Attention Deficit Hyperactivity Disorder (ADHD): Clinical Outcomes Measurement Development

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Objective: To develop a reliable and valid treatment outcome checklist for the measurement of ADHD treatment for children in a clinical setting.

Material and Method: The behavior indicators to assess the treatment outcomes of ADHD children were researched and developed by using multi-informants perspectives. The present study involved a qualitative study and two rounds of the Modified Delphi Techniques. In the first process, 11 parents/guardians of ADHD children aged 6 to 18 years were given a semi-structured interview on their expectation towards treatment outcomes at the Child and Adolescent Mental Health Rajanagarindra Institute. Items from literature reviews were also added before the first and second round evaluations using the Delphi by five different expert fields (six experts from each field). Final indicators from expert consensus were assessed from 180 ADHD patients, which were assessed by three child and adolescent psychiatrists. All items were analyzed for internal coefficient reliability. The Receiver Operating Characteristic (ROC) was used to calculate the cut off score.

Results: Thirteen indicators were assessed by experts as good content validity for clinical outcomes of ADHD treatment with the reliability of 0.60. The optimal cut-off point was 4 (sensitivity: 0.80; specificity: 0.76). The Area under curve (AUC) of total score was considered at a good level (0.83).

Conclusion: The ADHD clinical outcome checklist with 13 items has shown good validity and fair reliability. It can be a useful tool for ADHD treatment outcome assessment in clinical setting.

Keywords: Attention-deficit/hyperactivity, Clinical outcome measurement

Attention-Deficit Hyperactivity Disorder (ADHD) is a chronic neurobehavioral impairment, pervasive childhood disorder characterized by developmental inappropriate activity level, impulsive and poor organization of behaviors, easily distractibility, and inability to sustain attention and concentration. ADHD is most commonly found among school-age children. Even though the disorder is known to have a long-term effect, some symptoms can be recovered during adolescents. Despite that, some studies[1,2] showed that 15 to 70% of the population presented symptoms into their adulthood.

The prevalence of ADHD across the world is estimated to be 5%[3] and 8.1%[4] in Thailand. Considering Thai population statistics in 2012, 1.5 million out of 13.6 million children between the age of 5 to 19 were at risk of having ADHD[5]. ADHD patient prevalence ranks seventh in mental health problems and psychiatric disorders in clinical settings. It most commonly presents with disruptive behaviors or equivalent to 30 to 40% of all patients in the mental health services[6,7].

ADHD has yet to become a serious concern and interest for health policy makers in Thailand. Therefore, adequate service is not readily available in small provinces and accessibility remains very low. This is believed to be the consequence of a shortage of proper human resources and knowledge of ADHD to assess and evaluate treatment outcomes among general health professionals[8]. In addition, the perception, knowledge, attitudes of parents or guardians regarding the disorder are still being prioritized[9]. Unfortunately, this evaluation of parental perception has not yielded consistent results with the parent expectations; therefore, the aim of the present study is to develop an outcome assessment from parent perspectives. This

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type of evaluation would allow for a feasible checklist to measure clinical settings for academic accountability and quality assurance. Furthermore, such a tool could be applied in various situations that require more information on parental perception and be utilized as a helpful guideline for non-expert ADHD healthcare staff to learn more about the disorder from a different viewpoint.

Material and Method

The present study consisted of two phases. The First phase used the qualitative approach method aimed to develop preliminary items (behavior indicators) of the checklist to evaluate patients with ADHD. Two target groups were recruited consisted of six parents of children diagnosed as ADHD aged 6 to 12, and five parents of children with ADHD aged 13 to 18 years old. A semi-structured interview for opinions and expectations of treatment outcome was used in the study. Furthermore, additional preliminary items were developed from literature concerning treatment outcomes in ADHD and incorporated into the checklist. The first process contained 30 preliminary items that were reviewed by an expert committee. The second step was aimed to evaluate content validity and feasibility in clinical settings of the checklist by using the modified Delphi method for two rounds. Items scores were rated by thirty experts from five different fields (child and adolescent psychiatrists, psychiatric nurses, psychologists, social workers, special education teachers) who had more than five years of clinical experience in child and adolescent mental health area. Consensus was defined as an agreement of inter-quartile range not over 1 point and each item agreed if mean or mode of the rating was more than 3.

