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THE CHILD SURGERY WORRIES QUESTIONNAIRE ADOLESCENT FORM

María J. Quiles, Juan M. Ortigosa, Francisco X. Méndez and Sira Pedroche
University of Murcia

The need to assess children who are to undergo surgery and the lack of assessment instruments with appropriate psychometric properties justify the development of valid and reliable tests. We carried out a pilot study on the Child Surgery Worries Questionnaire (Cuestionario de Preocupaciones sobre Cirugía Infantil, CPCI), created to assess children's worries about surgery. The 29-item original version of the questionnaire was administered to a sample of 382 subjects, of both sexes, aged 11 to 14 years. The results showed worries related to (1) hospitalisation, (2) medical procedures, and (3) illness and its negative consequences. The rotated factorial pattern indicated that these three factors accounted by 32.945 % of the variance. The final version of the questionnaire consisted of 23 items.

La necesidad de evaluar psicológicamente a los niños que van a ser intervenidos quirúrgicamente y la falta de instrumentos de evaluación con propiedades psicométricas adecuadas justifican la creación de pruebas válidas y fiables. El objetivo del presente trabajo fue realizar un estudio piloto del Cuestionario de Preocupaciones sobre Cirugía Infantil (CPCI), diseñado para evaluar los aspectos de la intervención quirúrgica que preocupan al niño. La versión original del cuestionario de 29 elementos se administró a una muestra de 382 sujetos, de ambos sexos, de 11 a 14 años. Los resultados mostraron preocupaciones relativas a (1) hospitalización, (2) procedimientos médicos, y (3) enfermedad y sus repercusiones. El patrón factorial rotado indicó que estos tres factores explicaban el 32, 945 % de la varianza. Tras los análisis psicométricos la versión definitiva del cuestionario quedó finalmente reducida a 23 ítems.

Children's worries and fears with respect to invasive medical procedures (blood samples, bone marrow aspirations, electromyographs, etc.) has led to the study of the factors that cause these worries and the design of programmes to prevent or minimize the occurrence of emotional problems that interfere with the work of medical personnel and have negative repercussions on the subsequent psychological adjustment of the child.

Surgery is among the most feared of medical procedures, and leads to eating difficulties, sleeping problems, the reappearance of behaviours more common to earlier developmental stages, depression and somatic disorders such as loss of voice related to tonsil extraction (Zetterström, 1984). Surgery involves confronting a series of stressors (Méndez and Ortigosa, 1997) that provoke a variety of psychological, biological and developmental reactions in paediatric patients.

The study of stimuli, mediating variables and responses with respect to child surgery requires the assessment of the child in interaction with the stressful situations. Palomo (1995) lists the following objectives for this assessment:

1. To discover how a particular child perceives, feels and reacts in the different situations arising from hospitalization and surgery.
2. To discover how the child's parents and relatives assess the situation, and how they feel and react.
3. To analyze the relationship between the child and his/her parents and relatives before, during and after being in hospital and undergoing surgery.
4. To plan the psychological preparation programme for surgery taking into account the data obtained, the reason for hospitalisation, individual characteristics and the material and personnel resources available. This type of clinical evaluation is useful, according to Jay (1988), for collecting information on the child's ability to deal with the situation and also for choosing the most suitable form of preparation.

The achievement of these objectives requires suitable instruments that permit a viable, reliable and valid assessment of the above-mentioned variables within the hospital context. At present, child surgery patient evaluation is carried out using general instruments, developed and validated in non-surgical populations, and specific instruments for surgical populations. Robinson and Kobayashi (1991) consider careful revision of the latter

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Correspondence concerning this article should be addressed to Francisco X. Méndez Carrillo, Facultad de Psicología, Universidad de Murcia, 30080 Murcia, Spain. E-mail: xmendezc@fcu.um.es

essential in order to avoid the dissemination of tests whose psychometric properties are unknown, since they were mainly created for detecting changes subsequent to the application of psychological preparation programmes in small samples. In recent years this problem has begun to be addressed by research aimed at validating specific instruments for child hospitalization and diverse medical procedures (Kain, Mayes, O'Connor, Ciccheti, Caramico, Spieker, Nygren and Rimar, 1995; Forsyth, Horwitz, Leventhal and Burger, 1996; Ochoa, Repáraz and Polaino-Lorente, 1997).

