Nursing Care Plans Based on NANDA, Nursing Interventions Classification, and Nursing Outcomes Classification: The Investigation of the Effectiveness of an Educational Intervention in Greece

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PURPOSE: The aim of this study was to investigate the effectiveness of an educational intervention on home nursing care plans based on NANDA, Nursing Interventions Classification, and Nursing Outcomes Classification for registered nurses working at primary healthcare settings in Greece.

METHODS: This is a quasi-experimental study without a control group. The sample consisted of 19 registered nurses. The study tool was a questionnaire administered pre- and post-educational intervention.

FINDINGS: The intervention improved their skills on nursing diagnoses' nomination, proper formulation, and individualization of defining characteristics, but it did not improve them in desired outcomes formulation.

CONCLUSIONS: A significant effect of an educational intervention on nursing care plans was demonstrated.

IMPLICATIONS FOR NURSING PRACTICE: Nurses' knowledge and attitudes are important for understanding and integrating documentation within the nursing process.

Comparative evaluation (benchmarking) of the healthcare "outcome" is a key issue in the health sector. Still, health services' outcome is hard to define mainly because of the inhomogeneity and complexity of health care. Despite the significant progress made in the last decades, the results of the enhanced efforts to measure health services' outcome remain fuzzy, miscellaneous, tautological, and ephemeral (Berki, 1972). Nursing outcome is even more difficult to define. Its underlying cause is the limited time available for nurses to record purely nursing dimensions of care, compared with the considerable time spent on recording issues associated with medical treatment (Hansebo, Kihlgren, & Ljunggren, 1999; Kärkkäinen, Bondas, & Eriksson, 2005; Kirrane, 2001). This acts as a brake in promoting autonomy given to the Nursing Science, as opposed to documentation, which is the vehicle for its autonomy, because only in thus, exchange of information and benchmarking becomes possible.

This requires the establishment of a common language for describing nursing work. The "Professional Nursing

Language" should capture the full range and variety of individualized, holistic nursing care and ensure the distinct role of nurses at the local, national, European, and international levels. The development of that language surpasses standardized care, consolidating "expression patterns" of Nursing (Sheerin, Sermeus, & Ehrenberg, 2015).

Acknowledging the above need, in some of the states-members of the European Union, nurses develop primary nursing terminology, whereas in other cases translate and adapt foreign terminology developed by nurses, especially, of North America. Such efforts include International Classification of Functioning (ECF), International Classification of Nursing Practice (ICNP), and International Nursing Diagnoses Classification (NANDA-I). International Nursing Diagnoses Classification (NANDA-International = NANDA-I) is considered as the most updated, innovative, and applied globally (Muller-Staub, Needham, Odenbreit, Lavin, & van Achterberg, 2007).

The aforementioned classifications authorize the use of a common language among nurses and determine the nursing knowledge through the development of nursing evidence-based protocols, which guide the development of nursing care plans, tailored to specific environments and directed at individual patient cases and/or healthy citizens. Care plans may constitute guidelines of care and integrated into clinical practice for the evaluation and documentation of the care provided to patients (Doenges, Moorhouse, & Murr, 2008; Hildman & Ferguson, 1991; Lee, 2006; Shea, 1986).

Nursing care plans are vehicles for communication, records for the provided care, and constitute essential tools for everyday care. The care plans' structure is formed according to the nursing care system applied, and for this reason, it can take a variety of forms (Björvell, 2002; Mason, 1999). The basic means for understanding and using the abovementioned nursing care plans is systematic training, through which nurses' knowledge, attitudes, and skills can be improved (Chatzopoulou, Katsaragakis, Karlou, & Patiraki, 2012).

Background

Despite the rich international research activity in this field, in Greece, such efforts remain fragmented. The overriding problem is the fragmented or completely absent use of the nursing process. Although all undergraduate courses in nursing departments of both universities and technological educational institutes teach the specific way of providing nursing care, it is not applied in everyday practice. This fact is attributed to the nurses' shortage. If we accept this assumption as true, then we end up back at the point of the definition of the specific issue because thereby, the nurses working in Greek health sector become unable to demonstrate this shortage, and ultimately when they are asked to argue for the need for a prompt resolution to this problem, they measure their workload using indicators based on medical and not on nursing diagnoses. Thus, it becomes imperative to look for effective ways to introduce the use of

