

## Career Intentions and Dropout Causes Among Medical Students in Kazakhstan

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**Key Words:** *career intentions; dropout rates; medical students.*

**Summary.** *Background and Objective.* The number of new entrants to higher medical schools of Kazakhstan increased by 1.6 times from 2007 to 2012. However, it is not known how it will affect the shortage of human resources for health. Additionally, human resources for health in rural areas of Kazakhstan are 4 times scarcer than in urban areas. The aim of the present study was to investigate the intentions of students toward their professional future and readiness to work in rural areas, as well as to determine the causes for dropping out from medical schools.

*Material and Methods.* A cross-sectional survey was conducted in 2 medical universities in Almaty during the academic year 2011–2012. The study sample included medical students and interns. In total, 2388 students participated in the survey. The survey tool was an anonymous questionnaire.

*Results.* The students of the first years of studies compared with those of later years of studies were more optimistic about the profession and had more intentions to work in the medical field. Only 8% of the students reported a wish to work in rural localities. On the other hand, 4% of the students did not plan to pursue the profession. On the average, every third medical student dropped out on his/her own request.

*Conclusions.* Associations between intentions to work according to the profession and the year of studies, faculty, and residence area before enrolling in a medical school were documented. The majority of the students who came from rural areas preferred to stay and look for work in a city, which might contribute to an unequal distribution of physicians across the country.

### Introduction

One of the serious problems in the healthcare system of Kazakhstan is understaffing of skilled personnel. Today, there are more than 60 000 practicing physicians across the country. Despite an annual increase in health manpower with a higher education (more than by 9.5%) at the expense of admission to higher medical schools and an increase in the number of graduates, the staff shortage still persists, especially in rural areas (1), where 45% of the total population of Kazakhstan is settled. The supply with human resources for health is 4 times lower in rural than urban areas. Additionally, there is an unequal distribution of medical staff across the regions of the country, and in some regions, there are from 9.5 (Almaty region) up to 19.3 physicians (Karaganda region) per 10 000 population (2).

In Kazakhstan, in order to enter a higher medical school, entrants pass the Uniform National Testing after graduation from a secondary school. The testing includes 5 subjects, one of which is the main subject. In case of medical studies, the main

subject is biology, a discipline that is also the main subject in other higher schools preparing specialists in the fields of agrochemistry, ecology, soil science, biotechnology, defectology, psychology, veterinary medicine and sanitation, hunting, fishery, fruit and vegetable growing, melioration, and earth preservation. However, the personal characteristics of entrants and their ability and wish to be a physician, i.e., vocational suitability, are not considered.

Various methods of selection and admission of entrants to higher medical schools are practiced in different countries where testing, conversation or interview, and structured examinations (3–5) are used most frequently. In spite of a constant increase in the number of students in the medical universities in Kazakhstan (from 17 059 in 2008 to 30 744 in 2012), the dropout rate from medical schools is still high.

One of the causes of leaving the profession by youth at various stages of studies is a wrong vocational choice. The percentage of students who drop out remains high. These problems are also related to a lack of vocational orientation and professional selection.

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For example, in Denmark, a high level of dropouts (in most cases after the first year of studies) is considered as one of the basic problems of medical staff training (6). Australia and the Netherlands have reported the dropout rates from medical schools to be 12%–20% (7–9). In comparison, the dropout rates from medical schools in the United Kingdom and the United States are usually reported to be around 3%–4% (10, 11). It can show that young people have made a wrong vocational choice, and only at university, during the study process, they have understood it.

In order to solve a problem of low coverage of doctors in rural areas of Kazakhstan, a number of measures have been undertaken: allocation of encouraging means, accommodation, and signing of a tripartite agreement between a student, the state, and a healthcare setting where the future doctor will work within 5 years after graduation from the university.

In order to establish the causes of migration from rural areas, researchers of different countries have studied the opinions of medical students concerning the factors influencing their decision. Among the factors encouraging emigration, unsatisfactory financial conditions, bad working conditions as well as professional isolation, limited educational opportunities for oneself and the family, and absence of specific support have been mentioned by students (12).

