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## BURDEN OF CHRONIC HEALTH CONDITIONS IN ADOLESCENCE MEASURED BY SCHOOL SURVEYS

### OBCIĄŻENIE CHOROBAМИ PRZEWLEKŁYMI W OKRESIE DORASTANIA MIERZONE NA PODSTAWIE SZKOLNYCH BADAŃ ANKIETOWYCH

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#### Abstract

*The Chronic Conditions Short Questionnaire (CCSQ) included as an optional package in the Health Behaviour in School-aged Children (HBSC) study protocol identifies adolescents with chronic conditions, and helps to understand the psychosocial impact of such illnesses. However, reliability of the results depends on the proper definition of the group with chronic conditions.*

**The aim** of this paper is to report on the validity of self-reported data on chronic conditions obtained from the CCSQ questionnaire used in a large school-based population study.

**Material and methods:** The data was obtained from the 2010 HBSC study conducted in Poland in a group of 4570 pupils aged 13-17. The CCSQ includes three questions about chronic illness or disabilities occurrence diagnosed by a physician, and its selected consequences (missing school classes, medication). Four complex continuous scales were used as validation modules: the subjective complaints checklist and three sub-scales from the abbreviated Child Health and Illness Profile (CHIP-AE) questionnaire. The oldest age group was additionally asked about functional difficulties in: seeing, hearing, speaking, moving and breathing. Analysis of Variance with the post hoc test was used to compare subgroups of students defined according to CCSQ and functional difficulties.

**Results:** Chronic conditions were reported by 20.3% of young respondents (95% confidence interval 19.2-21.5%). A statistically significant difference was found between the mean indexes of all validation scales when comparing healthy and chronically-ill students meeting criteria of CCSQ. The difference increases in comparison with chronically-ill students with functional difficulties, missing classes or taking medication.

**Conclusions:** The CCSQ questionnaire is an appropriate tool for assessing the occurrence of long-term health problems from the perspective of adolescents. The instrument also importantly allows for an assessment of the impact of chronic and long-term conditions on medication usage and hindered access to education. Occurrence of long-term health problems is a significant confounding variable that should be routinely included in school surveys on health and health behaviours.

**Key words:** chronic conditions, school surveys, questionnaires, burden of disease

#### Streszczenie

Krótki kwestionariusz na temat występowania chorób przewlekłych (CCSQ – Chronic Conditions Short Questionnaire) został włączony do protokołu dwóch ostatnich serii międzynarodowych badań nad za-

chowaniami zdrowotnymi młodzieży szkolnej (HBSC – Health Behaviour in School-aged Children). Dysponowanie takim narzędziem daje unikatową możliwość porównywania uczniów zdrowych i chorych w wybranych krajach, pod warunkiem, że uczniowie chorzy zostali prawidłowo zidentyfikowani.

**Celem** tej pracy była ocena trafności kwestionariusza CCSQ na podstawie wyników anonimowego badania ankietowego przeprowadzonego w szkołach w populacji ogólnie uznawanej za zdrową.

**Materiał i metody:** Wykorzystano wyniki ostatniej serii badań HBSC przeprowadzonych w Polsce w 2010 r. w grupie 4570 uczniów w trzech rocznikach (średnio w wieku 13;7; 15,7 i 17,7 lat). CCSQ zawiera trzy pytania, z których pierwsze dotyczy obecności choroby przewlekłej stwierdzonej przez lekarza, a dwa pozostałe wybranych związanych z nią obciążeń (opuszczanie zajęć szkolnych, konieczność przyjmowania leków). Porównywano uczniów zdrowych i chorych pod względem wyników uzyskanych dla czterech skal zdrowotnych pochodzących z protokołu badań HBSC lub skróconej polskiej wersji kwestionariusza Child Health and Illness Profile (CHIP-AE). Najstarsza grupa była dodatkowo pytana o wybrane problemy funkcjonalne związane ze wzrokiem, słuchem, poruszaniem się i oddychaniem. Zastosowano analizę wariancji z testem post hoc dla porównania podgrup młodzieży wyróżnionych ze względu na obecność choroby przewlekłej i ograniczeń funkcjonalnych.

