



PERCEPTION OF THE ROLE OF PHYSICAL AND REHABILITATION MEDICINE AMONG PHYSIOTHERAPY STUDENTS

Piotr TEDERKO, MD, PhD¹, Marek KRASUSKI, MD, PhD², Marek ŁYP, PT, PhD³, Anna CABAK, PT, PhD⁴, Dariusz BIAŁOSZEWSKI, MD, PhD⁵, Iwona STANISŁAWSKA, PhD³ and Beata TARNACKA, MD, PhD¹

From the ¹Department of Rehabilitation, ^{1st} Faculty of Medicine, Medical University of Warsaw, Warsaw, ²Private Medical Practice, Krasuski Marek, ³Department of Physiotherapy, Rehabilitation College in Warsaw, ⁴Department of Physiotherapy, Faculty of Rehabilitation, University of Physical Education, and ⁵Physiotherapy Division, Department of Rehabilitation, ^{2nd} Faculty of Medicine, Medical University of Warsaw, Warsaw, Poland

Objective: To determine how the role of physical and rehabilitation medicine specialists in healthcare is perceived by physiotherapy students.

Design: Cross-sectional observational study.

Subjects: A total of 677 physiotherapy students and 519 final year medical students at the largest university-level educational institutions in Warsaw, Poland.

Methods: Questionnaire about knowledge of the role of physical and rehabilitation medicine specialists in the healthcare system.

Results: The definition of physical and rehabilitation medicine specialists was known to 32.9% of medical students and 19.9% of physiotherapy students. Misconceptions most frequently resulted from an inability to distinguish physical and rehabilitation medicine from physiotherapy. The leading role of physical and rehabilitation medicine specialists in team management of persons with disabilities was identified by 25.4–55.5% of medical and 5.8–9.0% of physiotherapy students.

Discussion: Inadequate perception of the role of physical and rehabilitation medicine specialists in healthcare may result from recent changes in the management of rehabilitation services, tendencies towards professional independence among health professionals, and insufficient formative education.

Conclusion: Perception of the role of physical and rehabilitation medicine specialists in healthcare was found to be inadequate among physiotherapy students. Changes in health professional education are warranted to maintain an effective patient-centred collaborative practice. Further research is needed at national and international levels to address the mutual perception of competencies and roles among students of health professions.

Key words: rehabilitation team; interdisciplinary collaboration; physiotherapy; physical and rehabilitation medicine; education.

Accepted Apr 19, 2018, Epub ahead of print Jul 2, 2018

J Rehabil Med 2018; 50: 661–667

Correspondence address: Piotr Tederko, Department of Rehabilitation, Medical University of Warsaw, Barska 16/20, PL-02-315 Warszawa, Poland. E-mail: p.tederko@gmail.com

Rehabilitation aims at the optimization of activity, social participation, and quality of life, as well as

LAY ABSTRACT

The efficacy of rehabilitation depends on good interdisciplinary collaboration between professionals in a rehabilitation team. Collaboration should be based on adequate mutual recognition of roles and competencies in the team. This study examined how the role of physical and rehabilitation medicine is perceived by physiotherapy students. A questionnaire was used to compare the knowledge of 677 physiotherapy students with that of 519 final-year medical students. Perception of the role of physical and rehabilitation medicine in the healthcare system was found to be suboptimal among physiotherapy students. The results of this study justify changes in the education of health professionals, to allow them to participate effectively in multiprofessional teams.

the health condition of people with acute and chronic disabilities. The efficacy of rehabilitation depends on smooth interdisciplinary collaboration. Effective team management is the responsibility of physicians specialized in Physical Medicine and Rehabilitation (PM&R), which is the term used in the USA, or Physical and Rehabilitation Medicine (PRM), the term used in Europe. The role of the specialized physician in rehabilitation typically involves establishing and verifying a diagnosis, developing a management strategy, treating underlying health conditions, reducing impairment, alleviating the impact of impairment on activities, modifying contextual factors to facilitate participation, preventing and treating complications, and addressing disorders, such as pain, nutritional difficulties, incontinence, communication disorders, mood and behavioural disturbances. PRM is necessary to reduce the consequences of disease and trauma in patients with severe and complex disabilities (1, 2).

