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Opt Model of Clinical Reasoning and Students Erudition in the Use of Terms Alliance 3N

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ABSTRACT

Main aim: To determine the effect of practicing nursing process by OPT model of clinical reasoning on the expertise of students of General Nursing study in the use of concepts Alliance 3N.

Background: The motive for the study was the work of the OPT model of clinical reasoning authors Pesut and Herman and research articles on the OPT model, the authors Bartlett et al., Bland et al. and Kautz et al.

Methods: Applied design was a natural experiment on two groups of students using pretest and posttest. Research instruments for this study were new and prepared on the basis Herman and Bartlett's published articles. These were working protocols for students and a tool to assess erudition of clinical reasoning. Content validation was carried out and evaluation tool was tested on reliability. The data were collected in a group of sixty-three students in the form of records to work protocols. The data extracted from the protocols were processed at 0.05 level of significance using Student's paired t-test and Wilcoxon paired test.

Results: The median of total score sheet clinical erudition was at full-time students in the pretest (before practicing) 18.9 points aft er exercise 19.5 (posttest). The median of total score before and after exercise was 18.0 and 17.0 points at part-time study students.

Conclusions: For full-time students' erudition in clinical reasoning with 3N Alliance terms aft er exercises has improved, but the difference was not statistically significant. For part-time study students Wilcoxon paired test showed a significant deterioration in student achievement. Use of NANDA diagnoses in both groups of subjects was explicit, major flaws were found in the choice of optimal NOC and NIC.

KEY WORDS

OPT model, worksheets, assessment tool, pretest, posttest, students' erudition, concepts of Alliance 3N

INTRODUCTION

The reason for the implementation of this study was the research communications of expert teams which were led by Bartlett, Bland and Kautz (Bartlett et al., 2008, pp. 337–344; Bland et al., 2009, pp. 14–21; Kautz et al., 2006, pp. 129–138). Their research follows the publication of Pesut and Herman, that have submitted OPT test model (1998, p. 29–36) to nursing professionalsas a teaching strategy of the third generation of the nursing process. Pesut and Herman based on the thesis that method of nursing process is continuously evolving, and therefore in teaching this method there may be observed continuous development as well. They stated that nursing process has shaped in three generations because of the influence of knowledges of nursing science (Pesut, Herman, 1998, p. 29). Diagnostic assessment, according to them, is part of the third generation containing the following steps: ADPIE – Assessment, Diagnosis, Planning, Intervention and Evaluation and it is presented to students till nowadays.

Teaching of the third generation of the nursing process is connected with **Outcome-Present State Test Model** (hereinafter „OPT test model") from authors Pesut and Herman (1998, pp. 29–31). They recommended the development of internal work of the students with knowledge in lessons and recommend the use of mind maps. Such a procedure, according to

the authors, develops structured thinking and clinical balance, which is headed by the steps of the nursing process. The output of practicing nursing process using the OPT model is a clinical balance sheet, whose structure corresponds to steps of the nursing process method. In the clinical balance there are recorded such information about the patient, based on which it can be watched the results of nursing care. The principle of practicing nursing process according to OPT model consists of connection of: a) clinical reasoning and present state s b) outcome state or the result of care (Pesut, Herman, 1998, p. 29, p. 31). OPT model offers a structure to use 3N Alliance, therefore, to work with the concepts of NANDA International, Nursing Outcomes Classification and Nursing Interventions Classifi cation (Bartlett et al., 2008, p. 343; Pesut, Herman, 1998, p. 29). In the nursing documentation, the concepts of 3N Alliance should be fundamental. They formulate information on nursing practice, form the basis for data or statistical summaries or managerial and educational projects.

Research of clinical effect of the OPT test model in teaching of the nursing process was developed by teams of writers Bartlett, Bland and Kautz (Bartlett et al., 2008, pp. 337–344; Bland et al., 2009, pp. 14–21; Kautz et al., 2006, pp. 129–138). The concept and the results of their studies (see bibliographical references below) formed input of the design of the present research.

