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19. Attitudes of students of physiotherapy of the University of Rzeszów towards wearing masks, maintaining social distance, rules of disinfection and vaccination against COVID-19

Postawy studentów fizjoterapii Uniwersytetu Rzeszowskiego wobec noszenia maseczek, zachowania dystansu społecznego, zasad dezynfekcji oraz szczepień przeciw COVID-19

Abstract

Introduction: The aim of the study was to determine factors differentiating the attitudes of students of physiotherapy of the University of Rzeszów (UR) towards wearing masks, maintaining social distance, disinfection rules and vaccination against COVID-19. **Material and methods:** The study was conducted among 200 students of physiotherapy of the UR. Men accounted for 31.5%, and women for 68.5%. The mean age was 21.64 ± 1.84 years. The study was based on a questionnaire survey. The dimension of attitudes of students of physiotherapy of the UR towards wearing masks, maintaining social distance, the rules of disinfection and vaccination against COVID-19 was analyzed in the following spheres: knowledge and beliefs (8.27 ± 3.35 points), actions (3.21 ± 1.95 points), a sense of uncertainty (3.6 ± 1.49 points), a sense of agency (2.94 ± 1.27 points) and a general attitude (9.6 ± 2.79 points). Statistical testing of Mann-Whitney, Kruskal-Wallis, and Spearman's rank test was carried out for a statistically significant relationship at $p < 0.05$. **Results:** Such dimensions as: declared attitudes, knowledge and beliefs based on science, actions and sense of agency were significantly higher in women ($p < 0.05$). The uncertainty dimension was significantly higher in men ($p < 0.05$). The higher the dimension of knowledge and beliefs based on science, the higher the dimension of the declared attitude, actions, sense of agency ($R > 0$), and the lower the dimension of uncertainty ($R < 0$, $p < 0.05$). **Conclusions:** Gender and dimension of knowledge and beliefs differentiated the attitudes of students of physiotherapy of the UR towards wearing masks, maintaining social distance, the rules of disinfection and vaccination against COVID-19.

Keywords: students, physiotherapy, COVID-19, attitudes

Streszczenie

Wprowadzenie: Celem badania było określenie czynników różnicujących postawy studentów fizjoterapii Uniwersytetu Rzeszowskiego (UR) wobec noszenia masek, zachowania dystansu społecznego, zasad dezynfekcji oraz szczepień przeciwko COVID-19. **Materiał i metody:** Badanie przeprowadzono wśród 200 studentów kierunku fizjoterapia Uniwersytetu Rzeszowskiego. Mężczyźni stanowili 31,5 proc. natomiast kobiety 68,5 proc. Średnia wieku wynosiła $21,64 \pm 1,84$ lat. Badanie miało charakter ankietowy. Wymiar postaw studentów fizjoterapii UR wobec noszenia maseczek, zachowania dystansu społecznego, zasad dezynfekcji oraz szczepień przeciw COVID-19 rozpatrzono w następujących domenach: wiedzy i przekonań ($8,27 \pm 3,35$ pkt), działania ($3,21 \pm 1,95$ pkt), poczucia niepewności ($3,6 \pm 1,49$ pkt), poczucia sprawczości ($2,94 \pm 1,27$ pkt) oraz postawy ogólnej ($9,6 \pm 2,79$ pkt). Przeprowadzono testowanie statystyczne: Manna-Whitney'a, Kruskala-Wallisa, Rang Spearmana. Dla zależności istotnej statystycznie $p < 0,05$. **Wyniki:** Wymiary: deklarowanych postaw, wiedzy i przekonań opartych na nauce, działaniach i poczuciu sprawstwa były istotnie wyższe u kobiet ($p < 0,05$). Wymiar niepewności był istotnie wyższy u mężczyzn ($p < 0,05$). Im wyższy wymiar wiedzy i przekonań opartych na nauce, tym wyższy wymiar deklarowanej postawy, działań, poczucia sprawstwa ($R > 0$), a niższy wymiar niepewności ($R < 0$, $p < 0,05$). **Wnioski:** Płeć oraz wymiar wiedzy i przekonań różnicowały postawy studentów fizjoterapii UR wobec noszenia masek, zachowania dystansu społecznego, zasad dezynfekcji i szczepień przeciwko COVID-19.