The second phase objective was not only to evaluate the quality of the items on the checklist but also to set the cut off score. In addition, the target group was ADHD participants aged 6 to 18 years that were previously assessed in pilot study. Sample size calculation was based on the Buderer's Disease Prevalence and Sample formula[10]. It was considered long term outcome with an ADHD poor outcome rate of 40 to 60% from the Barkley's study[11].

$$= \frac{Z^2_{\alpha/2}(\text{Sensitivity})(1\text{-Sensitivity})}{d^2}$$

n = required sample size,
$Z_{\alpha/2}$ = standard normal deviate corresponding to the specified size of the critical region: 1.96

Sensitivity = anticipated sensitivity: 0.9
d = absolute precision desired on either side of sensitivity: 10%

$$n = \frac{(1.96)^2(0.90)(0.10) = 42.6 \sim}{(0.1 \times 0.9)^2}$$

= 43 ADHD with poor outcome

The final sample size was increased to 180 ADHD cases in order to have a sufficient number to include poor ADHD outcome cases including drop out and incomplete data problems. Exclusion criteria were autism, psychosis, brain injury, full IQ below 70 or mental retardation.

Materials and assessments

A semi-structured parent interview and questionnaire for experts were used in the present study. The questionnaire consisted of 5-choice Likert scale questions ranging from 5 (being the most agreement) to 1 (being the least agreement). The Children-Global Function Assessment Scale (C-GAS)[12,13] was also used among child and adolescent psychiatrists for criterion validity analysis.

Ethical consideration

The study protocol was approved by the Institutional Review Board of the Faculty of Medicine, Chulalongkorn University in the sixth conference in 2013, IRB No. 59/55.

Results

Eleven parents and 29 experts were involved in the first phase and one hundred sixty children and adolescents with ADHD aged 6 to 18 years were recruited and enrolled. Then, a total of 128 children with good outcomes (104 Male, 24 female) and 52 children with poor outcome (48 Male, 4 Female) were enrolled in the second phase. There was no significant difference in the ratio of sex between two groups (χ^2 = 3.44, p<0.06). The mean age of good outcome ADHD and poor outcome ADHD were 11.0 (SD = 2.6) and 9.9 years (SD = 2.2). The mean range of service days for good outcome ADHD and poor outcome ADHD were 843 (SD = 80.3) and 743 days (SD = 63.3). Mean visits were 8.7 (SD = 5.9) and 10.4 (SD = 9.8) which were not significantly different in all factors.

Thirty preliminary clinical outcome items were identified by literature review, expert recommendations, and parent opinions. Then, 25 items were selected from two rounds of the Modified Delphi technique by experts (Table 1 and 2). Most experts suggested that "game

Table 1. Agreement items by experts in the Delphi 2 rounds

Items	Mean	Mode	Interquartile (Q3-Q1)
1) Use vulgarity	4.24	4	1
2) Harm (abuse) animals	3.9	4	0
3) Refuse to eat	Deleted in the first round		
4) Refuse to sleep	3.1	3	0.5
5) Engaging in dangerous activities such as playing with fire or doing inappropriate activity	3.34	3	1
6) Being injured or hospitalized from playing	4.6	5	1
7) Being relocated to different class due to behavior problem	4.1	4	0.5
8) Escape from home	3.03	3	0
9) Behavior scores were deducted	4.06	4	0
10) Drink intoxicated drink	2.89*	3	0.5
11) Smoking	Deleted in the first round		
12) Use drug	2.8*	3	1
13) Being unwillingly impregnated or impregnated someone	Deleted in the first round		
14) Engage in sexual intercourse	2.8*	3	0.5
15) Being grounded because of behavior problems	3.55	4	1
16) Stealing	3.75	4	0
17) Being suspended or dismissed from school	3.9	4	0
18) Bully or harm others	4.1	4	0
19) Engaging self-harm	3.48	4	1
20) Act violently and destroy stuff	4.55	5	1
21) Stay over at someone's house without parent permission	Deleted in the first round		
22) Escape or refuse to go to school	3.48	4	1
23) Fail or retake examination or repeat courses	3.96	4	0
24) Never hand in work or homework	4.82	5	0

