Analysis of nurse staffing and factors determining the demand for health care in Poland

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ABSTRACT

Introduction: Recent studies have indicated that an adequate nurse staffing in a hospital exerts an effect on both the level of health services provided and the safety of patients. Numerous reports confirm the shortage of nurses who, has been observed in almost all European countries, and may threaten the quality of health care.
Purpose: The objective of the study is an analysis of nurse staffing and the factors which shape the demand for health care in Poland.
Material and methods: The study was based on the analysis of scientific literature, legal acts and reports by Polish government and occupational organizations, which undertake the problem discussed.
Results: For years, in Poland, a decrease has been observed in nurse staffing rates per 1,000 inhabitants, compared to 15 countries of the European Union. The factors which affect the nurse staffing rate in Poland include changes in the sector of health care and the vocational education of nurses. Simultaneously, the limitations in employment of nurses are accompanied by an increased demand for health services. Considering the shortages in nurse staffing, and an increase in the demand for health services, there is a necessity to undertake systemic actions, both on the national and European level.
Conclusions: Systemic solutions are necessary to prevent a divergence between increasing public health care demand and limited or even decreasing number of nurses willing to work in the profession. Otherwise the realization of the health policy goals might be hindered.
Key words: health care, nurse, employment, demand

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INTRODUCTION

Health care systems in Poland and other European countries are undergoing constant changes in the search for optimum solutions to ensure the accessibility and delivery of high-quality health services. The necessity for the change's results from the disturbance of balance between an increasing demand for health care, accompanied by simultaneous limitations of financial resources for its provision, and the level of employment of nurses [1,2].

It is estimated that at present, over 4.5 million nurses are employed in the European region [1]. In Poland, according to the state of affairs on 31 December 2008, 183,049 nurses were employed [3]. Although nurses constitute the largest occupational group in the health care systems, their shortage is commonly observed in highly-developed countries. This tendency is due not only to a weak response of the educational system and an increase in the demand for health services provided by nurses, but also relatively less attractive working conditions, and low payment, compared to other occupational groups, limited opportunities of professional development, as well as earlier retirement [4,5,6]. The problem of the shortage of nurses in the system of health care is so important that, in recent years. It has become the subject of many reports, conferences, debates and interpellation on a political level. Exemplary reports concerning the state of nursing are available on the website: *http://cnm.independent.gov.uk, www.iom .edu/Activities/Workforce/Nursing.aspx, www. izba-piel.org.pl*. In 2010, several international conferences were organized devoted to the scope of problems pertaining to employment in health protection, the following of which deserve attention:

- conference organized by the ICN and WHO concerning improvement in the management of human resources, in which 181 researchers from 31countries participated;
- conference: 'Investing in Europe's health workforce of tomorrow', organized by the Belgian Presidency in Brussels, during which four main domains of activity were specified on the European Union level, and recommended to be followed by the successors, i.e. planning of employment of well-skilled health professionals, planning of new skills and tasks, designing a better work environment, and creating conditions for stimulating education and training of the health workforce with the aim of further promoting the quality and safety of care [7].

An interest in the matters of nurses and nursing was also expressed by the deputies for the European Parliament (from the United Kingdom, Belgium, Germany, Bulgaria and Romania), who submitted written Declaration No. 40/2010 in the matter of protection of health workers in the EU. The Declaration was signed by 182 deputies, including, among others: Isabell Durant - Vice-President of the European Parliament and Danuta Hübner - former European Commissioner from Poland. The signing of the Declaration became a basis for the organization of the European Parliament session in Strasbourg, 6-9 September 2010, devoted to employment of nurses in the European Union [7].

In Poland, during the period 2007-2010, deputies to the Parliament of the Republic of Poland submitted to the Minister of Health several interpellation in the matters associated with nursing care, e.g. No. 242 of 4 December 2007 in the matter of improvement of the conditions of work and payment for nurses and midwives; No. 5179 of 16 March 2008 in the matter of the dramatic situation in hospitals resulting from the lack of nurses willing to work; No. 1979 of 21 March 2008 in the matter of standards of employment of nurses in hospitals; No. 5109 of 16 September 2008 in the matter of employment of nurses in nursing homes, No. 5987 of 22 October 2008 in the matter of prophylactic services provided by nurses and midwives; No. 1722 of 21 July 2010 in the matter of limited patients' access to nursing and care services within long-term care provided by nurses.

