

# Quality of Life of Children with Attention-Deficit/Hyper Activity Disorder

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**Objective:** Attention-deficit/hyperactivity disorder (ADHD) has an impact on children and families. The purpose of this study was to assess the health-related quality of life between school-age children with ADHD compared with those without physical or mental disorders.

**Material and Method:** Self- and parent-reports describing the quality of life, covering 4 domains: physical, emotional, social, and school functioning, were obtained from 46 children with ADHD and 94 control children. At the time of the study, 17 of 46 children reported receiving medication for ADHD.

**Results:** After controlling for age and demographic background, both children with ADHD and their parents reported having a significantly lower quality of life score than controls and their parents. Children with ADHD also reported themselves to have a significantly low physical score, despite their physically healthy status.

**Conclusion:** Children with ADHD had impairment of their quality of life in the physical and psychosocial domains. Improvement of health-related quality of life should be integrated in the overall planning of the treatment goals.

**Keywords:** Quality of life, ADHD

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Attention-deficit/hyperactivity disorder (ADHD) is the most common behavioral disorder in childhood, affecting approximately 3-5% of school age children<sup>(1,2)</sup>, according to the Diagnostic and Statistical Manual of Mental disorders, Fourth Edition (DSM-IV)<sup>(3)</sup>. It is characterized by developmentally inappropriate hyperactivity, impulsivity, and inattention continuing throughout life<sup>(4)</sup>. Although ADHD does not directly affect physical health like other chronic physical diseases, it has an impact on the child's social, emotional, and academic functioning as well as that of his/her family. Children with ADHD are more likely to have school difficulties, disruptive behaviors, and negative interactions with their peers, teachers and parents. Effective treatment often requires a comprehensive and multimodal approach including

pharmacotherapy and behavioral and environmental modification<sup>(4,5)</sup>, which focuses on the reduction of behavioral symptoms and academic improvement, as well as improvement in their quality of life.

Because behavioral rating scales are often limited in their ability to measure treatment responses, the health-related quality of life (HRQOL) measurement has been developed to measure children's functioning in various areas, focusing on their perceptions<sup>(6-8)</sup>. The approach uses children's and parents' assessments rather than evaluation by clinicians. HRQOL can be assessed by generic or disease-specific measures. The quality of life measurement is varied according to the diseases and perspective of the observer. Multidimensional assessment is the appropriate approach to measure physical, psychological, and social aspects of children with ADHD. HRQOL questionnaires commonly used with children include the Children's Global Assessment Scale, the

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Child Health Questionnaire, the Pediatric Quality of Life (PedsQL™ 4.0), which was used in the present study, and other measures of quality of life for children<sup>(7,8)</sup>.

Although children with ADHD are physically healthy, unlike those with chronic physical diseases, they may have difficulties with their schoolwork, coping with peers, and controlling their emotions. Measures of health-related quality of life assess those areas of children's functioning that are affected by ADHD. The measurement of quality of life will be more accurate if it takes into account the child's and family's views. The present study aimed to provide some preliminary measurement of the quality of life among children with ADHD from both the children's and parents' perspectives.

#### **Material and Method**

Children with ADHD based on the DSM-IV criteria<sup>(3)</sup> (minimum treatment duration of 6 months), aged 8-12 years, attending the Developmental-Behavioral Pediatrics Clinic at the Chiang Mai University Hospital, were enrolled in the present study. Children at the age of 8-12 years without chronic illnesses from the well baby clinic at the same hospital and a primary school in the same location were recruited as the comparison group.

The Quality of Life study described in the present report was carried out using the Pediatric Quality of Life (PedsQL™ 4.0), developed by Dr. James W Varni<sup>(9-11)</sup>. The PedsQL, for children 8-12 years, consists of 2 versions: a child self-report and a parent proxy-report. The PedsQL™ 4.0 is simple and has been shown to be reliable, with high levels of internal consistency. Each version includes similar groups of items (8 physical and 15 psychosocial) and uses 5-point rating scales labeled "Never/Almost never/Sometimes/Often/Almost always".

The PEDSQL and study questionnaires, information about the study, and informed consent forms were sent to parents by mail. Before analysis, the raw score on each scale was transformed to a 0-100 scale, with higher scores indicating a better quality of life. The present study was approved by the Ethic Committee of the Faculty of Medicine, Chiang Mai University (No. 79/2003).

#### **Data analysis**

All scale scores in the PedsQL™ 4.0 were transformed linearly into scales of 0-100 points, with higher scores representing a better quality of life. No

answer responses to more than 50% of questions were coded as missing values and were not calculated. Data were collected and analyzed by using an SPSS program. Differences in variables between ADHD and control groups were tested using an independent t test and the X<sup>2</sup> test. A p-value of  $\leq 0.05$  was considered statistical significant.

