acquired skills and knowledge, to perform in a certain situation. In addition to competence is an articulate and complex combination of skills and capabilities that result from a conceptual and functional synthesis of theoretical aspects that linked to current experience (*Camelo and Angerami, 2013*).

Competence of nurse linked with some individuality as emotional intelligence (EI) and personality traits (*Beauvais, et al., 2011*). Recently, it is more important than intelligence quotient (IQ) in achieving positive outcomes regarding patients and nurses. Nursing practice environment has very complex demands of high-level competence and capability to collaborate as a member of the care team. Nurses' competence is based on both knowledge and skill taught to them (*Kuokkanen, et al., 2016*).

Nurse especially medical surgical nurse face many challenges during transition

to the workforce. As an overcrowded or increasing number of patients with multiple morbidities, they may suffer from significant anxiety, which can lead to exhaustion (*Hofler and Thomas, 2016*). *The original objectives of (American medical surgical nurse) AMSN were to:* improve the the MSNs, develop standards for practice, establishing the essence of the MSN practice also The goal of the Medical-Surgical Nursing (MSNS) specialty is to primary care, prevention, maintained and rehabilitation for restoring health by best evidence available. The practice of (MSNS) needs specialized of knowledge and skills to achieve health problems that affect patients, (MSNS) services are provided to adult. (*Academy of Medical-Surgical Nurses, 2015*). The (MSNS) especially new nurses increasing stress level and feelings of incompetence led to a higher potential for turnover, which could effect on quality, productivity, and providing safe patient care in health care agencies (*Kim, et al., 2015*).

In order to develop nurses professional practice, and provide continue optimal, quality patient care, training and education are very important components of any retention strategy and assist nurses with building self-confidence and competency in clinical skills (*Kim, et al., 2015*). Healthcare institutions and organizations are facing challenges, as increasing amounts of information, new technologies, low funding, and demands for accountability. The practice of nursing requires a complex combination of various attributes, so nurses require highly specialized competencies to determine patients' states accurately and predict and cope with the problems that may occur during nursing care. The urgency of adequate nursing competencies in changing and improving care is evident (*Nehrir et al., 2016*).

In addition to increasing patient acuity requires more skillful practitioner. New knowledge and technology require constant

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modifications in policies, positions, descriptions, and evaluation of skills of all personnel and especially professional nurses. So that institutions of health care seek for nurses with criteria of effectiveness, flexibility, and creativity also be critical thinkers. Plus require collaborative with team, safe practitioners and efficient managers of time in uncertain and demanding circumstances (*Parker et al., 2014*).

The hard changes in nursing science and technology, cost containment and deficient in time to establish patients relationships can cause increase in the levels of nurses interest of patient safety, quality of nursing care, nurse safety, as well as competency of nursing care and all of this effect on their productivity (*Farokhzadian et al., 2015*). Having competencies are essential for nurses, has direct effects on the safety and health of patients, and lack of it can result in medical mistakes and severe results for the patients. Thus, the competences of nurses have been a main professional and corporate problem for providers of nursing care. Furthermore, nurses should be capable to supply quality care for patients and to collaborate with other nurses and colleagues. Competence can be evaluated by using tools, which should indicate objective and subjective data about knowledge base and actual performance of the individual and be appropriate for the specific situation and the desired outcome of the evaluation (*Elmani, et al., 2015*).

In order to evaluate achievement of competency. The effectiveness of performance evaluations therefore depends on the competencies that are chosen. Because In recent years, evaluation of nurse performance is the most attractive studies for researchers. The nursing competency was assessed from different researchers using comprehensive tool for assessing nurses' performance and actual delivery of care to patients. It arranged into six subsections: psychosocial individual, psychosocial group, physical, general, communication, and

professional implications, or skills of competency include communication skills, caring, patient safety/illness, legal aspects and ethical practice, leadership and management skills, problem solving skills, decision making skills, and team work (*Fitzpatrick et al., 1994*).

From demand of World Health Organization (WHO) that all countries to implement plans for reinforcement nurses and supplying them with professional competency (*WHO, 2016*). Because this leads to high quality of care and enhance productivity through an increased satisfaction of patient about nurses and improve nursing education and practical and clinical nursing (*Nobahar, 2016*).

Productivity is defined as the relationship between output and the goods and services used to produced them (*Huber, 2014*). Productivity is traditionally regarded as the relationship between the outputs generated by a system and the inputs needed to create the outputs. Specifically, it is defined as the relationship of the amount produced by a system during specific period and the quantity of resources consumed to produce the outputs over the same period. Typically inputs are in form of labor (human resources) capital (physical and financial assets), energy, materials, and data. These resources are then transformed into outputs (goods and services) (*Kumar et al., 2014*).

