

## On-the-Job versus off Training of Nurses in Documentation of Nursing Practice

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### Abstract

**Background:** Training, either on-the-job or off-the-job, is the only means that may improve such lack of competencies in documentation. **Aim of the study:** To investigate the differences between on-the-job and off-the-job training of nurses in documentation of nursing practice. **Subjects and methods:** This quasi-experimental study was carried out at the primary health care (PHC) centers in Giza Governorate on two cluster samples of 75 nurses each, one for on-the-job and the other for off-the-job training. A self-administered questionnaire was used for nurses' knowledge and an audit sheet for their practice of documentation. The intervention consisted of a 2-day training in nursing documentation. **Results:** In total, only one (1.3%) nurse in each group had satisfactory pre-intervention, which increased to 94.7% in both groups after the intervention ( $p < 0.001$ ). Overall, no nurse in the two groups had adequate total audit before the intervention. After the intervention, none in the on-the-job and 4.0% in the off-the-job had adequate audit ( $p = 0.24$ ). Knowledge and audit scores significant positive correlation ( $r = 0.698$ ). **Conclusion and recommendations:** Both on-the-job and off-the-job approaches are effective in improving nurses' knowledge of documentation, but with less effect on their audited achievement of documentation criteria.

**Key words:** On-the-job, Off-the-job, Training ,Nurses, Documentation Audit.

### Introduction

Employees play a vital role in organization performance. Effective training and development are very important because it can help an organization to improve on its performance as well as on its productivity. Only the trained workforce could effectively respond to the new challenges as well as to the existing ones in their jobs. Skills are capacities and expertise in particular occupation. The higher productivity is increasingly driven by skills. Besides, the degree of competitive advantage of a firm depends increasingly on its skilled labor (*Gilmore and Williams, 2009*).

The developing countries are increasingly concerned with the rapidly changing demand for skills and the slow response of the general and vocational schooling tracks to adjust the provision of skills. Therefore, many employers complain about the lack of skills and education of their workforce. Policymakers are thus increasingly concerned that the supply of skills in the labor market does not keep pace with the demand. The investment by organizations in on-the-job training is one important way to mitigate this skills' gap as it develops job relevant skills among the existing employees (*Almeida and Faria, 2014*).

The keen importance on the factors to enhance the skills of employees, which are necessary for the achievements of targets and for

capturing the large competitive market. *Raza and Hassan (2014)*. Organizations who are the leaders among others are continually focusing on the training factors and more or less focusing on the gaps to be improved after training (*Obisi, 2011*). Learning depends on factors such as design and implementation of training and the learning climate of the organization (*Blanchard and Thacker, 2007*).

Nurses' daily documentation in the patient's record is negatively influenced by several factors, such as being disrupted during documentation activities, nurses' limited competence regarding documenting, lacking motivation to enter information into the patient record and receiving inadequate supervision (*Cheevakasemsook et al., 2006*). A positive influence on the documentation in the patient record is the use of electronic nursing process documentation systems (*Paans et al., 2011*).

### **Significance of the study**

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Although nursing documentation is essential in quality care, nurses' practice of documentation is often deficient due to lack of knowledge and/or skills. Training is the only means that may improve such lack of competencies in documentation. Training could be either on-the-job or off-the-job. Given the logistics needed in off-the-job training, on-the-job training may be preferable, and may consequently lead to better outcomes of training. Therefore, this study will compare the two approaches to reach to an evidence-based conclusion.

### **Aim of the study**

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This study was aimed at investigating the differences between on-the-job and off-the-job training of nurses in documentation of nursing practice through:

1. Measuring nurses' practice of documentation of the care they provide before and after on-the-job training;

2. Measuring nurses' practice of documentation of the care they provide before and after off-the-job training;

3. Comparing the outcomes of the two methods of training.

### **Research hypothesis**

The practice of documentation among the nurses receiving on-the-job training will be better compared with those receiving off-the-job training.

### **Subjects and methods**

#### **Research design**

A quasi-experimental design with non-equivalent control was used in the conduction of the study.

#### **Study setting**

The study was conducted at the primary health care (PHC) centers in Giza Governorate. There are 22 health administration, and 43 medical centers. The centers provide maternal and childcare (MCH) services, compulsory vaccination, family planning, dental care, as well as emergency services.

