

# Adaptation of the Russian Version of the Children’s Somatic Symptoms Inventory on a Sample of Orphans and Children without Parental Care

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This study was aimed to adapt the Russian version of the Children’s Somatic Symptoms Inventory-8 (CSSI-8). The participants were 160 orphans and children and adolescents left without parental care, including 80 girls and 80 boys aged 9 to 17 years ( $M=14,51$ ;  $Me=15$  years;  $SD=1,79$ ). All participants completed CSSI-8 and the Revised Child Anxiety and Depression Scale-30 (RCADS-30). The Russian version of the inventory was reliable and valid: firstly, it has a high Cronbach’s  $\alpha$ , showing its internal reliability; secondly, it has a one-factor structure, indicating its factor validity; thirdly, the relationship of somatic symptoms with anxiety and depressive symptoms proves convergent validity. Thus, 76,2% of children and adolescents had at least one specific somatic symptom, 44,4% complained of pain in stomach or abdomen, 58,7% of headaches, 30,6% of pain in lower back, 19,4% of faintness or dizziness, 29,4% of pain in arms or legs, 28,7% of heart palpitations, nausea or upset stomach, 47,5% of weakness in some parts of the body. In conclusion, it is important to make future psychometric examinations of the adapted questionnaire, which allow us to recommend it for school diagnosis and psychological counseling of children and adolescents, as well as screening and monitoring of somatoform disorders.

**Keywords:** somatization; internal reliability; factor validity; convergent validity; psychometric analysis.

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# Адаптация русскоязычной версии детского опросника соматических симптомов на выборке детей-сирот и детей, оставшихся без попечения родителей

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Представлены результаты адаптации русскоязычной версии детского опросника соматических симптомов (Children's Somatic Symptoms Inventory, CSSI-8). Материалом исследования стали данные, собранные на 160 детях и подростках, являющихся сиротами или оставшихся без попечения родителей, с помощью русскоязычных версий CSSI-8 и детской шкалы тревоги и депрессии (Revised Child Anxiety and Depression Scale-30, RCADS-30). Результаты проведенного исследования показали, что русскоязычная версия опросника надежна и валидна: во-первых, она имеет высокий показатель  $\alpha$ -Кронбаха, подтверждающий ее внутреннюю надежность; во-вторых, она имеет однофакторную структуру, свидетельствующую в пользу ее факторной валидности; в-третьих, взаимосвязи соматических симптомов с тревожными и депрессивными симптомами являются доказательством конвергентной валидности. Анализируется статистика соматических симптомов у детей-сирот и детей, оставшихся без попечения родителей. Обнаружено, что 44,4% опрошенных жаловались на боли в животе или желудке, 58,7% — на головные боли, 30,6% — на боли в нижней части спины, 19,4% — на обморок или головокружение, 29,4% — на боли в руках или ногах, 28,7% — на учащенное сердцебиение, тошноту или расстройство желудка, 47,5% — на слабость в некоторых частях тела. Делается вывод о важности будущих психометрических испытаний адаптированного опросника, которые позволят рекомендовать его для школьной диагностики и психологического консультирования детей и подростков, а также скрининга и мониторинга соматоформных расстройств.

**Ключевые слова:** соматизация; внутренняя надежность; факторная валидность; конвергентная валидность; психометрический анализ.

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## Introduction

In childhood, a child goes through certain stages associated with the development of mechanisms of mastering his own body, learning the logic and nature of his physicality. Healthy development involves the process of desomatization, when the child learns the psychological resolution of emotional discomfort (for example, asks for help, talks about his feelings, tries to negotiate), and adverse development triggers the process of resomatization, when the child expresses his condition through somatic response (for example, suffers from physical pain that arose after emotional shocks and have no physiological justification) [26].