**Wyniki:** 20,3% ankietowanych nastolatków uznało, że ma długotrwałe problemy ze zdrowiem. Przy porównaniu uczniów spełniających i niespełniających kryteria CCSQ uzyskano statystycznie istotną różnicę średnich indeksów wszystkich skal walidacyjnych. Wyniki uzyskane na tych skalach dodatkowo pogarszają się w przypadku występowania obciążeń związanych z chorobą lub ograniczeń funkcjonalnych.

**Wnioski:** CCSQ wydaje się być dobrym narzędziem identyfikującym dzieci i młodzież z długotrwałymi problemami zdrowotnymi w badaniach samoopisowych. Dodatkowo pozwala ono na ocenę obciążeń wynikających z choroby, takich jak: konieczność stałego przyjmowania leków lub ograniczony dostęp do zajęć szkolnych. Wobec narastającej epidemii chorób przewlekłych, pytania na ten temat powinny być rutynowo wprowadzane do badań ankietowych na temat zdrowia i zachowań zdrowotnych młodzieży szkolnej.

**Słowa kluczowe:** przewlekłe problemy zdrowotne, badania ankietowe w szkołach, kwestionariusze, obciążenie chorobą

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## INTRODUCTION

Chronic health conditions are a growing health problem among children and adolescents (1); early diagnosis, treatment and management are crucial. Furthermore, chronically-ill children need to be provided with social and emotional support to enhance their relationship with family and peers, as well as to improve their school life (2, 3). Surveys of adolescents are likely to be a valuable source of information about their experience of living with a long-term or chronic condition, and therefore gives an opportunity to assess the psychosocial effects of chronic conditions from the perspective of a young person (4). However, perception of chronic illness depends on the age of the young person, and involves cognitive, psychological, social and cultural elements. The items in the questionnaire should be understood by children, yet at the same time fit to the general operational definition of chronic illness. The lack of validated tools measuring self-reported chronic disease status is an obstacle limiting the development and wider use of this method of research. Validation of a questionnaire is a complex process that involves assessing its comprehensibility, acceptability, reliability and validity (5). The comparison of results obtained using a variety of tools, which theoretically should measure the same phenomenon, is considered to be a very important part of a validation study.

Questions on chronic conditions have been included in non-medical studies conducted among adolescents since late 80's. To our knowledge there is a limited number of validation studies of short generic questionnaires designed for adolescents with long-term or chronic conditions. There have been some studies relating to the validity of questionnaires completed by parents: these were based on comparisons with medical documentation (6, 7). In addition, a kind of research can be identified where the assessment of health problems from the perspective of the children, adolescents and the parents is compared; however, this is mostly done without reference to another external clinical criterion (gold standard) (8, 9).

Numbers of children affected by chronic illnesses or medical conditions vary depending on research method and applied definition. To define this group of adolescents, non-categorical approach (6, 7) has been used with the assumption that there are similarities in the living experiences of adolescents with different chronic conditions. The Chronic Conditions Short Questionnaire (CCSQ) served as a research tool. It was developed by an interdisciplinary research group and implemented in the HBSC (Health Behaviour in School-aged Children) World Health Organization collaborative study. It is conducted in schools collecting cross-national data every

4 years. The CCSQ was used as an optional package in 13 countries in the 2005/06 HBSC study, and in 15 out of the 43 countries in the HBSC research network in 2009/10. The CCSQ questionnaire was based on the previous experiences of researchers from Finland and Canada (10). In these countries, chronic conditions items were included in the HBSC survey as early as 2001/02 in addition to mandatory international protocol. The results of analyses published previously relate to various aspects of the functioning of adolescents with chronic conditions, including: emotional problems (10); adjustment to school (11); physical activity (12); injuries (13, 14), and bullying victimisation (15, 16). In Poland, after the initial experiences from 2006, it was decided to conduct an additional nationwide validation study. The 2010 Polish HBSC questionnaire was supplemented with a number of questions which, theoretically, should have differentiated between healthy and chronically-ill individuals, and between children with minor and major disorders.