A great interest of various institutions and politicians in the problem of shortage of nurses, which has been observed in recent years, results from difficulties in the realization of the goals of health policy and ensuring an adequate scope of health services in individual countries [8,9].

Number of nursing staff and its influence on health care

According to the World Health Report 2006, there is a direct relationship between positive health effects and medical staffing ratios [10]. Several researchers emphasize that adequate nurse staffing is among the factors' conditioning the quality of health care [8,11,12]. An adequate nurse staffing should be understood as the situation in which health care is provided in safe and comfortable working conditions, and positive effects are achieved in patient-care [8].

The researchers pay attention to the fact that an adequate nurse staffing must consider not only the number of nurses, but also other variables as: type of qualifications of nurses, work environment, effectiveness of the provided health care and its effect on the patients' health status. A large number of studies have been undertaken recently concerning the relationship between adequate nurse staffing and patients' safety, and the indices of the health care provided, such as: state of health of a patient, number of deaths and

complications, and patient satisfaction with care [13-16].

Lang et al. [17] indicated that adequate staffing results in lower mortality rates and shorter time of hospitalization. The report prepared by Kohn, Corrigan and Donaldson [18], on the order by the Institute of Medicine, confirmed that the existing problems in the health care result from improper procedures and personnel policy, and the lack of activities promoting safe performance of the occupation.

Several studies confirmed that the longer time devoted to care by a nurse, the shorter the time of hospitalization and the lower rate of complications like: urinary tract infections, bleeding from the upper alimentary tract, pneumonia, thromboembolic events and bedsores [19-22]. Another study showed that one additional hour of health care provided by a qualified nurse contributes to a decrease in the probability of development of patients' pneumonia by 8.9% [23].

There is a lack of studies confirming the effect of adequate nurse staffing on the level of health care provided in Poland. Efforts in this area have been undertaken by the Polish RN4CAST research team.

There is currently lack of a uniform system to monitor the demand and supply of nurses in Poland, according to the act of 27 August 2004, health care services are financed from public resources, and they remain within the competence of the proper minister for matters of health, and regional officers and regional self-governments [24]. The objective of the study is an analysis of nurse staffing and the factors which shape the demand for health care in Poland.

MATERIAL AND METHODS

The study was based on the analysis of scientific literature, legal acts and reports by Polish government and occupational organizations, which undertake the problem discussed.The research leading to these results has received funding from the European Union's Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 223468. For more information on the RN4CAST project, please visit www.rn4cast.eu.

RESULTS

Table 1 presents the summary of nursing personnel state in Poland over a period of last 10 years. These data based on information published by the Centre for Information Technology Systems in Health Care [3]. A great discrepancy between the number of nurses authorized to perform the occupation, and the number of nurses actually employed in health care facilities is evident. A downward tendency in nurse employment is visible. On 31, December 2009, 266,817 nurses aged 21-65, were registered in the Central Register of Nurses and Midwives, including 212,666 employed in public and non-public health care facilities [25]. The number of nurses employed in 2009 was comparable to data for 1995, when 211,603 nurses were employed.

The structure by age of the Polish nurses is an important element of this analysis. The mean age of the employed nurses is 44.24. The data presented in Table 2 shows that 15.52% of nurses are aged 21-35, whereas only 3.37%, i.e. 8,992 nurses belong to the age group 26 - 30. Analysis of the structure by age reveals a great difference between the numbers of nurses aged 36-40 (47,349), compared to the two younger age groups: 31-35 (27,874) and 26-30 (8,992). In each subsequent age interval, the number of nurses is smaller by approximately 20,000, compared to the older age group. According to the prognoses by the Central Council for Nursing and Midwifery, 80,814 nurses born between 1950-1960 will reach retirement age between 2010-2020. Pilot studies conducted by this institution in May 2010, which covered a sample of 210 different health care facilities indicate that 15.15 % of nurses employed in these facilities will retire between 2010 -2015 [25].

The simplest parameter reflecting the level of nursing employment in any individual country is the ratio between nurse staffing and the number of population [26]. In 2008, the ratio of nurse staffing in the Polish health care system per 1,000 inhabitants was 4.9, which was the lowest compared to 15 other European countries (Table 3). The data presented in Table 3 shows that Poland is the only European country where a downwards tendency has been observed for the last 18 years.