The wide range of goals to be achieved during the rehabilitation process entails a need for an interdisciplinary team approach. A team approach improves outcomes (including better survival rates) in persons with disability resulting from a range of disorders, notably cerebrovascular stroke, multiple sclerosis, brain injury, spinal cord injury, polytrauma, limb amputations, low back pain, heart disease, and chronic disabling lung disease (3–11). Successful teams should include professionals sharing a wide range of knowledge, aptitudes and professional skills (12).

The rehabilitation team should comprise PRM specialists, nurses with rehabilitation expertise, physiotherapists, occupational therapists, speech and language therapists, psychologists, social workers, prosthetists and orthotists, dieticians and additional professionals, depending on patients' specific needs and goals (2). For some patients, and at certain stages of treatment, only a few of the above disciplines would be involved. Competencies within a multiprofessional team working in interdisciplinary way are associated with specific professions, although considerable overlap is seen in practice. This overlap improves understanding of patient's needs, but requires effective team management. Key competencies of effective team members include agreement and understanding on how to achieve patient-centred goals most efficiently, appropriate range of knowledge and skills for the agreed task, mutual trust and respect, willingness to share knowledge and expertise and effective communication (13, 14). The achievement of good collaboration within a multiprofessional team requires mutual recognition of competencies and roles in healthcare of the involved professionals. Higher education institutions that train healthcare professionals have a role in addressing these concerns (15).

The availability of current information about the knowledge of the role of professionals involved in the

rehabilitation team among clinicians and students is necessary, as it allows for monitoring the development of rehabilitation teamwork in Europe and suggesting changes in educational curricula. Despite a well-described theoretical background to interdisciplinary collaboration within the team, studies analysing more general awareness of these issues are scant (16–18).

Objective

To analyse the role of PRM in the healthcare system as perceived by physiotherapy students.

Design

Cross-sectional observational study.

MATERIAL AND METHODS

The 2014–2015 population of students of medicine and health-related degree programmes in Warsaw, the largest university centre of health professional education in Poland, were investigated by sampling 1st, 3rd and 5th year students of physiotherapy of the 3 largest physiotherapy schools in Warsaw (2 public schools: 2nd Medical Faculty with Physiotherapy Department of the Medical University of Warsaw and Rehabilitation Faculty of University of Physical Education, and one non-public school, the Physiotherapy Department of Warsaw College of Rehabilitation). A comparison group comprised medical

Table I. Composition of the questionnaire with criteria for correct answers

Question	Correct answer	Grounds/references
1. Is PRM a basic specialty?	Yes	PRM has been a basic medical specialty in Poland since 1959 (19)
2. Is there a Rehabilitation Department in the local medical school?	Yes	The survey was performed in physiotherapy schools and medical schools located in a city with a medical university including a department of PRM
3. Indicate the percentage of population living with disabilities	12%*–23%**	*Persons, who have a legal confirmation of disability issued by an authorized body ^a **Biologically disabled person: those who feel constrained in the ability of performing basic activities for his/her age ^b
4. Are the rights of people with disabilities regulated by law?	Yes	The Convention on the Rights of Persons with Disabilities was ratified by Poland in 2012
5. Where did you obtain your rehabilitation knowledge from?		
6. Who is a person with disability?		A person with limited functional abilities due to complex interaction between a person's health condition (reflecting not only disease, but also physiological phenomena such as ageing) and personal factors vs. external factors, or the conditions under which the person lives ^c . A person with a limitation of his or her ability to perform particular activities (whether or not he or she has been legally recognized as a person with disability) ^b A person with legally recognized disability ^d
7. What is physical and rehabilitation medicine?		Independent medical specialty concerned with the promotion of physical and cognitive functioning, activities (including behaviour), participation (including quality of life) and modifying personal and environmental factors; responsible for the prevention, diagnosis, treatment and rehabilitation management of people with disabling medical conditions and comorbidity across all ages ^e
8. Who is most competent in undertaking and coordinating a comprehensive process aimed at functional improvement in a person with a disability resulting from: (a) polytrauma (b) cerebral stroke (c) spinal cord injury (d) congenital limb deficiency	(a–d) A PRM physician	The PRM specialist has a central role in rehabilitation when there is a complex combination of impairments, e.g. cognitive, behavioural and physical impairments, in which medical practitioners are trained to provide an overall analysis of the situation and to bring together the assessments provided by allied professionals; there has been a significant impairment resulting in loss of activity and/or participation following a sudden event, for example a stroke, spinal cord injury or trauma; medical measures are available that can directly improve impairments or enhance well-being and activity, for example in medication for spasticity, incontinence or pain, when medical treatment of the underlying condition and its complications itself carries risks of disabling effects that require monitoring; or where the medical risks of a disabling condition have been enhanced by changes in a patient's lifestyle, for example in the transition from adolescence to adulthood (1)

