

Quality of life in adolescents with primary headaches

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Abstract

Background Headaches are common problems in adults, adolescents, and children. Headaches impact a child's life, their family life, and even society. An assessment of quality of life in adolescents with primary headaches may help to determine actions necessary to improve the quality of life of these patients.

Objective To assess the quality of life of adolescents with primary headaches compared to healthy adolescents.

Methods We conducted a cross-sectional study in December 2009 on adolescents aged 13 to 18 years. The headache group consisted of children with primary headaches according to the *International Classification of Headache Disorders* and the control group consisted of healthy adolescents. Subjects were selected by consecutive sampling, with 75 subjects in each group. Subjects filled the *Pediatric Quality of Life Inventory* version 4.0 (PedsQL 4.0) questionnaire.

Results The mean PedsQL total score was significantly lower in the headache group than in the control group [175.7 vs. 392.2, respectively, (95%CI of differences -28.1 to -219.3, $P = 0.001$)]. However, out of 23 items in the questionnaire, 9 were not significantly different between the headache and control groups.

Conclusions Primary headaches in adolescents is associated with lower quality of life. Most quality of life domains scores are significantly lower in adolescents with primary headaches compared to those without primary headaches.

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Keywords: quality of life, primary headache, adolescents

Headache is the most common somatic complaint in children,^{1,2} and its prevalence depends on age and gender.³ Reported prevalences increase from 3% at age 3 to 7 years, to 4-11% at age 7 to 11 years, and 8-23% at age 11 to 15 years.⁴ Primary headaches arise intrinsically, without underlying disease.⁵⁻⁸ Examples of primary headaches are migraine, tension, and cluster headaches,⁵⁻⁸ with migraine as the most frequent type.^{4,9}

Headaches impact a child's life, their family life, and even society. A Dutch study in adolescents aged 12-18 years with headaches reported that they experienced more stress, fatigue, and poorer moods than adolescents who did not experience headaches.¹⁰ An Ohio survey also found that children's quality of life was adversely affected in all areas of functioning compared to the norms for healthy children.¹¹

An important outcome measure for treatment effectiveness is quality of life, which reflects the impact of disease and treatment using a subjective self-

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evaluation with regards to child's physical functioning and emotional well-being.¹ Knowledge on the quality of life in children with headaches is lacking.¹ To date, few studies in this field have provided information on a limited number of life domains,¹ whereas measuring quality of life should be a standard part of evaluating treatment outcomes in pediatric headaches.³ Our study was designed to assess the quality of life of adolescents with primary headaches compared to healthy adolescents.

Methods

We conducted a cross-sectional study in December 2009 in three junior high and two senior high schools in the Secanggang Subdistrict, Langkat District of the North Sumatera Province. We included adolescents aged 13 to 18 years who suffered from primary headaches according to the International Classification of Headache Disorders (2nd ed.) and healthy adolescents without headaches as controls. Adolescents with systemic disease such as malignancy, sinusitis, other viral infections, and those with a history of trauma, or disorders of the central nervous system were excluded.

Subjects provided written informed consent and were divided into two groups: the headache group of adolescents with primary headaches and the control group of healthy adolescents. The minimum number of subjects required per group was calculated to be 73 using the formula samples for two independent populations. Subjects were selected by consecutive sampling.

All subjects filled the Pediatric Quality of Life Inventory (PedsQL) version 4.0 questionnaire, to assess their quality of life. We also measured the subjects' weight and height. Before the questionnaires were filled, subjects were given instructions on how to fill the form and an explanation on the intent of the questions. We collected the filled questionnaires, examined them for completion, and calculated the sums and mean values for each domain, as well as the total values of all domains.

We used the PedsQL version 4.0 as an instrument to assess quality of life.³ This questionnaire covered four aspects of life: physical functioning (8 questions), emotional functioning (5 questions),

social functioning (5 questions), and school functioning (5 questions), as shown in **Table 1**.^{3,12} Each question was scored on a scale of 0-4, depending on the difficulty in implementing the activity in question. Scores ranged from 0 (not having problems) up to a score of 4 (always having problems). These scores were then translated into values of 100 to 0, with 0 = 100, 1 = 75, 2 = 50, 3 = 25 and 4 = 0. These values were added together and mean values calculated.¹³ Decreased quality of life was defined as a mean score lower than that of the other group. This study was approved by the Ethics Committee of the University of North Sumatera Medical School.

Results were considered to be statistically significant if P value was <0.05, with a 95% confidence interval. We used the independent t-test to assess for an association between primary headaches and quality of life in adolescents.

