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## Healthcare professionals knowledge of autism spectrum disorders

### Wiedza pracowników ochrony zdrowia na temat zaburzeń ze spektrum autyzmu

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## **Abstract**

**Introduction:** Autism spectrum disorders (ASD) is a diverse group of neurodevelopmental disorders, which belongs to the most frequent child developmental problems. It is characterized by different levels of functioning of persons who have this disorder, showing impaired social interaction, impaired communication, and restricted and repetitive behavior. What is more, there is a likelihood of occurring other disorders. Particularity of ASD, the difficulties in diagnosing cause that the person has frequent contact with medical personnel. The patient with ASD is a special patient, presenting atypical behaviors and reactions, due to the different perception of the surrounding reality. He requires from health care practitioners to adopt an individual approach and special treatment based on knowledge about the specificities of autism spectrum disorders and professional competence.

**The aim of a study:** Determining the level of knowledge of health care professionals on autism spectrum disorders. The factors which influence on the level of their knowledge were the subject of thorough statistical analysis. In addition, the views of medical personnel on the individual treatment of autistic persons in their work and the impact of the level of knowledge declared on the treatment of ASD patients were analyzed.

**Material and methods:** 122 health workers took part in the study in the Regional Specialist Hospital in Grudziadz: doctors, nurses / midwives and registrants / medical secretaries.

**Results:** The research shows that the level of knowledge of health care workers on ASD disorders is low. The best performers were doctors, then nurses/midwives and finally medical recorders/ secretaries. Despite low levels of knowledge, medical professionals do not participate in specialist courses and fewer than half of the subjects are knowledgeable about ASD. At the same time they are convinced of the need for special treatment of autistic patients, but not taking them out of queue.

**Conclusions:** Improving the knowledge of health professionals on autism spectrum disorders by increasing knowledge, attending conferences and the courses and experience of caregivers and professionals dealing with ASD patients will have a beneficial effect on the health and well-being of patients while providing health services, which will significantly improve the quality of services provided.

**Key words:** autism, disorders of autism spectrum, quality of services, knowledge worker

## **Admission**

Autism spectrum disorder (Autism, Asperger syndrome, overall developmental disorder) is a neurological developmental disorder. They occur in people all over the world, regardless of race, descent or socio-economic conditions [1]. Year by year, the number of people diagnosed with this type of disorder is gradually increasing. Autistic people, unlike the neuroists, perceive the world around them differently and process the information they reach from outside. Therefore, otherwise they can react to the environment, which most often manifests itself in their behavior, not always socially acceptable. Developmental deficits relate to problems with the processing of incoming stimuli, the establishment of social relationships, the reading of the body's speech, the difficulty of understanding other people's intentions, and the reading and showing of emotions [2, 3, 4, 5]. Families' efforts and various therapies help them to adapt to life in society, but they do not cause them to feel differently and think. Every effort should be made to ensure that the public understands and approves autistic persons, which would surely have a decisive advantage for both parties. Frequent contact with autistic persons is experienced by medical personnel. The tasks of health care professionals in examining the patient in both physical and psychological terms are related to the crossing of his personal space. They therefore require a specific understanding of the specificity of autism spectrum disorders and individual patient approaches.

The knowledge of health care workers is shaped by the prism of insignificant information taken from outdated books and far away from the real problems of autistic persons. On the other hand, more and more often health care organizations conduct workshops for medical personnel on the behaviour of autistic children in clinics and hospitals. Foundations working for people with autism spectrum disorders as well as parents of autistic children share their knowledge and experience in cooperation with medical institutions. These reflections, as well as the continuing health improvement in healthcare, inspired the author to take on the topic of the knowledge of medical professionals about autism.

The main aim of the work is to investigate the level of knowledge of health professionals about autism spectrum disorders. The specific objectives are to show whether there are differences in the knowledge they possess depending on the medical profession being performed. Does the medical staff seek to acquire knowledge in this topic, or have experience in working with autistic persons. Consideration was also given to the convictions

of medical personnel as regards the individual treatment of autistic persons when they were in contact with them at work.

## **Material and methods**

The study was conducted in the dr Wl. Bieganski Regional Specialist Hospital in Grudziądz. The investigation period consisted of May and June 2017. A total of 122 people took part in the study: 37 doctors, 49 nurses/midwives, 36 registrants/medical secretaries working at children's and adults' branches. Participation in the research was anonymous and voluntary, with the possibility of resignation at any time. The surveys were distributed at all hospital departments and received after completion by staff working at the branch. They were then developed statistically.

