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A cross-country analysis of Polish, Serbian, and Czech medical students' competencies in working with individuals with intellectual disabilities

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Abstract

Background The complexity of difficulties and limitations associated with intellectual disabilities entails the need for accessing support in healthcare services by competent physicians. The way medical education is structured in different countries may influence how well medical students are prepared to address the needs of patients with intellectual disabilities.

Methods Three self-constructed scales were used to compare the self-assessed competencies of undergraduate medical students from Poland, Serbia, and the Czech Republic working with individuals with intellectual disabilities and to understand the significance of selected variables differentiating these competencies across countries.

Results A total of 357 medical students from the three countries constituted the study sample. The students generally acknowledged the necessity of preventing discriminatory practices in healthcare and recognized the importance of special protection for individuals with intellectual disabilities. Differences were observed in their social distance and self-assessed competencies in working with these patients. Additionally, sociodemographic factors and prior experience played differing roles.

Conclusions The education of future doctors should include the opportunity to develop knowledge and skills to work with patients with disabilities.

Keywords Medical students, Education, Healthcare practice, Competence, Attitudes, Beliefs, Intellectual disability

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Introduction

Healthcare and people with intellectual disabilities

People with intellectual disabilities face an elevated risk of numerous diseases and conditions, such as cancer, diabetes, epilepsy, asthma, thyroid disorders, constipation, hearing loss, visual impairment, retinopathy of prematurity, injuries, osteoporosis, migraine, Parkinson's disease, and bronchiectasis [1]. According to Cooper et al., [2] individuals in this group experience a greater multi-morbidity burden at an earlier age than does the general population. These health challenges may lead to increased utilization of medical services, especially in general medicine and psychiatry [3], as well as a greater likelihood of hospitalization [4] and significantly shorter lifespan [5]. However, people with intellectual disabilities experience various discriminatory practices and health inequalities both in accessing and quality healthcare services and in using health preventive measures [6–10]. Significant barriers to providing health care for this group include diagnostic overshadowing [11], healthcare providers' stigmatizing attitudes [12], lack of understanding, knowledge, and awareness about how to support these people, communication barriers, fear and embarrassment that people with intellectual disabilities may experience, lack of their involvement in decision-making, and extended wait times for services [13].

Medical students' competencies and patients' intellectual disabilities

The complexity of difficulties and limitations associated with intellectual disabilities entails the need to access multifaceted support provided by competent professionals [14]. Competencies include a combination of skills, knowledge, attitudes, and beliefs that enable a person to succeed in performing a specific task [15]. In health care, "core competencies offer a common shared language for all health professions for defining what all are expected to be able to do to work optimally" [16]. These competencies should be acquired during medical education.^{17–23} Cultivating an attitude of inclusion and empowerment among physicians and addressing the distinctive needs of individuals with intellectual disabilities can enhance healthcare quality, potentially leading to improved health outcomes and reduced morbidity within this population [18, 19, 24, 25]. Furthermore, the diversity of health challenges encountered by individuals with intellectual disabilities necessitates that every medical student will eventually need the competence to care for these people [18]. This underscores the importance of examining this issue in medical students.

Research on medical students' beliefs, skills, and attitudes toward persons with intellectual disabilities is scarce [20]. These findings usually indicate that medical students' attitudes toward the community inclusion of

people with intellectual disabilities are generally favorable [21, 26]. Ryan & Scior's findings, for example, suggest that students hold positive beliefs and emotions toward this population in healthcare [25]. However, their participants noted that many other medical students expressed anxiety and concern about working with people with intellectual disabilities due to communication and other barriers, which was in line with other studies [17]. However, not all studies indicate positive beliefs about people with intellectual disabilities among medical students. One of them was conducted in Ethiopia [26] and showed that, according to most of these students, persons with intellectual disabilities have difficulty living at home, working or marrying.

Additionally, we know little about medical students' knowledge of and preparedness for working with patients with intellectual disabilities. A recent study from Canada indicated that most students felt unprepared to work with patients with intellectual disabilities [27]. Interestingly, a vast majority of students who reported receiving formal training indicated that they would benefit from additional training. These results align with those of a study conducted among Polish medical students [28], who reported that their knowledge about rare diseases and preparedness for caring for patients with rare diseases was insufficient.

