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Migration intentions among physicians working in Polish hospitals – Insights from survey research

Alicja Domagała [a,*], Katarzyna Dubas-Jakóbczyk [b]

[a] Department of Health Policy and Management, Institute of Public Health, Faculty of Health Sciences, Jagiellonian University Medical College, Krakow, Poland

[b] Department of Health Economics and Social Security, Institute of Public Health, Faculty of Health Sciences, Jagiellonian University Medical College, Krakow, Poland

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ABSTRACT

Background: Health workforce shortages could lead to burnout, excessive workload, dissatisfaction and consequently to migration. In Poland the exact scale of physician migration is unknown due to insufficient data.

Methods: A quantitative, cross-sectional survey of physicians working in Polish hospitals was conducted between March and June 2018. 15 Polish hospitals were included in the study (7 general, 5 specialist, 3 university). The data was gathered via an on-line, self-administered questionnaire, sent to physicians working in the included hospitals. Associations between the intention to migrate and demographic characteristics as well as work-related variables and overall satisfaction were measured. Simple and multivariable logistic regression analysis was conducted to determine significant predictors of migration.

Results: 1003 questionnaires were analyzed (response rate: 38%). 273 doctors declared the intention to migrate: 4.5% answering 'definitely yes' and 22.7% 'probably yes'. The main reasons were: higher earnings, better working conditions and better work-life balance abroad. Age and higher career satisfaction were negatively related to the intention to migrate: OR = 0.94 (95% CI 0,92–0,95) and OR = 0.44 (95% CI 0.34–0.56) respectively. Women were 54% less likely to intend to migrate than men (OR = 0.46, 95% CI 0.33-0.65). Almost 62% of physicians intending to migrate considered a temporary stay abroad.

Conclusions: Special attention should be paid to improving working conditions, including salary, but also reducing bureaucracy, improvement of work-climate and training opportunities.

1. Introduction

The health workforce (HWF) crisis is a crucial challenge for health policy-makers and managers in European countries. It is caused mainly by staff shortages, ageing of the HWF and an increasing demand for healthcare services [1,2]. These problems consequently lead to permanent stress, burnout, excessive workload and dissatisfaction of medical staff [3]. Some employees seeking better working conditions decide to emigrate. European countries are diverse in terms of socio-economic conditions and level of quality of life, with large differences in salary levels and access to new medical technology [4]. The barriers to moving abroad are relatively low within European Union (EU) due to the mutual recognition of professional qualifications [5].

Economic factors are the most cited reasons for migration, affecting leavers, returnees and those who remain, [4,6] but due to the complex nature of the migration process, there is a need for comprehensive knowledge about this phenomenon. Health-policy makers need to understand the trends of migration and monitor this process in order to undertake adequate actions. Nevertheless, the available data in many countries is fragmentary and scarce [6]. According to WHO analysis, the migratory flows of medical staff are generally documented poorly [7]. There is no mechanism to gather migration data and monitor flows in either the EU or wider Europe and the current data tend to be incomplete and fragmentary since they do not represent direct measurement of staff migration [7–9]. The Polish Supreme Audit Office states that there is a lack of monitoring process of medical staff migration and it draws attention to the dangers of the lack of a mechanism for estimating the scale of medical staff migration [10]. Due to the lack of

* Corresponding author at: Institute of Public Health, Faculty of Health Sciences, Jagiellonian University Medical College, Krakow, Grzegórzecka Str. 20, 31-531 Kraków, Poland.
E-mail address: alicja.domagala@uj.edu.pl (A. Domagała).

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comprehensive, reliable data in this field [11–13], in Poland information about 'intention-to-leave' is used, based on the number of certificates issued by the regional chambers of physicians confirming qualifications that grant the legal right to practice in other EU countries. According to the National Chamber of Physicians, the number of requested certificates increased rapidly in the initial phase following EU accession, but reduced starting in mid-2007 (after government regulations were introduced, increasing doctors' salary). In 2005 and 2006 more than 2000 doctors applied for the certificate, in 2007 it was approx. 1800, while beginning in 2008 the number of certificates issued each year was below 1000. The total number of certificates issued between 2004 and 2017 was 9535 (about 7% of 135,948 physicians with the legal right to practice) [14]. These data should be used only as an indicator of the interest of doctors in taking up a job abroad [15] and do not provide a picture of how many of these individuals actually leave the country. It represents intention to migrate rather than actual migration [16]. Furthermore, many doctors do not leave permanently [11,17]. However, the potential loss of 1000 physicians per year is still high relative to the numbers trained each year. In the 2016/2017 academic year, 2911 persons completed regular studies (full-time studies free of charge) and 378 completed external studies (studies paid for by the students) [18]. In 2017, physicians were trained at 19 universities (of which, 2 were private). Starting in the 2016/2017 academic year, the Minster of Health (who exerts full control over medical student enrolment) increased the quotas for medical study. In practice the effects on the labour market can be expected no earlier than 2023 (for graduates) and in 2029 (for specialists).