Childhood and adolescent somatization is a chronic, predictably developing process: in young children, somatic symptoms are isolated and usually boil down to repeated complaints on headaches and abdominal pain [11; 23], but as children and adolescents grow older, they increasingly experience a complex of specific somatic symptoms with the most frequent and intense experiences of pain in the extremities, muscle aches, fatigue and neurological symptomatology [31; 32]. According to epidemiological studies, from 33.7% to 69.2% of children and adolescents complain of certain symptoms that do not receive physiological justification during medical examinations [6; 20; 24]. Children and adolescents with somatic symptoms are more likely to skip classes at school and to suffer from psychological distress and psychiatric comorbidity [13], turn to health resources, undergo unnecessary medical interventions and are at risk of disability [15], than their peers who do not have complaints about somatic health.

Russian pediatricians and child psychiatrists often encounter the problem of somatization. They note that the somatization of mental disorders in childhood and ado-

lescence manifests itself in the form of pathologies of the gastrointestinal tract, skin changes, disorders of the musculoskeletal system, cardiovascular manifestations and other somatic symptoms and diseases, and also draw attention to the fact that the diagnosis and therapy of childhood and adolescent somatization helps to prevent psychosomatic diseases of adulthood at its early stage [1].

In foreign practice, the Children's Somatic Symptoms Inventory (CSSI) is widely used to examine the severity of somatization and specific somatic symptoms [28; 30]. CSSI was developed on the basis of the criteria of somatization disorder according to DSM-III-R and the somatization factor from the Hopkins Symptom Checklist and became the main instrument for screening and monitoring of childhood somatization worldwide [8]. The questionnaire has been successfully translated and adapted into Persian [14], Spanish [22], Polish [9], German [12], Turkish [16], Dutch [21], Italian [6] and Ukrainian [18], and also has a short psychometrically based version, a list of eight somatic symptoms ("Gastric or abdominal pain", "headaches", "pain in lower back", "faintness or dizziness", "pain in arms or legs", "heart beating too fast", "nausea or indigestion", "weakness in parts of body") [27].

The questionnaire has not yet been adapted into Russian, and therefore the aim of this study was the Russian adaptation of a short version of the Children's Somatic Symptoms Inventory-8 (CSSI-8).

## Organization and methods of research

**Procedure.** The survey was conducted in January-February 2023 in several orphanages with the permission of the administration and with the participation of psychologists and educators working in these organizations. We invited children and adolescents aged 8 to 18 years old who are

able to take written tests and do not have chronic mental and somatic diseases.

Children and adolescents completed the online questionnaire on their own, but had the opportunity to contact psychologists and educators if they had difficulties understanding the test statements.

**Participants.** 160 children and adolescents were recruited for this study, including 80 girls and 80 boys aged 9 to 17 years ( $M=14,51$ ;  $Me=15$  years;  $SD=1,79$ ).

**Methods.** Children and adolescents who participated in the study completed the following diagnostic materials:

1. The Children's Somatic Symptom Inventory-8 (CSSI-8) examines the severity of somatization in children and adolescents based on self-reports on eight specific somatic symptoms [30]. According to the instructions, children were asked to assess how much each symptom has bothered them over the past two weeks on a Likert scale from 0 ("not at all") to 4 ("very often"). The questionnaire was translated into Russian with the participation of a child psychiatrist and a health expert.

2. The Revised Child Anxiety and Depression Scale-30 (RCADS-30) measures the symptoms of major depressive disorder ("I feel worthless"), panic disorder ("All of a sudden I feel really scared for no reason at all"), social phobia ("I worry what other people think of me"), separation anxiety disorder ("I feel scared if I have to sleep on my own"), generalized anxiety disorder ("I worry that something bad will happen to me") and obsessive-compulsive disorder in childhood ("I have to keep checking that I have done things right") [25]. According to the instructions, the child needs to assess how often he experiences certain states and experiences, on a Likert scale from 0 ("never") to 3 ("always"). The measure was translated into Russian with the participation of a child psychiatrist and a health expert, and also checked for factor validity ( $\chi^2(364)=594$ ,  $p<0,001$ ;  $CFI=0,918$ ;

