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Representatives of generation 'Z' as future doctors – results of research among final year students at medical universities in Poland

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Abstract

Introduction and Objective. The nature of the work of doctors is inseparable from responsibility for human health and life, exposure to many risk factors related to physical, chemical, biological and psychosocial risks, as well as the specificity of the organization of the health care system in Poland. This prompted the authors to ask future doctors, currently students of the penultimate and the final year of medical studies, questions about what is important to them in their future profession and how studies at the medical universities met these needs.

Materials and method. Identification of skills important for future doctors to perform their profession was conducted in the third quarter of 2020 in the form of an online diagnostic survey on a sample of 442 fifth- and sixth-year medicine students at medical universities in Poland.

Results. The study shows that most students graduating in medicine are satisfied with their choice and intend to work in the profession they have learned. In this study, the responders, on average, felt well prepared theoretically for their future profession, whereas when indicating their practical preparedness, it was much lower. One of the most important skills indicated by students participating in this study was communication with patients.

Conclusions. Overall, the quality of medical studies in Poland is rated very high by the students. Nevertheless, there is a lack of or insufficient time spent on teaching and helping future doctors develop soft skills; therefore, more focus should be placed on this aspect of studies.

Key words

medical students, medical education, professional role

INTRODUCTION

Nowadays, the wide social view on modern medicine is being associated with development in the highly specialized technologies and modern medical equipment that save human life and health, as well as progress in research. A key element missing from this list is the medical profession itself which is increasingly underestimated. People also no longer recognize the concept of vocation as the reason for choosing this profession an integral part of the success of medicine. From the social point of view, the attitudes of doctors towards their profession and their professional satisfaction are of little importance in the effectiveness of treatment [1].

The observed progress in medicine and technological development is also accompanied by changes in health care systems and the roles of individual stakeholders of these systems. The role and place of the patient in the health care system is also changing significantly. Health systems and policies no longer focus only on healing and restoring health, the essence of health policy is health promotion and prophylactic which shape pro-health behaviour in society. Physicians are expected to promote a healthy lifestyle and encourage the public to benefit from preventive examinations and health programmes.

Despite medical studies being one of the most difficult and demanding [2], every year a dozen or more applicants compete for one place. According to the data published by the Ministry of Health in the last five years, there were in total over 1,000 medical places added to full-time master's studies conducted in Polish. In the academic year 2020–2021, the number of places for these studies in Poland was 5,103 [3]. Regardless of that, for many years Poland had the lowest rate of doctors per 1,000 inhabitants among all EU countries. In 2018, this number reached 2.4, with the EU average at 3.8 [4].

In accordance to the Act on the Professions of Doctor and Dentist practice in the medical profession there is a provision of health services by a person with the required qualifications, confirmed by relevant documents. These services are: health examination, diagnosis and prevention, rehabilitation of patients, providing medical advice, issuing medical opinions and certificates. The doctor is also obliged to practice in accordance with the indications of current medical knowledge, methods and means of preventing, diagnosing and treating diseases, following the principles of professional ethics and with due diligence [5].

The changes taking place in health systems in Europe and worldwide have been occurring in parallel with rapid technological development, which has led to the association

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of the successes of medicine mainly due to modern equipment and technological development. One of the forgotten elements in this list which truly determines the effectiveness of any health care system are human resources, the quality of which, however, depends on the level of education, competences, and a range of acquired soft skills. This introduces one of the biggest challenges in the current health care system, i.e. recruitment of an appropriately educated staff.

According to the authors of the current study, the above issue is of particular importance as today medical universities admit representatives of generation 'Z', who will be the first graduates of this generation to enter the labour market. Many researchers emphasize that generation 'Z' is very different from its predecessors – the 'Baby Boomers', generations 'X' and 'Y' – they were born in the 1990s and raised in the 2000s during the most profound changes of the century. The representatives of generation 'Z' form the first social group who do not know a world without computers, mobiles, internet or electronic gadgets. They are not familiar with the analog world and its logic. They can function alongside the real and virtual worlds; in their opinion, these two worlds are complementary [7]

The current study answers questions such as: what is important for young people who choose difficult medical studies? What caused that decided to study medicine? What competences, apart from medical knowledge, did they acquire during their studies? What is their hierarchy of non-professional values.