#### **Subjects**

The study population will consist of staff nurses working in the primary health care centers in Giza governorate. Nurses will be recruited in the study sample upon fulfilling the following eligibility criteria.

#### **Inclusion criteria:**

- Nurses working in the selected settings;

- With at least one year experience  
Sample size: The Sample size is calculated to detect an expected difference between the rate of adequate practice of documentation between on-the-job (p1=75%) and off-the-job (p2=50%) training with a 95% level of confidence, and a study

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power of 80%. Using equation for the difference between two proportions (EpiInfo 6.04), the estimated sample size is 65 nurses per group. After adjustment for a dropout of about 15%, the sample size will be 75 per group.

**Sampling technique:** A cluster sampling technique will be used in recruiting the required sample. The primary health care centers will constitute the cluster. A number of 16 centers will be selected by simple random sampling. They will be randomly assigned to either on-the-job training group or off-the-job training group. All the eligible nurses in the cluster will be included in the study sample.

### Tools of data collection

The researcher will prepare two data collection tools, questionnaire sheet and an audit sheet. Self-administered questionnaire: This will consist of three parts:

**Part I:** Nurse personal and job characteristics such as age, gender, qualification, experience, previous training, workplace, job position, ect.

**Part II:** This will assess the nurse's knowledge gain from the training. It will include question about nursing documentation definition, type, importance, common errors, ect. This will be filled as pre-and posttests.

**Part III:** This part is for nurse's feedback regarding the training received. It will cover satisfaction with the content and process, as well as the associated difficulties and barriers, and the suggestion for improvement. This will be after the training.

**Audit sheet:** this tool will be intended to assess the nurse's practice of documentation. It will be built-up based on the basic principles of nursing documentation such as clarity, completeness, no abbreviations, signature, date, ect. This tool will be applied before and after the training.

## II. Operational design

This design includes the preparatory phase, pilot study, and fieldwork.

### Preparatory phase

During this phase, the researcher reviewed with scrutiny the available literature pertinent to the study topic. This involved the use of textbooks, in addition to internet search for related articles in scientific journals. This helped in the preparation of the data collection tools.

Once prepared in their preliminary form, the data collection tools were presented to a panel of experts in nursing administration. They reviewed the clarity, relevance, logical sequence, and comprehensiveness of the tools for face and content validation. The tools were modified based on their comments and suggestions.

### Pilot study

A pilot study was carried out on approximately 10% of the study sample to assess the feasibility of the study and the applicability of the tools. It was conducted in primary health care centers other than those included in the study sample. The pilot also served to test the reliability of the training evaluation scale.

### Fieldwork

The study was carried out through assessment, planning, implementation, and evaluation phases.

**Assessment phase:** This involved conduction of the pretests using the self-administered questionnaire and the audit checklist. Upon obtaining the official permissions, the researcher met with the nurses in the selected centers, explained to them the aim of the study, and invited them to participate. Then, for each of the recruited nurses five records were randomly selected from the previous month. They were checked for completeness of documentation using the audit sheet. For each item of the audit sheet, the

numbers of records with fulfilled item were calculated.

**Planning phase:** Based on the analysis of the assessment phase data, and in the light of related literature, the researcher developed the training program. The program was main objective was to improve nurses' knowledge and skills regarding nursing documentation. It was in the form of a 2-full day small group sessions. A simple pamphlet was prepared to be distributed to participants by the end of the training.

**Implementation phase:** The researcher implemented the developed program in the selected centers for each of the two groups, namely on-the-job and off-the-job. This was done in small groups of 9-11 nurses. Eight training rounds were conducted for each of the on-the-job and off-the-job groups. The round consisted of two full-day sessions. The sessions covered topics such as the definition of nursing documentation, its objectives and rules, as well as electronic registration and the responsibility of the nurse in documentation.

**Evaluation phase:** The change in nurses' knowledge was assessed using the self-administered questionnaire as a posttest. The audit checklist was used to examine the change in their practice of documentation. This involved auditing of five patient records for each nurse during the month that followed the training program.