Nursing productivity is a formula-driven calculation. Units of Services (UOS) multiplied by the volume (patient days or emergency department visits) equals hours available to create direct productive staffing plans. Those hours multiplied by nonproductive factors to account for paid time off equals the total hours available for the staffing plan. This is then applied to the total hours (*Yoder-Wise, 2014*). While (*Kelly and Tazbir, 2013*), reported that calculating nursing productivity is challenging for nurse managers because it is difficult to quantify the efficiency and effectiveness of individual

nurses providing care to patients. Individual nurses can vary greatly in their professional competency; critical-thinking abilities, their practical skill levels, and their abilities to make timely and accurate decisions that affect patient outcomes.

Significance of the Study

The medical-surgical nurses are responsible for deliver of nursing care for adult patient with medical surgical problems . They over loaded by administration, clinical and paper workload which have effects on their productivity and also on nursing care quality. Also many studies found that the practical me nurses should be oriented and trained about professional competency from starting the work and continuous assessed their competency and productivity (*Mohammed, 2014; and Alomani, 2016*).

Moreover, Providing an orientation period that has continuing supportive measures in place can help ease competence in Professional development ,help nurses to provide high quality patients' care and improving productivity (*American Nursing Association "ANA", 2013; Kim, et al., 2015*).

Additionally when the researchers contacted with nurses at Benha university hospitals in different clinical setting especially medical-surgical departments found that they had low competent and low productivity, as lack of communication with patients, and insufficient patient care in medical surgical area. The researchers prepare that approach to help medical-surgical nurses to improve their professional competency, and increase productivity.

Aim of the study:-

The study aimed to: Evaluate the effectiveness of nurses' professional

competence approach on their productivity in medical-surgical units through:

1.Assessing the nurses' knowledge and performance toward professional competency approach pre, post, and follow-up intervention.

2.Assessing the nurses' productivity pre, post, and follow-up intervention.

3.Implementing the designed approach of professional competency.

Research hypothesis:-

There will be progressing and improvement in knowledge and performance, of nurses toward professional competency at work after implementation of the designed approach and it will have a positive effect on their productivity.

Material And Methods

Research design: A quasi-experimental design was utilized to achieve the aims of this study.

The Variables: The independent variable in this study was professional competency approach for nurses, while the dependent variable was nurses' productivity.

Setting: The study was conducted at Benha University Hospital at Alkaluobia Governate, in the following departments: General medical department includes; medical units 1,2,3,4,5, and 6. And General surgical department includes; general surgical units male and female

Subjects and sample: The subjects of this study consisted of convenient sample of nurses (100) nurses who are responsible for providing total direct nursing care activities to patients in the above mentioned study setting. And fulfilled the eligibility creation of work experience are not less than three

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years of job experience. The total staff nurses were distributed as the following 50 nurse in general medical units and another 50 nurse in general surgical units.

Tools of data collection:

Data for the present study was collected through using the following three tools.

First tool: Nurses' Knowledge Questionnaire: A structured questionnaire, developed by the researchers through review of the recent related literature (*Al-Mahmoud et al., 2013; Hsieh and Hsu, 2013; ANA, 2013; Black, 2014; Huang, and Hsieh, 2014; Huber, 2014; Liou and Cheng, 2014*). It included two main parts; *the first part:* it was consisted of nurses' personal data like: department, age, sex, marital status, years of experience, educational qualification, attending any previous training. *The second part:* knowledge test, it was included different items to assess nurses' knowledge regarding professional competency approach at work before, immediately post and follow-up after three months of intervention of the designed approach, it consisted of 50 items categorizing under five main categories as follows; communication skills (10 items), practical nursing skills (10 items), patients' safety measures (10 items), legal aspects and ethical behaviors (10 items), leadership and management skills (10 items).

The scoring system.

The questions were scored as "1" for correct answer, and "zero" for incorrect answer, and cut point was done at 60%= 30 scores. The total knowledge score was calculated as follow:

Unsatisfactory = < 60% score (0 - <30)

Satisfactory = ≥ 60% score (≥30).

Second Tool: Nurses' Observational Checklist:__An observational checklist

developed by the researchers based on the current related literature (*ANA, 2013; Hsu et al., 2013; Abdeen, and Metwally, 2014; Huang and Hsieh, 2014; Kumar et al., 2014; Lima et al., 2014; Liou and Cheng, 2014;*) aimed at assessing the actual performance of nurses before, post and follow-up after three months of the implementation of professional competency approach at work. It was consisted of 60 items with regards to communication skills (10 items), practical nursing skills (10 items), patient safety measures (10 items), patients' rights (10 items), legal aspects and ethical behaviors (10 items), leadership and management skills (10 items).

The scoring system

The scoring system of the observational checklist was based on a three-point Likert scale as follows: done completely "2 points", done incompletely "1 point" and not done "0 point". The total scores was (120) and cut point was done at 60% = 72 scores. The range scores of observational checklist were expressed as follow:

Poor Performance= <60 % score (60 - <72)

Average Performance= 60%-<75% score (72 - <90)

Good performance= ≥75% score (≥90-120)

Tool III: Nurses' Productivity Questionnaire: A structured questionnaire developed by the researchers based on the review of literature (4; 46; 25; 43; and 72), it was used to assess level of nurses' productivity before, immediately post, and follow-up after intervention of the professional competency approach. it was consisted of 60 items subdivided into six main subscales as follows; work habits effectiveness (10 items), quality of nursing services (10 items), decision making and problem solving (10 items), social relation and team building (10 items), work

motivation and staff development (10 items), and initiative and goal achievement (10 items).

