ORIGINAL ARTICLE

Psychometric properties of Conversion Disorder Scale- Revised (CDS) for children

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Abstract

Objective: To revise conversion disorder scale and to establish the psychometric properties of the revised scale.

Methods: This case-control study was conducted from February to June, 2014, at the Government College University, Lahore, Pakistan, and comprised schoolchildren and children with conversion disorder. In order to generate items for revised version of conversion disorder scale, seven practising mental health professionals were consulted. A list of 42 items was finalised for expert ratings. After empirical validation, a scale of 40 items was administered on the participants and factor analysis was conducted.

Results: Of the240 participants, 120(50%) were schoolchildren (controls group) and 120(50%)were children with conversion disorder (clinical group).The results of factor analysis revealed five factors (swallowing and speech symptoms, motor symptoms, sensory symptoms, weakness and fatigue, and mixed symptoms) and retention of all 40 items of revised version of conversion disorder scale. Concurrent validity of the revised scale was found to be 0.81 which was significantly high. Similarly, discriminant validity of the scale was also high as both clinical and control groups had significant difference ($p<0.001$) in scores. Cronbach's alpha of scale was $\alpha=0.91$ while item total correlation ranged from 0.50 to 0.80. The sensitivity and specificity analysis indicated that the revised conversion disorder scale was 76% sensitive to predicting conversion disorder while specificity showed that the scale was 73% accurate in specifying participants of the control group.

Conclusion: The revised version of conversion disorder scale was a reliable and valid tool to be used for screening of children with conversion disorder.

Keywords: Children, Conversion, Stressors. (JPMA 67: 725; 2017)

Introduction

For the growth of any country, there is a need to focus on the physical and mental well-being of our children and youth. Pakistan as a developing country needs the effort and hard work of our youth to become a prosperous nation. With reference to Pakistani culture, the study of somatic symptoms and related disorders, particularly conversion disorder, is needed because in our culture there is a tendency to accept physiological symptoms more readily as compared to psychological symptoms. Research conducted by Tomb and David (1995)[1] showed that in countries like Pakistan, there are biased attitudes towards mental health problems and these socio-cultural inhibitions are the most important factors that lead to lack of proper attention and promote emotional and psychological disorders.

In Pakistani society the cultural acceptance for physical symptoms and high chances of medical consultation increased the probability of channelising distress in the form of dissociation and conversion disorder. This could be a reason of high incidence rate of conversion disorder in Asian countries, particularly Pakistan, in the previous few years.[2] In a country where the basic needs of population are not met, provision of mental health facilities is a far-fetched idea.

Conversion disorder is named as Functional Neurological Symptom Disorder in Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-V).[3] The disorder was previously considered as one of the somatoform disorders, but in DSM-V it is categorised under the domain of somatic symptom and related disorders.

The manifestation of conversion disorder is influenced by culture as it affects the way a child's problem is treated by the parents. Culture also shapes the benefits and gains in children generally associated with conversion disorder.[4] In addition, culture also has significant impact on incidence rate and aetiological factors of conversion disorder so it is very important to study these domains, specifically in Pakistani culture.

Researches conducted on conversion disorder in both Western and non-Western countries agreed on the findings that conversion disorder is more common in those cultures that consider conversion symptoms acceptable rather than bizarre,[5] and its incidence rate is primarily high in those societies which have strict and

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conservative social systems that inhibit individuals from directly expressing their emotions and feelings towards others.[6]

Regarding symptom pattern of conversion disorder, Western studies indicated that somatic complaints, i.e. headache and lower back pain, were most frequently reported symptoms of conversion disorder.[7] While few researches conducted on conversion symptoms in Pakistani culture showed that manifestation of disorder in developing countries is different from Western countries as approximately one-third to one half patients consulting psychiatric units here present with motor symptoms.[8] A study[9] reported that unresponsiveness and tremors (jerky movements) are the most common presenting symptoms of conversion disorder. In Pakistani, culture conversion disorder is usually co-morbid with anxiety and depressive symptoms.[9]

The cultural impact on symptom presentation and other important domains of conversion disorder highlights the importance of indigenously developed and culturally valid and reliable scale so that conversion could be understood in Pakistani cultural perspective. In order to understand cultural aspects of conversion disorders a study[10] developed an indigenous conversion disorder scale (CDS)for children.