Słowa kluczowe: studenci, fizjoterapia, COVID-19, postawy

Introduction

COVID-19 is an acute infectious respiratory disease caused by infection with the Sars-Cov-2 virus. The first cases of the disease were detected and then described in the city of Wuhan in the Hubei province in central China at the turn of November and December 2019 [1]. The current standard for detecting Sars-Cov-2 virus infections is real-time PCR tests, in which a real-time polymerase chain reaction with reverse transcriptase occurs [2]. Common symptoms of infection include dry cough, tiredness, fever, and shallow breathing. The less common ones include headache, sputum production, chest pain, chills, diarrhea, vomiting, haemoptysis, nausea, and sore throat. However, most patients with the disease are mild [3,4].

For the general public around the world, various types of restrictions and forms of preventing the spread of the COVID-19 pandemic, as well as their causes, were an unexpected and completely new experience [5]. New restrictions often resulted in the inability to undertake various activities or their significant limitation (e.g, participation in social life). One form of infection prevention is keeping distance. Reducing human contact plays a key role in the speed at which viruses spread in the population, helping to delay the spread of the virus so that more infected people can receive

help and recover [6]. Other options include wearing face masks, proper disinfection, and vaccinations. All policies aimed at preventing the spread of COVID-19 were met with various attitudes from society [7].

An attitude should be understood as the relationship, management or behavior of a person toward specific phenomena, events, or in relation to people [8]. Observing every day what is seen and heard on the streets, in shops, on TV and other media, one can notice reactions common to the majority of society, but also clear differences in attitudes and declared behaviors. They have a direct impact on the adherence to procedures or adherence to the adopted safety rules. The attitudes represented may depend on many factors (e.g. the level of general anxiety, fear of death, worldview, etc.). To find out if and what kind of people accept or reject the recommended rules of conduct in a pandemic period and what sociodemographic and psychological factors affect attitudes towards restrictions and preventive actions, various studies have been carried out in various environments [9].

The aim of this study was the evaluation and analysis of the attitudes of physiotherapy students at the University of Rzeszow towards wearing masks, maintaining social distance, the rules of disinfection and vaccination against COVID-19, and the factors differentiating these attitudes.

Material and methods

The study was designed and conducted in the winter semester 2021/2022 as part of the Work in Research Teams course provided in the study program. The location of the research was the Institute of Health Sciences, University of Rzeszow. The study was carried out among a group of 200 students of physiotherapy. The inclusion criteria for the study was voluntary participation in the survey. The exclusion criteria were: no consent to participate in the survey or withdrawal from participation in the survey. The research tool was a proprietary questionnaire consisting of closed-ended questions about the record and appropriate data on the attitude of students of physiotherapy of the University of Rzeszow towards wearing masks, maintaining social distance, disinfection rules, and vaccination against COVID-19. The questionnaires were collected electronically, anonymously.

The attitudes of the University of Rzeszow physiotherapy students towards wearing masks, maintaining social distance, the rules of disinfection, and vaccination against COVID-19 were assessed in five domains: declared attitude, knowledge and beliefs, behavior, uncertainty, and a sense of agency.

The answers to the following questions were used to evaluate individual domains:

- *declared attitude*: 15. What is your attitude towards wearing masks?, 21. What is your attitude toward keeping a proper distance?, 34. What is your attitude towards immunization against Covid-19?
- *knowledge and beliefs*: 14. Do you know how to properly remove the protective mask?, 17. In your opinion, the social distance should be at least...?, 19. To what extent does maintaining an appropriate distance in contacts with people protect against coronavirus infection?, 23. After washing hands with soap, are they disinfected with an appropriate disinfectant?, 27. Did you know that the vaccine contains an antigen that stimulates the immune system to induce a specific immune response against a specific organism?, 26. Please indicate which method of disinfection of premises, in your opinion, brings the best results in combating coronavirus infection?, 13. Do you consider the introduced order to cover the nose and mouth justified?, 16. Do you think that social distancing should be kept during the COVID-19 pandemic?, 20. Do you consider the introduced order to keep the appropriate distance justified?, 24. Do you think that adequate disinfection during the COVID-19 pandemic can prevent infection?, 28. Please indicate to what extent you agree with the statement: Vaccination against Covid-19 reduces the risk of severe illness or death from coronavirus infection, 29. Please indicate to what extent you agree with the statement: Vaccination against Covid-19 should be compulsory, 30. Please indicate to what extent you agree with the statement: Vaccination against Covid-19 should be exempt from compliance with the rules of the sanitary regime (wearing masks, distance, etc.).
- *behavior*: 9. How often do you wear a mask in public spaces indoors?, 10. Do you always have the mask with you?, 11. How do you wear the mask?, 18. Do you keep your social distance yourself?, 22. Do you follow the established hand washing schedule each time you wash your hands?, 25. Do you use any disinfectants available in public places?, 31. Have you been vaccinated against Covid-19 – primary vaccination – two doses of the Pfizer/Moderna/Astra Zeneca preparation or one dose of the Johnson & Johnson preparation?
- *uncertainty*: 12. Does covering your nose and mouth have a positive effect on your sense of security?, 32. If you answered NO to the above question (31. Have you vaccinated against Covid-19...), please indicate what the reason is (specify whether the reason is rational / irrational)
- *a sense of agency*: 33. How much do you influence your infection with the coronavirus?

