Original Article

Quality of Life and Self Esteem in Children with Specific Learning Disorder after Receiving Treatment

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Background: Specific Learning Disorders (SLD) are associated with progressive school failure, lowered self-esteem, and stress of children and their parents. Treatment programs provided by special education teachers can help improve the academic achievements in children with SLD.

Objective: To investigate reading achievement, self-esteem, child quality of life and parent quality of life in children with SLD and compare between these factors pre- and post-interventions.

Materials and Methods: The present study was an experimental study. The subjects were 16 school children (8 to 13 years) with SLD with impairment in reading. The children received 12-session reading program from special education teachers. The instruments employed in the present study were WRAT-THAI, Rosenberg's self-esteem scale (RSE), Child quality of life (ThQLC), and parent quality of life (WHOQOL-BREF-THAI).

Results: The findings revealed statistically significant differences in reading achievement in WRAT-THAI, self-esteem, child quality of life in life perspective domain and child quality of life (parental report) in total score and family relationship domain. However, there was no statically significant difference in parent quality of life.

Conclusion: Participating in reading intervention program may have positive effects on self-esteem, and quality of life in addition to reading achievement. Increased self-esteem and improved quality of life may raise the children's positive self-perception and satisfaction in life, which in turn improve their academic achievements. Implication to improve these functional domains is suggested when planning educational program and treatment for children SLD.

Keywords: Specific learning disorder; Quality of life; Self-esteem

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Specific Learning Disorders (SLD) refer to a group of disorders with deficient learning process caused by brain dysfunction due to multiple genetics and environmental risk factors[1]. SLD are defined as delays in expected cognitive development in specific abilities. The children with SLD functions below age or grade level. Dyslexia is an alternative term used for a learning disorder that involves difficulties in accurate or fluent word recognition, decoding, and spelling[2]. Dyscalculia is an alternative term for difficulty in processing number, learning arithmetic, and performing accurate or fluent calculation. SLD can have a negative impact on the children's study, work, and daily living[3]. The incidence of SLD is commonly found around 5 to 6% in school age children[4]. Over 80% of SLD is dyslexia. These children may have academic achievements that were below than standard criteria. They may also have mental health disorders such as emotional and behavioral problems. Their education and quality of life may be in effect until later in their adolescence and adulthood[5].

The impacts of SLD on the children include having emotional and behavioral concerns up to 30%[6]. Children with SLD are also associated with low self-esteem[5], which causes a burden of stress in their parents[7]. The stress in the parents of children with SLD may result in changing way of life to meet the needs of their children, having anxiety about academic concerns of their children, and needing more time to spend on helping with their children's school work. It can be noted that having an ill or disable family member can affect the whole family and impose risks on the health and well-being of family caregivers. The burden of stress is great and may cause decreased family relationship and depleted self-care[8]. Therefore, early identification and planning for

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appropriate early treatment and effective educational intervention are the key factors to learning and development of children with SLD.

Bonifacci (2016)[9] studied parents of children with SLD (17 couples, 34 participants) and parents of children with typical development (17 couples, 34 participants) and found that children with SLD had lower self-esteem than children with typical development. Furthermore Matteucci (2019)[10] examined Health-Related Quality of life and psychological well-being among 30 children with SLD and their mothers and found that children with SLD reported significantly lower level of psychosocial health and that their mothers had a higher probability of being anxious and/or depressed when compared with general population. In Thailand, a recent research by Piyawattanametha (2020)[11] on mothers' attitudes and self-esteem in children and adolescents with LD indicated that attitudes of mothers were positively associated with the self-esteem of LD children and adolescents. In addition, a comparison study conducted by Kongthong (2012)[12] on quality of life in parents of children with LD and parents of children with other mental disorders and found that their quality of life was not different. To date, no research has been studied in Thailand about self-esteem and quality of life of children with SLD and compared the children's self-esteem and quality of life between pre- and post-treatments.

The present study aimed to determine in the group of children with SLD if their reading achievement, self-esteem, child quality of life and parent quality of life improved after interventions. The objective of the present study was to investigate the effect of intervention on self-esteem and quality of life of child and parent. The purpose of this study was to provide a preliminary report on the effects of the reading program based on pre- and post-interventions collected from school-aged children who undertook the one-on-one 12-session treatments for 30 to 45 minutes once a week during a three-month period. The findings from the present study could provide some validation for the implementation of long-term good-quality intervention.

Materials and Methods

Ethics

This research was certified by Human Research Ethics Committee, Faculty of Medicine, HRH Princess Maha Chakri Sirindhorn Medical Center, Srinakharinwirot University, under the approval No. SWUEC/E-034/2557. This research has been reviewed and approved by TCTR committee. The TCTR identification number is TCTR 20210312001.

