Self-reported Postoperative Recovery in Children

- development of an instrument

Ann-Cathrine Bramhagen RN PhD^{1,5, 6}, Mats Eriksson RN PhD^{2,7}, Elisabeth Ericsson RNA PhD^{2,7}, Ulrica Nilsson RNA PhD^{3,7}, Sue Harden RN^{4,6}, Ewa Idvall, RN PhD^{3,5,6}

¹Senior Lecturer, ²Associate Professor, ³Professor, ⁴CSN, e-learning/content developer ⁵Malmö University, Faculty of Health and Society, Department of Care Science Malmö, Sweden, ⁶Skane University Hospital, Malmö, Sweden ⁷Faculty of Medicine and Health, School of Health and Medical Science, Örebro University, Örebro, Sweden,

Correspondence: Ann-Cathrine Bramhagen, Jan Waldenströms gata 25, 205 06 Malmö, Sweden, + 46 40 665 79 40 +46 40 665 81 00

ann-cathrine.bramhagen@mah.se

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Abstract

Rationale, aims, and objectives: According the United Nations (1989), children have the right to be heard and to have their opinions respected. Since postoperative recovery is an individual and subjective experience and patient-reported outcome measures are considered important, our aim was to develop and test an instrument to measure self-reported quality of recovery in children after surgical procedures.

Methods: Development of the instrument Postoperative Recovery in Children (PRiC) was influenced by Quality of Recovery-24, for use in adults. Eighteen children and nine professionals validated the items with respect to content and language. A photo questionnaire was developed to determine whether the children's participation would increase compared to the text questionnaire. The final instrument was distributed consecutively to 390 children, ages 4–12 years, who underwent tonsil surgery at four hospitals in Sweden.

Results: A total of 238 children with a mean age of 6.5 years participated. According to the parents, 23% circled the answers themselves and 59% participated to a significant degree. However, there was no significant difference in participation between those who received a photo versus a text questionnaire. Psychometric tests of the instrument showed that Cronbach's alpha for the total instrument was 0.83 and the item-total correlations for 21 of the items were >0.20 .

Conclusion: Our results support use of the PRiC instrument to assess and follow up on children's self-reported postoperative recovery after tonsil operation, both in clinical praxis as well in research.

Introduction

Children's participation

It has been >25 years since the United Nations recognized the rights of children [1] and emphasized that children must be heard and their opinions respected in all matters. The European Association for Children in Hospital (EACH) has formulated ten articles concerning children's care in hospital, stressing the importance of "the possibility for children to have their own say in the care" [2]. Previous research concerning the quality of pediatric care mostly focused on the parents' perspectives and concluded that they seem to be satisfied with care [3-5]. However, in an interview study, children expressed that they wanted to have comprehensible information so that they could understand their illness and be involved in their own care; the study found that children were seldom offered a role in their own care [6]. Health-care professionals and parents have a significant influence on whether a child is involved or not in health-care decisions [7]. Since professionals and parents control the shared decision-making concerning hospital care, children's views receive minimal attention [8]. Therefore, research regarding children's experiences and views of hospitals and health care need to involve children; furthermore, research concerning children's participation in communication about health care needs to be conducted.

Postoperative recovery

Day surgery, in which patients are admitted, undergo surgery, and discharged on the same day, is a well-established practice in many countries. National statistics for the last five years in Sweden show that the majority of surgical procedures were performed in day-surgery settings. Further, there are no age restrictions for day-surgery treatments [9]. Patients admitted for day surgery are postoperatively monitored for only a few hours prior to discharge, at which point the patient must assume the primary responsibility for monitoring recovery [10]. Postoperative

recovery is an individual and subjective experience [11], and patients' subjective descriptions (e.g., Patient-Reported Outcome Measures (PROM) are considered to be a fundamental element of postoperative follow-up and therefore of great importance [12].

Most previous research concerning postoperative recovery has targeted adult patients. The use of scales to assess postoperative function and patient-reported outcomes has increased [13].

Myles et al. [14, 15] developed an instrument, the Quality of Recovery-40 (QoR-40), which has been revised to function in a day-surgery context for adults (QoR-24) [16]. In a meta-analysis of 18 studies with 3,459 patients, this instrument was reported to have excellent validity, reliability, responsiveness, and clinical utility for a broad range of patient populations [17].

