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Validation of the Youth Acute Pain Functional Ability Questionnaire (YAPFAQ) in Children and Adolescents Undergoing Inpatient Surgery

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ABSTRACT

Half of children admitted after surgery experience intense pain in hospital, and many experience continued pain and delayed functional recovery at home. However, there is a gap in tools available to measure acute functional ability in pediatric postsurgical settings. We aimed to validate the Youth Acute Pain Functional Ability Questionnaire (YAPFAQ) in a large inpatient pediatric surgical population, evaluate its responsiveness to expected functional recovery, and develop a short form for broad clinical implementation. The YAPFAQ is a self-report measure assessing acute functional ability, developed in children admitted for acute sickle cell pain. We evaluated psychometric properties of the measure in 564 children ages 8-18 years admitted after surgery. A sample of 54 participants completed the YAPFAQ daily for 3 days following major surgery to assess responsiveness. The measure showed good reliability (Cronbach's α=0.96) and construct validity, with expected relationships with physical health-related quality of life ($r=-0.53$, $p<.001$) and pain intensity ($r=0.42$, $p<.001$). YAPFAQ scores decreased over time showing good responsiveness to expected recovery. A 3-item short form of the YAPFAQ showed promising psychometric properties. Early assessment of functioning after surgery may identify children at risk for poor functional outcomes and allow targeting of therapies to improve postsurgical recovery.

PERSPECTIVE The Youth Acute Pain Functional Ability Questionnaire showed promising psychometric properties in a pediatric postsurgical population. This study addresses a gap in tools available to monitor functional recovery during hospitalization after pediatric surgery. Early detection of problems with recovery may enable targeted therapies to improve postsurgical outcomes.

INTRODUCTION

Each year, over one million children undergo inpatient surgery in the United States[5]. About 50% will experience moderate-severe pain while in the hospital after surgery[8]. Despite recognition of acute postsurgical pain as a critical factor in recovery after surgery, this rate has remained unchanged over several decades[3,8,19]. Many children continue to experience intense pain during the weeks after discharge from the hospital, which significantly impacts their postoperative health outcomes. At one month after hospital discharge, 10% of children report moderate-severe pain, which is associated with deterioration in physical and psychosocial health after surgery[16]. Recent research shows that these problems with recovery may persist long-term for a sizeable group of children, with around 20% experiencing persistence of pain and associated functional impairment extending over 12 months after major surgery[13,17]. Early detection of slower functional recovery during the initial days following surgery could allow implementation of closer post-discharge follow-up and targeting of therapies to improve health outcomes for these children.

Although measures assessing functional ability have been validated for youth with chronic pain, there is a gap in tools available to measure acute functional ability, which can be applied in an inpatient pediatric postsurgical setting. Existing functional measures in children predominantly evaluate function over weeks to months. For example, the Pediatric Quality of Life Inventory (PedsQL), the Patient Reported Outcomes Measurement Information System Pediatric Scales, and the Child Activity Limitations Interview[7,14,21]. Items assessed on these measures include activities relevant to the home setting (e.g. sports, schoolwork). These measures have vast utility spanning clinical and research settings; however, they do not assess acute pain-related functioning and are not suited to monitoring acute patterns of recovery in the hospital. In the context of acute postoperative pain, the Parents' Postoperative Pain Measure and the Paediatric Quality of Life Questionnaire are observational measures assessing function and behavior for use by parents to evaluate their child's

pain at home after day surgery[2,11] but are also not suitable for monitoring recovery in the hospital. We therefore sought to validate a measure of acute functional ability with the goal of clinical application in pediatric surgical populations.

Recently, Zempsky and colleagues (2014) developed and validated the Youth Acute Pain Functional Ability Questionnaire (YAPFAQ) to evaluate functional ability in children during hospitalization[22]. The 12-item measure was validated in children with sickle cell disease admitted to the hospital for an acute vasoocclusive pain episode. The YAPFAQ assesses areas of functioning relevant to acute pain, for example mobilization out of bed and ability to perform self-care, which can be assessed within the hospital setting. The measure assesses function in a 24 hour time frame and is therefore suited to monitoring daily change in function during acute recovery.