OBJECTIVES OF STUDY

For the purpose of preparing the information, researches were carried out in databases Scopus, Web of Knowledge, CINAHL, ProQuest, EBSCOHost and Medline – PubMed. To search for relevant resources the following keywords were used: nursing, Outcome-Present State Test, OPT model, clinical reasoning, nursing terminology, NANDA International, NIC, NOC. It was used English language, Boolean operator „AND" award criteria: period from 1960 to the present, titles, abstracts and full texts of articles. There were 6 foreign articles with research results OPT model found, namely from authors Bartlett et al., 2008; Bland et al., 2009; Kautz et al., 2005, 2006 and Kuiper et al., 2008. In the second stage of search, using the Czech keywords, Google Scholar search engine found book chapter from Sikorová with Bocková (2012, p. 70–89), which presents the concept of OPT model to the Czech public.

After studying named sources the **research question** was formulated as follows: „Does the practicing of nursing process, according to clinical OPT test model, have any impact on erudite use of 3N Alliance terms for students of general nursing?".

The main objective of this study was to determine the effect of practice of the clinical OPT test model on erudite use of 3N Alliance terms for students of general nursing. Sub-objectives of the research were formulated as follows:

1. To find out what differences shows a group of full-time students in the overall numerical score of erudite use of 3N Alliance terms in clinical OPT test model before and after exercise.
2. To find out what differences shows a group of combined students in the overall numerical score of erudite use of 3N Alliance terms in clinical OPT test model before and after exercise.

3a,b. To find out whether students of both groups show any differences before and after exercises in erudition of the test balance, recorded in the test protocol „Map of of clinical balance", „The network of clinical diagnostic balance" and „Clinical balance of decisions about the optimal NIC interventions and NOC outcomes of nursing care".

SUBJECTS

The respondents were 63 students of the second year of full-time and combined forms of general nursing. Selection of students was intentional. The criterion for inclusion of students in the group was signing the informed consent, which expressed agreement with the active participation in the investigation. The criterion for exclusion was the absence on any of the seminars with practicing nursing process according to clinical OPT test model. Subjects of the study were assigned an identification number by anonymous lottery to designate their protocols with test balance records. Basic descriptive characteristics of the respondents are listed in following table 1.

There were two groups of subjects, 22 full-time students and 41 students of combined form. In the group of full-time students, there were 21 women (95.5%) and 1 man (4.5%). The average age was 20.6 years, minimum age 20 years and maximum 23 years. In total 17 students (77.3%) attended secondary nursing school, 4 students (18.2%) grammar school and one student did not state his previous education. In the group of students of combined form there were 100% of women. The average age of students was 36.4 years, minimum 27 and maximum 50 years. The average length of experience was 15.3 years, minimum length of practice was three years and maximum 31 years (median length of experience was 16.0 years). A total of 30 students (73.2%) attended secondary nursing school, 9 students (22.0%) medical college, 1 student (2.4%) university and one student did not state her previous education.

Table 1 Basic descriptive statistics of subjects

	full-time study (n = 22)	combined study (n = 41)
sex F/M	21/1 (95.5 % / 4.50 %)	41/0 (100 % / 0 %)
age	20.6 ± 0.7 20.0 (20–23)	36.4 ± 6.8 38.0 (27–50)
education: secondary medical school grammar school college university not specified	 17 (77.3 %) 4 (18.2 %) – – 1 (4.5 %)	 30 (73.2 %) – 9 (22.0 %) 1 (2.4 %) 1 (2.4 %)
length of experience	–	15.3 ± 7.9 16 (3–31)

Average ± SD, median (min-max), SD … standard deviation

METHODOLOGY

The study falls into the category of empirical research and was carried out on the basis of the design of the natural experiment with the inclusion of pretest and posttest in two groups of students.