Scoring system

The subjects responses were scored based on a three-point Likert scale as follows: "3" always, "2" sometimes, and "1" rarely. Each nurse chooses the answer after reading and understanding carefully. The total scores (180) were summed up and graded according to the following scores that reflect the overall level of nurses' productivity, and was expressed as follows:

Low productivity level= $< 60\%$ score (60 - <108)

Moderate productivity level= 60% - $<75\%$ score (108 - <135)

High productivity level= $\geq 75\%$ score (135 - <180)

Operational design:

The current research was carried out on three phases; preparation, implementation, and evaluation.

- A written official letter was obtained from the Dean of the Faculty of Nursing, Benha University and delivered to the directors of Benha University Hospital in order to obtain their approval for conducting the study after explaining its purpose.

- Field work phase started from beginning of August 2015 to July 2016 covering eleven months it included the following:

The preparation phase

- The researchers reviewed current related literature and theoretical knowledge of the various aspects that concerning topic of the study to develop and construct the

study tools of data collection. And planning for professional competency approach. Translating tool into Arabic language to clear understand.

- The researchers started to assess the readiness of the subjects in the study setting to announce and encourage participation in the study.

- **The tools validity:** The tools of the study were tested for face and content validity by panel of experts consisted of five experts from medical-surgical and nursing administration departments at Faculties of Nursing. Based on their comments some modifications were done.

- **The tools reliability:** The tools were tested and measured by Cronbach's Alpha test. The value was 0.789 for nurses' knowledge questionnaire, The value was 0.859 for nurses' observational checklist, and the value was 0.796 for nurses' productivity questionnaire

- **The pilot study:** The revised tools were piloted with 10% from study subjects 10 nurse that were included in the main study sample to evaluate the effectiveness and clarity of proposed data collection tools, and to assess the feasibility of the study. It has also served in estimating the time needed for filling the tools that approximately ranged from (15-20) minutes for nurses' knowledge questionnaire, (10-15) for nurses' productivity questionnaire, the researchers observe nurses' performance throughout achieving their duties during shift, it was conducted by the researchers in November 2015.

- Detected needs were transformed to development of the professional competence approach; it was developed based on determined needs of studied nurses and relevant review of the literature. It was aiming to prepare and develop a professional competency approach for nurses at work. It

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covers the following contents; orientation about professional competence, improving effective communication skills, revision about routinely procedures in mentioned units, following patient safety measures, applying patients' rights, enhancing legal aspects and ethical behaviors, developing leadership and management skills, and improving productivity.

- The teaching sessions were "14" hours distributed as follows; "7" sessions 2 hours for each session depending on workload and including periods of discussions according to their achievement, progress and feedback; it started at 10.30 A.M to 12.30 P.M.

- The subjects were divided into 8 groups according to their departments, 4 groups for medicine and other 4 groups for surgery each group was 12 or 13 nurse. The program took about 30 days.

- The professional competency approach achieved by using available resources, relevant contents, and instructional strategies for each sessions. Different methods of teaching were used like; lecture, small group discussion, and brainstorming. Instructional media included; Power point presentation for knowledge, video about procedures and emphasize with booklet to be fixed and remind them that prepared by the researchers and distributed to nurses in the first day of the designed approach.

- Feedback was given at the beginning of each session about the previous one and at the end of each session about the current sessions, and different methods of evaluation were selected to suit the nurses' needs and achieve objectives and contents of the designed approach.

The implementation phase

- The researchers met subjects and explained the aim and nature of the study and method of filling the questionnaires. This

was done individually or through group meetings.

- The questionnaires were distributed by the researchers to the participated nurses before implementing the designed approach during the period of December 2015, to fill it during nurse's work hours (morning and afternoon shifts) which determined before with head nurse of each unit according to type of work and workload to ensure the continuity of patient care. *After that* observation was done by the researchers to assess the nurses' performance regarding professional competency approach in medical and surgical units.

The evaluation phase:

- The data were collected immediately after implementation of the designed approach by using the previous designed tools also data was collected after three months of implementing of the professional competency approach.

Ethical Considerations:

Informed the nurses about the purpose and benefits of the study, their participation was voluntary, and they have the right to refuse to participate in the study without giving any reason. In addition, confidentiality and anonymity of the subjects were assured through coding of all data. Insuring that the study not harming but useful for them.

Statistical design:

Data were verified prior to computerized entry. The Statistical Package for Social Sciences (SPSS version 15.0) was used for that purpose, followed by data analysis and tabulation. Descriptive statistics were applied (e.g., frequency, percentages, mean, and standard deviation). Test of significance (Chi square and F test) were used to test the homogeneity of the outcome variables between the groups and to test the

study hypothesis. Pearson correlation coefficients were used. A statistically significant difference was considered at $p \leq 0.05$, and a highly statistically significant difference was considered at $p \leq 0.01$.

