

4-1-2021

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Recommended Citation

Wittayapanyanond, Wangsuk; Pityaratstian, Nuttorn; and Buathong, Napakkawat (2021) "The psychometric property testing of the Children's Yale-Brown Obsessive Compulsive Scale (CY-BOCS): Thai version," *Chulalongkorn Medical Journal*: Vol. 65: Iss. 2, Article 9.

DOI: 10.58837/CHULA.CMJ.65.2.9

Available at: <https://digital.car.chula.ac.th/clmjournal/vol65/iss2/9>

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Original article

The psychometric property testing of the Children's Yale-Brown Obsessive Compulsive Scale (CY-BOCS): Thai version

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Background: Obsessive-compulsive disorder is a disease of various symptoms and severity. In Thailand, currently there is no tool to identify obsessive-compulsive disorder in children and adolescents.

Objective: To evaluate the validity and reliability of the Thai version of Children's Yale-Brown Obsessive Compulsive Scale (CY-BOCS).

Methods: This study is a cross-sectional descriptive study to test the content validity of questionnaire using the index of item-objective congruence (IOC) from experts' opinions and the internal consistency reliability in the sample of 61 child-psychiatrists in secondary, tertiary and psychiatric hospitals in Thailand that assessed children and/or adolescent patients with obsessive compulsive disorder within the past one year.

Results: The results showed that the content validity of the questionnaire met the standards, item-objective congruence (IOC) of CY-BOCS obsessions checklist, CY-BOCS compulsions checklist, obsessive severity subscale and compulsive severity subscale are 0.835, 0.812 and 0.945, respectively; and the total mean of IOC of all items was 0.841. The internal consistency reliability of this questionnaire by using Kuder-Richardson method was 0.857 for obsessive severity subscale, 0.850 for compulsive severity subscale and 0.932 for obsessive severity subscale and compulsive severity subscale.

Conclusions: The Thai version of CY-BOCS has acceptable content validity and reliability. This questionnaire can be a tool to assess obsessive compulsive disorders in children and adolescents. Therefore, the questionnaire can be used for the benefit of diagnosis, following-up treatments and further researches.

Keywords: Children's Yale-Brown Obsessive Compulsive Scale, Thai version, content validity, reliability.

Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-5)⁽¹⁾ characterized obsessive-compulsive disorder (OCD) by the presence of obsessions and/or compulsions. Obsessions are recurrent and persistent thoughts, urges, images that are unwanted. Compulsions are repetitive behaviors or mental acts attempts to decrease or stop obsessional thoughts. These behaviors causes anxiety, marked distress, time-consuming or cause impairment in social activities, occupation or other important functions. Obsession symptoms are related to stress and anxiety.

Epidemiologic studies found that lifetime prevalence of OCD were 1.0 – 3.0%.⁽²⁻⁵⁾ Subclinical OCD 2.0% across sites.⁽³⁾ Lifetime prevalence of OCD in Thailand was 0.3%.⁽⁶⁾ The prevalence of child and adolescent with OCD was 1.0 – 3.0%.^(5,7) As for childhood, boys are more commonly affected than girls, the ratio was at 3:2.^(8,9) But in adolescence, there is a similar prevalence in both sexes.

Age of onset of OCD is bi-modal, aged 10 to 11 years old, and during early adulthood.⁽¹⁰⁾ Children may not be able to recognize excessive worries and habits or may deny their secret struggle. Diagnosis is usually delayed in treatment after about many years of onset.

Natural history of the affected child and adolescent with OCD is chronic, waxing and waning symptoms.⁽¹¹⁾ The rate of remission is 32.0 – 79.0% depending on the methodology and types of samples. ⁽¹¹⁾ Half of remitted patients have residual

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Received: January 5, 2019

Revised: April 25, 2019

Accepted: December 30, 2019

symptoms, so the target of the treatment is decreasing symptoms of child that have subclinical, which can be OCD disorders over time.

OCD and subclinical OCD is disabling with adverse impact on functioning, including education and social/family life⁽¹²⁾ impaired quality of life in psychosocial function, personal and interpersonal functions.⁽³⁾

OCD has various symptoms and severity so the Yale-Brown Obsessive Compulsive Scale (Y-BOCS)^(13, 14) was developed to diagnose and assess the severity of OCD symptoms in the adult.

