

## Physical Functioning of Epileptic Children

### Funkcjonowanie fizyczne dzieci chorych na padaczkę

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#### Abstract

**Introduction.** Epilepsy belongs to the most frequently occurring nervous conditions. Depending on the course of the disease and on the support provided to the child from his/her closest family, the child's physical, mental and social functioning differs.

**Aim.** The aim of this paper is the physical functioning of epileptic children in the opinion of their parents.

**Material and Methods.** The study was performed on 94 children with diagnosed epilepsy, treated in the Department of Infectious Diseases and Child Neurology, Poznan University of Medical Sciences. A proprietary polling questionnaire as well as a parent-targeted QOLCE (Quality of Life in Childhood Epilepsy Questionnaire) served as the measure; consequently, parents or carers to the children within the study were also included as participants.

**Results.** The studied children were rarely left unmanned during play, and they never spent a night out. In the assessment of the physical functioning performed by fathers and mothers, a statistically significant difference ( $p \leq 0.05$ ) was observed; children function better in this section according to mothers. The parents'/carers' education as well as the child's educational facility is a statistically significant ( $p \leq 0.05$ ) factor influencing physical functioning of a child. No significant difference was noted between the child's area of residence ( $p \geq 0.05$ ) and age ( $p \geq 0.05$ ) and his/her physical functioning.

**Conclusions.** The majority of the studied children attended a school or a kindergarten. Epilepsy significantly limits children when it comes to their physical functioning. Among factors influencing the level of a child's physical functioning, parents' education and child's educational facility present themselves as the most relevant. (JNNS 2015; 4(4):146–151)

**Key Words:** children, physical functioning, epilepsy

#### Streszczenie

**Wstęp.** Padaczka jest jedną z najczęściej występujących chorób układu nerwowego. Zależnie od przebiegu choroby oraz wsparcia, jakie uzyskuje dziecko od najbliższych, różnie kształtuje się jego funkcjonowanie w sferze fizycznej, psychicznej i społecznej.

**Cel.** Celem pracy była ocena funkcjonowania fizycznego dzieci chorych na padaczkę w opinii ich rodziców.

**Materiał i metody.** Badaniem objęto 94 dzieci z rozpoznaną padaczką, leczonych w Szpitalu Klinicznym UM w Poznaniu w Klinice Chorób Zakaźnych i Neurologii Dziecięcej. Narzędziem badawczym był autorski kwestionariusz ankiety oraz kwestionariusz do oceny jakości życia dzieci z padaczką (QOLCE — Quality of Life in Childhood Epilepsy Questionnaire) przeznaczony dla rodziców — z tego też względu w badaniu wzięli udział rodzice lub opiekunowie badanych dzieci.

**Wyniki.** Badane dzieci rzadko pozostawały bez opieki w czasie zabawy oraz nie spędzały nocy poza domem. W opinii kobiet, dzieci istotnie statystycznie lepiej funkcjonują w obszarze fizycznym ( $p \leq 0,05$ ). Wykształcenie rodziców/opiekunów oraz miejsce odbywania edukacji przez dziecko jest czynnikiem istotnym statystycznie ( $p \leq 0,05$ ) wpływającym

na funkcjonowanie fizyczne dziecka. Nie stwierdzono różnicy istotnej statystycznie pomiędzy miejscem zamieszkania ( $p \geq 0,05$ ) i wiekiem dziecka ( $p \geq 0,05$ ) a jego funkcjonowaniem fizycznym.

**Wnioski.** Większość badanych dzieci uczęszcza do szkoły lub przedszkola. Padaczka w znacznym stopniu ogranicza dzieci w zakresie funkcjonowania fizycznego. Wśród czynników wpływających na stopień funkcjonowania fizycznego dziecka największe znaczenie ma wykształcenie rodziców oraz miejsce edukacji dziecka. (PNN 2015;4(4):146–151)

**Słowa kluczowe:** dzieci, funkcjonowanie fizyczne, padaczka

## Introduction

Epilepsy is one of most frequently occurring chronic and social diseases of a paroxysmal nature. It consists in sudden discharges of encephalic neural cells, leading to epileptic paroxysms, which may even pose risk to a child's life. The causes for the occurrence of the condition are varied and they may be congenital, acquired or of an unknown cause. The epilepsy is diagnosed, when epileptic paroxysms repeat spontaneously. Diagnosing the disease is the requirement to initiate a counter-epileptic treatment [1,2].

In epilepsy, besides problems resulting from paroxysms, emotional and cognitive disturbances occur, directly impacting a child's psychosocial development. Epilepsy, like any chronic condition, induces a plenty of limitations into a child's life: it causes difficulties in school, it has a significant impact on the child's psychosocial functioning [3].

