

Research Engineering In Nursing: What Impedes Nurses In Their Research The Most?

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Abstract

Objective: Findings of our study contribute to a greater awareness of the research engineering importance and research activities in general in the educational process and programs that offer education for nurses. Studying the factors that impede nurses in their research the most has been our research field.

Methods: The study was based on quantitative research methodology.

Results: The most impeding factor for nurses is the lack of training and education for different types of research in their professional practices. Next factor is education about the research approaches during their studies with lack of methodological assistance in the research coming in as third.

Conclusion: The study is important for further reflection on how to arrange and update the education programs and further professional training with skills and expertise of research engineering in nursing of future nurses in Slovenia and elsewhere. This is the new approach how to construct nursing research and translating its evidence-based findings into clinical practice that can improve nursing standards as well as overall clinical care.

Keywords: professionalism, research engineering, nurses, nursing research

I. Meaning of Research Engineering In Nursing For Profession's Development

Research engineering in nursing, which gives evidence and is a basis for modern scientific medicine, is a foundation for professionalism of profession. For this purpose, a Group for Research in Nursing was established in 2012 in University Medical Centre Ljubljana with a mission to select roles for carrying out the studies, leading a study register and establish a network of researching nurses.⁽¹⁾ Polit and Beck write that there is no expectation from every graduated nurse that she will be a researcher.⁽²⁾ However, there is a certain expectation that she will perform her duties on the basis of evidence and that she will support the development of research with her behavior. The nurse can only achieve that with good basic knowledge about meaning of research and development of profession. It is important how higher education professors introduce the meaning of research work to the students, because through their teaching approach, they influence the students' attitude towards research.^(3,4) With a higher degree of education, there is a change in the number of hours dedicated to courses on research for the undergraduate level of education programs of nurses.⁽⁵⁾ Knowledge and competences gained during the nurses' study, such as searching for literature, critical analysis of already published and performed studies, use and application of research in practice and conducting research, increase personal self-reliance, cognitive functioning and comprehension of work on basis of evidence, which strengthens professionalism.^(4,6) The profession consists of persons educated in the discipline according to nationally defined, regulated and monitored standards and programs. People join the profession and practice the performing scientific and technical field of the profession of nurses. The discipline is the knowledge and research base; the nursing profession consists of those who practice, research and performing professional development also through lifelong learning and commitment to leadership.^(7,8) Finally, nursing research concerns itself with teaching and research processes by creating some new approaches - as it is research engineering in nursing - to support an evidence based findings into clinical practice that can improve nursing standards as well as overall clinical care.^(9,10)

1.1 Applicability of action and evaluation research engineering in nursing – contribution to the development of nurses' profession

Research provides new insight into nursing practice as it develops and improves methods of care and review the effectiveness of existing practices within its system.^(5,11) The development of participatory research in nursing, ie. research with active participation in which we may also include the action and evaluation research in the field of professional work of nurses. Applicability of action and evaluation research engineering in nursing is based on: evaluation processes, protocols and standards in institutional health care environment, reflections of factors of the hidden curriculum, subjective theories, routines, knowledge, skills, attitudes and values with the process of reflection under the triangulation and hermeneutic-dialectic circle of constructivist-naturalistic evaluation from the authors Wrinkles and Lincoln.^(8,10,12)

Action and evaluation research engineering in nursing is a new approach which is based on the following methodological acts: (1) The evaluation in this approach allows us to critically evaluate nurses practice, such as via document analysis, collection of archive data, professional reflections and interviews with employees and users of health services, surveying, observation of specific activities/procedures, teaching processes and work methods. Methods and techniques of action and evaluation research engineering help employees to identify and changing their subjective theories, views and hidden curriculum factors, which are the basis of their professional practical work. It presents a strategy to the employees through which they are confronted with their own views.^(8,11,12) (2) In the broader international context in the nursing and medical field (including the field of education, carried out by nurses) action and evaluation research engineering in nursing is carried out by nurses who occupationally work in the area of research and wish to improve their work practice. It is carried out on the basis of a flexible research plan and form of action steps by continuously introducing changes that follow in spiraling circles between action and reflection. This aims to transfer knowledge directly into the working practices of nurses and its improvement, which also helps raise the quality of their professional work.^(4,6,10,13-15) Research relevant particularities of action and evaluation research engineering in nursing justify on the basis of following advantages:

- Possibility of monitoring professional practice of the nurses through the process of research reflection (with own reflection to new perspectives);^(4,6)
- Possibility of discovering the rules of conduct, rules of system maintenance and nurses' subjective theories, which guide the nurses' careers. If we directly monitor their functioning, we can detect legalities, according to which they operate; rules of conduct, which exist as social or developmental norms, linked to specific actions, which are confronted with the declared theories through the insight into the context;^(10,13-16)
- Possibility of deepening perceptions, skills and practices within participatory research and on this basis, modification or design of a grounded theory. The evaluation of the quality of (their own) experience and exploration of selected phenomenon directs the nurse to the creation of a grounded theory, whereby transfer of the operation of a new framework implies contextual understanding of the conditions of the new framework and includes a reflection on the consequences of using the action in a new context;⁽¹⁰⁻¹⁶⁾
- Possibility of practical testing the adequacy of alternative direction practical action's adequacy and on the basis of the results of the evaluation, the possibility of taking them into account in future actions;^(6,11-16)
- Possibility of transforming personal beliefs with the help of methods and techniques of action research (introspection, critical evaluation and analysis of the users of health services' documents, etc.). Understanding the work context of nurses includes their subjective knowledge and tacit skills. Latter often stays on a subconscious level. It is important to be aware of the importance of understanding the context in which we operate, because on this basis we can achieve a proper connection between theory and practice. And it is in this relationship that the methods and techniques of action research help nurses to be aware of and identify their (unconscious) assumptions, and subjective theories that influence their decisions in everyday working practices;
- Possibility of integration of the action research in the process of (self)reflection and (self)evaluation of the nurses' professional work.^(4,6,10-16)

In the introduction, we have shown that action and evaluation research engineering in nursing is an important factor of professional development, which gives a strength basis to professionalism of the profession. We can conclude that research engineering in nursing is one of the most usable and most often applied research approaches for nurses which is important for raising the quality of clinical care. In this study, the results of which are shown below, we intensively dealt with the field of studying the factors which, according to their assessment, most hinder nurses at research. We have set three research questions, namely:

- (1) Whether, and if so, the extent of nurses' experience in researching work practice?
- (2) What are the factors that they consider the greatest barrier when conducting research?
- (3) Are there considerable differences between the nurses in the studied variables depending on the number of years of work and achieved level of education?

II. Methods

The study is based on quantitative research paradigm in which descriptive and causal-nonexperimental method of empirical research was used. Data were collected using a questionnaire, which was previously tested on a pilot sample of fifteen respondents, checking the intelligibility of the questions. Surveying took place from January to September 2015. The questionnaire, in addition to questions about demographic characteristics (age, education, years of work), contained two sets of questions in relation to the core issue we were interested in, whether and, if so, to what extent, do nurses have experience in researching work practice and which factors they consider hindering about it. At the same time, we were also interested whether there are any present differences between the nurses depending on the level of education and the number of years of work. To

determine the validity (% of explained variance with the first factor) and reliability (% of explained variance with joint factors), we used the outcome of factor analysis, which showed that our research instrument is within the acceptable limit of validity (the first factor explained 25.8 % of variance) and reliability (with the outcome of factor analysis, we got three factors, which explained 61.6 % of variance).

We surveyed 159 nurses from all Slovenian regions. We received 158 valid surveys, which represent 94.4 % responsiveness. The sample is accidental. Average age of nurses was 37.4 years. There were 15 (9.5 %) nurses with postgraduate education, 66 (41.8 %) had undergraduate education, 50 (31.6 %) are nurses with Bachelor diploma and 27 (17.1 %) nurses had a medical high school diploma.

