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Original research article

The continuing education on personal work values of general nurses working in hospitals of the Czech Republic: A Euclidean distance-based measure

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ABSTRACT

Aim: The aim of our research was to find out the position (and its changes over a period of time) of continuing education on the personal work values scale of general nurses working in hospitals in the Czech Republic.

Methods: The research was designed as a comparative study (comparison of results from the years 2006, 2011 and 2016). The data were obtained through a questionnaire using Herzberg's two-factor theory of motivation. However, the theory was adapted to reflect current conditions of care-givers who work within a multidisciplinary team. The questionnaire aimed at distinguishing the order of the selected factors of working environment, which subsequently created the scale of personal values. 3081 respondents took part in the research in 2006, 1992 respondents in 2011, and 1751 respondents in 2016. The comparative analysis data were processed with the Euclidean distance model and non-parametric tests.

Results: In 2006, the possibility to engage in continuing education occupied 8th place on the scale of personal preferences (out of 16), in 2011 it ranked 10th, and 12th in 2016. The research results reveal a long-term tendency towards a decrease of personal preferences regarding continuing education. The decrease was statistically significant between the years 2006 and 2011 and the year 2016 ($p < 0.001$). The results indicate that with an increasing age the preference for continuing education decreases ($p < 0.001$). A statistically significant reduction in the preference for continuing education was found in nurses aged approx. 45 years.

Conclusions: Highly professional, effective and good quality education (and subsequent continuing education) is essential for the provision of safe and good quality care. A nurse in a managerial position should encourage staff nurses to continually learn irrespective of their age. Only this may lead to a high quality care for patients.

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Introduction

Advancements in health literacy, medical services, drugs, medical devices and equipment have resulted in the fact that people live longer than before. In 2012, the life expectancy in the Czech Republic was 80.9 years for women and 75.0 years for men. Thus, in comparison with 1991, the life expectancy extended by 5.5 years in women and by 7.5 years in men [1]. However, higher age brings the potential of health issues and age-related complications. A number of diseases that used to be fatal have become chronic, which means that they require permanent attention. Healthcare professionals are faced with more demands. Patients expect to be treated according to the latest scientific knowledge and procedures. To be able to meet the requirements, healthcare professionals have to be well educated and engaged in continuing education. Lifelong professional education is considered the essential factor contributing to good-quality healthcare [2]. Lifelong education can improve knowledge as well as skills [3]. Continuing education leads to higher professionalism of nurses and to improved nursing care [4]. With regard to the fast changes in patient/client care due to advancements in knowledge and skills as well as in technologies (procedures, methods, guidelines, etc.), further education has become vital for this non-medical profession [5,6].

Lifelong education of healthcare professionals and its legal status in the Czech Republic

Lifelong education (also referred to as continuing professional education, continuing professional development, lifelong learning, further professional training, continuing nurse education and continuing education) [4,7] is generally seen as a positive thing by nurses. However, there are some negative aspects connected with it [8]. When nurses feel a lack of support from their employer, they pay for their education and/or participate in various educational events in their free time [9, 10]. The possibility to be involved in lifelong education is related to satisfaction at work [11] and the retention of nurses [12]. Barriball et al. [13] divide professional nursing education into two categories: formal and informal. Formal education involves taking part in conferences, seminars and educational programmes (in the Czech Republic this is stipulated by the law) [13]. Informal education involves various activities, e.g. reading, self-study, or working in committees/associations (i.e. similar to the situation in other professions) [13]. The aim of continuing education is to enable non-medical healthcare workers to perform well and in accordance with the latest findings (which is also their legal duty). Lifelong education of non-medical healthcare professionals in the Czech Republic is an integral part of Act No. 96/2004 Coll., on conditions for the acquisition and recognition of competences to carry out a non-medical healthcare profession and the performance of tasks related to health care provision, as amended (Non-medical Healthcare Professions Act) [14]. The Act defines lifelong

education as the continuous increase and enhancement of knowledge, skills and competences in a given field according to the latest, state-of-the-art development. The Act also specifies types of lifelong education and legal obligation to continuous learning (for all non-medical professionals). With healthcare professionals working under supervision or direct management, the supervision and provision of this obligation is up to the employer or quality accreditor (if a healthcare provider is accredited). There are no sanctions for not meeting the provision. The situation is different with non-medical healthcare professionals working without supervision. These employees are legally bound to obtain the certificate of qualifications enabling them to work without supervision. To get the certificate, one has to be engaged in lifelong education. The employees either achieve 40 credits for taking part in education, specified by Decree No. 423/2004 Coll., which establishes a credit system for obtaining a certificate for the performance of a healthcare profession without direct supervision or professional supervision of medical personnel [15], or they prove they have studied professional literature on their own. They are examined by an examination board appointed by the Ministry of Health of the Czech Republic. The employee awarded the certificate is referred to as “registered”. In 2004, the registration was valid for six years. In 2011 the period was extended to ten years, yet the number of credits one has to obtain over this period of time for lifelong education remained the same [16].

