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Importance of most frequent needs of the disabled in shaping areas of support in public health. Part III. Scopes of locomotor capabilities of the disabled from the aspect of demographic and social conditioning and problems hindering daily functioning

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Abstract

Introduction and objective. Disability has an individualized character, both in terms of causes and effects, including limitation of locomotor skills. This is the problem to a great extent determining the level of daily functioning and the quality of life.

The aim of the study was assessment of locomotor capabilities according to the demographic, social and health characteristics, and the frequency of problems of daily life according to the scope of locomotor capabilities.

Material and methods. The study included 676 disabled aged 19–98; mean age 64. The survey was carried out using a standardized Disability Questionnaire.

Results. Statistically significant differences in categories of locomotor capabilities were observed according to age, education, material standard, housing conditions, legal disability status, and degrees of disability.

Ten problems varying in intensity occurred according to the scope of independent moving around: material difficulties, difficulties in settling office matters, loneliness (P<0.0001), too infrequent contacts with the family, negative attitude of surroundings towards disability, material dependence on others, lack of care by relatives and friends, difficult access to environmental nurse, difficult access to services from social worker, necessity of caring for a disabled person.

Conclusions. Locomotor capabilities of the disabled decrease over 64. Low level of education, material standard and poor housing conditions are associated with decreased capabilities for independent moving around without limitations. The types and number of problems with which the disabled struggle depends on the scope of their capabilities for independent moving around. In every dimension of functioning disability belongs to the scope of issues of public health.

Keywords

public health, disabled, demographic and social characteristics, locomotor capabilities of the disabled

INTRODUCTION

Disability is an issue extremely difficult to unequivocally specify or define. It has an individualized character, both in terms of causes and effects, including limitation of locomotor capabilities, i.e. capability for independent mobility. This is the problem to a great extent determining the level of daily functioning and the quality of life of this group. The consequences of disability, frequently limited possibilities of independent locomotion are interdependent on many factors defined as health, demographic, social and environmental. Here, the causes of disability are of primary importance, i.e. disease, injury, genetic/congenital defect. Each one may be the cause of disorders or loss of capability for independent locomotion, and their character may be long-lasting or permanent. This depends on the natural course of the disease, difficult to specify types and scale of the consequences. Almost always a differentiation of demographic and social characteristics may be observed, the effect of which may be difficult to estimate. These characteristics include gender, age, level of education, material standard, housing conditions, level of contamination of the environment, etc. Thus, disability is a complex phenomenon resulting from interactions between the characteristics of the human body and characteristics of the environment, including social environment in which the disabled person lives [1].

In every society there is a group of the disabled, differing by percentages. The size of these groups depends, to a

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great extent, on the adopted methods of qualification of functioning in an individual country. Lack of uniformity in qualifying for a group of the disabled is the lack of a uniform definition of disability. This results from the fact of occurrence of many quantitative and qualitative factors, which are, or may be, in disharmony with the personal traits of the individual. Therefore, a dysfunction in the state of health is an extremely individual process, and for this reason may be the development of an arbitrary definition of a disabled person will not be possible for long.

Multiplicity of problems falling within the daily functioning of the disabled with various scopes of locomotor capabilities, remains in the areas classified into health and environmental. With well-organized rehabilitation in the environment of life it is possible to considerably limit, or even eliminate physical, psychological, and social barriers. It turns out that disability is more a social than a medical problem [2]. Frequently barriers of a social character constitute for the disabled a considerably greater obstacle in daily functioning than the experienced functional limitations [3]. Therefore, specialists in public health should be more involved in studies of the problems of the disabled. With respect to limitations in locomotor capabilities one keyword is the most important 'rehabilitation'. There are many possibilities under this term, which are often not used in the treatment of the patient. The problem was undertaken as early as in the 1990s by Górski who perceived not fully exploited possibilities which may be provided by early rehabilitation in prevention of the development of chronic pathological conditions. This may become an indirect cause of the development of permanent disability, including locomotor disorders, and transition into the state of social dependence [4]. Rehabilitation of the disabled is a set of activities, especially organizational, therapeutic, psychological, technical, training, educational and social, aimed at the achievement, with an active participation of these persons, of the highest possible level of their functioning, quality of life and social integration [5].

OBJECTIVES

The aim of the study was assessment of locomotor capabilities according to the selected demographic, social and health characteristics, and the frequency of selected problems of daily life in the economic sphere, relations with the social environment and family, according to the scope of locomotor capabilities.

MATERIALS AND METHOD

The study included 676 disabled aged 19–98; mean age 64; males younger than females. The disabled in the study group were selected by the method of purposeful sampling. Into the study were qualified exclusively the legally or biologically disabled, capable of completing the survey, who expressed their consent to participate in research. The survey was carried out using a standardized Disability Questionnaire. Detailed information concerning the study group, the criteria of selection for research, detailed information concerning the study group and research methods were included in the first part of this article [6, 7].

Statistical analyses

Statistical analyses were performed using the software IBM SPSS Statistics v. 29. Categorial variables were presented in cross-tables. Significance of the differences in cross tables were assessed using the Pearson's chi-square test. The p values $p<0.05$ were considered statistically significant for two-sided test.