In 1997, Scahill L, *et al.* developed "Children's Yale-Brown Obsessive Compulsive Scale (CY-BOCS)" from Y-BOCS but the words of the probe question were modified to be suitable for children and adolescents.⁽¹⁵⁾ The CY-BOCS is the instrument of choice in assessing obsessive compulsive symptoms and severity in children and adolescents aged 8 - 17 years old in past one week, clinician rated, semi-structured interview. The reports are made independently by parents and children. But clinicians use their clinical judgment to final ratings. The CY-BOCS has 5 primary sections: instructions, obsessions checklist, compulsions checklist, obsessive severity subscale, and compulsive severity subscale. the symptom checklist (obsessions checklist and compulsions checklist) is a checklist reviewing the presence of specific obsessions and compulsions. The severity scale (obsessive severity subscale and compulsive severity subscale) measures the duration, interference, control, and distress caused by the obsessive-compulsive symptoms.

In Thailand, there have never been any validated measurement for OCD in children and adolescents. According to cross-cultural consideration, the researchers developed the Thai version of CY-BOCS for use in clinical setting for diagnosis, follow-up treatments and further researches.

Materials and methods

This study was a cross-sectional descriptive study to test psychometric property of the instrument, *approved* by the Institutional Review Board (IRB) of the Faculty of Medicine, Chulalongkorn University (IRB no. 533/60) prior enrolling participants. The participants were informed and gave consent, consist of 61 child psychiatrists in secondary, tertiary and psychiatric hospitals in Thailand that assessed children and/or adolescent patients with

obsessive compulsive disorder within the past one year. The study was collected data from April to July 2018 to test psychometric properties including content validity and internal consistency reliability.

Participants

Calculation sample size determination in descriptive research that knows the total population that wants to study using the formula of Taro Yamane (1973). Data from Child and Adolescent Psychiatrist Association of Thailand, there was 192 child and adolescent psychiatrists in 2016, calculated as the total population so the sample size consisted of at least 50 children and adolescents psychiatrists.

Inclusion criteria: Child psychiatrists in secondary, tertiary and psychiatric hospitals in Thailand that assessed children and/or adolescent patients with obsessive compulsive disorder within the past one year; use Thai fluently as the primary language for communication; voluntarily participated in the study.

Exclusion criteria: Individuals with illnesses affecting decision making including neurocognitive disorder, severe psychosis.

Procedures⁽¹⁶⁾

To test content validity of all items of obsessions checklist, compulsions checklist, obsessive severity subscale, compulsive severity subscale and CY-BOCS severity scale of this questionnaire by using the item-objective congruence index (IOC).

To test the internal consistency reliability of obsessive severity subscale compulsive severity subscale, and obsessive severity subscale and compulsive severity subscale of this questionnaire by using the Kuder-Richardson method.

Storch EA, *et al.*⁽¹⁷⁾ found the internal consistency reliability of the original version of CY-BOCS was good for the CY-BOCS obsession and compulsion severity scores ($\alpha = 0.80$ and 0.82), and the total score ($\alpha = 0.90$).

Using CY-BOCS symptom checklist among youth aged 5 - 8 years old with OCD, the internal consistency reliability of the CY-BOCS total scale ($\alpha = 0.72$) and compulsion severity subscale ($\alpha = 0.71$) are appropriate, but the obsession severity subscale was low ($\alpha = 0.64$).⁽¹⁸⁾

Wu MS, *et al.*⁽¹⁹⁾ found CY-BOCS has adequate reliability and validity when assessing the presence and severity of obsessive-compulsive symptoms in youth with high-functioning ASD. Internal consistency

reliability was good for the CY-BOCS total score and obsession severity subscale ($\alpha = 0.86$), but poor for the compulsion severity subscale ($\alpha = 0.59$). Good to excellent inter-rater reliability of the CY-BOCS total score and both severity subscales, indicating consistent ratings across different clinicians. The convergent and divergent validity of the CY-BOCS total score and both severity scales were satisfactory.