The research material was collected using a method of indirect measurement, a survey technique, to investigate a large number of research groups as quickly as possible. A survey questionnaire was used as a tool, which was directly sent to the respondent answering the questionnaire questions in writing. It was designed to understand the degree of knowledge of health professionals about autism spectrum disorders and to compare the level of knowledge to the approach of patients with ASD. The structure of the questionnaire included a heading explaining the purpose of the survey and information on anonymity. The questionnaire was divided into 3 parts. The first one, consisting of 8 single-choice questions, contained a metric and questions to obtain the necessary information on the individual characteristics of the respondent. The second part concerned the assessment of the knowledge declared by the health care professional, including terminology, causes, symptoms and treatment of autism spectrum disorders. This part contained 7 single-choice questions and 4 multiple-choice. The answers were evaluated using the <0.1> scale. The maximum number of points to obtain in this section was 25. A higher score meant a better reported knowledge of the problem. The level of knowledge determined the number of correctly provided replies and thus the number of points earned:

- high level 20-25 points
- average level 13-19 points
- low level 0-12 points.

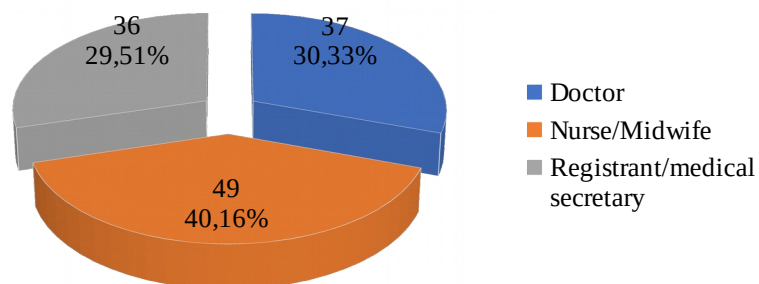
The third part of the survey questionnaire contained 2 single-choice questions to investigate the health worker's approach to patients with ASD.

122 health care workers took part in the survey. Occupations were grouped into 3 categories:

1. Doctor (general practitioner, specialist physician)
2. Nurse/midwife
3. Registrant/medical secretary.

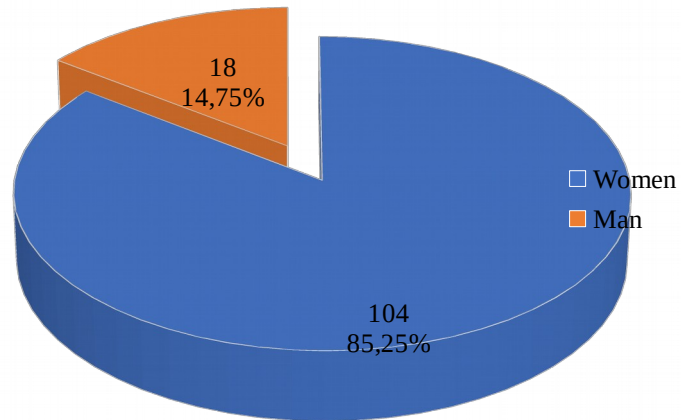
The studies ultimately involved 37 physicians (30%), 49 nurses/midwives (40%) and 36 registrants/medical secretaries (30%). The above distribution is shown in figure 1.

**Figure 1. Numerical and percentage distribution of medical professions of respondents**



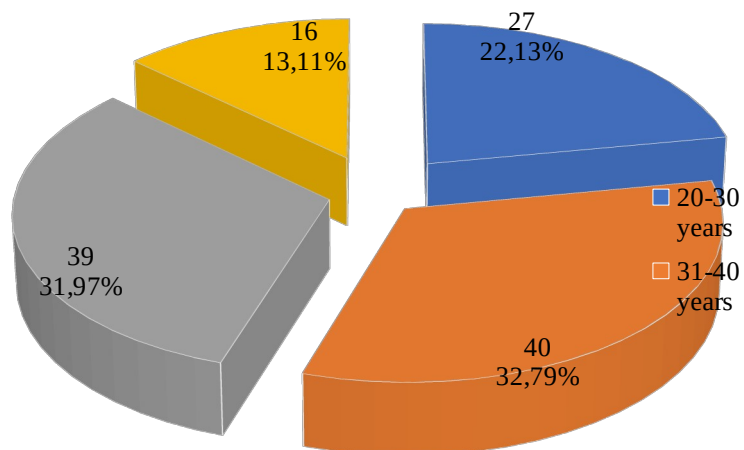
The vast majority of the respondents, as many as 85% (104 people) were women. The number of men who took part in the study was 15% (18 people). The division of respondents by gender is presented in figure 2.