When considering beliefs about intellectual disability in medical students, it is crucial to acknowledge the role of social identification. St. Claire reported that physicians and medical students, when focusing on medical conditions (medical diagnosis, subnormality), tend to hold more negative beliefs about people with intellectual disabilities than do those with personal conditions (personal beliefs about persons with intellectual disabilities) [29]. Additionally, medical students' perceptions of people with Down syndrome were found to be less stereotypical than those of other groups, such as mothers of children with Down syndrome [30], indicating a variation in experience.

The role of sociodemographic variables and prior experience

Medical students' competence in working with people with intellectual disabilities was found to be dependent on various variables, although the results are not always consistent. With respect to students' sex, most studies (e.g., [19, 31] suggest that women hold more favorable attitudes. In a study by Kritsotakis et al. [19], male medical students had higher "exclusion" scores related to persons with intellectual disabilities. Similarly, Li et al. [31] reported that female students expressed more positive attitudes toward including persons with intellectual disabilities than male students did. In turn, a study by Roca-Hurtuna & Sanz-Ponce [32] showed better results in

men's attitudes toward disability and a more positive view of women about future professional practice.

Another variable relates to students' age. The results showed that young people had better attitudes and a better vision of future professional practices concerning disability than older students did [32].

Another important variable is medical students' contact (including previous work) with persons with intellectual disabilities. Specifically, previous work and contact with persons with intellectual disabilities were related to more favorable attitudes (spheres: Similarity and Sheltering) and less favorable "Empowerment" attitudes of medical students toward these individuals [19]. Similarly, in a study by Li et al. [31], a mild positive association was found between attitudes toward the integration of persons with intellectual disabilities and students' contact with these people. Additionally, in a study by Ouellette-Kuntz et al. [33], medical students who had contact with persons with intellectual disabilities—compared with those without such experience—were more likely to believe that this population should be protected in the sphere of sheltering.

Research results on the impact of various interventions (e.g., training, clerkships, and course subjects with modules on intellectual disabilities) on medical students' attitudes toward this group of people are inconclusive. As shown by the literature review by Ryan and Scior [20], most studies suggest a positive impact of interventions on medical students' attitudes. However, some indicate a negative, minimal, or no impact. For example, finishing an intellectual disability module during the year at a university was associated with increased knowledge about intellectual disability and no change in attitudes toward the community inclusion of medical students with intellectual disabilities [21]. This aligns with recent studies (e.g., [34]). It is plausible that the effect of intervention might depend on the methods used. To effectively support the improvement of attitudes of medical students, seminars, role-playing, social contact, interactions with people with intellectual disabilities as simulated patients [23], panel discussions, virtual tours to developmental service sites [18], communication skills sessions on intellectual disabilities [17] or educational programs involving actors with intellectual disabilities [10, 21, 22] can be used. Training may lead to increased knowledge about people with intellectual disabilities. Expectedly, knowledge was related to more positive attitudes toward persons with intellectual disabilities [19] and toward integrating these people [31] among medical students.

Educating future health professionals in Poland, Serbia, and the Czech Republic

The education system of future health professionals, alongside its cultural context, seems crucial for

developing students' competencies. In general, medical professions are classified as public trust professions. This designation requires individuals to demonstrate high competence levels, complete higher education, and continually enhance their knowledge [35]. Medical education in Poland, Serbia and the Czech Republic is publicly funded, and it adheres to standards tailored to physicians, dentists, pharmacists, nurses, midwives, laboratory diagnostics specialists, physiotherapists, and paramedics [36].

The learning outcomes in all three countries emphasize graduates' ability to establish respectful and empathetic patient interactions, prioritize patient welfare, and uphold patients' rights. Specific learning outcomes include evaluating patients' functional status, understanding the social ramifications of disabilities, recognizing sociocultural barriers, and mastering effective communication techniques. However, the learning outcomes and names of the subjects taught during medical education lack a focus on specific disability types, such as intellectual disability [36].

