© Borgis New Med 2015; 19(2): 71-77 DOI: 10.5604/14270994.1169801

RELIABILITY AND VALIDITY OF A NEW QUESTIONNAIRE FOR THE ASSESSMENT OF NURSING SKILLS AND KNOWLEDGE IN RELATION TO TRANSFUSION THERAPY

***Veronika Rajki[1,2], Mária Csóka[1], Tibor Deutsch[3], Judit Mészáros[4]**

[1]Department of Nursing, Faculty of Health Sciences, Semmelweis University, Budapest, Hungary
Head of Department: Dr. Zoltán Balogh
[2]Doctoral School, Semmelweis University, Budapest, Hungary
Head of Department: Dr. Gyula Domján
[3]Department of Picture Imaging Diagnostic Analysis and Medical Instrumentation, Semmelweis University, Budapest, Hungary
Head of Department: Dr. Attila Doros
[4]Department of Nursing, Faculty of Health Sciences, Semmelweis University, Budapest, Hungary
Head of Faculty: prof. Zoltán Zsolt Nagy, MD, PhD

Summary

Introduction. All medical staff members involved in transfusion therapy, have professional-, legal- and ethical responsibility for their own actions.

Aim. This paper aims at reviewing nursing competencies assessing nurses' knowledge about transfusion therapy regulations and how it is reflected in their daily practice.

Material and methods. In the observational, cross-sectional, descriptive pilot study data was collected using questionnaire and interview method. Reliability and validity of the self-made questionnaire were characterized by Cronbach's alpha- and Pearson correlation coefficients, respectively.

Results. The level of the nurses' overall knowledge related to the current transfusion regulations was almost 90%, and 56.2% of nurses systematized the nursing functions correctly. Significant differences were found between the institutions in the practice of transfusion therapy and practice as well as in the use of relevant documentation. 75% of the institutions have their own transfusion protocol, and assigned nurses responsible for transfusion care work in more than fifth of the wards.

Conclusions. The developed survey tool may be useful for nursing teachers and nursing leaders to discover gaps between knowledge and decision-making skills, to deal with these problems Nursing aspects of transfusion therapy should be more carefully supervised by nursing leaders along with raising the colleagues' professional responsibility.

Keywords: nursing competency, transfusion-related knowledge, transfusion therapy in practice, reliability, validity, pilot study

INTRODUCTION

Nursing teachers always considered essential to assess the professional knowledge of nurses, and to compare this theoretical knowledge with daily practice. This is especially true in transfusion practice where knowledge, competency-based activities, use of guidelines and procedures specified in the Transfusion Regulation (1) is essential for safe implementation of transfusion according to the relevant legislation.

It's well-known that blood transfusion is a relatively common procedure, and needs necessary skill for many nurses working in a range of clinical environments. Blood transfusion carries a degree of risk, and avoidable mistakes can result in serious or fatal consequences. Adverse events are largely associated with human error, so knowledge and skills are essential. It is crucial for nurses to have sufficient knowledge of situations, amount of and methods of using blood components, possible side effects and necessary cares. While local and national policies go some way to reducing clinical risk, a comprehensive knowledge of the blood grouping system and compatibility, and the ability to recognize, respond to and report reactions, are also necessary to optimize patient safety. The lack of knowledge could be detrimental to patient safety.

Publications in the Hungarian literature do not address the practice of blood donation/ blood transfusion from nursing perspective with the exception of the pro-

fessional „Transfusion-related nursing care" protocol developed by the College of Nursing. This research aims to remedy these deficiencies based on useful results achieved abroad.

An educational program was developed by The Scottish National Blood Transfusion service. Its aim was to ensure high standard of care for blood transfusions in order to minimize risk to patients and healthcare practitioners. It was investigated whether understanding and knowledge of, and attitudes towards, safe transfusion practice decreased over time following completion of module 1 of the program. Healthcare practitioners who had completed the module were involved in the online survey, and comparisons were made between participants 6-8 weeks, 12-14 months and 22-24 months since module completion. To explore attitudes in more detail in-depth interviews were conducted with a sub-sample of survey respondents. The results have shown that mild, but statistically significant decrease was observed over time among the respondents in understanding the importance of transfusion factors. The authors didn't find any difference in knowledge between those who took the course more recently and those who were up to two years post-module. The study's findings suggest that frequent refresher courses are important to maintain safe practice (2).