^aStatistical Yearbook of the Republic of Poland. 2012. [cited 2014 May 5]. Available from: www.stat.gov.pl. ^bEuropean comparative data on Europe 2020 & People with disabilities. 2014; Leeds, UK. Academic Network of European Disability Experts. ^cWorld Health Organization. International Classification of Functioning, Disability and Health: ICF. Geneva: WHO; 2001. ^dAct on Vocational and Social Rehabilitation and Employment of Persons with Disabilities. J Laws 1997; 27 Aug 1997; 123 item 776. ^eEuropean definition of physical and rehabilitation medicine. 2003. [cited 2014 May 5]. Available from: https://www.euro-prm.org/index.php?option=com_content&view=article&id=15&Itemid=162&lang=en. PRM: physical and rehabilitation medicine.

students who had completed their PRM classes on the largest medical faculty in Warsaw (1st Medical Faculty of the Medical University of Warsaw). Study questionnaires were distributed among 1,106 physiotherapy students (360 in the 1st, 365 in the 3rd and 381 in the 5th year) and 684 medical students. The study group consisted of those who returned questionnaires: 677 physiotherapy students (233 first-year, 220 third-year, and 224 fifth-year students), whose responses were compared with those of 519 final-year medical students.

The study used an anonymous questionnaire designed by Denes et al. from Semmelweis University Department of Physical and Rehabilitation Medicine, Budapest, and employed previously in a Hungarian study of knowledge of PRM among physicians and medical students (16), subsequently modified in an international study of physicians and medical students by Tederko et al. (17). This tool recently underwent further modification, through the elimination of questions irrelevant to physiotherapists. Face validity was assessed as very good by a panel of 35 physiotherapy students. Content validity was confirmed as very good by a multiprofessional group of experts in rehabilitation. The tool consists of 5 multiple-choice questions with 3–6 distractors, and 3 open questions. Table I presents the questions and the criteria for correct responses.

RESULTS

The response rate in the group of physiotherapy students was 61.2% (67.4% in the first year, 60.3% in the third year, and 58.8% in the fifth year), whereas the response among medical students was 75.9%. The results of the survey are shown in Table II. The level of knowledge regarding PRM in both groups was low. There were striking differences in the rate of correct responses about PRM teaching in favour of medical students. The prevalence of disability appeared to be estimated by both groups with comparable accuracy, although physiotherapy students appeared to be less aware of the rights of persons with disabilities. Non-response rates were higher among physiotherapy students.

Only half of the medical students and slightly more than one-third of the physiotherapy students gave a correct definition of a person with a disability. In both groups, the most common mis-statements consisted in limiting the concept of disability to dependence