* Below average of 3 will be deselected

Table 2. Items recommend by experts in the 1st round

Items	Mean	Mode	Interquartile (Q3-Q1)
25) Game addiction or gambling addition	3.65	4	1
26) Conceal the truth or lying	3.50	4	1
27) Being denied from being left out	3.80	4	0
28) Willing to help parents and other (positive behaviors)	3.34	4	1
29) Receive rewards, certificates or compliments from organization	3.06	4	2
30) Interest or engage in activities apart from studying such as sport, music or art	3.55	4	1

addiction", "gambling" and "receiving rewards and compliments" should be separated into three distinctive factors before conducting criterion validity against the outcome assessment scores done by experts. The Criterion Related Validity analysis (Chi-squared) was then conducted between the items and the outcome assessment scores done by experts, as shown in Table 3. The results showed only 13 items were statistically significant and that they could be further separated into behaviors occurring within one month and behaviors occurring within three months: nine and four items, respectively. Experts further suggested that the frequency and periods of occurrences (one month or three months) should be limited to ease the process of recall. This would also increase and promote more reliability. Internal reliability was found to be 0.60, which

Table 3. Correlation between the items and C-GAS score by child and adolescent psychiatrists

Items	Scores of C-GAS		Crude OR (95% CI)	p-value
	Poor n = 52 n (%)	Good n = 128 n (%)		
1) Never hand in works or homework				<0.001**
Yes	35 (67.3)	42 (32.8)	4.2 (2.1 to 8.3)	
No	17 (32.7)	86 (67.2)	1	
2) Escape or refuse to go to school				0.017*
Yes	5 (9.6)	2 (1.6)	6.7 (1.2 to 35)	
No	47 (90.4)	126 (98.4)	1	
3) Act violently and destroy stuff				0.059
Yes	16 (30.8)	23 (18.0)	2.0 (0.96 to 4.2)	
No	36 (69.2)	105 (82.0)	1	
4 Self-harm				0.324
Yes	7 (13.5)	11 (5.9)	1.6 (0.6 to 4.5)	
No	45 (86.5)	117 (94.1)	1	
5) Stealing				<0.001**
Yes	19 (36.5)	2 (1.6)	36.2 (8.0 to 163)	
No	33 (63.5)	126 (98.4)	1	
6) Engage in dangerous activities such as playing with fire or doing impropriated activity				0.003*
Yes	20 (38.5)	23 (18.0)	2.8 (1.3 to 5.8)	
No	32 (61.5)	105 (82.0)	1	
7) Refuse to sleep				0.003*
Yes	32 (61.5)	48 (37.5)	2.6 (1.3 to 5.1)	
No	20 (38.5)	80 (62.5)	1	
8) Harm or abuse animal				0.184
Yes	9 (17.3)	13 (10.2)	1.8 (0.73 to 4.6)	
No	43 (82.7)	115 (89.8)	1	
9) Spend at least 2 hours on average playing game, computer or internet				0.369
Yes	40 (76.9)	90 (70.3)	1.4 (0.66 to 2.9)	
No	12 (23.1)	38 (29.7)	1	
10) Gambling				0.032*
Yes	5 (9.6)	3 (2.3)	4.4 (1.01 to 19.2)	
No	47 (90.4)	125 (97.7)	1	
11) Interest or engage in activities besides studying such as sport, music or art				0.031*
Yes	32 (61.5)	99 (77.3)	0.46 (0.23 to 0.93)	
No	20 (38.5)	29 (22.7)	1	
12) Conceal the truth				0.011*
Yes	36 (69.2)	62 (48.4)	2.3 (1.2 to 4.7)	
No	16 (30.8)	66 (51.6)	1	
13) Bully or harm others				0.294
Yes	12 (23.1)	21 (16.4)	1.5 (0.68 to 3.3)	
No	40 (76.9)	107 (83.6)	1	
14) Use vulgarity				<0.001**
Yes	36 (69.2)	47 (36.7)	3.8 (1.9 to 7.7)	
No	16 (30.8)	107 (83.6)	1	
15) Willing to help parents and others				0.594
Yes	40 (76.9)	103 (80.5)	0.80 (0.37 to 1.7)	
No	12 (23.1)	25 (19.5)	1	