The aim of this study was to identify important competences, indicate the role of soft skills, and attempt to prioritize values significant for the future doctors representing generation 'Z'.

Based on the aforementioned objective of the study, the following research questions were formulated and asked of the future doctors:

1) Which motivations for choosing this field of study were very important for the future doctors?
2) Which benefits of higher education that determine the quality of their work, were gained by the future doctors?
3) Which soft competences have the future doctors acquired during studies?
4) Which soft competences do they consider key for their future profession?
5) Which life values are crucial for the respondents?

MATERIALS AND METHOD

The survey, based on voluntary and anonymous participation, was carried out from June – September 2020, using a proprietary questionnaire consisting of ten closed-ended (multiple-choice) questions and five socio-demographic questions considering age, gender, year of study, and place of residence prior to studies. The method of an on-line diagnostic survey was used to conduct the study. The survey was organized by sending links to the questionnaire to the e-mail addresses of university deans' offices. The following procedure was used: anonymous responses received via a Google form were checked for completeness and forwarded for further analysis. Only fully completed questionnaires were used for statistical analysis.

The study group consisted of students from the fifth year (N = 270, 61.2%) and sixth year (N = 171, 38.8%) at medical universities in Poland. Women constituted 67% (N = 296) and men 33% (N = 146). Not all respondents marked the university at which they were studying. Among the answers marked, the largest number of students came from Wrocław Medical University (N = 100, 23%), followed by answers from students from the University of Silesia in Katowice (N = 68, 15%). The responses of students from the universities of Kraków, Łódź and Gdańsk were about the same (N = 24, 5%).

The selection of the research sample was deliberate due to the authors' interest in the profile of people who graduate from medical studies. The opinions, declarations and experience of the responders in the scope of the issues discussed in the current study can be treated as the most mature, thoughtful and up-to-date.

Statistical analysis was performed with the use of the Statistica StatSoft Polska software (reference). In order to replace the various questions with one dimension, initially for all groups of competency characteristics, etc., a factor analysis was carried out. The dimensions were calculated as the mean of the items, the reliability of which was first assessed using the Alpha-Cronbach measure (Tab. 1–5). If the alpha coefficients were greater than 0.7, the scale was considered reliable and all differences and correlations were made on these scales. Due to the lack of a normal distribution of the identified factors (Shapiro Wilk's test – $p < 0.05$), to test the differences between two groups of students, the Mann-Whitney U test was used, for tests between three or more groups the Kruskal Wallis test with the *post-hoc* Duna test of detailed comparisons was applied. Spearman's rho correlation coefficients were used to assess the significance and direction of the relationship between the selected factors. All tests were calculated at the alpha significance level = 0.05.

RESULTS

The first questions in the questionnaire concerned the respondents satisfaction with the choice they made when commencing medical studies, whether the choice was accidental or the studies were a continuation of a family tradition?

The vast majority of respondents confirmed that they were satisfied with their choice (N = 319, 72.2%) and declared that it was not made randomly (N = 427, 96.6%). Most of the students also stated that medical studies were not the continuation of a family tradition (N = 347, 78.5%). When declaring whether they intend to work in the studied profession, almost 90% of the respondents confirmed their willingness to undertake work as a doctor (N = 390, 89.0%).

Next, when asked about the factors that determined the choice of studie, the respondents most often indicated that it was the certainty of employment in the given profession, the possibility of intellectual development, willingness to help others, possibility of pursuing one's own interests, and the desire to fulfill one's dreams (Tab. 1).

Due to the high reliability, the results were averaged and an indicator was obtained, i.e. the decisive factors when choosing the medical field of study.

In the next question, the respondents were asked to what extent the studies at Medical University met their expectations in the areas mentioned below (Tab. 2).

According to the respondents, the studies met their expectations in such areas as: shaping the need for lifelong learning, theoretical professional preparation, and preparation for co-operation with others.