Table II. Questionnaire results

Group		Medical students (n = 519) n (%)	Physiotherapy students (n = 677)				
			Total years n (%)	1 st year (n = 233) n (%)	3 rd year (n = 220) n (%)	5 th year (n = 224) n (%)	
1. Is PRM a basic specialty?	Yes	451 (86.9)	207 (30.6)	73 (31.3)	91 (41.4)	58 (25.9)	
	No, it is a subspecialty	42 (8.1)	333 (49.3)	124 (53.2)	115 (52.3)	112 (50.0)	
	No such specialty	1 (0.2)	37 (5.5)	7 (3.0)	11 (5.0)	21 (9.4)	
	Do not know/no response	25 (4.8)	99 (14.6)	29 (12.4)	3 (1.3)	33 (14.7)	
2. Is there a Rehabilitation Department in the local medical school?	Yes	467 (90.0)	501 (74.1)	186 (79.8)	197 (89.6)	149 (66.5)	
	Does not exist but should be established	8 (1.5)	24 (3.6)	12 (5.2)	3 (1.3)	9 (4.2)	
	Does not exist and is unnecessary	2 (0.4)	4 (0.6)	0	0	4 (1.8)	
	Do not know/no response	42 (8.1)	147 (21.7)	35 (15.2)	20 (9.1)	62 (27.7)	
3. The percentage of population living with disabilities	Indicates correct figure	275 (52.9)	341 (50.5)	127 (54.5)	117 (53.2)	114 (50.9)	
	Underestimates	202 (38.9)	159 (23.5)	59 (25.3)	62 (28.2)	49 (21.9)	
	Overestimates	16 (3.2)	32 (4.7)	17 (7.3)	0	15 (6.7)	
	No response	26 (5.0)	144 (21.3)	30 (12.9)	41 (18.6)	46 (20.5)	
4. Are the rights of people with disabilities regulated by law?	Yes	504 (97.1)	597 (88.3)	219 (94.0)	215 (97.7)	197 (87.9)	
	No	4 (0.8)	10 (1.4)	3 (1.3)	0	7 (3.1)	
	Do not know/no response	11 (2.1)	69 (10.3)	11 (4.7)	5 (2.3)	20 (8.9)	
		472 (90.9)	582 (86.1)	210 (90.1)	201 (91.4)	202 (90.2)	
5. Sources of the respondent's knowledge of rehabilitation	Conferences and symposia	15 (2.9)	121 (17.9)	21 (9.0)	66 (30)	46 (20.5)	
	Mass media	99 (19.1)	192 (28.4)	88 (37.8)	45 (20.5)	67 (29.9)	
	Fellow students	70 (13.5)	231 (34.2)	75 (32.2)	92 (41.8)	80 (35.7)	
	Continuous medical education	6 (1.5)	161 (23.8)	35 (15.0)	46 (20.1)	88 (39.3)	
	Self-training	145 (27.9)	337 (49.9)	108 (46.4)	123 (55.9)	129 (57.6)	
6. Respondent knows definition of person with disability	Yes	265 (51.1)	234 (34.6)	87 (37.3)	94 (42.7)	70 (31.3)	
	No response	120 (23.1)	23 (3.4)	5 (2.2)	10 (4.5)	8 (3.6)	
7. Respondent knows definition of rehabilitation medicine	Yes	171 (32.9)	135 (19.9)	65 (27.9)	41 (18.6)	36 (16.1)	
	No response	147 (28.3)	82 (12.1)	19 (8.2)	39 (17.7)	24 (10.7)	
8. Indicates the leading role of PRM physicians in coordination of the comprehensive process leading to a functional improvement in a person with...	Polytrauma	Indicates	182 (35.1)	53 (7.8)	22 (9.4)	16 (7.3)	17 (7.6)
		Does not indicate	281 (54.1)	364 (53.7)	108 (46.4)	124 (56.3)	130 (58.0)
		No response	56 (10.8)	260 (38.5)	103 (44.2)	80 (36.4)	77 (34.4)
	Cerebral stroke	Indicates	132 (25.4)	39 (5.8)	19 (8.2)	11 (5.0)	10 (4.5)
		Does not indicate	350 (67.5)	577 (85.2)	191 (81.9)	189 (85.9)	196 (87.5)
		No response	37 (7.1)	61 (9.0)	23 (9.9)	20 (9.1)	18 (8.0)
	Spinal cord injury	Indicates	208 (40.1)	36 (6.4)	20 (8.6)	13 (5.9)	12 (5.4)
		Does not indicate	267 (51.4)	544 (80.3)	170 (72.9)	181 (82.3)	184 (82.1)
		No response	44 (8.5)	97 (14.3)	43 (18.5)	26 (11.8)	28 (12.5)
	Congenital limb deficiency	Indicates	288 (55.5)	61 (9.0)	28 (12.0)	21 (9.5)	15 (6.7)
		Does not indicate	170 (32.7)	459 (67.7)	154 (66.1)	150 (68.2)	158 (70.5)
		No response	61 (11.8)	151 (22.3)	51 (21.9)	49 (22.3)	51 (22.8)

PRM: physical and rehabilitation medicine.

and inability to walk or to move around. Awareness of the definition of PRM appears to be lower than knowledge of the definition of disability. PRM was correctly defined by one-third of medical students and one-fifth of physiotherapy students. Notably, the rate of correct responses appeared to decrease progressively towards graduation. Misconceptions most frequently resulted from an inability to distinguish definitions of PRM and physiotherapy.