#### **Results**

Of 80 questionnaires sent to children with ADHD and 200 questionnaires sent to control children, 46 were returned from children with ADHD and 95 were returned from controls, 1 of which had missing values. Therefore, the overall response rate was 50.4% (57.5% in the ADHD group and 47.5% in the control group). Since 1 questionnaire with missing values was excluded, a total of 140 questionnaires were analyzed.

Table 1 summarizes the demographic information of 46 children with ADHD and 94 controls with an average age of 10.10 years and 10.13 years respectively. The ADHD group had more males than the control group. The age of father and mother, the mother's education, family structure, family income, and family history of ADHD were not different between the two groups. Fathers of children with ADHD had lower education than those of the controls. Satisfaction in the child's school performance reported by their parents was significantly lower in the ADHD group than controls.

The mean PedsQL scores reported by children and their parents are shown in Table 2. The total, physical, and psychosocial scores reported by children with ADHD were significantly lower than those reported by the control children. Parents of children with ADHD also reported significantly lower scores in total and lower psychosocial functioning than parents of controls. No significant differences were found in the physical scores of their parent groups ( $p=0.15$ ).

The mean PedsQL score of children with ADHD who received medication and did not receive medication are shown in Table 3. The mean scores of physical, psychological, and total quality of life reported by these children were not different. Parents also reported similar functioning in quality of life between children with ADHD who received and did not receive medication. Only physical scores, parents of children who received medication reported significant better scores than those of children without medication ( $p=0.003$ ).

**Table 1.** Demographic variables of children with and without ADHD

	ADHD (n = 46) (%)	Control (n = 94) (%)	p value
Age (mean $\pm$ SD)	10.10 $\pm$ 1.53	10.13 $\pm$ 1.32	0.91
Gender: male	39/46 (84.8)	48/94 (51.1)	<0.001
Father age	40.85 $\pm$ 6.18	42.33 $\pm$ 5.64	0.19
Mother age	39.50 $\pm$ 7.15	39.53 $\pm$ 4.39	0.98
Father ed (yrs)	10.74 $\pm$ 3.86	12.31 $\pm$ 4.10	0.05
Mother ed (yrs)	10.61 $\pm$ 4.66	11.90 $\pm$ 4.30	0.12
Family structure			
Married	39/46 (84.8)	80/94 (85.1)	0.96
Divorce/widow	7/46 (15.2)	14/94 (14.9)	
Income (Baht)	14843 $\pm$ 10290	18479 $\pm$ 15134	0.17
Family history of ADHD	3/46 (6.5)	2/94 (2.1)	0.20
School performance reported by parents			
- satisfied	4/46 (8.7)	47/94 (50.0)	<0.001
- average	33/46 (71.7)	47/94 (50.0)	
- unsatisfied	9/46 (19.6)	0	

**Table 2.** The PedsQL score of children with ADHD and controls

	ADHD (n = 46)	Control (n = 94)	p value
Child self-report	Mean $\pm$ SD*	Mean $\pm$ SD	
Total score	1508.69 $\pm$ 312.25	1779.25 $\pm$ 322.61	<0.001
Physical	576.63 $\pm$ 140.38	630.32 $\pm$ 146.64	0.04
Psychosocial	932.06 $\pm$ 198.09	1148.93 $\pm$ 203.23	<0.001
Emotional	311.95 $\pm$ 90.48	371.27 $\pm$ 81.56	<0.001
Social	341.30 $\pm$ 93.42	410.90 $\pm$ 84.44	<0.001
School	278.80 $\pm$ 74.04	366.75 $\pm$ 75.88	<0.001
Parent proxy-report			
Total score	1362.50 $\pm$ 296.26	1609.04 $\pm$ 362.43	<0.001
Physical	492.39 $\pm$ 158.80	535.37 $\pm$ 169.85	0.15
Psychosocial	870.11 $\pm$ 168.54	1073.67 $\pm$ 224.94	<0.001
Emotional	308.15 $\pm$ 77.11	363.82 $\pm$ 87.34	<0.001
Social	310.32 $\pm$ 96.83	373.13 $\pm$ 94.06	<0.001
School	251.63 $\pm$ 71.76	336.70 $\pm$ 80.79	<0.001

\*Standard deviation

**Table 3.** The PedsQL of children with ADHD

	ADHD with medication (n = 17)	ADHD with no medication (n = 29)	p value
Child self-report	X $\pm$ SD*	X $\pm$ SD	
Total score	1491.18 $\pm$ 309.35	1518.97 $\pm$ 318.94	0.77
Physical	589.71 $\pm$ 137.23	568.97 $\pm$ 144.03	0.63
Psychosocial	901.47 $\pm$ 196.55	950.00 $\pm$ 200.22	0.43
Parent proxy-report			
Total score	1445.59 $\pm$ 352.25	1313.79 $\pm$ 252.01	0.19
Physical	579.41 $\pm$ 160.38	441.38 $\pm$ 136.16	0.003
Psychosocial	866.18 $\pm$ 212.31	872.41 $\pm$ 141.00	0.92

