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## **Application Developing of Virginia Handerson Model in Electronic Nursing Record (enr) at Andi Makkasau Hospital Parepare**

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### **Abstract**

Development of Electronic Nursing Record (ENR) is done to provide facilities for nurses to perform nursing care documentation via the computer software that will allow nurses, provide advantages in terms of effectiveness and increasing the time nurses visit patients. In this research, a model of nursing care documentation ie electronics based Electronic Nursing Record (ENR), the researchers conducted the development of models with 5 stages of model developmentPlomp namely, the initial assessment, planning, construction, implementation and evaluation. This study uses a mixed method design that is both quantitative and qualitative phases. Quantitative design is used to determine the readiness pengetahuan and nurses on the application of the model-based electronic documentation, as well as paper-based documentation quality comparison with electronics. Qualitative design used to obtain data on ENR models that can be applied in the hospital. The approach used in this study is a quantitative approach and qualitative methods of research and development (Research and Development / R & D).

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The population in this study were nurses hospitals AndiMakkasauParepare. The sampling technique used in this study correspond to the approach used every stage of research that is purposive sampling and total sampling. The results showed that the knowledge of nurses about nursing care documentation majority have a good category (97.5%) and the readiness of nurses towards the implementation of EletronicNursing Record (ENR) are largely in good keategori (58.5%), this shows that nurses in hospitals AndiMakkasauParepare have big capital and the conditions are ready for nursing care documentation melaksanakan-based technology that is Eletronic nursing Record (ENR). Then ENR has produced models that have been tested in the form of a computer program or application. Further comparison between the quality of the paper-based nursing care documentation with electronic-based nursing care documentation (ENR) is done Mann Whitney with significance value of 0.005 ( $P < 0.05$ ) showed that the ENR has better quality than with paper.

**Keywords:** Eletronic nursing records; nursing documentation; nursing care.

## **1. Introduction**

Nurses as one of the workers who had a big contribution to the health service, has an important role to improve the quality of service kesehatan.dalam efforts to improve the quality of health care, a nurse must be able to perform nursing care according to the standard, ie from start of study, up to evaluasi.Standar professional nursing practice is a guideline for nurses in Indonesia in implementing asuhan nursing through nursing process approach. Standards of nursing practice consist of assessment, nursing diagnosis, planning, implementation, and evaluation.Law nursing No. 38 Year 2014 Chapter V, Article 30, paragraph 1 in performing their duties as caregivers of nursing in the field of individual health efforts, the nurse is authorized, performing nursing assessment holistically, establishing nursing diagnosis, planning nursing actions, implementing nursing actions, evaluate the results of nursing action. In the process is a very important thing to do is nurse nursing care documentation as a form of responsibility and accountability as the service provider of nursing. Any action given to Klian should be recorded in the nursing care documentation.

Nursing documentation is one of the tools used in communications validate nursing in nursing care, means of communication between other health team and is a document of patients in nursing care. Based on the results of research conducted [1] showed a significant increase in the quantity and quality of documentation on three of the four rooms of 240 inpatient nursing documentation (= 60 documents per ward), chosen randomly from registration hospitalization. The results showed that the introduction of computer-based nursing documentation system can help improve nursing documentation. The quality of nursing documentation is not only influenced by human factors such as aspects of motivation and attitudes of nurses towards documentation, but also relevant to the organization in a hospital environment and technological aspects of performance and compliance. Interventions task to improve the quality of documentation needs to be planned continuous and a constant challenge.

Other studies have shown a significant increase of the quantity and quality of documentation on three of the four departments. The positive aspects include the completeness of the documentation of the nursing process, the formal aspects and quality improvement by nurses. The negative aspect is mainly related to the content of the

plan perawatan. Research that conducted by [2] in a hospital showed that there is 87% extra nurses working more than 12 hours because they have to finish documenting the conventional manner. In this regard, the creation of a sub-committee of the technology to determine whether the technology can improve service quality, efisiensi work, user satisfaction for nursing services.

The use of electronic-based recording (electronic nursing documentation system) has long been used by countries that are already developed. Indonesia itself is a developing country, in several public and private hospitals have started to implement it, although still limited to the demographic data of patients, nursing assessment, disease diagnosis, and therapy. From the preliminary study in several hospitals in South Sulawesi in general are still using paper format provided by the hospital and some of the results of research in hospitals in Indonesia stated that pendokumentasian nursing care are still many unfilled, for various reasons, among others, the workload, time limited not important stage is the knowledge of nurses in documentation. Therefore in this study developed a model based Electronic Nursing Record (ENR).