Responses to questions 8 (a–d) (see Table I) provided more detailed insight into the perception of the role of PRM specialists in rehabilitation, since these questions are concerned with the coordinating competence of PRM specialists. The leading role of PRM specialists in the team management of persons with disabilities was perceived by 55.5–25.4% of medical students and 9.0–5.8% of physiotherapy students. The rate of responses indicating the central role of PRM specialists decreased progressively towards graduation. The high rate of non-response among physiotherapy students is notable. Among the medical students who responded, there were many responses indicating surgeons, anaesthesiologists (in question 8a), neurologists (in question 8b), neurologists, neurosurgeons (in questions 8c) and paediatricians or family physicians (in question 8d) as those coordinating the rehabilitation team. Physiotherapy students frequently wrote that physiotherapy specialists were the most competent ones to coordinate comprehensive rehabilitation.

DISCUSSION

To the authors' knowledge, this is the first study to address awareness of the role of PRM in the healthcare system among physiotherapy students. The study was performed in Poland, a central European country with a long history and good tradition of PRM, physiotherapy and interdisciplinary collaboration (19–21). Former studies using similar tools have shown a low level of knowledge regarding the PRM role in healthcare among medical students and non-PRM physicians (16–18). The present study shows that the level of knowledge of PRM among physiotherapy students is even lower. This may result from recent social, political and economic changes affecting the healthcare system and education of medical and health-allied professionals.

Rationale of the comparison group

PRM is perceived differently by physiotherapy and medical students. Medical students take part in introductory training in specialties they could practice as physicians. At the Medical University of Warsaw, instruction in PRM involves 10 h of seminars and

20 h of practical classes for each student. A previous multicentre international study showed that the unique characteristics of PRM (biopsychosocial approach, the concept of functioning, need to synthesize knowledge from many other specialties) may be difficult for medical students to grasp (17). On the other hand, physiotherapy education in Poland does not prepare students to participate in the rehabilitation team in an interdisciplinary way, and physiotherapy curricula lack explicit instruction in this area. At the same time, knowledge of the biopsychosocial model of functioning, as well as preparation for interdisciplinary collaboration, should be important goals of education in physiotherapy (22, 23).

Knowledge of PRM among medical students should reflect the direct efficacy of PRM teaching, while the results obtained among physiotherapy students show the level of knowledge acquired without explicit learning. However, the results from both groups should not be compared directly. Finding where the knowledge of physiotherapy students differs from that of medical students should identify areas of conceptual difference.

Knowledge of PRM among physiotherapy students in the light of interdisciplinary collaboration

These results reveal that physiotherapy students have inadequate overall knowledge of the PRM role in healthcare. Respondents who were closer to graduation demonstrated decreasing ability (or willingness) to provide the definition of rehabilitation medicine (particularly by confusing it with the definition of physiotherapy), as well as an increasing tendency to indicate the physiotherapist as the professional most capable of coordinating rehabilitation in different health conditions. This may have resulted from a lack of systemic regulation of rehabilitation and recent legal changes regarding physiotherapy.

Grounds for the development of PRM and inter-professional collaboration in Poland were laid in the interwar period 1918–1939 (20). After World War Two, the adoption of Howard Rusk's concept allowed for rehabilitation to be approached as an integral part of primary care (19, 24) and an original Polish Model of Rehabilitation to be developed. This Model was officially recognized in 1970 by the European Office of the World Health Organization (WHO) as a solution worthy of popularizing (21).

PRM became a basic specialty for physicians in 1959 and, in 2008–2011 it was prioritized by the Ministry of Health. Education of physiotherapists was initiated in the 1970s at the technician level and advanced to master level at universities in 1984. Physiotherapy is currently taught at both the bachelor's and master's level.

The socioeconomic transition that began in Poland in the late 1980s resulted in decentralization of the health insurance system and significant changes in healthcare financing. The accumulation of debt in public hospitals (including highly specialized rehabilitation centres) (25), disbanding of the Ministry of Health and Social Care, low expenditure on health (4.6% of the gross domestic product in 2013, according to Eurostat Statistics Database), together with an exodus of health professionals (Table III) all precluded further implementation of the Polish model of rehabilitation, compromised interdisciplinary collaboration and resulted in ineffective management of rehabilitation services. Currently, there are no standards or systemic solutions regulating professional practice in rehabilitation medicine and physiotherapy in Poland. Some specialties, such as cardiology and neurology, claim to carry out rehabilitation in their fields without the involvement of PRM specialists.