Table 1. Descriptive statistics for factors determining the choice of commenced degree

		N	Mean	Standard deviation	Median
Deciding factors in selection of medical degree	Job security in the studied profession	442	4.28	1.01	5.00
	Fair remuneration	442	3.76	1.12	4.00
	High salary	442	3.25	1.17	3.00
	Confirmation of self-worth (recognition by other people)	442	3.25	1.33	3.00
	Prestige	442	3.28	1.27	3.00
	Willingness to help others	442	3.96	1.17	4.00
	Willingness to make one's dreams come true	442	3.91	1.22	4.00
	Possibility of intellectual development	442	4.27	0.99	5.00
	having connections that could help in further development in the professional career	442	2.46	1.43	2.00
	Suggestions from family members	442	2.31	1.33	2.00
	Other people's suggestions	442	1.80	1.09	1.00
	Ability to pursue one's own interests	442	3.91	1.20	4.00
	Other	442	1.87	1.22	1.00
	Deciding factors when choosing a medical field of study, alpha = 0.712	442	3.25	0.56	3.31

Source: Own elaboration, based on conducted study

Table 2. Descriptive statistics for factors determining the expectations of the medical students placed on their degree

		N	Mean	Standard deviation	Median
Expectations regarding medical studies	Theoretical professional preparedness	442	3.17	0.92	3.00
	Practical professional preparedness	442	2.00	0.86	2.00
	Preparedness for job search	442	1.63	0.82	1.00
	Preparedness to start one's own professional practice	442	1.51	0.75	1.00
	Preparedness for cooperation with others	442	2.90	1.11	3.00
	Shaping the need for lifelong learning	442	3.33	1.28	4.00
	Other	442	1.63	1.00	1.00
	Expectations regarding medical studies alpha = 0.748	442	2.31	0.62	2.29

Source: Own elaboration, based on conducted study

When indicating the benefits they obtained by graduating from university, the respondents first of all indicated that they shaped their personality traits (self-confidence, independence, ambitions), and subsequently stated that they felt well prepared for adult life and well prepared for their professional work (Tab. 3).

The respondents were also asked to indicate what competences they had acquired and the degree to which a given skill was acquired during their studies (on a scale from 1 – 5, where 1 means not at all, and 5 completely) (Tab. 4).

According to the respondents, the studies provided them with such competences as: setting priorities, assessing the patient's needs, teamwork skills, communication with the patient, time management skills and empathy.

When assessing the importance of the above-mentioned competences in the medical profession (on a scale from 1 – 5, where 1 is invalid and 5 is very important), the respondents considered all the listed skills as important. With skills

Table 3. Descriptive statistics for factors determining benefits

		N	Mean	Standard deviation	Median
Benefits	I am well prepared for work in my studied profession	442	2.03	0.96	2.00
	I am prepared for adult life	442	2.92	1.31	3.00
	Shaped my character (e.g. self-confidence, independence, ambitions)	442	3.13	1.29	3.00
	Other benefits	442	1.84	1.14	1.00
	Study benefits alfa=0.702	442	2.69	0.93	2.67

Source: Own elaboration, based on conducted study

Table 4. Descriptive statistics for factors determining acquired skills

		N	Mean	Standard deviation	Median
Impotance of competences	Coping with stress	442	3.17	1.26	3.00
	Assertiveness	442	3.04	1.22	3.00
	Assessment of patients needs	442	3.39	1.00	4.00
	Builiding a relationship with patient	442	3.08	1.11	3.00
	Communication with patient	442	3.27	1.09	3.00
	Ability to work in a team	442	3.29	1.13	3.00
	Difficult problem solving	442	2.83	1.17	3.00
	Empathy	442	3.21	1.24	3.00
	Ethics and values	442	3.11	1.23	3.00
	Compassion	442	3.14	1.23	3.00
	Self-confidence, self-worth	442	2.79	1.24	3.00
	Focus on the quality of performed work	442	3.05	1.23	3.00
	Taking the initiative	442	2.82	1.24	3.00
	Time management	442	3.22	1.28	3.00
	Setting priorities	442	3.51	1.20	4.00
	Decission making	442	3.18	1.15	3.00
	Competences alfa=0.901	442	3.13	0.77	3.19

Source: Own elaboration, based on conducted study

such as making decisions, communicating with the patient, coping with stress, solving difficult situations and assessing the patient's needs, were indicated as the most important competences.