### III. Administrative design

Letters addressed from the Dean of the Faculty of Nursing, Ain-Shams University to the administration of the Health Directorates involved. Then, the researcher met with the directors of the selected primary health care centers to clarify the aim of the study, take their

approvals, and arrange for data collection and implementation of the training program.

### Ethical considerations

Approval of the study protocol was secured from the research ethics committee in the Faculty of Nursing at Ain-shams University. A verbal informed consent was obtained from each nurse before collecting any data and after explanation of the study aim and procedures, as well as the rights to refuse or withdraw.

### IV. Statistical design

Data entry and statistical analysis were done using SPSS 20.0 statistical software package. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, and means and standard deviations and medians for quantitative variables. Cronbach alpha coefficient was calculated to assess the reliability of the developed scale through its internal consistency. Quantitative continuous data were compared using the non-parametric Mann-Whitney test. Qualitative categorical variables were compared using chi-square test. Whenever the expected values in one or more of the cells in a 2x2 tables was less than 5, Fisher exact test was used instead. In larger than 2x2 cross-tables, no test could be applied whenever the expected value in 10% or more of the cells was less than 5. Spearman rank correlation was used for assessment of the inter-relationships among quantitative variables and ranked ones. In order to identify the independent predictors of the knowledge and audit scores, multiple linear regression analysis was used and analysis of variance for the full regression models done. Statistical significance was considered at p-value <0.05.

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### Results

**Table (1):** Demographic characteristics of nurses in the two study samples

item	Training				X2 test	p-value
	On-the-Job(n=75)		Off-the-Job (n=75)			
	No.	%	No.	%		
<b>Age:</b>						
<40	54	72.0	44	58.7		
40+	21	28.0	31	41.3	2.94	0.09
Range	22.0-51.0		23.0-48.0			
Mean±SD	34.7±6.6		37.2±6.3			
Median	35.0		37.0			
<b>Gender:</b>						
Male	2	2.7	2	2.7		
Female	73	97.3	73	97.3	Fisher	1.00
<b>Marital status:</b>						
Unmarried (single/divorced/widow)	4	5.3	8	10.7		
Married	71	94.7	67	89.3	1.45	0.23
<b>Nursing qualification:</b>						
Nursing school diploma	60	80.0	50	66.7		
Higher diploma	13	17.3	17	22.7	--	--
Bachelor	2	2.7	8	10.7		
<b>Experience years:</b>						
<10	22	29.3	9	12.0		
10+	53	70.7	66	88.0	6.87	0.009*
Range	1.0-30.0		1.0-30.0			
Mean±SD	13.8±7.2		17.1±6.7			
Median	14.0		17.0			

(\*) Statistically significant at  $p < 0.05$

(--) Test result not valid

**Table(1):**The study involved 75 nurses on on-the-job training and an equal number on off-the-job training. Table 1 demonstrates that their ages were not statistically significantly different, with medians 35 and 37 years, respectively. They had an equal gender distribution, with majority of females and married. The on-the-job training group had a lower median experience years (14.0) compared with the off-the-job training group (17.0), and the difference was statistically significant ( $p=0.009$ ).

**Table (2):** Pre-intervention knowledge of documentation among nurses in the two study samples

Satisfactory knowledge (60%+) of documentation	Training				X <sup>2</sup> test	p-value
	On-the-Job (n=75)		Off-the-Job (n=75)			
	No.	%	No.	%		
Criteria	11	14.7	12	16.0	0.05	0.82
Correcting errors	21	28.0	22	29.3	0.03	0.86
Definition	53	70.7	48	64.0	0.76	0.38
Electronic	53	70.7	48	64.0	0.76	0.38
Record keeping	50	66.7	53	70.7	0.28	0.60
Objectives/utility	21	28.0	35	46.7	5.59	0.02*
Process	0	0.0	1	1.3	Fisher	1.00

(\*) Statistically significant at p<0.05

**Table (2):** shows wide variations in nurses' knowledge of documentation in the two study groups before the intervention. Meanwhile, more nurses in the off-the-job group had satisfactory knowledge of the objectives and utility of documentation compared with those in the other group, and the difference was statistically significant (p=0.02)