Ethical aspect of the performed questionnaire was ensured on the basis of *Statement about voluntary approach and the protection of personal data*. Participation in the survey was voluntary and anonymous. The conducting of the survey was approved by the Faculty of Health Sciences, University of Ljubljana. Data processing was carried out on the level of descriptive statistics, indicating frequencies, percentages, arithmetic mean and by using the statistical program SPSS 20.0. When determining statistically significant differences between nurses according to the different levels of education and the number of years of work, we used χ^2 test. Where the conditions for it have not been fulfilled, we used Kullback test. Differences were accepted as statistically significant when p value = 0.05.

III. Results

On the question *Do you have any experience with research in work practice*, more than half (59.5 %) of nurses answered that they do not have any experience (Table 1).

Table 1. Experience with research

Do you have experience with research in work practice?	Nurses f, f(%)
No	94 (59.5 %)
Yes	64 (40.5 %)
Total	158 (100 %)

Between nurses in regards to achieved level of education (postgraduate, undergraduate, high school) we detected no statistically significant differences ($\chi^2 = 4.137$, $g = 3$, $p = 0.568$) about whether they have experience with research in work practice or not. There were statistically significant differences ($\chi^2 = 3.239$, $g = 2$, $p = 0.047$) with a variable year of work:

- 46 nurses had up to 10 years of work experience, and only 4 (8.6 %) had no experience with research;
- 69 nurses had between 10 to 15 years of work experience, and 49 (71.1 %) had no experience with research;
- 43 nurses had more than 15 years of work experience, with 41 (95.3 %) with no experience in research.

Data shows that the younger generation of nurses has the most experience with research, and the older the least. If, together with listed data, we also consider the results of some foreign studies which show that experience with research is important for nurses' readiness to explore and change their own work practices.^(5,13,14) Therefore we conclude that nurses, who participated in the study, did not have enough opportunity and possibility for research, something we should fight for in the future, especially during the course of their studies. The results of our study show that there is need for thorough consideration on how to organize and update programs of education and further training of nurses, which would intensively include some research modules.

Our second research question concerned the study of the factors which most hinder the research according to the nurses' assessment (Table 2).

Table 2. Factors, which impede nurses at research

<i>According to you, which are the factors that impede you at research?</i>	<i>Nurses</i>	
	<i>f, f(%)</i>	<i>R*</i>
Organization of work - overwork	26 (8.7 %)	7
Lack of support from department's management where I am employed	31 (10.2 %)	6
Research work is not adequately evaluated with license points	38 (12.5 %)	4
Lack of training for different kinds of research, where we can solve problems from work practice	68 (22.4 %)	1
Lack of panels/congresses/conferences/professional seminars, where we could present our research findings	7 (2.3 %)	8
Lack of cooperation at research work between faculties and health institutions	22 (7.3 %)	5
During the course of studies, we should have been better educated about research work	59 (19.4 %)	2
During research, we are not guaranteed sufficient expert help and direction	52 (17.2 %)	3
<i>Total</i>	303 (100 %)	

*R= Rang (ranging of answers according to the frequency of occurrence of each category)

Nurses evaluated that with research factor *lack of training for different kinds of research, where we can solve problems from work practice* is the most impeding (R = 1), followed by *during the course of studies, we should have been better educated about research work* (R = 2) and *not guaranteed sufficient expert help and direction* (R = 3). Nurses (R=8) set out that *lack of panels/congresses/conferences/professional seminars, where we could present our research findings* is a factor, which is least impeding at research of work practice. What surprises is the information that factor *organization of work – overwork* is not evaluated as a factor that poses a big problem, quite contrary (R = 7). There are no statistically significant differences between the nurses when it comes to the level of education, but we did observe statistically significant differences with the number of years of work experience with two variables: *during the course of studies, we should have been better educated about research work* ($\chi^2 = 3.165$, $g = 2$, $p = 0.033$) and *lack of training for different kinds of research, where we can solve problems from work practice* ($\chi^2 = 3.101$, $g = 2$, $p = 0.041$). Data showed that older generations of nurses are statistically more likely to be less educated on the area of research and research work than a younger generation. On the other hand, the younger generation of nurses are statistically more likely to miss training for different kinds of research where they would solve problems from work practice than the older generations. On the basis of the latter, we suppose that the existent nursing study programs do train their students in general, basic knowledge about research work, however, they do not prepare them satisfactorily with specific research approached and methods, where they could solve problems from different work practices and work areas, where nurses are employed.