The indigenous CDS scale[10] was based on the DSM-IV tax revision (TR) criteria but due to recent modification in DSM-V criteria of conversion disorder there is a need to revise the CDS. The revision of scale is essential in order to overcome the scarcity of up-to-date indigenously developed tools of conversion disorder. The current study was conducted to update CDS according to DSM-V criteria of conversion disorder and to establish the psychometric properties of it. The revised version will be more culturally reflective and fulfilling the current criteria of conversion disorder so it will be very beneficial to understand conversion disorder among children in Pakistan.

Subjects and Methods

The study was conducted from February to June, 2014, at the Government College (GC) University, Lahore, Pakistan, and comprised schoolchildren and children with conversion disorder. In order to elicit symptoms, DSM-V criteria of conversion disorder was consulted and seven practising mental health professionals including four clinical psychologists, two psychiatrists and one neurologist were interviewed by using semi-structured interviews. Mental health professionals with at least three years of experience in child psychiatry were included in the sample for interview.

In order to generate items for revised version of CDS, seven practising mental health professionals were interviewed and were asked to report items on the basis of their clinical experience. At the end of this phase, all the items identified by experts were reviewed by two senior researchers and a list of 42 items was finalised for expert ratings after excluding overlapping items.

During this phase, the list of 42 items was given to experts for empirical validation. In order to get ratings from experts, seven practising clinical psychologists were selected who rated each symptom on the basis of degree to which it reflects conversion symptoms. Clinical psychologists having three years of experience in child psychiatry were selected as experts. Experts were provided with instructions to rate the list of items on the basis of degree to which each symptom is characteristic of conversion disorder in the Pakistani society. They were asked to rate these items on a four-point rating scale from 0 to 3 where 0 means that symptom is not representative of conversion disorder, 1= a little bit representative, 2= somewhat representative, and 3= representative of conversion disorder most of the time. After getting expert ratings, a league table of items was developed representing the degree of agreement among experts on each item. Items with 70% or above percentage of agreement were retained. After eliminating low-rating items, a list of 40 items was retained, which were transformed into three-point rating scale, i.e. 0 = not at all, 1= sometimes and 2= most of the time.

This phase of research was conducted to establish the psychometric properties of revised CDS version (CDS-R). The sample for the study consisted of children school children as the control group and children with conversion disorder as the clinical group.

Simple random sampling was used to get data from the schoolchildren. One boys' school and one girls' school was selected for data collection. Students of grade 6th, 7th, 8th and 9th were included in the study. Purposive sampling was used with conversion patients. Only those patients who were diagnosed by the clinical psychologist of the hospital according to the DSMV criteria were included.

The Children Somatisation Inventory (CSI) was developed and revised in 2009.[11] The revised version of CSI consists of 24 self-reported items which measure the extent to which a child has experienced these symptoms in the preceding two weeks. The items are rated on a five-point rating scale, with 0 = not at all, 1 = a little, 2 = some, 3 = a lot, and 4 = a whole lot. The Cronbach's alpha of English version of CSI was $\alpha = 0.85$ and that of Urdu version was α

= 0.83 which showed Urdu version is reliable in Pakistani culture.

CDS is an indigenous scale[10] for screening conversion disorder in children in Pakistani culture. The scale consisted of 19 items. CDS-R consisted of 40 items and these items were rated on a three-point rating scale, i.e. 0 = not at all, 1 = sometimes and 2 = most of the time.

In order to get data from hospitals, permissions were taken from concerned authorities. Participants were then approached for data collection. Informed consent was taken from parents or elder siblings of children. In addition, the purpose of the present research was fully explained to participants. The scale was individually administered on participants. In order to find discriminant validity, Urdu versions of CSI-24 and CDS-R were administered on the schoolchildren after getting permission from administration of government higher secondary schools for boys and girls. Students from classes 6th, 7th, 8th and 9th were selected through random selection. It was a group administration. Consent was taken from students and they were ensured about confidentiality of provided information.