$TLI=0,903$ ;  $SRMR=0,052$ ;  $RMSEA=0,063$  [0,054; 0,072]) and internal reliability ( $\alpha=0,80$  for the scale of major depressive disorder;  $\alpha=0,84$  for the scale of panic disorder;  $\alpha=0,83$  for the scale of social phobia;  $\alpha=0,76$  for the scale of separation anxiety disorder;  $\alpha=0,83$  for the scale of generalized anxiety disorder;  $\alpha=0,77$  for the scale of obsessive-compulsive disorder).

**Analytic strategy.** We used descriptive statistics, the Cronbach's alpha coefficient, the Pearson correlation coefficient, the Pearson's chi-squared test and confirmatory factor analysis by the maximum likelihood method. The Cronbach's alpha coefficient should be  $\geq 0,7$  [29]. The factor structure corresponds to the initial data in the comparative fit index ( $CFI$ )  $\geq 0,90$ ; the Tucker-Lewis index ( $TLI$ )  $\geq 0,90$ ; standardized root mean square residual ( $SRMR$ )  $\geq 0,08$ ; root mean square error of approximation ( $RMSEA$ )  $< 0,95$  [5; 10; 19]. The Pearson correlation coefficient and the Pearson chi-squared test are statistically significant at  $p<0,05$ . Data analysis was performed in Jamovi 2.3.21 and IBM SPSS for Windows 23.0.

**Ethical considerations.** The study was conducted in compliance with the ethical code of the Russian Psychological Society and the principles of the Helsinki Declaration adopted by the World Medical Association.

## Results

The Russian version of the CSSI-8 was internally consistent ( $\alpha=0,84$ ). The prevalence of specific somatic symptoms ranged from 19,4% (for reports of fainting or dizziness) to 58,7% (for reports of headaches), while 76,2% of children had at least one somatic symptom and from 1,9% to 10,7% of the children surveyed complained of frequent and very frequent somatic symptoms. Table 1 shows descriptive statistics for the CSSI-8 items, the Cronbach's alpha coefficients when excluding items from the questionnaire, and the prevalence of somatic symptoms.

Table 1

**Descriptive statistics, the Cronbach's alpha coefficients and the prevalence of somatic symptoms**

	CSSI-8 items	M	SD	$\alpha$	Skewness	% of any positive responses
1	Gastric or abdominal pain	0,62	0,82	0,82	1,30	44,4
2	Headaches	0,93	1,01	0,83	1,01	58,7
3	Pain in lower back	0,52	0,90	0,83	1,74	30,6
4	Faintness or dizziness	0,28	0,62	0,83	2,40	19,4
5	Pain in arms or legs	0,44	0,82	0,83	2,25	29,4
6	Heart beating too fast	0,43	0,77	0,83	1,88	28,7
7	Nausea or indigestion	0,41	0,75	0,82	2,28	28,7
8	Weakness in parts of body	0,78	1,05	0,82	1,44	47,5

Note.  $\alpha$  = the Cronbach's alpha coefficients when excluding items; the asymmetry is indicated with a standard error of 0,192.

The confirmatory factor analysis showed that the original CSSI-8 model has low data compliance ( $\chi^2(20)=55,7$ ,  $p<0,001$ ; CFI=0,914; TLI=0,880; SRMR=0,052; RMSEA=0,106 [0,073; 0,139]). After analyzing the modification indices and making covariance between the errors of item 1 ("gastric or abdominal pain") and item 7 ("nausea or indigestion"), the model showed acceptable compliance with the data ( $\chi^2(19)=43,3$ ,  $p<0,001$ ; CFI=0,942; TLI=0,914; SRMR=0,046; RMSEA=0,090 [0,054; 0,125]). The total somatization factor included items with factor loading from 0,41 to 0,58. Table 2 presents factor loadings and standard errors for the CSSI-8 items.

