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Full Length Research Paper

Reforms in higher nursing education in High Medical School of Bitola by Bologna declaration

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Nursing education in Europe and North America was reviewed, together with European Commission directives and regulations and pertinent World Health Organization documents. The new practical models for education are preferred. The aim of our research is to analyze the effect of education of nurses with faculty degree using one actual health activity. A total of 65 students in their third year of theoretical and practical courses were included. We made the evaluation before and after two months of the education. The analyses of the responses in the questionnaire showed a significant increase of the theoretical ($p<0.05$) and practical knowledge ($p<0.01$). In order to evaluate the effectiveness of the education, it is necessary to choose an educational model that will offer reflexive information from the students. Choosing current medical topic and following the standards of prevention in treatment is one important segment of the health system in every country.

Key words: Education model, nursing practice, medical standards.

INTRODUCTION

We have had a long tradition in nursing education at the High Medical School in Bitola since 1985. The Ministry of Education and Sciences of our country is a signatory of Bologna declaration for educational standards in EU (Bologna declaration, 1999; Davies, 2008). We have a three years basic education for nurses with curriculum adapted by European credit transfer system, and consequently our students have possibilities to continue their education at other universities. The economic developement and health standards in our country are not in the same level with those in the developed countries. The Ministry of Health has invested in the equipment, and the Ministry of Education and Science has invested in medical professionals who are going to work with the equipment.

Traditionally, nurses provide care on the basis of medical diagnosis and physician's instructions; thus nurses serve the physicians, and not the patients. Assisting the physician in his curative role is an important function of the nurse; it is not his or her primary role. For nurses today, the principal responsibility is to identify and address patient's needs, develop a plan for nursing care, provide care and assess the outcome. It is a complex intellectual process and requires a wide range of knowledge and skills (Carlies et al., 1999). A high educated nurse must be a health professional to deliver patient-centered care as a member of an interdisciplinary team, with emphasis on evidence-based practice, quality improvement and intensive use of health-related information technology (Keighley, 2009).

The students who study at the faculty of health vocations at the university in Bitola gain their knowledge through theoretical and practical education. Studying through practice is of a special importance for the medical staff. Management of certain health problem theoretically and practically is done according to the latest developments in the medical sciences and solution to problem from the socio-economic aspect. The students have at their disposal modern technical equipment, including

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computer for theoretical lessons and the library has subscribed to the Hinary project, which helps both the students and medical personnel in their research activities. Practical education is performed at the specialized classrooms of the clinical hospital, at the institutions for health protection and through project activities. A number of students have certain pre-knowledge gained from the media and their previous edu-cation. The university education for nurses should strive to achieve a higher level. In order to see if this is possible, we made an analysis of one actual medical problem, namely spine deformities. Use of video terminals and long-term forced bad posture are increasing, which result in a larger number of spine deformities.

The team of early detection and prevention of these deformities includes a medical doctor and a nurse. However, no clinical tests are included. The fact that there are deformities is emphasized.

The aim of this research is to define the effect of the education through assessment of the knowledge obtained during the study programs.

METHODS

Participants

The research was conducted among third year students in the nursing program for their rehabilitation therapy and with the educational unit management of the spine deformities and the role of the nurse in the health system. A total of 65 students were included (60 females and 5 males) at the age of 21 to 22. This gender disparity is a trial situation without any consequences on results. 90% of this age group completed the secondary medical school. There were 2 educators. The education aims to enable the nurses to execute the school screening reviews for the spine deformities.

Instruments scales and variables

In order to evaluate the effect of the theoretical courses, we have designed a questionnaire with 20 questions, which had to be answered by the students before and two months after the completed educational training. Each correct answer is labeled with a star (in the questionnaire). Here are the questions included:

Questionnaire for spine deformities

1. Scoliosis is a spine deformity
(a) Left right curving, (b) front back curving, (c)* 3D curving

2. Idiopathic scoliosis has etiology
(a) Known, (b)*unknown, (c) correctly defined

3. The treatment of the scoliosis is defined according to Rahall's rule
(a)* The size of the curve, (b) age (c), etiology of the deformity

4. The school screening for spine deformities is applied in our country
(a)*Yes, *(b) no, (c) I do not know

5. Is the educational system for nurses and physiotherapists applied in the education for screening of deformities?
(a)*Yes, (b) no, (c) I do not know

6. Who executes the school screening program for deformities in our country?
(a)*Doctor of general practice, (b) orthopedic doctor, (c) nurse, (d) physiotherapist

7 Which do you think is the most economic way to perform the review in schools?
(a) Orthopedic doctor, (b) doctor of general practice,(c)* nurse, (d)* physiotherapist, (e) somebody else---------- who, (g) combination of the above-mentioned