Result

Table (1): Shows that half (50%) of the studied nurses were working in medical department while the other half were in surgical department. The highest percent (90% & 61%) of them were female and married respectively. Less than half (40% & 48%) of nurses their age ranged between 30–<40 years old and having Nursing diploma respectively. More than one quarter (27%) of nurses having 20–<30 years of working job experience. Also more than three quarters (78%) of them haven't any previous training courses.

Figure (1): This figure represents that there were improvement in nurses' knowledge after intervention of professional competence approach both immediately post and follow-up. In the pre-intervention; more than three quarters (77%) of nurses their knowledge was unsatisfactory. While in the immediate post and follow-up after three months it was increased to (92% & 83%) and became satisfactory respectively.

Table (2): This table illustrates that there were statistical significant improvement in the level of studied nurses' knowledge after intervention of the professional competence approach both post and follow-up. The least mean scores (2.58 ± 0.87) of nurses was related to communication skills in pre-intervention and it was improved and increased to (9.22 ± 0.89) that represent in immediately post and it slightly decreased to (6.84 ± 0.91) in the follow-up after three months but still more than pre-program.

Figure (2): This figure exhibits that there were improvement in total level of

nurses' performance after implementation of the designed professional competence approach. In the pre-intervention; the majority (77%) of nurses were poor practice in pre-intervention. While after implementation of the designed approach it was increased and become good in both the immediately post (79%) and it was slightly decreased to (62%) in the follow-up but still more than pre-intervention.

Table (3): This table describes that there were statistical significant improvement in the level of nurses' performance after intervention of the professional competence approach both post and follow-up. The least mean scores (9.87 ± 3.69) of nurses was related to practical nursing skills in pre-intervention and it was improved and increased to (17.98 ± 4.41) in immediate post and it slightly decreased (16.53 ± 3.07) in the follow-up after three months but still more than pre-intervention.

Figure (3): This figure displays that there were improvement and increasing in the nurses' total level of productivity after intervention of the designed professional competence approach both immediately post and follow-up. In the pre-intervention; most of nurses (81.5%) their level of productivity was low. While after implementation of the approach it was improved, increased and become high in both immediate post (64%) and it was slightly decreased to (57%) in the follow-up after three months but still more than pre-intervention.

Table (4): This table shows that there was statistical significant improvement and increasing in the nurses' productivity after intervention of the designed professional competence approach both immediately post and follow-up. The least mean scores (14.34 ± 3.48) of nurses was related to quality of nursing services before intervention and it was improved and increased to (25.87 ± 4.21) in immediate post and it slightly decreased to

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(22.11±4.54) in the follow-up after three months but still more than pre-intervention.

Table (5): This table represents that there was highly statistical significant positive correlation between nurses' knowledge and performance regarding the designed professional competence approach.

Table (6): This table reveals that, there was highly statistical significant positive correlation between nurses' knowledge and performance regarding the designed professional competence approach and their productivity. This mean when nurses' knowledge and performance toward professional competence approach increased this will be enhance, improve, and increase their productivity.

Figures And Tables

Table (1): Frequency distribution of studied nurses' personal characteristics. (N=100)

Personnel characteristics	No	%
Department		
Medical	50	50%
Surgical	50	50%
Sex		
Male	10	10%
Female	90	90%
Marital status		
Married	61	61%
Unmarried	27	27%
Divorced	5	5%
Widowed	7	7%
Educational level		
Nursing diploma	48	48%
Nursing Technical Institute	31	31%
Bachelor degree in nursing	21	21%
Age		
20- < 30 years	20	20%
30 – < 40 years	40	40%
40 – < 50 years	25	25%
≥ 50 years	15	15%
Mean ± SD	38.7 ± 10.74	
Years of experience		
3-< 10 years	23	23%
10 – < 20 years	20	20%
20 – < 30 years	27	27%
30 – ≥ 40 years	30	30%
Mean ± SD	15.9 ± 9.57	
Attending any previous training courses		
Yes	22	22%
No	78	78%

