

# The Effectiveness of Electronic Nursing Documentation in Improving the Quality of Care of Hospitalized Patients

Sahar A. Abd- ElMohsen, Ph.D\* Ali A. Albzia, Ph.D\* Magda M. Elgamil, Ph.D\* Ibrahim Abdullah H Albarqy, MSc\*\*

## ABSTRACT

**Objectives;** to assess and compare nurse burnout related to the use of E-based versus paper-based nursing documentation, identify the effectiveness of E- nursing documentation in improving the quality hospitalized patients' care, and to explore and compare the relationship between burnout and the quality of hospitalized patient care. A comparative, analytical descriptive approach was used.

**Methods:** The current study employed the analytical-descriptive approach which seeks for verifying the effectiveness of electronic nursing documentation in improving the quality of hospitalized patients' care. A convenient sample of patient records and nurses from two purposefully selected hospitals, one uses electronic nursing documentation (King Fahad Medical City) and the other uses paper nursing documentation (Alsulayl general hospital), KSA. **Tools:** A- The Maslach burnout inventory to assess burn out among nurses in both hospitals, B- The Cat-ch-Ing instrument for assessing quality and quantity of nursing documentation and C- a structured patient survey tool.

**Results;** there were differences in burnout in favor of paper-based documentation, and statistically significant differences were found between the study sample users of E- documentation and paper documentation on the quality of hospitalized patients' care in favor of e-nursing documentation at P (0.01), a negative correlative relationship was found between all burnout dimensions and the overall degree of burnout and the quality of hospitalized patients' care.

**Conclusion:** Use of Electronic nursing documentation was of great value on patient outcomes, and nurses' burnout.

**Keywords:** nurses' burnout, electronic nursing documentation, paper nursing documentation quality of patient care, and hospitalized patients.

### “What is known”

In order to maintain the continuity of the individually planned patient treatment, documentation is an upgrade to the structured communication between healthcare personnel. Both paper-based and electronic health records have obvious limitations when it comes to actual nursing documentation.

### “What it contributes”

This study investigates the way in which the type of nursing documentation affects the quality of patient care, also it gives us the key behind one reason for nurse's burnout.

### \* Implications of the study:

Patients; a better patient outcome in the hospital setting which employs E-nursing documentation system. Nurses; a low burn out level among nurses working in the hospital setting using the E-nursing documentation. clinical practice; low cost due to improved patient outcome and low hospital stay.

## INTRODUCTION

Documentation of patient care is a core vital ability utilized by nurses to convey the state of patients' health, their specific needs, and their reactions to treatment<sup>1</sup>. Nursing practice benefits from promoting and enhancing nursing documentation methods. With the adoption of electronic documentation systems, healthcare documentation keeps getting more complicated. Electronic documentation systems allow for endless numbers of data pieces, in contrast to traditional documentation, where the amount of documentation is constrained by the size of the paper and letter font.<sup>2</sup> Compassion weakness, depersonalization, and

diminished individual success are all symptoms of burnout, a condition that can affect those who work in teams and provide assistance to others.<sup>3</sup> Potential stressors include the suffering and death of patients, their difficult behavior, unreasonable requests, problematic patients, organizational issues, and a lack of ardent support from coworkers and other staff members.<sup>4,5</sup> Healthcare personnel have been stated to be possibly subject to burnout as the demand for health services keeps rising. Given their extremely taxing work demands and extended patient interaction, the nursing sector in particular has reported significant levels of burnout.<sup>6</sup> Burnout syndrome affected about 11.2% of nurses globally.<sup>7</sup>

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\* Department of Nursing Sciences  
College of Applied Medical Sciences in Wadi Alldawasir  
Prince Sattam bin Abdulaziz University, Saudi Arabia.  
E-mail: sah.ahmed@psau.edu.sa

\*\* King Fahad Medical City, Riyadh, Saudi Arabia.

In Yanbu, Saudi Arabia<sup>8</sup> have found that The nurses' overall burnout rate was rather high. Moreover, Healthcare providers' burnout may potentially have a negative impact on patient care.<sup>9</sup> Also, <sup>10</sup> reported that Burnout and nurse quality of care were highly correlated, and poor nursing quality can dramatically worsen patient outcomes as UTIs, patient falls, pressure ulcers, critical episodes, and readmission. the national agenda <sup>11,12</sup> assumes that The quality of care given to hospitalized patients will significantly increase with the use of electronic sources, such as nursing documentation.

## OBJECTIVES

The current research aims to: Assess and compare nurses' burnout in relation to the use of electronic-based versus paper-based nursing documentation, Identify the effectiveness of electronic nursing documentation in improving the quality of care to hospitalized patients and Explore and compare the relationship between burnout and the quality of hospitalized patient care.