Therefore, research on medical students' beliefs and social distance from patients with intellectual disabilities is important for several reasons. First, although people with intellectual disabilities experience higher rates of health conditions than the general population does, they are among those who face the most significant health inequalities [37]. Second, many authors point to the unpreparedness of medical students in caring for people with intellectual disabilities [38, 39]. Third, there is a dearth of research on medical students' attitudes toward intellectual disabilities. Although some studies address attitudes toward these people, quite often, these endeavors concentrate on attitudes in general (what medical students think about these individuals) or attitudes toward these persons' community inclusion (e.g., [26, 33] or sexuality [14]). In this study, we focus on medical students' perceptions of people with intellectual disabilities as patients and the rights of people with intellectual disabilities in healthcare.

Aim

This study aims to compare the self-assessed competencies of undergraduate medical students from Poland, Serbia, and the Czech Republic in working with individuals with intellectual disabilities and to understand the significance of selected variables differentiating these competencies across countries. We chose these three countries because, as opposed to other countries where studies on medical students' competencies are more often conducted, they are located in Central and Southeastern Europe, having shared historical experiences such as the influence of the Habsburg Monarchy, the effects of World War II, and the political transitions from communism

to democracy. The majority populations in all three countries are of Slavic origin, contributing to linguistic and cultural similarities. For example, Polish, Serbian, and Czech languages share linguistic roots within the Slavic language family, although they belong to different branches (West Slavic for Polish and Czech, South Slavic for Serbian). Furthermore, all three countries have ratified the United Nations Convention on the Rights of Persons with Disabilities, committing to promote the rights, dignity, and inclusion of people with intellectual disabilities. Although social attitudes towards persons with intellectual disabilities may vary across countries, all three have national regulations aimed at protecting these individuals.

Representatives of these three countries collaborate within the COST (CA21123) action, which focuses on understanding cancer prevention in persons with intellectual disabilities. International analyses could be useful not only for cognitive but also for practical reasons. Such analyses may serve as a basis for planning universal solutions to enhance students' competencies in cross-country settings, which may be important given the observed tendencies of intensified mobility among them.

Given diverse socio-cultural and educational factors that shape the specific context of students' experiences in the three countries and the potential significance of sociodemographic variables in differentiating their attitudes towards individuals with ID, the following hypotheses were formulated:

H1 There are differences in the assessment of competencies made by Polish, Serbian, and Czech students.

Medical education systems vary significantly across countries, influencing how students perceive their competencies. While each country follows a structured medical education system with strict regulations on theoretical and practical training, Czech students often report feeling underprepared for clinical practice [40]. Similar challenges may exist in Poland and Serbia, but differences in curricula, the extent of hands-on training, and the integration of clinical practice can lead to varying self-assessments of competency. These disparities may stem from factors such as access to clinical training, variations in faculty teaching styles, and differences in national accreditation requirements.

H2 Gender-related differences exist in assessing competencies among students from different countries.

Gender differences in self-assessment of competencies are commonly observed across various fields, including medicine. Research suggests that female students and healthcare professionals may underestimate their practical competencies compared to their male counterparts, even when their actual performance levels are similar

[41]. Male students may feel more confident in procedural tasks, while female students may rate themselves lower due to differences in confidence levels. Additionally, cultural and educational differences among Polish, Serbian, and Czech students could further influence gender disparities in competency assessment.

H3 There are differences between upper-year and lower-year medical students' competencies.

Although medical students' perception of their competency may not always align with their actual preparedness—since even senior students may feel inadequately prepared for clinical practice due to gaps in practical education [40]. Competency levels are expected to progress naturally throughout medical education as students gain more theoretical knowledge and practical experience. For example, Czech medical students must complete at least 5,500 h of training during their studies, while similar requirements exist in Poland (5,700 h) and Serbia (5,475 h). This suggests that lower-year students, who have had less exposure to clinical environments, are likely to report lower competency levels compared to upper-year students with more hands-on experience.