A positive opinion was obtained from the Bioethical Committee of the University of Rzeszow (resolution number 2022/003).

Statistical analysis

The analysis of quantitative variables (i.e. expressed in number) was performed by calculating the arithmetic mean (M), standard deviation (SD), median, minimum value and maximum value, quartiles. The analysis of qualitative (i.e. non-numeric) variables was performed by calculating the number and percentage of occurrences of each value. The comparison of the values of the quantitative variables in two groups was performed using the Mann-Whitney test. The comparison of the values of the quantitative variables in three and more groups was performed using the Kruskal-Wallis test. After detecting statistically significant differences, post-hoc analysis with the Dunn test was performed to identify statistically significantly different groups. Correlations between the quantitative variables were analyzed using the Spearman correlation coefficient.

In the analysis, a significance level of 0.05 was adopted. The condition to recognize the results as statistically significant was the test probability p that satisfies the inequality <0.05 . The analysis was performed in the R program, version 4.1.2. [10].

Results

The average age of the examined group was 21.64 ± 1.84 years. The group consisted of 137 (68.50%) women and 63 (31.50%) men. Nearly half of the respondents, 95 (47.50%) declared that their place of residence is rural, 29 (14.50%) of the respondents – a city with less than 20,000 inhabitants, 58 (29.00%) – a city with 20 to 200,000 inhabitants, while 18 (9.00%) – a city with over 200,000 inhabitants. In total, 105 (52.50%) persons came from an urban environment. Among the respondents, the vast majority, 186 (93.00%), were unmarried persons, and 14 (7.00%) were married. First-year students constituted 47 (23.50%) of the respondents, second-year – 37 (18.50%), third-year – 28 (14.00%), fourth-year – 57 (28.50%), and fifth-year – 31 (15.0%). 111 (55.50%) of the respondents were assigned to the group of the first level of education, and 89 (44.50%) to the second level. Full-time students constituted the majority – up to 166 (83.00%) among the respondents, and part-time students constituted a group of 34 (17.00%) people. 126 (63.00%) declared lack of professional activity, while 74 (37.00%) persons were already employed. When it comes to religious commitment, 18 (9.00%) respondents showed strong opposition or reluctance, 26 (13.00%) lack of commitment, average involvement was indicated by 117 (58.50%) respondents, and strong 39 (19.50%) (Table 1).

Table 2A presents the statistical characteristics of the domains. The declared attitude was measured with the point values – the average point value was 9.6, minimum was 3 and maximum was 15. The dimension of knowledge and beliefs showed an average score of 8.27, minimum – 2 and maximum – 17 respectively, the dimension of action (behavior) – on average 3.21, (minimum 0, maximum 7), the dimension of uncertainty – on average 3.6 (minimum 1, maximum 6), the dimension of the sense of agency – on average 2.94 (minimum 1, maximum 6).