Correct selection among rural schoolchildren, development of necessary conditions for work and life in the countryside, and further support can be the key aspects in solving this problem (13).

The aim of the present study was to investigate intentions of students toward their professional future and intentions to work in rural areas, as well as to determine the causes for dropping out of medical schools.

### Material and Methods

The study was conducted in 2 higher medical schools in Almaty (southern capital of Kazakhstan): Kazakh National Medical University named after S. D. Asfendiyarov (KazNMU) and Kazakhstan-Russian Medical University (KRMU), a public and a private high school, respectively. Of note, KRMU that is a private school has the right to provide educational services on the demand of the state, which means that some students can study at the expense of the state.

The total number of students in the 2011–2012 academic year was 8454, of which 7124 students were at KazNMU and 1330 students at KRMU. A total of 2388 students interviewed: 2113 first- to sixth-year students and 275 interns recruited from the Faculties of General Medicine, Preventive Medicine, Dentistry, Medical Business, and Pediatrics.

The students from the Faculties of Nursing and Public Health due to the absence of such faculties in KRMU for comparative analysis were excluded. Due to the same reason, the students of the faculty of Preventive Medicine (from the third to the sixth year of studies) were excluded as well.

The study groups for the survey were chosen using the randomization method. The sampling was systematic. The sample included the students of all the years of studies of Kazakh and Russian departments. The first element was randomly selected; then, with step “n,” every “k” element was selected. The size of the general population was  $N=n \times k$ . For sampling of KazNMU, the selected  $n$  was 5, and for KRMU 2, as the number of students of KazNMU is 5 times higher than that of KRMU. The total sample size was 2401 subjects, which allowed providing an acceptable level of a statistical error of 5% ( $P < 0.05$ ).

The questionnaire included 51 items, reflecting motivation for obtaining the medical education, character of preparation before entering a higher medical school as well as further plans of a student concerning the chosen profession and other questions. The survey was conducted in lecture rooms, lecture halls, and clinical settings. The participation in the survey was voluntary and anonymous. Of the 2500 distributed questionnaires, 2388 were considered as adequate for further analysis (response rate, 95.5%), 38 questionnaires were not returned, and 74 questionnaires were incomplete. For study and analysis of the causes for dropping out of a medical school, annual internal reports of the medical schools were used.

The study was approved by the ethical committee of the Kazakh School of Public Health in 2011.

Statistical data analysis was performed using the SPSS software for Windows 15.0. Statistical procedures included calculation of means and proportions, the  $Z$  test for large samples, and the Pearson correlation.

### Results

In total, 2388 subjects were enrolled into the survey: 1526 (63.9%) from KazNMU and 862 (36.1%) from KRMU. There were 1434 students and 92 interns from KazNMU, and 679 and 183, respectively, from KRMU. The majority (74%) of the students were women, studying at the expense of the state (71%), and not married (86%). The comparison of the sociodemographic characteristics of the sample between the 2 higher schools demonstrated significant differences, except for gender, work experience in healthcare, and attempt to enter a university (Table 1).

The majority of the students entered a medical university on their first attempt, and only 7% undertook the second or the third attempt. About 75%

Table 1. Sociodemographic Characteristics of Students of Medical Universities

Characteristic	KazNMU	KRMU	<i>P</i>
Gender			
Male	372 (24.3)	237 (27.4)	>0.05
Female	1154 (75.6)	625 (72.5)	
Age, years			
16–17	127 (8.3)	41 (4.7)	<0.001
18–19	379 (24.8)	359 (41.6)	
20–21	442 (28.9)	102 (11.8)	
22–23	377 (24.7)	166 (19.2)	
24 and older	201 (13.1)	194 (22.5)	
Marital status			
Married	184 (12.0)	147 (17.0)	<0.01
Unmarried	1342 (87.9)	715 (82.9)	
Place of residence before entering a university			
Urban area	782 (51.2)	507 (58.8)	<0.001
Rural area	744 (48.7)	355 (41.1)	
Studies financed by			
State grant	1225 (80.2)	474 (54.9)	<0.001
Self-financed	301 (19.7)	388 (45.0)	
Entered a medical university after			
School	1398 (91.6)	710 (82.3)	<0.001
Medical college	88 (5.8)	136 (15.8)	
Another university	40 (2.6)	16 (1.9)	
Entered a medical university			
On the first attempt	1422 (93.1)	793 (91.9)	>0.05
On the second attempt	104 (6.8)	69 (8.1)	
Work experience in healthcare			
Yes	389 (25.5)	192 (22.3)	>0.05
No	1137 (74.5)	670 (77.7)	
Own medical skills			
Yes	1275 (83.6)	694 (80.5)	<0.05
No	251 (16.4)	168 (19.5)	

Values are number (percentage).