Methods

Instruments

In this study, three self-constructed scales were utilized: (a) the Beliefs about Rights of Individuals with Intellectual Disabilities in Healthcare Scale (Beliefs Scale); (b) the Distance Scale toward Patients with Intellectual Disabilities (Distance Scale); and (c) the Self-assess Competence in Working with Individuals with Intellectual Disabilities Scale (Competence Scale). All the scales used in this study were developed specifically for this project by Polish authors (K.Ć., M.P., A.Ż., Z.K.) and are provided in a supplementary file. We used the back-translation method, where a bilingual person translates the scale into the target language, and another person translates it back into the original language to compare both versions. The process consisted of several phases. First, we applied back-translation to create equivalent Polish and English versions of the scales. Next, the scales were discussed with co-authors from Serbia (D.M., S.G.) and the Czech Republic (F.D., V.T), leading to several modifications based on these discussions. In the following phase, we used back-translation to develop Serbian and Czech versions of the scales. Finally, the scales were pretested through a qualitative review by a bilingual person to assess the degree of equivalence between the translated versions. These tools were also reviewed by authors and subsequently adapted for use in Serbia and the Czech Republic.

The Beliefs Scale comprises six statements describing the rights of individuals with intellectual disabilities

regarding access to preventive screenings and vaccinations, health education, obtaining adapted medical information and information about their health status, and the right to privacy in healthcare. All the items are rated on a Likert scale ranging from 1 – *strongly disagree* to 5 – *strongly agree*.

The Distance Scale, which consists of 10 statements, is based on the Bogardus scale [42]. Its construction takes into account the gradation of situations describing professional contacts with patients with intellectual disabilities, such as acceptance of a patient with intellectual disabilities in the hospital and on the ward where the student would work and acceptance of a person with intellectual disabilities as a patient for whom routine medical and specialist actions are performed. Students refer to individual statements describing each situation’s potential degree of acceptance on a five-point scale (from 1 – *strongly disagree* to 5 – *strongly agree*). Higher scores on the scale indicate a more favorable tendency, i.e., acceptance of patients with intellectual disabilities in various professional situations.

The Competence Scale comprises five statements describing the scope of professional activities/actions undertaken toward patients with intellectual disabilities: patients’ health assessment, collaboration during treatment or therapy, care for patients, communication with patients, and assessment of their needs. Students self-assess their competence on a five-point scale (from 1 – *no competence* to 5 – *very high competence*).

We conducted an EFA (Principal Component Analysis method, with verification of variable adequacy using the Kaiser-Meyer-Olkin test and Bartlett’s test of sphericity) on the results obtained from the three countries for each tool. In almost all scales in Poland, Serbia, and the Czech Republic, the Kaiser-Meyer-Olkin test results exceeded 0.8 (except for Distance Scale in the Czech students – the score was 0.7 in this group), and Bartlett’s test of sphericity was significant in all cases ($p < .05$). In the interpretation of the factor structures of the scales, quantitative criteria (including the scree plot and the eigenvalues of the factors) and qualitative criteria (the content of the items that make up the factors) were taken into account. As a result, it was decided to adopt single-factor structures of the tools. The internal consistency indices of the test were calculated for the scales, which turned out to be satisfactory (Table 1). Split-half reliability was also calculated. In this case in Beliefs Scale and Distance Scale in

Czech group the results were 0.54 and 0.50, respectively. In the remaining cases the results for the scales exceeded the value of 0.60.

Students’ sociodemographic characteristics and prior experiences (such as contact with persons with intellectual disabilities) were obtained via a questionnaire.

Data collection

Students were recruited through universities that provide education for future health professionals. In each country, one to five institutions were randomly selected from data registers available online. Subsequently, letters were sent to the authorities of these university units requesting assistance in the research, along with information about its purpose and implementation method. Data collection took place from June 2023 to February 2024.

The research was conducted online. Designated individuals provided students with a link to a webpage hosted on the Google platform, where the tools were made available, along with instructions for their completion.