There are three self-reports for the assessment of hospital fears in children: the Hospital Fears Rating Scale (Melamed and Siegel, 1975); the Hospital Fear Questionnaire (Roberts, Wurtele, Boone, Gunther and Elkins, 1981); and the Children`s Medical Hospital Fear Questionnaire (Aho and Erickson, 1985). These three instruments were developed to assess the efficiency of psychological treatment in the reduction of medical fears.

Despite a lack of data on their psychometric properties, they continued to be used in subsequent research, especially Melamed and Siegel's inventory (Bradlyn, Christoff, Sikora, O'Dell and Harris, 1986; Campbell, Clark and Kirkpatrick, 1986; Huber and Gramer, 1991; Pinto and Hollandsworth, 1989; Zastowny, Kirschenbaum and Meng, 1986). The Hospital Fears Rating Scale evaluates the child's fear in a variety of situations related to hospitalization and surgery. It consists of 16 items on hospital and medical aspects and 9 on general fears.

The questionnaire designed by Roberts *et al*. (1981) assesses fear of medical procedures and hospitalization through questions such as: "How afraid are you of having an operation?", or "How afraid are you of having a blood test?" We know of only one further study in which this report has been used (Elkins and Roberts, 1985). The questionnaire of Aho *et al.* (1985) consists of 51 elements on fears related to becoming ill, going to the doctor or going to hospital. The only psychometric information provided is test-retest reliability or the measure of the stability of frequency and intensity scores, which ranged from 0.78 to 0.95.

In addition to the lack of psychometric studies, it should be added that there are no instruments in this field that have been developed with a Spanish population. Moreno, Blanco and Rodríguez (1992) point out the scarcity in this country of validation studies for psychological tests. The objective of the present pilot study was to elaborate and test a self-report for identifying those events which most worry adolescents in the event of having to be hospitalized or operated on. The identification of the most common worries will facilitate the design of future programmes for the psychological preparation of patients undergoing surgery.

METHOD

Description of the instrument

The original version of the Child Surgery Worries Questionnaire (CPCI) included the main concerns related to undergoing surgery, in accordance with the scientific literature, the previously-mentioned self-reports and the professional experience of the authors. Table 1 shows the wording of the 27 items related to illness, pain, death, injections and needles, anaesthesia, the operation, the operating theatre, parents, the hospital stay and interpersonal relationships. It also included two open questions: "Would you remove any worries from the questionnaire?", and "Would you add anything to the questionnaire?".

Self-assessment of the degree of worry was made using a 5-point Likert-type scale (0 = not at all worried, 1 = a little worried, 2 = moderately worried, 3 = considerably worried, 4 = extremely worried: Thus, the range of scores was 0-108.

Table 1
Items of the original version of the Child Surgery Worries Questionnaire (CPCI)

Below are a series of situations that occur when a person is admitted to hospital for an operation. Suppose you are ill and have to have an operation, and tell us how worried you would be about each situation, using the following scale:

0	**1**	**2**	**3**	**4**
Not at all worried	A little worried	Moderately worried	Considerably worried	Extremely worried

I'M WORRIED ABOUT…

1. This illness they're going to operate on me for
2. Not recovering fully from the illness
3. Not being able to do the same things as before the illness
4. Being hurt during the operation
5. Not being able to bear the pain of the illness
6. Dying because of the illness
7. Injections
8. Having to have a needle in my arm for hours (drip)
9. Them taking blood out of me
10. How they'll anaesthetise me
11. What I'll feel during anaesthesia
12. How I'll come round after the operation
13. Waking up during the operation
14. What the operating theatre will be like
15. Being naked in the operating theatre
16. Leaving my parents before the operation
17. What I'll feel during the operation
18. The operation leaving scars
19. Knowing who's in the operating team
20. The food in hospital
21. Whether or not my parents can stay with me in hospital
22. What activities I'll be able to do while I'm in hospital
23. Knowing when I'll be able to leave hospital
24. Showing fear or pain
25. The way the hospital staff will treat me
26. Being with people I don't know
27. My parents being nervous

Sample and Procedure

We recruited a sample of 382 subjects of both sexes. Ages ranged from 11 to 14, with an average of 12.707 and a standard deviation of 1 (see Table 2).