Table 1. Number of nurses in Poland over the period of 11 years.

Year	Number of nurses authorized to practice the occupation	Number of nurses employed in health care facilities	Nurse staffing ratio per 1,000 inhabitants
1998	265,383	216,336	5.5
1999	293,679	197,153	5.1
2000	340,906	189,632	4.91
2001	267,208	186757	4.83
2002	260,714	200,000	4.86
2003	265,200	181,291	4.75
2004	268,818	180,787	4.74
2005	273,810	173,609	4.69
2006	275,188	179,269	4.7
2007	272,757	182,404	4.79
2008	275,122	183,049	4.8

Source: Own study based on data from the statistical Bulletins of the Ministry of Health of 1998-2009.

Table 2. Number of nurses registered in the Central Register of Nurses and Midwives by age group (state of affairs on 31 December 2010).

Age intervals	Number of nurses	Index of age structure %
21-25	4,526	1.70
26-30	8,992	3.37
31-35	27,874	10.45
36-40	47,349	17.75
41-45	48,061	18.01
46-50	46,908	17.58
51-55	42,646	15.98
56-60	28,423	10.65
61-65	12,038	4.51
Total	**266,817**	**100**

Source: Main Council of Nursing and Midwifery. Preliminary assessment of nurse and midwife staff resources in Poland by 2010. Warsaw, June 2010, p.11.

Table 3. Nurse staffing ratio in selected European countries during the period 1990-2008

Countries	1990	1995	2000	2005	2008
	Nursing staff per 1,000 population				
Austria	7.7	8.9	8.9	9.3	9.3
Belgium	4.8	5.1	4.9	5.5	5.6
Czech Republic	8.4	8.6	8.9	8.9	9.1
Denmark	8.9	8.9	9.2	9.4	9.7
France	5.6	6.1	6.7	7.3	7.5
Nethelands	11.4	11.4	12.0	12.7	12.8
Spain	6.8	6.8	6.9	7.1	7.1
Ireland	14.1	14.6	14.8	15.2	15.3
Germany	9.1	9.1	9.4	9.7	9.8
Poland	**5.4**	**5.4**	**4.8***	**4.6***	**4.9***
Slovakia	6.2	6.2	6.9	6.7	7.1
Sweden	7.6	8.6	8.7	8.8	8.8
Italy	4.8	4.9	5.3	5.3	5.4
Hungary	7.7	8.0	8.0	8.3	8.6
United Kingdom	7.9	8.0	8.9	12.1	11.8

Source: OECD Health Data, 2005, 2009 (* The differences in the data presented in the table 1 and 3 results from the different data resources.)

DISCUSSION

Moreover, in the year 2000, a drastic decrease in the number of nursing staff was noted, when compared to 1995. Both changes in the system of health care and vocational education of nurses were responsible for this situation [27-29]. Due to the deficit in the funding of health care. Changes in the health care system caused the restructuring of employment in the group of nurses [9]. The efforts undertaken by the health care managers to strive for a decrease of the expenses were related also with payments for medical staff and led to 'freezing' of nursing workplaces or even their reduction. Managers forced nurses to perform their occupation within the economic activities undertaken as so-called self-employment, or by employing nurses on an additional civil law

contract. Due to low payment, observed in Poland over several years, a new phenomenon has been noted concerning the employment of nurses on more than one contract. Since there is no obligation to inform the primary employing institution about undertaking work in another institution, the phenomenon of undertaking work by nurses in more than one workplace is currently difficult to assess [25].

During the analyzed period 1994-2000, changes in the system of nurses' education caused a drastic reduction in the number of graduates from nursing schools (from 14,000 in 1995 to 2,500 in 2000) [27,30,31]. This was caused by closing, the recruitment to secondary medical schools in 1991, prolongation of the education time in medical vocational schools to 2.5 years and further pedagogical innovation in 10 medical schools which prolonged education to a 3-year cycle (in the year 1996). At the same time, a decreased interest of adolescents in nursing occupation was also observed, which was partially associated with poor working conditions, low payment and social status and limitations in acknowledgment of the occupational qualifications of Polish nurses abroad**.** [5,27,28,30,31].