* 13 items were selected to be used in the next process

Table 3. cont.

Items	Scores of C-GAS		Crude OR (95% CI)	*p*-value
	Poor n = 52 n (%)	Good n = 128 n (%)		
16) Fail or retake examinations or repeat courses				<0.001**
Yes	22 (42.3)	17 (13.3)	4.7 (2.2-10)	
No	30 (57.7)	111 (86.7)	1	
17) Being suspended or dismissed from school				0.025*
Yes	4 (7.7)	1 (0.8)	10 (1.1-97)	
No	48 (92.3)	127 (99.2)	1	
18) Behavior scores were deducted				0.006*
Yes	11 (21.2)	9 (7.0)	3.5 (1.3-9.1)	
No	41 (78.8)	119 (93.0)	1	
19) Being relocated to different class due to behavior problem				0.298
Yes	1 (1.9)	0 (0.0)	0.28 (0.22-0.35)	
No	51 (98.1)	128 (100.0)	1	
20) Being grounded due to behavior problem or commit crime				0.201
Yes	2 (3.8)	1 (0.8)	5.0 (0.45-57.1)	
No	50 (98.3)	127 (99.2)	1	
21) Being injured or hospitalized from playing				0.141
Yes	13 (25.0)	20 (16.6)	1.8 (0.81-3.9)	
No	39 (75.0)	108 (84.4)	1	
22) Escape from house (more than 1 night)				0.025*
Yes	4 (7.7)	1 (0.8)	10.5 (1.1-97)	
No	48 (92.3)	122 (99.2)	1	
23) Being denied from being part of a group				0.275
Yes	14 (26.9)	25 (19.5)	1.5 (0.71-3.2)	
No	38 (73.1)	103 (80.5)	1	
24) Receive rewards or certificates from organization				0.950
Yes	16 (30.8)	40 (31.3)	0.97 (0.48-1.9)	
No	36 (69.2)	88 (68.8)	1	
25) Receive compliments from others				0.368
Yes	25 (48.1)	71 (55.5)	0.74 (0.39-1.4)	
No	27 (51.9)	57 (44.5)	1	

* 13 items were selected to be used in the next process

was considered "fair" based on the concept by Fisher & Corcoran (1994)[14]. When using the cutoff point of 4, the value of the area under the curve was 0.83, 80.8% for sensitivity and 76% for specificity. As Table 4 demonstrated, this is considered to be good[15] when compared with the outcome assessment scores using the Children-Global Function Assessment Scale (C-GAS) by three child and adolescent psychiatrists.

Discussion

The development of the ADHD outcome assessment checklist was based on the International Classification of Functioning, Disability and Health-Children and Youth (ICF-CY Model). It was developed by the World Health Organization (WHO) prioritizing the daily functioning of children with ADHD rather than the symptoms of the disorder[16]. Numbers of behaviors were found to negatively impact children's functioning, which were known to be problematic behaviors for ADHD and were categorized as part of conduct disorder that has a common comorbidity with ADHD[17].

