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Designing evidence based nursing care instructions for mechanically ventilated patients in Intensive Care Unit

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ABSTRACT

Aims: According to this approach that: "standardization of nursing care according to the last evidences has the best results in increasing care quality", the aim of this study has been determined: "Designing evidence based nursing care instructions for mechanically ventilated patients".

Methods: The study had been done with "developmental research" method with the approach based on evidences in Intensive Care Units of Baqiyatallah hospital in 1392. At first quality of 15 present instructions in Intensive Care Units had been evaluated in three levels of weak, moderate and good. Then 22 new instructions had been designed according to Stetler model and with the approach based on evidences. For assessing content validity of the instructions, opinions of ten faculty members of Baqiyatallah, Tehran and Shahid Beheshti Universities had been considered in three refers by Delfi method. Applicability of the instructions had been assessed by focused group discussion method with experienced experts of Intensive Care Units.

Results: Evaluation of the 15 present instructions showed that their quality is in the medium. In addition to reviewing nursing books, 655 articles had been studied, and with considering criteria of choosing evidences, 121 articles had been chosen as credible evidences. At the end 22 care instructions with good quality had been designed.

Conclusions: Lack of specification of the present instructions and their low quality showed necessity of designing instructions based on evidences with high quality and specifically for different units. Designing such instructions prepares background of using nursing studies at bedside and it is going to be an effective step for based on evidence nursing. So it is recommend that designing such application instructions should be in the priority of the next studies.

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1. Introduction

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By developing nursing professions, consequently need to the nurses that achieved specialized training increases. With such condition, growth rate of medical and treatment technology has been caused time limitation for specialized training for nurses. In order to manage such educational challenge and utilization of the last scientific evidences at bedside, nursing care instructions have been used as a valuable source for the nurses. Evidence based practice at bedside has been become as a necessity for effectiveness of care and providing a safety and exact care for the patient. In addition, evidences which have been achieved from published researches were presented as valuable science sources for directing care performance of the patient [1].

Nursing care instructions are counted as key components in clinical policies of America and always it has been tried to update these instructions according to the last researches and the best available evidences in coordinated and systematic form [2,3]. Using instructions in nursing is positively effective on promoting cares quality and performance. Instructions have special position in providing solutions and standardization of the methods and are counted as a helping instrument and a guide for treatment team. The best reason of using instructions in treatment centers is promoting services quality, reducing costs, increasing community health level and putting national standards with international standards in the same level [2].

Nursing care instructions are completed systematic instructions that makes clinical nurses to be able to take appropriate and right decisions in clinical conditions and health care's [4,3]. Because nurses have effective role in increasing care quality, these instructions should be useful for the nurses in different clinical conditions and they should consider all the conditions and situations that a nurse faces with them, so clinical instructions specially are designed according to the best existing evidences in treatment centers [2]. Mr. Lee explains that the first and the most important factor in improving care quality is ability to measure the quality. He states that; the most valuable measuring quality is evaluation of the nurses' activities in providing nursing care to the patients, structure of providing care is changing rapidly and clinical instructions and standards are one of the most important instruments for increasing care quality, because proper evaluation system for nursing cares can be established by presence of nursing instructions [5].

Also Ghomri et.al in his/her study proves that because nurses are a big group of care team, in the case of increasing care quality they can have remarkable effect on patients' satisfaction increase [6]. Nurses who care patients in Intensive Care Unit, provide exact, constant and special cares to the patients that are in vital, critical and unstable conditions and need to constant and severe care by the experienced nurses who have high knowledge and also necessary skill for using advanced equipment and facilities [7], time is limited for the nurses inn intensive units and it is especially important and it is essential to achieve necessary information as fast as possible and they have to design and perform care program. Using high volume of results and findings of the new studies is difficult for medical staff, especially for nurses. Clinical instructions are recommended as means of facilitating and shorten the interval between research findings and clinical cares. Performing clinical instructions helps to clinical proper decision taking and consequently they have time and money saving [6]. According to one of the main reasons of doing this study, also international association of health supports using clinical instructions and entering the evidences at the bedside in order to spread nursing and midwifery and it states that only 38% of

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provided nursing services to the patients were according to the studies, and because of rapid growth of medical and health science, it is necessary to try for spreading and updating clinical instructions and achieving newer sources [8].