IV. Discussion

When it comes to changes in nurses' professional work, the findings of our study contributed to an awareness of importance of action and evaluation research engineering in nursing and research activities in general, in an educational process and nursing programs. The results of study are important for further thought on how to organize and update programs of education and further training of nurses in Slovenia and elsewhere. Our sample covered all Slovenian regions. It showed a certain state and gave an insight into factors, which, according to the nurses, hinder them with research work. If we want nurses to pursue research of practice and research work more intensively, they need to prepare themselves for research during the course of their studies, with an application attitude towards their discipline, where they should also get actual practical research experience. It is especially important that they acquire fundamental methodological knowledge, which is/will be used in their profession such as knowledge from area of documentation analysis, triangulation of sources and method, comparison, analysis and development of standards, protocols, guidelines, evidence based research approach with research methods in nursing, researching the influences on evidence-based nursing practice implementation, etc..^(5,11,17,19) Constructing new research and translating its evidence-based findings into clinical practice can improve nursing standards⁽²⁰⁾ as well as overall clinical care.^(16,17,19) For effective research work, nurses need an ability for it, which should be nurtured in the educational process, beside personal preparedness. At the same time, the health institution's organization of work itself and the atmosphere in which the nurse works is not negligible as well. Our results also highlight the importance of intensive cooperation with employers to facilitate the establishment of research groups that help employees acquire research experience. Given that research develops and betters nursing methods, research approaches and reviews the effectiveness of already existing practices, it would be reasonable to involve nurses in research projects and interdisciplinary research teams that cover the scope of their professional work either in academic or clinical environment. Therefore, nurses could be (with suitable leadership, methodological and professional support) even more intensively active in research and as a result, be able to strengthen the process of transmission of professional research knowledge directly in their work and professional environment. Researching one's own practice provides an insight into nursing practice, as it develops and improves methods of work in nursing and assesses their efficiency inside the existing practice of a certain system.^(5,7) Nurses that have these experiences are often also qualified for reflection and evaluation of their practice as well as for the implementation of the evidence-based findings from other research into their own clinical settings.⁽¹⁰⁾ These findings should be considered when designing undergraduate and postgraduate study programs for future nurses and when planning for the cooperation of educational institutions with health professionals in clinical environments.

V. Conclusion

The impact of the action and evaluation research engineering role must be a result of research improvements in care through a whole system's approach in clinical management of institution where nurses work. A key nursing research skills including caring, communicating, researching and providing a holistic approach to care might be lost when nurses substitute for doctors, they must to be a part of the professional experts in the context of a multi-disciplinary team.⁽¹⁹⁾ High quality professional work can only be ensured when it is derived directly from practice, from practitioners who, in addition to possessing appropriate research

knowledge and behaviors, evaluate the health professional practice and their role in it through participatory research and reflection. This is a precondition for the professional development of health professionals. Future research should focus on quantifying this impact by designing studies which include prospective collection of data relating to these outcomes.

Authorship Statement

Conflict of Interest

The authors declare that no conflict of interest exist. The work is original; that it has not been previously published in print or electronic format and is not under consideration by another publisher or electronic medium; that it has not been previously transferred, assigned, or otherwise encumbered; and that the authors have full power to grant such rights. With respect to the results of this work, the manuscript of this or substantially similar content will not be submitted to any other journal until the review process in your journal has been officially completed. Authors allow the transfer of copyright to the publisher. Manuscript has been read and approved by all the authors.

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Ethical Approval

Authors confirm that the procedures followed in the manuscript were in accordance with the ethical standards of the journal and responsible institution that scientists work in.

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