Based on preliminary data General Hospital (Hospital) AndiMakkasauParepare, documentation of nursing care are still using paper format.

Results of preliminary interviews with hospital nurses miraculous that the nursing documentation not being filled because of a problem understanding of the importance of documentation, time constraints, the number of patients who were not balanced with the amount of power that the increased workload in addition sometimes askep format is not available.

Based on the above can set a general goal of this research is a model mengembangka Electronic Nursing Record (ENR) in hospitals AndiMakkkasau, Parepare.

## **2. Materials and Methods**

### ***2.1 Research design***

This study uses a mixed method design that is both quantitative and qualitative phases. Quantitative design is used to determine the readiness pengetahuan and nurses on the application of electronic-based documentation models. Qualitative design used to obtain data on ENR models that can be applied in the hospital. The approach used in this study is a quantitative approach and qualitative methods of research and development (Research and Development / R & D).

### ***2.2 Population and Sample***

The population in this study is perawatRSUDAndiMakkasau City Parepare. Teknik sampling used in this study corresponds to the approach used every stage of research yakni purposive sampling and total sampling.

### ***2.3 Method of collecting data***

The study is in the initial assessment stages using two questionnaires, namely knowledge of nursing care documentation with the type of scale used was Gutman and the readiness of nurses hospitals AndiMakkasauParepare application of technology-based nursing documentation Electronic Nursing Record (ENR) with the type used is a Likert scale.

Then in the planning stage FGD method is used to collect data.Selanjutnya at the implementation stage and the evaluation used a questionnaire assessing the quality of nursing care, paper-based to electronic-based that has been developed that uses a Likert type scale.

### 2.4 Data analysis

Analysis of the data used in this study correspond dengan research approach used every stage of research, the descriptive analysis, thematic analysis and comparative analysis.

### 3. Results

Development Model Electronic Nursing Record (ENR)

#### 1. Initial Assessment Phase (Phase I)

Nurses knowledge about Nursing Documentation.

Almost all nurses in hospitals AndiMakkasauParepare have sufficient knowledge about nursing care documentation in both categories namely 97.5%, and only 2.5% in the medium category and no nurses with less knowledge categories, table 1.

**Table 1:** Distribution of Knowledge Nursesat Nursing Documentation in hospitals AndiMakkasauParepareCity in 2016 (n = 118)

Category	Number	Persentase (%)
Enough	115	97,5
Less	3	2,5
Total	118	100

Knowledge of nurses about nursing care documentation based on each room.

In both categories is a nurse at the VIP room I, II VIP, VIP III, Bougenville, Bed and Nusa Indah by the same percentage (100%), then the room Teratai (93.9%) and room Chrysanthemum (77.8%) can be seen in table 2.

Readiness Nurses on the Application of Electronic Nursing Record (ENR)The majority of nurses in hospitals AndiMakkasauParepare have a good readiness of the implementation of Electronic Nursing Record (ENR) that is in both categories as much as 58.5%, 41.5% in the medium category and no nurses with less readiness category.

In more researchers describe the distribution of hospital nurses readiness category AndiMakkasau city of Pare Pare on the implementation of Electronic Nursing Record (ENR) based treatment rooms where work can be seen on page appendix table 3.

**Table 2:** Frequency Distribution of Knowledge Nurses Nursing Documentation in hospitals AndiMakkasauParepareCity in 2016 by Room Place of Work (n = 118)

Rooms	Good		Moderate	
	Number	(%)	Number	(%)
VIP I	8	100	0	0
VIP II	10	100	0	0
VIP III	11	100	0	0
Anggrek	12	100	0	0
Asoka	12	100	0	0
Bougenville	8	100	0	0
Melati	16	100	0	0
Nusa Indah	16	100	0	0
Seruni	7	77,8	2	22,2
Teratai	15	93,9	1	6,3

**Table 3:** Frequency Distribution Readiness Nurses in hospitals AndiMakkasauParepareCity in 2016 (n = 118)

Category	Number	Percentage (%)
Ready	69	58,5
Not so ready	49	41,5
Total	118	100

Sequentially readiness of nurses based on each room that are in both categories ranging from the highest percentage of nurses in the room Bed and Nusa Indah by the same percentage (81.3%), VIP room, I also room Asoka (75%), Lotus room (62.5%), VIP III (54.4%), VIP room II (50%), the room Chrysanthemum (33.3%), Orchid room (25%) and the last is room Bougenville (12, 5%), can be found on table 4.