Results

Screening for primary headache was done in 463 adolescents. We included 75 adolescents with primary

Table 1. Four domains of life assessed in PedsQL version 4.0

Domains	Problems
Physical functioning	Walk > 100 m
	Run
	Sport activity/exercise
	Lift something heavy
	Take a shower by self
	Do chores around the house
	Hurt or ache
	Have low energy
Emotional functioning	Feel afraid or scared
	Feel sad or blue
	Feel angry
	Have trouble sleeping
Social functioning	Worry about what will happen
	Have problem getting along with other kids
	Other kids don't want to be friend
	Other kids tease me
	Can not do things that other kids can do
School functioning	Hard to keep up when play with other kids
	Hard to pay attention in class
	Forget things
	Have trouble with schoolwork
	Miss school because of not feeling well
	Miss school to go to the doctor

Table 2. Subjects characteristics

Characteristics	Primary headaches group (n=75)	Without primary headaches group (n=75)
Gender, n (%)		
Male	30 (40.0)	32 (42.7)
Female	45 (60.0)	43 (57.3)
Mean age (SD), years	14.8 (1.07)	14.7 (1.02)
Age group by year, n (%)		
13 years	9 (12.0)	10 (13.3)
14 years	21 (28.0)	22 (29.3)
15 years	23 (30.7)	27 (36.0)
16 years	19 (25.3)	14 (18.7)
17 years	3 (4.0)	2 (2.7)
Mean weight (SD), kg	41.2 (7.22)	36.8 (6.54)
Mean height (SD), cm	148.5 (7.92)	145.8 (7.88)
Mean body mass index (SD)	18.6 (2.78)	17.3 (2.52)

Table 3. Mean scores of the PedsQL domains

PedsQL* domains	Primary headache group (n=75) mean (SD)	Without primary headache group (n=75) mean (SD)	95%CI of differences	P value
Physical functioning	252.3 (125.04)	620.3 (141.04)	-409.7 to -326.1	0.001
Emotional functioning	162.0 (88.30)	402.3 (84.05)	-267.1 to -213.8	0.001
Social functioning	197.5 (100.45)	379.3 (105.10)	-214.2 to -150.2	0.001
School functioning	185.3 (86.00)	399.5 (90.95)	-241.2 to -186.9	0.001
Total	175.7 (88.20)	392.2 (162.05)	-283.1 to -219.3	0.001

*Mean (SD)

headaches and 75 adolescents without headaches. We found no significant differences in sex, age, weight, and height between the groups. The 15-year-old age group had the largest number of subjects, as shown in **Table 2**.

Table 3 shows that mean PedsQL score was significantly lower in the headache group than in the control group in each of the four domains. In addition, the mean total scores were significantly lower in the headache group than in the control group (175.7 vs. 392.2, respectively, P=0.001).

Among 23 problems assessed in the PedsQL, we found no significant differences between the headache and the control groups in the following nine problems: walk > 100m, lift something heavy, have low energy, have problem getting along with other kids, other kids do not want to be friend, can not do things that other kids can do, hard to keep up when play with other kids, hard to pay attention in class and have trouble with schoolwork. The scores of other 14 problems, all was significantly lower in adolescents with headaches compared to those without headache.

Discussion

Headache is one of the most common type of pain in children, besides abdominal and limb pain.^{14,15} Headaches in children and adolescents affect their quality of life¹¹ and tend to continue into adulthood.¹⁶ Bothering and long-lasting headaches have a negative influence on children.¹² Children with headaches have a more pessimistic outlook and are less satisfied with their lives.¹²

The World Health Organization defines health-related quality of life as an individual's perception of their position in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards and concerns.¹⁷ In this study, we used the 4th edition of PedsQL as an instrument to assess quality of life in adolescents with headaches compared to healthy adolescents of similar age and educational background. Children's quality of life may be assessed with various instruments, but the PedsQL is a commonly-used health-related quality of life measure in the pediatric literature.³ The 4th

edition of the PedsQL may be used to assess the quality of life of children with headaches.^{3,12,13}

We found a significant association between primary headache and quality of life. We also found a significantly lower mean total PedsQL score in adolescents with primary headaches than in healthy adolescents. A survey in Ohio on 572 patients with headaches found that children's quality of life was adversely affected in all areas of functioning when compared to norms in healthy children.¹¹

Four domains were considered in the PedsQL: physical, emotional, social, and school functioning, with a total of 23 problems to be assessed. We found significantly lower scores in all four PedsQL domains in the headache group than in the control group. An Italian study reported that primary headache negatively influenced quality of life, with lower scores in psychological, physical and social functioning in the headache group than in headache-free controls.¹⁸

Our study had more female than male subjects. This gender difference may be explained by an experimental pain study in healthy human subjects which found that male subjects had greater stimulus thresholds and pain tolerance compared to female subjects.¹⁹

A limitation in our study was that we did not categorize primary headache by type, severity, and frequency of pain. Also, we only used quality of life data from the adolescents' reports, without cross-checking with reports from parents or teachers. A previous study found that reports from multiple sources (parents, teachers, and children) provided more objective information.²⁰

In conclusion, primary headaches significantly affect all quality of life domains in adolescents.

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