Polish physicians were emigrating to EU countries even before formal accession, but clearly this process increased significantly after 2004, following the elimination of formal barriers. According to the European Commission Regulated Profession Database, since Poland's accession to the EU, approx. 4700 physicians who acquired their diploma in Poland have registered in another EU country and have had their professional qualifications formally recognized. The vast majority of these procedures took place in four countries: the UK (1598), Germany (861), Sweden (586) and Ireland (515) [19]. Other physicians have also migrated to EFTA countries.

In the Polish context, medical staff migration generally means emigration. The data available suggest that the inflow of foreign-born and foreign-trained physicians in Poland is insignificant [8]. The share of foreign-trained doctors in Poland in 2015 was only 1.8% of the total number of medical doctors compared to the average of OECD countries of 16.9% [20]. This is mostly due to language barriers, the lack of a proactive recruitment policy and inadequate employment conditions. The situation of the Polish physician is characterized by poor working and employment conditions, shortages, heavy workload and barriers to professional development (indicated mainly by young physicians) [11,13]. According to OECD data, employment in health and social work as a share of total employment in Poland is only 5.9% versus 10.1% in OECD countries on average [20]. Poland has the lowest ratio of practicing doctors per 1000 population among EU countries – 2.4 in Poland in 2016 compared to 3.6 in the OECD on average [21]. Moreover, the composition of the physician population causes concern due to the age structure. The average age of a practicing physician in Poland in 2017 was 50.2, and the average age of a specialist was 54.2 [8]. Over 26% of Polish doctors are over 60 and only about 22% are younger than 35 [8]. It is very common that many doctors work in both the public and private sectors. The shortage of medical doctors, noted in the majority of medical specializations, is becoming one of the key reasons for limited access to health care services and the lengthening of the average wait time. The main problems with doctor shortages are reported by managers of small, local hospitals. In general, competition between hospitals in employing doctors is very high and as a consequence, numerous hospitals have been forced to cease provision of services due to doctor deficits [22].

Also, although regulatory salary increases have been implemented in recent years, compared to other high-income countries, doctors' wages in Poland are still low [22]. All these factors lead to physicians' dissatisfaction and could contribute to the decision to practice medicine abroad [11,22]. Polish physician migration has become a subject of interest in the context of the discussion about the above mentioned current shortage. These challenges inspired us to design a study focused on the intended migration of Polish doctors.

The main objectives of this research were to: 1) evaluate the scale of migration intentions among physicians practicing in Polish hospitals, 2) identify the main predictors and barriers related to migration intentions and 3) investigate whether there is a relationship between the level of physicians' satisfaction and their tendency to migrate.

2. Methods

2.1. Study design and sampling

A quantitative, cross-sectional survey of doctors working in hospitals in Poland was conducted between March 5th and June 15th, 2018. The selection criteria for hospitals invited to the study were: (1) different geographic areas (to reach cross- national distribution); (2) equal in size and no significant differences in terms of the number of physicians in three hospital subgroups: general, specialist and university hospitals; and (3) reachable hospital managers to authorize the research.

Of the 21 hospitals that were invited to participate, 15 hospitals were included in the study: 7 general, 5 specialist and 3 university hospitals. Six hospitals were excluded due to poor engagement of physicians in the study (4 hospitals) and lack of support from hospital managers to conduct the study (2 hospitals). The 15 hospitals included in the study involved both public and private institutions, respectively, 12 and 3. All doctors employed in the selected hospitals were invited to participate. The response rate of physicians was 38% (n = 1035). In the data analysis, we included only questionnaires with no missing data (n = 1003).

Consent to conduct the study was obtained from the Jagiellonian University Bioethical Committee (approval number: 122.6120.290.2016).

The data was gathered via on-line survey. Following the Dillman method [23], personalised e-mails were sent to physicians, providing the objective and implications of the study. Detailed instructions and a link to the survey were included, explaining the purpose of the research, its scientific and academic nature, terms of anonymity and confidentiality. Three follow-up e-mails were sent. The participation was voluntary. To increase the response rate, the survey results were offered to the hospital managers to disseminate to physicians. Moreover, paper copies of the survey were prepared and delivered to physicians who experienced problems completing the on-line version of the survey. Research confirms that multiple follow-ups and reminders including a copy of the instrument are associated with higher response rates [24]. Our approach is in line with the methodology of improving response rates in physician surveys [25] and best practices in surveying doctors proposed by Flanigan et al. [26].