One of the most common surgical procedures in the pediatric population is surgery of the tonsils, which can lead to severe pain that lasts for many days [18, 19, 20]. Tonsillectomy is associated with significantly longer pain duration and also with more reported "severe-to-worst pain" at home than other elective procedures, and this has a negative impact on behavior [21].

Children's self-report

Previous studies have described children's experiences with, for example, pain after surgery.

An interview study with 80 children ages 6–15 years revealed that the children had more pain after a tonsillectomy than they had expected [22]. In other studies, children used the Face Pain Scale to indicate severe and extended postoperative pain in the first days after tonsil surgery, as well as a high frequency of nausea and vomiting [20, 23, 24].

There is a difference between a child perspective, where e.g. the health care system defines what is good for the child, and child's perspective [25]. Children's own views should be considered in the planning and delivery of pediatric care. For example, the Child Care Quality at Hospital (CCQH) has been shown to be useful among children during hospital stays [26], and in a study by Stewart et al. [27], children were used as experts and as content validity evaluators for a child self-report instrument, the Uncertainty Scale for Kids (USK). The

instrument was developed from interviews, and the items were then validated by children, who were encouraged to consider the expert's role and not to respond to the items from their own perspective. De Tovar et al. [28] tested two postoperative pain self-report instruments and found that children ages 5–15 years preferred a picture-based instrument: the Faces Pain Scale-Revised (FPS-R) over the Color Analog Scale (CAS). Currently, a significant amount of pediatric surgery is performed on a day-care basis [29], but a review of the literature revealed that there is limited knowledge concerning self-reported postoperative recovery among children.

Therefore, the aim of our study was to develop and test an instrument to measure children's self-reported quality of recovery after a surgical procedure with both text and photo questionnaires.

Methods

Postoperative recovery in children: instrument design

Development of the Postoperative Recovery in Children [PRiC] instrument was influenced by the QoR-24, for use in adults, which has been tested for validity and reliability [16, 17, 30]. The items were revised for the purpose of this study so that children could understand them. As for the QoR-24, the items were contained in three dimensions physical comfort, physical independence, and emotional state. For this initial study, we designed PRiC to assess postoperative recovery after tonsil surgery in children ages 4–12 years.

Validation of item contents by professionals

The first version of PRiC contained 26 items, whereof 11 items asked about daily activities (e.g., “being able to eat as usual” and “being able to sleep as usual”), six concerned physical items (e.g., “nausea and vomiting”), and five concerned psychological issues (e.g., “feeling

lonely and sad”). One question concerned pain (from the surgical wound), and another was of a more general nature and addressed the current wellbeing. Nine professionals—one anaesthesiologist; one ear, nose, and throat specialist; three pediatric nurses, two assistant nurses, one preschool teacher, and one social worker—were asked to evaluate the items. All had comprehensive experience working with children in different contexts. The professionals were informed about the purpose of the instrument and were asked to answer on a 5-point scale, with 1 being “not at all relevant” and 5 being “very relevant.” The professionals confirmed the relevance of most of the items, but their feedback resulted in a reduction of items: “had problems going to sleep” and “being able to sleep as usual” were combined into one item (i.e., “having problems sleeping”). The items “felt alone” and “being shaky” were considered irrelevant and were thus excluded. Furthermore, two questions were added concerning problems with urination and defecation.

Following the feedback from the professionals, the general question concerning pain was also excluded, and four items were added: “abdominal pain,” “pain in the ears,” “headache,” and “having blood in the mouth.” Two of these items (i.e., “pain in the ears” and “having blood in the mouth”) were chosen since they were considered specifically applicable to tonsil operation. Furthermore, the research group made a linguistic revision based on feedback from the professionals. In summary, the professionals concluded that the instrument covered essential parts of recovery after tonsil surgery and that the items were comprehensible to children in the chosen age group.

Comprehensibility of the items

Twelve healthy children ages 4–12, who were purposefully selected due to age and gender, provided comments concerning the comprehensibility of the questions from a child’s perspective. Two children (6 and 8 years old) had problems understanding the questions, and linguistic revisions were made. One 7-year-old boy expressed problems with the response

scale. The items were changed linguistically so that the response scale was equal for all questions and constructed in such a way that the response “not at all” indicated optimal postoperative recovery and all of the questions had the same response alternatives. Information whether these children had any previous surgical experience was not collected.