Results

There were 240 children in the study, including 120(50%) schoolchildren and 120(50%) children with conversion disorder. Of the schoolchildren, 60(50%) were boys and 60(50%) were girls. The mean age in the clinical group was 13.25±2.47 years and in the control group it was 13.15±1.38 years.

In order to explore the factorial structure of CDS-R, exploratory factor analysis, principal component method with varimax rotation was used. The criteria to retain factors were scree plot, eigen value of > 1 and factor loading of >0.40. The scree plot revealed five factors for CDS-R. At the end, five factors solution was retained as it gives a clear distinction of items.

Five factors among the total 40 items were identified. All 40 items were retained on five-factor loading. The 1st factor 'swallowing and speech symptoms' consisted of 10(25%) items and had highest amount of variance. This was followed by 2nd factor 'motor symptoms' that included 9(22.5%) items. Factor 3 'sensory symptoms' and factor 4 'weakness and fatigue' consisted of 8(20%) items each while the 5th factor 'mixed symptoms' comprised 5(12.5%) items in total. Eigen value of all the five factors was more than 1 which implies a high degree of variance in the scale.

Cronbach's alpha of total score of CDS-R and its five subscales were calculated. It was found that reliability of all five factors was in the range of 0.61 to 0.85 which was significantly high. The reliability of total score of CDS-R was 0.91 which was also significantly high. The high alpha reliability of CDS-R shows that scale was highly internally consistent.

In order to find concurrent validity of CDS-R, Urdu version of a standardised scale of somatisation, i.e. CSI-24,[11] was used. The correlation between two scales was found to be 0.81 which was significantly high.

The discriminant validity of CDS-R was calculated by comparing control and clinical groups. Independent sample t-test was used for comparing scores of both groups (Table-1).

There was a significant difference between the scores of control and conversion groups. On average, conversion patients scored high on CDS-R as compared to the control group. The significant difference between scores of both groups indicated that CDS-R had high discriminant validity.

The split half reliability of the CDS-R was calculated by dividing the scale of 40 items into two equal halves of 20(50%) items each. The reliability of the first half of scale was found to be 0.83 and the reliability of its second half was calculated to be 0.86 which showed that both parts of CDS-R were equally reliable.

The data obtained from conversion disorder patients was analysed to identify the percentile scores and their suggested category. These values were important to interpret the scores obtained on CDS-R and identify the severity level of conversion symptoms of an individual (Table-2).

The sensitivity of a clinical test refers to "the ability of the test to correctly identify those patients with the disease" while specificity could be described as "ability of the test to correctly identify those patients without the disease".[12]

In order to find sensitivity and specificity of CDS-R, the concept of true and false positive and true and false negative was used, i.e. participants of both clinical and control groups who had cut-off CDS-R score of less than or above 19 were considered. The results of the sensitivity analysis showed that CDS-R correctly screened out 91(76%) patients while 29(24%) patients had scores less than cut-off of CDS-R as they had very mild symptoms of conversion disorder. Similarly, specificity analysis showed that 88(73%) participants of the control group were correctly reported as without conversion disorder while 32(27%) had scores above the cut-off of CDS-R showing

Table-1: Factor Loadings, Eigen Values and Cronbach Alpha for Exploratory Factor Analysis with Varimax Rotation of Conversion Disorder Scale-R (factor loading > .40).