Data analysis

The data were analyzed via SPSS (PS IMAGO PRO 9.0). One-way ANOVA was conducted by grouping the participants by country, followed by a post hoc test (Fisher’s NIR). In assessing the significance of variables such as students’ gender and year of study (younger-older cohorts), nonparametric tests were applied because of the failure to meet the condition of equal group sizes. Specifically, the Mann-Whitney U test was used. The significance level (p) was set at 0.05.

Ethical issues

The study was approved by the Scientific Research Ethics Committee of the University of Warmia and Mazury in Olsztyn, Poland (Decision No 14/2023 dated 22/05/2023); the Ethics Committee of the Faculty of Health and Social Sciences at the University of South Bohemia in České Budějovice, Czech Republic (Statement No 009/2023 dated 14/06/2023); and the Ethics Committee of the Faculty of Medicine at the University of Novi Sad, Serbia (Statement No 01–39/227/1 of June 10, 2023).

The study was conducted in accordance with the principles described in the Declaration of Helsinki and informed consent to participate was obtained from all study participants. No personal data were collected, and participants were assured that their participation was voluntary and anonymous, with the option to withdraw at any stage.

Table 1 Scales reliability (Cronbach’s α)

Scale	Poland	Serbia	Czech Republic
Beliefs Scale	0.87	0.90	0.71
Distance Scale	0.85	0.89	0.71
Competences Scale	0.89	0.92	0.94

Note. In the Distance Scale, the higher the scores, the more favourable tendency

Table 2 Sociodemographic characteristics of participants

Baseline characteristic	Poland		Serbia		Czech Republic	
	n	%	n	%	n	%
Sex						
Female	78	66.6	90	75	84	70
Male	38*	32.5	29**	24.2	36	30
Age						
18–24	93	79.5	108	90	106	88.3
25–29	18	15.4	10	8.3	13	10.8
30–35	6	5.1	2	1.7	1	0.8
Study year						
1	30	25.6	31	25.8	30	25
2	11	9.4	25	20.8	40	33.3
3	20	17.1	21	17.5	22	18.3
4	5	4.3	32	26.7	12	10
5	42	35.9	7	5.8	12	10
6	9	7.7	4	3.3	4	3.3
Having friends or relatives diagnosed with ID						
Yes	23	19.7	19	15.8	30	25
No	81	69.2	101	84.2	90	75
I do not know	13	11.1	0	0	0	0
Presence of the subject/course relating to working with people with ID in the study plans						
Yes	12	12.8	20	16.7	0	0
No	100	85.5***	100	83.3	120	100
I do not know	1	0.9	0	0	0	0

Note. N = 357 (n = 117 for Poland, n = 120 for Serbia, n = 120 for the Czech Republic)

*1 agender **in 3 cases missing data *** I don't know yet

Table 3 Means, standard deviations, and one-way analyses of variance in beliefs scale, distance scale and competences scale

Measure	Poland		Serbia		Czech Republic		F (51.54)	η ²
	M	SD	M	SD	M	SD		
Beliefs Scale	25.6	4.1	27.1	4.5	26.9	2.5	1.06	0.01
Distance Scale	41.7 ^A	6.7	38.1 ^{AB}	7.9	31.1 ^{AB}	3.3	87.40***	0.33
Competences Scale	13.5 ^A	4.4	14.5 ^B	4.8	9.8 ^{AB}	4.2	58.38***	0.25

Note. Means with the same letter within a row (e.g., ^A, ^A) are significantly different ($p < .001$, Fisher's NIR)

*** $p < .001$

Results

In all the examined groups, the majority were women (Table 2). People from the youngest age category, i.e., 18–24 years old, predominated. Generally, among the students from the three countries, there were more lower-year students, although in Poland, there were slightly more individuals studying in the fifth year, whereas in Serbia, it was in the fourth year.

Most students did not have friends or relatives with an intellectual disability diagnosis. Most students in this study did not take subjects or courses during their education that directly prepared them to work with individuals with intellectual disabilities. None of the students in the Czech Republic and fewer than one-fifth of the students in Poland and Serbia admitted that they had such a subject/module during their studies.