The value of the chi-square test is a summary measure, which does not provide information about the direction and size of the deviations from random expectations in individual table cells. This possibility is provided by using the values of deviations of the numbers obtained from the numbers expected in each cell. Numbers expected randomly in a given cell, i.e. assuming no relationship between row variable and column variable is an easy to calculate product of row and column count, divided by the total numbers in the table. If the deviation value is positive we are talking about surplus, and when it is negative, we are talking about shortage compared to expectations. In practice, in order to be independent from the differences in numbers in the cells standardized values are used. In analyses the so-called adjusted Pearson residuals (AR) are applied calculated as follows:

$$AR = (O_{ij} - E_{ij})/sqr(E_{ij}(1 - m_j)/N)(1 - n_i)/N))$$

with m_i being the row total, n_j the column total and N the total number of observations.

AR follows a standard normal distribution N (0,1), which enables us to run post-hoc hypotheses tests on any number of the standardized residuals. AR has a normal distribution, therefore, its values higher than N(0,1)1–a/2=1.96 have the probability lower than 0.05 in two-sided test. In the case of determination of the significance of deviations for a larger number of cells the correction for multiple comparisons should be taken into account. With Bonferroni correction the corrected value is $P_{acorr=}0{,}05/k$, where k is the number of cells in the table. For corrected probability the corrected value of deviation may be calculated (Excel contains an appropriate function), which will be a new criterion for the assessment of the significance of deviations in individual table cells [8, 9]. In order to compare significance for multiple comparisons the Benjamini-Hochberg procedure was also applied [10].

RESULTS

Locomotor capabilities acccording to selected demographic and social characteristics

The frequency of locomotor capabilities according to socio-demographic and disability variables is shown in Table 1. An especially important issue in the functioning of the disabled are locomotor capabilities, i.e. ranges of independent moving around and needs resulting from the character of these abilities. In order to determine actual needs in this area the capabilities for independent moving around have been defined into three categories based on the respondents' self-assessment. These were: moving about exclusively within the lodging/house (14.8%); within lodging/house and house yard (27.5%), moving about over slightly longer distances, e.g. outpatient department, shop, pharmacy (31.1%), and moving around without limitations (26.6%).

Due to the small numbers in statistical analysis a group of 14 persons (2.1%) with extreme disability, i.e. those permanently bedridden was omitted, where males constituted 57.1%,

Table 1. Locomotor capabilities according to socio-demographic and disability variables

Variable	Category	Total		Moves about the lodging	Moves about the lodging and house yard	Moves about at slightly longer distances	Moves about without limitations	*P* $(AR_{acorr})^A$
		Count	Row %	Row $\%_{AR}$	Row $\%_{AR}$	Row $\%_{AR}$	Row $\%_{AR}$	
Total		662	100	14.8	27.5	31.1	26.6	
Gender	Males	287	100	$12.9_{-1.2}$	$25.8_{-0.9}$	$31.0_{-0.1}$	$30.3_{1.9}$	0.22
	Females	375	100	$16.3_{1.2}$	$28.8_{0.9}$	$31.2_{0.1}$	$23.7_{-1.9}$	
Age	< 50 yrs	99	100	$15.2_{0.1}$	19.2_{-2}	$22.2_{-2.1}$	$43.4_{4.1}$	***P*<0.0001**
	50-64 yrs	236	100	$8.5_{-3.4}$	$19.5_{-3.4}$	$37.7_{2.7}$	$34.3_{3.4}$	(2.96)
	65-79 yrs	233	100	$14.2_{-0.3}$	$33.5_{2.5}$	$33.0_{0.8}$	$19.3_{-3.1}$	
	80 yrs and older	94	100	$31.9_{5.0}$	$41.5_{3.3}$	$19.1_{-2.7}$	$7.4_{-4.5}$	
Place of residence	Rural	253	100	$12.3_{-1.5}$	$27.3_{-0.1}$	$34.8_{1.6}$	$25.7_{-0.4}$	0.30
	Urban	409	100	$16.4_{1.5}$	$27.6_{0.1}$	$28.9_{-1.6}$	$27.1_{0.4}$	(2.73)
Education	Primary	251	100	$16.7_{1.1}$	$35.5_{3.6}$	$33.5_{1.0}$	$14.3_{-5.6}$	***P*<0.0001**
	Primary vocational	156	100	$17.9_{1.3}$	$25.0_{-0.8}$	$29.5_{-0.5}$	$27.6_{0.3}$	(2.96)
	Secondary	178	100	$11.8_{-1.3}$	$23.6_{-1.4}$	$27.5_{-1.2}$	$37.1_{3.7}$	
	Higher	77	100	$9.1_{-1.5}$	$15.6_{-2.5}$	$35.1_{0.8}$	$40.3_{2.9}$	
Material standard	Very good/Good	260	100	$16.2_{0.8}$	$28.1_{0.3}$	$23.5_{-3.4}$	$32.3_{2.7}$	**0.0002**
	Mediocre	263	100	$11.8_{-1.8}$	$27.0_{-0.2}$	$33.1_{0.9}$	$28.1_{0.7}$	(2.87)
	Poor/Very poor	139	100	$18.0_{1.2}$	$27.3_{0.0}$	$41.7_{3.0}$	$12.9_{-4.1}$	
Housing conditions	Very good	79	100	$16.5_{0.4}$	$17.7_{-2.1}$	$29.1_{-0.4}$	$36.7_{2.2}$	**0.007**
	Good	333	100	$15.0_{0.2}$	$26.4_{-0.6}$	$29.1_{-1.1}$	$29.4_{1.7}$	(2.96)
	Mediocre	206	100	$12.1_{-1.3}$	$31.6_{1.6}$	$33.5_{0.9}$	$22.8_{-1.5}$	
	Poor/Very poor	44	100	$22.7_{1.5}$	$34.1_{1.0}$	$38.6_{1.1}$	$4.5_{-3.4}$	
Cause of disability	Disease	542	100	$14.4_{-0.6}$	$25.6_{-2.3}$	$33.0_{2.3}$	$26.9_{0.4}$	**0.046**
	Injury	92	100	$19.6_{1.4}$	$31.5_{0.9}$	$23.9_{-1.6}$	$25.0_{-0.4}$	(2.87)
	Congenital defect	28	100	$7.1_{-1.2}$	$50.0_{2.7}$	$17.9_{-1.5}$	$25.0_{-0.2}$	
Legal disability status	No	230	100	$13.9_{-0.5}$	$20.4_{-3.0}$	$32.6_{0.6}$	$33.0_{2.7}$	**0.006**
	Yes	432	100	$15.3_{0.5}$	$31.3_{3.0}$	$30.3_{-0.6}$	$23.1_{-2.7}$	(2.73)
Degree of disability	Light	53	100	$7.5_{-1.7}$	$24.5_{-1.1}$	$32.1_{0.3}$	$35.8_{2.3}$	**0.0002**
	Moderate	170	100	$11.8_{-1.6}$	$24.7_{-2.4}$	$35.3_{1.8}$	$28.2_{2.0}$	(2.87)
	Considerable	209	100	$20.1_{2.7}$	$38.3_{3.1}$	$25.8_{-2.0}$	$15.8_{-3.5}$	
Cause of disability	Single cause	607	100	$14.5_{-0.7}$	$27.0_{-0.9}$	$31.6_{0.9}$	$26.9_{0.5}$	0.60
	Combined causes	55	100	$18.2_{0.7}$	$32.7_{0.9}$	$25.5_{-0.9}$	$23.6_{-0.5}$	(2.73)