Educational activities and events designed for nurses are various. It is possible to collect credits, e.g. for attending four seminars (each lasting 2 h), one day of a professional conference, or by co-authoring a poster. Other forms of continuing education include, e.g. e-learning, seminars, professional training courses, accredited conferences, etc. Recognition of other forms of education lies in the competence of a professional association of the given healthcare workers, or of the Ministry of Health of the Czech Republic. The number of credits serves as an instrumental regulatory method, and should not reduce the education to “a hunt for credits”. The obligation – legal as well as ethical – of each healthcare professional is also stipulated by Act No. 372/2011 Coll., on healthcare services and the conditions of their provision (Healthcare Service Act) [17]. Provision of *lege artis* care is the responsibility of the healthcare provider as well as of every individual healthcare worker (e.g. the Code of Ethics for nurses and non-medical healthcare professionals). It is the manifestation of professionalism, continuing self-improvement, responsibility for the care provided, and indicates respect to patients/clients. It is the commitment to provide the best and safest care possible; a highly professional and holistic one. Lifelong learning (with minor exceptions) is seen as qualification enhancement specified by the Act No. 262/2006 Coll., the Labour Code, as amended [18], which specifies the worktime for qualification enhancement, which is subsequently in the employer’s interest to have qualified personnel. Therefore, the employer is obliged to enable workers to take part in educational events and reimburse their salary or wage.

European Union and continuing education of nurses

Free movement of persons is one of the pillars of European integration. The 2005/36/EC directive of the European Parliament and of the Council of Europe on the recognition of professional qualifications [19] stipulates it is the member states' responsibility to provide a legally binding system of lifelong learning to nurses (caregivers responsible for general care) and midwives. The directive determines only the aim of the legal provision; the content of lifelong learning or its quantification is the responsibility of each member state. Therefore, we cannot say that the European Union law forces the Czech Republic to have the current system of lifelong learning, but we can say that the European Union law orders the adoption of an effective system of lifelong learning. Thus lifelong learning has become an integral part of the European regulation.

The aim was to establish the position of the factor and its alterations in time of lifelong education. It was set on personal preferences of work scale values of general nurses employed in hospitals throughout the Czech Republic. The comparative study was defined by the following research question: "What is the position of the factor 'possibility of further professional training, learning and education' on personal scale of work values of the working environment of general nurses employed in hospitals of the Czech Republic, and what attributes are attached to the priority given to this factor by general nurses?" Partial goals of the comparative study included the following:

- 1) To find out the complex and complementary (using comparison) position of the factor "possibility of further professional training, learning and education" on personal scale of work values of the given target group.
- 2) To investigate whether the position of the above given factor changed during the research (within the monitored periods).
- 3) To ascertain whether there are sociodemographic characteristics determining the position of the factor examined.

Materials and methods

We used a comparative research design. Working environment involves a number of factors influencing employees and, therefore, a multi-factorial approach is required. This is facilitated by Herzberg's two-factor theory [20] that was intentionally adopted by the authors. The theory identifies individual factors as separate elements of the working environment related to motivation and job satisfaction, e.g. salary, appreciation, relationships with co-workers, etc. Herzberg [20] distinguished between the so-called hygiene factors (working conditions, safety at work, job security, wage/salary, and interpersonal relations, personal and social policy of an employer) and motivators (responsibility, achievement, recognition from a supervisor, challenging work, personal growth and career advancement). Herzberg's original factors were modified

by a multidisciplinary team of health professionals in order to better reflect current practices and the situation of inpatient care. The modified factors became the basis of the scale (16 points) [21]. The list of factors dealt with in the research is given in Table 1.