8. At what age should the school screening be started?
(a) *7, (b) 9, (c) 15

9. Which are the three basic tests for spine deformities?
(a)*Test of higher shoulder,(b) test of higher rib, (c)* test of antireflection and back, asymmetry,(d) test of shorter leg, (e)* test by Matthias,(g) test of fall of the pelvis

10. How do you prevent the postural incorrect standings?
(a)*with exercises, (b) with brace, (c) with exercise and brace

11. Which are the three most applied exercises in the world for spine deformities?
(a)*Exercises by Schrot, (b) exercises for extension, (c)*exercises by Doboshewich, (d) exercises for kyphosis, (e) exercises by Mats, (g)*exercises by SOSORT, (k) I do not know

12. Are there unique criteria for screening of spine deformities in the world?
(a) Yes, (b)*no, (c) I do not know

13. Can one postural deformity – bad posture be transformed to scoliosis?
(a)*Yes, (b) no, (c) I do not know

14. The corset for spine deformities is applied with previous clinical examination and that is?
(a)*With X-ray, (b) without X-ray

15. Which are 4 complications of spine deformities?
(a)*Pain, (b) shortness of breath, (c) *functional disturbances of KBS and respiratory system, (d)*esthetic defect, (e)* changed quality of life, (g) poor appetite, (f) broken parts?? (h) I do not know.

16. The effect from the treatment with corset is reached by wearing it,
(a) 12 h per day, (b)* 23 hours per day, (c) 6 h per day, (d) I do not know

17. The corset for spine deformities is worn,
(a) 6 months, (b) 15 years, (c)*till the end of the growth of a bone - 21 years, (d) I do not know

18 The operative treatment is sophisticated and efficient,
(a) Yes, (b)*no, (c) I do not know

19 Treatment with exercises has fast and long-lasting effects,
(a) Yes, (b)*no (c) I do not know

20 Treatment with exercises is applied in the schools in Macedonia, (a) Yes, (b)* no (c) I do not know

Measures

Theoretical courses of the students were conducted according to the master form of teaching and by using written materials.

The practical course consisted of practical performance of 4 tests for spine deformities and practical education for entering data according to prepared protocol. The students were taught to mark the test as a positive or negative one. In the protocol they had to enter the personal data of the child, school grade, age, sex, weight, height, calculated body mass, index positive or negative test. The students were educated to apply the following test:

Test 1: Higher set shoulder (Figure 1)
Test 2: Adams test for back asymmetry (Figure 2)
Test 3: Test by Matthias (Figure 3)
Test 4: Test for shorter pelvifemoral muscles (Figure 4)

Each student had to examine 5 children and after the improvement of the motivation, each successfully examined child got a higher grade at the final exam.

Ethics consent

Ethics consent was obtained by the Ministry of Education and Ministry of Health. The students had to examine 5 children from their surrounding at the age of 6 to 17, with the parents' previous permit confirmed by their signature.

Data analyses

1. For evaluation of the effect of the education, each correct response to the questionnaire was given points in terms of the total number included in the poll; for each correct answer t-test was made opposite to the proportions, which were significant at $p<0.05$.
2. The evaluation of the interests for participation in the project was made by comparing the total number of those who were educated and to those who sent the examination lists.
3. The evaluation of the successfully learnt part of the practical course was done by calculating the total number of examined children and the total number of valid examination.

The evaluation of the effect of the treatment was made with t-test, differences of proportions and previous evaluations (2 and 3) with set significance at $p<0.05$.

RESULTS

The effect of theoretical education

The effects of the theoretical course in terms of positive answers before and after the education are shown in Table 1, presenting a total number of 65 tested students. A significant improvement of the results obtained for 14 questions from the questionnaire was noticed ($p<0.05$) and the present sufficient level of pre-knowledge for 5 questions is significant for the learnt educational unit. Of the overall number of questions and sub-questions (27) 14 (52%) which had improvement of the gained knowledge ($p<0.05$), 1(6.5%) had worse an-swer and 5 out of 12 (Questions 2, 8, 9/c, 15/a,d) had high pre-know-ledge ($p>0.05$). Total 19 (70%) of the questions there is a high level of knowledge of the material ($T=2.1$, $p<0.05$).

Figure 1. High set shoulder (Test 1).

Figure 2. Adams test for back asymmetry (Test 2).

Figure 3. Test by Matthias (Test 3).

Figure 4. Test for shorter pelvifemoral muscles (Test 4).

The effects of practical education

Of the total number of 65 students, 59 (90.8%) submitted examination lists ($p<0.05$). Of the total number of examined children (280), 248 (88.6%) were of valid examination lists ($p<0.05$). The effect of the theoretical education was analyzed with T test and the difference in proportion is presented in Table 2.