**Table (3):** Post-intervention total knowledge and audit scores among nurses in the two study samples

item	Scores (max=100)				Mann-Whitney Test	p-value
	On-the-Job (n=75)		Off-the-Job (n=75)			
	Mean±SD	Median	Mean±SD	Median		
Knowledge	77.0±9.6	80.00	74.1±8.9	76.70	6.44	0.01*
Audit:						
Accuracy	42.7±10.7	43.60	41.8±15.0	40.00	1.47	0.22
Timing	33.1±13.7	36.00	23.2±16.8	24.00	21.76	<0.001*
Signature	21.1±9.3	20.00	19.0±14.5	16.00	5.14	0.02*
Ethical issues	51.2±10.5	52.50	53.6±15.9	52.50	0.21	0.65
Total audit	39.7±8.5	41.40	37.9±12.6	37.20	5.24	0.02*

**Table(3):**As shown in Table 3, after implementation of the intervention the knowledge score of the nurses in the on-the-job group was statistically significantly higher in comparison with those in the off-the-job group (p=0.01). Similarly, their audit scores were significantly higher regarding timing (p<0.001) and signature (p=0.02), in addition to the total audit score (p=0.02).

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**Table(4):** Pre-post-intervention knowledge and audit among nurses in the on-the-job training group.

	Time				X <sup>2</sup> test	p-value
	Pre (n=75)		Post (n=75)			
	No.	%	No.	%		
Total knowledge:						
Satisfactory	1	1.3	71	94.7		
Unsatisfactory	74	98.7	4	5.3	130.88	<0.001*
Audit:						
Accuracy	0	0.0	2	2.7	Fisher	0.50
Timing	0	0.0	0	0.0	0.00	1.00
Signature	0	0.0	0	0.0	0.00	1.00
Ethical issues	0	0.0	21	28.0	24.42	<0.001*
Total audit:						
Adequate	0	0.0	0	0.0		
Inadequate	75	100.0	75	100.0	0.00	1.00

(\*) Statistically significant at p<0.05

**Table (4):** illustrates statistically significant improvements among the nurses in the on-the-job group after implementation of the intervention. This was evident in their knowledge (p<0.001), as well as the ethical issues in audit (p<0.001). However, there was no improvement in total audit.

**Table (5):**Pre-post-intervention knowledge and audit among nurses in the off-the-job training group.

Item	Time				X <sup>2</sup> test	p-value
	Pre (n=75)		Post (n=75)			
	No.	%	No.	%		
Total knowledge:						
Satisfactory	1	1.3	71	94.7		
Unsatisfactory	74	98.7	4	5.3	130.88	<0.001*
Audit:						
Accuracy	0	0.0	8	10.7	Fisher	0.006*
Timing	0	0.0	3	4.0	Fisher	0.24
Signature	0	0.0	3	4.0	Fisher	0.24
Ethical issues	1	1.3	24	32.0	25.39	<0.001*
Total audit:						
Adequate	0	0.0	3	4.0		
Inadequate	75	100.0	72	96.0	Fisher	0.24

(\*) Statistically significant at p<0.05

**Table (5):**Similarly, in the off-the-job group, the post-intervention phase showed statistically significant improvements (Table 5). This was noticed in their knowledge (p<0.001), and in the accuracy (p=0.006) and ethical issues (p<0.001) in audit. Meanwhile, no significant improvement could be revealed in total audit.

**Table( 6):** Pre-post-intervention knowledge and audit scores among nurses in the on-the-job training group

Item	Scores (max=100)				Mann-Whitney Test	p-value
	Pre (n=75)		Post (n=75)			
	Mean±SD	Median	Mean±SD	Median		
Knowledge	37.7±8.9	36.70	77.0±9.6	80.00	109.89	<0.001*
Audit:						
Accuracy	14.6±5.9	14.50	42.7±10.7	43.60	102.55	<0.001*
Timing	8.5±6.3	8.00	33.1±13.7	36.00	80.77	<0.001*
Signature	7.0±5.2	8.00	21.1±9.3	20.00	72.08	<0.001*
Ethical issues	18.3±6.8	20.00	51.2±10.5	52.50	102.81	<0.001*
Total audit	13.3±3.9	13.10	39.7±8.5	41.40	103.50	<0.001*

(\* ) Statistically significant at p<0.05

**Table( 6):** As illustrated in Table 6, there were statistically significant improvements of the knowledge and audit scores of the nurses in the on-the-job group after implementation of the intervention (p<0.001). The median knowledge score increased from 36.70 to 80.00, and the median total audit scores from 13.10 to 41.40.