Development of a photo questionnaire

The rationale for developing a photo questionnaire was to test if children’s participation in answering the items could be increased compared to answering a traditional text-based questionnaire. Development and design of the photo questionnaire was conducted in two steps. First, six healthy children, ages 5 to 12 years, were asked to participate in developing the photo questionnaire. They were divided into three groups based on age. One of the authors (SH) informed the children of the purpose of the study and then read the text aloud, since not all of the children were able to read. A discussion followed concerning how to best illustrate the text for each item with a photo; subsequently, the children looked at the photos together with SH and, if needed, new photos were taken until all of the children were satisfied and expressed that the pictures represented the content of the question. The photos display healthy children illustrating the different items. All photos were taken with consent from the children and both their parents.

Second, the children who participated in evaluation of the text questionnaire were also asked to provide comments on the relevance of the photo chosen for each item. The children provided comments on the photos, and some changes were made. Pictures for two items were replaced: “having blood in the mouth” and “have had difficulty peeing” since the children expressed that the first suggested pictures did not illustrate the meaning of the item.

In total, the final PRiC instrument included 23 items concerning different aspects of recovery (reductions and revisions of the items are reported in Table 1). All of these items concerned the previous 24 hours. The items were assessed on a four-grade scale: “not at all,” “a little,”

“much,” and “very much,” where very much indicated the lowest level of recovery. One item of a more general nature that addressed the children’s present general health was also included, to be answered with: “very well”, “pretty well”, “pretty bad”, or “very bad.”

Insert Table 1 about here

Participation items

For the study, two questions concerning the children’s participation in self-reporting postoperative recovery were added. One addressed the child: “Did you answer the questions yourself?” From the face-validity test with the children, the question “If no, who helped you?” was added. The other question addressed the parents: “How involved has your child been in responding to the statements and questions above?” This question had five response alternatives, from 1 (“not at all”) to 5 (“very”).

Participants

The final instrument was distributed to a group of children who were undergoing tonsil surgery (tonsillectomy or tonsillotomy/partial tonsillectomy). This procedure was chosen since it is one of the most common operations for otherwise healthy children, and it is mostly performed as day surgery. The participants were consecutively recruited from four hospitals and one private day-surgery clinic in Sweden in 2012–2014. The inclusion criteria were as follows: healthy children without any chronic disease between the ages of 4 and 12 who were selected for day surgery and whose parents could read, understand, and speak Swedish.

Procedure

A total of 390 children were invited to participate, and they received, together with their parents, verbal and written information about the study. The participants were randomized into

two groups by means of data-driven selection lists; one group received the text questionnaire and the other received the photo questionnaire. Upon being discharged from the hospital, the children received the instrument for reporting postoperative recovery on the first, fourth, and tenth days after surgery, along with prepaid envelopes. Ultimately, 238 children answered for day 1 and returned it. Results from the subsequent days will be reported elsewhere. No reminder was sent out.

Statistics

Data were analyzed with Statistica 10 (StatSoft Scandinavia AB). Descriptive statistics are presented as numbers and percentages and arithmetic means and medians. Differences between groups were tested with Student's *t*-test and Yates corrected chi-square test according to data level. Cronbach's coefficient alpha was used to test internal consistency. The Pearson product-moment correlation coefficient was used for item-total correlations, and the patients' scores were explanatory factor analyzed (principal component, unrotated) in one-factor loadings for three predetermined dimensions. The dimensions from the original instrument (QoR-24) were physical comfort (15 items), physical independence (five items), and emotional state (three items).

Ethics

The children who illustrated the items in the photo version of the PRiC instrument provided verbal permission and their parents provided written consent to use the photos. Parents provided their written consent for the study, and the children provided assent. The children could either write their name or draw a picture on the consent form. The study was approved by the Research Ethics Committee of Uppsala (2012/106).

Results

Demographics

A total of 61% ($n = 238$) of the children answered the instrument on the first day after the surgical procedure. The mean age was 6.5 years (6.6 and 6.4 years for girls and boys, respectively). There was no significant difference in the number of girls (55%, $n = 130$) and boys ($n = 108$). In total, 50% ($n = 120$) received a photo questionnaire and 50% ($n = 118$) a text questionnaire. There were no significant differences between the text and photo groups with respect to sex or age.