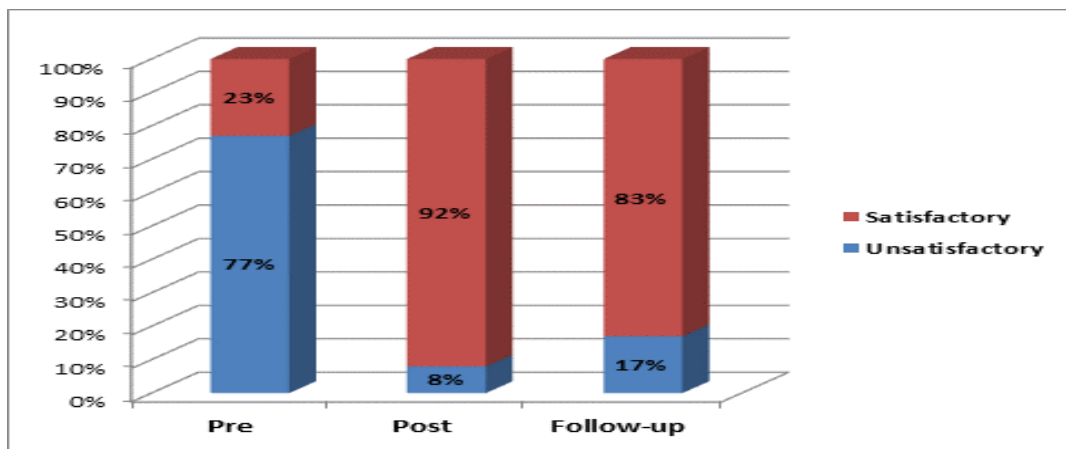


Figure (1): Total level of nurses' knowledge regarding professional competence approach at work throughout study phases. (N=100)

Table (2): Mean scores of nurses' knowledge regarding professional competence approach throughout study phases. (N=100).

The categories	Maximum scores	Pre		Post		Follow-up		F test	P value
		X	±S.D.	X	±S.D.	X	±S.D.		
1. Communication skills	10	2.58	±0.87	9.22	±0.89	6.84	±0.91	5.78	< 0.01**
2. Practical nursing skills	10	3.72	±1.53	8.66	±1.34	6.63	±0.63	3.478	< 0.05*
3. Patients' safety measures	10	2.64	±1.01	8.47	±0.98	6.34	±1.06	3.72	< 0.05*
4. Legal aspects and ethical behaviors	10	3.32	±1.44	8.79	±0.93	6.54	±0.88	4.89	< 0.01**
5. Leadership and management skills	10	2.62	±0.93	8.91	±1.03	6.72	±1.04	5.68	< 0.01**
Total	50	14.88	±4.57	44.05	±3.98	33.07	±4.01	5.98	< 0.01**

(*A statistical significant difference $P \leq 0.05$ and **A highly statistical significant difference $P \leq 0.001$)

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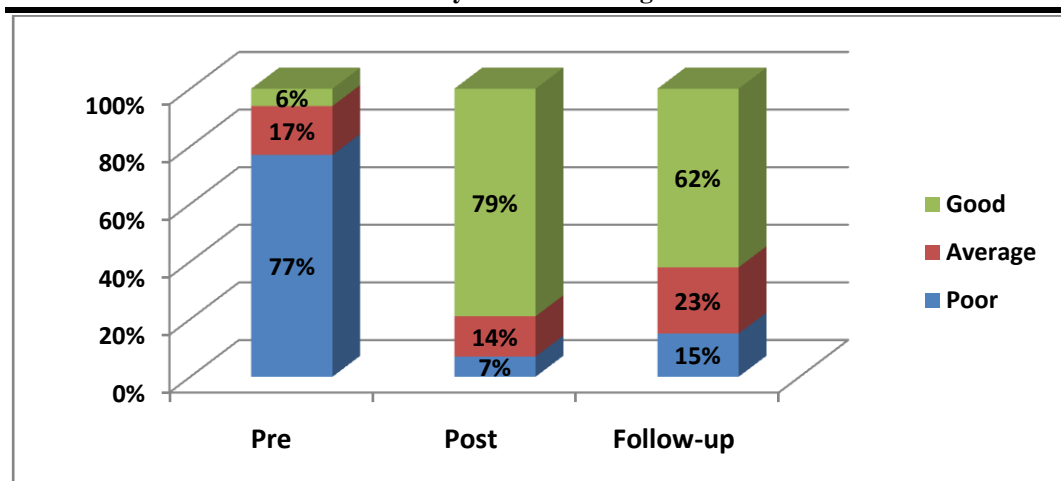


Figure (2): Total level of nurses' performance regarding professional competence approach at work throughout study phases. (N=100).

Table (3): Mean scores of nurses' performance regarding professional competence approach throughout study phases. (N=100).

Variables	Maximum scores	Pre		Post		Follow-up		F test	P value
		X	±SD.	X	±SD.	X	±SD.		
1. Communication skills	20	10.23	±2.49	18.92	±3.78	16.92	±3.79	5.89	< 0.01**
2. Practical nursing skills	20	9.87	±3.69	17.98	±4.41	16.53	±3.07	4.99	< 0.01**
3. Patient safety measures	20	11.56	±3.87	19.34	±4.58	16.78	±4.06	6.54	< 0.01**
4. Patients' rights	20	12.48	±3.34	19.18	±3.12	16.58	±3.04	5.95	< 0.01**
5. Legal aspects and ethical behaviors	20	12.50	±4.25	18.65	±3.27	16.78	±4.06	4.78	< 0.01**
6. Leadership and management skills	20	11.48	±3.98	18.87	±3.38	16.83	±3.15	5.69	< 0.01**
Total	120	68.12	±7.57	112.94	±10.81	100.41	±9.65	7.83	< 0.01**

(*A statistical significant difference $P \leq 0.05$ and **A highly statistical significant difference $P \leq 0.001$)