**Table (7):** Pre-post-intervention knowledge and audit among nurses in the off-the-job training group

Item	Scores (max=100)				Mann-Whitney Test	p-value
	Pre (n=75)		Post (n=75)			
	Mean±SD	Median	Mean±SD	Median		
Knowledge	39.7±9.9	40.00	74.1±8.9	76.70	105.57	<0.001*
Audit:						
Accuracy	14.3±9.0	14.50	41.8±15.0	40.00	91.35	<0.001*
Timing	7.5±8.2	4.00	23.2±16.8	24.00	50.73	<0.001*
Signature	7.3±5.1	8.00	19.0±14.5	16.00	44.78	<0.001*
Ethical issues	21.9±11.7	20.00	53.6±15.9	52.50	88.56	<0.001*
Total audit	14.0±7.1	13.10	37.9±12.6	37.20	96.59	<0.001*

(\* ) Statistically significant at p<0.05

**Table (7):** Likewise, in the off-the-job group, Table 7 indicate statistically significant improvements of the knowledge and audit scores after implementation of the intervention (p<0.001). The median knowledge score rose from 40.00 to 76.70, and the median total audit scores from 13.10 to 37.20.

**Table(8):**Correlations between nurses' knowledge and audit scores and their characteristics

Item	Spearman's rank correlation coefficient					
	Pre (n=150)		Post (n=150)		Total (n=300)	
	Knowledge	Audit	Knowledge	Audit	Knowledge	Audit
Audit	-0.13		0.10		.698**	
Age	-0.15	-.212**	-.235**	-.228**	-0.11	-.124*
Qualification	0.11	0.11	0.11	0.00	0.06	0.03
Experience	-.180*	-0.13	-.319**	-0.12	-.135*	-0.06



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(\*) Statistically significant at  $p < 0.05$       (\*\*) Statistically significant at  $p < 0.01$

**Table(8):** As displayed in Table 8, nurses' knowledge scores had a statistically significant moderate positive correlation with their audit scores in the total sample ( $r=0.698$ ). Conversely, the knowledge (post) and audit (pre/post/total) scores had weak negative correlations with their age. Meanwhile, all their knowledge scores had statistically significant weak negative correlations with their experience years.

**Table (9):** Best fitting multiple linear regression model for the knowledge score

Item	Unstandardized Coefficients		Standardized Coefficients	t-test	p-value	95% Confidence Interval for B	
	B	Std. Error				Lower	Upper
Constant	18.69	4.28		4.363	<0.001	10.26	27.13
Intervention	36.88	1.03	0.89	35.698	<0.001	34.85	38.92
Married	-5.93	1.92	-0.08	3.098	0.002	-9.70	-2.16
Experience years	-0.35	0.07	-0.12	4.866	<0.001	-0.50	-0.21

r-square =0.81

model anova:  $f=434.91$ ,  $p < 0.001$

**Table (9):** Variables entered and excluded: age, gender, qualification, courses, group In multivariate analysis (Table 9), the study intervention was the only statistically significant independent positive predictor of nurses' knowledge score. On the other hand, their being married and their experience years were negative predictors. As evident from the value of the standardized coefficient, the study intervention was the most influential predictor. The model explains 81% of the variation in the knowledge score.

**Table (10):** Evaluation of the training by nurses in the two study samples .

Item	Training				X <sup>2</sup> test	p-value
	On-the-Job		Off-the-Job			
	No.	%	No.	%		
Place:						
Comfortable	68	90.7	72	96.0	1.71	0.19
Good ventilation	67	89.3	73	97.3	3.86	0.049*
Calm	58	77.3	57	76.0	0.04	0.85
Good lighting	70	93.3	74	98.7	Fisher	0.21
No interruptions	60	80.0	66	88.0	1.79	0.18
Time:						
Start time	67	89.3	71	94.7	1.45	0.23
No. of daily hours	50	66.7	68	90.7	2.87	<0.001*
No. of days	58	77.3	65	86.7	2.21	0.14
Rest time	59	78.7	67	89.3	3.17	0.07
Content:						
Clear objectives	74	98.7	74	98.7	Fisher	1.00
Comprehensive	73	97.3	73	97.3	Fisher	1.00
Logic sequence	68	90.7	74	98.7	Fisher	0.06
Recent information	72	96.0	75	100.0	Fisher	0.24
Training methods:						
Versatile	72	96.0	74	98.7	Fisher	0.62
Interesting	67	89.3	75	100.0	Fisher	0.006*
Allow participation	73	97.3	75	100.0	Fisher	0.50
Score:						
Mean±SD	92.5±8.7		95.9±7.5			
Median	93.70		100.00		9.92	0.002*