**Figure 2. Gender-based breakdown of respondents**



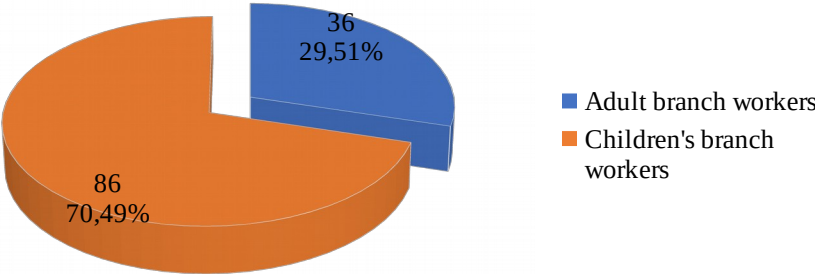
Four age ranges were identified among the respondents. The chart below shows the number and percentage of health workers in a given age range. The largest group was employees in the age range of 31-40 years-40 people (33%) and 41-50 years (32%) and the smallest group of employees aged over 51 years (13%).%

**Figure 3. Age characteristics of the respondents**



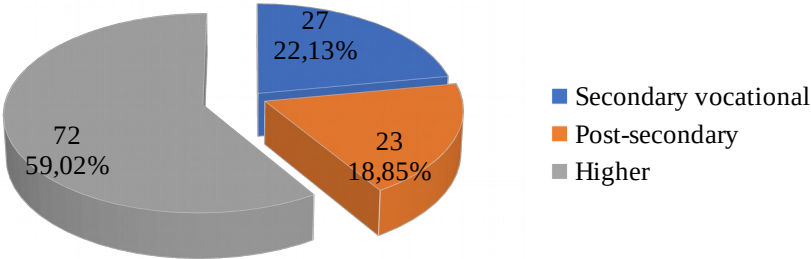
Respondents in terms of workplace (department) were divided into two groups: employees of children's departments and employees of adult departments. 70% of respondents (86 people) worked at branches for children, while 30% (36 people) in adult branches (figure 4).

**Figure 4. Workplace in children's and adults' department**



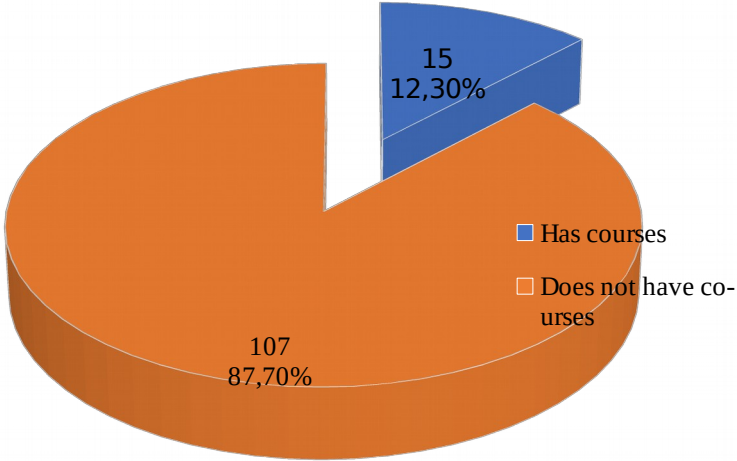
In terms of education, health workers were divided into three groups. The number and percentage of groups is presented in Figure 5. The most numerous were people with higher education (72 people, which constituted 59% of the respondents). Then, 27 people with secondary vocational education (22%) and 23 people with post-secondary education (19%).

**Figure 5. Education of health professionals**

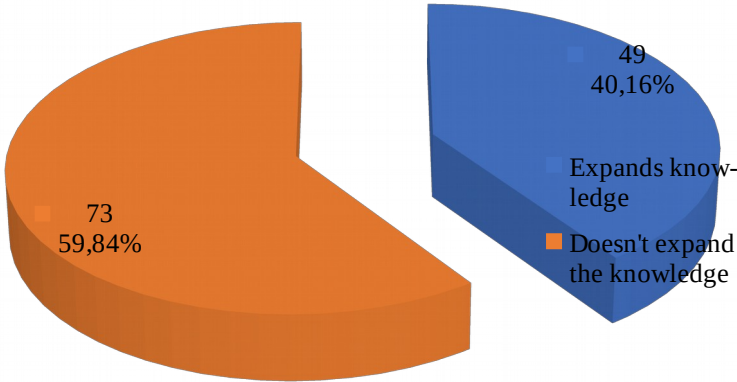


Of the respondents, only 12% of healthcare workers (15 people) have completed courses on autism spectrum disorders (figure 6) and 40% of workers (49 people) improve their knowledge of ASD by reading the literature on the subject, participating in thematic conferences or contacting professionals dealing with autism (figure 7).