Next, the future doctors were asked a question regarding their life values. The respondents were asked to indicate (on a scale from 1 – 5, where 1 means not important all and 5 very important) what they value most in life, choosing from e.g. having work, family, health and religion. They indicated that the family is the most important for them (4.63), followed by passions (4.05), work (3.52) and third **–?-** (Tab. 5).

In order to verify whether there were significant relationships between the selected factors, Spearman's rho correlation coefficients were calculated. These included: factors deciding when choosing a medical field of study, expectations for medical studies, benefits from studies, competences, importance of competences and importance of work, family, and passions.

Positive correlations, strong in a few cases, were observed between various factors; for instance, the higher the expectations the students had towards medical studies, the greater the benefits they associated with the studies (rho = 0.596; $p < 0.01$); and they gained higher competences (rho = 0.669; $p < 0.01$). Higher competences were also quite strongly

Table 5. Descriptive statistics for factors determining importance of the acquired skills

		N	Mean	Standard deviation	Median
Importance of the Competences	Coping with stress	442	4.72	0.63	5.00
	Assertiveness	442	4.40	0.75	5.00
	Assessment of a patient's needs	442	4.63	0.67	5.00
	Builiding a relationship with a patient	442	4.42	0.78	5.00
	Communication with a patient	442	4.75	0.56	5.00
	Ability to work in a team	442	4.42	0.77	5.00
	Difficult problem solving	442	4.67	0.68	5.00
	Empathy	442	4.23	0.96	5.00
	Ethics and values	442	4.21	0.97	4.00
	Compassion	442	3.76	1.14	4.00
	Self-confidence, self-worth	442	4.17	0.84	4.00
	Focus on the quality of performed work	442	4.55	0.71	5.00
	Taking the initiative	442	3.93	0.99	4.00
	Time management	442	4.45	0.77	5.00
	Setting priorities	442	4.53	0.75	5.00
	Decission making	442	4.76	0.57	5.00
	Importance of competences alfa=0.894	442	4.41	0.50	4.50

Source: Own elaboration, based on conducted study

related to the benefits of studies (rho = 0.636; p <0.01). For students who valued work, family and passions, a moderate correlation with competences was shown (rho = 0.301; p <0.01).

In order to verify whether significant differences in certain factors were seen, based on whether the studies were a continuation of a family tradition, the statistics of the Mann-Whitney U test were calculated. The analysis showed that regardless of the reason for choosing the medical profession, the surveyed students did not differ in terms of specific factors.

In order to verify whether there were significant differences in certain factors according to year of stud, and secondly, whether the choice of the field was accidental, the Mann-Whitney U test was performed. In the first case, it was shown that the year of study (5th or 6th) had no influence, and the students did not differ in terms of the factors mentioned. In the second case, factors related to whether the choice of the field of study was or was not accidental were considered. Students who made an informed decision more often (ME = 3.31) analyzed various factors determining the choice of the university, compared to students who declared a random choice of the field of study (ME = 2,.27; p <0.01).

In the case where the choice of the course was not accidental, the factors such as work, family, and passions (ME = 4.00) were more important than in the case of students who declared a random choice of the course (ME = 3.37; p = 0.040).

In order to verify whether there were significant differences in certain factors representing satisfaction with the choice of the field of study, the Kruskal Wallis test with the Duna *post-hoc* test was performed. It was shown to be statistically significant that students who were satisfied with the choice of the field of study, compared to the group of those who were not satisfied and those who did not have an opinion, rated the expectations of medical studies higher (ME = 2.43; p <0.01), the benefits of studying (ME = 3; p <0.01), competences (ME = 3.44; p <0.01) and importance work, family, passions (ME = 4.33; p <0.01). The lowest results in the above-mentioned factors were indicated by students who were dissatisfied with the choice of the field of study.