The aims of the present study were therefore to 1) validate the YAPFAQ in a large inpatient pediatric surgical population, 2) evaluate responsiveness of the measure to expected functional recovery during hospitalization in a sample of children admitted after major surgery, and 3) develop a new short form amenable to broad clinical implementation in the hospital setting. We hypothesized that the YAPFAQ would have good construct validity as demonstrated by expected positive correlations with pain intensity and physical health on the PedsQL. Further we hypothesized that the YAPFAQ would be responsive to daily improvement in function during the first three postsurgical days in the hospital.

METHODS

To accomplish our aims we conducted two studies: Study 1 is a cross-sectional assessment of pain and function during hospitalization in a large cohort of children admitted after inpatient surgical procedures; and Study 2 is a daily assessment of pain and function during the first three postoperative days in a sample of children hospitalized following major surgery. All procedures were approved by

the Institutional Review Board. Parents provided consent and children gave their assent prior to participation in the studies. Children in both samples were reimbursed with gift cards for their participation.

Procedures

Study 1: Participants were initially approached by the Outcomes Assessment Program at a children's hospital in the northwestern United States within 72 hours following child admission after surgery. The Outcomes Assessment Program is an ongoing hospital program assessing satisfaction with hospital care and quality of life in all eligible and consenting families with a child admitted to the hospital. For the purposes of the present study, children were also asked to complete measures of pain intensity and function as part of this assessment. During the time period of this study, 89% of families with children admitted to surgical units were approached for potential participation by the Outcomes Assessment Program. Overall participation rate amongst eligible families was 70%. After providing consent, children completed self-report questionnaire measures (YAPFAQ, pain intensity, PedsQL) in English or Spanish using a notebook computer provided by the Outcomes Assessment Program. Research assistants abstracted clinical characteristics from the medical record.

Study 2: Participants were comprised of children enrolled in an ongoing longitudinal study examining outcomes over one year after major surgery. This sample of children was chosen for assessment of responsiveness of the measure during hospitalization, as they are typically inpatient for three or more days. During the time frame of this study, 113 children meeting eligibility criteria were approached for potential participation in the ongoing longitudinal study, and 63 (56%) of those approached agreed to participate. Fifty-three of the 63 children enrolled into the ongoing longitudinal study participated in the present study. For the purposes of this study, children completed the YAPFAQ measure daily between 2 and 5 pm for three days following surgery (excluding the day of surgery), either on paper or electronically using RedCAP.

Participants

Study 1: Five hundred and sixty-four children age 8-18 (mean = 13.0, SD = 3.1) admitted to inpatient surgical services participated in this cross-sectional study. Children undergoing inpatient surgery were eligible for inclusion; day (outpatient) surgeries were not eligible for inclusion. Children were also excluded from the study if they did not speak English or Spanish, were developmentally delayed, had been admitted to the hospital in the preceding 2 months, had social service involvement for a safety alert, were in strict protective isolation for infective risk, or did not have a parent/ guardian available for consent. Surveys were completed in English by 511 (90.6%) families, and in Spanish by 53 (9.4%) families.

Study 2: Fifty-three children ages 10-18 (mean = 14.3, SD = 1.9) undergoing major surgery completed assessments on three consecutive days following surgery. Children were eligible for this study if they were admitted for elective inpatient spinal fusion, hip/femur osteotomy, or pectus deformity repair surgery. Exclusion criteria included non-English speaking families, developmental delay, presence of a serious comorbid condition (e.g. cancer, neuromuscular disease, previous major surgery), or child does not reside with their parent/ legal guardian.

Measures

Sociodemographic characteristics. Parents reported on children's age, sex, race/ethnicity, and parent education level.

Clinical characteristics. Surgical category, length of hospital stay, and medical complexity were collected from patient's electronic medical records. Medical complexity was identified based on diagnosis codes according to the Pediatric Medical Complexity Algorithm (PMCA); participants were categorized as 1) without chronic disease, 2) noncomplex chronic disease, or 3) complex chronic disease. PMCA has good sensitivity and specificity in pediatric inpatients[18].