Assessing and diagnosing the patients in Intensive Care Units are difficult, because the patient is in critical situation and it is possible to not be able to have necessary cooperation in providing the information and physical examinations. Evidence based instructions explain executive processes of clinical care and prevent non-standard clinical works [9]. Taking care of the patients who are under mechanical ventilation has been among integral components of nursing and taking care of the patients in intensive units and which more than anything distinguishes intensive units from other hospital units is the mechanically ventilated patients . According to the present statistics in the world at least 15% of the patients who are hospitalized in Intensive Care Units especially for long time (until 21 days and more) are under mechanical ventilation [10]. In spite of life-giving benefits of mechanical ventilation for patients, like other interventions it is not without complication. Some complications have been preventable; it is while other complications can be just minimized, without being destroyed completely [11].

Reviews showed that despite strategy of Ministry of health based on performing nursing care according to evidences and emphasis on this discourse in nursing colleges, still there is not necessary attempt about nursing and care performance according to evidences at bedside and intensive units by nursing managers. Still care instructions based on nursing according to evidences are not designed scientifically and systematically. According to the above matters and in order to eliminate the need of the clinical nurses of Intensive Care Units to the based on evidences instructions, this study had been done with the aim of "designing evidence based nursing care instructions for mechanically ventilated patients in Intensive Care Unit"

2. Methods

This study had been done with the method of developmental research with evidence based approach and according to Stetler model in the framework of nursing process in Intensive Care Units of Baqiyatallah hospital in 2012. Promoting and completing the present knowledge has been defined as developmental research by using systematic, scientific and justifiable process which is doing in the framework of one study [12].

National Health and Medical Research Forum of Australia stated framework and processes of doing developmental studies as follows:

1. Specifying need to the instructions and range of instructions, including aim and considered population.
2. Reviewing evidences and manufacturing of the instructions.
3. Assessing instructions through experts and specialists' opinions in the form of holding meetings.
4. Implementation and evaluation of instructions.

In 2010 Research Center for Cardiovascular Patient Care attempted to develop instructions of nursing care of the patients who were under Percutaneous Coronary Intervention. In this study, the type of the study has been named as developmental instructions and processes of doing the work are as follows:

Doing comprehensive studies of resources and articles, holding meetings in order to have a summary of professionals' opinions and to use Dolfi technique for correcting experts' opinions. In this study it has been emphasized that for improving care quality of the patients with Percutaneous Coronary developed and special instructions should be used [14].

In this study Intensive Care Unit of Baqiyatallah hospital was the study

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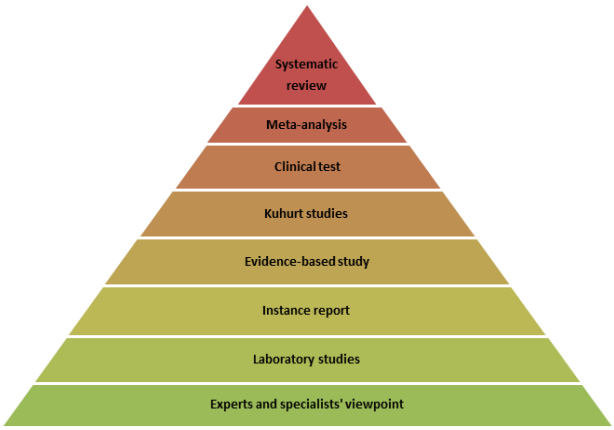
environment and all the instructions in this unit, books, scientific sources and articles were the study population. Considering inclusion criteria of the articles and purposive sampling, 121 chosen articles among 655 studied articles, 15 instructions in the unit and 22 designed instructions had formed sample volume of this study. Inclusion criteria of the articles as credible evidence were as follows:

1. They were between 2006 to 2012 and their full text was available.
2. They were about nursing care of the mechanically ventilated patients and Intensive care unit.
3. According to priority order, systematic review and clinical trial or at least review articles had been used.
4. They have to be extracted from credible sites such as; SID, Cochran Data base, Pub Med and Elsevier and CINAHL.