2.2. Questionnaires

The questionnaire to measure the intention to migrate was developed based on Clarke et al. [27] and adapted to the Polish context. The Polish version of the tool was pre-tested on a group of

eight physicians to ensure readability and clarity of meaning. The questionnaire included seven questions. The intention to migrate was measured via the question: *Are you currently considering practicing medicine abroad?* The respondent could answer on a 4 item scale: 1 – definitely no, 2 – probably no, 3 – probably yes, 4 – definitely yes. Doctors who answered: probably yes or definitely yes were classified as those with the intention to migrate. Only these respondents were asked the following question regarding reasons for migration (17 items measured on the 4 items scale from: 1 - strongly disagree, 2 - disagree; 3 - agree and 4 - strongly agree). All respondents were asked to answer the question about perceived migration barriers.

For the assessment of physician satisfaction we used the multidimensional approach developed by Lepnurm et al., [28,29] based on 4 corner dimensions of physician satisfaction (4CornerSat): personal, professional, inherent and performance. The 4CornerSat questionnaire has been adapted and validated in Spain [30,31] and Poland [32]. The instrument used in our research had 17 items, plus a global item of overall satisfaction. Each of the items were scored on a 6-point scale from 1 - very dissatisfied to 6 - very satisfied. The detailed results of the satisfaction survey are presented in a separate publication [33].

2.3. Statistical analysis

We measured associations between the primary outcome – the intention to migrate and demographic characteristics and work-related variables, as well as overall satisfaction. Continuous variables are expressed as mean and standard deviation (SD) or as median (interquartile range, q1-q3), as appropriate. The Shapiro-Wilk test was used to assess conformity with a normal distribution. The continuous variables were compared between groups using a *t*-test (one-way analysis of variance ANOVA, in the case of at least 3 groups) or the Mann-Whitney U test (Kruskal-Wallis test, in the case of at least 3 groups) for variables with non-normal distribution. Categorical variables were described by percentages and compared using the $\chi 2$ test. The variable - overall satisfaction was expressed as a mean value and SD.

Simple and multivariable logistic regression analysis was conducted to determine which variables were significant predictors of the intention to migrate (including answers: probably yes and definitely yes). The independent variables were: age, gender, marital status, having children, specialisation, performing additional shift work duties, total number of working hours per week, form of employment, number of employment places and overall level of satisfaction. For the purposes of the regression analyses, the variable 'marital status' was categorized into two groups: single (including widows/widowers) and in relationship (marriages and informal relationships). Backward logistic regression was applied. Results were presented as odds ratios (ORs) and corresponding 95% confidence intervals (CI). Two models are presented: model A – association for each variable separately and model B – presented results of multivariable logistic regression with significant predictors.

Statistical analyses were performed using SPSS 23.0 (SPSS Inc., Chicago, IL, USA). P-values <0.05 were accepted as statistically significant.

3. Results

3.1. Sample characteristics and migration intentions

1.003 questionnaires were analyzed (response rate 38%). The respondents mean age was 43.4 (SD = 11.76) and the majority of them were men (n = 518, 51.6%). In terms of the respondents qualifications and workload, the majority: had a specialization (n = 679, 67.7%) and performed additional shift-work duties (n = 775, 77%). The mean total number of hours worked per week was 60.3 (SD = 16.94) (Table1). Out of 1003 respondents, 273 declared the intention to migrate, including 45 (4.5%) answering 'definitely yes' and 228 (22.7%) 'probably yes'. In general, all associations measured between demographic and work place related variables as well as satisfaction with intention to migrate were statistically significant (Table 1).

Men more often considered the option to migrate: 5.2% answered 'definitely yes' and 26.3% 'probably yes' in comparison to 3.7% and 19.0% respectively for females (p = 0.02). In terms of marital status, single physicians and those in an informal relationship more often declared the intention to migrate than married or widowed physicians. Also childless physicians more often considered the option to migrate than those with kids (9.0% answered 'definitely yes' and 33.1% 'probably yes' vs 2.4% and 17.8% respectively, p < 0.001). The intention to migrate was negatively related to age and work experience - with younger and less experienced doctors more often considering practicing medicine abroad.

Among specialists, only 2.7% answered the question of intention to migrate 'definitely yes' and 16.2% answered 'probably yes'. In comparison, among residents, 8.3% answered 'definitely yes' and 36.4% 'probably yes'. Among specialists, 41.8% definitely denied intention to migrate (answer 'definitely no') in comparison to only 17.0% for residents (p < 001). Doctors intending to migrate had a higher mean value of total working hours per week: 62.7 (SD = 17.18) for those answering 'definitely yes' and 64.5 (SD = 17.40) for 'probably yes' in comparison to 56.8 (SD = 17.28) for 'definitely no' and 60.7 (SD = 15.72) for 'probably no' (p < 0.001).