DISCUSSION

Screening of school for spine deformities is an important health activity, where a large number of health workers and employees in the Ministry of Health and Ministry of Education are included. This health activity is burdened with the cost of the activity itself, the education of the staff who made the screening and the attitude of the society towards this activity (Douglas, 2008; Grivas et al., 2007).

The prevention of the activity has been solved differently in different countries of the world. In the USA the screening is made by a nurse who is employed in schools (one nurse per 700 to 2000 students). In Macedonia, school screening for spine deformities is performed every 24 months as a constituent segment of the general systematic check-ups and it is performed by a doctor of general practice and a nurse. The screening is free of charge and it is regulated by law (www.ministryofhealth.gov.mk.2012).

School screening for spine deformities has preventive importance since spine deviations can be detected early and this would enable conservative treatment. This kind of treatment is more acceptable for the patients, it is less expensive and it stops the progression of the curve (Griniene and Liutaite, 2009).

The standard test for early screening of spine deformities that we applied for the education of the nurses is a constituent segment of the theoretical education of the nurses and those who are involved in early screening and monitoring of the deformities.

We conducted an educational workshop aimed at teaching students how to enter the data in the protocol as well as to perform the examination of the children, which has proved to be efficient because in the end the number of the successfully examined children was significant. A substantial number of students who were included in the preparation of the protocol showed that the method of studying and development of clinically justified skills for studying is efficient (Salsali, 2005; Fitzpatrick, 2004; Junious et al., 2004; Borneuf and Haihg, 2010).

In this way, we enable transfer from feasible to effective studying, which was the aim in several cited articles that discuss education of nurses and midwives (Stronge, 2007; Sibbald et al., 2006).

For the evaluation of the effect of the education, it is necessary to get reflexive information for the applied

Table 1. Effect of theoretical courses.

Question no.	Before education	%	After education	%	Effect (t value)	P value
1	11	16.9	46	70.7	4.1	<0.05
2	54	83	51	78.4	-0.05	>0.05
3	34	52.3	54	83.	3.1	<0.05
4	30	46.1	47	72.3	2.36	<0.05
5	21	32.3	51	78.5	0.117	>0.05
6	14	21.5	29	44.6	3.95	<0.05
7	16	24.6	49	75.3	1.165	>0.05
8	51	78.4	58	89.2	1.53	>0.05
9	a)0	a)0	a)36	a)55	a)80	<0.05
	c)48	c)74	c)58	c)89	c)1.99	<0.05
	e)58	e)89	e)54	e)83	e)0.9	>0.05
10	20	31	24	37	0.42	>0.05
11	6	9	29	44.6	2.5	<0.05
12	0	0	4	6	0.5	>0.05
13	58	89	64	98	2.09	<0.05
14	22	34	45	69	2.8	<0.05
15	a)40	a)82	a)65	a)100	a)1.28	>0.05
	c)35	c)54	c)60	c)92	c)4.2	<0.05
	d)47	d)72	d)54	d)83	d)1.3	>0.05
	e)38	e)58	e)54	e)83	e)2.65	<0.05
16	4	6.1	58	89	6.57	<0.05
17	14	21.5	32	49	1.6	>0.05
18	3	4.6	29	44.6	2.66	<0.05
19	14	21.5	26	40	1.27	>0.05
20	14	21.5	49	75	4.2	<0.05

P<0.05 significant; P>0.05 not significant. a); b); c); d) and e) represent sub questions and the statistic is made with differences of proportion to represent the effect of education.

Table 2. Effect of practical courses.

Educated	Sent list (%)	Did not send (%)	T-test	P value
65	59 (90.8)	6 (9.2)	70	<0.05
Total number of examination	**Valid examination (%)**	**Non valid examination (%)**		
280	248 (88.6)	32 (11.4)	15.44	<0.05

P<0.05 significant; P>0.05 not significant.

education (Junious et al., 2004). We did that by completing the questionnaire before and after the education and the number of successfully examined children was an indicator for gained practical knowledge.

Our educational courses give positive contribution in knowledge enhancement of the nurses. Positive experience from this kind of studies has already been seen in many educational centers in the Great Britain and USA (Biggs, 1999; Šimunovićet al., 2010).

Successful education is realized by choosing and identifying a model, which will function and facilitate the process of studying and should be based on problem

studying (Laurant et al., 2005).

In our presentation, we have explained the actual situation regarding health protection of spine deformities and we have explained the role of the nurse with university education in screening of spine deformities in our health system (and the American health system).