Research design

This is an experimental study in children with specific learning disorders with impairment in reading. Their reading scores of wide range achievement test (WRAT-THAI), self-esteem and child quality of life and parent quality of life were compared pre- and post-intervention.

Samples

Participants were 16 children aged between 8 to 13 years, who were diagnosed with SLD with impairment in reading by child and adolescent psychiatrists and developmental pediatricians. The children received treatments at HRH Princess Maha Chakri Sirindhorn Medical Center and practiced reading with special education teachers once a week, a total of 12 sessions during a 3-month period. All participants participated in 12 sessions of treatments. The data were collected from July 2014 to June 2015.

Inclusion criteria: Children diagnosed with SLD with impairment in reading according to DSM-5 criteria, aged between 8 to 13 years.

Exclusion criteria: 1) Children with intellectual disabilities; 2) Unable to answer the questionnaire; 3) No permission from parents.

Methods

Step 1

1) Participants were asked for their assent and parental permission were obtained. The psychologist conducted the wide range achievement test (WRAT-THAI) in reading, writing and mathematics and Wechsler Intelligence Scale for Children (WISCIII).

The WISC-III was designed to evaluate a child's intellectual capacity, and it was scored using Full scale IQ, Verbal IQ, Performance IQ, and their subscale scores; WISC-III subtest reliabilities were as moderate to excellent (0.61 to 0.92)[13]. The Wide Range Achievement test-Thai version (WRAT-Thai) developed by Phumriang Sayawaranon in 1997 is an academic achievement test. This test is an individual assessment that measures learning skills in three domains: word reading, spelling, and mathematics, for students in first through sixth grades. The test's reliability was 0.97, and each domain's reliability was 0.93, 0.89, and 0.88, respectively. The examinee's scores are compared to the criteria for the grade level in which the examinee is studying. This enables the amount of learning ability of the test takers to be determined[14].

2) Data collection in pre-enrollment

Rosenberg's self-esteem scale (RSE), Thai version[15], was a self-administered questionnaire with 10 items to measure self-esteem. It was developed by Yaowaluck Mahasittiwat. The reliability value was 0.89.

Thai child quality of life measurement form (ThQLC)[16] for children aged between 6 to 15 years, comprised 28 items to assess child quality of life within six domains, including physical, mental, social/self-image, learning, family relationship, and overall life perspective. The form was divided into two sets, one for children and the other for parents as the respondents. The reliability values of the ThQCL were 0.85 for the child self-reported form and 0.89 for parent-reported form.

A brief quality of life measurement form by WHO (WHOQOL-BREF-THAI version)[17] consisted of 26 items to assess parent perception of quality life within four domains including physical health, psychological, social relationships,

and environment. The reliability and validity were 0.84 and 0.65 respectively.

Step 2: Practice with special education teachers (reading practice)

Participants underwent 12 one-on-one 30 to 45 minute sessions of reading practice with special education teachers on a weekly basis for 3 months. Each child had an individualized study plan.

The reading practice was divided into 3 phases.

Phase 1 (2 sessions): Preparation, build a relationship between participant and special education teacher, activities and games to promote visual perception.

Phase 2 (4 sessions): Reading preparation and learning consonants and vowels by using games and activities

Phase 3 (6 sessions): Reading practice.

Step 3: Data collection after the practice with special education teachers (post-intervention)

WRAT-THAI was conducted by the psychologist to measure reading abilities.

The following questionnaires were repeated:

- Rosenberg's self-esteem scale (RSE), Thai version
- ThQL
- WHOQOL-BREF-THAI

Analysis procedures and methods

Dispersion was examined using basic statistics, which includes number, percentage, and mean. WRAT-THAI scores (reading part), self-esteem, child quality of life and parent quality of life were analyzed and compared the difference between pre- and post-interventions using paired sample t-test in SPSS software version 22.

Results

There were 16 samples in the present study. According to the demographic data (Table 1), the participants were between 8 to 13 years old. The average age was 10 years. There were 10 males and 6 females. They were studying in grades 2 to 8, with IQ between 83 to 116. The average IQ was 98.06. Nine participants were diagnosed with impairment in reading, written expression, and mathematics. Seven participants were diagnosed with impairment in reading and written expression.

The scores of reading abilities (reading part of WRAT-THAI) (Table 2) between pre- and post-intervention were significantly different, i.e., 10.06 and 13.88, respectively.

The scores of self-esteem (Table 3) between pre- and post-intervention were significantly different.