(\*) Statistically significant at  $p < 0.05$

**Table (10):** demonstrates that high percentages of the nurses in the two groups were satisfied with the place, time, content, and methods of training. Meanwhile, significantly higher percentages of the nurses in the off-the-job group were satisfied with the ventilation of the place ( $p=0.049$ ), number of daily work hours ( $p<0.001$ ), and the training methods being interesting ( $p=0.006$ ). In total, their median satisfaction score was 100.00 compared with 93.70 among those in the on-the-job training, and the difference was statistically significant ( $p=0.002$ ).

## Discussion

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Training is one of most effective interventions in the human resources departments. Beyond the acquisition of knowledge and skills, training also helps employees and organizations to improve performance, successfully manage conflicts, encourage more job engagement and foster organizational commitment (*Ahadi and Jacobs, 2017*). Such training could be on-the-job or off-the-job training (*Dedy et al., 2016*).

The present study was aimed at investigating the differences between on-the-job and off-the-job training of nurses in documentation of nursing practice.

Moreover, in the current study, the history of previous attendance of training courses indicates very low percentages in both groups, although it was significantly lower among the nurses in the on-the-job training group. The insufficient training in both groups points to lack of staff development activities, which would have a negative impact on nurses' performance. The significant difference between the two groups in previous training should therefore be taken into consideration when comparing them for effect of the different approaches to training. In agreement with this, the lack of training was the most important factor underlying deficient practice of documentation among nurses in a study in Ethiopia (*Kebede et al, 2017*).

According to the present study results, the nurses' total knowledge about documentation was very deficient before

the training intervention. Thus, only one nurse in each of the two training groups had total satisfactory knowledge before the intervention. Meanwhile, the only significant difference between the two groups was regarding the objectives and utility of documentation, where more nurses in off-the-job group had satisfactory knowledge. Nonetheless, in quantitative analysis, no significant differences could be demonstrated in the total knowledge scores of the two groups before the intervention.

These aforementioned present study findings of the very low level of knowledge among the nurses in both groups is undoubtedly a reflection of their lack of attendance of training courses as outlined above. In line with this, research has often reported that training leads to improvements in nurses' documentation skills and consequently in its quality (*Tiusanen et al, 2010*).

The implementation of the present study intervention led to significant improvements in nurses' knowledge of documentation. This was shown in all the areas of knowledge, and equally in both groups. The significant improvement in the two groups was demonstrated both in categorical as well as in quantitative analyses where the mean and median scores were almost doubled after implementation of the intervention. In agreement with this, a study in the United States revealed significant improvements in nurses' knowledge of stroke and related documentation after attendance of a training program (*Reynolds et al, 2016*).

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Although significantly more nurses in the on-the-job group in the current study had satisfactory knowledge of the process of documentation. Moreover, the total post-intervention knowledge score was significantly higher among the nurses in the on-the-job group. This difference could be attributed to that the nurses receiving on-the-job training could more easily relate the knowledge of the process of documentation to the process in the setting. In congruence with this, the *Health Foundation Report (2012)* highlighted that the on-the-job training approach is gaining more importance since it helps attendants to directly apply the knowledge gained into actual practice.

The current study has also examined the effect of the two training approaches on nurses' audited documentation. The audit method was used to evaluate the quality of nurses' documentation accuracy, timeliness, signing, and ethical issues. This approach is best in gauging the quality of documentation as outlined by *Mykkänen et al (2012)* who also highlighted its importance in helping the nurses to develop the process of patient care, an improve the quality of patient care. It also serves to identify their training needs. Additionally, *Viana et al (2016)* mentioned that the audit of nursing documentation forms a part of their educative process.