**The aim** of this paper is to report on the validity of self-reported data on chronic conditions obtained from the CCSQ questionnaire used in a large school-based population study. Secondary aims were: 1) To assess if the CCSQ enables the determination of the severity of the condition; and 2) To assess to what extent the CCSQ enables to understand the impact of a long-term condition on wellbeing.

## MATERIAL AND METHODS

### The Sample

The CCSQ was completed in Poland by students aged 13, 15 and 17 years (N=4570) as part of the 2010 HBSC study. The survey group comprised of 1637 students aged 13, 1547 students aged 15, and 1386 students aged 17 years. Looking at the demographic characteristics, 52.6% were female; urban city, small-town and rural dwellers made up 36.3%, 27.0%, and 36.7% of respondents, respectively. The student response rate was 81.8%. Data was collected using standardised self-completion questionnaires administered in a classroom setting. Participation was anonymous and voluntary, and the protocol was accepted by a local bioethical committee. A detailed description of sampling and the organisation of the research can be found in the international (17) and national (18) report.

### Measures

#### Chronic Conditions Short Questionnaire

The layout of the CCSQ can be found in figure 1. A standard cleaning procedure was applied, resulting in the reduction of missing data from 2.4% to 0.9%.

Based on the CCSQ, students were classified in three categories:

- healthy students;
- students with a chronic condition without related consequences (in terms of medication or school attendance);
- students with a chronic condition and related consequences (fig. 1).

1. Do you have a long-term illness, disability, or medical condition (like diabetes, arthritis, allergy, or cerebral palsy) that has been diagnosed by a doctor?

Yes

No

2. Do you take medication for your long-term illness, disability or medical condition?

I do not have long-term illness, disability or medical condition

Yes

No

3. Does your long-term illness, disability or medical condition affect your attendance and participation at school?

I do not have long-term illness, disability or medical condition

Yes

No

Fig. 1. Template of Chronic Conditions Short Questionnaire (CCSQ).

Ryc. 1. Wzór krótkiego kwestionariusza na temat chorób przewlekłych (CCSQ).

#### Additional items on functional difficulties

In addition, the older age group was asked about functional difficulties to explore the severity of their chronic conditions. It included a question about the occurrence of selected symptoms which are proof of limited functional abilities and, irrespective of the CCSQ, could measure the severity of the condition. Questions were asked about difficulties in sight (but not about wearing glasses), hearing, speech, moving, and breathing. These were based on the question used in the HBSC survey in Finland and Canada in 2001/02 (10), and in Poland (19).

#### Health measure

Four health scales were adopted as validation modules: the first two were given to the three age groups studied, and the last two were only given to 17 year olds. In all scales, students were considered to have more health problems if they reported a high score.

**SCL – Symptoms Checklist:** Students were asked to indicate on a five-point Likert scale (from rare to almost daily) how often they experienced eight complaints: headache, abdominal pain, backache, feeling low, irritability or bad mood, feeling nervous, sleeping difficulties, and dizziness (20). This scale ranged from 0-32, and has Cronbach's alpha equal to 0.842.

**LA – Limitations in Activity:** This is a module of seven questions from the CHIP-AE questionnaire (*Child Health and Illness Profile – Adolescent Edition*) (21). It assesses the restriction of activity as manifested by absence from school and the reduction in normal activities, as well as specific limitations in mobility. This scale ranged from 0-28, and has Cronbach's alpha equal to 0.742.

In addition, 17 year old students answered eight further questions from the abbreviated Polish version of the CHIP-AE questionnaire examining physical and psychosocial feelings (substantially distinct from SCL): the 3-element Physical Discomfort (PD) ranged from 0-12, and the 5-element Emotional Discomfort (ED)

scale ranged from 0-20, with identical response categories as in the LA. Cronbach's alpha was equal to 0.796 and 0.853, respectively.

### Analysis

The  $\chi^2$  test was used for the comparison of frequencies. Convergent validation was explored by comparing the mean scores of the indices of the four scales (SCL, LA, PD and ED) in groups identified according to the occurrence of chronic conditions and co-existing consequences. Additionally, the influence of limitations in functioning of four analysed indices was studied in children with chronic conditions. A one-factor analysis of variance (ANOVA) was used to explore the overall difference between subgroups of students, while the Games-Howell post-hoc test was used to compare the subgroups of students. All reported p-values are two-tailed, and statistical significance is  $p < 0.05$ . Statistical analyses were performed using SPSS v.17.