A research project of the Scottish National Blood Transfusion Service, ascertained student nurses' knowledge retention of safe transfusion practice following a standardized teaching and learning program in Scotland, UK. A questionnaire was used to assess the level of students' knowledge (n = 118) attained on the day of the session, and 4–6 months and 11-12 months thereafter.

An insight into the effectiveness of a standardized teaching approach was provided by this study focusing on areas for review in the light of incorrect answers. Despite the attendance of the Standardized Program, there was a wide range of initial overall scores achieved. The study demonstrated a clear decline of knowledge during the study period. The influence of experience on knowledge retention appears to have a positive effect at 6 months but no appreciable effect at 12 months. These results should be confirmed by larger, multicenter investigations (3).

Another article described the evaluation of a teaching package designed for nursing students to acquire the knowledge required for safe administration of blood transfusions. Nurses, as the health care professionals ultimately responsible for the bedside check, have the final opportunity to prevent a miss-transfusion. Applying structured learning programs in the undergraduate nursing curriculum can improve students' knowledge. A structured questionnaire was applied to assess students' knowledge of the process for transfusing blood components pre- and post-teaching and evaluate the effectiveness of the teaching pack. The results from this evaluation questionnaire proved that this teaching pack provided students with essential knowledge for administering blood transfusions safely under supervision but will require further development in collaboration with teacher colleagues and from the Blood Transfusion Service. It appeared relevant to students' learning needs and assisted many to improve their knowledge. This teaching pack was an important step towards ensuring that newly qualified nurses have the required knowledge to ensure the right patient receives the right blood at the right time (4).

An online „Nursing Times Learning" unit on safe blood transfusion was launched in 2013 (5).

Important results were derived from a study involving two consecutive surveys conducted in a hospital in France in 2005. Poor nurses' awareness of transfusion practice was found in the 1st survey. A second survey was carried out two years following the implementation of a „Good Transfusion Practices" training program. 4 questions were identical to those in the first survey in order to assess the impact of this training strategy. These 4 questions were related to blood sample identification, checking patient identification, checking "use by date" on blood product bag and the pre-transfusion bedside compatibility test. Nurses' behaviors were also evaluated by checking the pre-transfusion procedures, including interpretation of bedside compatibility tests. The impact of attendance at the training course, the period of employment, day versus night shift were also investigated as potential correlates to the results of the 2nd survey. Significant improvement in knowledge of Good Practices between the first and the second survey was found ($p < 0.0001$), but the multivariate analysis showed training to have heterogeneous impact on different outcomes. Both pre-transfusion protocol checks ($p = 0.05$) and pre-transfusion bedside compatibility test interpretation of ABO compatibility ($p = 0.007$) were improved significantly (6).

A survey was conducted between January and April 2010 in three main teaching hospitals of Bamako and Kati and in six referral health centers of the district of Bamako. The study's aim was to determine the level of knowledge and practice of medical staff personnel on transfusion medicine. A questionnaire was used for the survey, the sample consisted of specialized practitioners (15%), general practitioners (21.4%), nurses (41.6%), and midwives (22%). 70.9% of the staff did not receive any training in blood transfusion since their graduation. The general knowledge about blood transfusion was insufficient in 53.9% of staff and excellent in 46.1%. Only 42.9% of medical staff has a good basic knowledge of blood products, their indications, and related accidents. This survey also highlighted the weaknesses in transfusion system in Bamako with incomplete knowledge of the professional staff, as well as their little experience (7).

In the United Arab Emirates nurses' knowledge of blood transfusion also has been investigated. A few surveys conducted earlier in this topic also pointed out both the knowledge and the practical shortcomings. This descriptive, cross-sectional study was made in two general hospitals in Abu Dhabi, in which 248 nurses were taken into by random sampling. The response rate was 94.3%. The knowledge-questionnaire consisted of six parts, 49 items was developed for the test. Data were analyzed using descriptive and inferential statistics. The overall knowledge scores of nurses were generally low ranging from 27-56 of a possible score of 70. There were statistically significant relationship between nurses' knowledge and the work setting, the country where they trained and type of qualifications (8).