## METHODS

**First: Research Procedures:** In this section, the researchers present the methodology utilized in this research, the research sample, the research tools (questionnaires): the steps of preparing it, its psychometric properties, and the statistical methods used to answer the research questions.

**Study Methodology:** The current study relies on the analytical-descriptive approach for its suitability for the nature of the current study, which seeks for verifying the effectiveness of electronic nursing documentation in improving the quality of hospitalized patients' care.

**Study setting:** Two purposefully selected hospitals in KSA, one uses the electronic recording of patient data and the other uses paper records (Alsulayl general hospital).

## STUDY SAMPLE

**Sample for verifying the study tools (Pilot study):** The sample of the study consisted of (30) nursing staff in Alsulayl general hospital and King Fahad Medical City (KFMC), KSA.

**The Main Study Sample:** The main study sample consisted of (30) nursing staff from Alsulayl general hospital who utilize paper nursing documentation and the second group comprised (30) nursing staff members who use e-nursing documentation at King Fahad Medical City. The researchers ensured that the number of the two research samples of the users of electronic and paper nursing documentation was equal so as not to affect the study results.

## STUDY TOOLS

**Maslach Burnout Inventory™ (MBI) by<sup>13</sup>:** It is the most widely used indicator of burnout and has been supported by significant studies for more than 35 years. The measure examines three factors including emotional exhaustion, depersonalization, and personal achievement—to assess the likelihood of burnout. The Maslach Burnout Inventory™ (MBI) by Maslach et al. was selected to be part of this study tool after reviewing related studies and previous literature on electronic documentation in general; and what was written about electronic nursing documentation in particular, in addition to reviewing the measurements in this field.

**The Scale Validity:** The psychometric properties of the Maslach Burnout Inventory scale were confirmed by applying the scale to the

sample of the pilot study (30) from the nursing staff at Alsulayl general hospital and King Fahad Medical City. The formative and construct validity was ensured by measuring the correlation coefficient between each statement's total score on the survey and the field to which it pertains, as shown in Table (1), and then between each domain's overall degree and the scale's overall degree, as shown in Table 2. This will help determine the scale's internal consistency.

**The Scale Reliability:** Cronbach's alpha internal consistency was used to establish scale reliability. The reliability coefficients were, respectively, (0.864, 0.786, 0.939), and all of them were significant at (0.01) level. Thus, The scale's high level of validity and reliability allows for its use in the main study.

**The Cat-ch-Ing instrument:** A novel documentation approach was created and put through testing in 1992 by <sup>14</sup>. The abbreviation for the approach, By combining the Swedish words for wellness, integrity, preventive, and security VIPS was developed, which are considered to be the most important goals of nursing care.

This form contains a nursing care plan since it is designed to be used for recording the nursing procedure. A nursing discharge note is also included in the model. The model's objective is to direct nurses in the assessment, problem identification, goal, planning, implementation, and evaluation sequences such that nursing documentation is organized, sufficient, and simple to use in clinical care.

The Cat-ch-Ing instrument's final version (appendix), finished in December 1996, consists of 17 questions: 10 indicating the existence of each nursing process phase; One asks about keywords, one inquires about the existence of the assigned nurse to each patient, and four ask about dating, signatures, and readability.

**SCORING:** The overall score is between 0 and 80 points. Questions posed to measure the substance of the nursing process may contribute 68 % of the final score; 15% of the questions are related to criteria for judging legibility, signature, and dating; 7% are related to keywords; 5% are related to the nursing discharge statement; and 5% are related to identifying a primary nurse. The quantity and quality of nine of the questions can be graded. Five questions, such as "Are all entries signed?" can only be assessed for quantity, while one query regarding legibility can only be rated for quality. The two remaining questions have "yes" or "no" answers.

The inter-rater reliability coefficient was calculated to be 0.98, 0.98, and 0.92 for each group of patient records from the three sections. The expert panelists' shared content validity ratio (table 1) varied from 0.60 to 1.0. The expert panelists determined that all but three of the instrument's 12 items measuring the nursing process were crucial.

## A structured patient record survey tool

This tool was designed by the researchers to assess the demographic and medical variables of the studied patients; these data were not statistically analyzed it was collected for the identification of records only and from the nurse's perspective does the type of nursing documentation affects patient's outcomes and if yes in what way.

## RESULTS

To obtain the study results, the researchers used the following statistical techniques: t-test for comparing variations between independent samples, as well as averages, standard deviations, frequencies, and percentages of replies from the study sample on the study tools, and

Pearson's correlation coefficient to confirm the relationships between variables.

**Table (1)** shows the values of the correlation coefficients and their statistical significance for each statement of the Maslach Burnout Inventory scale.

The significant correlation ( $r = 0.68$ ) between the scores of the Ehnfors and the Cat-ch-Ing instruments served as evidence of the criterion-related validity for the Cat-ch-Ing instrument in.