**Figure 6. ASD specialist courses**



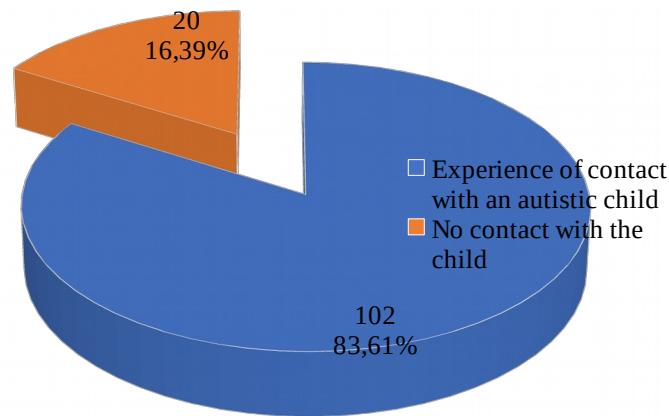
**Figure 7. Expanding knowledge about ASD themes**





The chart below shows that the vast majority, because as many as 84% of health workers (102 people) have already experienced contact with a person with autism spectrum disorder, and only 16% (20 people) do not possess such experience.

**Figure 7. Experience of contact with a person with ASD**



## Results

In assessing the level of knowledge of health professionals about autism spectrum disorders, first of all, the frequency distributions of the test sample were read. This distribution seems to confirm the hypothesis, only 5.7% of the subjects received a high score and as many as 48.4% were low (table 1).

**Table 1. Distribution of the frequency of results in the test group**

The result in the knowledge test	n	%
Low (score $\leq$ 12 pts)	59	48,4
Average (12 pts < score $\leq$ 19)	56	45,9
High (19 pts < score)	7	5,7

Then it was checked whether the result is dependent on the profession performed by the respondent. The results of the Pearson Chi-square test confirmed that the result was substantially dependent on the profession being performed  $\chi^2 = 11,64$ ;  $p < 0,05$ ; V Cramer = 0,22. After reviewing the following table of quotas, it can be noted that the best results were characterized by doctors, followed by nurses and midwife, and the least-advised registrants and medical secretaries (table 2).

**Table 2. The Chi-squared test results for the relationship between the profession and the result in the ASD knowledge test**

		The result in the knowledge test			χ <sup>2</sup>	p	V Cramera
		low	average	high			
Profession	doctor	N	12	22	11,64	<0,05	0,22
		%	32,4%	59,5%			
	nurse/midwife	N	22	23			
		%	44,9%	46,9%			
	registrant/medical secretary	N	25	11			
		%	69,4%	30,6%			

An ANOVA test showed that there were significant differences in the results achieved in the ASD knowledge test among those performing various professions  $F = 6.94$ ;  $p < 0.001$ ;  $H_2 = 0.10$ . The observed difference was characterized by a moderate effect strength. For better understanding, additional post-hoc tests were performed (table 3).

**Table 3. ANOVA results for differences in the test of knowledge of ASD between persons performing different professions**

Profession	N	M	SD	F	p	h <sup>2</sup>
doctor	37	14,18	3,55	6,94	<0,001	0,10
nurse/midwife	49	12,90	4,25			
registrant/medical secretary	36	10,93	3,18			

In order to better understand the outcome of the ANOVA test, a post hoc test with Tuckey's correction has been performed. They showed that both physicians ( $M = 14.18$ ;  $SD = 3.55$ ) as well as nurses ( $M = 12.90$ ;  $SD = 4.25$ ) recorded significantly better results from registrants/medical secretaries ( $M = 10.93$ ;  $SD = 3.18$ ).