Finally, the intention to migrate was related to the overall level of physician satisfaction. Doctors intending to migrate had a lower mean level of satisfaction (on the scale 1 – very dissatisfied to 6 – very satisfied): 3.60 (SD = 0.80) for those answering 'definitely yes' and 3.82 (SD = 0.70) for 'probably yes' in comparison to 4.30 (SD = 0.64) for 'definitely no' and '4.03 (SD = 0.63) for those who answered probably no' (p < 0.001).

In terms of the hospital location, doctors working in hospitals in small cities (county hospitals) less often declared the intention to migrate than those working in hospitals in bigger cities (2.8% answered 'definitely yes' and 16.0% 'probably yes' vs 5.1% and 25.4% respectively, p < 0.001).

3.2. Type of migration

The majority of doctors with the intention to migrate (168 out of 273) considered a temporary stay abroad (Supplementary file S1). There were no statistically significant differences in the basic characteristics (i.a.: gender, age, children, marital status, work experience, workload, type of employment) between those who considered a temporary versus a permanent stay abroad. However, doctors who considered a permanent stay abroad had a statistically significant lower level of overall job satisfaction than those considering a temporary stay (3.63, SD = 0.74 in comparison to 3.88, SD = 0.70, p = 0.004). Also the doctors who chose permanent stay abroad more often answered 'definitely yes' to intention to migrate, than those choosing temporary stay (76% in comparison to 24%, p < 0.001).

The countries most often indicated as migration destinations were Germany, the United Kingdom, Norway and Sweden. They were indicated by 22.3%, 19.8%, 11.7% and 8.8% of doctors with the intention to migrate respectively. In general, the vast majority of doctors (more than 83%) indicated a European country as the destination. Among non-European countries, Australia, the United States and Canada were most often indicated.

Table 1
Physician's characteristics by intention to migrate.

Intention to migrate / Variable	Definitely No (n = 339)		Probably No (n = 391)		Probably Yes (n = 228)		Definitely Yes (n = 45)		All (n = 1003)		P value
Sex											
Male	160	30.9%	195	37.6%	136	26.2%	27	5.2%	518	51.6%	
Female	179	36.9%	196	40.4%	92	19.0%	18	3.7%	485	48.4%	0.020[B]
Age, years, mean (SD)	49.4	(11.67)	42.5	(10.9)	37.8	(9.42)	33.9	(6.4)	43.4	(11.76)	<0.001[A]
Marital status, n (%)											
single	39	20.0%	71	36.4%	68	34.9%	17	8.7%	195	19.4%	
married	265	37.4%	287	40.5%	137	19.4%	19	2.7%	708	70.6%	
widow/widower	26	55.3%	16	34.0%	3	6.4%	2	4.3%	47	4.7%	
in an informal relationship	9	17.0%	17	32.1%	20	37.7%	7	13.2%	53	5.3%	<0.001[B]
Having children, n (%)											
no	68	21.1%	119	36.8%	107	33.1%	29	9.0%	323	32.2%	
yes	271	39.9%	272	40.0%	121	17.8%	16	2.4%	680	67.8%	<0.001[B]
Work experience, years, median (q1-q3)	25	(14-33)	15	(6-26)	8,5	(4-20)	6	(4-10)	15	(6-27)	<0.001[C]
Specialist, n (%)											
no	55	17.0%	124	38.3%	118	36.4%	27	8.3%	324	32.3%	
yes	284	41.8%	267	39.3%	110	16.2%	18	2.7%	679	67.7%	<0.001[B]
Additional shift-work duties n, (%)											
no	103	45.2%	80	35.1%	36	15.8%	9	3.9%	228	22.7%	
yes	236	30.5%	311	40.1%	192	24.8%	192	4.6%	775	77.3%	<0.001[B]
Total no of working hours per week, mean (SD)	56.8	(17.28)	60.7	(15.72)	64.5	(17.4)	62.73	(17.18)	60.3	(16.94)	<0.001[A]
Type of employment, n (%)											
job agreement	201	30.4%	269	40.6%	161	24.3%	31	4.7%	662	66.0%	
contract	123	45.2%	92	33.8%	46	16.9%	11	4.0%	272	27.1%	
mix	14	22.2%	28	44.4%	18	28.6%	3	4.8%	63	6.3%	<0.001[B]
Number of employment places, n (%)											
only 1 hospital	149	42.7%	117	33.5%	67	19.2%	16	4.6%	349	34.8%	
also additional providers	190	29.1%	274	41.9%	161	24.6%	29	4.4%	654	65.2%	<0001[B]
Overall satisfaction, mean (SD)	4.31	(0.64)	4.03	(0.63)	3.82	(0.70)	3.60	(0.80)	4.06	(0.69)	<0.001[A]

Data are shown as mean (standard deviation = SD), median (q1-q3) or number (percentage). A p-value from ANOVA, B – p-value from $\chi 2$ test, C - p-value form Kruskal-Wallis test.