The Youth Acute Pain Functional Ability Questionnaire. The YAPFAQ is a 12-item self-report questionnaire assessing acute pain-related physical function over the preceding 24 hours[22]. Patients rate their perceived level of difficulty performing each activity that day on a 5-point Likert scale with anchors 0 = "not difficult", and 4 = "extremely difficult". Example items include getting up from the bed, taking a shower or bath, and turning in bed. Scores are summed for a total possible score of 48, with higher total scores indicating greater difficulty performing functional activities. This measure has been found valid and reliable in assessment of function in children with sickle cell disease admitted to the hospital for acute pain management.

Pain intensity. Current pain intensity was rated using an 11-point numeric rating scale (NRS), with anchors "0" indicating "no pain" and "10" indicating "worst pain possible." The NRS is a valid and reliable measure of pain intensity during acute postsurgical recovery[12].

The Pediatric Quality of Life Inventory. The generic core PedsQL scale contains an 8-item subscale assessing physical functioning and a 15-item psychosocial subscale assessing emotional, social, and school functioning[20]. The PedsQL acute form assesses function in the past 7 days, and the standard form assesses function in the past month. For the purposes of this study, participants were asked to respond to questions based on the time frame since hospital admission, as has been previously described in the inpatient setting[6]. Participants report frequency of difficulty experienced with functioning on a 5-point Likert scale with anchors 0 indicating "never" and 5 indicating "almost always". Items are reverse scored and transformed to a 0-100 point range. Items are averaged to produce total and subscale scores such that higher scores indicate better health-related quality of life. This measure has shown good validity in pediatric populations[20,21].

Statistical approach

Analyses were conducted using SPSS version 19.0. The psychometric properties of individual items were first assessed. The means and standard deviations of items were considered, as

well as inter-item correlations, corrected item correlations, and visual and statistical assessment of item distributions. Item 10 of the YAPFAQ, "do homework or schoolwork," had poor psychometric properties, with a significant positive skew (skew = 0.58) driven by disproportionately frequent "0" responses, likely reflecting that this item was not relevant to the inpatient postsurgical setting. This item was therefore removed from all subsequent psychometric analyses.

Analysis of variance (ANOVA) was used to test differences by race; Pearson correlation coefficient was computed to assess differences by age; and chi square analysis assessed differences by sex. To assess psychometrics of the YAPFAQ in the postsurgical sample, we conducted exploratory factor analysis (EFA), and assessed reliability and validity in Study 1. We conducted EFA with iterated principal component extraction method and applied varimax rotation, replicating the measure's original validation[22]. Items were assigned to the factor with the highest factor loadings. Assignments were reviewed and compared to the original measure factor structure. Reliability was assessed using Cronbach's alpha. Convergent validity was assessed with Pearson correlations between the YAPFAQ total score and the PedsQL physical health subscale score and numerical pain ratings.

In study 2 to assess responsiveness of the YAPFAQ to expected daily recovery, we first conducted a repeated-measures ANOVA to determine whether there was a significant effect of recovery time on YAPFAQ scores. We then calculated standardized response means by calculating $M_2 - M_1 / SD_{diff}$ (SD_{diff} = standard deviation of score changes) to assess sensitivity to detect improvement in function over time[9].

To achieve our aim of developing a short form YAPFAQ applicable to pediatric surgery, the full sample of Study 1 was randomly divided into two groups: a primary development group for item level analysis and evaluation of possible configurations, and a test group for cross-validation of the proposed configuration. We examined descriptive statistics and distributions of individual items

within the primary development group. Items with significant factor cross-loadings in EFA in the full sample were removed (8, 9, 11). With the remaining items, we conducted inter-item correlations and corrected item scale correlations against YAPFAQ total score and subscale scores[4]. To incorporate the domains assessed in the primary measure, we aimed to retain at least one item from each domain in the short measure (dressing, washing, movement). We identified one item from each domain based on the greatest correlation with their respective factor score. We reviewed all items for relevance to the postoperative setting. For example, 'put on or change your shirt' may be less relevant to postoperative patients wearing a hospital gown. In all cases the item with the highest correlation to factor scores was also the item identified as most relevant to the setting. Identified items were then averaged for each factor, and linear regressions were conducted to determine the amount of variance of each full factor accounted for by the proposed short form items. The sum of the three items comprised the proposed YAPFAQ-3 Total including 2 items from the activities of daily living factor (one item representing dressing, and one item representing washing), and one item from the movement factor. Finally, a linear regression was conducted to assess the variance of the full YAPFAQ explained by the proposed YAPFAQ-3. The resulting YAPFAQ short form was cross-validated in the test sample, assessed for reliability and validity.