The children came from two schools selected at random from a list of schools in the "Murcia metropolitan area" educational district, as defined by the Ministry of Education and Culture. The questionnaire was administered collectively by the school psychologist in the classroom during time devoted to tutorial activity. Time taken for completion of the questionnaire was 10 – 15 minutes.

Psychometric analyses

Reliability of the instrument was calculated using Cronbach's alpha coefficient for all items. Analysis of items was carried out using item-total correlations.

In order to find the construct validity a common factor analysis of repeated principal axes with varimax rotation was carried out. The selection criteria were: 1) items with an eigenvalue equal to or than one, 2) factors that accounted for at least 5% of total test variance, and 3) item saturation greater than 0.40.

Table 2
Distribution of the sample by sex and age

Age	Boys	Girls	Total
11 years	24 (12.31%)	29 (15.51%)	53 (13.87%)
12 years	50 (25.64%)	54 (28.88%)	104 (27.23%)
13 years	64 (32.82%)	63 (33.69%)	127 (33.25%)
14 years	57 (29.23%)	41 (21.92%)	98 (25.65%)
TOTAL	195 (51.05%)	187 (48.95%)	382 (100%)

Table 3
Factor loadings of the items in each of the factors

	FACTORS		
Items	1	2	3
1	0.237	0.225	**0.432**
2	0.138	0.022	**0.624**
3	0.063	0.025	**0.576**
4	0.093	**0.438**	0.378
5	0.158	0.312	**0.523**
6	0.138	-0.054	**0.494**
7	0.069	**0.699**	-0.034
8	0.226	**0.648**	0.108
9	0.142	**0.569**	0.026
10	0.235	**0.600**	0.152
11	0.268	**0.406**	0.160
13	0.190	0.256	**0.462**
16	**0.514**	0.200	0.343
17	**0.400**	0.364	0.366
18	**0.402**	0.246	0.125
19	**0.451**	0.120	0.193
21	**0.532**	0.089	0.338
22	**0.642**	0.105	0.036
23	**0.457**	0.169	0.168
24	**0.406**	0.304	0.171
25	**0.541**	0.090	0.191
26	**0.450**	0.089	0.018
27	**0.579**	0.168	0.083

RESULTS

Exploratory factor analysis

The rotated factor pattern isolated three factors that accounted for 32.945% of the test variance. The first factor, *worries about hospitalization*, accounted for 13.247% of the variance and was made up of 11 items (16, 17, 18, 19, 21, 22, 23, 24, 25, 26 and 27) related to the hospital stay, 'worry about whether or not my parents can stay', and 'knowing when I'll be able to leave hospital'. The second factor, *worries about medical procedures*, accounted for 11.292% of the variance and included 6 items (4, 7, 8, 9, 10 and 11) relating to frightening and medical procedures and the pain involved, worries about being hurt during the operation, and injections. The third factor, *worries about the illness and its repercussions*, accounted for 10.286% of the variance and consisted of 6 items (1, 2, 3, 5, 6 and 13) related to the fact of being ill and its negative consequences, worries about the illness that requires surgery, and not being able to do the same things as before the illness.

4 items were eliminated (12, 14, 15 and 20) because their factor loading was less than 0.40. In the open questions, more than 5% of the subjects suggested removing items 15 and 20, which were those with the lowest factor loadings. Thus, the final version of the questionnaire consisted of 23 items. Table 3 shows the factor loadings of the items in each of the factors.

Descriptive study of the items and reliability

Table 4 shows the item-total correlations of the revised version, which ranged from 0.369 (Item 6: I am worried about dying because of the illness) to 0.663 (Item 17: I am worried about what I'll feel during the operation). 65% of the items obtained correlations of more than 0.5, indicating the good fit of most items with regard to the total of the test.

Cronbach's alpha coefficient was 0.876.

Descriptive analysis of the sample

Table 5 shows the sample results for the questionnaire. The mean total score was 40.554, which is below the central value of the test (51).

Statistically significant differences were found in the total score of the questionnaire due to the following variables: sex (p=0.000), previous surgery (p=0.010) and age (p=0.007). The interactions among these variables were not found to be significant.