What is significant in the proceedings of diagnosing epilepsy, is the necessity to deal with the disease, to cope with it in everyday life, and to help in the optimal degree of maintaining health. A good quality of life is an achievable physical, mental and psychological state allowing functioning in the society and fulfilling social roles, good disposition and happiness in a suffering person or a patient under treatment [2].

An epileptic patient, due to the occurrence of paroxysms, usually perceives a feeling of disability, reflected in limits to a proper social and physical functioning. Epilepsy is not only the issue of the suffering person. The condition frequently impacts the functioning of the entire family, the siblings. Not unfrequently does it demand that the family change their everyday timetable, resign from their free time or their hobby. It is especially in the case of epilepsy occurring in a child, that the disease changes much in the life of the family [4].

The aim of the paper is to assess the physical functioning of children suffering from epilepsy, according to their parents.

## Material and Methods

The research was conducted in the Department of Infectious Diseases and Child Neurology, Poznan University of Medical Sciences, on a group of 94 children aged 4 to 18 (Table 1). The examination was conducted by means of the method of a diagnostic survey, using a proprietary survey questionnaire and the QOLCE (Quality of Life in Childhood Epilepsy Questionnaire) for parents. The self-constructed survey questionnaire consisted of 5 multiple-choice questions covering: the responder's sex, education and place of residence, as well as the child's age and the school he or she attends. The QOLCE (Quality of Life in Childhood Epilepsy Questionnaire) consisted of 76 questions, considering such areas as: physical, emotional, cognitive and social functioning [5,6]. Both the questions in the proprietary questionnaire and in QOLCE were answered by the children's parents or legal carers. In QOLCE, the answers

Table 1. Characteristics of the examined group

Variable	N (%)
Gender	
Female	71 (75.5)
Male	23 (24.5)
Education	
Elementary	6 (6.4)
Vocational	17 (18.1)
Secondary	36 (38.3)
Higher	35 (37.2)
Place of residence	
Urban	58 (61.7)
Rural	36 (38.3)
Child's age	
4–6 years	34 (36.2)
7–12 years	33 (35.1)
13–18 years	27 (28.7)
Facility child attends — care	
Kindergarten	30 (31.9)
School	55 (58.5)
Home care	9 (9.6)

provided were within the range of the following options: Very Often, Fairly Often, Sometimes, Almost Never, Never, and Not Applicable. For statistical analysis, a part of QOLCE was employed — the one concerned with the area of physical functioning.

The examination was performed with prior permission from the Hospital Director and from the Bioethics Board of the Nicolaus Copernicus University's Collegium Medicum in Bydgoszcz.

The statistical analysis was conducted using the calculating programme MS Excel and Statistica v. 10.0. The mean ( $\bar{x}$ ) was calculated in the statistical analysis along with the standard deviation (SD) and the minimum (Min.) and maximum (Max.) values. The relationship between two variables was calculated by means of the Spearman R correlation coefficient. The significance of differences between the two groups as for quantitative variables was validated by means of the Mann-Whitney test. The differences between three groups or more were validated by means of the Kruskal-Wallis test.  $p \leq 0.05$  was adopted as the level of statistical significance.

## Results

Over the preceding 4 weeks, during everyday activities (Table 2), the child usually played without restraint at home, like other children of his or her age (65.9%); the child was able to undertake the same motor activity as other children of his or her age (47.8%) and needed more attention than other children of his or her age

(41.5%). To the lowest degree the child would leave for a party without being attended (41.5%), go swimming on their own (53.3%) and spend a night out (52.1%). The mean index of the physical limitation amounted to: 41.45 points. The minimum level was 0 points, the maximum was 100 points. In general, one may state, that the examined children were physically limited to a significant degree.

Table 3 presents the results of epileptic children's physical functioning, in relation to the selected variables. In the statistical analysis, a significant discrepancy ( $p=0.015$ ) was noted between men and women in the opinions of their child's physical functioning. The women group produced higher values, meaning that in their opinions children physically functioned better. Taking into consideration the place of residence, higher values were observed in the group of urban dwellers, meaning that the functioning of epileptic children in the city is better when compared to the countryside. This is proven by the statistical analysis ( $p$  on the verge of significance =0.053). When considering education, the highest values were observed in the group of parents/carers holding a degree of higher education ( $\bar{x}=49.04$ ), meaning that the higher level of the carers' education positively impacts the quality of physical functioning of children. The examined children's parents'/carers' education maintained in a statistically significant ( $p=0.004$ ) correlation with the results from the domain of physical functioning. The analysis of the child's age revealed, that the highest values were noted in the group of children aged 13–18 ( $\bar{x}=48.53$ ), and the lowest among children

Table 2. Occurrence of selected aspects of physical exercise during daily activities over the last 4 weeks