the nursing process within standardized language. The most common barriers to implementation also include limited ongoing education, lack of motivation to learn, or the nurses' difficulties in adjusting to its use (Whitley & Gulanick, 1996). It has been argued that the implementation of NANDA, Nursing Interventions Classification, and Nursing Outcomes Classification—shortened to NNN—nursing diagnoses, interventions, and outcomes are related to better quality of nursing diagnosis documentation, etiology-specific nursing interventions, and nursing-sensitive patient outcomes (Muller-Staub et al., 2007). Also, teaching and clinical strategies should be developed to guide students to focused learning on nursing diagnosis and utilization of standardized care plans (Carpenito-Moyet, 2010). Aspects that should be taken into account to improve the introduction and use of the nursing process include specific protocols development, review of data record, empowerment of nurses to implement the nursing process more effectively (De Moraes Lopes, Higa, Dos Reis, De Oliveira, & Christóforo, 2010) and peer reviewing (Florin, Ehrenberg, & Ehnfors, 2005).

Purpose of the Study

The purpose of this study was to investigate the effectiveness of an educational program on home nursing care plans based on NNN for registered nurses working at primary healthcare settings in Peloponnese, Greece.

Method

Setting and Sample

This is a quasi-experimental study without a control group. The sample consisted of 19 registered nurses (*N* = 19) working at primary healthcare settings in Peloponnese. The participants were randomly selected by the 6th Regional Health Authority of Greece. The selection criteria were:

1. to be registered nurses (graduates from nursing departments of universities and/or technological educational institutes),
2. to have at least 5 years of work experience in primary healthcare settings, and
3. to have proficiency in the Greek language.

The above nurses attended an educational intervention that was part of a project co-funded by the Greek Government and the European Union in terms of National Strategic Reference Framework (NSRF) titled "Development of Home Nursing Care Plans Based on Nursing Diagnoses." The educational intervention was in the form of a clinical seminar that had a duration of 60 hr, equally spaced in 10 days, during the period from January 12, 2015 to March 10, 2015. The chosen method of clinical seminars included the following direct and indirect teaching and learning

methods: (a) lectures; (b) bidirectional questions–replies; (c) groupworking; and (d) case studies, allowing in this way the application of theoretical knowledge in real-life situations, through the reinforcement of the trainees to make correct clinical decisions based on the theoretical framework of Doenges et al. (2008). To evaluate the educational intervention, a questionnaire developed and standardized in the context of Chatzopoulou's (2010) doctoral thesis was used after her graded permission. The questionnaire consists of 22 items related to the evaluation of the trainees' attitude towards the documentation of nursing care and the application of the nursing process. The Cronbach's alpha coefficient for these items was 0.79, suggesting that these have an acceptable internal consistency. The responses to these items were Likert scale type on a 5-point scale (1 = *I agree strongly*, 5 = *I disagree strongly*).

Items about the participants' demographic and educational characteristics as well as their previous teaching and clinical experience on the nursing process and documentation were added at the end of the questionnaire.

Lastly, one clinical scenario was used in order to evaluate the trainees' knowledge and skills on the nursing process.

The questionnaire was completed at the beginning and after the end of the educational intervention. All the trainees were informed about the purpose of the study. It was explained to them that their participation was voluntary and their answers were confidential. Out of the 20 trainees, 19 participated in the study (response rate 95%).

Data Analysis

Data statistical analysis was performed by the use of IBM Statistical Package for Social Sciences (version 21.0, released 2012; IBM SPSS Statistics for Windows, IBM Corp., Armonk, NY, USA). Control of the variables' normality was performed with the Kolmogorov–Smirnov test. The mean value and standard deviation (*SD*) were used to describe the quantitative variables and the frequency (*N*) and 100 percent rate (%) for the description of qualitative variables. The comparison between normal regular variables before and after the educational intervention was done by paired statistical control Z of Wilcoxon (Z, p) and between qualitative variables with paired statistical control Mac Nemar (p). The two-tailed significance level was set at ≤.05.

Findings

Most of the participants were female (*N* = 16, 84.2%), and their mean age was 42 years (*SD* = 5.8) and married (*N* = 13, 68.4%). The majority of them (*N* = 16, 84.2%) were graduates from technological educational institutes, and 36.8% had a postgraduate diploma or specialty. The mean years after their graduation were 17.8 (*SD* = 8.3), and their work experience was 18.2 years (*SD* = 7.1). Of the participants, 52.6% had a previous education and experience in nursing process, mostly in a basis of continuing nursing education and only two of them (10.5%) during their basic nursing education.

Participants were asked to report their knowledge (Table 1) and experience (Table 2) in the implementation of the nursing process before and after the educational intervention.