[A] In brackets are provided corrected critical AR values. In the table AR values significantly higher than expected are marked in green; AR values significantly lower than expected are marked in red.

disabled aged 50–64 – 43.9%, those aged under 50 – 35.7%, respondents aged 65–79 -14.3%, 80 and over – 7.1%, and urban inhabitants – 71.4%.

In the examined group no statistically significant differences in individual categories of locomotor capabilities were found according to gender. Males insignificantly more often than females moved about without limitations (30.3% and 23.7%, respectively), whereas females significantly more frequently than males moved about within lodging/house (16.3% and 12.9%, respectively). Statistically significant differences in categories of locomotor capabilities were observed according to **age** (*P*<0.0001). The higher the age category, the clearly lower the percentage of respondents who were able to move about without limitations. The percentages of these persons were significantly higher than expected in the age groups < 50 yrs (43.4%) and 50–64 yrs (34.3%), while significantly lower than expected in older groups (65–79 yrs 19.3%; 80 yrs and older 7.4%). The capabilities for moving about only within the space of the lodging/house were significantly higher than expected among persons from the oldest age group (31.9%), whereas significantly less respondents than expected in this category of locomotor capabilities were in the age group 50–64 (8.5%). No significant differences between frequencies of individual categories of locomotor capabilities were found according to the **place of residence**, only the percentage of the disabled moving about lodging/house was insignificantly higher among urban than rural inhabitants – 16.4% and 12.3%, respectively. In turn, among rural population the percentage of the disabled who moved about over slightly longer distances was insignificantly higher than that of the urban population (34.8% vs 28.9%, respectively). Significant differences were observed in the structure of locomotor capabilities according to education (P<0.0001). Significant differences in individual scopes of moving about were noted in two categories. The first category was moving about the lodging/house and house yard, which occurred significantly more often than expected among respondents with primary education (35.5%), and significantly more rarely than expected in the group with higher education (15.6%). The second category was moving around without limitations.

This category was significantly more frequent in the group with secondary school education (37.1%) and insignificantly more frequent in the group with higher education (40.3%), whereas it was significantly more rarely noted in the group with primary education (14.3%). **Material standard** occurred to be the factor which strongly differentiated the structure of locomotor capabilities (P=0.0002). Significant detailed differences between groups with various material standard were observed, similar to education, in two categories: moving about the lodging and house yard significantly more often than expected in the group poor/very poor (41.7%), whereas significantly more rarely than expected in the group very good/good (23.5%). In turn, the category moving around without limitations was insignificantly more frequent in the group with very good/good material standard (32.3%), while significantly more rare than expected in the group poor/very poor (12.9%). In the examined population significant differences in locomotor capabilities were also found according to the housing conditions (P=0.007). Similar to education and material standard detailed differences in locomotor capabilities according to the housing conditions were observed in two categories of these capabilities. In the group with very good housing conditions the percentage of respondents who moved about the lodging and house yard was significantly lower than expected (17.7%), whereas insignificantly higher than expected was the percentage of the disabled who moved about without limitations (36.7%). Also, the percentage of those who moved about without limitations was significantly lower than expected in the group with poor/very poor housing conditions (only 4.5%).