After asking for permission from questionnaire developer to translate the questionnaire into Thai language, approved by IRB and then forwarded the translation of the questionnaire by 2 independent language experts (1 medical and 1 non-medical language experts) and consensus between them and then blind backward translation; then compared backward translation with original version and then consult advisor and childhood OCD experts (the first revision) to make linguistic adjustment. Descriptive statistics examined baseline characteristics of the study sample. Testing the content validity of the questionnaire, using the index of IOC from experts' opinions of the symptom checklist and the severity scale and then consult advisor and experts to make linguistic adjustment (the second revision). Testing the

internal consistency reliability of the second revised questionnaire of the severity scale, using the Kuder-Richardson method by purposive sampling, 61 child psychiatrists.

Described translated questionnaire to participants. Then participants completed the questionnaire. Collected data were statistically analyzed (including amount, percentage, mean IOC and Kuder-Richardson coefficient) with statistical package for the social science for Windows (SPSS) version 22.0.

Results

Characteristics of samples

Participants were the child psychiatrists in secondary, tertiary and psychiatric hospitals in Thailand who assessed children and/or adolescent patients with obsessive compulsive disorder within the past one year. According to Table 1, the average age of 61 participants were 37.72 ± 7.58 years old, consisting of female 88.5%, graduated from child and adolescent psychiatry (80.3%). Most of those have worked in government hospitals (47.5%) and treated 1 child and/or adolescent patient with obsessive compulsive disorder within the past one year (24.6%).

Table 1. Demographic data of participants.

Variables	Number	Percentage
Gender		
Male	7	11.5
Female	54	88.5
Age (years)		
Less than 31	5	8.2
31 - 40	40	65.6
41 - 50	12	19.7
51 - 60	1	1.6
More than 61	2	3.3
Not available	1	1.6
Education		
Child and adolescent psychiatry	49	80.3
Child and adolescent psychiatry and pediatrics	4	6.6
Child and adolescent psychiatry and general psychiatry	5	8.2
Child and adolescent psychiatry, general psychiatry and pediatrics	2	3.3
Child and adolescent psychiatry, preventive medicine and community mental health	1	1.6
Workplace		
Government hospital	29	47.5
University hospital	23	37.7
Private hospital / Clinic	6	9.8
Government and private hospital	2	3.3
Not available	1	1.6
Number (s) of children and/or adolescent patients with obsessive compulsive disorder within the past one year		
1	15	24.6
2	9	14.8
3	9	14.8
4	5	8.2
More than 4	23	37.7

Content validity

The content validity was indicated by the IOC of each item rated by 3 clinical experts. If IOC less than 0.5 (including Concerned will get others ill by spreading contaminant (aggressive); no concern with consequences of contamination other than how it might feel; fear harm will come to others (may be because something child did or did not do); excessive concern or fear of offending religious objects (God); fear of not saying just the right thing; excessive or ritualized showering, bathing, tooth brushing, grooming, or toilet routine; and ritualized eating behaviors), the items would be edited on “question reviewed by experts”.

According to Table 2, Obsessions checklist: the majority of IOC was 1 (25 items, 28.7%) and mean of IOC was 0.835; compulsions checklist: the majority of IOC was 1 (19 items, 21.8%) and mean of IOC was 0.812; obsessive severity subscale and compulsive severity subscale: The majority of IOC was 1 (5 items, 5.7%) and mean of IOC was 0.945; the total mean of

IOC of all items was 0.841, found the content validity of this questionnaire met the standard.

Reliability

The consistency of the item and the remaining items (Internal consistency reliability) was indicated by the corrected item-total correlation of the obsessive compulsive severity scale (range 0.613 - 0.834), obsessive severity subscale (range 0.613 - 0.792), and compulsive severity subscale (range 0.538 - 0.763) were 0.2 or above (Table 3 - 5). The result of Cronbach's Alpha if item deleted of the obsessive compulsive severity scale, obsessive severity subscale, and compulsive severity subscale indicating the deletion of any items did not change the Cronbach's Alpha value, therefore, all items in each section remain (Tables 3 - 5).

The Kuder-Richardson coefficient of the obsessive compulsive scale (0.932), obsessive severity subscale (0.857) and compulsive severity subscale (0.850) was high (Table 6).

Table 2. Summary of IOC and amount and percentage of sections.