KazNMU, Kazakh National Medical University named after S. D. Asfendiyarov; KRMU, Kazakhstan-Russian Medical University.

of the subjects had no work experience in healthcare before entering a medical school.

The analysis of students' intentions to work in the medical field (Fig. 1) revealed that the students of the first years of studies compared with the later years of studies were more optimistic about the profession and had more intentions to work in the medical field for the rest of life. During the first years of studies, 12% of the subjects had intentions to work in the medical field for the rest of life, while the percentages of the subjects having such intentions tended to decrease to 8.8% among students studying in the fourth year and to 7.2% among the interns.

The comparison of the students according to their marital status revealed that the percentage of married students increased from 2.2% among the first-year students to 10.3% among the fourth-year students and to 46.5% among the interns.

The analysis of intentions toward work across the years of studies showed significant differences ( $\chi^2=109.8$ ,  $df=24$ ,  $P<0.001$ ). In addition, a negative correlation between the year of studies and student's intentions was documented ( $r=-0.3$ ,  $P<0.001$ ). Intentions about the possibility to change the professional field were expressed by a similar proportion

(2%–3%) of the first-, second-, and sixth-year students as well as the interns, which slightly exceeded that of the third- to fifth-year students.

Among the first- and fifth-year students, lacking intentions to work in the medical field after university graduation were more expressed than among others. This can refer to the fact that during the first years, students adapt to an academic study load at university and up to the fifth year they face other problems, such as specialization choice, university graduation, etc., which in general could influence their intentions regarding a professional career.

The study also found significant differences in intentions across faculties ( $\chi^2=154.01$ ,  $df=16$ ,  $P<0.001$ ). The students of the Faculties of General Medicine, Medical Business, and Dentistry 1.1 to 1.5 times more frequently reported intentions to stay in the selected professional area in comparison with the Faculties of Pediatrics and Preventive Medicine. On the other hand, 12% of the students of the Faculty of Preventive Medicine stated that they did not intend to stay in the field of healthcare after graduation.

In total, 4% of the study subjects did not plan to work in the medical field. Among them, more than