Another cross-sectional descriptive study investigated nurses' knowledge of blood transfusion. 117 nurses in medical training hospitals of Shahrekord University of Medical Sciences participated in the study in 2004. Data was collected with a questionnaire including 4 sections and 29 questions. Sections included demographic data, nurses' knowledge of blood components, nurses' knowledge of infusion techniques, and nurses' knowledge of indication and side effects of blood components infusion. Knowledge scores were coded at first and then categorized in three levels of „good", „average", and „poor". Data were analyzed by using SPSS software. The nurses' knowledge was average in relation to blood and blood component, techniques of blood components infusion, and its indication and side effects (66.7%, 65.8% and 59%, respectively). The findings showed that the nurses' knowledge of blood and blood component was average and insufficient. Therefore, the authors recommended to activate the blood transfusion committees in hospitals to improve the quality of this common procedure and prevent side effects by in-service trainings of nurses (9).

AIM

The aim of our study was to elaborate various nursing competencies associated with different nursing tasks involved in transfusion therapy along with the analysis of professional-, legal- and ethical aspects of nursing care. Our objectives can be specified as follows:

- to develop and test a special questionnaire for evaluating transfusion-related nursing knowledge;
- to compare current practice with the recommended guidelines specified in the Transfusion Regulation's directions, issued in 2008;
- to assess medical and nursing competencies associated with transfusion therapy such as blood products request, completion of the pre- and post-transfusion laboratory tests, follow-up of the changes in the Transfusion Regulation, bed-side blood-grouping, devices of blood-heating, the execution of biological probe, the use of rubber gloves, the storage of bags and administration set (fitment), and the local practice for documenting complications;
- to collect data before-, during and after transfusion procedure in hospital wards, where the implementation of nursing tasks are monitored;
- to explore the causes of similarities and differences in transfusion therapy along with the examination of transfusion rules that were adopted;
- to evaluate the local blood transfusion practice;
- to explore the extent according to which head nurses and nurses working on different patient wards know the rules relating to the transfusion therapy in all institutions involved;
- to analyze the paper-based and electronic documentation of the transfusion therapy, the local protocols and the professionalism of nursing documentation in some hospital wards.

MATERIALS AND METHODS

To answer descriptive research questions, an observational, cross-sectional design was adopted. Both quantitative methods (survey/questionnaires) and qualitative methods (interview) have been employed.

Transfusion-related knowledge and practice have been surveyed using a new questionnaire. The questionnaire has been developed following the structure of the current Transfusion Regulation published in 2008 (1). The questionnaire items corresponded to the order of transfusion procedure, the elements of the professional-, legal- and ethical aspects of nursing care, and the acquired experiences during direct observation. The questionnaire contains 29 questions divided into three parts: (I) Socio-demographic questions (8 items), (II) Transfusion therapy-related knowledge assessment (12 items), and (III) Transfusion therapy practice-related questions (9 items). Each received answers (variables) were recorded in SPSS, after coding.

Transfusion therapy practice-related information was assessed via direct observation during institution visits. Data were collected in three hospitals, where direct observation and interview were made with the involvement of local participants. In the first county hospital a chief physician, the head nurse and the nurse assigned for transfusion management were involved (n_1 = 3 persons). In the second hospital (in the capital city) on the first ward a doctor, the head nurse and a nurse, and on the second ward the head nurse participated in the study (n_2 = 4 persons). In the third (rural) hospital the head assistant of the Transfusion Department and on a ward the head nurse took part in the conversation (n_3 = 2 persons). The institution visits took place on the first week of July 2014 and one month thereafter in August. The organization of

the observations and survey was supported by the directors of nursing.

Data collection about the characteristics of local practice of transfusion therapy and transfusion therapy-related knowledge was made with the questionnaire among nurses and head nurses on certain hospital wards performing transfusion therapy. The respondents were selected using the unknown probability sampling method.