Table 1. Characteristics of the studied group

	Parameter	Total (N=200)
Age [years]	M±SD	21.64±1.84
	Median	22
	Quartiles	20 – 23
Gender	Woman	137 (68.50%)
	Man	63 (31.50%)
Living environment	City over 200,000 residents	18 (9.00%)
	City 20-200 thousand residents	58 (29.00%)
	City below 20,000 residents	29 (14.50%)
	Village	95 (47.50%)
Living environment (city/village)	City	105 (52.50%)
	Village	95 (47.50%)
Marital status	Married	14 (7.00%)
	Single	186 (93.00%)
Year of study	I	47 (23.50%)
	II	37 (18.50%)
	III	28 (14.00%)
	IV	57 (28.50%)
	V	31 (15.50%)
The level of education	First level of education (I, II, III)	111 (55.50%)
	Second level of education (IV, V)	89 (44.50%)
Study type	Part-time study	34 (17.00%)
	Full-time study	166 (83.00%)
Professional activity	I am not professionally active	126 (63.00%)
	I work	74 (37.00%)
Religious commitment	Strong opposition, reluctance	18 (9.00%)
	Lack	26 (13.00%)
	Average	117 (58.50%)
	Strong	39 (19.50%)

Statistically significant relationships

The results of the study showed that gender is the determinant that differentiates attitudes toward wearing masks, maintaining social distance, disinfection rules, and vaccination against COVID-19. Statistically significant relationships were obtained for gender, which differentiated the dimensions of declared attitude, knowledge and beliefs, action, uncertainty and sense of agency (all $p < 0.05$). Women, compared to men, have a higher dimension of declared attitude ($p < 0.001$), the dimension of knowledge and beliefs ($p = 0.031$), the dimension of action ($p < 0.001$) or the sense of agency ($p = 0.044$), and a lower dimension of uncertainty ($p = 0.006$) (Table 2B).

**Table 2. A - Statistical characteristics of domains (points),
B - Characterizing variables compared to gender**

A. Statistical characteristics of domains							
Variable	N	No data	M	SD	Median	Min	Max
Declared attitude	200	0	9.6	2.79	10	3	15
Knowledge and beliefs	200	0	8.27	3.35	8	2	17
Action (behavior)	200	0	3.21	1.95	3	0	7
Uncertainty	200	0	3.6	1.49	4	1	6
A sense of agency	200	0	2.94	1.27	3	1	6
B. Characterizing variables compared to gender							
Variable		Gender		p			
		Woman (N=137)	Man (N=63)				
1	2	3	4	5			
Declared attitude	M±SD	10.18±2.65	8.35±2.68	p<0.001 *			
	Median	10	8				
	Quartiles	9 - 12	7 - 10				
Knowledge and beliefs	M±SD	8.64±3.6	7.48±2.59	p=0.031 *			
	Median	8	7				
	Quartiles	6 - 11	6 - 8				
Action (behavior)	M±SD	3.66±1.8	2.24±1.92	p<0.001 *			
	Median	4	2				
	Quartiles	2 - 5	1 - 4				
Uncertainty	M±SD	3.40±1.45	4.05±1.5	p=0.006 *			
	Median	3	4				
	Quartiles	2 - 5	3 - 5				

1	2	3	4	5
A sense of agency	M±SD	3.07±1.23	2.67±1.32	p=0.044 *
	Median	3	3	
	Quartiles	2 - 4	1 - 4	

Mann-Whitney test; p – statistical significance coefficient; N – number; M – arithmetic mean; Max – maximum; Min – minimum; SD – standard deviation; * statistically significant relationship (p<0.05)

The place of residence differed only in one dimension. The uncertainty dimension was significantly higher (p=0.019) for the inhabitants of the smallest towns compared to the inhabitants of rural areas or larger cities (Table 3A).

Statistically significant dependencies for the dimension of knowledge and beliefs were obtained. The dimension of knowledge and beliefs differentiates the dimensions of the declared attitude, action, uncertainty, and sense of agency (p < 0.05). The statistically significant (p<0.05) and positively (R>0) correlating variables were: declared attitude, action (behavior) and sense of agency. Uncertainty was a statistically significant (p<0.05) and negative (R<0) correlating variable. The higher the dimension of knowledge and beliefs, the higher the dimension of declared attitude, action, sense of agency, and the lower the dimension of uncertainty (Table 3B).