Locomotor capabilities according to the most important characteristics describing disability

The causes and scopes of locomotor capabilities depend on many factors which occur independently or are mutually dependent. The most important of these factors are the causes of disability, degree of disability, and the legal status.

In analyses the most frequently applied division of the causes of disability was used, i.e. disease, injury, and congenital/genetic defect. The most frequent cause of disability was disease occurring as the only cause of disability in 81.8% of respondents, in 13.9% these were injuries and accidents, while in 4.3% – congenital/genetic defects (in the case of the last two categories the accompanying cause might have been a disease). The causes of disability were related with differences in the structure of capability for independent moving around (P=0.046), however, after Bonferroni correction none of the analyzed standardized residuals remained significant. In the group where the cause of disability was only a disease the category moving about over slightly longer distances was insignificantly more often noted than expected (33.0%), while insignificantly more rarely than expected – the category moving about the lodging and house yard (25.6%). The last category was insignificantly more frequently observed in the group where the cause of disability was congenital defect (50%). Irrespective of the cause of disability in all three groups the percentage of persons who moved about without limitations was 25% – 27%.

Legal disability status and degrees of disability

According to the legal status the examined population of the disabled has been divided into two groups, i.e. persons with certified degree of disability – conventionally referred to as legally disabled (65.3%), and those without legally certified disability – biologically disabled (34.7%). These two groups significantly differed by the structure of the scopes of independent moving around (P=0.006). Detailed analyses showed that among the legally disabled the category moving about the lodging and house yard was significantly more frequent than expected (31.3%), whereas among those biologically disabled this category was significantly more rare than expected (20.4%). Among the legally disabled the percentage of persons who moved about without limitations was insignificantly lower than expected (23.1%), whereas in the group of those biologically disabled this percentage was insignificantly higher (33.0%).

Persons with legally certified disability status had one of the three degrees of disability: considerable (48.4%), moderate (39.4), or light (12.3%). Significant differences in the scope of independent moving around were observed between the above-mentioned groups (P=0.0002). The higher the degree of disability, the lower the percentages of respondents in the category of those moving around without limitations. However, detailed AR values showed that significant differences occurred only in two cases. In the group with considerable disability the percentage of persons in the category moving about the lodging and house yard was significantly higher (38.3%), while the percentage of those in the category moving around without limitations – significantly lower (15.8%).

Locomotor capabilities and types of problems disturbing daily functioning

Abilities of independent moving around (locomotor capabilities) affect the functioning of every disabled person in all domains of life. A large part of these difficulties concern social relations. Reduced capabilities for independent moving around deteriorate the quality of life in the spheres of the family, occupational activity, or in the local environment.

The frequency of problems disturbing daily functioning according to locomotor capabilities is shown in Table 2. A part of the problems occurred among respondents with insignificantly different intensity, irrespective of the scope of independent moving around. These problems concerned contacts and services on the part of health care and institutions in the social environment: lack of possibilities of rehabilitation at place of residence, difficult access to physician, lack of employment adjusted to disability, or were associated with the family: family disagreements, alcohol abuse by a family member.

Ten problems varying in intensity occurred according to the scope of independent moving around. 1. **Material difficulties** (P=0.02) most often concerned the subpopulation of the disabled moving over slightly longer distances (85.9%), followed by those who moved within the lodging/house and house yard (82.2%). Here, the percentage of persons moving about independently without limitations was the lowest (73.1%). 2. **Difficulties in settling office matters** (P=0.004) were most often reported by respondents who moved about the lodging (63.9%). Here, the percentage of persons moving about independently without limitations was the lowest (73.1%). 3. **Loneliness** (P<0.0001) was most frequently mentioned by those who moved about the lodging (72.2%) and moved about the lodging and house yard (66.1%), whereas most rarely by those who moved about without limitations (32.4%). 4. **Too infrequent contacts with the family** (P<0.0001). This

Table 2. Problems disturbing daily functioning according to locomotor capabilities