A selected sample of 30 nurses and head nurses in three hospitals participated in the assessment of the measuring instrument (10 participant in each institution). Although the number of respondents remained the same in each institution, different nurses were involved in the repeated surveys. The „July" respondents are marked with n_j, while those participating in the „August" survey are represented with n_a.

The reliability of the new instrument has been evaluated using the standard deviation (SD), test-retest analysis, Pearson correlation coefficients and Cronbach alpha (10, 11,12). The statistical analysis was performed using the SPSS program (version 20).

Our research protocol has been approved by the ethical committee of the Semmelweis University in conformity with the rules of data protection.

RESULTS

30 nurses were asked to participate in the evaluation of the survey questionnaire. The number of returned and properly filled-in questionnaires was 29 during testing, and this figure dropped to 27 when the instrument was retested.

Reliability of the questionnaire

Both overall transfusion-related knowledge scores and transfusion practice scores showed excellent test-retest reliability in terms of means and standard deviation statistics. In „July" survey the variance/standard deviation of knowledge score was 29.6/5.4 while in the retest procedure in August these values were 16.7/4.7, respectively. The same characteristics were found to be very close to each other when the overall score of the 9 questions about the practice of transfusion therapy were evaluated: 34.3/5.9 in July and 34.0/5.8 in August, respectively.

Figure 1 summarizes some test-retest reliability measures calculated from data collected in response to selected question groups in our survey. Some questions are related to transfusion-oriented knowledge, while other items characterize transfusion practice.

Table 1 Summarizes how the number of correct and incorrect answers depend on the frequency nurses perform transfusion therapy.

The results of test-retest reliability assessment are shown in table 2. Items covered include 11 questions about the transfusion therapy-related knowledge and 9 questions about transfusion therapy-related practice and local customs. The table 2 contains linear correlation coefficient (Pearson's correlation coefficient) values (10-12).

Inter-item reliability has been characterized by Cronbach's alpha' statistics. This value in the case of transfusion therapy-related knowledge was 0.906 (excellent) during the test of the questionnaire, and it was 0.880 (good) during the retest of the question-