Table 3. A - Characterizing variables compared to living environment, B - Characterizing variables compared to knowledge and beliefs

Variable		A. Living environment				p
		City with more than 200.000 residents (N=18)	City 20-200 thousand residents (N = 58)	City below 20,000 residents (N = 29)	Village (N = 95)	
1	2	3	4	5	6	7
Declared attitude	M±SD	10.67±3.34	9.97±2.66	8.59±2.64	9.48±2.72	0.074
	Median	11	10	9	9	
	Quartiles	8.25 - 13	9 - 11	7 - 10	8 - 11	
Knowledge and beliefs	M±SD	9.17±3.94	8.52±3.52	6.86±1.9	8.38±3.4	0.112
	Median	7.5	8	7	8	
	Quartiles	6 - 11	6 - 10,75	6 - 8	6 - 9,5	
Action (behavior)	M±SD	3.78±2.6	3.28±1.86	2.41±1.59	3.31±1.93	0.081
	Median	5	3	2	3	
	Quartiles	1,25 - 6	2 - 4	1 - 3	2 - 5	

1	2	3	4	5	6	7
Uncertainty	M±SD	2.94±1.73	3.45±1.45	4.24±1.09	3.63±1.52	0.019*
	Median	2	4	4	3	
	Quartiles	2 – 4.75	2 – 4	4 – 5	3 – 5	C>B,D,A
A sense of agency	M±SD	2.94±1.55	3.07±1.21	2.48±1.12	3.01±1.28	0.159
	Median	3	3	3	3	
	Quartiles	1,25 – 4	2 – 4	2 – 3	2 – 4	

Kruskal-Wallis test + post-hoc analysis (Dunn's test); p – statistical significance coefficient; M – arithmetic mean; SD – standard deviation; * statistically significant relationship (p<0.05)

Parameter	B. Knowledge and beliefs
Declared attitude	R=0.631, p<0.001 *
Action (behavior)	R=0.675, p<0.001 *
Uncertainty	R=-0.554, p<0.001 *
A sense of agency	R=0.492, p<0.001 *

Spearman's rank test; p – statistical significance coefficient; R – Spearman's correlation coefficient; * statistically significant relationship (p<0.05)

There is no statistically significant relationship between: age (Table 4A), living environment (city/village) (Table 4B), marital status (Table 4C), year of study (Table 5A), the level of education (Table 5B), type of study (Table 6A), professional activity (Table 6B), religious commitment (Table 7) and attitude towards wearing masks, social distancing, disinfection rules and COVID-19 vaccination (all at p≥0.05).

**Table 4. A – Characterizing variables compared to age,
B – Characterizing variables compared to living environment (city/village),
C – Characterizing variables compared to marital status**

Variable	A. Age
	Spearman's correlation coefficient
Declared attitude	R=0.068, p=0.336
Knowledge and beliefs	R=-0.049, p=0.489
Action (behavior)	R=0.058, p=0.418
Uncertainty	R=-0.045, p=0.523
A sense of agency	R=-0.084, p=0.24

Spearman's rank test; p – statistical significance coefficient; R – Spearman's correlation coefficient; * statistically significant relationship (p<0.05)

Variable		B. Living environment		p
		City (N=105)	Village (N=95)	
Declared attitude	M±SD	9.7±2.85	9.48±2.72	p=0.409
	Median	10	9	
	Quartiles	8 – 12	8 – 11	
Knowledge and beliefs	M±SD	8.17±3.32	8.38±3.4	p=0.343
	Median	7	8	
	Quartiles	6 – 10	6 – 9,5	
Action (behavior)	M±SD	3.12±1.98	3.31±1.93	p=0.451
	Median	3	3	
	Quartiles	2 – 5	2 – 5	
Uncertainty	M±SD	3.58±1.47	3.63±1.52	p=0.885
	Median	4	3	
	Quartiles	2 – 5	3 – 5	
A sense of agency	M±SD	2.89±1.27	3.01±1.28	p=0.525
	Median	3	3	
	Quartiles	2 – 4	2 – 4	
Variable		C. Marital status		p
		Married (N = 14)	Single (N=186)	
Declared attitude	M±SD	9.5±3,48	9.61±2.74	p=0.648
	Median	8	10	
	Quartiles	8 – 12,5	8 – 11	
Knowledge and beliefs	M±SD	8.07±3,91	8.28±3.32	p=0.403
	Median	6,5	8	
	Quartiles	5.25 – 9,5	6 – 10	
Action (behavior)	M±SD	2.93±2,53	3.23±1.91	p=0.419
	Median	2	3	
	Quartiles	1 – 5,25	2 – 5	
Uncertainty	M±SD	3.93±1,82	3.58±1.47	p=0.366
	Median	4,5	4	
	Quartiles	2,25 – 5	3 – 5	
A sense of agency	M±SD	2.64±1,22	2.97±1.28	p=0.329
	Median	3	3	
	Quartiles	2 – 3	2 – 4	