3.3. Reasons for migration

The majority of doctors intending to migrate indicated six main reasons influencing their decision to leave. More than 50% of respondents chose 'strongly agree' when asked to assess the following reasons: higher earnings abroad (80.6%); better working conditions abroad (72.9%); better work-life balance abroad (66.7%); better training opportunities abroad (58.6%); obligation to perform many non-core tasks (53.5%) and stressful working environment (51.6%). On the other hand, the three reasons that were more often assessed as 'strongly disagree', influencing the decision to leave were: lack of supervisor's support (29.7%); not being respected by senior colleagues (32.6%); and family/personal reasons (40.7%) (Supplementary file S2).

Fig. 1 compares the frequency of reasons to migrate per stage of doctors' professional development: specialists and residents. Only in the case of the fourth reason was there a statistically significant difference between the two groups. Specialists more often chose 'strongly agree' for the problem of an understaffed workplace (55.5% in comparison to 42.8% for residents, p = 0.04). Yet residents more often chose 'strongly agree' due to the poor quality of training and professional development (22.1% vs 13.3%, p = 0.004); better training options abroad (65.5% vs 50.8%, p = 0.003); need to emigrate in order to increase my competitive position in the future in Poland (20% vs 12.5%, p < 0.001).

3.4. Predictors of migration

In a simple logistic regression model all considered variables (with the exemption of the number of employment places) were significantly associated with intention to migrate (Table 2). In multivariable models significant predictors of migration intention were: age, gender, children, total number of working hours/week, and overall satisfaction. Age was negatively related to the intention to migrate: physicians older (by 1 year) had 6% lower chances of intending to migrate. Women were 54% less likely to intend to migrate than men. A similar association was observed in the case of children – doctors with children were 37% less likely to intend to migrate than those without children. Overall satisfaction was negatively related to the intention to migrate: higher value of satisfaction (by one unit on the scale of career satisfaction) was associated with lower chances of intending to migrate (56%). By contrast, the total number of working hours/week was positively related – doctors with a higher (by 1 h) total number of working hours/week had 2% higher chances of intending to migrate.