**Table 4:** Frequency Distribution Readiness Nurses on Implementation of Electronic Nursing Record (ENR) in hospitals AndiMakkasauParepareCity in 2016 by Room Place of Work (n = 118)

Rooms	Good		Moderate	
	Number	(%)	Number	(%)
VIP I	6	75	2	25
VIP II	5	50	5	50
VIP III	6	54,5	5	45,5
Anggrek	3	25	9	75
Asoka	9	75	3	25
Bougenville	1	12,5	7	87,5
Melati	13	81,3	3	18,8
Nusa Indah	13	81,3	3	18,8
Seruni	3	33,3	6	66,7
Teratai	10	62,5	6	37,5

## 2. Planning Stages (Stage II)

This part illustrates the overall theme is formed from the results of the analysis based on the answers and discussion from informants.

When the researchers conducted Focused Group Discussion (FGD) which refers to the purpose of research, informants in this study earlier given description of the results of phase study on the model of Electronic Nursing Record (ENR) as well as the design of the early models ENR is intended to provide the perspective of the initial informant before FGD the design of the model ENR General Hospital (RSU) AndiMakkasauParepare. Based on the FGD guidelines set out five key themes in the design study model IPE in Nikken UIN Alauddin Makassar. Various themes are: 1) Assessment, 2) Diagnosis, 3) Intervention, 4) Implementation 5) Evaluation. But in the implementation of the FGD, these themes are described and discussed together the nursing process.

### a. Nursing process

FGD, informants revealed input for the revision of the initial draft ENR that have been made include any adjustments to the existing standards in hospitals, integrated documentation, as well as their informant at the

time when the FGD documented.

#### 1) Adjustment of Nursing Process

Informants when FGD provide input that the draft ENR needs to be developed with the adjustment of the assessment, diagnosis and interventions that have been there previously defined at the hospital so that it will leihmake it easier for them to implement.

#### 2) Documenting integrated

At the time of the informant FGD mengemukakanbahwa in documenting care / nursing process needs to be integration among all the professions in terms of implementation in order to follow the standards set.

#### 3) The need for a documentation

At the time of FGD informant suggested that the draft should be accompanied ENR made implementation time nursing care.

### *3. Stages of Realization / Construction (Phase III)*

At this stage,

based on the results of the planning on the FGD ENR in the form of software that are ready to proceed to the implementation phase.

### *4. Stages Test, Trial Implementation and Revision (Stage IV)*

At this stage of testing (implementation) for 14 days to install an application that has been made into a computer in the maintenance space becomes a space pilot ENR applications.

### 5. Stages of Implementation and Evaluation (Phase V):

The difference between the quality of Paper-Based Nursing Documentation with electronic-Based Nursing Documentation.

At this stage of implementation for 14 days, then the measurement of the quality of nursing care documentation with ENR then, after normality test significance value to pretest 0020 which means that the value of  $p < 0.05$  was thus concluded the data is not berdistribusi normal and at posttest value of  $p = 0288$  or the value of  $p > 0.05$  so that it can be concluded the data were normally distributed.

Because there is one that is not normally distributed data is then ineligible for parametric test that used alternative is to test Mann-Whitney. Hasil normality test can be seen in appendix table 5.

Furthermore, from the results of statistical tests to see the difference in quality of paper-based documentation to

electronic-based documentation quality using Mann Whitney test found no difference in quality documentation with significance value of 0.005 ( $P < 0.05$ ).

Where the median value of paper-based documentation quality is 83, while the quality of the electronic-based documentation is 90. It can be seen in appendix table 6.

**Table 5:** Results Normality Test Data Quality Assessment Nursing Documentation to the Application of Electronic Nursing Record (ENR) at Nusa Indah Hospital Inpatient AndiMakkasauPareparein 2016 (n = 22)

Gropus		Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statisti c	df	Sig.	Statisti c	df	Sig.
Documentation quality	<i>Paper Based Nursing Documentation</i>	.214	22	0.10	.907	22	.041
	<i>Electronic Based Nursing Documentation</i>	.159	22	.156	.948	22	0.288

Lilliefors Significance Correction

**Table 6:** Difference Analysis Paper-Based Documentation Quality With Quality-Based Electronic Documentation (n = 22)

	n	Median (minimum- maksimum)	P
Documentation quality of paper base	22	83 (67-98)	0.005
Documentation quality of elektronik base	22	96 (81-99)	

\* Mann-Whitney test

#### 4. Discussion

##### 4.1 Initial Assessment Phase (Phase I)

Nurses knowledge about Nursing Documentation

Measurement of knowledge of nurses hospitals AndiMakkasau Pare Pare on nursing care documentation, shows that the majority of nurses have knowledge about nursing care documentation in sufficient category (97.5%), as many as 3% of nurses have knowledge in the moderate category and none of the nurses who have knowledge



less about aboutasuhan nursing documentation. Measurement of knowledge using 13 items of questions with "Yes" and "No". Those questions is a series of questions prepared by the basic theories were considered very important to know before the implementation of Electronic Nursing Record (ENR) because knowledge is the basis for the nurse to be able to melaksanakan functions, duties, and their role as caregivers keperawatn along with responsibility and gugatnya.