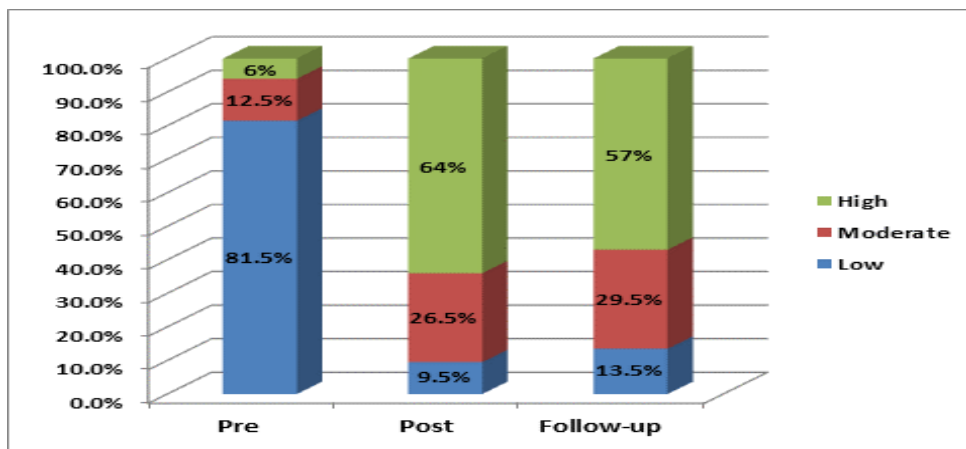


Figure (3): Total level of nurses' productivity throughout study phases. (N=100)

Table (4): Mean scores of nurses' productivity throughout study phases. (N=100).

Variables	Maximum scores	Pre		Post		Follow-up		F test	P value
		X	±SD.	X	±SD.	X	±SD.		
1. Quality of nursing services	30	14.34	±3.48	25.87	±4.21	22.11	±4.54	6.12	< 0.01* *
2. Decision making & problem solving	30	16.16	±4.32	24.39	±4.37	21.17	±4.53	5.89	< 0.01* *
3. Social relation and team building	30	16.13	±4.09	26.84	±4.17	22.23	±4.05	6.12	< 0.01* *
4. Work effectiveness habits	30	16.64	±4.12	24.13	±4.74	21.98	±4.02	5.89	< 0.01* *
5. Staff motivation and development	30	16.92	±4.27	25.65	±4.17	20.45	±4.67	6.22	< 0.01* *
6. Initiative and goal achievement	30	16.78	±4.06	26.37	±4.58	23.12	±4.58	6.32	< 0.01* *
Total	180	96.95	±11.38	153.25	±12.68	131.06	±10.45	6.43	< 0.01* *

(*A statistical significant difference $P \leq 0.05$ and **A highly statistical significant difference $P \leq 0.001$)

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Table (5): Correlation coefficient between nurses' knowledge and performance regarding professional competency approach throughout study phases.

knowledge	Performance	
	r	P value
pre	0.353	0.001**
Post	0.608	0.001**
Follow-up	0.419	0.001**

(*A statistical significant difference $P \leq 0.05$ and **A highly statistical significant difference $P \leq 0.001$)

Table (6): Correlation coefficient among nurses' knowledge and performance regarding professional competency approach and their productivity

Professional competency approach	Nurses' productivity	
	r	P-Value
Knowledge	0.871	0.001**
Performance	0.846	0.001**

Discussion

Professional competence increases productivity. Some nurses accomplish more than others, and better use of their professional and management skills leads to saving available time, improve quality of patient care, enhanced effectiveness, and increasing productivity. (*Duygulu and Kublay, 2011; and Stack, 2013*). Nursing competency is generally viewed as a complex integration of knowledge including professional judgment, skills, values and attitude. Nursing can be an especially demanding career. Professional competence can make the nurse much more efficient nurse (*Hashemzadeh et al., 2011; Thomas, 2012*).

The present study showed that the half of the studied nurses was divided in to two halves (medical and surgical department). The highest percent were female and married. Less than half of nurses' age ranged between 30–<40 years old and had nursing diploma. More than one quarter of nurses having 20–<30 years of working experience. Also more than two quarters of nurses haven't any previous training courses about professional competency and productivity. From the

researchers' point of views, that this findings were related to younger age nurses chosen to work at medical-surgical department because this basic area to gain experience, and the competency not from polices and procedure from hospital.

The findings of the present study was in agreement with those in a study done by *El-Maghraby, (2016)*, who study the effect of orientation program on competency of newly graduated nurses NGNs and found that sixty percent of newly graduated nurses were in the age group 24-25 years. In the same respect, the foregoing findings of the current study was incongruent with *Al-Mahmoud et al., (2013)*, who reported on their study on nurse-interns' their age range from 22-25 years. Also the results of the present study disagreement with, *Sheldon and Hilaire, (2015)*, who found in their study on NGNs ages ranged from twenty two to sixty years with a mean of 30.2 (SD = 9.4).