Somatic symptoms were associated with symptoms of anxiety and depression.

Table 3 shows the correlation coefficients between the CSS-8 and RCADS-30 scores.

Somatization depended on the gender, but not on the age of the children and adolescents ( $r=0,047$ ,  $p=0,559$ ). Girls were more likely to complain about gastric or abdominal pain ( $\chi^2(1)=18,459$ ,  $p<0,001$ ), headaches ( $\chi^2(1)=8,356$ ,  $p=0,004$ ), pain in lower back ( $\chi^2(1)=4,972$ ,  $p=0,026$ ), faintness or dizziness ( $\chi^2(1)=9,002$ ,  $p=0,003$ ), heart beating too fast ( $\chi^2(1)=5,980$ ,  $p=0,014$ ), nausea or indigestion ( $\chi^2(1)=8,356$ ,  $p=0,004$ ), weakness in parts of body ( $\chi^2(1)=8,120$ ,  $p=0,004$ ), but not about a pain in arms or legs ( $\chi^2(1)=4,394$ ,  $p=0,036$ ). The statistics of specific somatic symptoms in girls and boys are presented in Table 4.

Table 2

**Factor loading and standard errors for the CSSI-8 items**

	CSSI-8 items	Factor loading	Standard error
1	Gastric or abdominal pain	0,48	0,06
2	Headaches	0,58	0,08
3	Pain in lower back	0,55	0,07
4	Faintness or dizziness	0,41	0,05
5	Pain in arms or legs	0,49	0,06
6	Heart beating too fast	0,52	0,06
7	Nausea or indigestion	0,51	0,06
8	Weakness in parts of body	0,74	0,08

Table 3

**Correlations between the CSSI-8 and RCADS-30 scores**

RCADS-30 scales		CSSI-8 total score
1	Symptoms of major depressive disorder	0,43
2	Symptoms of panic disorder	0,46
3	Symptoms of social phobia	0,30
4	Symptom of separation anxiety disorder	0,31
5	Symptoms of generalized anxiety disorder	0,42
6	Symptoms of obsessive-compulsive disorder	0,41

Table 4

**The statistics of somatic symptoms in girls and boys**

Somatic symptoms		Girls (%)	Boys (%)
1	Gastric or abdominal pain	61,3	27,5
2	Headaches	70,0	47,5
3	Pain in lower back	38,8	22,5
4	Faintness or dizziness	28,7	10,0
5	Pain in arms or legs	32,5	26,3
6	Heart beating too fast	37,5	20,0
7	Nausea or indigestion	36,3	21,3
8	Weakness in parts of body	58,8	36,3

**Discussion**

The results of this study, aimed at the Russian adaptation of the short version of the Children’s Somatic Symptoms Inventory-8 (CSSI-8), showed the psychometric soundness of the adapted instrument. The high Cronbach’s alpha coefficient ( $\alpha=0,84$ ) confirmed the internal reliability of the adapted questionnaire. The one-factor model, which repeats the original structure of the questionnaire and incorporates all eight somatic symptoms into a single somatization factor, testifies in favor of the factor validity of the Russian version of the CSSI-8. The correlation between somatic symptoms and anxiety and depressive symptoms confirmed the convergent validity of the adapted questionnaire. Previously, experts identified the comorbidity of somatoform, anxiety and depressive disorders in clinical practice [13] and the relationship between somatic, anxiety and depres-

sive symptoms in correlation studies [24]. Moreover, some researchers argue that a somatic symptom can be considered as a sign of an advanced anxiety or depressive disorder and should be carefully studied not only by pediatricians, but also by child psychiatrists and psychologists [20].