Before the intervention, the present study results showed that the accuracy of nurses' documentation was very deficient in both groups as the audit results demonstrated. Almost all the criteria of accuracy had a median of zero, which means that at least one-half of the nurses did not meet these criteria. These findings are worrisome given the importance of the accuracy criteria such as neatness, legibility, use of correct abbreviations, no generalized/ subjective phrases, no blank spaces, etc., in ensuring the quality and usefulness of the medical records. In this respect, *Akhu-Zaheya et al (2018)* emphasized that nursing documentation must be accurate since it reflects the quality

of the nursing care provided to their patients.

At the post-intervention, significant improvements were revealed in the audit of accuracy of documentation in both groups. However, the improvements were variable across the various criteria, with most medians reaching only 2.0 out of five records audited, which means around 40% improvement on average. Meanwhile, both groups had medians of 3.0 for the items of clear hand writing and correct language. Such improvement in the accuracy of documentation is of major importance in ensuring patient safety as emphasized in a study in the United States (*Patterson et al, 2017*).

Moreover, the current study findings demonstrated that the nurses in the off-the-job group had significantly better audits regarding neatness, use of black ink. Conversely, they had lower audits regarding the items of no blank spaces left, and lines were drawn on blank spaces. Overall, significantly more nurses in the off-the-job group had adequate audit of the accuracy of documentation. This indicates that the off-the-job training is more beneficial in this area compared with the on-the-job training approach. This could be attributed to that they are more dedicated to the training being far from any interruptions at work. A similar beneficial effect of off-the-job training was reported in a study in Russia (*Belykh and Byvaltsev, 2014*).

Concerning the audit of nurses' timely documentation, the current study findings similarly demonstrated marked deficiencies at the intervention phase in both groups. Thus, the medians of almost all items were 0.0, which signifies that one-half or more of the nurses did not meet these criteria in the audited records. Meanwhile, significantly more nurses in the on-the-job group had better documentation of a new date for each shift, and a date for each entry. In line with this, a study in Taiwan by *Pei-Rong et al. (2013)*

demonstrated that the on-the-job training was more successful in improving nurses' use of a new documentation system due to more convenience and ease of use.

Nevertheless, none of the nurses in either group of the current study had adequate total timely documentation before the intervention. This could be attributed to lack of knowledge or perception of the importance of such criteria of documentation. In congruence with this, a study of nursing documentation in Slovenia revealed that a very low percentage of the audited records had adequate documentation. This was explained by the lack of knowledge and training, in addition to work organization factors (*Rajkovič et al, 2016*).

The third domain of nursing documentation audited in the present study was that of nurse's signature. The results point to very deficient nurses' documentation in this domain, with almost all medians being zero in almost all criteria. Thus, the majority of the audited records lacked full name signing, were not signed for corrected errors, and had cross-signing. Only signing with title was noticed in almost half of the records. Meanwhile, significantly more nurses in the off-the-job group had their records signed in full name. In total, none of the nurses in either group had adequate audited performance in this domain of documentation.

The abovementioned lack of the current study nurses' practice of documentation related to signature could be attributed to nurses' worries of signing in full name for fear of the legal consequences. A similar deficiency in signing in patients' records was reported in a study among nurses in Ghana (*AvokaAsamani et al, 2014*). It could also be due to absence of clear instruction guidelines and of close supervision as revealed by *Stevenson et al (2017)* in a study of nursing documentation in Sweden.

As regards the nursing documentation ethical issues, the present study findings demonstrated relatively better nurses' performance before the intervention. It was noticed that significantly more nurses in the off-the-job group had records with fixed color ink, no irrelevant details, and with no copies of the original record. However, they had significantly less records with no subjective words. Nonetheless, in total, none of those in the on-the-job group, and only one in the off-the-job group had adequate total audit in this domain, and their mean total scores did not significantly differ. In agreement with this, a study in Serbia demonstrated marked deficiencies in nurses' documentation skills (*Paunic and Stojkovic, 2014*).