In 1999, the education of nurses in Poland was carried out in 129 medical vocational schools. Due to the adjustment of nurse education to the European Union requirements, in the subsequent years, there was no recruitment to medical vocational schools. According to the act in the matter of the occupations of a nurse and midwife [30], the recruitment to medical vocational schools in Poland was discontinued in the school year 2003/2004, while education was started at the universities or colleges, the number of which slowly progressed over the next 10 years.

In 1999, the State Centre for Strategic Studies, in association with the Inter-Sectoral Team for Prognostication of Demand for Employment, estimated the demand for nurses. Concerning changes in the health care system, the education of nurses, and the provision of availability and quality of health services, the target demand for nursing staff was determined on the level of 328,600 to 341,700 by 2010 [32]. As the point of reference, this analysis used the number of 216,386 nurses employed in 1998. In the prognoses a natural annual loss of 2.5 %, which constitutes 5,000 to 8,000 nurses, was considered. The migration rate of nurses to EU countries was not taken into account [32]. The analysis indicated a necessity to increase the number of employed nurses from 87,000 to 104,000 [30, 32]. Based on these data the Polish Ministry of Health estimated that approximately 53,219 nurses should be educated at 59 colleges and universities up to the year 2010 [30]. Although by June 2010 nursing bachelor degree, studies were started at 69 colleges and universities, only about 27,320 graduates actually completed the studies by 2010 [25]. The Main Council of Nursing and Midwifery also showed that out of these 27,000 nurse graduates who obtained the right to perform the occupation only approximately 18,000 applied to the regional nurse councils for professional certification, which allows them to undertake work in nursing profession [25]. Thus, it may be concluded that within the last 10 years, approximately 9,000 nurse graduates did not undertake employment in this occupation.

The Poland entry into the European Union had another significant effect on the domestic employment of nurses. The migration phenomenon, stimulated by a shortage of medical staff, in 'old' EU countries, has occurred. The developed countries supplement their shortage of staff by immigrants from other countries by offering them higher payment and better working conditions than in the native country [26,33,34]. According to the ICN data, nurses constitute a considerable group among migrants; up to 25% of health care staff in countries such as Australia, Canada, the United Kingdom and the United States [6]. For an individual nurse an emigration, however, offers a great personal opportunity, while for the country of origin, it means the worsening of an already difficult situation in the system of health care [5]. Since the year 2000, there has been a growing interest in the size and possible effects of migration of health care staff on an international scale. The report 'International flow of medical personnel – directions and implications for policy', published in 2003 showed that the worldwide shortage of approx. 4.25 million health staff is the major external factor for migration. The WHO classified the following internal factors of nurses' migration: work environment conditions, low payment, hindered opportunities for occupational promotion, necessity for continuing education by nurses on their own resources [10]. In Poland, the Ministry of Health and the District Chambers of Nurses and Midwives monitor the registration of the occupational qualifications certificates issued for nurses and midwives in order to undertake work in other EU country. [35; '*Monitoring of the phenomenon of migration of Polish physicians, nurses and midwives after Poland joined the European Union'*]. During the period between 1 May 2004 and 31 December 2009, 11,590 certificates were issued, which constitutes 6.33% of all nurses employed in Polish health care facilities. Recently, an annual downward tendency has been observed in the ratio of nurses who apply for this certificate (0.70% in 2008, and 0.65 % in 2009) [25]. According to the Ministry of Health, the number of occupational qualification certificates issued does not equal the number of nurses who undertake work abroad. Some Polish nurses get employed at nursing homes or long-term care

facilities abroad when obtaining unpaid leave from their primary institution of employment in Poland. In addition, nurses who graduated from the previous systems but either did not sufficiently know the language of the receiving country, or cannot obtain the qualification level approved according to the Directive 36/2005EC, do not apply for the occupational qualification certificates [35]. However, they may migrate and undertake working at nursing homes and other long term facilities.