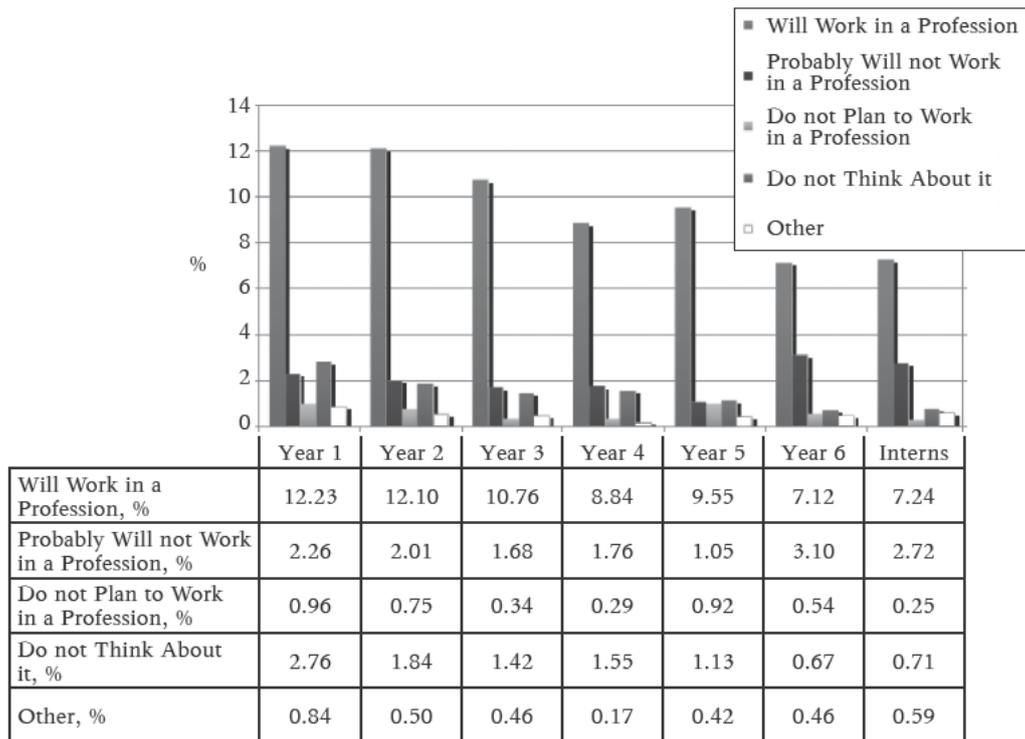


Fig. 1. Students' intentions toward their professional future depending on the study year

half of the students were studying at the expense of the state, which could be considered as a relevant loss of national budget funds.

The analysis of intentions of the students in association with a future professional career and a specialization chosen at the moment of the survey revealed that three-fourths of the respondents of each specialty wanted to work in the medical field, except for the Faculty of Pediatrics where half of the students considered resigning the medical field. Consideration of change of the activity area was reported by 20% of the future doctors of narrow specializations, such as otorhinolaryngologists, cardiologists, hematologists, etc. (Table 2).

The comparison of students' plans to stay in the field across the faculties demonstrated that almost

12% of the respondents of the Faculty of Preventive Medicine did not plan to work in the field after graduation (Fig. 2).

Almost all the students who specified a city as the place of residence before entering a higher medical school reported the wish to work in a city. Similarly, the majority (80%) of the students who arrived from rural areas considered a city as the main place of their future work after graduation. According to the study data, less than 8% of all the students linked their career with work in a rural area. Additionally, 27% of the students specified other choices and, among them, the desire to work in other countries (17.7%) and other choices (9.6%).

The analysis of dropout reasons showed significant differences in the rates of all dropout reasons

Table 2. Future Intentions Toward Career and Specialties Chosen by Students

Chosen Specialty at the Time of Survey	Intentions of Students Toward Their Career					Total
	Work in a Profession	May Go out of Medicine	I do not Plan to Work in Medicine	Did not Think	Other	
Physician	189 (71.0)	39 (14.7)	8 (3.0)	24 (8.7)	7 (2.6)	267 (100)
Surgeon	269 (70.6)	33 (8.7)	21 (5.5)	48 (12.6)	10 (2.6)	381 (100)
Obstetrician-gynecologist	268 (76.1)	51 (14.4)	10 (2.8)	15 (4.3)	8 (2.4)	352 (100)
Narrow field specialist	346 (65.8)	109 (20.7)	11 (2.0)	39 (7.5)	21 (4.0)	526 (100)
Dentist	199 (63.0)	39 (12.4)	20 (6.3)	51 (16.1)	7 (2.2)	316 (100)
Not determined	160 (63.0)	32 (12.6)	20 (7.8)	38 (15.0)	4 (1.6)	254 (100)
Other	189 (64.7)	45 (15.4)	7 (2.4)	26 (8.9)	25 (8.6)	292 (100)

Values are number (percentage).