The average scores of the Belief Scale in students from three countries fall within the upper limit of achievable results, indicating a positive trend that reflects the

recognition of the rights of individuals with intellectual disabilities to full and facilitated access to medical services, information, and education (Table 1). A positive tendency indicating the acceptance of patients with intellectual disabilities in various contexts can also be observed in the case of the Distance Scale results, especially among Polish students. Lower scores, indicating a less favorable attitude, were noted among students from Serbia and the Czech Republic (considering their reference to the achievable range, i.e., 10–50). Czech students rated their competences in working with patients with intellectual disabilities relatively low, considering that the average score on the Competence Scale remains below half of the range of achievable results (1–25). Higher self-assessment of competencies was observed among students from Serbia and Poland.

No significant differences were observed regarding the results obtained by students from the three countries on the Belief Scale (Table 3). In turn, they significantly

Table 4 Results of the analysis of the gender variable for the competences of Polish students

Measure	Female		Male		Z	p
	M	SD	M	SD		
Beliefs Scale	26.18	5.62	28.23	3.04	1.45	0.146
Distance Scale	40.66	6.24	42.16	6.95	1.47	0.143
Competences Scale	14.97	4.42	12.76	4.29	-2.44	0.015*

* $p < .05$ **Table 5** Results of the analysis of the year of study variable for the competences of Polish students

Measure	Lower-year		Upper-year		Z	p
	M	SD	M	SD		
Beliefs Scale	25.93	5.65	28.47	2.69	-2.59	0.009*
Distance Scale	40.90	7.14	42.11	6.50	-0.81	0.417
Competences Scale	12.68	4.75	13.89	4.20	-1.30	0.194

Note. Lower-year (1st and 2nd year) and Upper-year (≥ 3 rd year)* $p < .05$ **Table 6** Results of the analysis of the year of study variable for the competences of Czech students

Measure	Lower-year		Upper-year		Z	p
	M	SD	M	SD		
Beliefs Scale	26.70	2.60	27.10	2.41	-0.77	0.441
Distance Scale	31.41	2.60	30.66	4.16	-0.30	0.764
Competences Scale	9.29	4.39	10.56	3.75	2.05	0.041*

Note. Lower-year (1st and 2nd year) and Upper-year (≥ 3 rd year)* $p < .05$ **Table 7** Results of the analysis of the gender variable for the competences of Serbian students

Measure	Female		Male		Z	p
	M	SD	M	SD		
Beliefs Scale	27.21	3.82	27.00	6.30	-1.84	0.067
Distance Scale	39.02	7.37	35.62	8.97	1.75	0.080
Competences Scale	14.47	4.84	14.72	4.78	-0.54	0.596

differed in terms of social distance and self-assessment of competencies. Polish students, who achieved the highest average score on the Distance Scale, indicating the most positive trend, significantly differed from students from Serbia and the Czech Republic. Significant differences in social distance were also noted between the results of students from Serbia and those from the Czech Republic. Future physicians from Serbia rated their competencies in working with patients with intellectual disabilities higher than those surveyed in the Czech Republic did. A significant difference in the self-assessment of competencies was also observed between Polish and Czech students.

The sex of the students was significant only in the Polish group in terms of competency in working with patients with intellectual disabilities ($Z = -2.44$; $p = .014$) (Table 4). Compared with male students, female students rated their competencies higher.

In the analysis involving the variable of year of study, a division into two categories was made: lower-year (1st and 2nd year) and upper-year (≥ 3 rd year) cohorts. This

variable significantly differentiates the beliefs of Polish students regarding the rights of individuals with intellectual disabilities in healthcare ($Z = -2.59$; $p = .010$), with a more favorable tendency observed among upper-year students (Table 5). This variable was also significant for students from the Czech Republic. In this case, the Competences Scale ($Z = -2.05$; $p = .041$) revealed a significant difference between the lower-year and upper-year cohorts in favor of the latter (Table 6).

Discussion

Generally, the students in this study show respect and support for people with intellectual disabilities and recognize these people's rights, which aligns with prior research [24, 32]. The results of the comparative analyses that were obtained partially confirmed the hypotheses that had been formulated.