Problems		Total		Moves about the lodging	Moves about the lodging and house yard	Moves about at slightly longer distances	Moves about without limitations	P $(AR_{\alpha cor})^A$
		Count	Col. %	Col. $\%_{AR}$	Col. $\%_{AR}$	Col. $\%_{AR}$	Col. $\%_{AR}$	
Material difficulties	No	127	19.3	$19.6_{0.1}$	$17.8_{-0.6}$	$14.1_{-2.3}$	$26.9_{3.0}$	**0.02**
	Yes	531	80.7	$80.4_{-0.1}$	$82.2_{0.6}$	$85.9_{2.3}$	$73.1_{-3.0}$	(2.9)
Lack of possibilities of rehabilitation at place of residence	No	258	39.4	$35.1_{-0.9}$	$37.2_{-0.7}$	$35.9_{-1.2}$	$48.3_{2.8}$	0.05
	Yes	397	60.6	$64.9_{0.9}$	$62.8_{0.7}$	$64.1_{1.2}$	$51.7_{-2.8}$	(2.8)
Difficult access to physician	No	267	40.7	36.1_{-1}	$45.0_{1.4}$	$34.1_{-2.3}$	$46.6_{1.8}$	0.04
	Yes	389	59.3	63.9_{1}	$55.0_{-1.4}$	$65.9_{2.3}$	$53.4_{-1.8}$	(2.8)
Difficulties in settling office matters	No	285	43.5	$36.1_{-1.6}$	$42.2_{-0.4}$	$38.5_{-1.7}$	$54.9_{3.5}$	**0.004**
	Yes	370	56.5	$63.9_{1.6}$	$57.8_{0.4}$	$61.5_{1.7}$	$45.1_{-3.5}$	(2.9)
Loneliness	No	304	46.3	$27.8_{-4.0}$	$33.9_{-3.9}$	$48.1_{0.6}$	$67.6_{6.5}$	**<0.0001**
	Yes	352	53.7	$72.2_{4.0}$	$66.1_{3.9}$	$51.9_{-0.6}$	$32.4_{-6.5}$	**(3.5)**
Too infrequent contacts with the family	No	305	46.7	$28.9_{-3.8}$	$39.1_{-2.4}$	$47.1_{0.1}$	$64.2_{5.4}$	**<0.0001**
	Yes	348	53.3	$71.1_{3.8}$	$60.9_{2.4}$	$52.9_{-0.1}$	$35.8_{-5.4}$	(3.2)
Negative attitude of surroundings towards disability	No	387	59.2	$47.4_{-2.6}$	$52.8_{-2.1}$	$61.7_{0.9}$	$69.6_{3.2}$	**0.001**
	Yes	267	40.8	$52.6_{2.6}$	$47.2_{2.1}$	$38.3_{-0.9}$	$30.4_{-3.2}$	(3.0)
Family disagreements	No	393	60.1	$61.9_{0.4}$	$61.7_{0.5}$	$54.6_{-1.9}$	$64_{1.2}$	0.27
	Yes	261	39.9	$38.1_{-0.4}$	$38.3_{-0.5}$	$45.4_{1.9}$	$36_{-1.2}$	(2.8)
Material dependence on others	No	398	60.9	$45.4_{-3.4}$	$50_{-3.5}$	66.7_{2}	$74.0_{4.1}$	**<0.0001**
	Yes	256	39.1	$54.6_{3.4}$	$50_{3.5}$	33.3_{-2}	$26.0_{-4.1}$	(3.1)
Lack of care by relatives and friends	No	402	61.4	$42.3_{-4.2}$	$57_{-1.4}$	$59_{-0.8}$	$79.3_{5.7}$	**<0.0001**
	Yes	253	38.6	$57.7_{4.2}$	$43_{1.4}$	$41_{0.8}$	$20.7_{-5.7}$	(3.3)
Difficult access to environmental nurse	No	423	64.4	$61.9_{-0.6}$	$63.9_{-0.2}$	$55.8_{-3.1}$	$76.4_{3.9}$	**0.0005**
	Yes	234	35.6	$38.1_{0.6}$	$36.1_{0.2}$	$44.2_{3.1}$	$23.6_{-3.9}$	(3.0)
Difficult access to services from social worker	No	450	68.5	$60.8_{-1.8}$	$68.3_{-0.1}$	$62.1_{-2.4}$	80.5_{4}	**0.0004**
	Yes	207	31.5	$39.2_{1.8}$	$31.7_{0.1}$	$37.9_{2.4}$	19.5_{-4}	(3.1)
Lack of employment adjusted to disability	No	496	75.8	$72.2_{-0.9}$	$79.3_{1.3}$	$72.8_{-1.2}$	$77.9_{0.7}$	0.34
	Yes	158	24.2	$27.8_{0.9}$	$20.7_{-1.3}$	$27.2_{1.2}$	$22.1_{-0.7}$	(2.8)
Necessity of caring for a disabled person	No	534	81.8	$87.6_{1.6}$	$87.2_{2.2}$	$77.5_{-1.9}$	$78_{-1.5}$	**0.020**
	Yes	119	18.2	$12.4_{-1.6}$	$12.8_{-2.2}$	$22.5_{1.9}$	$22_{1.5}$	(2.9)
Alcohol abuse by a family member	No	552	84.5	84.4_{0}	$83.8_{-0.3}$	$85.4_{0.4}$	$84.4_{-0.1}$	0.98
	Yes	101	15.5	15.6_{0}	$16.2_{0.3}$	$14.6_{-0.4}$	$15.6_{0.1}$	(2.7)

[A]In brackets are provided corrected critical AR values. In the table AR values significantly higher than expected are marked in green; AR values significantly lower than expected are marked in red.

problem most rarely concerned persons without locomotor difficulties (35.8%), and most frequently those who moved about the lodging (71.1), and the group of those who moved about the lodging and house yard (60.9%). 5. **Negative attitude of surroundings towards disability** (P=0.001). This complaint was most often reported by those who moved about the lodging (52.6%) and respondents who moved about the lodging and house yard (47.2%), whereas more rarely by the disabled who moved about without limitations (30.4%). 6. **Material dependence on others** (P<0.0001), was also most often indicated by the disabled who moved about the lodging (54.6%), and those moving about the lodging and house yard (50.0%), while more rarely by respondents who moved about over slightly longer distances (33.3%) and those moving around without limitations (26.0%). 7. **Lack of care by relatives and friends** (P<0.0001). This problem most frequently occurred in the group of the disabled who moved about the lodging (57.7%), and most rarely among those who moved about without limitations (20.7%). 8. **Difficult access to environmental nurse** (P=0.0005). This problem was most frequently reported by the group of respondents who moved about over slightly longer distances (44.2%), whereas most rarely among those who moved about without limitations (23.6%). 9. **Difficult access to services from social worker** (P=0.0004). This problem was most often reported by respondents who moved about the lodging (39.2%), and those who moved about over slightly longer distances (37.9), while most rarely by those who moved about without limitations (19,5%). 10. **Necessity of caring for a disabled person** (P=0.020) was most often mentioned by respondents who moved about over slightly longer distances (22.5%) and those who moved about without limitations (22.0%), whereas more rarely by those who moved about the lodging (12.4%) and the disabled moving about the lodging and house yard (12.8%).