Half of the children underwent adenotonsillotomy ($n = 98$) or tonsillotomy ($n = 15$), and the other half underwent adenotonsillectomy with ($n = 69$) or without ($n = 51$) tonsillectomy (missing data, $n = 5$). The main indications for the procedures were airway obstruction/hypertrophic tonsils ($n = 180$), infection/inflammation as recurrent tonsillitis ($n = 17$), and “chronic” tonsillitis ($n = 25$). The types of anaesthesia were inhalation (64%, $n = 152$) and total intravenous anaesthesia (33%, $n = 78$) (missing data for 3%, $n = 8$).

Participation

For the question of whether the child had circled the answers themselves, 23% said “yes” ($n = 55$) and 76% said “no” ($n = 181$) (missing data, $n = 2$). There was a significant difference ($p < 0.001$) in age between those answering “yes” (mean age 8.6 years) and “no” (mean age 5.8 years).

Parents were asked on a 5-point scale to what extent the child participated in answering the questions, and 59% answered 5 (“very much”), 8% answered 4, 15% answered 3 (“somewhat”), 5% answered 2, and 9% answered 1 (“not at all”). Of those who received a photo questionnaire, 61% ($n = 73$) answered that the child participated “very much” compared to 56% ($n = 66$) of those with the text questionnaire ($p > 0.5$).

Postoperative recovery

The median for the response to the different items varied between “not at all” and “very much,” and the mean values were between 1.1 (“difficulty breathing”) and 3.0 (“difficulty attending daycare/school”) (Table 2), where the lowest value corresponds to “not at all.” The two specific items for tonsil surgery showed that about 27% had had a sore throat (“very much”), and that 25% had blood in their mouth; 24% “a little” and 1% “much-very much”. At the moment at which they answered the questionnaire, the majority of the children felt either “very well” (16%) or “pretty well” (60%).

Insert Tables 2 and 3 about here

Psychometrics

Cronbach’s alpha for the total instrument (23 items) was 0.83. For the three dimensions physical comfort, physical independence, and emotional state, Cronbach’s alpha was 0.75, 0.71, and 0.39, respectively. Item-total correlations varied between 0.1 and 0.6, and 22 of 23 items had a correlation of ≥ 0.2 (Table 2). One-factor loadings and item-total correlations for each dimension are reported in Table 3. In the physical comfort dimension, 8 of 15 items loaded >0.40 . In the physical independence dimension, all five items loaded >0.40 , as did all three items in the emotional state dimension.

Discussion

Participation of children with the self-report instrument

To meet the goals of the United Nations [1] and EACH [2] to respect and involve children in their own care, the present study developed and tested an instrument (PRiC) to capture

children's postoperative recovery from the child's perspective. The instrument was specifically developed for children undergoing a tonsil operation, since this surgery is one of the most common surgical procedures [19, 31] and children have reported severe pain after tonsillectomy even after discharge from hospital [19, 21, 24, 31]. Most tonsil operations are performed on children 4–12 years of age [18]. In order to develop the instrument to measure postoperative recovery at home and to achieve a high degree of participation among the children themselves, the following steps were taken.

Instrument development

Development of the PRiC instrument was influenced by a validated QoR-24-instrument [16, 17, 30,] but modified for use in children. Both children and health-care professionals participated in development of the instrument. Professionals ($n = 9$) with different competencies verified that the instrument covered all of the important parts of recovery after tonsil operation and that it could be understood by children in the selected age group. Since our aim was to create an instrument to capture children's views of recovery, a group of children of the same age as the target group were involved in evaluating the instrument for content validity and comprehensibility. To achieve content validity, the judgments of professional experts (e.g., anaesthesiologists and pediatric nurses) were used [32], but children were also utilized as experts in order to gain a child's perspective and level of comprehension.