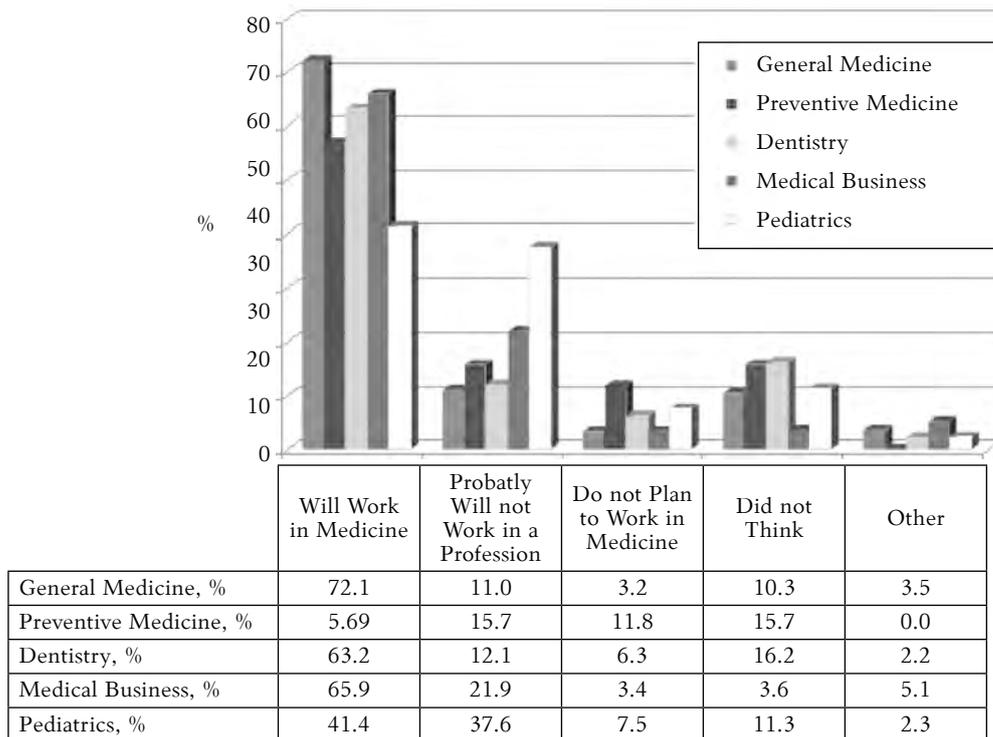


Fig. 2. Students' intentions toward their professional future depending on the faculty

when the 2007–2008 period was compared with other periods. This fact demonstrated that young people made a wrong choice concerning the specialty and understood it only at university during studies. Quite an obvious cause is that there is no vocational orientation system at schools, and senior schoolchildren have no opportunity to try one or other profession. Individual request and transfer to another university were the most prevalent reasons for dropping out. Tables 3 and 4 show the detailed information on the dropout reasons among students.

### Discussion

In general, a number of factors influence the formation of future plans concerning one's career, and this particular study tried to investigate associations between intentions to work according to

the profession and some factors in order to define trends and possible reasons for career intentions among students. We found that the students of the first years were most likely to work in the medical field, but from the fourth year of studies, this percentage tended to decrease, and among the interns it was only 7%. This can be explained by the fact that students of the first years have not faced clinical disciplines, medical practice, and other related aspects of work in medicine yet. We also consider that marital status (marriage foremost) and other family issues can influence the intentions of medical students. Our study revealed that up to the fourth year of studies, the proportion of married students increased from about 2% among the first-year students to 46.5% among the interns.

Our study on the intentions of students con-

Table 3. Reasons of Dropping out Among KazNMU Students From 2007 to 2012

Reason	Year of Study				
	2007–2008	2008–2009	2009–2010	2010–2011	2011–2012
Financial difficulties	0 (0)	4 (0.7)	8 (2.0)	7 (1.7)	8 (1.9)
Academic failure	0 (0)	201 (35.5)*	10 (2.6)	107 (26.4)*	44 (10.4)*
Transfer to other university	49 (32.6)	37 (6.6)*	62 (15.8)*	48 (11.8)*	124 (29.3)*
Individual request	25 (17)	272 (48.0)*	177 (45.0)*	177 (43.6)*	144 (34.0)*
Health reasons	5 (3.3)	0 (0)	1 (0.3)	2 (0.5)	2 (0.5)
Other reasons	71 (47.3)	52 (9.2)*	135 (34.3)*	65 (16.0)*	101 (23.9)*
Total	150 (100)	566 (100)	393 (100)	406 (100)	423 (100)

Values are number (percentage).

\* $P < 0.05$  compared with the 2007–2008 period.