A) Research plan:

1. Pilot study was conducted in 15 general nurse bachelor students, daily form. Information describing the results of a pilot study are listed in article by Marečková et al. (2013).
2. Modifying the descriptions of the patient (in literature as well as „the story of a patient" or „casuistry")- in testing and training work protocols on the basis of outputs of piloting.
3. Verification of content validity of modified descriptions of the patient.
4. The first inclusion of test protocol suite (with a description of the patient) into practice to obtain data of the pretest.
5. Practice of the clinical balance by teaching strategies of the OPT model, three distinct descriptions of the patient, three follow-up exercises, work of students with work protocols.
6. The second inclusion of test protocol suite (with a description of the patient) into practice to obtain data of the posttest.
7. Evaluation of protocols of pretest and posttest with modified evaluation tool – reliability verified by preliminary research.
8. Statistical processing of empirical data.
9. Interpretation of results and preparation of the text for publication.

B) Brief description of methods:

ad 1, 2) – On the basis of observations of piloting subjects, the modification of the formulated descriptions of the patients was made. Students recommended the text to be more „readable". Concept describing a patient with features of NANDA-International diagnosis (hereinafter also „NANDA-I") was maintained. Descriptions of patients formed introductory part of all sets of work protocols (one testing and three for practice). Working protocols were not modified after piloting. Already in the pilot study, the research team performed a partial modification of graphic design of the work protocols so that there can be identified the Aliance 3N concepts (NANDA International, NIC and NOC). Sets of protocols contained: a) Description of the patient, b) Map of search for diagnostic elements – records of essential diagnostic information in the description of the patient, c) The network of diagnostic balance – diagnostic elements NANDA-I from the description of a patient and d) Clinical balance of interconnection of NANDA-I, NOC and NIC, therefore, complex clinical protocol balance sheet (the name of the nursing diagnoses with a defining feature („DF"), related factors („RF"), chosen by NOC to evaluate patients and NIC intervention. As the study of NOC and NIC concepts are new in the Czech Republic, students received a Czech version of the relevant NOC scales and NIC interventions. Information about research tools, see Article (Marečková et al. 2013, in press).

ad 3) – Content validity was verified by Fehring technique (Mazalová, Marečková, 2012, p. 5), with the involvement of four nursing professionals, master studies graduates and with experience in teaching nursing process.

ad 4, 5 a 6) – On the first inclusion of test protocol set with the description of the patient to obtain data of pretest, subsequent clinical practice of balance sheet on the basis of three different descriptions of the patient,including the inclusion of the second testing protocol set, there was used the method of individual work of students with working protocols.

ad 7) – Modifications evaluation tool for monitoring erudition of students in the use of Alliance 3N concepts in clinical balance sheet took place before piloting. Reliability was verified by Cronbach alpha coefficientand the inclusion of test-retest reliability using the Spearman correlation coefficient.

C) Data processing:

To analyze the obtained data it was used a statistical software SPSS version 15 (SPSS Inc., USA). To compare scores of erudition of students before and after exercise it was used Student's paired t-test and Wilcoxon signed-rank test. To verify the normal distribution it was used Shapiro-Wilk test. Tests were conducted at significance level 0.05.

RESULTS

Sub-objective 1: For full-time study, the median of overall numerical score was 18.9 points before exercise. The minimum score was 15, maximum 22 and SD 1.9 points. After exercise, the mean total score was 19.5 points (min-max: 15 to 24 points, SD 2.3 points). The difference was not at a level of significance of Student's paired t-test p = 0.513, statistically significant.

Sub-objective 2: For the combined studies, the median total score was 18.0 points before exercise (min--max: 16–22) and after exercise 17.0 points (min-max: 13–21). Wilcoxon signed-rank test showed, at the level of significance p = 0.027, significant reductions in total points score.