Processes of doing the work:

1. **Preparation**: during this process, problems in taking care of the mechanically ventilated patients who are hospitalized in Intensive Care Units had been assessed and the quality of the present care instructions [15 instructions) in Intensive Care Unit of Baqiyatallah hospital by using checklist made by Ms. Nezamzadeh (according to the framework of nursing process and AGREE & GLIA tools) had been used in order to assess quality of care instructions. This checklist includes two parts and 26 items with two answers (yes-no). 11 questions for assessing instructions identification and 15 questions for assessing quality of instructions in these tools had been predicted. Validity of the tools had been done by Ms. Nezamzadeh and with survey of 10 nursing specialists. Also stability of the tools had been confirmed by Intra-rater correlation coefficient method and with 0.78 [15].

   Quality of 15 instructions in the unit had been evaluated with these tools in moderate level. New instructions had been extracted from nursing credible books and resources. And considering clinical need of the nurses, 22 new instructions were made.
2. **Accreditation**: articles had been studied according to evidence based pyramid (in priority order and choosing from higher level) and articles inclusion criteria. Picture number 1 shows order of the studies according to their value. It should be mentioned that searching the articles and studying them had been done by Pico method. Then feedback had been taken from faculty members of Baqiyatallah, Tehran and Shahid Beheshti Universities by Delfi method in three processes, in order to confirm the content and their opinions had been considered.



3. **Comparison study**: with inviting a ten-member team of experienced nursing experts of Intensive Care Unit and formation of a focus group, functionality and practicality of these instructions had been studied in Intensive Care Unit.
4. **Usage**: in order to make these instructions applicable, after observing clinical nurses' opinions, final instructions for taking care

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of the mechanically ventilated patients had been prepared to perform by providing identification of the instructions and determining operational codes.

5. **Performance**: designed instructions were given to education and research management and nursing services management of Baqiyatallah hospital in order to be performed.
6. **Evaluation**: Quality of new instructions had been assessed by using Nezamzade's tools that they were evaluated in a good level. In order to do clinical evaluation and that with doing these instructions whether nursing care quality increases or not? These instructions should be performed in Intensive Care Unit of Baqiyatallah hospital and considering time limitation of this study, doing this process was not among the aims of the study and it needs another study.

3. Results

The first finding of the study is that in the present conditions, there were no separated care instructions specifically for the mechanically ventilated patients. Among general care instructions, 15 instructions that were almost similar to the instructions specifically for mechanical ventilation in the sources had been chosen and their quality had been assessed, that all of them were evaluated in the moderate level. Finally 22 specific care instructions in the nursing process framework and according to nursing diagnosis were stated for the mechanically ventilated patients that their quality had been evaluated in a good level. Table shows this in comparative form.

The below list shows 22 nursing diagnosis for the mechanically ventilated patients that nursing instructions are written in this framework:

1. Discomfort (NANDA)
2. Impaired spontaneous ventilation (NANDA)
3. Impaired spontaneous ventilation (NANDA)
4. Impaired gas exchange and ineffective respiration pattern (NANDA)
5. Ineffective airway clearance (NANDA)
6. Anxiety (NANDA)
7. Risk for injury (NANDA)
8. Risk for infection (NANDA)
9. Impaired verbal communication (NANDA)
10. Oral mucous membrane impaired (NANDA)
11. Dysfunctional ventilator weaning response (NANDA)
12. Risk for aspiration (NANDA)
13. Imbalanced nutrition: less than body requirement (NANDA)
14. Risk for infection :tracheal tube or tracheostomy (NANDA)
15. Risk for infection: cvp line or urine catheter (NANDA)
16. Acute confusion: sensory overload (NANDA)
17. Acute confusion: sensory deprivation (NANDA)
18. Acute confusion: hallucinations (NANDA)
19. Disturbed body image
20. Relocation stress syndrome (NANDA)
21. Powerlessness (NANDA)
22. Compromised family coping (NANDA)

Designed instructions had two parts:

1. **Identity of the instructions:**
   In this part the aim of designing these instructions and twenty two nursing diagnosis taken from these sources have been explained for the mechanically ventilated patients . Then the aim group, methods that are using for designing instructions, the names of the related specialists that had participated in studying validity of the instructions and their applicability, inclusion criteria and choosing evidences, rules related to the way of documenting instructions in the cardex and therapy sheet, sources that are using in the evidences and finally expiration date of the instructions and necessity to its update

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have been stated. It should be mentioned that these instructions should be updated in 2016 with newer sources.