One goal of the present study was that the child should actively participate in answering the questions regarding their postoperative recovery. Therefore, we added the question "How involved has your child been in responding to the statements and questions above?" Although three-quarters of the children did not circle the answer themselves, 59% had participated "very much" in answering the questions, which may indicate that the instrument has captured the child's view of recovery to some extent. To our knowledge, there is no study evaluating the use

of a photo questionnaire. However, the present study did not find any difference between the children's level of participation with the text questionnaire compared to the photo questionnaire. This is partly in contrast with the results of a study by De Tovar et al. [28], where participating children answered that they preferred a picture-based instrument (the FPS-R) to the use of a CAS. On the other hand, the present study did not ask the children whether they preferred a photo or a text questionnaire; however, as the response rate did not differ between the groups, it is possible that use of a photo questionnaire in itself did not increase the response rate.

A point to be considered regarding children's participation in matters concerning themselves is that research has shown that both parents and professionals have a tendency to take a protective standpoint concerning children's participation in decision-making in order to protect the child [33]. However, it is often possible to ask children how they feel even though they cannot read or write. Despite the fact that the youngest children in our study had assistance from their parents with circling the answers on the instrument, it was the children's voices and views concerning postoperative recovery we intended to capture. It is possible that the parents "protected" their children from involvement, in line with the results of the study by Coyne and Harder [33]. Nevertheless, there was a significant difference in age ($p \leq 0.001$) between those who had circled the answers themselves (mean age 8.6 years) and those who had not (mean age 5.8 years). This could imply that children over 8 years of age are likely to be invited to answer the questions themselves.

The sample size in the present study ($n = 238$) was considered sufficient for examining psychometric properties on a 23-item instrument, in accordance with the recommended rule of five times as many subjects as items, or at least 200–300 subjects [34, 35]. The majority of the 23 items had an item-total correlation between 0.2 and 0.6, with just one item below the recommended limit of ≥ 0.20 for item-total correlations [32]. The three one-factor loadings

showed that the majority of the item loadings exceeded or were equal to 0.4, which can be used as a cut off [36].

Cronbach's coefficient alpha was also considered satisfactory for two of the dimensions, physical comfort and physical independence [0.75, 0.71]. However, it was lower for the third dimension, emotional state [0.39], which can probably be explained by three items. A Cronbach's coefficient alpha of 0.70 is considered to indicate satisfactory reliability at early stages of scale development [37].

The three dimensions included different numbers of items, from physical comfort with 15 items to emotional state with three items. This can be explained by the focus on physical symptoms such as vomiting, feeling cold, and having different pain experiences, which are specific important factors to assess after a surgical procedure to enable better treatment and prevention before the child is discharged. We suggest that the results from this 23-item instrument should be presented at the item level and not at the dimension level to best determine surgical profiles for different procedures. The dimensions will have a major impact when developing the instrument, to ensure that the instrument has a holistic view of recovery.

Postoperative recovery

Since postoperative recovery is an individual and subjective experience [31], it is highly relevant and important to ask primarily the children about their subjective experiences, not the parents or professionals. It is important that children are able to communicate about their recovery and thereby influence the treatment provided by caregivers. The development of valid and reliable pediatric recovery assessment tools for children's self-reporting is an important step toward improving children's management after surgery. Reliable assessment of children's postoperative recovery may be influenced by their limited capability to express morbidity in

words; consequently, illustrations can help to increase both children's and parents' knowledge about their condition and procedure as well as their satisfaction at being involved. Most of the children in the present study reported a low degree of postoperative symptoms on the first day after surgery. However, "a little" symptoms such as of blood in the mouth, 24%, is an important information and a warning bell of a life threatening complication i.e. post-surgical haemorrhage [18]. Furthermore, 1% reported "much-very much" blood in the mouth a frequency that is in line with what has been reported previously in a study of 54,696 tonsil surgery patients [38]. It seems thought that the PRiC questionnaire is sensitive in capturing tonsil surgery specific complications. Furthermore, 52% had "much" or "very much" pain from a sore throat. This is in line with the study by Karling et al. [21], in which pain after tonsillectomy was associated with more pain compared to other surgical procedures. After tonsillectomy, the pharyngeal wound is left open and pain nerve fibers are exposed to hypotonic solutions and mechanical trauma from swallowed food [19]. In the present study, 70% reported having had "a little," "much," or "very much" difficulty eating. The pain from swallowing limits a child's ability to resume eating, drinking, and taking oral medication. Pain after tonsil surgery in children and adolescents can last >7 days and lead to weight loss, which affects recovery [24]. It is therefore of great importance to systematically assess and follow up on postoperative pain, as well as on eating difficulties.