H1: Students from these three countries significantly differ in their social distance from patients with intellectual disabilities and their self-assessed competence in working with them. However, they do not differ in their

Table 8 Results of the analysis of the gender variable for the competences of Czech students

Measure	Female		Male		Z	p
	M	SD	M	SD		
Beliefs Scale	26.93	2.61	26.72	2.30	0.65	0.513
Distance Scale	30.93	3.41	31.50	3.18	-0.99	0.320
Competences Scale	9.69	4.11	10.11	4.34	-0.48	0.635

Table 9 Results of the analysis of the year of study variable for the competences of Serbian students

Measure	Lower-year		Upper-year		Z	p
	M	SD	M	SD		
Beliefs Scale	26.96	3.94	27.27	5.00	-1.29	0.198
Distance Scale	38.09	7.65	38.17	8.13	-0.06	0.953
Competences Scale	14.82	5.13	14.20	4.52	0.83	0.404

Note. Lower-year (1st and 2nd year) and Upper-year ($\geq$ 3rd year)

beliefs regarding the rights of patients with intellectual disabilities. The Polish students obtained the highest scores on the Distance Scale, significantly differing from the two groups. This means that the level of acceptance they declare toward patients with intellectual disabilities in various professional situations is the highest. The self-assessment of general competencies is the highest among medical students from Serbia. They significantly differ in this regard from future physicians from the Czech Republic, who rated their competencies relatively low. Considering the mean scores obtained in the Polish and Serbian groups, it can be concluded that the students' ratings are within average limits, whereas in the Czech group, they are low. The low self-assessment of competencies among these students seems to align with prior research. For example, a comparative study of Polish and Czech students showed that the attitudes of the former were more favorable in certain dimensions related to disability [43]. The differentiating factors may stem from a broader social and educational context, including the specifics of students' educational programs. Available research indicates that even students from the same country (the Czech Republic) differ in their attitudes toward people with disabilities depending on the type of university they attend. However, differences related to nationality (Czechia-Slovakia) appeared to be insignificant [44].

Future research should consider educational programs as a potentially differentiating variable, although operationalizing such a variable may pose a significant challenge for researchers. In the present study, none of the Czech students reported that their curriculum included subjects or topics related to intellectual disabilities, despite the fact that a relatively high number of respondents from this country declared having personal acquaintances with individuals with intellectual disabilities. The majority of respondents across all groups have not had opportunities to engage with individuals with

intellectual disabilities or learn about their specific needs, whether through education or personal experience.

This trend has not been confirmed, for example, in a Canadian study [45], where most medical students had various forms of contact with individuals with intellectual and developmental disabilities, including through volunteering, family experiences, or school-based interactions. However, only a small group had access to formal education on this type of disability, similar to the findings of the present study. It should be noted, however, that the group of individuals with intellectual and developmental disabilities is broader than the population of those with intellectual disabilities.

Even when declared attitudes – such as recognizing the rights of individuals with intellectual disabilities, which in this study showed no differences between groups – are positive, they may not necessarily translate into effective medical practice if experience and competencies are lacking. Future research should include broader analyses that explore the relationships between the aspects examined here – namely, beliefs, social distance, and self-assessed competence in working with individuals with intellectual disabilities.

H2: Analyses considering the variable of students' gender in individual countries confirmed the hypothesis only regarding the variable of competence in the Polish group. Compared with men, women rated their competencies in working with patients with intellectual disabilities more favorably. These results are in line with those of studies by Boyle et al. [24], Kritsotakis et al. [19] and Li et al. [31] but contrary to those obtained by Roca-Hurtuna & Sanz-Ponce [32].

H3: Analyses considering the study year confirmed the hypothesis regarding beliefs in the Polish group and competences in the Czech group. In both cases, more favorable trends were observed among upper-year students than among lower-year students. Therefore, it can be concluded that upper-year medical students from Poland exhibited more favorable beliefs regarding the access

of individuals with intellectual disabilities to services and rights in healthcare, including examinations, vaccinations, information in adapted form, education, and respect for privacy. Compared with lower-year students, upper-year students from the Czech Republic presented a higher assessment of their competences to work with a patient with intellectual disability with whom they would undertake specific professional activities in the future. Given that upper-year students are more likely to have at least some training regarding working with patients with disabilities and that their level of knowledge about disability is greater, the results in these two groups seem to be consistent with prior research indicating positive effects of various interventions on medical students' attitudes toward patients with intellectual disabilities [17–19, 21–23, 31].