The mean of the girls' group is significantly higher than that of the boys. By age, the mean of the girls is higher than that of the boys in the four groups, and signifi-

cant at ages 12, 13, and 14. The mean of those children with previous experience of surgery is significantly lower than that of those with no such experience. This difference is statistically significant in children aged 11 and 13.

There is a significant difference between the intensity of pre-surgery worries experienced by 12 and 13-year-olds. 11-year-olds show lower levels of fear while the highest scores are obtained by 12 and 13-year-old.

As can be seen in Table 4, there are five items that present an above-average level of worry, and Item 6 ("dying because of the illness") registered a level of between "considerably" and "extremely" worrying. This item represents the most worrying for the children, with 77% of subjects giving it a score of 4 ("extremely worried"). Other items presenting high mean scores, though not as high as those for Item 6, were "not being able to do the same things as before the illness", "waking up during the operation", "not fully recovering from the illness", and "not being able to bear the pain of the illness".

On the other hand, there are seven items with a level lower than 1 "a little worried". These items, in descending order according to their means, are: "What activities I'll be able to do while I'm in hospital", "How they'll anaesthetise me", "What I'll feel during anaesthesia", "Them taking blood out of me", "Knowing who's in the operating team", "Injections", and the item with the lowest mean of the whole questionnaire, "Being with people I don't know".

To complete the descriptive study of children's principal pre-surgery worries we selected those items with the maximum score (4=extremely worrying), as indicators of clinical fear, and those with the minimum score (0=not at all worrying). Table 6 shows the items given maximum and minimum scores, respectively, by the highest percentages of subjects.

Table 4
Mean, standard deviation and item-total correlation of items of the final version of the Child Surgery Worries Questionnaire (CPCI)

Item*	Mean	Standard deviation	Item-total correlation
01	1.777	1.225	0.538
02	**2.606**	**1.277**	**0.470**
03	**2.740**	**1.285**	**0.408**
04	1.648	1.313	0.528
05	**2.357**	**1.242**	**0.571**
06	**3.449**	**1.164**	**0.369**
07	0.853	1.148	0.424
08	1.719	1.325	0.574
09	0.900	1.125	0.446
10	0.913	1.141	0.570
11	0.908	1.157	0.506
12		Eliminated	
13	**2.727**	**1.353**	**0.545**
14		Eliminated	
15		Eliminated	
16	1.459	1.335	0.642
17	1.499	1.299	0.663
18	1.407	1.263	0.498
19	0.877	1.145	0.494
20		Eliminated	
21	1.654	1.306	0.597
22	0.929	1.102	0.507
23	1.315	1.270	0.516
24	1.165	1.224	0.550
25	1.215	1.175	0.532
26	0.601	0.949	0.378
27	1.919	1.307	0.537

* In bold, items whose score is more than 2, which indicates a level higher than "moderately worried".

DISCUSSION

Hospitalisation and surgery cause exposure to a variety of stressors, each of which is powerful enough to generate stress responses (Méndez, Ortigosa and Pedroche, 1996). We therefore consider appropriate the multifactorial nature of the construct "child surgery worries", a component of a class of medical fears. Factor analyses of general child fear inventories produce between three and eleven factors (Méndez and Macià, 1997), and those

Table 5
Means (and standard deviations) of total score in the Child Surgery Worries Questionnaire (CPCI) of the sample by sex and age

Age	Boys	Girls	Total
11 years	30.250 (9.971)	36.897 (17.797)	33.887 (15.023)
12 years	38.469 (17.493)	46.463 (15.389)	42.660 (16.827)
13 years	35.750 (13.952)	49.159 (17.476)	42.402 (17.115)
14 years	36.877 (17.144)	43.268 (13.775)	39.551 (16.062)
TOTAL	36.088 (15.578)	45.187 (16.587)	40.554 (16.693)

Table 6
Percentages of subjects with worries that obtain maximum and minimum scores in the Child Surgery Worries Questionnaire (CPCI)