2. Content of the instructions:

These instructions have been designed according to nursing process and they have nursing diagnosis, evaluation criteria and nursing actions in coded form and along with guide on how to register and appendix of the using sources for each of them. Because it is not possible to provide all the designed instructions in this writing, we just mention the first case as an example:

301. Discomfort (NANDA)

Nursing diagnosis:
Patient's discomfort related to : An endotracheal tube and mechanical ventilation
Evaluation criteria:
Patient's appearance ,malaise, complaining of pain, insomnia ، PR,RR,BP ، breathing pattern
Nursing actions:
1. Assessing the position, diffusion, intensity and quality of the pain (16-19) 2. Ramsey sedation scale (20-22) 3. Lack of leaving the patient until relieving malaise (9,23) 4. Reducing environmental stimuli (9,23,24) 5. Limiting or increasing meeting time that is appropriate with the patient's tendency (9, 25). 6. Explaining treatment actions to the patient (25,26) 7.Using humidifier or HME (Heat and Moisture Exchanger) in ventilation way (27,28) 8. Observing patient's immunity in doing the procedures like suction (26, 29, 30). 9. using Non-pharmacological methods of pain relief like relaxation (26,31,32) 10. teaching numerical evaluation tool of pain intensity to the patient (16-19) 11.recommending extubation at the first possible chance (18,33) 12. recommending to prescribe sedative (20,24,26)

Among other findings of this study we can mention 121 chosen articles among 655 studied articles that they were searched and chosen with different key words. Topics of these articles are listed in table 2.

4. Discussions

By analyzing findings of the study, some points have to be mentioned. Firstly lack of special instructions for taking care of the mechanically ventilated patients and low quality of 15 chosen instructions confirm necessity of doing such a study. Like what we were looking for in this study in order to design special instructions for mechanically ventilated patients, anesthesiology department and special cares of Australia worked more specialized and in 2007 started to design special care instructions for mechanically ventilated patients about relaxation techniques, to prevent unexpected removal of endotracheal tube, malaise and delirium. In order to explain necessity of designing these instructions, it has been pointed to high stress of patients who are hospitalized in Intensive Care Units and are under mechanical ventilation as a serious and important challenge [34).

Secondly, from the approach of methodology of this study, choosing developmental method and doing its procedures is completely scientific and it is according to several studies that we are going to point to them. In 2003 Taylor started to make nursing care instructions in intensive

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units based on the best and the most effective scientific evidences. In this process, there was a committee consisting of the best clinical nurses for making instructions and the procedures of making clinical instructions included: making clinical variables, making program management group, searching in scientific and research sources, considering specialists and advisors' opinions and finally publication and dissemination of the instructions. These instructions have been performed in Intensive Care Units where the patients need more care and they could be helpful in decision taking of the nurses in taking care of the patients. Taylor also explained nursing care instructions in behaving with every special patient in order to have the best judgment at any special situation [22].

.NIEC(National Institute of Excellent Care) stated processes of developing instructions as follows: developing necessary criteria for designing instruction, developing rules and making workgroup, searching credible witnesses and analyzing the witnesses, poll of the expert group and consultation about the instructions, developing and dissemination of care instructions based on evidences [35). Fiona et.al in 2006 in a study similar to our study assessed and collected evidences and the last researches about cares and further necessary actions for the mechanically ventilated patients. In this study, the last scientific evidences and documents about topics such as; patient's safety and using equipment for the mechanically ventilated patients, patient's comfort, patient's position, health, psychological problems, pain management, and prescribing sedatives after doing internet search in some credible sites (MEDLINE, SINAHL, EMBASE,Psych REVIEW) in 1998-2006 had been collected and provided [36).