Table 4. Criterion validity between outcome score by checklist and outcome by Child and Adolescent Psychiatrist committee assessment with the cut-off point of 4

	Poor outcome assessment (n = 52) n (%)	Good outcome assessment (n = 128) n (%)	Total (n = 180)
Poor outcome scores	42 (80.8)	30 (33.4)	72
(equal or more than 4 point)	58.3	41.7	
Good outcome' scores	10 (19.2)	98 (76.6)	108
(less than 4 point)	9.3	90.7	
Averaged score of indicators	4.5	2.2	p-value = 0.011*

* Independent t-test
Positive Predictive Value = 42/72 = 58.3; Negative Predictive Value = 98/108 = 90.7; Sensitivity = 42/52 = 80.8; Specificity = 98/128 = 76; Accuracy = (42 + 98)/180 = 78
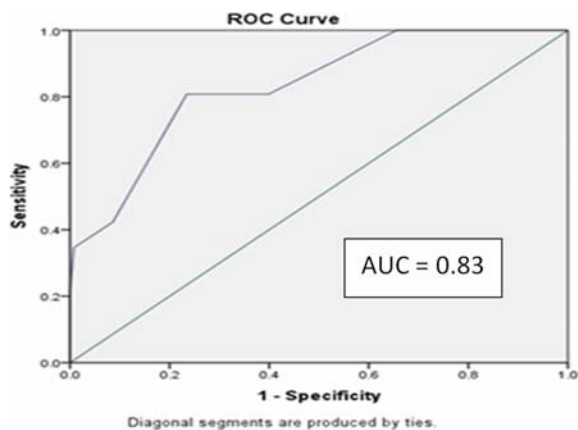

Fig. 1 Relative operating characteristics curve for total score of the ADHD clinical outcome checklist.

Table 5. ROC analyses on the checklist

Score	Sensitivity	Specificity
1	1.000	0.852
2	1.000	0.656
3	0.808	0.398
4	0.808	0.234
5	0.423	0.086
6	0.346	0.008
7	0.212	0.000
8	0.115	0.000
9	0.038	0.000
10	0.019	0.000
11	0.000	0.000
12	1.000	0.852

In the item content validity process and the determination of the appropriateness of the checklist, the Modified Delphi technique was thoroughly considered and identified as the most appropriate method. One reason is because it allows interviewees to freely express and revise their opinions after receiving feedback by peers. In the present study, 29 out of 30 experts completed and responded back. This high response rate was due to the fact that only two round ratings (appropriate literature review and parent item interview conclusions) were conducted. The minimum requirement for an effective Modified Delphi requires at least 17 responders and limits the number of the items in the assessment. This aims to avoid an un-collaborative of responders or boredom when answering too many items[18].

In the first round of the Modified Delphi, some indicators or behaviors, such as item 3 "refuse to eat", item 13 "being unwillingly impregnated or impregnated someone" and item 21 "stay over at someone's house without permission", were deselected by specialists because these behaviors have impacts that are derived from other factors other than from ADHD. Additionally, the checklist was suggested to be revised by adding items that contain positive behaviors such as "engage in creative activities", "receive rewards and compliments and willing to help others". One explanation for not including positive items is that when parents or involved people emphasize on positive behaviors of the children, it affects the positive relationship between the children and the parents, resulting in a higher tendency in changing negative behavior perception. However, when parents or involved people emphasize on only on children's negative behaviors by scolding or punishing, it also ends with the opposite result. In some cases, parents may even use physical force to deal with

problematic behaviors; consequently, without awareness of the deterioration of symptoms and relationships between parents and children[19]. From the parent perspective, academic functioning, self-responsibility, and disruptive behavior like stealing are high concern items which should be included into a clinical management plan.