Mann-Whitney test; p – statistical significance coefficient, N – number; M – arithmetic mean; SD – standard deviation; * statistically significant relationship (p<0.05)

Table 5. A – Characterizing variables compared to year of study, B – Characterizing variables compared to the level of education

Variable		A. Year of study					p
		I (N=47)	II (N=37)	III (N=28)	IV (N=57)	V (N=31)	
Declared attitude	M±SD	9.53±2.66	9.73±2.64	9.36±2.9	9.42±3.02	10.1±2.7	p=0.949
	Median	9	9	9,5	9	10	
	Quartiles	8 – 11.5	8 – 11	8 – 11	8 – 12	8 – 11.5	
Knowledge and beliefs	M±SD	8.21±3.22	8.19±3.4	7.5±2.94	8.49±3.48	8.74±3.7	p=0.816
	Median	8	7	7,5	8	8	
	Quartiles	6.5 – 10	6 – 10	5.75 – 9.25	6 – 9	6 – 10	
Action (behavior)	M±SD	3.02±1.78	3.11±1.98	3.07±2.05	3.32±1.84	3.55±2.32	p=0.818
	Median	3	3	3	3	3	
	Quartiles	2 – 4	2 – 4	1 – 5	2 – 5	2 – 5.5	
Uncertainty	M±SD	3.64±1.52	3.59±1.48	3.79±1.5	3.74±1.41	3.16±1.59	p=0.530
	Median	4	4	4	4	3	
	Quartiles	2 – 5	2 – 5	3 – 5	3 – 5	2 – 4,5	
A sense of agency	M±SD	3.09±1,28	2.7±1.45	2.68±1.22	3.04±1.18	3.1±1.25	p=0.309
	Median	3	3	3	3	3	
	Quartiles	2 – 4	1 – 3	1,75 – 4	2 – 4	2,5 – 4	
Variable		B. The level of education				p	
		First level (N=111)		Second level (N=89)			
Declared	M±SD	9.55±2.71		9.66±2.9		p=0.681	
	Median	9		10			
	Quartiles	8 – 11		8 – 12			
Knowledge and beliefs	M±SD	8.05±3.21		8.55±3.53		p=0.613	
	Median	8		8			
	Quartiles	6 – 10		6 – 9			
Action (behavior)	M±SD	3.05±1.9		3.42±2.01		p=0.186	
	Median	3		3			
	Quartiles	2 – 5		2 – 5			
Uncertainty	M±SD	3.68±1.49		3.52±1.49		p=0.448	
	Median	4		3			
	Quartiles	3 – 5		2 – 5			
A sense of agency	M±SD	2.83±1.3		3.09±1.23		p=0.172	
	Median	3		3			
	Quartiles	2 – 4		2 – 4			

Mann-Whitney test; p – statistical significance coefficient; N – number; M – arithmetic mean; SD – standard deviation; * statistically significant relationship (p<0.05)

**Table 6. A – Characterizing variables compared to study type,
B – Characterizing variables compared to professional activity**

Variable		A. Study type		p
		Part-time (N=34)	Full-time (N=166)	
Declared attitude	M±SD	9.68±2.89	9.58±2.77	p=0.944
	Median	9.5	10	
	Quartiles	8 – 11.75	8 – 11	
Knowledge and beliefs	M±SD	8.41±3.79	8.24±3.27	p=0.870
	Median	8	8	
	Quartiles	6 – 10.75	6 – 9.75	
Action (behavior)	M±SD	3.18±2.17	3.22±1.91	p=0.821
	Median	3	3	
	Quartiles	1 – 5	2 – 5	
Uncertainty	M±SD	3.71±1.53	3.58±1.49	p=0.602
	Median	4	4	
	Quartiles	3 – 5	2 – 5	
A sense of agency	M±SD	2.91±1.31	2.95±1.27	p=0.843
	Median	3	3	
	Quartiles	2.25 – 4	2 – 4	
Variable		B. Professional activity		p
		I am not professionally active (N = 126)	I work (N = 74)	
Declared attitude	M±SD	9.82±2.64	9.23±3.01	p=0.074
	Median	10	9	
	Quartiles	8 – 12	7 – 11	
Knowledge and beliefs	M±SD	8.37±3.44	8.11±3.21	p=0.659
	Median	8	8	
	Quartiles	6 – 10	6 – 9	
Action (behavior)	M±SD	3.35±1.81	2.97±2.17	p=0.135
	Median	3	3	
	Quartiles	2 – 5	1 – 5	
Uncertainty	M±SD	3.53±1.46	3.73±1.55	p=0.400
	Median	4	4	
	Quartiles	2 – 5	3 – 5	
A sense of agency	M±SD	3±1.21	2.85±1.37	p=0.47
	Median	3	3	
	Quartiles	2 – 4	1.25 – 4	