The result can be assumed that nurses in hospitals AndiMakkasauParepeare State has authorized capital (knowledge) that is sufficient to implement the electronic-based nursing care, it also shows a good understanding of the theory of nursing care. Similar to the study conducted by Mastini (2013) [3], that respondents with good knowledge with appropriate documentation completeness and as much as 83.3% of respondents with less knowledge with complete documentation does not correspond as much as 86.4%. Knowledge relating to the completeness of the documentation of nursing care ( $p < 0.05$ ) in which the results obtained by the analysis of the questionnaire as much knowledge as 14 questionnaires filled out by the nurse on duty at Medical Surgical Space and Space Ratna.

If either the nurse's knowledge is likely to have the ability to have a complete nursing documentation, vice versa, if the nurse showed less knowledge of nursing care documentation is incomplete. This is what will drive nurses to be ready to apply the Electronic Nursing Record (ENR).Preparedness for the Implementation of Electronic Nursing Record (ENR)

Measurement readiness Hospital nurse AndiMakkasauParepeare, shows that the nurse has largely preparedness for the implementation of Electronic Nursing Record (ENR) in either category (58.5%), as many as 41.5% of nurses had readiness in the medium category and none nurses who have poor readiness of the implementation of Electronic Nursing Record (ENR). Measurement readiness to use 10 statements with "Strongly Agree," "Agree", "Disagree" and "Strongly Disagree". A statement of which approach strongly agree that "The existence of nursing care electronic documentation software will help nurses make the team better health services", "I will study well if there are electronic nursing documentation system". While the answer is not agreed to appear on the statement "can be harmful to the patient if the nurse has in electronic nursing documentation system", and "electronic nursing documentation system will degrade the performance of the profession".

It is important for nurses is openness and confidence to accept and utilize electronic ashuan based nursing well. Readiness owned nurse is an initial step that is very appropriate to begin the implementation of Nursing Eletronic Record (ENR). This illustrates that the nurses are in a good readiness to implement ENR.

Response to the statements contained in the instrument indicates that the hospital nurses AndiMakkasauParepeare Makassar realize the importance to create a development in terms of nursing care documentation. Nurse is a resource that supports improving the quality of health services in hospitals, and therefore any form of developments in it is a good faith to support the improvement of health services.Readiness is an illustration of the attitude of a determination by the individual liking or disliking toward the object (stimulus). The attitude is emerging here could be interpreted if the better preparedness of nurses towards implementation of Electronic Nursing Record (ENR), there is usually a tendency to do a proper and appropriate documentation.

#### ***4.2 Planning Stages (Stage II)***

Based on the analysis of the results of the research with a qualitative approach through Focused Group Discussion (FGD), found the main themes that provide feedback on the draft Electronic Nursing Record (ENR) in the General Hospital (RSU) AndiMakkasauParepare

##### **a. Nursing process**

The results of this study stated that the component input in the design phase ENR include adjustments to the nursing process that has been applied previously by hospitals, integrated documentation as well as the needs of the time in the documentation process. This means that before ENR applied in a hospital needs to increase efforts for the implementation of ENR can run well and the nurse's role also can run well. These results are in line with [4] that for nurses and leadership in nursing, attention and efforts should be enhanced to ensure the role of nursing in nursing care is seen in a way that can be extracted to meet the information needs of many individuals involved in providing care directly. Outside the individual patient, the data found in the EHR can also facilitate new methods and inventions to manage health at a greater rate through institutions, organizations, and groups that are registered nationally whose mission is to address issues of public health, which remains a burden on individuals, communities and nations.