These results were contradicted with *Manoochehri et al., (2015)*, who reported on their study on novice nurses in Iran that the participants' age ranged from 22-24 years,

years of their skill among one-eighteen years with an average 5.7 years and twenty two of them had worked during studying.

In contrary to *Mohammed, (2014)*, who reported on his study at Benha University Hospital that the majority of newly baccalaureate graduate nurses NBGNs age was less than 24 years with less than one year experience, half of NBGNs were married, all of them have a Bachelor degree in nursing, three quarters of NBGNs were working in medical units. Also *Mahfouz, (2011)*, who conducted his study on assisting teaching staff (ATS) at Benha Faculty of Nursing, and showed that all of ATS have a bachelor degree in nursing, less than one thirty of them was below age of 27 years old, less than half of ATS having 4 years of experience,

The current study portrayed that there were improvement in nurses' total knowledge after intervention of professional competence approach both immediately post and follow-up. In the pre-intervention; more than three quarters of nurses their knowledge was unsatisfactory, while in the immediate post and follow-up after three months it was increased and became satisfactory. Moreover the most improved items of knowledge were related to communication skills, leadership and management skills. This may be due to high desire of nurses to improvement and change to be aware of their responsibilities also indicate that efficiency of the designed approach and the written booklet which given to them, encourage participants to learning and ability of gaining knowledge easily.

This finding is supported by *Kamel, (2010)*, who said that this improvement in knowledge can be influenced by the rate of memorization, ability of knowledge acquisition, the accumulation of learned knowledge of life, and the refreshing information using different approach of active and participative learning during implementation of program, such as work

activities and group discussion, brainstorming, group activities, ... etc. for the nurses. Also the use of multiple media made optimized learning through; Power-point presentation, video auditory, kinesthetic and visual learning styles.

The foregoing findings was matched with *Mahfouz, (2011)*, who found in his study that there was high statistical improvement in the level of ATS knowledge after intervention both immediately post and follow-up program. Also this result is going in the line of *Mohammed, (2014)*, who reported that there was significant improvement in NBGNs' knowledge after implementation of the educational program. Moreover, this consistent *Kirwa and Gakere, (2016)*, who reported that the continuous practice of hand skills lead to improvement of knowledge and performance.

Similarly, *Abdeen and Metwally, (2014)*, who confirmed in their study on fourth year nursing students that there was significant improvement in students' knowledge throughout immediate post and follow up phases of the program.

These findings matches with *El-Maghraby, (2016)*, who reported that there was an increase in the total mean scores of newly graduated nurses' knowledge immediately post and after three months post program relative to pre-program. In the same line *Hus et al., (2014)*, who found that the mean score of knowledge was high at post-test than at pre-test.

On the other hand there was studies disagreement with this finding as, *Ebrahimi et al., (2016)*, who reported on their study that there was lack of knowledge. His founding in the same line with *Sönmez and Yıldırım, (2016)*, who reported on their study at Turkey that there was lack knowledge. Also *Mahfouz, (2011)*, who concluded that the most improved items of knowledge were related to clinical trainer and clinical

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evaluation. In addition to *Mohammed, (2014)*, who revealed a significant improvement of head nurses' knowledge regarding to types of time management and activities to be delegated.

Concerning nurses, actual performance regarding professional competency throughout the three study phases, findings of the present study illustrated that there were statistical significant improvement in the total level of nurses' performance after intervention of the designed approach both post and follow-up also the most improved items of performance were related to practical nursing skills, communication skills, leadership and management skills. This improvement in performances may be related the condensed and complete approach that lead to this improvement of skills scores at the immediate post and follow up phase also increase nurse enthusiasm to be competent.

The results were supported by *Bassanini et al., (2007)*, *De-Grip and Sauermann, (2013)*, who assumes that participation leads to an increase in skills (human capital) and thus makes the worker more productive, positive returns to training could also be explained by other factors, such as higher motivation or stronger loyalty that workers may show after their employer has 'invested' in them.

These findings agreed with *Abd EL-Aleem, et al., (2009)*, who reported that it is apparent that the post program mean score of each dimension was significantly higher than the preprogram mean score. Additionally, *Abd El-Aziz, (2009)*, and *Kamel, (2010)*, who noted that there were a marked increase in the participants' knowledge and performance immediately post program compared to preprogram.

Some international studies are matches with these findings as, *Karahan et al., (2012)*, who reported on their study that most of nurses perceived themselves to be

partially competent across the range of nursing practices, also revealed on their study that most of them felt themselves to be most competent in areas of basic nursing practices such as hygiene, fluid volume monitoring, and medication administration.. Also, in Australia *Lima et al., (2014)*, who reported that graduated nurses make self-assessment to their competence as rather good for overall competence and each of the domains.

In addition, *Cheng et al., (2014)*, who reported that there was a significantly higher post-test clinical competence (post competence) score compared to the pretest clinical competence score. Also *Bano, (2017)*, in U.S.A. added that two percent of nurses agreed that they feel more confident in their knowledge and skills to provide all aspects of patient-centered rehab nursing care after the class.