Mann-Whitney test; p – statistical significance coefficient; N – number; M – arithmetic mean; SD – standard deviation; * statistically significant relationship (p<0.05)

Table 7. Characterizing variables compared to religious commitment

Variable		Religious commitment				p
		Strong opposition, reluctance (N=18)	Lack (N=26)	Average (N=117)	Strong (N=39)	
Declared attitude	M±SD	10.67±2.91	9.88±2.8	9.3±2.64	9.82±3.09	p=0.232
	Median	10.5	10	9	10	
	Quartiles	9 – 13	8.25 – 11.75	8 – 11	8 – 11.5	
Knowledge and beliefs	M±SD	9.78±4.52	8.38±3.06	7.91±3.08	8.59±3.6	p=0.526
	Median	8.5	7.5	7	8	
	Quartiles	6.25 – 14.25	6.25 – 9.75	6 – 9	6 – 9.5	
Action (behavior)	M±SD	3.28±2.02	3.12±2.08	3.06±1.88	3.69±2.05	p=0.454
	Median	3	3	3	3	
	Quartiles	2 – 4.75	2 – 5	2 – 4	2.5 – 5	
Uncertainty	M±SD	3.72±1.36	3.46±1.33	3.63±1.5	3.56±1.65	p=0.943
	Median	4	3	4	3	
	Quartiles	3 – 4	3 – 4.75	2 – 5	3 – 5	
A sense of agency	M±SD	3.28±1.67	2.81±1.13	2.97±1.24	2.82±1.27	p=0.484
	Median	3.5	3	3	3	
	Quartiles	1.5 – 4.75	2 – 4	2 – 4	2 – 3.5	

Kruskal-Wallis test; p – statistical significance coefficient; N – number; M – arithmetic mean; SD – standard deviation; * statistically significant relationship (p<0.05)

Discussion

The COVID-19 epidemic has caused a lot of confusion in society. The new situation in which we found ourselves forced many people to adapt their lives and implement new rules of functioning. The restrictions that have been introduced, as well as the measures to prevent infection, have meant that, as a society, we should demonstrate specific attitudes that would minimize the spread of the virus. Despite the fact that the topic is quite new, numerous studies have already been carried out, both in Poland and around the world. For example, one study was conducted on a group of 1,474 medical students in Pakistan. This was a cross-sectional study conducted in June 2020 using a questionnaire. The survey consisted of questions about demographics, knowledge, attitudes and practices [11].

The analysis of the results showed that women studying medicine had greater knowledge, positive attitudes and good practices against

COVID-19 than men. These results were statistically significant, as in the case of our study. Fifth-year medical students with a higher level of education had a higher dimension of knowledge, attitudes and practice [11]. Our research has shown that the higher the dimension of knowledge and beliefs (tested on the basis of the domain scale), the higher the dimension of the declared attitude, action, sense of agency, and the lower the dimension of uncertainty. The level of education did not differentiate the dimension of the attitude tested.

In turn, in the province of Henan (China), a survey was conducted among health care workers. The study, which was conducted in February 2020 with the use of questionnaires, concerned the knowledge, practice and attitudes of employees in 10 hospitals. The researchers managed to obtain 1,357 surveys, which showed that 89% of health care workers had sufficient knowledge about COVID-19, of which over 85% were afraid of self-infection with the virus, and 89.7% used correct practices. Moreover, the authors point out that the attitudes and practices of health care workers were related to their professional experience, job category and the level of knowledge about COVID-19 [12].