Based on the AR values it was assessed which problems with their high or low intensity with respect to expectations distinguished a group with specified capabilities for moving about. In the group with most serious locomotor limitations – **moving about the lodging**, high percentages were observed of those who reported: loneliness, too infrequent contacts with

the family, material dependence on others and the lack of care by relatives and friends. The group of respondents **moving about the lodging and house yard** reported more complaints than expected concerning loneliness and material dependence on others. In the group of the disabled **moving about over slightly longer distances** a significantly higher number of respondents mentioned difficult access to environmental nurse. The most distinctive group were persons **moving around without limitations**. A smaller percentage of them with respect to expectations reported the following problems: Material difficulties, Lack of possibilities of rehabilitation at place of residence, Loneliness, Too infrequent contacts with the family, Negative attitude of surroundings towards disability, Material dependence on others, Lack of care by relatives and friends, Difficult access to environmental nurse, and Difficult access to services from social worker.

DISCUSSION

Each investigated problem concerning the disabled is always associated with the need for adopting a definition or term of disability, which correspond to the adopted research objectives. In scientific studies the definition published by the experts of the World Health Organization (WHO) is most frequently quoted: As disabled are considered persons who cannot partially or totally provide themselves opportunities for individual and social life due to congenital or acquired impairment of physical and/or mental abilities [11]. An interesting philosophy of defining disability was presented by the International Classification of Functioning, Disability and Health (ICF). The concept of 'disability' was introduced in order to define a multidimensional phenomenon resulting from interactions between people and their physical and social environment. Wilmowska-Pietruszyńska emphasizes that ICF does not concern exclusively the disabled, in fact, it applies to everyone. Using ICF all aspects of health and states related to health can be described [12]. Disability is the result of limitations which, to a various degree, lead to the deterioration of physical and/or mental functions. It may be total, partial, permanent or temporary, congenital or acquired, stable or progressive. Each type of disability is troublesome; however, probably one of the most difficult is physical and mental disability. Diagnosing of problems related with disability is difficult due to their multidimensional character, which makes the selection of research methods and tools relatively difficult. Many research goals are obtained by the development of standardized tools, the importance of which is not smaller than that of standard methods. In the presented study data was collected based on the respondents' self-assessment of their locomotor capabilities. This is the best method of real assessment of one's own abilities, in this case locomotor capabilities. A huge plus is the fact that in the medical evaluation of the state of health the self-assessment is also taken into account, and not exclusively objective facts. This especially concerns the disabled with locomotor limitations.

In various populations of the disabled there are various groups of persons with limited locomotor capabilities. From among 64.3 million of adult Americans living with disabilities (25%), one per seven adults has locomotor disability, the disability most frequently occurring in the USA. Most frequently they are females, mainly the representatives of minorities and poor groups living in the south, persons aged 65 and older. Simulation studies show that by 2035 as many as 17 million households (an increase by 7.4 million, compared to 2013) will include at least one person with locomotor disability. Younger persons aged between 45–64, who live below the poverty threshold, are almost five times more exposed to locomotor disability, compared to those who live above the poverty level [13, 14].

Locomotor disorders are most often the consequence of chronic diseases, followed by injuries and congenital/genetic defects. Frequently, disability is the result of many factors, which is called a complex or multiple disability [15]. The consequences of physical disability are extremely complex, and ultimately cannot be fully diagnosed. They are often mutually dependent, for example injuries and anatomical defects, chronic diseases and somatic consequences, genetic defects which often require surgical interventions.

The presented study showed that physical limitations of various types concerned 65.3% of the examined disabled. In 81.8% of respondents disability resulted from a disease. This contradicts the fact that locomotor disorders are most often associated with the effects of injuries and accidents. Meanwhile, most reasons for this state are somatic and psychosomatic diseases. Gait disorders are frequently caused by the effects of neurological diseases. One example may be complaints experienced in the course of discopathy. Thompson considers that the morbidity rate due to this cause is higher than that in the case of ischemic heart disease, or arterial hypertension. An effective therapy for 'back pain' should be a multidisciplinary rehabilitation intervention of a psychobiosocial character [16, 17]. In turn, Hunt et al. undertake problems of chronic inflammatory diseases of the joints which lead to disability, and this state within a short time leads to physical, psychological and social limitations. In order to improve the physical condition it is necessary to introduce full rehabilitation process, or its most needed stages. Persons who underestimate locomotor rehabilitation, especially those older, less educated, have a lower level of psychosocial and physical health [18]. Another, frequent consequence of disability is cerebral stroke, therefore, an interest of many researchers focuses on the assessment of functional capacity and the quality of life of these patients. The main goal of actions undertaken on behalf of patients who had undergone cerebral stroke is full restoration of the lost functions, skills and capabilities, as much as possible, or compensation of irretrievably lost functions. Here, an early rehabilitation is most important [19, 20, 21].