Seven (36.8%) and five (26.3%) participants answered that they do not apply at all or at a minimum-level nursing process in clinical practice. Following the educational intervention and after understanding the content of the plans,

Table 1. Comparison of Trainees' Responses Regarding Knowledge in Nursing Process Before and After Educational Interventions

Knowledge	Pre-educational intervention		Posteducational intervention		*p* (paired)
	N	%	*N*	%	
None	3	15.8	2	10.5	.180
Little	10	52.6	6	31.6	
Moderate	4	21.1	4	21.1	
Good	2	10.5	5	26.3	
Excellent	0	0.0	0	0.0	

Table 2. Comparison of Trainees' Responses Regarding Experience in Nursing Process Before and After Educational Interventions

Experience	Pre-educational intervention		Posteducational intervention		*p* (paired)
	N	%	*N*	%	
None	7	36.8	12	63.2	.128
Little	5	26.3	2	10.5	
Moderate	5	26.3	3	15.8	
Good	2	10.5	1	5.3	
Excellent	0	0.0	0	0.0	

more nurses (*n* = 12 [63.2%] and *n* = 2 [10.5%]) answered that they do not apply at all or at a minimum-level nursing process and care plans.

Moreover, the majority of the participants before and after the educational intervention reported no use of any nursing taxonomy for documentation in every day practice (pre 15 [78.9] vs. post 15 [78.9], *p* [paired] = 1.000). Before the educational intervention, only five participants (26.3%) reported that they use NANDA Taxonomy for documentation nursing care. After the educational intervention, a statistically significant number of 15 participants (78.9%) (*p* [paired] = .013) reported the use of NANDA Taxonomy in everyday practice. Only few participants reported the use of other nursing taxonomies for documentation pre- and posteducational intervention such as Nursing Outcome Taxonomy (pre 2 [10.5%] vs. post 1[5.3%], *p* [paired] = 1.000), Nursing Intervention Taxonomy (pre 2 [10.5%] vs. post 1 [5.3%], *p* [paired] = 1.000), ICNP (pre 1 [5.3%] vs. post 2 [10.5%], *p* [paired] = 1.000).

Additionally, before and after educational intervention, all the participants (*N* = 19, 100%) reported that they would like to provide and document nursing care by using nursing process and care plans in everyday practice. Despite this result, they reported a moderate attitude regarding the use of nursing process and care plans for documentation (mean ± *SD*: pre 74.1 ± 7.4 vs. post 75.1 ± 6.1). Their responses were not statistically significantly different between before and after the educational intervention (*p* [paired] = .406).

Based on the clinical scenario, before the educational intervention, participants recognized almost 10 different patients' health problems, but only 2 of them were nursing diagnoses according to the NANDA Taxonomy (Table 3).

Trainees improved their skills on nursing diagnoses' formulation. Their skills were evaluated regarding the: (a) choice of the right-related factors and defining characteristics, and (b) the individualization of these according to patients' nursing diagnosis "acute pain (00132)."

Almost all participants (*N* = 18, 94.7%) recognized the right-related factor after the educational intervention (*p* [paired] = .008) vs. 11 (57.9%) participants before the edu-

cational intervention. Additionally, 10 participants (52.6%) before the educational intervention versus 4 participants (21.1%) after the educational intervention (*p* [paired] = .034) properly individualized the related factors based on patients' pain characteristics.

Participants' responses regarding the selection and proper formulation of the defining characteristics were statistically significantly improved (*p* [paired] <.0001 and *p* [paired] <.0001, respectively).

Although only 4 (21%) participants had chosen both defining characteristics for acute pain patients' nursing diagnosis before the educational intervention, 15 (78.9%) participants chose both defining characteristics after the educational intervention. On the other hand, 15 (78.9%) participants have not chosen any defining characteristics before the educational intervention, but only 2 participants (10.5%) did it after the intervention.

Similar results were found for the individualization of defining characteristics. Almost all participants (*N* = 16, 84.2%) did not individualize defining characteristics for scenario patient's pain characteristics before the educational intervention, and only three participants (15.8%) after. On the other hand, 1 (5.3%) participant before versus 14 (73.7%) participants after the educational intervention had properly formulated the defining characteristics (*p* [paired] <.0001). Contrary, the participants did not improve their skills in formulating the desired outcomes. Although less participants (pre *n* = 10 [52.6%] vs. post *n* = 4 (21.1%), *p* [paired] = .109) gave a totally wrong formulation of the desired outcomes after the educational intervention, a significant number of 15 (79%) participants (vs. post 9 [47.4%]) did not include the necessary criteria mainly in timeframe.