## RESULTS

### Prevalence of chronic conditions and related consequences (CCSQ questionnaire)

Data on the prevalence of chronic conditions and consequences are presented in table I. Overall, in the surveyed group of Polish students aged 13-17 years, chronic conditions were reported in more than one-fifth (20.3%; 95% confidence interval 19.2-21.5%). The prevalence was significantly higher in girls than in boys (22.5% vs 17.9%, respectively;  $p < 0.001$ ). Chronic conditions were reported relatively less often among 13 year-old students (17.5%) than among 15-17 year-olds (21.9%) ( $p < 0.001$ ). Among students having reported chronic conditions, 57.0% indicated that they take medication related to their condition, and 24.6% stated that the chronic condition is the reason for missing school classes; 64.6% of them reported at least one of these two restrictions. Finally, the surveyed population was divided into three groups of students: healthy (79.7%), and those with chronic conditions without (7.2%) and with (13.1%) related consequences.

### Health problems among students meeting CCSQ criteria

Students reporting a chronic condition according to the CCSQ had significantly higher means on four complex scales under study (in table II comparison (1) vs (2);  $p < 0.001$  for all scales). A higher level of health problems was found for all scales among students with chronic conditions and co-existing consequences, when compared to others. By using the post-hoc test, significant differences in scores were found between the following groups:

- healthy students and those with chronic conditions without co-existing consequences only for the SCL and PD scales;
- healthy students and those with chronic conditions with co-existing consequences for all scales;
- students with chronic conditions with and without co-existing consequences only for the LA and PD scales, and tending to significance for SCL ( $p = 0.057$ ).

### Additional effect of functional difficulties in 17 year-old students

There was 9.5% of missing data on functional difficulties. One of the five functional difficulties occurred in 17.9% of 17 year-old students. This percentage was 7.8% in the group of healthy students and 51.4% in the group of students with chronic conditions, according to the CCSQ. This percentage was also higher in students who were frequently absent from school or were taking medication (56.3%) when compared with students with chronic conditions but without such restrictions (42.0%) ( $p = 0.021$ ).

Figure 2 shows the prevalence of detailed functional difficulties (ranging in descending order), depending on the classification based on the CCSQ. The percentage of difficulties among healthy students varies between 0.6% (limitation in movement) to 4.4% (difficulties in seeing). No significant difference was found between those with and without condition-related consequences. In the group of children with chronic conditions, limitation in movement were ranked second among all problems.

Table I. Prevalence (%) of chronic conditions and related burdens according to the CCSQ criteria.

Tabela I. Występowanie (%) chorób przewlekłych i związanych z nimi obciążeń według kryteriów kwestionariusza CCSQ.

CCSQ item	Total	13 yrs	15 yrs	17 yrs
Among the total sample (N=4,570)				
Students with chronic condition	20.3	17.5	22.4	21.4
Students who need medication	11.5	9.4	13.2	12.2
Students who miss classes	5.0	4.3	5.1	5.7
Students with at least one disease-related consequence	13.1	10.8	14.7	14.1
Among students reporting chronic conditions (N=929)				
Medication	57.0	57.3	59.0	58.1
School absence	24.6	24.6	22.8	26.9
At least one listed above	64.6	61.7	65.9	65.9

Tabela II. Means scores ( $\pm$ SD) for complex health scales in relation to chronic conditions (CC) and related consequences.Tabela II. Średnie indeksy ( $\pm$ SD) dla złożonych skal zdrowia w zależności od występowania chorób przewlekłych (CC) i wybranych związanych z nimi obciążeń.