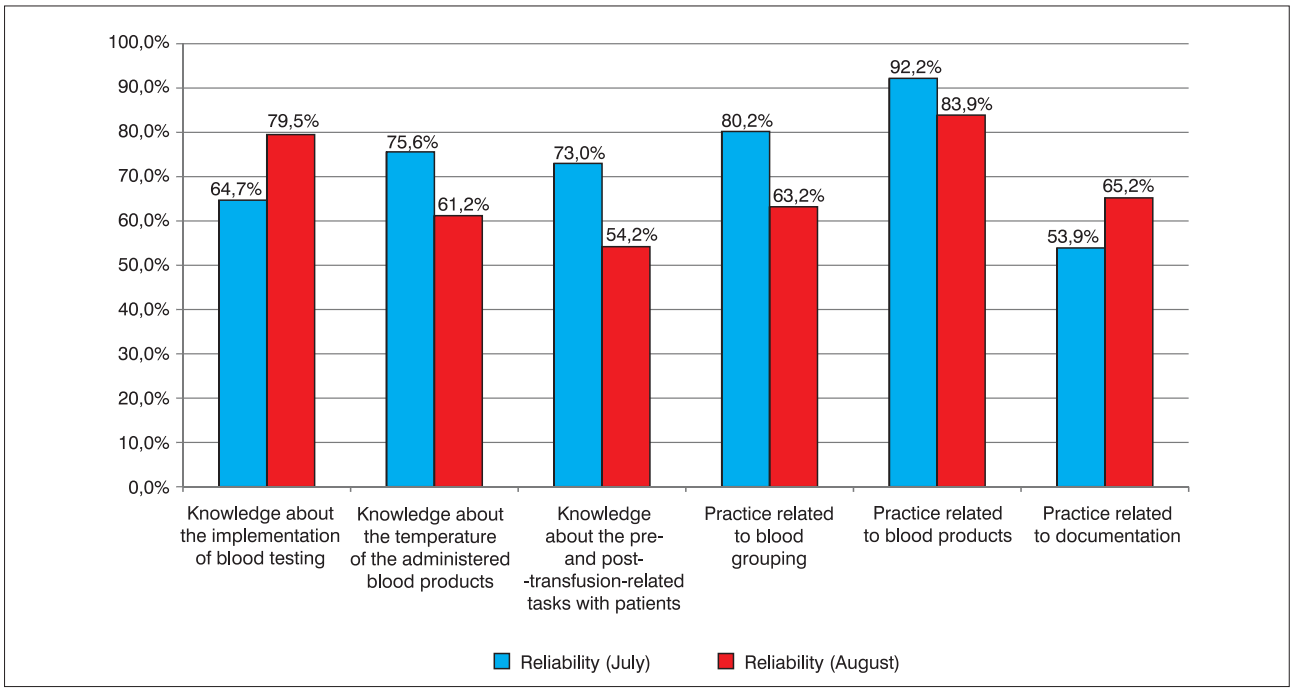

Fig. 1. Reliability in certain question groups (nj = 29 subjects, and na = 27 subjects).

Table 1. Relationship between transfusion-related knowledge and nurses involvement in transfusion therapy.

Institution	Daily, weekly or bi-weekly participation in transfusion therapy			Monthly or less frequently participation in transfusion therapy		
	participant nurses/ total number of responses	number of correct answers (%)	number of incorrect answers (%)	participant nurses/ total number of responses	number of correct answers (%)	number of incorrect answers (%)
„A" hospital (July)	10 persons/110	88 (80%)	22 (20 %)	-	-	-
„B" hospital (July)	5 persons /55	34 (61,8%)	21 (38,2%)	4 persons /44	22 (50%)	22 (50%)
„C" hospital (July)	5 persons /55	28 (50,9%)	27 (49,1%)	5 persons /55	24 (43,63%)	31 (56,37%)
„A" hospital (August)	10 persons /110	85 (77,3%)	25 (22,7%)	-	-	-
„B" hospital (August)	2 persons /22	13 (59,1%)	9 (40,9%)	7 persons /77	41 (53,25%)	36 (46,75%)
„C" hospital (August)	4 persons /44	15 (34,1%)	29 (65,9%)	6 persons /66	26 (39,4%)	40 (60,6%)

Table 2. Pearson's correlation coefficient values in relation to tests-retest comparison.

Items	Pearson's correlation coefficient
Do the Transfusion Regulation contain a sample about Patient information and statement of consent?	–
Which blood sample is suitable for the preliminary laboratory blood group serology testing, what kind of tubes would you use for this purpose?	1.000
What temperature limits should the blood products be within before its administration?	0.599
When the heated blood products administration should be started?	0.878
What does the „blood sample before transfusion" mean?	0.939
Is clinical AB0- and RhD blood group determination compulsory before administration of chosen/selected blood?	–
Which is the right answer in relation to the "clinical blood group determination"?	0.711
Which tests/exams need to be performed before transfusion accordingly the patient's condition and the indications for transfusion beside blood group serology tests?	0.927
Which statement is true in relation to the administration of blood products?	0.811
Which statement is true in relation to the biological probe/testing?	0.733
What are the tasks after transfusion therapy?	0.965
Who determines the blood group on your ward?	–
How do you perform bedside blood group determination on your ward?	0.826
How do the blood products arrive on your ward (transportation)?	0.813
How do you warm the blood products on your ward?	0.756
What are the characteristics of the implementation of biological testing on your hospital ward?"	0.209
What are the characteristics of the blood products administration on your ward?	0.536
How do you store the devices after transfusion therapy?	0.811
How do you describe the documentations on your ward?	0.626
What types of documents do you use in connection with the transfusion therapy on your ward/institution?	0.955

naire. Cronbach's alpha's value in the case of transfusion therapy-related practice and local customs was 0.924 (excellent) during the test of the questionnaire, and it was 0.894 (good) during retesting. Cronbach's alpha's value in the case of knowledge about nursing functions was 0.969 (excellent) during the test of the questionnaire, and it was 0.953 (excellent) during retesting.