#### ***4.3 Construction Stages (Stage III)***

Based on the inputs on the FGD has been in construction back in ENR that can be applied in the RSU AndiMakkasauParepare. In the research by Park and his colleagues [5] that research is one of the first attempts to develop ENR system based on the model information and clinical practice guidelines to support nursing practice and nursing. Report documentation prepared in detail in prototype systems were found to be quite relevant, useful and applicable. This study has revealed the feasibility of developing the ENR system. However, there is a tendency that the different point of different provisions in the process of documenting nursing care, then from this research is done so that the ENR being developed can be aplikatif. Study by Jansen colleagues [6] by the Research and Development (R & D) revealed that the quality of data collection the assessment can be enhanced with ENR solution and will facilitate clinical research nurse. Finally, detailed clinical model (DCM) may be used by other disciplines as well, thus allowing the potential for better cooperation.

#### ***4.4 Stages Test, Trial Implementation and Revision (Stage IV)***

Implementation carried out for 14 days by installing applications that have been created into the computer in the maintenance space becomes a space pilot ENR applications. The nurse said that it is raising the completeness of nursing care in patients and is also able to increase the number of visits patients while on duty, although still in the stage of adaptation to expedite the process of inputting or assessment. In the study MeibnerandSchnepp [7] suggest that the use of information technology requires a different form of treatment informasi. Beberapa people feel a new form of information processing is as beneficial while others tidak. Temuan next is find it more difficult to enter data and results in documentation buruk. Peningkatan clinical nurse record quality leads to an overall improvement in the quality of care. However, if the poor quality of records, some nurses feel this is not

necessary. In addition, the length of time required to complete the documentation are prominent themes in the process.

They are more efficient with electronic documentation showing improvement treatment. The sharing time are less efficient with electronic documentation, information processing considered time-consuming. Usually, something which is likely to benefit when using IT, but this is dependent on the sale or inhibiting factors such as ease of use and ability to use them, availability of equipment and technical functions, as well as attitude. In summary, the results showed that the nurses feel information technology as beneficial when it is able to simplify their work routines everyday and as an expense when it complicates their work processes. Do IT complicate or simplify their routines depending on factors that affect. Garis between the benefits and burdens are different semipermeabel. Pengalaman accordance with the duties and responsibilities.

#### **4.5 Stages of Implementation and Evaluation (Phase V)**

The quality difference between Paper-Based Nursing Documentation with electronic-Based Nursing Documentation.

Phase evaluation using quantitative research approaches aimed at comparing the nursing care documentation using paper with documentation of nursing care using the Electronic Nursing Record (ENR). The results of this study indicate that there is a difference in quality of documentation with significance value of 0.005 ( $P < 0.05$ ). Where the median value of paper-based documentation quality is 83, while the quality of the electronic-based documentation is 96. This means that by using ENR quality nursing care can be improved.

The results of this study are consistent Ammenwerth, et. al., [8], this study aimed to compare the paper-based documentation with electronic-based research by using research methods research design Randomized Control Trial (RCT) to compare the two systems of this documentation. The result showed that the time savings or improved quality of electronic-based documentation can not be demonstrated overall significant, but the benefits can be observed by looking at their time savings in nursing intervention and completeness of documentation. During the study there was a slight decrease in the use of time in the group that use electronic-based documentation. From interviews also obtained that information by using a computer-based documentation can boost the cooperation between the health professions where nurses and doctors declare with electronic-based communication between health workers better, supported by an increase in patient documentation completeness. Further research by Rouleau and his colleagues [9] with the approach of systematic reviews of the impact of the use of technology and information on nursing services concluded that currently has the potential to be supported, enhanced, or limited by the use of information technology and communications to provide different types of care and services to patients. This finding is an interesting starting point to compare and contrast the findings of a separate review of the positive and negative impacts of technology, information and communication on the treatment [10].

#### **5. Conclusions and Recommendations**

From the results, it can be concluded that the majority of nurses at RSU AndiMakkasauParepare have sufficient

knowledge of the nursing care documentation with a percentage of 97.5% and no perception of poor value. Then the majority of nurses also have a good readiness to adoption of ENR with a percentage of 58.5%, and there is no readiness buruk. Kemudian value has been generated ENR models that have been tested in the form of an application or computer program. Then, comparison between the quality of nursing care documentation paper-based to electronic-based nursing care documentation (ENR) shows that the ENR has better quality than with paper.

Advice can be given in the form of the presence of this study, it is suggested to the decision-makers in the RSU AndiMakkasauParepare order models ENR can be immediately applied, the support of all parties in the General Hospital (RSU) AndiMakkasauParepare will be a great asset in the application ENR ini. Bagi subsequent researchers ENR is expected to test a model that has been generated in this study and then make corrections-improvement toward the better, in order to create an effective and efficient model of ENR.

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