After implementation of the current study intervention, significant improvements were shown in the ethical issues of documentation audited in both training groups. Some criteria demonstrated considerable improvements such as those of keeping records in private place and making no copies of the original. This was particularly evident among the nurses in the on-the-job group. Nonetheless, the total scores of the ethical issues did not differ significantly between the two groups, but were significantly higher in the pre-post comparisons within each group, thus indicating the beneficial effect of both training approaches.

According to the results of the present study, a statistically significant moderate, close to strong, positive correlation was demonstrated between nurses' knowledge and audit scores. This indicates that improving nurses' knowledge would have a positive impact on their audited practice of documentation. However, this correlation was not identified in multivariate analysis, probably due to the confounding effects of age, marital status, and experience years.

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In order to confirm the effect of the training intervention, and to examine whether the two training approaches had different effectiveness or not, multivariate analyses were carried out. The findings revealed the study intervention was the only significant independent positive predictor of nurses' knowledge score and it was the most influential. Meanwhile, the training approach, whether on-the-job or off-the-job, was not a factor influencing the improvement in nurses' scores of knowledge. Thus, training in any forms can lead to significant improvements of nurses' knowledge of documentation. In agreement with this, a quasi-experimental study in Greece revealed significant improvements in nurses' knowledge following an educational intervention (*Patiraki et al, 2017*).

Meanwhile, the current study multivariate analysis identified the state of being married, as well as the experience years of the nurses were negative predictors of their knowledge score improvement. The negative effect of being married is quite conceivable given the family obligations, which could negatively affect commitment to the training course attendance and attentiveness. In congruence with this, a study among health workers in Tanzania demonstrated a significant effect of the marital status on their motivation to work and learn (*Sato et al, 2017*).

As for the improvement in nurses' audit scores, the present study findings identified the training intervention as its main significant independent positive predictor. It was also the most influential factor on this score, although the approach to training had no influence on it. This provides a further evidence of the beneficial effect of both on-the-job and off-the-job training on nurses' audited documentation.

The foregoing current study findings are in agreement with the study carried out in Sweden by *Catrin Björvell et al (2002)* who studied longitudinal effects of a

nursing-documentation intervention on the quantity and quality of the nursing documentation in a sample of patient records, and demonstrated significant improvements after the training was implemented. On the same line, studies in Nigeria (*Adubi et al, 2017*), and in the United States (*Margonary et al, 2017*) showed statistically significant improvements in nurses' documentation after a training program intervention.

Meanwhile, the nurses' experience years and their previous attendance of training courses were additional positive predictors of the improvements in their audit scores. The positive effect of experience is quite plausible given that documentation depends in a large part on practice, which is mostly improved by experience. The attendance of training courses is also expected to have a beneficial effect on nurses' documentation. In line with this, a study in Taiwan showed that the experience years were having a positive impact on nurses' competence and practices (*Hsieh and Chen, 2017*).

Lastly, the majority of the nurses in the on-the-job as well as the off-the-job groups in the present study expressed their satisfaction with the training provided. This included satisfaction with the content and methods of training, and also the venue and schedule. Nonetheless, the score of total satisfaction was significantly higher among those in the off-the-job group. This could be attributed to that being in a new location far from job interruptions gives a better opportunity to concentrate on the training. In agreement with this, *Lussier and Hendo (2012)* recommended that the off-the-job training should better be far from the workplace to avoid problems related to work that can disturb the attendants and decrease their concentration to the training.

### **Conclusion**

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The study results conduce to the conclusion that the nurses in the study settings have deficient knowledge of

documentation and their audited related practices are inadequate. The implementation of on-the-job and off-the-job training intervention is effective in improving their knowledge of documentation, but is less effective on their audited achievement of the documentation criteria. No real differences are revealed between the two approaches and both are highly satisfying to attendant nurses.

### **Recommendations**

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- The nursing staff in primary health care centers need intensive training in documentation to improve their related knowledge and skills.
- The training programs should include both on-the-job and off-the-job training in order to combine the benefits of the two approaches.
- On-the-job training should better be used in case of hands-on training on forms and equipment specific to the workplace.
- The off-the-job training should be preferred when it involves training on new equipment or procedures, and in case of inter-sectoral and inter-professional training.
- In off-the-job training, the logistics of transportation to the training venue must be considered in planning any training programs.
- Periodic audit of nursing documentation should be done, with constructive feedback to nurses on their performance in documentation.

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