In the examined group the greatest locomotor difficulties were experienced by 14.5% of respondents, whose locomotor capabilities were limited to moving around rooms within the lodging/house. Considering the necessity for staying permanently at home this environment is of the key importance for these persons regarding the quality of life and independence, irrespective of the age at occurrence of disability with locomotor problems. These people have the right to good, physically adjusted housing conditions. A high deficit of lodgings for persons with physical disabilities exposes them to a higher risk of homelessness [12, 22, 23]. According to CCD the disabled at any age, of any race, and those who are poor are affected by the housing crisis in the country, and this factor is highly discriminative [22, 24].

An important problem in the examined population was the lack of possibilities of rehabilitation at the place of residence (60.6%). This problem most often concerned persons who

moved about over slightly longer distances (33.2%). Groups who despite greater problems with locomotion mentioned this problem considerably more rarely were smaller. Possibly, if there were possibilities of rehabilitation in the home environment the disabled would be more interested in these needs. The fact is also puzzling that the examined persons insufficiently perceived the needs related with provision of orthopaedic and rehabilitation aids, mainly by the disabled with the lowest locomotor capabilities (9.4%). All the disabled require rehabilitation; however, many studies demonstrate that the majority experience limitations in access to these activities [7]. Deprivation of a disabled person of rehabilitation in its every respect leads to secondary disability and deterioration of the quality of life [25].

The problem concerning the possibility to undertake employment by persons with locomotor disability are directly associated with rehabilitation (24.2%). This problem was most frequently reported by the respondents moving about at longer distances (35.4%), followed by two subsequent groups, i.e. those who moved about without limitations, and those who moved about within lodging/house – nearly equally often (24.1% and 23.4%). In the group of the disabled with the lowest locomotor capabilities the percentage of such persons was 17.1%. For the disabled occupational activity is one of the stages of rehabilitation. A study by Sierpińska showed that occupationally inactive persons with hepatitis C considerably more rarely accept the disease, compared to those occupationally active [26]. Persons with anatomical deficits, mainly after amputation of higher or lower extremities experience especially great difficulties with finding employment. This type of impairment and other factors, cultural, family, poverty, or finally, the reluctance of employers hinder the disabled to undertake employment [27, 28]. The lack of stable employment is associated with many unfavourable factors. Here, we can talk about multi-stage consequences, namely experiencing health problems, including many chronic diseases, great physical limitations, high risk of poverty, material dependence on others, or the states of depression [29, 30].

Irrespective of the causes of disability accessibility of health care is especially important for the disabled. Most frequently the respondents mentioned hindered access to a primary health care physician and specialists (58.5%). The percentages of persons who expressed such needs for care with respect to the environmental nurse (37.7%) and social worker (31.5%) were the lowest. Care on the part of a nurse and social worker is associated to a high extent with performance of rehabilitation tasks. A study by Sierpińska showed that patients with somatic diseases (hepatitis C) also experience difficulties with contacts with a family physician. Their expectations concern an explanation of the essence of the disease and procedures concerning examinations, treatment, and rehabilitation [31]. A study by Ocoro concerning the overall prevalence of disability and according to the type of disability, and access to health care according to the type of disability demonstrated that locomotor disability was most prevalent among people at middle age (18.1%), and those aged 65 and older. Most often they had a hindered access to health care [14].

Needs in this area evidence the necessity for better organization of health care, especially on the level of primary health care.

A study by Sochańska-Kawiecka showed that not only in the opinion of the disabled, mainly those intellectually disabled, but also according to their caregivers, a great problem is the necessity for waiting in a queue. This is frequently the cause of various antisocial behaviours [32].

One of the greatest problems in daily functioning of the disabled is loneliness (53.7%). This occurs irrespective of the level of physical functioning of the disabled; however with various frequency. A study by Emerson showed that the disabled experienced loneliness, low perception of social support and social isolation to the considerably higher degree, compared to those able-bodied. The frequency of occurrence of loneliness was the highest among the adult disabled who were younger, occupationally inactive, lived in rented lodgings, lived alone, and had a low level of access to the environmental resources. Loneliness is relatively common in the general population. For example, in England 5% of adults indicate that they feel lonely 'frequently' or 'always', and the subsequent 16% admit that they feel lonely 'from time to time', whereas in Germany 11% of adults aged 35–74 report the feeling of loneliness [33]. According to Borowiecki the protection against loneliness is education aimed at the preparation of a person for social life and equipping with skills necessary for coping with difficult situations [34].