Along the same line, *Numminen et al., (2014)*, who reported on their study in Finland that the overall level of nurse competence was good assessed by nurses themselves and their managers. According to *Kim et al., (2015)*, who study improving clinical competence and confidence of senior nursing students through clinical preceptorship and found that the majority of the students reported that they were competent to very competent on each skill.

This results matches with *Kamboj, (2013)*, who report that structured residency program offer means to increase their competency and assisting them in their transition. Mean scores of observer-reported and self-reported competency were increased in the total scores and all subscales from the start to the end of the program and the independent t- test were significant. Also this findings was agreement with *El-Maghraby, (2016)*, who reported that there was inadequate performances of subjects and significant improvement in their performance level and scores and in all competency skills subscale post the program, also he found that there was a significant improvement of newly

graduated nurses' performance level three months post program in all competency subscales including clinical skills.

In this respect for *Kim et al., (2015)*, who reported on their study that carried out in U.S.A. the novice nurses that compared to the pre-program data, students have responded with an increased level of the post-program average per each category, indicating their perceived improvement in competency in nursing knowledge, skills and attitude.

Similarly, these findings were consistent with *Jansson, (2014)*, who reported on his study in Finland on critical care nurses that human patient simulation education significantly improved skills among critical care nurses these findings were in agreement with those of a study carried by *kim et al., (2015)*, who revealed on their study on senior nursing students through Clinical preceptor-ship that there were highly significant differences between the pre- and post- means of the per-student-averages for Confidence and for Competency.

Also . According to *Sheldon and Hilaire, (2015)*, who reported in their study in U.S.A. that more than half of subjects only reported feeling always confident to provide safe care half of the time.

The results of the present study displayed that there were improvement and increasing in the nurses' total level of productivity regarding nursing care after intervention of the designed approach both immediately post and follow-up. In the pre-intervention of the designed approach; most of nurses' productivity mean scores were low regarding quality of nursing services, social relation, team building, decision making and problem solving, while after implementation of the approach it was increased and become high in both immediate post and it was slightly decreased in the follow-up after three months but still more than pre-intervention.

This in researchers views that efficient implementation competent approach but the nurse not retained the information for long period. Also may due to human character, as qualification, nursing experiences, skills & knowledge, and competency are the predictors of job productivity.

This result was supported by *Holland and McIntosh, (2012)*, who reported that training programs for new staff increased their productivity. Training has been established as a metric for resident clinical performance because it tends to increase with each year of training. In the same respect, *Stephen, (2001)*, who reported that increasing employee participation in decision making, in training and education lead to effective work and also enhance productivity.

Additionally, the increased knowledge and performance acquired by the nurses, in my opinion these results may be due to, the fact that learning was not a passive experience and courses created an interactive environment that increased nurses' performance. In addition, the several cycles of repetition had created a truly dynamic interactive educational sessions. While the slightly decline in nurses' scores at the follow-up phase after three months this could be attributed to knowledge is decreased with time and the nurses can't retains knowledge for long periods of time may be due to many causes such as; there is no continuing training and education programs, increasing work load, forgetting, lack of monitoring ... etc.

Similarly, this finding is supported by some Egyptain studies as *Ibrahim, (2013)*, who revealed in their study on staff nurses at Zagazig University Hospital that there was a slight decrease in nurses' knowledge scores at three months post-program was compared to immediately post program. Also *Mohamed, (2015)*, who reported on their study on intern-students that there was a slight

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decrease in knowledge score at three months post program.

Conclusion

The present study was concluded that there were high statistical significant improvements in the knowledge, performance, and productivity of nurses after intervention of the designed professional competence approach both immediate post and follow-up after three months. Moreover the most improved categories of knowledge were related to communication skills, leadership and management skills.

The most improved dimensions of performances were related to practical nursing skills, communication skills, leadership and management skills. In relation to improved items of nurses' productivity were related to quality of nursing services,

In addition to there was highly statistical significant positive correlation between nurses' knowledge and performance. Accordingly, there were highly statistical significant positive correlation among nurses' knowledge, performance, and productivity.

nurses' knowledge and performance toward professional competence approach improved and there were progressing and improvement in the knowledge and performance of nurses toward professional competency approach at work and it was have a positive effect on their productivity.

Recommendations

According to study finding the following were recommended:

1. In-service training and education programs must be a continuous process for refreshing and increasing nurses' knowledge and skills about the concept of professional competency approach as well as to emphasize nurses' productivity.

2. Establish a standardized training approach for developing of nurses to be professional competent nurses.

3. Conduct well designed and effective periodically workshops as needed for nurses about effective communication and social relation, leadership and management skills, team building, decision making and problem solving, and quality of nursing services, productivity.

4. The hospital education center: should be preparing for attending of certified training courses in professional competency should be considered a requirement for promotion of nurses' productivity.

5. Further research: Replication of the study must be conducted on a larger probability sample is highly recommended to allow generalizable results.

6. Future research: Study must be conducted about causes of problem in nursing competence.

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