Sub-objective 3a: Scores of erudition of full-time students in tools a) „Map of clinical balance sheet", b) „The network of clinical diagnostic balance" and c) „Clinical balance sheet of decisions about optimal NIC interventions and studied outcomes of NOC nursing care" before exercises and after their completion significant differences were not detected. The Wilcoxon matched pairs test significance was p = 0.317, accordingly for tools a) „Map of clinical balance sheet" and b) „The network of clinical diagnostic balance". Significance value of Student's paired test for tool c) „Clinical balance sheet of decisions about optimal NIC interventions and studied outcomes of NOC nursing care" was p = 0.688. Results – see Table 2. Sub-objective 3b: For items of tool a)„Map of clinical balance sheet" of combined study before and after exercise significant differences were not detected. Conversely, a significant decrease after exercise has been shown to score items of tools b) „The network of clinical diagnostic balance" and c) „Clinical balance sheet of decisions about optimal NIC interventions and studied outcomes of NOC nursing care". For tool b) significance level of Wilcoxon matched pairs test was p = 0.046, for tool c) it was p = 0.031. Results are summarized in Table 3.

DISCUSSION

Although the pilot survey did not bring clearly positive results, it confirmed the feasibility of the research. The average value of the total score of protocols in piloting before exercise was 17.9 points (min-max: 7-25, SD 4.7 points), after exercise 19.0 points (min-max: 11-25 points, SD 4.7 points). The improvement after exercise occurred, but with the results just below the level of significance. Statistical analysis showed a significant change in terms of improved outcomes, for a protocol "The network of clinical diagnostic balance". The results of the pilot have been a motive for the implementation of research for more numerous group, with subjects of regular and combined form of study, the students of the second year of general nursing. Already developed tools were used (Marečková, et al., 2013, in press).

Among the surprising results of the research were the ones showing only a slight improvement of complex erudition of full-time students (pretest 18.9 and posttest 19.5 points) and its worsening in students of combined form (pretest 18.0 and posttest 17.0 points), when the Wilcoxon signed-rank test showed a significant deterioration in results of students after exercise. These results can be compared and discussed with the content of the study by Kautz et al. (2006, p. 129), as it is also focused on the use of NANDA,

Table 2 Scores before and after exercise for instruments – full-time study

instruments	score before practice	score after practice	p
Map of clinical balance	3.0 (2–3)	3.0 (2–3)	0.317[a]
The network of clinical diagnostic balance	7.0 (6–7)	7.0 (7–7)	0.317[a]
Clinical decision balance about optimal NIC and NOC interventions	9.0 ± 1.9 (5–12)	9.5 ± 2.3 (5–14)	0.688[b]
Total erudition score	18.9 ± 1.9 (15–22)	19.5 ± 2.3 (15–24)	0.513[b]

median (min-max), [a] … Wilcoxon signed-rank test, [b] … Student's paired test

Table 3 Scores before and after exercise for instruments – combined study

instruments	score before practice	score after practice	p
Map of clinical balance	3.0 (3–3)	3.0 (3–4)	0.157[a]
The network of clinical diagnostic balance	7.0 (7–7)	7.0 (5–7)	0.046[a]
Clinical decision balance about optimal NIC and NOC interventions	8.0 (6–12)	7.0 (5–11)	0.031[a]
Total erudition score	18.0 (16–22)	17.0 (13–21)	0.027[a]

median (min-max), [a] … Wilcoxon signed-rank test

NOC and NIC concepts. Teaching strategy of OPT model was included by the authors in clinical exercises. They developed scoring instrument (Kautz et al., 2006, p. 135) and retrospectively evaluated 100 work protocols. They argue that the NANDA International nursing diagnoses were explicitly mentioned in 92% of protocols, NOC terms only in 22% and NIC terms in 61% of protocols. This experience corresponds in principle to Olomouc study. The names of NANDA International diagnoses were correctly given in 100% records of full-time students and in 95% of the combined study. Partial deficiencies were noticeable in the records of identifying symbols and related characters of NANDA International, highly skilled were in 75%. More significant deficiencies of erudition of clinical balance sheet were in the selection of optimal NOC and NIC components for the nursing care of the patient described. No student reached in this part of clinical balance sheet the maximum score of 18 points (full-time min. 5, max. 14, combined min. 4, max. 12 points). Study endpoints of Bartlett et al. (2008, pp. 337–344), one of the motives of the present research, are not discussed. Evaluation tool, published by this team, indeed does not follow the clinical balance sheet in the intentions of the explicit use of Aliance 3N terms. It presents the positive outcomes of OPT model as a teaching strategy and it is an important basis for improving the teaching of the nursing process in our country.