Table 1 – Working environment factors (used in a questionnaire form) and their coded abbreviations (used in figures)

Abbreviation in graphs	Factor term in questionnaire
Image_PP	"Image" (respectability, reputation) of your medical facility to the public.
WoCo_PP	Working conditions (safety and health protection at work, spatial layout of workplace, labour).
Technique_PP	Possibility to use modern technique and technical, technological equipment and instrumentation.
Education_PP	The possibility of further professional training, learning and education (courses, seminars, other educational events).
Information_PP	Information (sufficient access to information and its provision).
PoG_PP	Possibility of career advancement.
InRe_Su_PP	Working relationship with senior staff.
Prestige_PP	Prestige of your job.
InRe_PP	Cooperation with other professionals (physicians, paramedical staff, other professions...).
Recognition_PP	Non-monetary recognition of one's personal work results, e.g. praise, recognition of one's work in front of colleagues).
Benefits_PP	Fringe benefits provided by employer (personal accounts, vitamins, subsidised meals, etc.)
Care_PP	Care of patients (care itself).
InRe_PE_PP	Mutual working cooperation in one's workplace.
WoCo_PP	Working climate (atmosphere in workplace).
Job_sec_PP	Job security.
Salary_PP	Salary/wage.

Note: _PP = personal preference.

In view of the fact that respondents' priorities are investigated (the rank of the factors from the most to the least important), the questionnaire is designed so that the factors are in competition and show the least possible correlativity. This means that Cronbach's alpha cannot be used to measure internal consistency, because this requires correlation. Validity of the questionnaire is based on the validity of Herzberg's two-factor theory of motivation [20].

The first part of the questionnaire included questions related to sociodemographic characteristics of the set. In the second part, the respondents (i.e. general nurses working in hospitals in the Czech Republic) were asked to make a subjective ranking of factors 1–16, where 1 = factor considered the most important, and 16 = factor considered

the least important. Each factor was assigned only one number, i.e. no two different factors could be assessed equally (ranked identically). The data were collected in three individual surveys. The first took place in 2006 [21], the second in 2011 [22], and the third in 2016 (as a part of Palacký University Olomouc students grant competition: “Psychological safety at work in non-medical healthcare professions”, IGA FZV 2015_007). In 2006 and 2016 the data were collected by means of questionnaires, which were sent to 25 randomly selected hospitals based on an agreement with the hospital management. In 2006, there were 3081 self-selected respondents (i.e. sampled by a non-probability selection based on the voluntary principle) and in 2016 there were 1761 self-selected respondents (i.e. sampled by a non-probability selection based on voluntariness principle). The HR department prepared an exact number of questionnaires and envelopes for each clinic or department and the materials were distributed in a head nurses’ meeting. The nurses returned the

questionnaires in a sealed envelope in one or two boxes placed in the hospital. They had one month to complete the questionnaire. The boxes were then emptied and the envelopes were sent to the authors. In 2011, the data was collected using a structured interview based on the questionnaire. Trained interviewers asked questions and recorded answers in the questionnaire. The representative sample was selected and data was collected by an agency that specializes in healthcare research (Inres-Sones v.o.s). In 2011, there were 1992 respondents – general nurses were selected randomly with the help of quotas. Their sociodemographic characteristics, such as region and age, corresponded to the structure of the basic set of all employed general nurses in the Czech Republic at the time. Thus the research results may be generalized for the whole basic population of general nurses in the Czech Republic. Basic characteristics of the sets in 2006, 2011 and 2016 are summarized in Table 2.

Table 2 – Basic characteristics of research samples (year 2006, 2011, 2016)

		Year					
		2006		2011		2016	
		N	%	N	%	N	%
Total participants		3081		1992	100	1751	100
Gender	Female	3022	98.0	1913	96.0	1708	97.5
	Male	59	2.0	79	4.0	43	2.5
Age	Under 30	721	23.0	395	20.0	358	20.9
	31 to 40	1014	33.0	823	41.0	783	45.6
	41 to 50	831	27.0	687	35.5	534	31.1
	Over 50	515	12.0	87	4.5	41	2.4
Education ^a	SZŠ	1540	50.0	798	40.1	561	32.0
	PSS	1212	39.3	486	24.4	632	36.1
	VOŠ	263	8.5	263	13.2	218	12.5
	VŠ	62	2.1	445	22.3	303	17.3
	Other	4	0	0	0	37	2.1
Work experience	<5 yrs.	582	19.0	288	14.5	224	12.9
	5–15 yrs.	932	30.0	533	26.8	458	26.4
	Over 15 yrs.	1557	51.0	1171	58.8	1069	61.6
Position	Managerial	317	12.0	361	18.0	193	11.0
	Line	2764	88.0	1631	82	1558	89.0
Work-load	Full-time	2948	96.0	1829	91.8	1571	90.0
	Part-time	133	4.0	163	8.2	180	10.0

Note: ^a SZŠ = secondary school of nursing, PSS = postgraduate studies, VOŠ = college of nursing, VŠ = university.