**Table 4. Post hoc test results with Tuckey's correction for differences between test subjects performing different professions in the knowledge test of ASD**

			Average difference	SE	p
Tukey's HSD test	doctor	nurse/midwife	1,28	0,82	0,27
		<b>registrant/medical secretary</b>	<b>3,25</b>	<b>0,88</b>	<b>&lt;0,001</b>
	nurse/midwife	doctor	-1,28	0,82	0,27
		<b>registrant/medical secretary</b>	<b>1,97</b>	<b>0,82</b>	<b>&lt;0,05</b>
	registrant/medical secretary	<b>doctor</b>	<b>-3,25</b>	<b>0,88</b>	<b>&lt;0,001</b>
		<b>nurse/midwife</b>	<b>-1,97</b>	<b>0,82</b>	<b>&lt;0,05</b>

An ANOVA test showed that there were significant differences in the results achieved in the ASD knowledge test among those who had or have not experienced contact with an autistic child  $F = 20.19$ ;  $p < 0.001$ ;  $H^2 = 0.14$ . The observed difference was characterized by high effect strength. Persons who have experienced prior contact with an autistic child ( $M = 13.36$ ;  $SD = 3.73$ ) achieved substantially higher scores than those who did not possess such experience ( $M = 9.35$ ;  $SD = 3.22$ ).

**Table 5. ANOVA results for differences in the test of knowledge of ASD between persons who had or did not contact an autistic child**

Contact with an autistic child	N	M	SD	F	p	$h^2$
Yes	102	13,36	3,73	20,19	<0,001	0,14
No	20	9,35	3,22			

An ANOVA test showed that there were no significant differences in the results achieved in the ASD knowledge test among people who attended or not in the courses associated with ASD  $F = 2,18$ ;  $p < 0,14$ ;  $\eta^2 = 0,02$  (table 6).

**Table 6. ANOVA results for differences in the test of ASD knowledge between subjects who attended or not in the courses associated with ASD**

Participating in ASD-related courses?	N	M	SD	F	p	$\eta^2$
Yes	15	14,10	4,53	2,18	0,14	0,02
No	107	12,51	3,82			

The studies examined the impact of the gender, age and education of the test person on the level of knowledge on ASD. Analysis of the ANOVA test revealed no differences in knowledge between women and men  $F = 0,14$ ,  $p = 0,71$ ;  $\eta^2 = 0,00$  (table 7).

**Table 7. ANOVA results for differences in the knowledge test between women and men**

Sex	N	M	SD	F	p	$\eta^2$
Women	104	12,65	3,99	0,14	0,71	0,00
Men	18	13,03	3,67			

There were no significant differences in the knowledge of autism in relation to age  $F = 0,76$ ,  $p = 0,52$ ;  $\eta^2 = 0,00$  (table 8).

**Table 8. ANOVA results for differences in the knowledge test between people of different ages**

Age	N	Average	Standard deviation	F	Significance	$\eta^2$
20 to 30	27	12,89	3,69	0,76	0,52	0,00
31 to 40	40	12,74	4,03			
41 to 51	39	12,09	3,31			
more than 51	16	13,81	5,36			

Analysis of ANOVA test, however, showed that there were significant differences in the knowledge of autism between people with different levels of education  $F = 7,81$ ;  $p < 0,001$ ;  $\eta^2 = 0,12$ . The observed difference was characterized by a moderate effect strength. In order to better understand the result, additional post-hoc tests with Gabriela's amendment were performed, taking into account the inequality of the subgroups analysed.

**Table 9. ANOVA test results for differences in the autism knowledge test between persons with varying degrees of education**

	N	Average	Standard deviation	F	p	$\eta^2$
Secondary vocational	27	11,85	1,98	7,81	<0,001	0,12
Post-secondary	23	10,43	3,82			
Higher	72	13,75	4,16			

Post hoc tests showed that people with higher education were significantly more knowledgeable (M = 13.75; SD = 4.16) from persons with post-secondary education (M = 10.43; SD = 3.82).

**Table 10. Post hoc test results with Gabriel's amendment for the knowledge of ASD between people of different education**

Groups compared		Average difference	SE	p	
Gabriel's test	Secondary vocational	Post-secondary	1,42	1,06	0,45
		Higher	-1,90	0,84	0,06
	Post-secondary	Secondary vocational	-1,42	1,06	0,45
		<b>Higher</b>	<b>-3,32</b>	<b>0,89</b>	<b>&lt;0,001</b>
	Higher	Secondary vocational	1,90	0,84	0,06
		<b>Post-secondary</b>	<b>3,32</b>	<b>0,89</b>	<b>&lt;0,001</b>

The analysis showed that there was no significant relationship between the profession performed by the respondent and attendance at the courses associated with ASD  $\chi^2 = 2,31$ ;  $p = 0,32$ ; V Cramer = 0,14 (table 11).