**Table 1.** Correlation Coefficients between the domain's overall score and the Scale's Overall Score

Domain	Burnout	Depersonalization	Personal achievement
Correlation Coefficient	0.721	0.465	0.466
Sig. Level	0.01	0.01	0.01

**Table 2.** Content validity ratio between expert panelists judging items of the instrument as essential or not in measuring the nursing process in the patient record

Ratio	Judged as "essential" by experts (n=10)	Item
0.80	9/10	Is there a nursing history?
		Is there a nursing status:
1.0	10/10	On arrival?
0.80	9/10	Updated?
0.60	8/10	On discharge?
1.0	10/10	Is there a nursing care plan: Nursing diagnosis?
0.60	8/10	Expected outcome?
0.80	9/10	Interventions: Planned?
0.80	9/10	Implemented?
0.60	8/10	Is the underlying information for the nursing diagnosis described in the nursing status?
0.80	9/10	Is the nursing outcome described?

**Table (3)** illustrates that there were differences in burnout in favor of paper-based documentation at the level (0.01) in the three dimensions and the overall degree, indicating that the users of paper nursing documentation are more likely to be burned out than the e-nursing documentation users.

**Table 3.** Surveying the Primary Study Sample of Electronic Nursing Documentation Users Points of View Regarding Its Benefits

Ratio	Judged as benefits by primary study sample (n=30)	Item
0.90	27/30	Allowing duty is easier?
0.85	26/30	There is more time to complete patient documentation.
0.93	28/30	There is more time for patient care effectively.
0.85	26/30	We can spend more time with more patients.
0.90	27/30	Our files are always complete
0.90	27/30	It makes it easy for us to communicate quickly and effectively.

In the current study, the effect size coefficient was (0.993); illustrating that the effect size was large and that e-nursing documentation had a significant effect on the quality of hospitalized patients' care as illustrated in **(table 4)** which reveals a survey of the primary study sample of users of electronic nursing documentation points of view regarding its benefits.

**The First Hypothesis Validation Results;** "Are there any differences between the study sample users of e-nursing documentation and paper nursing documentation in burnout?" To verify this hypothesis the researchers utilized the t-test to illustrate the differences between the users of e-nursing documentation and paper nursing documentation in burnout and Table (4) indicates the results of this hypothesis.

**Table 4.** Study Hypotheses

Variables	E-nursing Documentation		Paper nursing Documentation		t-value	Sig.
	Mean	SD.	Mean	SD.		
Emotional exhaustion	23.06	5.95	30.00	7.61	3.93	0.01
Depersonalization	15.53	5.56	21.16	7.45	3.31	0.01
Personal achievement	35.63	9.81	43.80	5.02	5.55	0.01
Total	74.23	11.41	93.96	12.52	6.37	0.01

**Table (5)** illustrates that there were differences between the study sample of users of e-nursing documentation and paper nursing documentation on the quality of hospitalized patients' care in favor of e-nursing documentation at the (0.01) level, indicating that e-nursing documentation had a great impact in improving the quality of hospitalized patients care. To identify the effect size of e-nursing documentation on the quality of hospitalized patients' care, the researcher calculated the effect size with Cohen's effect size equation (Kotrlík & Williams, 2003:4). The effect size is large if it is greater than or equals to (0.8), but if the value is between (0.5:0.8) the effect size is medium, while if the value is less than or equal to (0.2) the effect size is weak.

**The Second Hypothesis Validation Results;** "There are differences between the study sample of users of e-nursing documentation and paper nursing documentation in the quality of hospitalized patients care". To verify the validity of this hypothesis, the researchers utilized the t-test to reveal the differences between the users of e-nursing documentation and paper nursing documentation in the quality of hospitalized patient care, and Table (5) indicates the results of this hypothesis.

**Table 5.** t-test to reveal the differences between the users of e-nursing documentation and paper nursing documentation on the quality of hospitalized patient care

Variables	E-nursing Documentation		Paper nursing Documentation		t-value	Sig.
	Mean	SD.	Mean	SD.		
Quality of Care	71.00	0.40	46.00	2.03	66.29	0.01

**Table (6)** reveals that there was a negative correlative relationship between all burnout dimensions and the overall degree of burnout and the quality of hospitalized patients' care.

**The Third Hypothesis Validation Results**

Is there a statistically significant correlative relationship between burnout and the quality of hospitalized patient care? To verify the validity of this hypothesis, the researchers utilized Pearson's correlation

coefficient to reveal this correlation, and Table (6) illustrates the results of this hypothesis.