It was also verified whether there were significant differences in certain factors in relation to whether the students intended to work in the studied profession after graduation. This was assessed by the Mann-Whitney U test. Those who replied in the negative were omitted from the analysis because it was a small sample (N = 5).

The analysis showed that students who declared their willingness to work in the studied profession rated the factors determining the choice of the medical field of study higher (ME = 3.31; p <0.01), expectations in relation to medical studies (ME = 2.29; p <0.01), benefits from studies (ME = 2.67; p <0.01), competences (ME = 3.25; p <0.01) and the importance of competences (ME = 4.50; p = 0.018), compared with the group of respondents who were undecided whether they would commence work in their studied profession.

In order to verify whether there were significant differences in certain factors according to place of residence, the Kruskal Wallis test was applied. Students, regardless of their place of residence, evaluated certain factors in a comparable manner, but the results for this test were not statistically significant.

DISCUSSION

The study shows that most students graduating in medicine are satisfied with their choice and intended to work in the studied profession. When choosing their studies, they were primarily guided by the certainty of working in this particular profession. This factor seems to be extremely important, taking into account the volatility of the professional market situation in Poland. Some of the further considerations regarding these results are firstly where students plan to start/continue their careers. Since, this study did not focus on the future career plans of the students. One question that could be added to follow-up studies is whether graduates of medical universities and medical studies conducted in Poland intend to work in the country or abroad.

In a similar study from 2019, the most important factor proved to be the certainty of employment in the studied profession [7], indicated by almost all respondents (96.9%), assigned as very important (49.1%) or important (47.8%). The responders equally highly appreciated the following factors:

- development of interests in natural science. As many as 92.5% of respondents assessed this as a very important (54.0%) or an important (38.5%) factor;
- fair (90.7%) and high remuneration (78.8%). In this aspect, it is worth paying attention to two issues: 1) a fair salary proved to be more important for the respondents than a high salary; 2) both of these factors were mainly indicated by respondents as important or not very important;
- willingness to help others. Despite the relatively high total indication of the importance of this factor (88.2%), nearly a half of the future doctors rated this factor only as important (42.2%). Moreover, almost one-in-ten indicated this factor as not very important (8.7%) or completely unimportant (3.1%);
- need for recognition by others, was at least important for 85.7% of the respondents, making it almost as important

as the willingness to help others. Therefore, it may seem justified that for over three-quarters (76.4%) of the respondents the prestige of the profession chosen, played a major role when choosing the field of study[7].

The results of the survey (March – June 2018) show that physicians working in university hospitals in Poland are rather satisfied with their careers. Level of salary was most often indicated as the reason for dissatisfaction and as a reason for migration intention. There are, however, other factors that contribute to both the level of career satisfaction and migration intentions; for example, working environment and career development opportunities [8]. Results of the current study suggest that physician satisfaction is negatively related to the intention to migrate, whereas a higher level of satisfaction is associated with a lower willingness to migrate. Therefore, special attention of healthcare managers should be devoted to the measurement and improvement of physicians' satisfaction [8]. Other European studies have reported that physicians' dissatisfaction with working conditions could be an emigration driver [9, 10]

According to Krajewski-Siuda et al., 26% – 36% of graduates of Polish medical universities will find employment abroad where they often work in better conditions and for higher salaries than in Poland. Therefore, it seems to be a significant element to consider and focus on in subsequent studies [11].

Secondly, in the research conducted in 2012 in Wrocław among students of the sixth year of medicine, the most frequently indicated motive for choosing medical studies by the surveyed group was the willingness to help others, which was indicated by nearly half of the respondents; for every fifth person it was the guarantees of employment, the remaining persons rated the high prestige of the medical profession, the good economic situation of doctors, or family tradition, with a similar frequency [12].