A systematic assessment of pain is needed because failure to provide sufficient analgesia for children's post-tonsillectomy pain after discharge remains a significant problem. Information from the Swedish tonsil registry showed that about 26% of patients were in contact with hospital care due to pain after tonsillectomy [18]. Optimal use of multimodal pain medication after tonsil surgery is essential for reducing associated complications such as dysphagia, decreased oral intake, and dehydration [19, 20, 31]. Moreover, other postoperative problems, such as vomiting and difficulties defecating, have been reported. Some common side effects when pain medication is used for several days include headache, nausea or vomiting, stomach

ache, constipation, and dizziness, increasing the recovery time [19, 20, 31]. Roughly half of the children in the present study had a little difficulty talking, which is also associated with sore throat, and children are advised to avoid too much talking after tonsillectomy. Nevertheless, in spite of all of the reasons why information about postoperative recovery is important, to the best of our knowledge, no validated self-reported instrument has been used to systematically assess and follow postoperative recovery after discharge in children undergoing either tonsil surgery or other types of surgery [9].

Conclusions

Our study suggests that the PRiC instrument maybe be useful for assessing and following up children's self-reported postoperative recovery after tonsil surgery. The PRiC instrument may also have some utility in research as a tool for measuring outcomes. However, further studies are needed to evaluate the instrument in other populations of children and adolescents.

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Figure legend

Figure 1. Example from the photo questionnaire.

Figure 1. Example from the photo questionnaire.

Table 1: Items from QoR-24¹ to PRiC - reduction and revision

Item QoR-24	PRiC before CV ²	reduction/revision	PRiC for test	Rationale after CV
Nausea	felt nausea	linguistic revision	have I felt like vomiting/throwing up	relevant item
Vomiting	vomiting	linguistic revision	Have I vomited/thrown up	relevant item
Feeling too cold	felt cold	linguistic revision	Have I been feeling cold	relevant item
Feeling dizzy	felt dizzy	linguistic revision	Have I been dizzy	relevant item
Sore throat	having a sore throat	linguistic revision	have I had a sore throat	added as surgery specific
			have I had stomach ache	added as surgery specific
			have I had an ear ache	added as surgery specific
Headache	had headache	linguistic revision	have I had headache	relevant item
Feeling depressed	felt sad	linguistic revision	have I felt sad	relevant item
Bad dreams	having nightmares	linguistic revision	have I had frightening dreams	relevant item
			have I had difficulty peeing	added due to professional's suggestion
			have I had difficulty pooping	added due to professional's suggestion
Sore mouth	having a sore mouth	linguistic revision	have I had blood in my mouth	change to be surgery specific
Able to breathe easy	being able to breathe as usual	linguistic revision	have I had difficulty breathing	relevant item
Having a good sleep	being able to sleep as usual	linguistic revision	have I had difficulty sleeping	relevant item
Being able to enjoy food	being able to eat as usual	linguistic revision	have I had difficulty eating	relevant item
Able to write	being able to draw or write	linguistic revision	have I had difficulty playing/being active	relevant item
Feeling rested	felt rested	linguistic revision	have I had difficulty resting	relevant item
Have normal speech	sounded as usual when speaking	linguistic revision	have I had difficulty talking	relevant item
Able to brush teeth	being able to brush my teeth	linguistic revision	have I had difficulty brushing my teeth	relevant item
Able to look after own appearance	being able to wash myself as usual	linguistic revision	have I had difficulty washing myself/showering	relevant item
Able to return to work	being able to attend daycare	linguistic revision	have I difficulty attending daycare/school	relevant item
Having a general feeling of wellbeing	felt well	linguistic revision	at the moment I feel	general question 4 scale
Feeling in control		excluded		not relevant for children
Feeling comfortable		excluded		children did not understand
Feeling restless	felt restless	excluded		children did not understand
Shaking or twitching	shaking the body	excluded		children did not understand
Pain from wound	had pain (from wound)	excluded		instead four surgery specific questions
Feeling anxious	been anxious	excluded		not relevant
Feeling alone	felt alone	excluded		not relevant
Muscle pain	pain from body	excluded		not relevant
Back pain	pain from back	excluded		not relevant

¹ Quality of Recovery-24 ² CV content validity test

Table 2: The results of the individual items in the Postoperative Recovery in Children, frequencies, mean, median and item-total correlations (n=238)