**Table 6.** Pearson's correlation coefficient relationship between burnout and the quality of hospitalized patient care

Burnout	the quality of hospitalized patients' care	
	Correlation Coefficient	Sig. Level
Burnout	-0.476	0.01
Depersonalization	-0.385	0.01
Personal achievement	-0.431	0.01
Total	-0.648	0.01

**DISCUSSION**

The availability of electronic data storage that enables automatic quality assessment, avoiding time- and money-consuming human chart reviews and medical record abstraction, making EHR an ideal tool for evaluating healthcare quality and tracking the performance of healthcare providers.<sup>15,16</sup>

The adoption of any comprehensive EHR may be slowed down by a number of possible obstacles, including a lack of computer literacy, high costs, security worries, workflow challenges, and time.<sup>17</sup> According to the Center for the Advancement of Health, in 2007, illegible handwriting was the cause of more than 60% of prescription errors in hospitals, which has been a major cause of drug errors historically.<sup>18</sup>

The current study results revealed that there were differences in burnout in favor of paper-based documentation at the level (0.01) in the three dimensions (emotional exhaustion, depersonalization, and personal achievement) and the overall degree of burnout, indicating that the users of paper nursing documentation are more likely to be burned out than the e-nursing documentation users. The researchers attributed this result to the possibility that paper records are time-consuming, they don't have a consistent layout and information format that makes the records different from one to another, and illegible handwriting can lead to fatal errors that always put the nurse in a stressful situation for fear from errors. On the other hand; users of electronic nursing documentation pointed out the benefits of its use as follows; it gives them time to be more in contact to provide direct patient care, easier to fill in a complete consistent format as it is a consistent template and it also allows communicate quickly and effectively.

This result contradicts the result of<sup>19</sup> who reported that two hours were spent using the EHR for every hour spent directly treating patients and related administrative tasks, which results in severe clerical and cognitive loads. Additionally, according to<sup>20</sup>, only 13.6% of healthcare professionals (HCPs) who do not use an EHR think they have enough time for documentation, compared to nearly 50% of those who do. The excessive use of the EHR at home by more than one-third of HCPs is a factor in their discontent and lack of work-life balance, which raises the risk of burnout.<sup>21,22</sup>

Many nurses are unhappy with their despite all these potential advantages for patients and providers, EHR. Nearly 14,000 nurses participated in a study, and 69% said their IT department is ineffective, and 92% said their EHR is a problem. Additionally, they think that using the EHR requires a lot of time and takes attention away from their patients.<sup>23</sup>

A negative correlative relationship was found between all burnout dimensions and the overall degree of burnout and the quality of hospitalized patients' care. That is, the higher the burning degree, the lower the quality of hospitalized patients' care, and vice versa. The researchers attributed this result to as was reported in a meta-analysis conducted by<sup>24</sup> provided evidence that the implementation of EHR can enhance healthcare quality, boosting productivity and adherence to recommendations while decreasing prescription mistakes and adverse drug effects (ADEs).

By using EHRs, Medical errors, inconsistent clinical practice, and the application of inefficient treatments are all decreased<sup>25</sup>, which leads to better patient outcomes and more cost-effective care.<sup>26</sup> Additionally, The use of appropriate information technology (IT) in the delivery of healthcare boosts hospital efficiency, according to a number of studies, with benefits outweighing implementation costs<sup>27</sup> and patient satisfaction.<sup>28</sup>

For each and every member of the hospital staff, maintaining the security of all protected health information is a significant task. using security and audit trails that provide information about who has accessed the medical data when and what was done by the individuals while accessing each record, EHRs facilitate this and enhance accountability. Additionally, EHRs protect this information from anybody without authorization to view patient data. On the other side, Health information can be read, printed, and communicated by people to healthcare practitioners using patient portals, giving them the capacity to act as their own advocates.<sup>29</sup>

With technological improvements, The use of an EHR can improve nursing documentation, patient outcomes, and patient care. Additionally, it will keep transforming the healthcare industry.<sup>30</sup>

Finally, the present study results revealed that there was a negative correlative relationship between all burnout dimensions and the overall degree of burnout and the quality of hospitalized patients' care. And this result comes in line with the results of<sup>31</sup> and<sup>32</sup> who found that, when nurses included in their research experienced burnout, it resulted in a substandard quality of care being provided to patients. Also in the same line other studies have shown that the incidence of burnout syndrome is inversely proportional to patient outcomes.<sup>33</sup> Additionally, studies show that clinicians who spend more time on administrative work report lower job satisfaction, which is associated with an increase in burnout symptoms.<sup>34</sup>

**RECOMMENDATIONS**

An important solution to the documentation burden is the optimization of the EHR and education. Strategies for the implementation of EHR should be recommended and promoted. Also, The results of this study suggest that in order to raise patient care quality perceptions, it is necessary to identify strategies for preventing and reducing burnout.

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A. A. Conceived and designed the analysis, Performed the analysis.

M. M. Conceived and designed the analysis, Collected the data, Contributed data or analysis tools.

I. A. Collected the data from KFMC.

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**Competing Interest:** None

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