In the current study, on average, the respondents felt well-prepared theoretically, mean – 3.17, whereas when indicating their practical preparedness, the mean value decreased to 2.00. Similar results were shown in a study conducted at three universities in the UK, in which some of the results show that graduates were looking forward to starting their first job as a doctor, felt well-prepared for basic clinical tasks, e.g. history taking, and were confident in their communication skills. On the other hand graduates listed multiple concerns about skills which they felt could only be acquired during work, e.g. dealing with acutely ill patients, prescribing, managing workload, and being on call. Additionally, some of the concerns raised had to do with preparedness for undertaking practical procedures, as some of the respondents would have performed a very few clinical procedures on real patients while at medical school [13].

One of the most important competence indicated by students participating in this study was communication with patients, mean score – 4.75. Yet, when the same students were asked whether they felt well-prepared to communicate with patients, the mean score dropped to 3.27. This suggests that although the students value the ability to successfully communicate with patients, they do not feel well-prepared for it. According to the study by Renjan et. al [14], doctors' communications skills are indeed one of the most crucial yet neglected aspects in medical training. In the article, authors focus on communication as an integral part and a key element for success of their work, e.g. during the first interaction with a patient – before the formal interview, during medical interview, while communicating with care givers, attendants or with colleagues, managing difficult encounters, and communicating and delivering bad news. The authors indicate this gap in medical training and emphasize that the formal training of doctors in improving communication skills should be added to the curriculum for medical degrees as it had been proven to improve the overall success of their work [14]. As the feeling of under-preparedness to communicate is also reflected in the results of the presented study, this problem should be further assessed because it is an inseparable and very important part of doctors' work.

In the current study, the results were assessed and analysed in multiple ways, various possible correlations were tested and considered, as well as some confounding variables. However, one stratification of the students was not included in the study – gender differences. The gender effect on feeling prepared to start work as a doctor was considered in a study conducted in 2014 by Savirko et al. According to this study men usually feel slightly better prepared for work than women, independently of medical school, ethnicity, graduate entry status and intercalated degree status. When assessing preparedness for work in specific areas, women were significantly more likely to feel unprepared for physical, emotional and/or mental demands faced during medical work, and somewhat more likely than men to feel unprepared when it comes to clinical procedures. Men, on the other hand, were slightly more likely than women to feel unprepared for conducting administrative tasks [15].

The current study focused on the preparedness of medical students to start work as doctors. It can be supposed that in practice doctors could be exposed to some factors and obstacles that were not emphasised during their medical studies. Therefore, a complementing, i.e. follow-up study could be performed on a similar or possibly the same sample after the initial commencement of work; for instance, the study conducted in Germany by Ochsmann et al. on a sample of 637 doctors with up to two years of experience. The results indicated that about 60% of the junior doctors felt their medical degree poorly prepared them for their further professional carreer [16]. A similar study was conducted by Goldacre et al. in which the authors surveyed junior doctors one and three years after graduating from different medical schools across the UK. The results showed a high variation in response to how well young doctors felt about their preparedness to commence work as a doctor; between 82% -30% for doctors one year after graduation and 70%-27% for doctors three years after graduation [17], with an overall tendency of the students to admit the feeling of being unprepared to start work. Interestingly, the authors emphasised that these substantial differences were also correlated with the different medical schools from which the responders graduated, which is an important factor to consider in any further studies. Another study performed by three teams from different UK universities confirmed that once graduates become doctors, they tend to see some of the missing skills that make them feel under-prepared [13]. The junior doctors indicated skills such as adaptation to hospital procedures, clarification of the role of a junior doctor, and understanding of the boundaries of that role. The authors of the current study believe that a paired study of this kind would give a big overview and be an addition to existing

studies on whether the views of students have changed once they took on the role of a junior doctors, and what gaps need to be addressed. Hence, study like this could serve as valuable feedback for medical universities in further adjustments to the curriculum for medical degrees.

Implications and limitations of the study. The authors of the current study intend to continue the research carried out on the discussed topic. Due to the limitations of the research sample, it is important to underline that generalizing the research results must be approached with caution.

CONCLUSIONS

- The study shows that most students graduating in medicine are satisfied with their choice, and intend to work in the profession the studied.
- In this study, on average, the respondents felt well-prepared theoretically for their future profession, whereas when indicating their practical preparedness, their preparedness was much lower.
- One of the most important competences indicated by students participating in this study was communication with patients

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