Answer	Very Often		Fairly Often		Sometimes		Almost Never		Never		Not Applicable	
	N	%	N	%	N	%	N	%	N	%	N	%
Needed more attention than other children of his/her age	15	16.0	19	20.2	26	27.7	30	31.9	2	2.1	2	2.1
Needed additional protective measures	3	3.2	6	6.4	21	22.3	21	22.3	36	38.3	7	7.4
Played freely at home, like other children of his/her age	21	22.3	41	43.6	13	13.8	14	14.9	2	2.1	3	3.2
Played freely out of home, like other children of his/her age	10	10.6	25	26.6	29	30.9	18	19.1	9	9.6	3	3.2
Went swimming on his/her own	3	3.2	4	4.3	12	12.8	15	16.0	52	55.3	8	8.5
Did sport other than swimming	3	3.2	14	14.9	16	17.0	20	21.3	34	36.2	7	7.4
Spent a night out	1	1.1	3	3.2	12	12.8	22	23.4	49	52.1	7	7.4
Played with friends out of home without supervision	2	2.1	9	9.6	21	22.3	26	27.7	29	30.9	7	7.4
Went for a party without supervision	2	2.1	3	3.2	24	25.5	16	17.0	39	41.5	10	10.6
Was able to exercise like other children of his/her age	13	13.8	32	34.0	17	18.1	19	20.2	11	11.7	2	2.1

N=94;  $\bar{x}$  — 41.45; SD — 19.450; Min. — 0.0; Max. — 100.00

Table 3. Physical functioning of epileptic children and selected variables

	Variable	N	$\bar{x}$	SD	Value	p
Sex	Female	71	47.26	17.72	2.436*	0.015
	Male	23	38.50	13.59		
Area of residence	Urban	58	36.73	20.94	1.934*	0.053
	Rural	36	44.38	18.03		
Education	Elementary	6	41.60	12.42	0.292†	0.004
	Vocational	17	36.71	13.51		
	Secondary	36	45.86	15.17		
	Higher	35	49.04	20.14		
Child's age	4–6 years	34	40.40	15.94	0.179†	0.084
	7–12 years	33	47.17	16.56		
	13–18 years	27	48.53	18.61		
Child's educational facility	Kindergarten	30	38.55	16.20	6.674‡	0.036
	School	55	49.27	16.77		
	Home Care	9	41.57	16.67		

\* Mann-Whitney Test; †Spearman R; ‡Kruskal-Wallis Test

aged 4–6 ( $\bar{x}=40.40$ ). This means that older children find it easier to function. Regrettably, the age of the examined children did not maintain in a statistically significant correlation ( $p=0.084$ ). When considering the dependency of physical functioning of the children on the child's place of education, it was noted that the children attending a school produced the highest values ( $\bar{x}=49.27$ ). This was confirmed in the statistical analysis, where a statistically significant ( $p=0.036$ ) difference was observed between the various child's education groups.

## Discussion

The study involved 94 carers of childhood epileptic patients. In the greatest majority, these were women (75.5%), mostly mothers (74.5%). One of the women under the study was a second carer. The number of fathers was decidedly lower — 28.7%. The majority of the responders were urban dwellers (61.7%) with a secondary education degree (38.3%) or higher (37.2%). One in five carers under the study had finished their education on an elementary or vocational levels. In most cases, the study considered children between 4–6 years or 7–12. Barely 29% were children older than 12 years. Nearly every third child was in a kindergarten, while almost 59% were school pupils. Every tenth child remained under the custody of a parent or another carer.

The physical functioning of the child was taken for analysis. The mean result of the physical activity was rated at barely 41.45 points for the entire group under the study, which points to a level of functioning lower than average. Exactly half of the children scored below

42.5 points. A detailed analysis of the proprietary studies revealed, that according to the carers, almost every fourth child tended to play freely at home, similarly to other children of their age, even though he or she was in need for more attention. Almost 14% of the carers thought their wards were able to partake in the same physical activity as other children of the same age. More than half of the parents (52.1%) noted, that children had never spent a night out of home, while 41.4% of the studied children never went for a party without adult supervision.

In the group studied by Rosińczuk-Tonderys et al. [7], almost 58% of the studied parents did not show excess care toward their child, but rather tried to treat them equally to other children, while 42% fulfilled all the wishes of their child as much as their means would allow. A decisive majority (68.43%) tended to allow their diseased child freedom out of home. Research by Michalska et al. [8] correspond perfectly with the proprietary study, the former being conducted among children with cerebral palsy. Functioning in the physical domain, including motor activity (walking, running, exercising or sports, lifting heavy objects), autonomous performance of self-service activities, as well as reception of fatigue and pain, were rated lowest by mothers of the infant cerebral palsy patients under the study —  $1.75 \pm 21.22$ , compared to  $84.48 \pm 19.51$  rated in the group of healthy children.