Subgroups by CCSQ	Subjective Complaints (SCL)	Child Health and Illness Profile – Adolescent Edition (CHIP-AE) subdomains		
		Limitations of Activity (LA)	Physical Discomfort* (PD)	Emotional Discomfort* (ED)
Total sample	9.4 $\pm$ 7.0	2.6 $\pm$ 3.4	4.4 $\pm$ 3.0	6.1 $\pm$ 4.5
Healthy students (1)	8.9 $\pm$ 6.8	2.4 $\pm$ 3.2	3.9 $\pm$ 2.9	5.7 $\pm$ 4.4
Students with CC (2) in which:	11.7 $\pm$ 7.5	3.3 $\pm$ 4.0	5.4 $\pm$ 3.2	7.5 $\pm$ 4.8
– without consequences (3)	10.9 $\pm$ 7.0	2.6 $\pm$ 3.1	4.8 $\pm$ 3.2	6.2 $\pm$ 4.3
– with consequences (4)	12.1 $\pm$ 7.7	3.7 $\pm$ 4.4	5.6 $\pm$ 3.2	8.1 $\pm$ 4.9
Post hoc test - p value				
(1) vs (3)	<0.001	0.389	0.025	0.460
(1) vs (4)	<0.001	<0.001	<0.001	<0.001
(3) vs (4)	0.057	<0.001	0.087	0.003

\*Questions asked only to 17 year-old students.

Table III presents the mean health scores in four subgroups of chronically ill 17 year old students. Post-hoc tests showed significant difference between the most extreme groups (1 and 4):  $p < 0.001$  (SCL),  $p = 0.009$  (LA),  $p = 0.025$  (PD),  $p = 0.006$  (ED). However, within the groups that were homogenous in terms of the presence of disease-related consequences (1 vs 2 and 3 vs 4), the additional effect of functional difficulties were not seen. The two last groups are only explicitly different in the limitations in the everyday activity index (LA) ( $p = 0.006$ ). The comparison of the two groups of adolescents with functional limitations (Groups 2 and 4 in table III) showed no significant differences in the average index of health.

## DISCUSSION

In the past, attempts to standardise the methods of measuring the occurrence of chronic conditions in children in non-clinical studies have been mostly determined from questionnaires completed by their parents. Cognitive studies confirmed the need of asking adolescents directly about their health and health-related needs and feelings (4). This study aimed to assess the validity of the CCSQ questionnaire, a self-reported measure of chronic conditions used in a school-based population study carried out in 2010 in Poland among 4570 students aged 13-17. The validity of this questionnaire, which is an international tool promoted by the HBSC research network, was assessed. The study proves the consistency of the CCSQ with the answers to related questions, mostly from the CHIP-AE questionnaire. Considering the low percentage of missing data and incoherent answers, the

CCSQ was an understandable questionnaire for students during early to mid adolescence.

### *Strengths of the CCSQ as a part of the HBSC questionnaire*

The CCSQ uses the non-categorical approach (6, 7, 22) to measure the occurrence of chronic conditions in a population. The simple construction of the CCSQ makes it possible to include it in other, more complex research tools, and to use it in international research. The CCSQ meets the criteria of a non-categorical instrument, as it has a clear definition of a long-term health problem or disease (23, 24).

The inclusion of questions about chronic conditions in large-scale school surveys like the HBSC is valuable in assessing the impact of health conditions on certain aspects of quality of life. The school environment offers a means for young people to comment on their life outside medical setting. Therefore, the improved level of confidentiality and comfort is offered for young people to answer a range of health related questions. Moreover, as the HBSC questionnaire addresses a broad range of issues pertinent to young people, it offers an opportunity for young people with chronic conditions to highlight issues concerning their overall wellbeing.

### *Methodological considerations*

The CCSQ questionnaire demonstrates considerable strengths over a single question, open-ended item, or extended categorical approach (checklists of medical disorders or disease types) when researching the occurrence of chronic conditions. Co-existing problems related to

Table III. Means scores ( $\pm$ SD) for complex health scales in relation to functional difficulties among 17 year-old students reporting chronic conditions identified by CCSQ.Tabela III. Średnie indeksy ( $\pm$ SD) dla złożonych skal zdrowia w zależności od występowania problemów funkcjonalnych u 17-latków z chorobami przewlekłymi według kryteriów CCSQ.