Items that obtain maximum score in the CPCI

Nº	ITEM: I'M WORRIED ABOUT…	%
6	Dying because of the illness	**77%**
13	Waking up during the operation	**43%**
3	Not being able to do the same things as before the illness	**39%**
2	Not fully recovering from the illness	**35%**
5	Not being able to bear the pain of the illness	**25%**

Items that obtain minimum score in the CPCI

Nº	ITEM: I'M WORRIED ABOUT…	%
26	Being with people I don't know	**61%**
8	Having to have a needle in my arm for hours (drip)	**53%**
19	Knowing who's in the operating team	**51%**
11	What I'll feel during anaesthesia	**49%**
9	Them taking blood out of me	**49%**
10	How they'll anaesthetise me	**47%**

of specific inventories, such as the Inventory of School Fears (Méndez, 1988), between four and six (García, 1997). High internal consistency was obtained. Thus, the Child Surgery Worries Questionnaire (CPCI) is a reliable and valid instrument and one that is easily-applied, the completion period for the final version being a mere ten minutes.

The results obtained show differences according to sex in three age groups. The greater incidence of pre-surgery worries among girls is in line with the tendency of general child fears indicated by data from normative studies in Spain (Pelechano, 1981) and in other countries (Ollendick, King and Frary, 1989).

From this study, we can see that pre-surgery worries increase with age, and that adolescents of 12 and 13 present the most intense levels. A possible explanation for this would be that as cognitive development increases the subject is more conscious of the risks of surgery, and thus the intensity of worry increases. Although the relationship between child fears and age is not clearly defined, studies seem to indicate a falloff in the number of worries with the passing of time and the appearance of peaks at certain ages (Méndez and Macià, 1997). However, in the case of specific fears of situations that become more demanding as one develops, an increase can be observed according to the child's age, as in the case of school fears (Méndez, García and Olivares, 1996).

With respect to the influence of previous experience, the mean for children who have already undergone surgery is significantly lower that for those who have not. This discovery is consistent with previous studies with Spanish populations (Quiles, Ortigosa, Méndez and Pedroche, 1998a, 1998b) carried out with the Hospital Fears Rating Questionnaire (Melamed and Siegel, 1975), but is not consistent with results obtained by other authors in the USA (Melamed, Yurcheson, Fleece, Hutcherson and Hawes, 1978; Melamed, Dearborn and Hermecz, 1983).

The items that most worry adolescents are related to the illness and its consequences, such as death, pain or disablement; the least worrying items are related to frightening medical procedures, such as injections or anaesthesia, and stressful aspects of hospitalisation, such as uncertainty about activities during the hospital stay or relationships with people unknown to them. The most worrying situations have a marked aversive nature and are perceived as negative stimuli. On the other hand, it is probable that medical treatment and hospitalisation, despite their intrusive nature, are seen in a positive light, since they are aimed at restoring health. The differences in worries found according to age and prior experience should be borne in mind in the design of psychological preparation programmes adapted to the individual needs of the child patient. In principle, it appears that adolescents of 12 and 13 with no experience of operations would suffer the greatest anxiety in the event of surgery. There data should be completed with information on younger children in order to confirm the possible increase in medical fears with age. This would allow the identification of target subjects of preparatory psychological treatment for child surgery, as well as optimum individualisation of these programmes through concentration on the most intense worries according to the characteristics of each child patient.

The Child Surgery Worries Questionnaire (CPCI) is the first self-report for assessing worries caused by hospitalisation and surgery that has been validated with a Spanish population. Given its pioneer status, it cannot be compared with similar instruments. Nevertheless, certain limitations of our pilot study should be considered in an assessment of the results. These limitations include the small sample size and the calculation of only one measure each for reliability and validity. Future research should apply the CPCI to wider representative samples in order to obtain temporal stability and convergent and discriminant validity, as well as to carry out the normative study for the elaboration of scales. The purpose of the CPCI's validation is to identify the most prevalent worries, which may serve as a guide for the design of preventive psychological programmes, as well as to identify those adolescents that would most benefit from psychological preparation. In short, the interest lies in satisfactorily answering the question posed by Ortigosa, Méndez and Quiles (1996): "*Which* specific preparation programme, applied by *whom*, is the most effective, with *which* children (and parents), undergoing operations for *which* pathologies, *when*, and in *which* hospital context?" (p. 222).

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