ITEM	Not at all n (%)	A little n (%)	Much n (%)	Very much n(%)	Missing n	Median	Mean	Item-total Correlations
<i>During the last day/night (within the last 24 hour)</i>								
<i>Have I...</i>								
felt like vomiting	158 (66)	62 (26)	13 (5)	4 (2)	1	Not at all	1.4	0.4
thrown up	207 (87)	17 (7)	6 (3)	5 (2)	3	Not at all	1.2	0.3
been feeling cold	131 (55)	86 (36)	15 (6)	4 (2)	2	Not at all	1.5	0.4
been dizzy	138 (58)	73 (31)	16 (7)	9 (4)	2	Not at all	1.6	0.5
had a sore throat	12 (5)	101 (42)	60 (25)	65 (27)	0	Much	2.7	0.6
had a stomach ache	147(62)	73 (31)	12 (5)	4 (2)	2	Not at all	1,5	0.3
had an ear ache	185 (78)	44 (18)	4 (2)	4 (2)	1	Not at all	1,3	0.2
had a headache	158 (66)	65 (27)	10 (4)	2 (1)	3	Not at all	1.4	0.3
felt sad	100 (42)	95 (40)	37 (16)	4 (2)	2	A little	1.8	0.4
had frightening dreams	200 (84)	25 (11)	8 (3)	3 (1)	2	Not at all	1.2	0.2
had difficulty peeing	223 (94)	11 (5)	0	3 (1)	1	Not at all	1.1	0.1
had difficulty pooping	186 (78)	29 (12)	9 (4)	7 (3)	7	Not at all	1.3	0.3
had blood in my mouth	178 (75)	56 (24)	1	1	2	Not at all	1.3	0.3
<i>Have I had difficulty...</i>								
breathing	208 (87)	26 (11)	0	1	3	Not at all	1.1	0.3
sleeping	154 (65)	67 (28)	11 (5)	4 (2)	2	Not at all	1.4	0.4
eating	67 (28)	106 (45)	41 (17)	20 (8)	4	A little	2.1	0.6
playing/being active	106 (45)	70 (29)	36 (15)	20 (8)	6	A little	1.9	0.6
resting	171 (72)	43 (18)	15 (6)	6 (3)	3	Not at all	1.4	0.2
talking	111 (47)	85 (36)	27 (11)	12 (5)	3	A little	1.7	0.5
brushing my teeth	133 (56)	71 (30)	19 (8)	13 (5)	2	Not at all	1.6	0.5
washing myself/showering	202 (85)	22 (9)	6 (3)	2 (1)	6	Not at all	1.2	0.3
attending daycare/school	38 (16)	13 (5)	27 (11)	91 (38)	69	Very much	3.0	0.5
<i>At the moment I feel</i>								
	Very well n (%)	Pretty well n (%)	Pretty bad n (%)	Very bad n (%)				

39 (16)

143 (60)

41 (17)

9 (4)

6

Pretty well

2.1

0,5

Table 3: Item-total correlations and one factor loadings in the three dimensions of Postoperative Recover in Children (n=238)

PHYSICAL COMFORT			PHYSICAL INDEPENENCE			EMOTIONAL STATE		
Items	Item-total correlations	One factor loadings	Items	Item-total correlations	One factor loadings	Items	Item-total correlations	One factor loadings
Vomiting	0.50	-0.65	Playing/being active	0.53	-0.74	Felt sad	0.33	-0.81
Thrown up	0.32	-0.47	Talking	0.52	-0.73	Frightening dreams	0.13	-0.45
Feeling cold	0.32	-0.42	Brushing my teeth	0.55	-0.77	I feel	0.24	-0.71
Dizzy	0.45	-0.58	Washing myself	0.29	-0.48			
Sore throat	0.50	-0.64	Attending daycare	0.44	-0.65			
Stomach ache	0.40	-0.54						
Ear ache	0.19	-0.24						
Headache	0.29	-0.39						
Peeing	0.20	-0.27						
Pooping	0.29	-0.39						
Blood in my mouth	0.27	-0.39						
Breathing	0.26	-0.35						
Sleeping	0.42	-0.55						
Eating	0.49	-0.62						
Resting	0.27	-0.37						