For child quality of life (Table 4), the scores of overall life perspective domain were significantly different. The total scores and the scores of physical, mental, social, learning, and family relationship domains were not significantly different.

For child quality of life (parental report) (Table 5), the total scores and family relationship domain were significantly different. The scores of physical, mental, social, learning, and over all perspective domains were not significantly different.

For parent quality of life (Table 6), overall quality of life, physical, mental, social relationship, and environmental domains were not significantly different.

Table 1. Demographic data

Data	n (%)	Mean (SD)
Age		10.0 (1.59)
8	3 (18.75)	
9	4 (25.00)	
10	3 (18.75)	
11	4 (25.00)	
13	2 (12.50)	
Sex		
Male	10 (62.50)	
Female	6 (37.50)	
Level of education		
Grade 2	1 (6.25)	
Grade 3	3 (18.75)	
Grade 4	4 (25.00)	
Grade 5	6 (37.50)	
Grade 8	2 (12.50)	
IQ		98.06 (10.26)
83 to 89	3 (18.75)	
90 to 110	11 (68.75)	
111 to 116	2 (12.50)	
LD type		
Reading + writing	7 (43.75)	
Reading + writing + mathematics	9 (56.25)	

Table 2. Levels of dyslexia

Wide range achievement test (WRAT)	Mean	SD	p-value
Pre	10.06	11.47	0.032*
Post	13.88	12.91	

* $p<0.05$

Discussion

The present study found that there were statistically significant differences in levels of reading ability, self-esteem, child quality of life in overall life perspectives, parental report of child quality of life in total score and family relationship domain between pre- and post-interventions among children with specific learning disorders

with impairment in reading. However, there was no statistically significant difference in the parent quality of life.

Table 3. Self-esteem

Self-esteem	Mean	SD	p-value
Pre	17.31	2.06	0.008*
Post	19.31	3.36	

* p<0.05

In the present study, the scores of reading abilities between pre- and post-intervention were significantly different, but the grade level in reading part were not significantly improved. This may be because the only 12-session practice might show a minimal changing effect on reading achievement of SLD children with impairment in reading. The intervention in this study was divided into 3 phases for reading preparation, learning consonants and vowels, and reading practice. This conformed to the meta-analysis study conducted by Galuschka (2016)[18] found that reading performance can best be developed by using the systematic instructions of letter-sound correspondences, letter-syllable and morpheme synthesis. The guideline

Table 4. Child quality of life

Child quality of life	Pre mean (SD)	Post mean (SD)	p-value
Total score	76.28 (9.36)	79.13 (9.61)	0.104
Physical	86.88 (10.47)	87.50 (8.16)	0.779
Mental	73.44 (15.13)	75.63 (15.80)	0.476
Social	76.56 (17.48)	79.06 (18.99)	0.423
Learning	63.13 (16.72)	65.94 (16.55)	0.446
Family relationship	78.53 (1.89)	80.47 (1.97)	0.356
Overall life perspective	83.20 (14.38)	89.45 (14.92)	0.013*

* p<0.05

Table 5. Child quality of life (parent report)

Child quality of life (parent report)	Pre mean (SD)	Post mean (SD)	p-value
Total score	69.97 (8.54)	75.05 (11.30)	0.046*
Physical	80.31 (14.54)	82.81 (13.41)	0.451
Mental	60.63 (13.15)	66.56 (17.48)	0.205
Social	71.88 (18.43)	78.13 (18.25)	0.177
Learning	51.56 (14.46)	57.50 (13.67)	0.193
Family relationship	66.95 (16.54)	78.83 (16.17)	0.046*
Overall life perspective	91.41 (12.26)	92.19 (13.40)	0.609

* p<0.05

Table 6. Parent quality of life

Parent quality of life	Pre mean (SD)	Post mean (SD)	p-value
Overall quality of life	92.88 (10.63)	93.25 (10.34)	0.684
Physical	25.75 (2.89)	26.19 (2.43)	0.403
Mental	22.31 (2.55)	22.00 (2.71)	0.401
Social relationship	9.81 (1.51)	9.94 (1.83)	0.795
Environmental	26.44 (3.76)	26.56 (3.52)	0.817

recommendations on early treatment initiation, individual group settings or small groups settings and longer duration of the intervention are associated with a greater improvement in reading and/or spelling performance. The study conducted by Aaron (2008)[19] on the effects of intervention on reading achievement of children with learning disability by comparing pre- and post-treatments, in which children were divided into two groups, treatment and control groups. In treatment groups, the children were divided by their competency levels, including word recognition training group and comprehension group. Individualized lesson plans were also provided. After-class practice was provided to the treatment groups for 4 days a week, 1 hour at a time. In control group, the children were not divided by their competency levels. According to the 7-year data collection, the results revealed that the treatment groups had higher word attack scores and comprehension scores than those in the control group. This suggested that educational support should be provided continually and systematically for a long-term effect on reading development in children with learning disability. However, the present study did not divide the children by their competency levels and that the duration of study was only 3 months. Therefore, the future study may need to divide children by their competency levels and follow-up for a long period of time in order to see the significant effects of the intervention on reading achievement of children with specific learning disorders.