Relationships between knowledge and practice

An important objective of the study was to evaluate how transfusion-related knowledge is reflected in the practice of transfusion. This relationship has been analyzed by comparing responses to related questions in the knowledge and practice sections of the questionnaire. For example, we examined the correlation between the question „Which statement is true in relation to biological probe/testing?" and that of „What are the characteristics of the implementation of biological testing on your hospital ward?" The first questions addresses the relevant piece of knowledge, the second question addresses the same issue from the perspective of daily practice. In this case the Pearson's correlation coefficient was r = 0.606 in „July" survey and r = 0.488 in „August" survey (10, 11).

Pearson's correlation coefficient was r = 0.80 in July in the case of the correlation between „What temperature limits should the blood products be within before its administration?" and „How do you warm the blood products on your ward?". In August the Pearson's correlation coefficient was r = 0.78.

The Pearson's correlation coefficient was r = 0.663 in July, and r = 0.896 in August survey when the two questions „What are the tasks after transfusion therapy?" and „How do you store the devices after transfusion therapy? Were compared with each other.

Typical deficiencies/errors revealed

The analysis of the interviews and in site observations revealed the following deficiencies and problems associated with the transfusion therapy:

blood products are carried in hands from the Blood bank, there's no cooler bag;

- execution of the biological probe is missing in several times;
- the „Transfusion Diary" is not written (neither paper- nor electronic form) since 2001;
- physicians not always wear gloves during blood-grouping;
- only approximately 90% of the nurses pull gloves on during the blood administration;
- blood warmers are not used (although VM-1 blood warmer device is on the wards);
- doctors insist on the use of the old type of blood group determination („tile" technique), instead of Serafol (or other proper card);
- the patient's blood group often controlled unduly (repeatedly per bag, the doctor and the nurse perform the blood group control);
- in one hospital ward nurses regularly determine blood groups;
- it's not possible to print empty documents from the computer, only after use of the patient's data;
- blood products were warmed in hot water, the basin what was used for this wasn't clear, the basin was in the sink, which also was not entirely clear;
- blood products weren't stored in thermometer checked, permanently warm, 37 °C water, and not together with the protective cover;
- the nurse administered the blood product to the patient (in the presence of the doctor), and didn't wear gloves;
- the devices (bags, tubing) are not stored in refrigerator for 48 hours after the transfusion therapy. There is no "bloody" refrigerator on the ward (they put the tubing, and empty bags as hazardous waste into the yellow boxes);
- transfusion therapy has no uniform marking in nursing documentation (patient care sheet) on the ward, there are colleagues who document it with red ink, others do it with blue ink, and some others document only the type of blood products and its administered volume with red;
- transfusion protocol is old, it's from 2007;
- Serafol card is not held for 48 hours, because it's „disgusting";
- use of the red color to mark transfusion in documentation is not unified among physicians;
- biological probe is performed twice per bag;
- transfusion booklet is not signed by anyone on the ward, only by one colleague from the Transfusion Department.

Assigned nurses

Nurses from 8 different hospital wards participated in our „July" survey and nurses from one of these wards (Gastroenterology) mentioned that a transfusion responsible nurse is working in the ward. In our „August" survey nurses participated from 10 different hospital wards, and nurses from four of the wards (oncohematology-, gastroenterology- internal medicine ward- and pediatric intensive care unit) mentioned that a transfusion responsible nurse is working in the wards.

DISCUSSION AND CONCLUSIONS

The knowledge and adequate use of guidelines and procedures specified in the Transfusion Regulation (1) is essential for safe implementation of transfusion therapy. The lack of knowledge and proper skills could be detrimental to patient safety. The current national-level Transfusion Regulation is available for professionals on all hospital wards. During our research we understood that

about 70% of hospital wards have their local transfusion protocol. Therefore one might expect nurses to have acquired the necessary knowledge and skills (professional-, legal- and ethical competence) needed for adequate and safe transfusion therapy. Our study revealed however, that this is unfortunately enough, is not the case.

Nurses' transfusion-related overall knowledge is only 65.6% and is incomplete in several areas. This is especially true when nurses are confronted to determine independent, dependent and interdependent nursing functions. The knowledge of the nursing functions among nurses in our survey was 63.75% in July, and it was 48.625% in August, so its average was 56.2%.