For many years, the profession of physiotherapist was classified as a paramedical profession, together with masseurs, radiology technicians, dental technicians, analysts, etc. The *Act on the Profession of Physiotherapist* (Journal of Laws of 2015, item 1994 of 30 November 2015) (26) concludes a long-lasting aim to enlarge the professional competencies of physiotherapists. The Act states that physiotherapy is an independent medical profession with its own Chamber of Physiotherapists, and that physiotherapists are competent in establishing indications for and planning therapy with, physical modalities, therapeutic exercises, and massage, and prescribing medical devices, and can specialize in physiotherapy. These regulations are in contradiction to the European definition of a Medical Act, determining rehabilitation as an activity that must be executed by a physician (27) (Directive 2005/36/EC of The European Parliament and of The Council of 7 September 2005 on the recognition of professional qualifications (annex 5), International Standard Classification of Occupations, International Classification of Health Professions and the sentence of European

Table III. Rates of selected practicing medical and allied health professionals per 100,000 inhabitants in Poland and the European Union

	Poland	European Union
Physicians	220 ^a	354.1 ^a
Physicians practising PRM	5.05 ^b	3.28 ^c
Physiotherapists	65 ^a	106.2 ^a
Nurses	524 ^a	671 ^a

^aEurostat Statistics Database. 2014. [cited 2017 Aug 18] Available from: <http://ec.europa.eu/eurostat/data/database>.

^bNational Consultant for Physical and Rehabilitation Medicine, by courtesy of Krystyna Książopolska-Orłowska, 2016.

^cEuropean Board of Physical and Rehabilitation Medicine data by courtesy of Fitnat Dincer, 2012.

PRM: physical and rehabilitation medicine.

Court of 27 June 2013 on Recognition of diplomas and other evidence of formal qualifications) (28).

The findings of the current study suggest that current formative education in physiotherapy emphasizes professional independence rather than interdependence and leads to the feeling that a physiotherapist can practice solely and has a central role in rehabilitation. The level of knowledge of disability (both the rate and the definition) among physiotherapy students, which was lower than that of medical students, and did not improve towards graduation, indicates that physiotherapy students could have some difficulty understanding and addressing disability as a multifaceted issue. Lack of appreciation of the role of PRM in the healthcare system may result from the collapse of the rehabilitation system, strong tendencies towards professional independence, and the lack of a framework for developing collaborative competencies in the healthcare education system. Ineffective communication between team members, poor information transfer and discontinuity of care have been found to lower quality of care at follow-up and increase the rate of sentinel events (13). Incomplete or delayed information has been shown to adversely affect follow-up management (29). Moreover, blurring of the roles of individual professionals in the team is a serious risk factor for conflict and burn-out among team members (13).

Need for effective team collaboration and education of healthcare professionals

Because of the unique set of competencies of PRM specialists in diagnosis, functional assessment and modification of all aspects of functioning (1, 2), the leading role of the PRM specialist cannot be replaced by the collaboration of a non-PRM specialist (e.g. orthopaedic surgeon, cardiologist or neurologist) with the physiotherapist in any care setting. Intervention resulting from this model, focused on the physical consequences of the leading cause of the disability, and ignoring the bio-psycho-social model of PRM approach, could result in neglecting comorbidities and prevention and management of complications, lowering the performance and participation of persons with a disability and, finally, lowering their social reintegration.

Changing global health needs demands a shift in the healthcare model from provider-driven to patient-centred. Formative learning promoting the role of a healthcare professional is not about who has got a more important role in the team, but rather how to address the patient's needs (15). Many of the competencies recently proposed as key elements of educational curricula for healthcare professionals relate to teamwork.

Sharing information about the roles of team members, determining professional responsibilities and boundaries, and learning about how different professions can work together to optimize their strengths in providing patient care all contribute to the development of interventions adequately addressing common patient-centred care goals (13).