Subsequent studies used questionnaires to measure attitudes towards the COVID-19 vaccine, fear of COVID-19 disease, general tendencies to conspiracy thinking, COVID-19 conspiracy beliefs, knowledge about vaccines, attitudes towards science, previous preventive behavior during the course of the pandemic, perceived levels of disease susceptibility, and germ avoidance. Relationships between attitudes towards the COVID-19 vaccine and experiences related to the COVID-19 pandemic, sex, age and level of education of participants were also investigated. The survey was conducted between November 30 and December 9, 2020 and included 468 respondents (218 men, 248 women, and two people declaring a different gender), between 18 to 70 years old. The analyzes revealed associations of attitudes towards the COVID-19 vaccine with most of the variables studied. The authors found that men were more positive about the COVID-19 vaccine than women. Correlation analysis did not show a significant relationship between the age of the participants and their attitudes toward the COVID-19 vaccine, as well as between participants with secondary and higher education [13]. These results are slightly different from those we obtained.

A study was conducted to assess the level of knowledge and attitude of people applying for vaccinations to the need for vaccinations in the time of a pandemic in 100 patients of Centrum Medyczne Medica Sp. z o.o. Prof.-Med. in Włocławek. The research tool used in the study was the State and Trait Anxiety Inventory and an own questionnaire. Most of the respondents assessed their knowledge about preventive vaccinations

as average. The vast majority (96%) of the respondents subjected their children to preventive vaccinations. More than half of the respondents vaccinated their child out of their own beliefs, and in 62% of the cases the pediatrician was the source of the decision to administer the vaccine. The respondents' responses show that the main reason for vaccinating a child was the fear of the child becoming ill and complications, the obligation to perform preventive vaccinations and a smoother transition of the disease after vaccination. The least frequent reason for implementing preventive vaccinations was the pressure of the state institutions and society and the threat of a penalty for nonperformance, free vaccinations, or pressure from the social environment. Most believe that the immunization program in Poland is absolutely necessary and it is right that it is mandatory. In the opinion of the majority of respondents, vaccines are safe and always help to fight infectious diseases. Definitely fewer respondents are of the opinion that with the current level of medicine, vaccines can be dispensed with, and none of the respondents considered vaccines harmful to health. The data obtained show that some of the respondents who came for vaccinations had concerns and doubts about preventive vaccinations. The most frequently reported concerns were complications after vaccination. Almost half of the respondents positively assess the need for protective vaccinations in the pandemic era, and in 38% of the cases, the pandemic did not affect the assessment of the need for vaccination [14]. In the authors' own research, it was found that the higher the dimension of knowledge and beliefs, the higher the dimension of action that takes into account vaccination.

Authors of a study conducted using an online survey in September and October 2021 on a group of 1,466 Poles aged 18 to 80 years. The questions included in the survey were related to attitudes towards vaccination, including vaccination against COVID-19, the occurrence of an adverse reaction to vaccine in the past. The authors showed that the female gender and the place of residence were significant predictors of the acceptance level of vaccination. However, the authors of the study point out the need for a critical approach due to the predominance of women who participated in the study. Note that the characteristics of the group; that is, the predominance of students and people with higher education and residents of larger cities, could have influenced the results of the study [15]. Our study also included a higher number of female students, from cities, which can also be considered a limitation on the one hand and, on the other hand, a reflection of the structure of the studied groups of students.

Another study, which also concerned the attitude, but on the immunization of children, was conducted in the Śląskie and Małopolskie voivodships at the turn of 2016/2017. The aim of the survey was to assess knowledge and learn about the opinions and views of parents on immunization in Po-

land. The study included 233 parents or legal guardians of children under compulsory vaccinations. The results showed that both younger mothers and younger fathers were significantly more opposed to vaccination [16]. These results differ from the results of our research, in which age did not differentiate attitudes. On the other hand, the opinions of anti-vaccination opponents depended on education. People with primary education had doubts about the effectiveness of vaccinations. The number of supporters of vaccination increased as the level of education increased [16]. These results are partly in line with our research. There was no correlation with the level of education, but the higher the level of knowledge and beliefs, the higher the level of the declared attitude. The possibility of positively shaping the attitudes of physiotherapy students at the University of Rzeszow towards wearing masks, maintaining social distance, the rules of disinfection, and vaccination against COVID-19 by increasing the level of knowledge is very important from a practical point of view.

Conclusions

Gender (as an objective determinant) and knowledge (as a subjective determinant) differentiate the attitudes of physiotherapy students of the University of Rzeszow toward wearing masks, maintaining social distance, the rules of disinfection, and vaccination against COVID-19.

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