In 2011, the mean age of respondents was 41.42 years (SD = 11.21). The mean length of work experience in healthcare was 19.19 years (SD = 11.45). In 2016, the mean age of respondents was 40.85 (SD = 10.67) and the length of work experience in healthcare 19.99 (SD = 11.31). The mean values of the first set cannot be presented as the data were only collected at intervals.

The data obtained were processed with IBM SPSS 19.0 Base software. To assess the data, the Euclidean distance model was used. This model is a cluster data analysis method, which gives not only the rank of the factors, but also shows the distance between them. It must be assumed

that the data are not correlated or that the correlativity is very low [22]. The questionnaire design met the required low correlativity, and a one-dimensional Euclidean distance model for the analysis was selected by Acrea CR, Ltd., which is the supplier of IBM SPSS in the Czech Republic. Apart from the statistical tests, the model was also used to study the typology of nursing turnover [23].

Normality of data distribution was tested with the Kolmogorov–Smirnov test. As the data did not show normal distribution, the non-parametric Mann–Whitney and Kruskal–Wallis tests were used to test the differences between the groups of respondents. The significance level was set at 5%.

Results

The results of the 2006 survey showed that the factor “possibility of further professional training, learning and education” ranked 8th (Chart 1). In the third research question, sociodemographic characteristics of the set were tested. To determine differences between sociodemographic characteristics, education, length of work experience and age, the Kruskal–Wallis test was used. To identify the differences between sociodemographic characteristics of position and work-load, the Mann–Whitney test was used. No significant difference was found in any of the five characteristics.

Chart 1 – Rank of the factor “possibility of further professional training, learning and education” and other factors of working environment (2006)

In 2011, the factor “possibility of further professional training, learning and education” ranked 10th (Chart 2). Sociodemographic characteristics (education, position, age and work-load) were tested, too.

Chart 2 – Rank of the factor “possibility of further professional training, learning and education” and other factors of working environment (2011)

Statistical tests were used to determine the differences in sociodemographic characteristics of education, length of work experience, age, position and work-load.

The only statistically significant difference was found in the category of age. With increasing age, the preference for further education decreases ($p < 0.001$). The distribution of preferences in individual intervals of the age category is given in Chart 3.

Chart 3 – Sociodemographic category of age and the preference for further education (2011)

The third 2016 survey revealed that the factor “possibility of further professional training, learning and education” decreased to 12th position (Chart 4).

Chart 4 – Rank of the factor “possibility of further professional training, learning and education” and other factors of working environment (2016)

No statistically significant difference was found in sociodemographic characteristics education, position and work-load. However, similar to 2011, the data from 2016

indicate that with an increasing age the preference for further education decreases ($p < 0.001$) (Chart 5).

Chart 5 – Sociodemographic characteristic age and the preference for further education (2016)

With regard to the second research question, the Kruskal–Wallis test was used to determine the differences in the position of the factor “possibility of further professional training, learning and education” in individual stages of the research (2006, 2011, and 2016). A statistically significant decrease was found in the preference of the factor between the year 2006 and the year 2011 ($p < 0.001$); and between the year 2006 and the year 2016 ($p < 0.001$) (Chart 6). Although a fall in this factor was also found between the years 2011 and 2016, the decrease was not statistically significant.

Chart 6 – Comparison of the factor “possibility of further professional training, learning and education” rank in the years 2006, 2011, and 2016