Item-Objective Congruence Index		Number (s) of items that received an IOC score sections (%)				
		0	0.3	0.67	1	Mean of IOC
Obsessions checklist		0 (0.0)	4 (4.5)	12 (13.7)	25 (28.7)	0.835
Compulsions checklist		1 (1.1)	2 (2.2)	12 (13.7)	19 (21.8)	0.812
Obsessive Severity subscale		0 (0.0)	0 (0.0)	1 (1.1)	5 (5.7)	0.945
Compulsive Severity subscale		0 (0.0)	0 (0.0)	1 (1.1)	5 (5.7)	0.945
Total CY-BOC	87 (100.0)	1 (1.1)	6 (6.8)	26 (29.8)	54 (62.0)	0.841

Table 3. Item-total statistics of the CY-BOCS: obsessive compulsive severity subscale.

Items	Corrected item-total correlation	Cronbach's Alpha if item deleted
Time spent on obsessions	0.659	0.930
Obsession-free interval	0.834	0.921
Interference from obsessions	0.659	0.930
Distress from obsessions	0.676	0.928
Resistance (from obsessions)	0.737	0.926
Control over obsessions	0.834	0.921
Time spent on compulsions	0.659	0.930
Compulsion-free interval	0.834	0.921
Interference from compulsions	0.775	0.926
Distress from compulsions	0.613	0.930
Resistance (from compulsions)	0.776	0.924
Control over compulsions	0.692	0.928

Table 4. Item-total statistics of the CY-BOCS: obsessive severity subscale.

Items	Corrected item-total correlation	Cronbach's Alpha if item deleted
Time spent on obsessions	0.626	0.849
Obsession-free interval	0.792	0.803
Interference from obsessions	0.626	0.849
Distress from obsessions	0.613	0.839
Resistance (from obsessions)	0.639	0.844
Control over obsessions	0.792	0.803

Table 5. Item-total statistics of the CY-BOCS: compulsive severity subscale.

Items	Corrected item-total correlation	Cronbach's Alpha if item deleted
Time spent on compulsions	0.610	0.842
Compulsion-free interval	0.763	0.798
Interference from compulsions	0.727	0.822
Distress from compulsions	0.538	0.844
Resistance (from compulsions)	0.727	0.808
Control over compulsions	0.631	0.829

Table 6. Kuder-Richardson coefficient.

Sections	Obsessive severity subscale	Compulsive severity subscale	Obsessive compulsive severity scale
Kuder-Richardson	0.857	0.850	0.932

Discussion

The internal consistencies of a German version of the CY-BOCS (CY-BOCS-D)⁽²⁰⁾ prove to be adequate to very good, convergent and divergent validity can be confirmed. The results support the “gold standard” status of the procedure also for the German-speaking area.

The total mean of IOC of all items of CY-BOCS Severity scale was 0.841 (only 7 items of the CY-BOCS Thai version have IOC less than 0.5.) so indicating the content validity of this questionnaire met the standard (Table 2). The majority of IOC of the Obsessions Checklist was 1 (25 items, 28.7%) and the mean of IOC was 0.835; the majority of IOC of the Compulsions Checklist was 1 (19 items, 21.8%) and the mean of IOC was 0.812; the majority of IOC of the Obsessive Severity subscale and the Compulsive Severity subscale was 1 (5 items, 5.7%) and the mean of IOC of both Severity subscales was 0.945.

To test the internal consistency reliability of this questionnaire by using the Kuder-Richardson method was 0.857 for Obsessive Severity Subscale, 0.850 for

compulsive severity subscale and 0.932 for obsessive severity subscale and compulsive severity subscale, indicating every section has high value, therefore, the CY-BOCS Thai version has acceptable internal consistency reliability.

This study was a cross-sectional descriptive study that causes test-retest reliability of questionnaire cannot be done. The questionnaire was not widely distributed among the most child and adolescent psychiatrists and has not been applied to children and/or adolescents with OCD. Not test interrater reliability is limitation.

This study was conducted based on CY-BOCS because CYBOCS II was published after in 2018.

Conclusion

The Psychometric Property Testing of the CY-BOCS Thai version had acceptable content validity and reliability so this questionnaire can be a tool for more research in order to assess obsessive compulsive disorders. Therefore, this questionnaire can be used for the benefit of diagnosis, following-up treatment and further research.

Acknowledgements

The authors would like to thank to Assistant Professor Pranee Muangnoi, Queen Sirikit National Institute of Child Health, Bangkok, Thailand for their assistance with data collection, content experts for scale development and all respondents for their participations in the study.

Conflict of interest

The authors, hereby, declare no conflict of interest.

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