According to what is said as one of the reasons of doing this study, performing nursing instructions at beside increases care quality. We point to two cases of the studies that prove this claim. Motahedian Tabrizi et.al in 2009 showed the effect of planned cares on decrease of dialysis complications. Nurses with doing planned cares decreased complications in dialysis patients [37). In the study of Melnick et.al which had been done in 2004 nurses believed that if clinical cares come with research evidences, care quality will be increased. Also in this study they achieved this result that only 46% of the nurses believe that their cares of the patients are based on evidences [38).

The last point is that these instructions had been designed in order to be performed at bedside and its arrangement should be provided and it can't be done without providing its backgrounds. Adib Hajbagheri in 2007 assessed nurses' perception of evidence based care. This qualitative research which had been done on 21 nurses, head nurses and director of nursing services assessed nursing cares and nurses' perception of evidence based care through interview and observation in Kashan, according to nurses' opinions, nowadays nursing is based on practical knowledge and scientific evidences are less used and doing care, based on studies and articles faced with problem [39). So it is recommended that in order to provide background of performing these instructions, there should be held training programs either in evidence based nursing dimensions and also in training content of these instructions for nurses.

It is recommended to do a research, based on assessing the effect of these instructions on nursing cares quality of the mechanically ventilated patients. Study of Parvarzadeh which had been done in 2005 can be as a practical example which confirms our recommendation. Parvarzadeh et.al studied the effect of instructions of standardization of clinical care services on the pregnancy outcome. In this study mothers were divided into two groups of 100 people: one group was case group and another group was control group, and in the case group cares had been performed in the

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form of standard. Results showed that in mothers that had been cared according to the standards, obstetric indicators had been promoted and they had fewer problems consequently [40).

5. Conclusions

Currently, situation of evidence based nursing and taking advantage of the latest scientific evidences and documents in nursing cares is away from the appropriate situation and this vacuum had been proved specially about mechanically ventilated patients . We can increase quality of these instructions and provide background of applicability of nursing researches and draw scientific evidences from theory to bedside through scientific methods of designing evidence based nursing instructions. Also using nursing process in designing instructions of taking care of the patients is recommended as a systematic, dynamic and focus thinking method.

Meetings and conferences which had been established in this study with faculty members of the colleges and nurses of Intensive Care Units had an interesting point and that was feeling of need and interest of all these dears towards developing scientific instructions and standard for taking care of the patients and all of them emphasized that such an action should be done for all the units and unscientific actions and the actions which are according to taste should be prevented.

Institutionalization of using evidence based instructions and specifically for every group of the patients and designing encoding system of these instructions and agreed abbreviations and symbols can make a fundamental change in nursing documentation system and it can be a very effective step in the way of evidence based nursing cares and increase of quality of taking care of the patients. We have to remember that still there are lots of published researchers that with designing nursing care instructions specifically for the patients of different units, we can give these studies to the nurses in the application form and provide background of increasing quality of nursing care of the patients.

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Table 1. comparison of quality of nursing care instructions in the present condition and after designing:

Frequency / quality	Present condition		After designing	
	number	percent	number	percent
weak	0	0	0	0
moderate	15	100	0	0
good	0	0	22	100
total	15	100	22	100

Table 2. lists of topics of the chosen articles as credible evidences

Number of the articles	Field of studying and searching
10 articles	Comfort and discomfort factors in mechanically ventilated patients
20 articles	Separating patient from ventilator
20 articles	Acquired infection in Intensive Care Unit
10 articles	Feeding mechanically ventilated patients
5 articles	Taking care of the eye in mechanically ventilated patients
5 articles	Meeting mechanically ventilated patient
5 articles	Stress in mechanically ventilated patient
5 articles	Communication with mechanically ventilated patient
5 articles	suction
5 articles	Teaching to the family
3 articles	New types of tracheal tube and tracheostomy
7 articles	Psychological problems of mechanically ventilated patients
5 articles	Methods of non-invasive ventilation
5 articles	Using tranquilizer in these patients
5 articles	Assessing pain in these patients
5 articles	Matters related to the sleep of these patients
1 article	Intubation method
121 articles	Total of the articles

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