Table 4. Reasons of Dropping out Among KRMU Students From 2007 to 2012

Reason	Year of Study				
	2007–2008	2008–2009	2009–2010	2010–2011	2011–2012
Financial difficulties	11 (16.0)	6 (8.5)*	6 (11.5)	9 (15.5)	4 (6.7)*
Academic failure	13 (18.9)	14 (20.0)	9 (17.3)	8 (13.7)	5 (8.4)*
Transfer to other university	9 (13.0)	12 (17.2)	8 (15.3)	12 (20.6)*	13 (21.6)*
Individual request	21 (30.4)	23 (32.8)	19 (36.5)	22 (37.9)	24 (40.0)*
Health reasons	0 (0)	1 (1.5)	0 (0)	2 (3.4)	1 (1.6)
Other reasons	15 (21.7)	14 (20.0)	10 (19.2)	5 (8.6)*	13 (21.7)
Total	69 (100)	70 (100)	52 (100)	58 (100)	60 (100)

Values are number (percentage).

\* $P < 0.05$  compared with the 2007–2008 period.

cerning their professional future career and the specialization chosen at the moment of the survey revealed that three-fourths of the students of each specialty were willing to work in medicine. However, 20% of the future physicians of narrow specializations (otorhinolaryngologists, cardiologists, hematologists, etc.) reported a possibility to change the scope of activity. According to the previous literature, future professional plans concerning one's career in rural areas depend on the character of admission to medical high schools, i.e., an interview with applicants (14–16) that allows the evaluation of cognitive qualities. The use of personal psychometric tests (17) is also considered as an important aspect for future medical practice (18).

There is convincing evidence that students of the urban origin most likely stay to work in a city; however, the majority of students from rural areas also express the wish to look for a job in a city rather than in rural areas. According to our results, less than 8% of the students linked their career with a rural area, and it is not known how it will affect a manpower shortage in the future. However, we consider the revision of existing measures on the attraction of interns to rural areas as necessary. A number of authors claim that the choice of a career in rural localities is promoted by the use of work experience in the countryside during the process of education. There is sufficient evidence that rural practice can influence the choice of a rural career by city students (19, 20).

Some authors emphasize the necessity for measures to encourage rural medical workers to stay in rural areas. For this purpose, professional support at national, state, and local levels (21, 22) is necessary. The presence of opportunities for career growth (23) and readiness to accept a rural way of life as well as establishment of good relations with local people (24, 25) are the key factors influencing the stay of specialists in rural areas.

It is also necessary to pay attention to those students who do not plan to work in the medical field at all. The majority of them are the students who have

obtained an educational grant from the state, which is associated with meaningless economic expenses for students' training. Therefore, there is a necessity for stricter rules and working terms in healthcare settings for students educated at the expense of the state. Moreover, it is an alerting fact that half of the students in the Faculty of Pediatrics consider leaving the medical field.

According to the internal management reports of the medical schools, among the causes of the dropout rates the prevailing reasons are the following: financial difficulties, academic failure, transfer to other universities, student's individual request, health reasons, and breach of discipline (behavior-related problems). The main reason for dropping out of a medical school is student's own wish (41%). This suggests that the students made a wrong choice of their future profession, and only in the learning process they realized it. A high percentage of dropouts by free will among all the reasons for dismissal specify the necessity to conduct a professional orientation among schoolchildren who wish to enter a medical university. A recent literature review of the factors associated with dropping out of a medical school included 13 studies (26). The review concluded that a broad range of entry qualifications seemed to be associated with a lower risk of dropping out, particularly among those having earned a prior degree, but also with A-levels in natural sciences and high admission test scores (26).

Therefore, it is necessary to pay special attention to the process of selection of entrants to medical studies in Kazakhstan, which should include an admission interview in order to gather more detailed information about an applicant. Low dropout rates in countries where the method of selection of entrants is applied can serve as convincing evidence (10, 11, 27).

## Conclusions

Associations between intentions to work according to the profession and the year of studies, faculty, and residence area (urban or rural) before enrolling

in a medical school were documented. The majority of the students who came from rural areas preferred to stay and look for work in a city, which might contribute to an unequal distribution of physicians across the country.

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### Statement of Conflict of Interest

The authors state no conflict of interest.

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