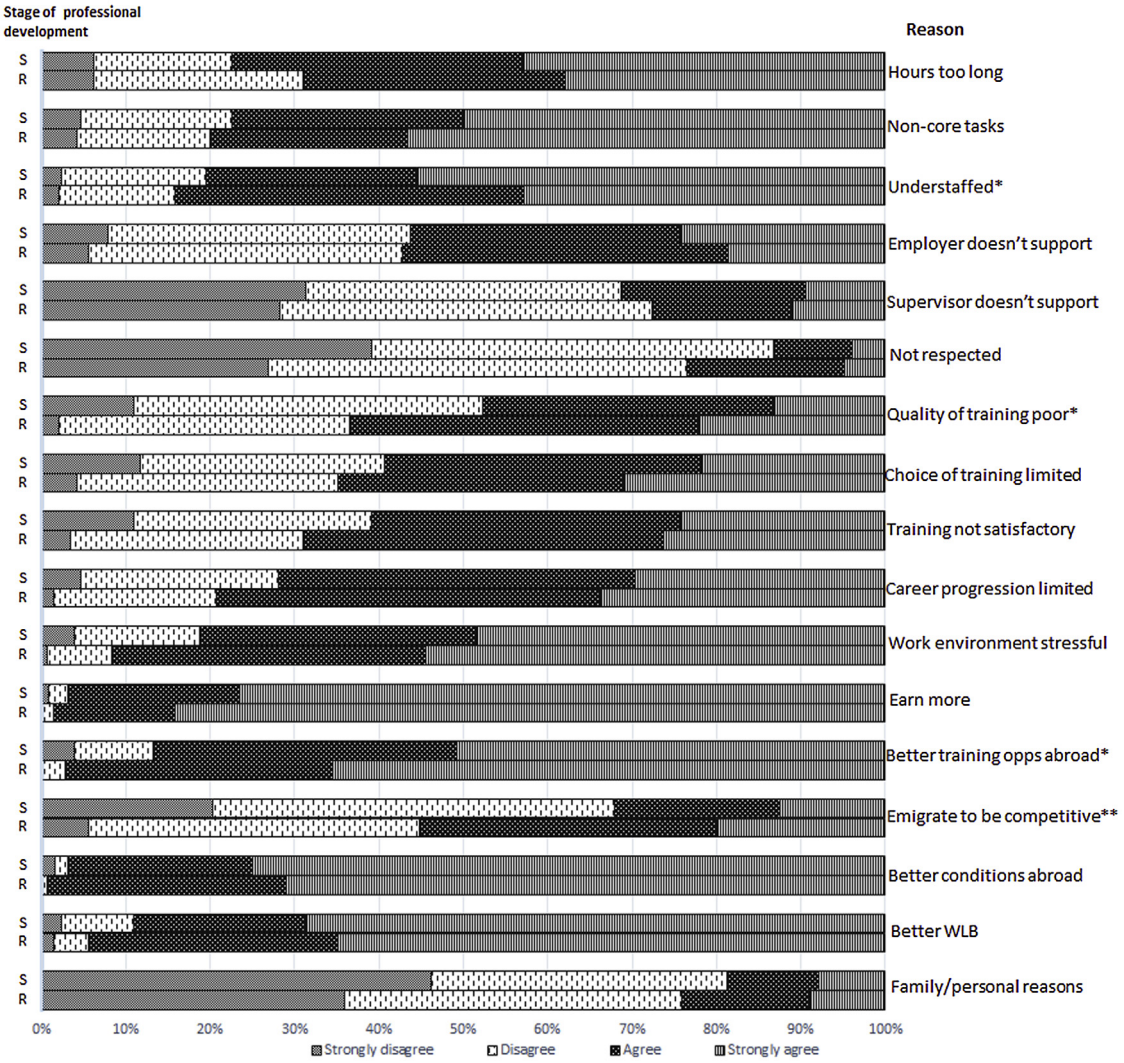

Fig. 1. Comparison of the frequency of reasons to migrate among physicians with and without specialization. S – specialists, R – residents. *p<0.05;**p<0.001.

3.5. Barriers to migration

The majority of doctors (70%) indicated 'leaving family' as a migration barrier. Almost 34% of respondents indicated good professional position in Poland, while 17% and 14% indicated concerns related to new working environment and language barrier, respectively. Table 3 compares perceived migration barriers between doctors with and without intention to migrate. In the case of three barriers, there were statistically significant difference between the two groups: doctors not intending to migrate more frequently indicated good professional position in Poland as a barrier (40% in comparison to 15% among doctors intending to leave, $p < 001$) while doctors intending to migrate more frequently indicated concerns related to new working environment (25% in comparison to 14% among doctors not intending to leave, $p < 001$) as well as concerns related to foreign culture (15% in comparison to 10%, respectively, $p = 0.03$)

4. Discussion

Results show that residents are much more interested in practicing medicine abroad, compared to their colleagues with specializations. Among specialists only 2.7% answered the question of intention to migrate 'definitely yes' compared to 8.33% among residents. Also, specialists more often definitely denied intention to migrate (42% vs 17% respectively).

These results are in line with data gathered by the National Chamber of Physicians, according to which 7% of practicing doctors applied for formal certificates confirming their legal right to practice in other EU countries [14].

A study conducted by Jośko et al. in four Polish medical universities showed that almost 40.6% of future physicians planned to emigrate after graduation [34]. Results reported by Krajewski-Siuda, et al. indicated that about 62% of Polish fifth-and-sixth year medical students planned to seek employment abroad [35].

Research has shown that the share of those who declare intent to migrate is the largest among students [36], smaller among residents and the smallest among practicing specialists. Similar results have been reported from a study conducted in 2017 in Lithuania, where 39% of medical students, 21% of residents and 6% of physicians declared intention to migrate [37].

International research has found that HWF movement is especially noticeable from Eastern and Southern Europe [4,38]. As a consequence, these countries are training medical staff for their richer neighbors [39]. Jośko et al. reported that medical students indicated as emigration destination countries mainly: the UK, Sweden, Norway, Spain, Germany and Ireland [34]. Other studies have also confirmed that the majority of emigrating Polish physi-

Table 2
Simple and multivariable logistic regression analysis of predictors of migration.