Implications

The current study indicates that although medical students' beliefs about the rights of patients with intellectual disabilities are generally favorable, there is a pressing need to reduce students' social distance from these patients and enhance their competencies in working with them. Literature reviews (e.g., [10, 20] indicate that medical students' attitudes toward people with intellectual disabilities are responsive to interventions. Personal contact with individuals with intellectual disabilities plays a crucial role in enhancing medical students' competencies [46, 47]. While it may be challenging to ensure such contact in clinical settings due to the absence of patients with intellectual disabilities during medical training, it can be facilitated through extracurricular activities, study visits, or volunteer work in institutions specializing in the social, vocational, or medical rehabilitation of individuals with intellectual disabilities. Direct interaction is a key factor in strengthening attitudes, particularly in the cognitive dimension [39], as it allows students to understand the specific needs, challenges (e.g., communication difficulties), and daily functioning of individuals with ID. Participation in educational activities where individuals with disabilities take on active roles would provide students with insights into patients' competencies in self-determination – an essential aspect of upholding their rights [39].

Reducing health inequalities requires actions to ensure that healthcare staff possess the knowledge and skills to identify and address the health needs of people with intellectual disabilities [48].

Limitations

First, the study was cross-sectional. As such, it involves looking at data at one specific point in time [49], and it is not possible to determine how medical students' competencies change over time. To further analyze this issue, a

longitudinal study is necessary. Second, the groups were relatively small and homogenous regarding the distribution of certain variables, such as the declared participation in classes dedicated to intellectual disability issues, which prevented the planned analyses from being conducted. Additionally, the unequal category sizes required nonparametric tests for some variables included in the analyses. Third, the results of this study rely on measuring students' competence through self-reported assessments. Subsequent studies may prioritize developing and utilizing validated outcome measures on the basis of actual performance, employing rigorous methodologies [50]. Fourth, we focused on students' beliefs and social distancing with respect to medical conditions. Importantly, these results might be different (possibly more positive) if students refer to personal conditions [29]. Finally, we recognize the psychometric limitations of our tools, especially in the Czech group. Further research is being conducted (in Serbia) or is planned to verify the psychometric properties of the tools in each country.

Conclusion

Quality care for patients with intellectual disabilities is essential to meet their unique needs and bridge healthcare disparities. This study revealed that medical students in Poland, Serbia, and the Czech Republic generally held positive beliefs regarding the rights of these patients. They acknowledged the necessity of preventing discriminatory practices in healthcare and recognized the importance of special protection for individuals with intellectual disabilities. However, differences were observed in their social distance from people with intellectual disabilities and their competence self-assessment in working with such patients. Additionally, the influence of sociodemographic factors and experience varied across countries, suggesting the significance of national, cultural, and educational contexts. To provide effective healthcare for patients with intellectual disabilities, medical students must be proficient in medical procedures and prioritize viewing all patients, including those with intellectual disabilities, as individuals first.

Supplementary Information

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Supplementary Material 1

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Author contributions

K.Ć. and M.P. wrote the main manuscript, M.P. prepared tables. K.Ć., M.P., Z.K. and A.Ż. prepared the tools. All authors conducted research in their countries and reviewed the manuscript.

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Data availability

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

The study was approved by the Scientific Research Ethics Committee of the University of Warmia and Mazury in Olsztyn, Poland; the Ethics Committee of the Faculty of Health and Social Sciences at the University of South Bohemia in České Budějovice, Czech Republic; and the Ethics Committee of the Faculty of Medicine at the University of Novi Sad, Serbia. The study was conducted in accordance with the principles described in the Declaration of Helsinki and informed consent to participate was obtained from all of the participants in the study.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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Not applicable.

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