None of the participants' demographic or professional characteristics was statistically significant in relation to their responses regarding the nursing diagnoses' nomination before and after the intervention (*p* > .50). Additionally, participants' responses regarding their knowledge and experience on the implementation of nursing diagnoses and care plans were not associated with their skills to recognize

Table 3. Comparison of Trainees' Responses Regarding Recognition of Nursing Diagnoses Before and After Educational Interventions based on a Clinical Scenario

Type of patient problem	Pre-educational intervention Mean ± *SD* (range)	Posteducational intervention Mean ± *SD* (range)	*p* (paired)
Patient's health problems	9.6 ± 3.2 (0–18)	6.4 ± 1.8 (4–10)	Z = −2.3 *p* = .003
Nursing diagnoses (NANDA)	1.6 ± 1.6 (0–7)	6.2 ± 2.1 (1–10)	Z = −3.7 *p* < .0001
Nursing assessment	0.7 ± 0.7 (0–4)	0	Z = −2.7 *p* = .016
Nursing outcomes	0.5 ± 0.5 (0–5)	0	Z = −1.3 *p* = .180
Nursing interventions	2.7 ± 2.7 (0–10)	0	Z = −2.7 *p* = .007

SD, standard deviation.

scenario patients' health problems and to nominate nursing diagnoses before and after the educational intervention ($p > .050$).

Moreover the participants' responses regarding their attitudes for the use of nursing process and care plans for documentation were strongly negatively correlated with the number of scenario patients' health problems recognized (rho = -0.48, $p = .037$, $n = 19$) but not with the number of nursing diagnoses recognized (rho = -0.28, $p = .909$, $n = 19$) before the educational intervention. After the educational intervention, participants' responses regarding their attitude for the use of nursing process and care plans for documentation were not correlated with the number of scenario patients' health problems recognized. Moreover, nurses' responses regarding their attitude for the use of nursing process and care plans for documentation were not associated with the skills regarding nursing diagnoses' nomination before and after educational intervention.

Conclusions

The majority of participants reported little knowledge and experience in the implementation of nursing process and care plans before and after the educational intervention, and there were no statistical differences between their responses. It is worth noting that none of the participants reported excellent knowledge or experience in the implementation of the nursing process and care planning. These results suggest that nurses may have overestimated their knowledge and experience for the implementation of nursing process and nursing care plans before the educational intervention. Although taking part in the educational intervention provided them with knowledge on the content of the nursing process and care plans, their responses for overall knowledge were not significantly improved, but remained almost the same. The preservation of their moderate attitude for documentation of care by using the nursing process is possibly due to their original false beliefs on the use of standards. Consequently, the results revealed that the participants reported what they wish to use for nursing care documentation rather than what they actually use.

Regarding the clinical scenario instead of nominating nursing diagnoses according the NANDA-I classification, the participants nominated medical diagnoses, nursing assessments, outcomes, and mostly interventions before the educational intervention, but after that, participants' responses were improved statistically significantly. Despite the decreased number of patients' health problems based on the scenario, the participants nominated only nursing diagnoses, chosen from the short catalog of the total 36 taught nursing diagnoses during the educational intervention.

Participants' responses regarding selection and proper formulation of defining characteristics were statistically significantly improved after the educational intervention.

In conclusion, the study revealed that a well-organized and structured educational intervention could improve atti-

tudes, knowledge, and skills of nurses. Nursing diagnoses, interventions, and outcomes should not be taught separately, but they should be integrated as in the case of the present intervention (Muller-Staub et al., 2007). Knowledge, attitudes, and skill level of nurses are important for understanding and integrating documentation to nursing process in daily practice and hence to ensure positive outcomes for patients. Although nurses seem to have a positive attitude towards documentation and the nursing process, a significant gap in knowledge and skills in regard to planning and documentation of nursing care still remains.

Implications for Nursing Knowledge and/or Language Development

Although nurses seem to have a positive attitude toward documentation and the nursing process, an important gap in knowledge, planning, and documentation of nursing care still remains. The present intervention has demonstrated positive results in improving knowledge and attitudes to documentation and nursing process and could serve as a basis for education in clinical practice.

Knowledge Translation

Introduction of new practices in home care nursing involves challenging changes. The successful involvement of nurses is considered as an important success factor. All of the above imply knowledge translation, evidence-based interventions, and a strong commitment to quality. Educational interventions on nursing documentation and nursing diagnoses lead to more systematic and standardized documentation.

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