Significant improvement was shown in the results of 14 questions from the questionnaire and the sufficient level of pre-knowledge related to the 5 questions for the learnt educational unit was significant. This model of education can be applied to other educational unit, where students of the same age are going to be examined (second and third year of studies) (Salsali, 2005; Fitzpatrick, 2004; Junious et al., 2004). On the other hand, the educational courses on spine deformities included in the curriculum for the nursing study program with basic faculty education will enable nurses to gain specific knowledge in preventive medicine in the health system in schools. According to one study from Litany (Perrenound and Spitzer, 2005), the health of the school children was considerably better when nurses who constantly followed the children's health were employed. The most commonly encountered health problems were cold, headaches, problems with food digestion and spine deformities.

The directives for reorganization of the health systems in many countries are aimed at involving nurses specialized in health protection in the health system. Nurses have to be educated to work by precisely defined pro-tocols given by the Ministry of Education in our country. This will result in a higher level of health protection, and economical one, because the service of the nurse costs less than her education or post-education as it has been done in Australia (Borneuf and Haihg, 2010; Šimunovićet al., 2010). The involvement of the nurse in many specialized health activities and work with protocols has socio-economic importance as it reduces the number of unemployed nurses (Perrenound and Spitzer, 2005).

Recent development of a system of peer review to assess educational standards has provided an opportunity to build an international community of professionals and formulate educational standards for nursing care (Parker et al., 2009; Workgroup of European Nurse Researchers; Halcomb et al., 2004; Ketola, 2009).

Over the last decade, the World Health Organization (WHO) has provided a number of tools to support and facilitate the design of new models of university-based nursing education. In addition, WHO provides guidance on quality control and education evaluation, preparation of nursing teachers and mentors and criteria for the schools of nursing. We must be informed and involved in all strategies of WHO (Forbes et al., 2010; World Health Organization, 2000; World Health Organization, 2001; Montour et al., 2009).

Traditional schools of nurses have existed in France, Germany, Austria and Luxemburg. High professional university school has existed in Holland, Belgium, UK, Spain and Norway. University second level exists in the UK, Ireland, Sweden and Germany (Laurant et al., 2005).

The findings indicate that demographic trends pose an immediate threat to the sustainability of the nursing workforce in the rural setting. Many nurses are close to retirement, but lack of opportunities for full-time positions as well as specialized and expanded nursing practice are attracting younger nurses to urban centres. Government policies focussing on the retention of clinical expertise, the recruitment of new graduates and expanding the role of registered practical nurses have been more difficult to implement in the rural setting. Implications for future research include the need to address data gaps to facilitate workforce planning and to evaluate the effectiveness of provincial recruitment and retention strategies in the rural context (Kennedy et al., 2011).

To develop a community nursing care is a more conceptually complex model of anticipatory care. It is needed to build on initial exploration, within which all aims, roles, practices and methods of evaluation can be located and clearly visible. This offers the potential to enable practitioners to interpret and apply policy, otherwise change may be limited and result in service gaps (Hodges, 2009).

In literature, mentoring system for education of nurse practitioners is an actual issue. The use of learning contracts, formulation of ground rules, use of information in student's handbooks and discussion of the expectations of the mentor and mentee can help prevent or counteract problems in the relationship (Halcomb et al., 2008).

There is a need to develop nurse leaders and managers not only to embrace the challenges of general practice from an operational perspective, but also to undertake a clinical leadership role. As clinical leaders, these nurses will need to develop a culture that not only optimizes health outcomes but also advances the status of the nursing profession (Smith and Zsohar, 2007). Positive outcomes of successful mentoring programs for the neophyte educator include a collegial relationship with the mentor, improved job satisfaction in a faculty role, improved quality of nursing education, and retention in the nursing education profession.

This project has been functioning for 4 years on the same subject by same educators; it is easy to achieve its objectives and there are no social limits.

The learning materials are utilized at the medical faculties in our country and in collaborating universities (TEMPUS Program).

Further research needs to comprehensively investigate the role of nurses in the Macedonian setting with a view to developing effective and sustainable frameworks for clinical practice. In particular, high-level evidence is required to evaluate the efficacy of the role of nursing practice compared to current disease management strategies.

Conclusion

From the completed investigation on education of nurses in Macedonia and its comparison with the EU and the world in general, we can conclude that:

1. Our country has university second level education by Bologna Process and the European Credit Transfer and accumulation System- ECTS standards.
2. Nurses with university degree must be involved in our medical system, if we want to have European standard for practicing nursing.
3. Our vision is to improve the entire educational process related to nursing study programs and commence doctoral studies for nurses.
4. Nurses that graduate from our schools are ready to be employed in the European Union (EU) market, but we need them here to help our sick people and for community care.
5. There are many people who seek help in rural countries. We can be involved in helping these countries under the patronage of the World Health Organization (WHO).

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