In Study 1, 18 participants (3.2%) were excluded from analyses for missing greater than 20% of YAPFAQ item responses, yielding a total of 564 participants included in analyses. Five participants did not complete PedsQL subscale scores and 7 did not complete numerical pain ratings; these participants were excluded pairwise from respective validity analyses. In Study 2, 4 participants (7.5%) were missing greater than 20% of YAPFAQ item responses for at least one day of assessment, and 9 participants did not complete the questionnaire on one of the 3 days of assessment. These participants were excluded from ANOVA analyses and respective effect size analysis. After

exclusions, <1% of remaining data were missing; thus, the participant's mean for all other responses was used for missing responses.

RESULTS

Participant characteristics are presented in Table 1. Study 1 included 194 children age 8-11, 168 children age 12-14, and 202 children age 15-18. The majority of participants in study 1 underwent general (n=221, 39.2%) or orthopedic (n=173, 30.7%) surgeries; the remainder included ear, nose and throat, plastic, oral and maxillofacial, urology, neurosurgical, and cardiac procedures. The majority of children in study 1 (53.2%) had no underlying chronic condition, while 30.3% had a non-complex chronic condition, and 16.5% had a complex chronic condition. Study 2 included 30 children age 10-14, and 23 children age 15-18. Children in study 2 underwent major spine (n=36, 68%), hip (n=2, 4%), or pectus (n=15, 28%) surgeries.

Psychometric properties of the YAPFAQ for assessing pain-related function in a pediatric surgical population

YAPFAQ scores (mean = 19.94; SD = 12.44; range = 0-44) in study 1 did not differ by age (r = .02, p = 0.53), race ($F(4, 559) = 1.68$, p =0 .15), or sex ($\chi^2 = 85.81$, p = 0.16).

Exploratory Factor Analysis. We conducted EFA using data from participants in study 1. EFA with varimax rotation yielded one factor, based on eigenvalues greater than 1. However, given the 2-factor model presented in the original validation [22], a 2-factor model was forced. All items loaded to the same factors as in the original validation, however there was significant cross loading of 3 items (8, 9, 11); see Table 2 for full report of items and factor loadings. The first factor comprised activities of daily living (n = 7 items), accounting for 70.79% of the variance; the second comprised movement/mobility items (n = 4), accounting for 6.45% of the variance, together accounting for

77.24% of the variance. Based on interpretability and consistency with the YAPFAQ's original report, the 2-factor solution was deemed final.

Reliability. We assessed reliability of the YAPFAQ in the participants from study 1. Internal consistency assessed with Cronbach's alpha for the total YAPFAQ score was excellent at $\alpha = 0.96$; for the activities of daily living factor, $\alpha = 0.94$; and for movement, $\alpha = 0.92$.

Validity. We assessed validity of the YAPFAQ by examining correlations between the YAPFAQ total score and the PedsQL physical health subscale score and numerical pain ratings in participants from study 1. The YAPFAQ showed good construct validity. As hypothesized, higher YAPFAQ scores (i.e., greater perceived difficulty of functioning) were correlated with lower physical health (PedsQL physical health subscale score; $r = -0.53$, $p < .001$) and higher pain intensity ratings ($r = 0.42$, $p < .001$).

Responsiveness. We assessed responsiveness of the YAPFAQ to expected daily recovery during hospitalization, in study 2. YAPFAQ scores decreased significantly over time, reflecting expected improvement in function, $F(2, 64) = 26.05$, $p < .001$. Standardized response means (SRM) indicated responsiveness to expected daily recovery in function after surgery; means, standard error and SRM are presented in Table 3.