CONCLUSION

The study did not confirm the expected improvement of erudition of students in use of Aliance 3N terms. When using the nursing terminology to patient records, whose characteristics were presented by the text, the students were able to work better with the NANDA International terms and showed significantly less skills in working with NOC and NIC concepts.

Experts with the potential of research in this area may be recommended to edit further the evaluation tools to monitore the use of terminological components more sensitivelly and thus reveal deficiencies more precisely. We recommend to innovate a working protocol „Clinical balance sheet of decisions about optimal NIC interventions and studied outcomes of NOC nursing care".

The conclusions of the research form an evidence for the organizers and teachers of nursing disciplines for improvement and more precise teaching of nursing care, held by the method of nursing process. Studying nursing diagnosis, appropriate NOC assessments and NIC interventions with nursing activities is desirable to introduce into series of nursing and clinical subjects of all years of field of general nursing.

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REFERENCES

BARTLETT, R. et al. 2008. Evaluation of the Outcome – Present State Test Model as a Way to Teach Clinical Reasoning. *Journal of Nursing Education*. 2008, vol. 47, no. 8, p. 337–344. ISSN 0148-4834.

BLAND, A. R. et al. 2009. Implementation and Testing of the OPT Model as a Teaching Strategy in a Undergraduate Psychiatric Nursing Course. *Nursing Education Perspectives*. 2009, vol. 30, no. 1, p. 14–21. ISSN 1536-5026.

KAUTZ, D. D. et al. 2005. Promoting Clinical Reasoning in Undergraduate Nursing Students: Application and Evaluation of the Outcome Present State Test (OPT) Model of Clinical Reasoning. *International Journal of Nursing Education Scholarship*. 2005, vol. 2, no. 1, p. 1–19. ISSN 1548-923X.

KAUTZ, D. D. et al. 2006. Using NANDA, NIC, and NOC (NNN) Language for Clinical Reasoning With the Outcome-Present State-Test (OPT) Model. *International Journal of Nursing Terminologies and Classifications*. 2006, vol. 17, no. 3, p. 129–138. ISSN 2047-3095.

KUIPER, R. A. et al. 2008. Debriefi ng with the OPT Model of Clinical Reasoning during High Fidelity Patient Simulation. *International Journal of Nursing Education Scholarship*. 2008, vol. 5, no. 1, p. 1–14. ISSN 1548-923X.

MAREČKOVÁ, J. et al. 2013. Nástroje klinické rozvahy pro výuku ošetřovatelského procesu. *Ošetrovateľstvo: teória, výskum, vzdelávanie*. 2013, vol. 3, no. 2. In press. ISSN 1338-6263.

MAREČKOVÁ, J. et al. 2013. OPT model a klinická rozvaha v ošetřovatelském procesu – předvýzkum. *Kontakt*. 2013, vol. 16, no. 1. In press. ISSN 1804-7122.

MAZALOVÁ, L., MAREČKOVÁ, J. 2012. Typy validity ve výzkumu komponent NANDA-International. *PROFESE on-line*. 2012, vol. 5, no. 2, p. 11–15. ISSN 1803-4330.

PESUT, D. J., HERMAN, J. 1998. OPT: Transformation of Nursing Process for Contemporary Practice. *Nursing Outlook*. 1998, vol. 46, no. 1, p. 29–36. ISSN 0029-6554.

SIKOROVÁ, L., BOCKOVÁ, S. 2012. Model klinické rozvahy v ošetřovatelství. In Kozáková, R. et al. (eds.). *Případové studie pro výuku ošetřovatelství a porodní asistence*. Ostravská univerzita v Ostravě: Lékařská fakulta, 2012. p. 70–89. ISBN 978-80-7464-215-9.

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