An extremely difficult problem with which 40.8% of respondents struggle in their daily life were negative attitudes of the local community towards disability. It is a puzzling fact that the negative behaviours due to disability were equally often perceived by respondents with the lowest level of locomotor capabilities (19.1%), and those who were able to move about without limitations (19.5%). In the remaining categories of locomotor capabilities the percentages were higher, whereas the highest percentage concerned persons who moved about over slightly longer distances (33.3%). Many studies show that behaviours and attitudes of the members of society towards the disabled are extremely diverse. They may be specified according to the scale from excessive kindness to pity, through indifference to disapproval, or even disgust. These behaviours most often concern persons with dysfunctions of the motor organs, with cognitive disorders, and mental diseases, but not only. In their study Hilbert et al. attracted attention to an important problem of discrimination due to obesity. Epidemiologists call obesity an epidemic of contemporary time, although the term epidemic is always reserved for the assessment of contagious diseases [35]. By medicalization of obesity classification of obesity as a disease or disability is promoted, in order to decrease or protect against stigmatization and discrimination due to body weight [36, 37]. Based on a study conducted using a self-report questionnaire in a representative German population Hilbert demonstrated that in society a significantly greater acceptance was observed of the term disease than acceptance of the term disability [35]. In their study conducted in a group of 13,996 adult participants of the weight control programme living in Australia, Canada, France, Germany, Great Britain, and the United States Puhl et al. confirmed that 58% of the participants experienced stigmatization related with weight. The researchers showed a high support for the policy of counteracting bullying because of weigh [38]. A study by Subu et al. on patients in Indonesia demonstrated that not only the disabled with mental diseases struggle with negative experiences in the sphere of discrimination, but also employees of health care, mainly nurses involved in the care of metal health [39]. In turn, a study by Sulaimani et al. showed that persons suffering from autism are also subject to discrimination; however studies of

this problem are scarce [40]. This problem still requires many more studies in order to confirm the relationship between discrimination and the state of health [41, 42, 43].

For each disabled person, irrespective of the type of disability, relations with the members of the nearest family are most important. The presented study showed that unfortunately in nearly a half of the respondents these relations are disturbed. These problems were defined as infrequent contacts with the family (53.2%), significantly dependent on the scopes of performance in locomotion. This problem equally often affected persons moving about within an lodging/house, and those moving over slightly longer distances (31% each). Nevertheless, the lowest and similar percentages were observed in the subpopulation of the disabled moving about exclusively around the lodging/house (19.8%) and in the group of those mobility-efficient. Social dysfunctions include also family disagreements (40.0%) insufficient care on the part of relatives and friends (38.6%), and alcohol abuse by at least one family member (15.5%). In turn, a study by Sochańska-Kawiecka showed that as many as 45% of respondents considered that a disabled person and his/her family cannot count on support of organizations and institutions functioning in Poland, and the same percentage reported the lack of reliable information concerning assistance available on the part of support institutions [32]. The respondents often deny that their family is covered with care when a disabled person occurs within it.

One of the difficult problems burdening the respondents on a daily basis is the necessity to provide care for another disabled person who is a family member, despite own body dysfunctions (18.3%). This may evidence, among other things, an insufficient medical and social care in the environment, stereotypic thinking about the disabled, and negative attitudes towards them [39].

Despite many research, legal, and organizational achievements, the problem of the occurrence of the phenomenon of disability in many societies still remains not so much underestimated as not fully understood in its multidimensional character. This is evidenced even by the confirmed facts concerning inequalities in health, especially in populations of rural disabled. Persons with limitations of locomotor capabilities encounter an especially large number of difficulties in daily life, mainly those who require the provision of specialist orthopaedic, rehabilitation, and technical aids. The disabled are often treated as either undemanding or demanding persons. They have the same right to the feeling of safety and freedom to choose their life as persons free from various types of dysfunctions of the body which generate disability [44]. Until effective educational programmes are implemented for all social groups, a low level of knowledge of society concerning disability and the disabled will not change the fate of the majority of these people. Friedman writes that work on an individual scale in order to provide better services and support for individual disabled persons is needed, but still insufficient [45]. A wide range of activities is needed here in the area of public health.

In order to facilitate for the disabled an access to information about the forms of support in functioning in the environment the Social Insurance Institution (ZUS) and the State Fund for Rehabilitation of Disabled Persons (PFRON) developed a Guide for Persons with Disability. A lot of information includes, among other things, the course of medical certification, principles of granting allowances, conditions of therapeutic rehabilitation carried out by the ZUS, employee rights, and principles of applying for such a type of support. On request of the environment of persons with disabilities in the Guide instead of the statutory term 'a disabled person' was used the wording 'a person with disability' [46]. In this respect a study by Albin et al. is interesting, who together with many co-authors of various professions presented own terms for disability. They also paid attention to the fact that the term 'a disabled person' is the wrong term, should be a person 'with disability', because such a form emphasizes the strength of the person, and does not assign him/her a role [47].

CONCLUSIONS

1. The scope of independent moving around of the examined group of the disabled depends on age. Full locomotor capabilities of the disabled, i.e. capabilities to move about without limitations significantly decrease in persons aged over 64. At the age of 80 and older a significant increase is observed in the percentage of persons with very limited locomotor capabilities: moving about the lodging, and moving about the lodging and house yard.
2. Among the disabled in the study low level of education, low material standard and poor housing conditions are associated with decreased capabilities for independent moving around without limitations.
3. No differences in the scope of independent moving around were found according to light and moderate degrees of disability. Only the persons within a considerable degree of disability had capabilities lower, compared to the disabled possessing lower degrees of disability.
4. The types and number of problems with which the disabled struggle depends on the scope of their capabilities for independent moving around. In the most unfavourbale situation are persons with the lowest locomotor capabilities: moving about the lodging, moving about the lodging and house yard, those who experience loneliness, the lack of contact with the family, and material dependence on others.
5. In every dimension of functioning disability belongs to the scope of issues of public health. An especially important problem for the disabled is elimination or limitation of architectural and social barriers, increasing an access of the disabled to rehabilitation actions in their environment of life, both in urban and rural areas.

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