Factors influencing the demand for health care

Demographic and environmental factors as well as lifestyle factors influence health care demand. Demographic factors exert also a significant effect on social demand for education. In Poland, the effect of demographic factors on education results from the irregularity of the structure of the population, which is characterized by an intermittent occurrence of so-called 'baby boom and bust'. During the period 1995-2000, the number of children and adolescents aged 7-14 decreased by approx. 945,000. At the same time, an increase by approximately 343,000 was observed in the 15-18 adolescent age group, and also by 839,000 in the 19-24 young adults group. During the subsequent decade, a further decrease by approximately 800,000 occurred in the population of children and adolescents aged 7-18. A considerable decrease in the group aged between 19-24 is expected in the years 2010-2015 [35].

The growing demand for health care results from the process of ageing of the population, the dynamics of which varies according to the regions of the world and Europe. In the Central and East European countries, this process began later than in the Western Europe and the United States. A decrease in the number of births and prolongation of the average life span are the main factors of the population ageing. According to the data of the Main Statistical Office, in 2035 the Polish population will decrease by 2 million, i.e. by 5.5 % of the state registered in 2007. Simultaneously, an increase is expected in the number of population aged over 65 [36]. Due to the natural ageing of the population and longer life span, an increase in morbidity caused by chronic diseases leading to disability is likely to occur. An increase in the incidence of diabetes, arterial hypertension, athero-sclerosis, osteoporosis, and senility rises need for professional medical staff, mainly in fields of geriatrics, rehabilitation, and long-term care, as well as for the development of new forms of at home and inpatient care [37,38].

While analyzing the effect of environmental factors and lifestyle on health care, one should refer to the concept of health fields by Lalonde, published in 1974. The starting point for this concept was the assumption that health is determined by several factors related with genetic inheritance, environment, lifestyle, and health care services [39]. In 1995, Badura [40] estimated a percentage effect of the above-mentioned factors on cardiovascular mortality as: biological (25%), environmental (9%), lifestyle (54%) and health care services (12 %). The authors of the National Health Programme (1996-2005) in Poland admitted that the state of health depends on lifestyle – in 50-60 %, environmental factors - 20%, and genetic factors and health care services about 10% each [41].The style of life covers a set of habits, activities and behaviors characteristic for individual, as well as social groups [42]. According to Łuszczyńska [43], health behaviors are divided into: those conducive for health, such as: physical activity, healthy nutrition, protection against radiation, and activities hazardous for health, such as tobacco smoking, abuse of alcohol or psychoactive substances. The choice of health behaviors is determined by personality traits, attitudes and beliefs concerning the life and individual system of values, previous experiences with respect to health, and social-cultural factors [43]. While recognizing a considerable effect of lifestyle on the health of an individual, the World Health Organization set tasks for nurses in this area, which cover health promotion and education [44].

The environmental factors exerting an effect on health include economic and social situation, and pollution of the natural environment. In the economic sphere, unemployment, impoverishment and social stratification play, the major role. Unemployment hinders or prevents satisfaction of important social needs, and leads to impoverishment, educational delay and health problems. A direct consequence of unemployment includes social pathologies, deepening of social insecurity, threat to social safety on individual, family, social group's levels, as well as the whole society. Impoverishment of the society limits or makes impossible the use of modern medicine and pharmacology [45,46].

The state of health of an individual is also affected by the purity of the natural environment. It has been confirmed that contamination of the air, water, and soil contributes to the development of a number of diseases, as: allergies, asthma, bronchitis, bronchoconstriction, pneumoconiosis, lung cancer, insomnia, headaches, arterial hypertension, myocardial hypoxia, acceleration of atheromatous process, conjunctivitis, sight and hearing impairment. The primary tasks of nurses in this area focused on prevention, health education, and care of patients [47].

The effect of nurse staffing on the state of health of the population and quality of health services was confirmed by scientific studies conducted in various countries.

According to the WHO report, there is a shortage of nursing staff in every country, which

will probably enlarge due to the increase in demand for health services and decreased demand for education, caused by demographic rate changes and a declining interest of adolescents in vocational education in nursing. The satisfaction of the growing social demand for high-quality care, including prophylaxis, health promotion and health education requires undertaking of essential systemic actions on national and international, European levels. Hence, the problem of nurse staffing should become a priority issue which should be considered in the context of changes in the national and EU system of health care and global health policy.

CONCLUSIONS

Systemic solutions are necessary to prevent a divergence between increasing public health care demand and limited or even decreasing number of nurses willing to work in the profession. Otherwise the realization of the health policy goals might be hindered.

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