Among the participants, 76,2% of orphans and children left without parental care had at least one somatic symptom and complained about gastric or abdominal pain (44,4% of cases), headaches (58,7% of cases), pain in lower back (30,6% of cases), faintness or dizziness (19,4% of cases), pain in arms or legs (29,4% of cases), heart beating too fast (28,7% of cases), nausea or indigestion (28,7% of cases) and weakness in parts of body (47,5%). These values exceed the previously detected 33,7—69,2% of cases of somatization in children and adolescents growing up in biological families, and emphasize the fact that the Russian version of the CSSI-8

was adapted on a specific sample [6; 20; 24]. It can be assumed that orphans and children left without parental care express psychological distress in the form of somatic symptoms and diseases as more obvious and requiring adult help and attention signs of distress than symptoms of mental health and developmental disorders. Earlier, Russian experts found that the psychosomatic health of children placed in foster care gets better within a year after they leave an orphanage [2].

We also found that somatization depends on gender, but not on the age of orphans and children left without parental care. The high susceptibility of girls to somatization is a well-known effect that persists into adulthood and is associated with the fact that women have greater visceral sensitivity, notice and describe somatic symptoms earlier and more accurately, encounter stereotypes less often regarding the ways of manifestation of somatic distress, and are also more often exposed to traumatic situations during their lives, leading to the development of somatic symptoms and psychosomatic diseases [3]. Foreign experts note that gender differences in the severity of somatization become noticeable at the age of 13, soften by the age of 15, but remain statistically significant throughout later life [3; 7; 24]. The fact that this study revealed the absence of age differences in the symptoms of somatization may be due to the fact that somatization is considered one of the earliest mechanisms of response to psychological distress, which is successfully consolidated and repeated at any age period when encountering traumatic circumstances [26].

The present study has a number of limitations and prospects related to overcoming

them. The main limitation is the size and specificity of the study sample. Psychometric analysis should be based on data from broader categories of respondents, include materials from a survey of children and adolescents with somatic diseases [30]. Another limitation is the lack of control over the variables affecting the course of somatization in childhood and adolescence [4; 13]. A significant limitation also lies in the absence of such objective criteria for somatization as information on the prevalence of school absences, statistics on children and adolescents' visits to medical institutions. The prospects for further psychometric testing of the Russian version of the CSSI-8 are related to the need for its testing in clinical (including on a sample of children with somatic diseases and somatoform disorders) and population conditions, since this will allow us to recommend the questionnaire for use in screening and monitoring of somatoform disorders in childhood and adolescence, as well as in the practice of school diagnostics and psychological counseling of children and adolescents [17].

## Conclusion

1. The Russian version of the Children's Somatic Symptoms Inventory, adapted in this study, is psychometrically consistent, and therefore can be recommended for the diagnosis of somatization in orphans and children left without parental care.

2. The adapted questionnaire needs further psychometric examinations, namely, approbation in clinical and population conditions, upon successful completion of which it can be recommended for solving a number of diagnostic and consulting tasks.

## Приложение

### Русскоязычная версия детского опросника соматических симптомов (Children's Somatic Symptoms Inventory-8, CSSI-8)

**Инструкция.** Перед тобой ряд симптомов, которые касаются здоровья и настроения детей и подростков. Оцени, пожалуйста, насколько часто тебе приходилось испытывать каж-

дый из этих симптомов в течение прошедших двух недель, используя следующую шкалу ответов:

совсем нет	редко	иногда	часто	очень часто
0	1	2	3	4

1	Боли в животе или желудке	0	1	2	3	4
2	Головные боли	0	1	2	3	4
3	Боли в нижней части спины	0	1	2	3	4
4	Обморок или головокружение	0	1	2	3	4
5	Боли в руках или ногах	0	1	2	3	4
6	Учащенное сердцебиение	0	1	2	3	4
7	Тошнота или расстройство желудка	0	1	2	3	4
8	Слабость в некоторых частях тела	0	1	2	3	4

**Обработка результатов.** Для получения общего показателя соматизации нужно сложить оценки по всем пунктам опросника. Чем выше общий показатель, тем более тяжелой считается детская и подростковая соматизация.

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