Two core competencies for patient-centred collaborative practice include understanding and appreciating professional roles and responsibilities and communicating effectively. Positioning these 2 competencies as important aims of formative education should facilitate the forging of connections between education, practice and outcomes (14). Other skills important for effective teamwork include understanding group norms, conflict resolution, the ability to tolerate differences, the ability to contribute to shared care plans and goal setting, a willingness to collaborate, and mutual trust and respect (30).

Although there is an abundance of evidence supporting interprofessional education for health profession students (31–33), this is not the norm in medical and physiotherapeutic schools and colleges in Poland. In large universities hosting multiple faculties, including medical and physiotherapy ones, an interprofessional model of learning could be implemented as a part of the strategic plan (13). The development of strategies promoting balance between the need for interdependence and the desire for professional autonomy, as well as the importance of recognizing each other's expertise and strength in the delivery of patient care focusing on the patient's needs, helps to reduce professional boundaries and role conflicts (14).

Study limitations and further research

This study deals with fundamental elements of healthcare education and illustrates the situation in a single country using populations of students. The results are not generalizable to other populations. This study should be replicated in Poland and other countries in a multicentre setting with a random selection of participants.

Further research on perception of the PRM role in the healthcare system should involve students of other professions represented in the rehabilitation team. Another issue worth investigating is how medical students and PRM trainees perceive the competencies of physiotherapists and other members of the team.

Conclusion

Inadequate perception of the role of the PRM specialist in healthcare by physiotherapy students, as revealed in the analysed population, suggests that changes

are needed in the education of health professionals to enable students to achieve skills that allow them to participate effectively in multiprofessional teams. Further research at national and international levels is warranted.

The authors have no conflicts of interest to declare.

REFERENCES

- White book on physical and rehabilitation medicine In Europe. *J Rehabil Med* 2007; 39 (Suppl 45): 6–47.
- Neumann V, Gutenbrunner C, Fialka-Moser V, Christodoulou N, Varela E, Giustini A, et al. Interdisciplinary team working in physical and rehabilitation medicine. *J Rehabil Med* 2010; 42: 4–8.
- Stroke Unit Trialists' Collaboration. How do stroke units improve patient outcomes? *Stroke* 1997; 28: 2139–2144.
- Khan F, Turner-Stokes L, Ng L, Kilpatrick T. Multidisciplinary rehabilitation for adults with multiple sclerosis. *Cochrane Database Syst Rev* 2007; 2: CD006036.
- Powell J, Heslin J, Greenwood R. A multidisciplinary community-based rehabilitation program improved social functioning in severe traumatic brain injury. *J Neurol Neurosurg Psych* 2002; 72: 193–202.
- Bloemen-Vrencken JHA, de Witte LP, Post MWM. Follow-up care for persons with spinal cord injury living in the community: a systematic review of interventions and their evaluation. *Spinal Cord* 2005; 43: 462–475.
- Menetrez JS. Inpatient multitrauma rehabilitation in a U.S. military hospital. *Phys Med Rehabil Clin N Am* 2002; 13: 67–83.
- Meier RH 3rd, Heckman JT. Principles of contemporary amputation rehabilitation in the United States, 2013. *Phys Med Rehabil Clin N Am* 2014; 25: 29–33.
- Karjalainen KA, Malmivaara A, van Tulder MW, Roine R, Jauhiainen M, Hurri H, et al. Multidisciplinary biopsychosocial rehabilitation for sub-acute low back pain among working age adults. *Cochrane Database Syst Rev* 2003; 2: CD002193.
- McAlister FA, Lawson FM, Teo KK, Armstrong PW. Randomised trials of secondary prevention programmes in coronary heart disease: systematic review. *BMJ* 2001; 323: 957–962.
- Griffiths TL, Burr ML, Campbell IA, Lewis-Jenkins V, Mullins J, Shiels K, et al. Results at 1 year of outpatient multidisciplinary pulmonary rehabilitation: a randomised controlled trial. *Lancet* 2000; 355: 362–368.
- Griffin M, Patterson M, West M. Job satisfaction and teamwork: the role of supervisor support. *J Organ Behav* 2001; 22: 537–550.
- Buring SM, Bhushan A, Broeseker A, Conway S, Duncan-Hewitt W, Hansen L, et al. Interprofessional education: definitions, student competencies, and guidelines for implementation. *Am J Pharm Educ* 2009; 73: 59.
- Suter E, Arndt J, Arthur N, Parboosingh J, Taylor E, Deutschlandler S. Role understanding and effective communication as core competencies for collaborative practice. *J Interprof Care* 2009; 23: 41–51.
- van Heerden B. Effectively addressing the health needs of South Africa's population: the role of health professions education in the 21st century. *South Afr Med J* 2012; 103: 21–22.
- Denes Z, Fazekas G, Zsiga K, Péter O. [Physicians' and medical students' knowledge on rehabilitation.] *Orvosi Hetilap* 2012; 153: 954–961 (in Hungarian).
- Tederko P, Krasuski M, Denes Z, Moslavac S, Likarevic I. What medical doctors and medical students know about physical medicine and rehabilitation: a survey from Central Europe. *Eur J Phys Rehabil Med* 2016; 52: 597–605.