Sr. No.	Item No.	Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
1	3	Speaking with coughing	0.48	0.01	0.03	-0.00	0.52
2	9	Change of voice	0.52	0.11	0.23	0.24	0.10
3	11	Coughing	0.49	-0.03	-0.10	0.09	0.49
4	20	Difficulty in breathing	0.70	0.02	0.12	0.28	0.08
5	22	Depletion of voice	0.54	0.15	0.11	0.29	-0.11
6	25	Lump in throat	0.66	0.25	0.04	-0.12	0.15
7	30	Difficulty in speaking	0.58	0.16	0.18	0.32	0.15
8	35	Difficulty in swallowing	0.73	0.04	0.10	-0.14	0.12
9	36	Rapid breathing	0.56	0.23	0.17	0.09	0.02
10	37	Stretch during speaking	0.73	0.12	0.12	0.07	0.10
11	7	Immobility of one or more body parts	0.29	0.49	0.36	0.13	0.27
12	23	Lying on floor during fits	-0.06	0.41	0.02	0.12	0.46
13	24	Inability to move hand	0.12	0.54	0.22	0.31	-0.08
14	26	Extra-sensory perceptions	0.14	0.65	0.12	-0.02	-0.00
15	31	Paralysis	0.11	0.50	0.03	0.31	0.41
16	32	Partial/complete seizures	0.04	0.51	0.33	0.10	0.10
17	34	Inability to listen during fits	0.05	0.62	0.07	-0.03	0.20
18	39	Blindness	0.24	0.57	-0.06	0.23	0.06
19	40	Perception of being possessed	0.11	0.63	0.12	-0.10	-0.17
20	1	Pain in legs and foot	0.07	0.03	0.60	0.23	-0.00
21	2	Cramp in hands and foot	0.17	0.22	0.49	-0.17	0.26
22	5	Feeling stretching in body	0.05	0.05	0.60	0.17	0.17
23	13	Tingling sensation in body	0.15	0.00	0.63	0.17	0.06
24	19	Body stiffness	0.15	0.28	0.66	-0.08	0.11
25	21	Pain in hands and arms	0.30	0.11	0.55	0.18	0.18
26	33	Difficulty in walking	0.16	0.45	0.42	0.27	-0.13
27	38	Numbness of body organs	0.13	0.34	0.52	0.15	-0.08
28	6	Headache	-0.11	-0.15	0.12	0.59	0.15
29	12	Pale skin colour	0.31	0.14	0.23	0.43	-0.00
30	14	Difficulty in maintaining balance while walking	0.27	0.13	0.13	0.56	-0.31
31	16	Pain in eyes	0.12	0.07	0.17	0.62	0.18
32	17	Dizziness	-0.08	0.17	0.03	0.71	0.10
33	27	Blurred vision	0.20	0.38	-0.02	0.53	0.06
34	28	Weakness	0.02	0.08	0.40	0.41	0.09
35	29	Sleepy or heavy feelings in head	0.14	0.07	0.23	0.67	0.17
36	4	Pain in stomach	0.11	-0.01	0.22	0.04	0.51
37	8	Faintness	-0.14	0.56	0.07	0.24	0.43
38	10	Pain in chest	0.34	-0.03	0.20	0.12	0.51
39	15	Vomiting	0.15	0.23	0.07	0.09	0.42
40	18	Severe backache	0.03	0.02	0.39	0.18	0.44
		Eigen Values	4.62	4.06	3.70	3.70	2.67
		% of Variance	11.56	10.15	9.26	9.25	6.68
		Cumulative Variance	11.56	21.71	30.97	40.22	46.91

Note. Factor loadings >0.40 are in boldface.

Table-2: Mean, SD and t-value of Control Group and Clinical Group on CDS-R (N = 240).

Scale	Groups	M	SD	t(238)	p
CDS-R	Clinical group	34.05	15.51	10.55	0.001***
	Control group	16.21	10.11		

***p < .001

CDS-R: Revised version of conversion disorder scale

M: Mean. SD: Standard deviation.

Table-3: CDS-R Scores, Percentile and their Category (N = 120).

CDS-R Score	Percentile	Category
1 - 19	25	Mild Conversion Symptoms
20 - 34	50	Moderate Conversion Symptoms
35 - 47	75	Severe Conversion Symptoms
48 - 80	100	Very Severe Conversion Symptoms

CDS-R: Revised version of conversion disorder scale.

some symptoms of conversion disorder (Table-3).