## Discussion

There were no differences in demographic variables between the children with ADHD and the controls, except for the gender of children and the education of their fathers. ADHD was more common in boys than in girls, therefore, the percentage of males was higher than the controls. Fathers of children with ADHD had fewer years of education, although only 3 of them reported having ADHD themselves, which may be from sub clinical ADHD or other unidentified factors. Most parents of children with ADHD reported lower academic performance of their children more commonly than parents of controls, which was consistent with the reasons for referral of their children to the clinic.

A response rate (50.4%) was found in the present study, compared with 31-70% in other studies<sup>(12-14)</sup>. The reasons were because the children's addresses accessed from the hospital records were not recent and the study design was using mail out/ mail back without directly contacting the families. It was not possible to compare participants and non-participants in terms of clinical variables in the present study.

Differences in the quality of life scores reported by children between the two groups were significant. Parents of children with ADHD also reported lower scores of quality of life than those of controls which was consistent with the study by Sawyer MG et al<sup>(15)</sup>. In many areas of their study, children with mental disorder including ADHD, were reported to have a lower quality of life than children with physical disorders<sup>(15)</sup>. Children with ADHD were reported by their parents to have similar physical health compared with controls, but important deficits in psychosocial health, which was similar to the study by Klassen AF et al<sup>(14)</sup>, who conducted a cross-sectional survey using the Child Health Questionnaire completed by parents. In that study, children reported themselves to be lower in both physical and psychosocial functioning. School and social functioning were affected among children with ADHD reported by Basstiaansen et al<sup>(16)</sup>.

Although more females were found in the control group, which may affect the quality of life such as physical score, it was found in the present study that the controls had higher scores indicating a better quality of life. Because ADHD has no direct effect on physical health like other chronic physical illnesses, the poor quality of life of these children may be from the disorder itself.

There were some limitations in the present study. The study design used the mail out/ mail back method, therefore the number of parents and children returning questionnaires was quite low, which was consistent with the study by Landgraf JM et al<sup>(13)</sup>, who had a response rate of 31%. Although quality of life reports were obtained from both parents and children, school reports would add more information about overall functioning. The quality of life was not compared among each subtype of ADHD or clinical symptoms in the present study. It was found in the study by Matza LS et al<sup>(17)</sup> that quality of life was negatively correlated with clinical symptoms of ADHD. Despite the small sample, lower quality of life was found in children with ADHD in the present study, however, a larger sample size would increase the information and reliability of the present study.

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## การศึกษาคุณภาพชีวิตของเด็กที่เป็นโรคสมาธิสั้น

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**วัตถุประสงค์:** โรคสมาธิสั้นมีผลกระทบต่อเด็กและครอบครัว การศึกษานี้ทำเพื่อประเมินคุณภาพชีวิตด้านสุขภาพของเด็กวัยเรียนที่เป็นโรคสมาธิสั้นเปรียบเทียบกับเด็กที่ไม่เจ็บป่วยทั้งโรคทางกายและโรคจิตเวช

**วัสดุและวิธีการ:** เด็กและพ่อแม่ตอบแบบสอบถามเกี่ยวกับคุณภาพชีวิตซึ่งครอบคลุม 4 ด้านคือ การทำหน้าที่ทางร่างกาย อารมณ์ สังคม และการเรียน โดยมีเด็กสมาธิสั้น 46 คน และเด็กกลุ่มควบคุม 94 คน ขณะทำการศึกษามีเด็กสมาธิสั้นจำนวน 17 คนได้รับยารักษาโรคสมาธิสั้นด้วย

**ผลการศึกษา:** เมื่อควบคุมอายุของเด็กและลักษณะสภาพทางสังคม พบว่าทั้งตัวเด็กและพ่อแม่ของเด็กโรคสมาธิสั้นรายงานคะแนนคุณภาพชีวิตต่ำกว่าเด็กและพ่อแม่ของกลุ่มควบคุม เด็กสมาธิสั้นเห็นว่าตนเองมีคุณภาพชีวิตทางด้านร่างกายต่ำแม่สุขภาพแข็งแรงก็ตาม

**สรุป:** พบว่า เด็กที่เป็นโรคสมาธิสั้นมีปัญหาคุณภาพชีวิตทั้งสุขภาพร่างกายและจิตใจ การช่วยให้คุณภาพชีวิตด้านสุขภาพดีขึ้นควรเป็นส่วนหนึ่งของการประเมินและเป้าหมายในการดูแลเด็กกลุ่มนี้