18. Tederko P, Krasuski M, Nyka I, Denes Z. [Knowledge of physical and rehabilitation medicine among physicians and medical students in Poland.] *Wiad Lek* 2015; 68: 123–131 (in Polish).
19. Kiwerski J, Kwolek A, Śliwiński Z, Woźniewski M, editors. [Polish Rehabilitation 1945–2009.] Wrocław: Ossolineum; 2009 (in Polish).
20. Lubecki M. Medical rehabilitation in Poland before 1950. Professor Ireneusz Wierzejewski and his students – Franciszek Raszeja and Wiktor Dega. *Hygeia Public Health* 2011; 46: 396–400.
21. Lubecki M. The Polish model of rehabilitation accepted and recommended by WHO. *Hygeia Public Health* 2011; 46: 506–515.
22. Higgs J, Refshauge K, Ellis E. Portrait of the physiotherapy profession. *J Interprof Care* 2001; 15: 79–89.
23. Frantz JM, Rhoda AJ. Implementing interprofessional education and practice: lessons from a resource-constrained university. *J Interprof Care* 2017; 31: 180–183.
24. Dillingham TR. Physiatry, physical medicine, and rehabilitation: historical development and military roles. *Phys Med Rehabil Clin N Am* 2002; 13: 1–16.
25. Sagan A, Panteli D, Borkowski W, Dmowski M, Domański F, Czyżewski M, et al. Poland health system review. *Health Syst Transit* 2011; 13: 1–193.
26. [Act on the Profession of Physiotherapist of 25 Sep 2015.] *Journal of Laws of the Republic of Poland* 2015 Nov 30 [cited 2018 May 29]. Available from: <http://dziennikustaw.gov.pl/du/2015/1994/1> (in Polish).
27. European Union of Medical Specialists. European definition of the Medical Act. UEMS 2005 [cited 2017 Jul 13]. Available from: www.uems.net.
28. European Court (First Chamber) on Recognition of diplomas and other evidence of formal qualifications. Directive 2005/36/EC – Profession of physiotherapist – Partial and limited recognition of professional qualifications – Article 49 TFEU In Case -575/11 2013 Jun 27 [cited 2017 Jul 10]. Available from: <http://curia.europa.eu/juris/document/document.jsf?text=&docid=138853&pageIndex=0&doclang=EN&mode=lst&dir=&occ=first&part=1&cid=513378>.
29. Kripalani S, LeFevre F, Phillips C, Williams M, Basaviah P, Baker D. Deficits in communication and information transfer between hospital-based and primary care physicians. *JAMA* 2007; 297: 831–841.
30. San Martin-Rodriguez L, Beaulie, M, D'Amour D, Ferrada-Videla F. The determinants of successful collaboration: a review of theoretical and empirical studies. *J Interprof Care* 2005; 19 (Suppl 1): 132–147.
31. Yarborough M, Jones T, Cyr TA, Phillips S, Stelzner D. Interprofessional education in ethics at an academic health sciences center. *Acad Med* 2000; 75: 793–800.
32. Johnson AW, Potthoff SJ, Carranza L, Swenson HM, Platt CR, Rathbun JR. CLARION: a novel interprofessional approach to health care education. *Acad Med* 2006; 81: 252–256.
33. Banks S, Janke K. Developing and implementing interprofessional learning in a faculty of health professions. *J Allied Health* 1998; 27: 132–136.