In case of the determinant of the gender of the respondents, the literature reference differs. Own observations point to a decidedly different physical functioning depending on the carer's sex, which stays in accordance with the reports by other authors. However, some authors

point to a worse functioning when reported by women in comparison to the opinion of men.

The place of residence was found to be a variable differentiating (on the verge of significance) the examined children in the area of physical functioning. According to the carers, children inhabiting urban areas functioned better than their peers from the countryside. In the study by Girzelska et al. [9], a statistically significant dependence was revealed between the quality of life of epileptic persons, and their area of residence. A detailed analysis confirmed reports from other authors, revealing that rural inhabitants assessed their quality of life lower than urban dwellers. Most of the surveyed who lived in the countryside assessed their quality of life as mediocre, and less than 30% as good. Nearly half of the surveyed coming from urban areas assessed their quality of life as mediocre or good.

In the case of the carers' education, a significant difference was observed between the studied children as to their physical functioning. The highest values were noted in the group of children under the custody of parents/carers with a higher education degree. The higher the education of a carer, the better the child's functioning.

In the numerous studies being performed, the material situation of the family, or its general economic status attracted more attention than the parents' education. The examined children's quality of life grows alongside the increase of their social-economic status (low status corresponding to the lower value of the children's quality of life) [10]. Studies conducted by Girzelska et al. [9], among adult epileptic patients, may serve as complementary to the proprietary studies. The authors proved, that the higher the levels of education and professional activity is, the higher is the subjective assessment of the studied persons' quality of life. The observations performed on the basis of the presented paper confirm the opinions made by other authors, concerning the impact of education on the global quality of life. The low education level is usually combined with a decreased quality of life, similar to the proprietary study results, mainly in the domain of physical functioning [11].

An analysis concerning the impact of the age of the examined children on their physical functioning in the assessment of their carers was conducted as well. It revealed that the differentiating variable of age did not have a significant statistical impact on physical functioning. The youngest children showed the lowest functioning according to their parents (40.40 points) while the oldest ones scored the highest (48.53).

In the study by Michalska et al. [3,8], the influence of the age of the examined persons on the quality of life was studied. Any statistically significant interdependencies were found only between the age and the physical functioning and the general assessment. In the study by

Michalska et al., the quality of life indicators decreased alongside the age of the examined persons, proving a worsening quality of life, unlike in the proprietary study. In each age group, similar to the mean results of the entire group, the element assessed lowest was the physical functioning, while the highest-rated was emotional functioning.

The proprietary study included also an analysis of the physical functioning depending on the type of a facility the child attended. Significant statistical differences were noted in the domain of physical functioning, the children attending a school scoring decidedly higher than kindergarten pupils and children remaining in the custody of their parent. The study revealed children attending a school to have a higher functioning indicator (49.27 points) in the opinion of their carers those children who remain at home (41.57 points).

Due to the fact, that no up-to-date reports exist as for the impact of school and kindergarten on the quality of life of epileptic children, it is hard to provide reference to the proprietary research. The isolation of a suffering child at home, the lack of educational situations preparing a child to function in a group of peers can cause not only frustration, but also a wrong self-assessment. A diseased child left at home is very often bereft of experiences enjoyed by his or her healthy peers. The lack of perceptual-motor experiences may lead to developmental disturbances and thus significantly decrease the quality of life. Not every parent can satisfy the basic mental needs of his or her child, including the need for security, emotional connection, acceptance and recognition. The lack of feeling secure can start producing aggressive reaction or lead to a general anxiety to the environment. As for the lack of acceptance, it often leads to disturbances in the feeling of one's value, and to a disbelief in one's own capabilities, more in a psychological than physical sense. The proprietary research showed, that children function better in a group, therefore every child diagnosed with epilepsy should hold a full right to a normal life and to active participation in social life, provided that their health allows it. Consequently, one need to consider whether it is not worthwhile to face the needs of those children, whose life already began with difficulties on the paths of their educational roam?

## Conclusions

Most of the children under the study attended a school or a kindergarten. Epilepsy significantly limits the children in their physical functioning. Among the factors impacting the level of a child's physical functioning, the most significant ones are the parent's education and the child's educational facility.

## Implications for Nursing Practice

The conducted research suggests specific advice for nursing teams, mainly in the aspect of a patient's and their carers' education. The limitations to the physical functioning may result mostly from an excessive care from the parents/carers. Although various difficulties may occur, the rule of the thumb should be for the epileptic children to participate in the everyday life as much as it is possible. Taking into consideration the intellectual potentials of the child, it is advisable to continue his or her school education, with short breaks for individual learning at home when an extraordinary aggravation of epileptic paroxysms occur or when extraordinarily aggravated mental symptoms occur. The goal should be to have the smallest possible limitations to an epileptic child's physical functioning, related to the age, the physical and intellectual capabilities, comorbidities or the type and the degree of paroxysm control.

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