**Table 11. The Pearson Chi-square test results for the relationship between the respondent's profession and the courses associated with ASD**

		Attending courses related to ASD		$\chi^2$	p	V Cramera
		Yes	No			
Profession	doctor	n	5	2,31	0,32	0,14
		%	13,5%			
	nurse/midwife	n	8			
		%	16,3%			
	registrant/medical secretary	n	2			
		%	5,6%			

An analysis of the Pearson Chi-square test showed that there was a significant relationship between the profession performed by the respondent and the widening of their knowledge of issues related to ASD  $\chi^2 = 27,52$ ;  $p < 0,001$ ; V Cramera = 0,47. The values in the cross-table clearly indicate that doctors most often claimed to increase their knowledge of ASD related issues in relation to the other professions (table 12).

**Table 12. The Pearson Chi-square test results for the relationship between the respondent's profession and the courses associated with ASD**

		Expanding the knowledge associated with ASD		$\chi^2$	p	V Cramera
		Yes	No			
Profession	doctor	n	27	27,52	<0,001	0,47
		%	73,0%			
	nurse/midwife	n	17			
		%	34,7%			
	registrant/medical secretary	n	5			
		%	13,9%			

## Discussion

Studies carried out and results have led to reflection on the level of knowledge of health professionals on autism spectrum disorders and the declared approach to patients with ASD. Increasingly, occupational health workers experience contact with people with ASD. The basis of the relationship with the patient is communication, which is particularly disturbed in autistic persons [1, 7, 8, 9]. Effective communication between the patient and the

medical staff is essential for effective treatment [10]. In order to establish a relationship with the patient with ASD it is necessary to know at least the basics of this disorder. The results of their own studies confirmed the hypothesis that the level of knowledge of health professionals about autism spectrum disorder is relatively low. Only 5.7% of the subjects received a high score, while as many as 48.4% were low. A statistically significant difference occurred between the level of knowledge declared in a different medical profession. The best results were obtained by doctors, which is due to the preparation and the role of professional. The worst was a group of registrants/medical secretaries, among which no person received a high score, only 30.6% of people received the average result, while as many as 69.4% of the people received a low score. It is the responsibility of the registrant/medical secretary to make an appointment to the patient and to provide him with adequate waiting conditions in line with the physician or examination and to gather the first interview about possible problems with Patients with ASD [11]. The level of competence also depends on whether a medical professional attempts to self-study in this regard, by reading literature, attending conferences or specialised courses. The analysis showed that only 12% of the surveyed had specialised courses, while 40% of respondents expanded their own knowledge in this matter. It would therefore be advisable to organise recurring courses, trainings and meetings with specialists in ASD disorders, which would undoubtedly increase the level of knowledge of medical professionals and at the same time increase the quality of medical services provided.

A detailed analysis of the factors that did not affect the level of knowledge of ASD confirmed the hypothesis that there were no differences between women and men and between people with varying age. Significant differences in the level of knowledge about ASD between respondents relate to the level of education. People with higher education were more knowledgeable.

The incidence of developmental disorders in children [12.13] indicates that there is a need for a high level of knowledge of ASD disorders, particularly in the health care professionals dealing with children. However, the analysis of the results obtained showed that there were no differences in the result achieved in the knowledge test among people working at different branches.

In the course of the analyses in terms of impact the level of knowledge of previous experience with the person with ASD, significantly higher scores were achieved by the medical professionals who had such experience. The observed difference was characterized

by high effect strength. The results of the study showing that as many as 84% of health care professionals have experienced early contact with the autistic child, it signals the enormous incidence of autism spectrum disorders.

According to the definition of the Polish language dictionary PWN, special means unique [14]. In accordance with that determination, special treatment should include the adoption of the patient out of order. However, in order to understand the reason why a patient with ASD should be treated in a special way and out of order, it is necessary to know the autism spectrum disorder, the symptoms characteristic of this disorder and the causes of perception and behaviour of people with ASD.

## **Conclusions**

1. Improving the knowledge of health professionals about autism spectrum disorders will result in a beneficial therapeutic effect and patient comfort in providing health services, which will significantly increase the quality of the benefits provided.
2. The level of knowledge about ASD does not depend on age and sex respondents
3. People with higher education have more knowledge of ASD disorders.

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