The checklist consists of 13 items showing both good content validity and consensus among experts. This was based on the analysis of the mean and mode values from 3 points and above, interquartile range of less than 1, which also presented a statistically significant relationship. Furthermore, it has a reliability of 0.60, which was considered "fair". The wide age range of the participants (6 to 18 years old) was suspected as the explanation. Due to the different development period, parents also expected different outcomes. Consequently, participants in different age groups may be interpreted by the content of the items separately. In addition, from careful analysis, reliability could be improved if the question "interest or engage in activities besides studying such as sport, music or art" was removed. The item was designed to assess positive behavior that was later added according to specialist suggestion, however it affected the reliability inconsistently[20]. In other words, the item requires interpretation of individuals; unlike other items which asks of specific behaviors or present straightforward types of questions.

As clinical service settings in Thailand are routine, the outcome assessment of ADHD treatment has not been invented based on children's daily functioning. Furthermore, research on Bio-markers for ADHD or standardized instruments to diagnose and assess treatment outcome of the disorder has yet to provide strong supporting evidence[3,21]. Questionnaires for screening and diagnosis by psychiatrists based on Diagnostic and Statistical Manual (DSM) of American Psychiatric Association (APA) are common methods that are widely used[22]. Therefore, we decided to use C-GAS which assesses daily functioning by three child and adolescent psychiatrists[12,13,23]. With the use of a standardized instrument, data subjectivity is reduced. As our results showed, outcome assessment scores are consistent with the scores done by psychiatrists with the value area under the curve of 0.83 (true positive is higher than false positive)[24,25], the mean of poor outcome assessment scores being higher than 4.5 and the mean of good outcome assessment score at 2.2. This mean deference shows a statistical significance ($p < 0.05$).

Conclusion

The treatment ADHD outcome checklist is capable to differentiate between ADHD participants with good treatment outcome and those with poor treatment outcome at the cut-off score of 4. The sensitivity of 80.8% and specificity of 76.6% was useful compared to the gold standard child and adolescent psychiatrist assessment. In addition, the assessment is empirically appropriate for use to assess treatment outcomes of ADHD specifically, for children aged 6 to 18 years. As daily functioning is the main expectation of parents or caretakers for children with ADHD, specialists should consider to evaluate a broader item list as an effective treatment outcome rather than evaluation based solely on symptoms of the disorder[9].

Clinical implications

1) Clinical follow-up should include evaluating symptoms of ADHD and behaviors that effect daily functioning which corresponds with both patient and caretaker perspectives and expectations.

2) In addition to reducing ADHD symptoms, daily and academic functioning must take clinical management into account. There are many other activities such as sports, art, music that can potentially help reinforce positive behaviors. With this, children with ADHD could show better daily-life functioning and quality of life.

Research implications

1) Analysis of severity and impact of the specific behaviors on children lives are recommended to be included in further study. Duration of treatment and visits should be considered as a factor, therefore weighted items according to the impact of the behaviors may be included in the analysis for a more precise assessment.

2) The checklist or outcome assessment should be tested in different settings before mainstream implementation in order to evaluate the generalizability in terms of application (such as convenience or satisfaction). Consequently, results will be useful for future health policy measures.

What is already known on this topic?

Treatment outcome assessment of ADHD must include both symptoms and behavior by parent expectation which impacts daily life function. According to the study, factors were the best long-term predictor. In Thailand, most assessment tools were purposed to

screen ADHD however, its items only consisted of clinical symptoms with no assessment of daily life function in child and adolescent mental health services.

What this study adds?

An ADHD clinical outcome checklist is valid and reliable for outcome assessment of children with ADHD by parent expectations and multidisciplinary perspectives in clinical services.