Variable	OR[A] (95% CI)	OR[B] (95% CI)
Age	0.93 (0.92-0.94)	0.94 (0.92-0.95)
Sex		
Male	1	1
Female	0.64 (0.48-0.85)	0.46 (0.33-0.65)
Marital status		
single	1	
in relationship	0.53 (0.39-0.73)	
Having children		
no	1	1
yes	0.35 (0.26-0.46)	0.63 (0.44-0.90)
Specialist,		
no	1	
yes	0.29 (0.21-0.38)	
Additional shift-work duties		
no	1	
yes	1.7 (1.18-2.43)	
Total no of working hours per week	1.02 (1.01-1.03)	1.02 (1.01-1.03)
Type of employment		
job agreement	1	
contract	0.65 (0.46-0.91)	
mix	1.22 (0.71-2.12)	
Number of employment places		
only 1 hospital	1	
also additional providers	1.31 (0.97-1.77)	
Overall satisfaction	0.44 (0.36-0.55)	0.44 (0.34-0.56)

OR – odds ratio, A – simple logistic regression, B - multivariable logistic regression.

cians have gone to the UK, Germany and the Scandinavian countries [11,13,39]. Our research confirms these results: the countries most often indicated by our respondents were: Germany (22%), the UK (20%), Norway (12%) and Sweden (9%).

Polish physicians leave the country mainly for financial reasons, but the 2007 change in salary levels for physicians resulted in decreased interest in emigration [11,13,39]. Also the analysis of the number of certificates issued between 2007–2017 to physicians to confirm their legal right to practice in other EU countries confirms that the trend is probably stable and remains at the level of approx. 7% [14]. Other often cited push factors for emigration are poor working conditions, including working environment, terms of employment, job climate, access to modern infrastructure and incomplete health reforms [11,39].

The main reasons for migration indicated by our respondents were: higher earnings abroad (81%); better working conditions abroad (73%); ability to achieve better work-life balance (67%); better training opportunities abroad (59%); obligation to perform many non-core tasks (54%) and stressful working environment (52%). These results are partially in line with a study conducted by Clarke et al. which explored the predictors of trainee doctors emigrating from Ireland [27]. In this study the predictors of migration were poor training opportunities (its overall low quality and inadequate supervision) as well as family and personal reasons.

The results of our research show that intent to emigrate can be related to socio-demographic factors, work-related factors and organizational issues. Women were 54% less willing to migrate compared to men; doctors having children have lower chances of intention to migrate by 37% in comparison to those without children.

Age and overall satisfaction were negatively related to the intention to migrate: being older and having a higher level of satisfaction were associated with a lower intent to migrate. Other research has also found that dissatisfaction with working conditions could be an emigration driver [37,40–42].

According to our results, over 61% of doctors with the intention to migrate considered a temporary (for 2–5 years) stay abroad. Other research indicates that Polish physicians do not emigrate permanently, but part-time jobs abroad are often treated as a means of earning additional money [13]. Various mobility practices are observed, like short-term work cycles or weekend work which make the process of Polish doctors emigration a mixed phenomenon [11].

Our study shows that the intent to migrate was negatively related to age and work experience: younger and less experienced doctors more often considering practicing medicine abroad. Due to the unfavorable age structure of practicing doctors [8], this situation clearly needs attention.

The improvement of doctors' working and employment conditions calls for close cooperation among the main stakeholders; however, this cooperation for many decades has been weak or non-existent. Many essential postulates were raised by one of the leading stakeholders - The Polish Chamber of Physicians, especially regarding changes in under-and-postgraduate training; increasing the admission quota for medical study and regulations regarding the performance of physicians' profession [43–45]. The Polish health care system has a long tradition of medical staff striking over working conditions and wage increases. The good mobilization capacities of Polish trade unions and the vast range of their strategies have proved ineffective in ensuring an increase in unions' leverage and the stability of the workforce situation [46]. But on the other hand, the government's reaction to long strikes has usually included wage increases for all medical staff or settlements with a particular staff category [22].

In autumn 2017, Polish residents frustrated with workload, shortages, and poor working conditions, organized different kinds of protests demanding reforms. Their main postulates were increasing public healthcare expenditure from the current budget of 4.8% to at least 6.8% of GDP, reducing bureaucracy; increasing the number of HWF; improving working conditions and increasing salaries. Similar problems were indicated by our respondents as the main migration drivers. In January 2018, the newly appointed Minister of Health promised an increase in public expenditure to over 6% of GDP by 2024 and agreed to increase salaries of specialist physicians working only in one hospital; increase salaries for residents, and reduce the administrative burden of hospital doctors [22,47].

These decisions are consistent with the expectations of young doctors, yet a systemic, comprehensive strategy that would improve the stability of the HWF long-term is still needed. In 2018 the government introduced so called 'patriotic vouchers' for physicians who signed a written declaration to stay in the Polish health care system for a minimum of two years after completing residency training [48]. These documents guaranteed residents an increase in remuneration of 600–700 PLN per month (about 150 Euro) during specialization training.