Discussion

Nurses take on multiple roles when taking care of patients – the role of an assistant, an educator, the defender of patient’s rights, etc. In order to fulfil their roles, nurses have to learn continually. The aim of the research was to determine the rank of the factor “possibility of further professional training, learning and education” on the personal scale of work values. The results of individual stages of the research suggest that in 2006 (i.e. two years after the law regulating the long-life education of non-medical healthcare professionals came into effect) the factor ranked 8th on the scale of 16 factors; in 2011 it ranked 10th, and in 2016 it dropped to 12th position. The comparison revealed a significant drop in 2011 and 2016 as opposed to the year 2006 ($p = 0.000$). Decreasing importance of further education was clearly demonstrated. One explanation might be that Act No.105/2011 Coll. [16] altering Act No.96/2004 Coll. [14], extended the period over which the credits must be earned (i.e. from 6 to up to 10 years). Most nurses had already earned the credits and therefore continuing education was no longer a priority for them. In 2011, the Act was amended in terms of moderation of the provisions related to issuing a certificate for the performance of a healthcare profession without supervision. We can speculate that nurses took the regulation as another moderation of lifelong education conditions and this is reflected by the decrease in the rank of this factor. Nurse’s age plays a significant role in the preference of the factor. Shortly after the Act became effective (in 2006), the impact of age on the rank of the factor was not significant. This is in agreement with the findings in a Jordanian study [24]. However, in 2011 and 2016 it was found that nurses’ age played a significant role in prioritizing continuing education. The research suggests that younger nurses (up to 45 years) rank the possibility of further professional training significantly higher than the older ones (over 45). Similar results are given by Wray et al. [25], who report a significantly lower proportion of nurses over the age of 50 taking part in continuing education compared to their younger colleagues. On the other hand, Lammintakanen and Kivinen [26] surveyed three age groups and found that the youngest nurses prefer further professional training the least. Older nurses – due to their substantial work experience – are more experienced and prefer a less formal type of education (e.g. based on discussions with their colleagues), while younger and less experienced nurses prefer formal education [27]. Yet there may be other reasons behind the differences when it comes to age. We can assume that nurses’ opinions reflect the sceptical views of their employers who are reluctant to enable older nurses to take part in educational events. Employers may believe that older nurses are not able or willing to learn as fast and effectively as younger ones, and that to invest finances into the development and education of older staff is not effective as they are nearing retirement age [28, 29]. One of the possible reasons for this might be the age-related loss of cognitive functions, which hinders the educational process [30]. Another reason may lie in the

increased expenses due to employees' career advancement and promotion into a higher tariff class [31]. This aspect plays an important role in the current economic situation. We should also take into consideration the manager's concern about their status when a nurse achieves superior knowledge [8]. Management of healthcare providers should be aware of the fact that with the ageing of the whole population the health-care providers are ageing, too. Therefore, it is necessary to prepare appropriate conditions for older employees and create education strategies they will find attractive.

On June 21 2017, the President of the Czech Republic signed an amendment of Act 96/2004 Coll. (Non-medical healthcare professions Act), which modifies the conditions for lifelong education for nurses. According to the amended act, continuing education is still obligatory for healthcare professionals, but the forms of education are largely voluntary and the credit system is now abolished. The easing of legislative conditions around lifelong education seems to have resulted in lower interest in further professional training among general nurses.

Pool et al. [32] suggest that giving the nurses more competence is one of the most important motivators for self-education at the workplace. Nurses also need to have a more participatory role in their learning [33].

Limitations of the study

The major limitations are in the methodology. In 2006 and 2016, inpatient healthcare providers were selected randomly (by random sampling), and individual respondents took part in the survey voluntarily. Therefore, it is possible that the views of those who did not take part in the survey might have been different. Other limitations are different methods of data collection – in 2006 and 2016 by means of a questionnaire, in 2011 through a structured interview based on a questionnaire. The collection of data may have influenced the results obtained. Moreover, the questionnaire, based on the modified Herzberg's two-factor theory of motivation, is not standardized in the Czech Republic or abroad and is used as a managerial tool. We should also mention different numbers of respondents in individual sets (though the number of respondents in each set exceeded the number required at the level of significance of both 5% and 1%).

Conclusion

The findings of the research confirm what experts in the area had already suggested: that continuing education becomes a formality; "a hunt for credits" which is necessary for job security, and does not reflect a desire for professional advancement leading to higher quality care for patients. Over the years, the interest in education dropped as the nurses gradually obtained the required number of credits. We can conclude that the legal provisions forced nurses working without supervision into lifelong educations due to the threat of losing their registration, but did not motivate them to receive education to improve care for patients.

The findings also suggest that with increasing age, the interest of nurses in taking part in lifelong education drops. The Czech Republic, like most countries in the Western world, has a rapidly ageing population. Lifelong learning is critical to enable nurses to remain adaptive and resilient to new challenges, such as the development of technologies, equipment, drugs, and procedures, etc.

Further research should focus on changes in the preferences for "the possibility of further professional training, learning and education" after the latest amendment act becomes into effect.

Ethical approval

The aim of the research was agreed to by the ethical committees of providers of health care services. The respondents agreed to be part of the research.

Conflict of interests

The authors of the article have no actual or potential conflict of interest to disclose.

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