Disease-related consequences and functional difficulties	N	Subjective Complaints (SCL)	Child Health and Illness Profile Adolescent Edition (CHIP-AE) subdomains		
			Limitations of Activity (LA)	Physical Discomfort (PD)	Emotional Discomfort (ED)
Chronically ill without related consequences					
– without functional difficulties (1)	58	9.8 $\pm$ 5.8	2.5 $\pm$ 3.6	4.5 $\pm$ 3.4	6.0 $\pm$ 4.2
– with functional difficulties (2)	42	12.9 $\pm$ 7.3	3.4 $\pm$ 3.4	5.1 $\pm$ 3.0	6.5 $\pm$ 4.6
p – post hoc (1) vs. (2)		0.158	0.553	0.894	0.939
Chronically ill with related consequences					
– without functional difficulties (3)	84	12.1 $\pm$ 7.0	2.8 $\pm$ 2.7	5.1 $\pm$ 3.3	7.8 $\pm$ 5.1
– with functional difficulties (4)	108	14.6 $\pm$ 7.3	4.5 $\pm$ 4.1	6.1 $\pm$ 3.1	8.5 $\pm$ 4.8
p – post hoc (3) vs. (4)		0.072	0.006	0.159	0.811

the need to take medication and/or miss school classes are good indicators of severity. The question about school absence, included in the CCSQ, is an important disease burden measurement, and has been confirmed by the studies by Lightfoot *et al.* In the interviews conducted, students with chronic diseases mentioned school absence as one of the main problems, along with the difficulties in communicating with teachers and peers (25).

Overall, results from all the applied health scales worsened in students with chronic conditions, when compared to healthy peers. It was shown that students with chronic conditions who do not suffer from co-existing problems differed from healthy peers mainly with respect to the occurrence of subjective complaints (SCL). It may therefore be assumed that if only one basic question about chronic disease occurrence is used, some individuals with unspecific subjective complaints will be categorised as ill. This makes the inclusion of additional questions, showing the extent of disease severity, even more important. Two additional questions proposed in the CCSQ also seem to be more important than an analysis of functional problems, as used previously in the Finnish and Canadian studies (10). The weakness of questions about functional problems is in the amount of missing data when compared to the CCSQ. It could be argued whether the list of functional problems should be expanded (e.g. seizures). Nevertheless, functional difficulties may be considered to be included in research. The analysis of specific functional difficulties provided additional arguments in favour of the CCSQ's validity. Considering that asthma is one of the main chronic illness during childhood and adolescence (26), the highest percentage of young people indicated breathing problems as expected.

Another, although secondary, aim of this type of research was to assess the prevalence of chronic conditions, as well as geographical variations and related trends. It should be noted that in school surveys a small number of children with more serious disorders is not included as they are outside the mainstream school system or live in residential care facilities. Results of school surveys cannot be generalised for the entire population, but they can provide a good estimation of total prevalence (27). The proportion of students with chronic illnesses in the 2010 Polish HBSC survey did not differ greatly from the results of the national 2009 Health Interview Survey, where parents were the respondents (28). It was also similar to the percentage found in many other countries participating in the HBSC study. By including the CCSQ questionnaire in school surveys, the likelihood of correct allocation of students to the ill group or the healthy group is quite high.

#### Limitations of the study

Although CCSQ is an international tool, the data used here is from only one country. All validation questions, including those about functional difficulties, were only available for one group, which was already at the threshold of adulthood. The number of cases of functional difficulties was rather low. The differences in their prevalence among the chronically ill group with and without related consequences (fig. 2) were likely to be important. However, the low number of cases probably caused the lack of statistical significance.

From a clinical point of view, the presence of symptoms included in the validation scales do not confirm any illness in terms of medical diagnosis. However, it can be