4.1. Implications

Due to the health professionals crisis and globalization of their labour market, the development of comprehensive databases, monitoring and evidence analysis of the HWF are required as critical enablers to develop policy, advocacy, governance, and accountability [52–56]. To better prepare Europe's future health workforce, international initiatives in this field are also valuable [54]. Due to the migration of younger doctors, and indicated staff shortages, Poland as a source country faces many concerns. Physicians leaving the country have been discussed as one factor contributing to the current shortage of physicians in Poland. There are a few implications for health policy makers from this study. The first is to improve databases on the scale and reasons for doctor migration. The next is to improve HWF strategies and planning, taking into account not only ad-hoc solutions, but mainly long-term perspectives. There is a need for the Polish health system to significantly strengthen its physician workforce planning capacity [12] and to better rec-

Table 3
Comparison of perceived barriers to migration between doctors with and without intention to migrate.

Intention to migrate / Barrier	Language barrier		Good prof. position in Poland		Leaving family		Concerns related to foreign culture		Concerns related to new working environment	
	Yes, n, (%)		Yes, n, (%)		Yes, n, (%)		Yes, n, (%)		Yes, n, (%)	
No	113	15.5%	295	40.4%	504	69.0%	74	10.1%	104	14.2%
Yes	31	11.4%	42	15.4%	199	72.9%	41	15.0%	67	24.5%
P value		0,09		<0001		0,24		0,03		<0001
Overall	144	14.3%	337	33.6%	703	70.0%	115	11.5%	171	17.0%

p-value from $\chi 2$ test.

ognize the impact of current and future migration. This research has provided current information derived from a large sample of physicians in an effort to promote the identification of the reasons motivating Polish physicians to migrate. If these reasons and "push" factors are better known, proper actions can be developed to prevent physicians from leaving the Polish health sector. Analysis of migration trends showed that increasing physicians' salary in Poland in 2007 caused reduction of migration outflow. Although the average wages of medical staff in Poland have increased during the last decade, physicians' salaries are still much lower than in other high-income countries. In 2016, the average specialist salary was at the level of 1.4 times the average salary in the country, which was the lowest among the 21 analyzed OECD countries [57]. Further increase of physician wages should be one of the key strategies leading to improvement of employment conditions. The next urgently needed steps should be further increase in admission quotas to medical study, correlated with an increase of residency places based on prior in-depth national analyses.

Actions seeking to increase doctor retention should also focus on modifiable factors associated with the intention to migrate, such as physician satisfaction [58], as our study found that doctors intending to migrate had a significantly lower mean level of satisfaction. Hence, prerequisites allowing positive management of work-related factors affecting physician satisfaction seem to be urgently required. Such actions may also prevent currently undecided physicians from emigrating in the future [58]. Retention of physicians can also be improved by focusing on working conditions and environment: the above mentioned arrangement of the remuneration system, salary increases, strengthening teamwork climate in hospitals, reducing administrative burden, facilitating working time and improvement of infrastructure. To conclude, the crucial challenge for policy-makers is the implementation of a holistic, systemic approach to medical staff planning based on strategic principles.

4.2. Limitations

Our study is not free of limitations. The relatively low response rate is one. However, many international studies underline that surveys among physicians have a low response rate in comparison with the general population [25,26,49]. There is evidence indicating that physicians do not significantly differ among respondents and non-respondents in terms of answers and group characteristics. In this case, larger sample sizes compensate for greater nonresponse [26]. The National Chamber of Physicians reported that the highest percentage in all their previous studies was 17% [50], so our 38% response rate is quite satisfying.

The next limitation of our research is the composition of the study sample. The participants' mean age (43.4) is lower than the average age of Polish practicing physicians (50.2) [18]. Moreover the majority of our respondents were men (51.6%), while the share of male physicians is lower (42.3) [18]. Our sample distribution is in line with the results of other studies, which reported that physicians participating in on-line surveys tended to be younger and male [51]. Considering that the intention to migrate was often declared by our younger and male respondents, it is possible that among the practicing physician population the intention to migrate is less prevalent (female doctors and older cohorts are less likely to migrate than young male physicians).

Also, the cross-sectional nature of the study makes it difficult to define conclusions about causality. Notwithstanding these limitations, this is the first research to assess the scale of migration intentions among physicians working in Polish hospitals with an approach to explore associations between physician satisfaction and migration intentions.

5. Conclusions

As a result of inadequate policies in respect to the HWF, the Polish system is facing many challenges, including: excessive workload, shortages and dissatisfaction of medical staff, which could lead to emigration of medical professionals, especially younger generations. A systemic approach to HWF planning, including monitoring migration trends and improving working conditions, should be implemented.

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Appendix A. Supplementary data

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