These figure obviously depend on the frequency nurses are involved in transfusion procedures. The knowledge of nurses involved in transfusion therapy daily, weekly or bi-weekly did not reach the level of 90% in none of the institutions, while in those who do transfusion monthly or less frequently the average knowledge didn't reach the 50% level.

Significant differences were found between institutions regarding the practice of transfusion therapy, in particular the application of nursing- and other relevant documents, blood-grouping and blood-warming.

We also revealed that 70% of the institutions use their own "hospital transfusion procedural instructions" as part of the hospital's quality documentation system, specifying procedural steps of transfusion therapy, the staff responsible for the various elements of the process and the way of documentation. Nurses responsible for transfusion-related nursing care control and its co-ordination, are assigned in 28% of wards that have been studied.

The developed survey tool may be useful for nursing teachers and nursing leaders to discover gaps between knowledge and decision-making skills, to deal with these problems. Nursing aspects of transfusion therapy should be more carefully supervised by nursing leaders along with raising the colleagues' professional responsibility. □

References

1. Barótiné Tóth K: Blood Transfusion Policy: methodological letter by Hungarian National Blood Transfusion Service 2nd edition. [Transzfúziós szabályzat: az OVSZ módszertani levele 2. kiad.] Országos Vérellátó Szolgálat, Budapest 2008: 1-113. **2.** Smith A, Gray A, Atherton, I et al.: Does time matter? An investigation of knowledge and attitudes following blood transfusion training. Nurse Educ Pract 2014; 14(2): 176-182. **3.** Smith FC, Donaldson J, Pirie L: Pre-registration adult nurses' knowledge of safe transfusion practice: Results of a 12 month follow-up study. Nurse Educ Pract 2010; 10(2): 101-107. **4.** Mole LJ, Hogg G, Benvie S: Evaluation of a teaching pack designed for nursing students to acquire the essential knowledge for competent practice in blood transfusion administration. Nurse Educ Pract 2007; 7(4): 228-237. **5.** Higgins D, Jones D: Ensuring patient safety blood transfusision. Nurs Times 2013; 109(4): 22-23. **6.** Tramalloni D, Auperin A, Oubouzar N et al.: Implication of nurses in transfusion safety: knowledge assessment and practice evaluation at the Gustave-Roussy institute. Transfus Clin Biol 2005; 12(6): 427-432. **7.** Diakite M, Diawara SI, Tchogang NT et al.: Knowledge and attitudes of medical personnel in blood transfusion in Bamako, Mali. Transfus Clin Biol 2012; 19(2): 74-77. **8.** Hijji B, Parahoo K, Hussein MM et al.: Knowledge of blood transfusion among nurses. J Clin Nurs 2013; 22(17-18): 2536-2550. **9.** Aslani Y, Etemadyfar S, Noryan K: Nurses' knowledge of blood transfusion in medical training centers of Shahrekord University of Medical Science in 2004. Iran J Nurs Midwifery Res 2010; 15(3): 141-144. **10.** Tóthné Parázsó L: The mathematical foundations of research methodology. [A kutatásmódszertan matematikai alapjai.] Eger: Eszterházy Károly Főiskola. Available from: http://www.tankonyvtar.hu/en/tartalom/tamop425/0005_31_kutatasmodszertan_pdf/adatok.html; (acces date 11-07-2013). **11.** Sajtos L, Mitev A: Handbook of research and data analysis using SPSS. [SPSS kutatási és adatelemzési kézikönyv.] Aliena Kiadó, Budapest 2007: 203-214. **12.** Falus I, Ollé J: Empirical research practice: data processing and statistical analysis. [Az empirikus kutatások gyakorlata: adatfeldolgozás és statisztikai elemzés.] Nemzeti Tankönyvkiadó, Budapest 2008: 186-205, 323-325.

Received: 11.05.2015
Accepted: 10.06.2015

Correspondence to:
*Veronika Rajki
Doctoral School
Semmelweis University
Budapest, Hungary
1088 Budapest, Vas utca 17
tel.: tel.: +36 1-486-58-36
e-mail: rajki.veronika@se-etk.hu