Discussion

Conversion disorder is one of most frequently reported psychiatric problems in our culture as it accounts for 12.4% admissions in psychiatric in-patients of Pakistan.[13] One of important reasons of this gradual increase in the incidence rate of conversion disorder is our cultural practice of accepting physical symptoms instead of psychological problems.[2] In addition, culture also influences the manifestation of conversion disorder, therefore, to fully understand cultural-based symptoms of conversion disorder there is a need of indigenously developed and culturally valid and reliable scale.

The factor analysis conducted on CDS-R revealed five factors, i.e. swallowing and speech symptoms, motor symptoms, sensory symptoms, weakness and fatigue and mixed symptoms. The first factor consists of swallowing and speech-based symptoms of conversion disorder, e.g. difficulty in swallowing, lump in throat, difficulty in speaking, speaking with coughing, change of voice, etc. This factor appears to be most significant factor as it consists of most important symptoms reported by the participants of clinical group.

This finding is contradictory to findings of previous researches. The accurate reason of this contradiction between previous indigenous and foreign studies is not very clear, but there are several possibilities. One important assumption of this difference in symptom is "current health concerns of the particular culture".[14] Therefore, it could be assumed that the major concern of conversion disorder patients of the current study was swallowing and speech-related problems, but this concern could change with the passage of time.

The second most significant factor revealed by factor analysis is related to motor symptoms of conversion disorder including seizures, immobility and abnormal movement. The emergence of this factor as second most significant factor was in accordance with findings of previous researches which concluded that motor symptoms are most common symptom reported by conversion disorder patients in Pakistan.[8,15] The relative more importance of motor symptoms of conversion disorder in countries like Pakistan could be due to cultural acceptance of this expression of emotional distress.[16] Since convulsions or seizures are generally considered as life-threatening, an individual with this manifestation could easily attract attention of others.[17]

The second factor also contains items that are related to sensory perceptions, e.g. extra-sensory perceptions, perception of being possessed, etc. In our culture, these symptoms are usually considered as part of some culturally authorised religious and spiritual practices as one study[17] also reported that possession and other such symptoms are fourth-most common reported symptoms in India.

The third factor comprises of sensory symptoms of conversion disorder including anaesthesia or sensory loss and pain. The presence of this domain after convulsion or seizure symptoms of conversion disorder was in line with a study.[18] The quite high significance of sensory symptoms in our society could be particularly associated with secondary gain of relief from work as most of the patients with these symptoms discontinue their routine tasks.[2] Moreover, due to a lack of accurate understanding of nature of conversion disorder, most of the people considered sensory loss as an indicator of severe underlying medical problems so these symptoms are quite frequently brought into clinical attention.

The fourth factor consists of weakness and fatigue based symptoms of conversion disorder, e.g. pale skin colour, difficulty in maintaining balance while walking, dizziness, blurred vision, weakness and sleepy or heavy feelings in head. This factor did not receive much attention in previous studies on conversion disorder.[19] Contrary to this, in Pakistani culture there is a common practice of giving considerable importance to the symptoms of fatigue and weakness either associated with conversion disorder or with any other problem.

The fifth factor is based on mixed symptoms category of conversion disorder, e.g. pain in stomach, faintness, pain in chest, vomiting and severe backache. This is the least important factor, possibly due to the combination of different physical complaints that are not specifically associated with conversion disorder.

Overall, factor analysis of CDS-R revealed some similarities and some differences with previous Western studies and indigenous studies. The more significance of swallowing and speech symptoms and items related to extra-sensory perceptions and possession are culturally unique items,

but items of other domains i.e. motor, sensory, mixed, are equally important in Pakistani culture.

Conclusion

Most significant symptoms of conversion disorder in our culture were swallowing and speech-related symptoms. Inspite of increased awareness regarding conversion disorder, symptoms related to possession and extra sensory perception are equally prevailed here, therefore, the present study can serve the purpose of understanding conversion disorder in cultural context with a revised and up-to-date screening tool.

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