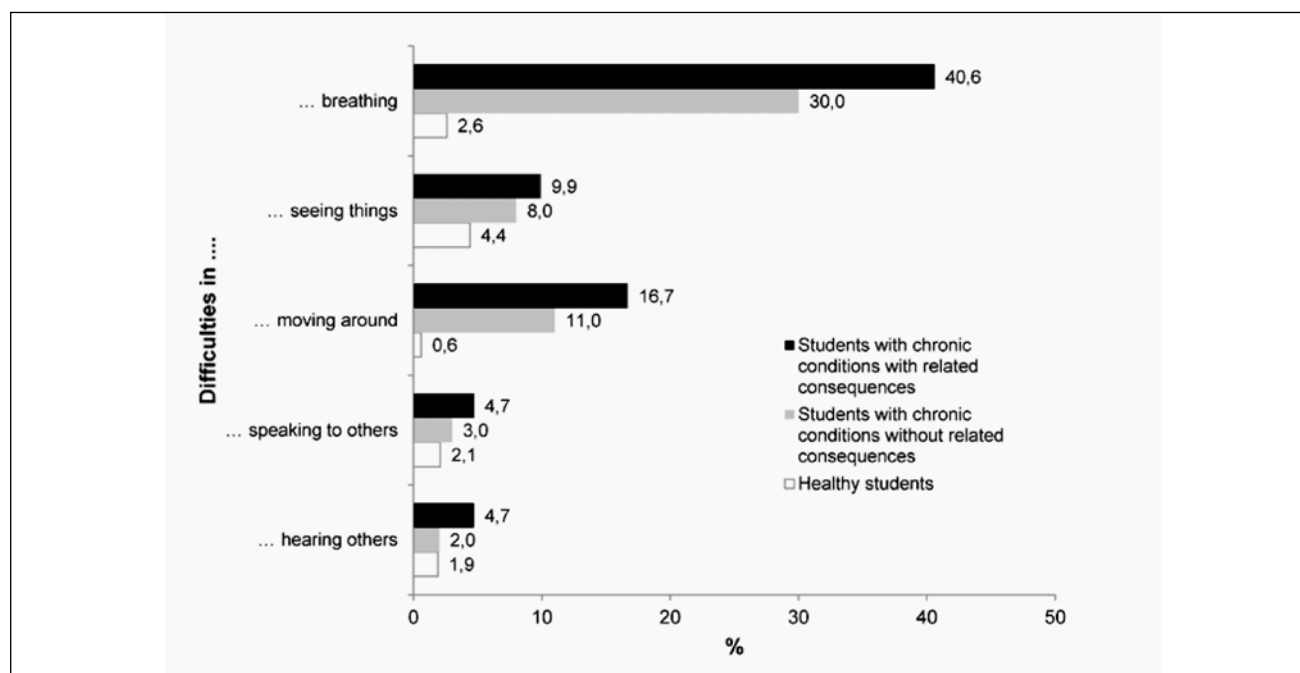


Fig. 2. Incidence of selected functional difficulties among 17-year-old students meeting criteria of the CCSQ.

Ryc. 2. Występowanie wybranych problemów funkcjonalnych u 17-latków spełniających kryteria CCSQ.

assumed that the CCSQ, in a simple manner, identifies students with a number of confirmed health problems (29) who should be included in further study, based on international HBSC data.

#### Implications for further research and practice

Since a growing percentage of adolescents with chronic diseases, this group will significantly influence the assessment of health of the entire population. When analysing various aspects of student wellbeing, it is justified to treat the information about the occurrence of long-term health problems as a significant confounding variable. The CCSQ questionnaire is an appropriate tool for assessing the occurrence of long-term health problems from the perspective of adolescents. However, efforts to improve it are highly recommended.

The results obtained here deserve particular attention, especially when interpreting future research based on HBSC data collected in other countries. It is difficult to identify the determinants of a self-reported health if information on chronic conditions are not included in proposed models, as confirmed by previous studies (30, 31). Conclusions reached so far have strong practical implications. Omitting the information on chronically-ill children in population studies excludes the possibility of identifying their needs, and makes it more difficult to implement appropriate preventive strategies and to evaluate their effectiveness (23, 32).

## CONCLUSIONS

1. The population of children and adolescents with chronic diseases has increased over recent decades. Despite the vast literature related to this issue, we still know too little about the impact of chronic diseases on the functioning of young individuals in school and peer

environments. School surveys may be an excellent source of relevant information, provided that the group of the chronically ill students is identified correctly. Questionnaires used in school surveys should be assessed for their reliability and validity.

2. The Chronic Conditions Short Questionnaire is an example of a reliable and valid short instrument to be used in other studies. It uses a standard non-categorical approach. The definition of a chronic illness was fully understandable for adolescents aged 13 or more. Occurrence of long-term health problems is a significant confounding variable that should be routinely included in school surveys on health and health behaviours.

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