In addition, the present study revealed the scores of self-esteem between pre- and post-intervention were significantly different. This conformed to the research by Garcia (2008)[20] on children with learning deficiencies using cognitive strategy intervention program, which found self-efficacy was significantly changed in girls but not in boys. In contrast, the research conducted by Terras (2009)[21] found that self-esteem in the dyslexia group was not different from the control group and that both children and parents in the dyslexia group with the high score of self-worth, had good attitudes toward their reading issues and viewed such issues did not affect their relationships. Moreover, the recent research by Piyawattanametha (2020)[11] on maternal attitudes and self-esteem of children and adolescents with LD found that attitudes of mothers were positively associated with self-esteem of LD children and adolescents. Therefore, it can be concluded that not only the treatment but also the understanding and positive attitude towards specific learning disorders, can increase the self-esteem of children with SLD. In the present study, the scores of self-esteem between pre- and post-interventions were significantly different but there were confounding factors such as psychoeducation about the disorder and child rearing that could affected self-esteem of the children.

In regard to child quality of life, the present study found the scores of overall life perspective domain were significantly increased. As for child quality of life (parental report), this study indicated that the total score and the scores of family relationship domain were significantly increased. The increased family relationship could be explained by the fact that families of children with SLD who attended intervention sessions might pay more attention and provide more support to their children. Because this research was a short-term study, there were not significant changes observed in other domains of QOL. In contrast, the research conducted by Ginieri-Coccossis (2013)[22] on the quality of life of children and adolescents with SLD, using the German version of QOL questionnaire, KINDL(R) revealed that these children and adolescents with SLD had emotional and social issues when comparing with the control group. Similarly, the research by Balazes (2016)[23] found that the quality of life of children with dyslexia (self-reported version) was not different from the control group. On the other hand, child quality of life (parental report) had lower quality of life than the control group in some domains. Since the present study was conducted in a small sample size (16 children) within a short period of time (three months) to examine the effects of the intervention on QOL of children with SLD, there might be confounding factors that could affect quality of life of the child such as family care, academic intervention and attention from the school.

In addition, the lack of significant change found in parent quality of life was possibly due to the short period of study and the small sample size. The results were inconsistent with the research by Ginieri-Coccossis (2013)[22] on the quality of life of parents whose children were diagnosed with specific LDs, using the same questionnaire that found the score of social and environmental domains were low when comparing with the control group. The results of the present study were compatible with the research by Kongthong (2012)[12] on the comparison of QOL of the parents of children with LD and the parents of children with other mental disorders that found no significant difference in their QOL. In the present study, the effect of the intervention provided to the children, on their parents' QOL was not significant because the sample size was small and that the interventions was provided in a short period of time.

The limitations of the present study include there was no comparison group (may lead to data analysis bias) and that the sample size was small. Moreover, there was no information about confounding factors such as comorbidities (ADHD, language disorder), current medications used (methylphenidate for treatment ADHD) and learning assistance from parents and teachers. In addition, the WRAT-THAI is an initial screening tool for specific learning disorders, and therefore, might not be suitable for monitoring the progression of treatment. Hence the future study should include control group and information about confounding factors in order to assess the effect of intervention. Furthermore, dividing subgroup of samples by age or reading competencies should be considered when studying the efficacy of intervention in children with SLD.

Conclusion

In post-intervention, Specific Learning Disorders with impairment in reading children's scores of levels of reading part, self-esteem, child quality of life in overall life perspective

domains, child quality of life (parental report) in the total score and family relationship domain were significantly different. Therefore, the implementation of continual and systematic intervention along with family and school educational psychological supports are crucial in providing a long-lasting effect on reading achievements of children with SLD.

What is already known on this topic?

Educational intervention are the key factors for learning development in SLD with impairment in reading.

What this study adds?

Reading achievement scores, self-esteem, and child quality of life in some domains were different between pre- and post- 12-session-reading intervention with special education teachers for 3 months. Although the intervention was provided in a short period of time, it demonstrated a significant change after intervention. However, long-term planning for special education program should be considered when addressing learning difficulties as well as the effects the program has on continuous improvement in children with SLD.

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Potential conflicts of interest

The authors declare no conflict of interest.

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