Potential conflicts of interest

None

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การพัฒนาการประเมินผลลัพธ์การบำบัดเด็กสมาธิสั้น

รัตนศักดิ์ สันติธาดากุล, พรชัย สิทธิศรัณย์กุล, สมรัตน์ เลิศมหาฤทธิ์, ฉัททธร พิทยรัตน์เสถียร

วัตถุประสงค์: เพื่อศึกษาความเที่ยงและความตรงในการพัฒนาแบบสำรวจผลลัพธ์การบำบัดเด็กสมาธิสั้น สำหรับประเมินประสิทธิผลการรักษาเด็กสมาธิสั้น ในหน่วยบริการ

วัสดุและวิธีการ: การวิจัยและพัฒนาตัวชี้วัดเชิงพฤติกรรมเพื่อประเมินผลการบำบัดรักษาเด็กสมาธิสั้นจากมุมมองของผู้เกี่ยวข้องที่หลากหลาย ด้วยการวิจัย เชิงคุณภาพและเทคนิคเดลฟายประยุกต์จำนวน 2 รอบ เริ่มต้นด้วยการด้วยการสัมภาษณ์แบบกึ่งโครงสร้างในผู้ปกครองเด็กสมาธิสั้นจำนวน 11 ราย เกี่ยวกับความคาดหวังต่อผลลัพธ์ในการบำบัดรักษาเด็กสมาธิสั้นจากสถาบันสุขภาพจิตเด็กและวัยรุ่นราชนครินทร์ ร่วมกับการทบทวนวรรณกรรมที่เกี่ยวข้อง เพื่อสร้างเป็นแบบสอบถามความคิดเห็นต่อพฤติกรรมที่เหมาะสมเป็นตัวชี้วัดผลลัพธ์การบำบัดเด็กสมาธิสั้นในขั้นตอนเดลฟาย จำนวน 2 รอบ นำแบบสอบถามที่สร้างขึ้นสำรวจความคิดเห็นและตรวจสอบความตรงเชิงเนื้อหาข้อคำถามจากผู้เชี่ยวชาญทั้ง 5 วิชาชีพ ๆ ละ 6 ราย เมื่อได้พฤติกรรมตัวชี้วัด จากฉันทามติของผู้เชี่ยวชาญแล้ว หลังจากนั้นจึงทดสอบคุณภาพของแบบสำรวจกับผลการประเมินการรักษาของคณะจิตแพทย์เด็กและวัยรุ่น จำนวน 3 ท่าน ในกลุ่มตัวอย่างเด็กสมาธิสั้นจำนวน 180 ราย โดยการวิเคราะห์จาก ค่าสัมประสิทธิ์ความเที่ยงเชิงความสอดคล้องภายใน ค่าความไว ความจำเพาะ และพื้นที่ใต้โค้ง Receiver Operating Characteristic (ROC) เพื่อพิจารณาตัดคะแนนที่เหมาะสม

ผลการศึกษา: พฤติกรรมที่นำมาเป็นตัวชี้วัดในการบำบัดในแบบสำรวจมีจำนวน 13 พฤติกรรม/เหตุการณ์ที่ผ่านการตรวจสอบความตรงเชิงเนื้อหาสำหรับ ใช้ประเมินผลลัพธ์การบำบัดเด็กสมาธิสั้นจากผู้เชี่ยวชาญ มีค่าความเที่ยงเท่ากับ 0.60 ทั้งนี้เมื่อใช้จุดตัดที่ 4 คะแนน พบว่ามีความไวร้อยละ 80.8 ความจำเพาะร้อยละ 76.0 มีค่าพื้นที่ใต้กราฟ (AUC) เท่ากับ 0.83 จัดอยู่ในระดับดีเมื่อเทียบกับการประเมินผลของคณะจิตแพทย์เด็กและวัยรุ่น

สรุป: แบบสำรวจตัวชี้วัดผลลัพธ์เด็กสมาธิสั้นมีจำนวน 13 พฤติกรรม/เหตุการณ์ มีความตรงในระดับดีและความเที่ยงในระดับพอใช้ มีประโยชน์สำหรับ นำไปใช้ประเมินผลการรักษาเด็กสมาธิสั้นในหน่วยบริการต่อไป