Proposed YAPFAQ short form

Alternative configurations of YAPFAQ items were considered to generate a short form to facilitate wider use and clinical utility of the measure in the hospital setting, using data from study 1. Item level analysis was conducted in the primary development group of study 1; descriptive statistics for YAPFAQ items are presented in Table 4. As reported above, items 8, 9, and 11 had significant cross-loadings and were excluded from the shortened measure. Remaining items from both activities of daily living and movement subscales were chosen based on correlations with the respective factor scores and relevance to the hospital setting. Item-scale correlations are presented in Table 5. Within

the two domains represented by the activities of daily living factor, item 2 ("Put on or change your hospital gown or clothes") and item 3 ("Wash your body") were most strongly correlated with the activities of daily living score (r = .91, p < .001 and r = .92, p < .001, respectively). Together these two items significantly predicted the full measure activities of daily living score (B= 0.95, $t(270)$ = 49.91, p < .001) and explained a significant portion of its variance (R^2 = .90, $F(1, 270)$ = 2490.31, p < .001). Within the movement/mobility factor, item seven ("Go outside your room") was most strongly correlated with total movement score (r = .93, p < .001). This item significantly predicted total factor score (B= 0.93, $t(270)$ = 41.60, p < .001) and explained a significant portion of its variance (R^2 = .87, $F(1, 270)$ = 1730.31, p < .001.). These three items were combined to form a YAPFAQ 3-item short form total score (YAPFAQ-3, Appendix 1). YAPFAQ-3 significantly predicted YAPFAQ Total (B= 0.96, $t(270)$ = 56.65, p < .001) and explained 92% of the variance (R^2 = .92, $F(1, 270)$ = 3208.80, p < .001). Cross-validation of the proposed configuration was assessed in the test group of study 1. Reliability and validity of the YAPFAQ-3 score were assessed. Cronbach's alpha was good at α = 0.86. YAPFAQ-3 showed good convergent validity with Peds QL physical health subscale score (r = -0.48, p < .001), and numerical pain ratings (r = 0.43, p < .001).

DISCUSSION

This manuscript presents an adapted measure to assess daily functioning in children hospitalized after surgical procedures. The YAPFAQ showed good reliability, validity, and responsiveness in pediatric postsurgical samples. A proposed short form version of the YAPFAQ consisting of 3 items showed promising psychometric properties comparable to the full version.

The YAPFAQ was developed to assess acute pain-related functional ability, and was originally validated in children admitted for acute pain related to sickle cell disease. We extend the use of the YAPFAQ to monitor functional ability in children admitted for acute recovery after

surgery, finding good reliability and good convergent validity with pain intensity and with physical function on the PedsQL in our sample. Convergence with pain intensity was greater in our surgery sample compared to the original validation in a sickle cell disease sample, reflecting that pain may be more strongly related to function in the context of acute postsurgical pain than in the context of acute or chronic pain associated with sickle cell disease.

A two-factor model in our postsurgical sample yielded similar configuration to the original YAPFAQ validation. The activities of daily living factor accounted for a greater proportion of variance in total functional ability scores (70.79%), while movement items accounted for less of the variance (6.45%), reflecting the greater impact of surgery on function related to self-care than on movement. In the original validation in patients with sickle cell pain the activities of daily living factor accounted for 40.67% of variance, and the movement factor accounted for 24.30% of variance. Together, factors representing movement and activities of daily living accounted for a greater proportion of variance (77.24%) than in the original sickle cell validation sample (65%). This is not surprising given that the majority of our sample was without chronic illness, and thus the direct impact of acute pain on their functional ability may have been more directly assessed by the YAPFAQ.

We further extend the original validation of the YAPFAQ by assessing responsiveness to expected acute functional improvement, demonstrating detectable improvement in functioning over the first 3 postoperative days. Research has identified a significant portion of children that struggle with pain and recovery at home after hospital discharge, which can persist, impacting long-term health-related quality of life. Evaluation of functioning in the acute postsurgical period may identify children experiencing poorer functional recovery in the hospital to enable early intervention to prevent poorer postsurgical outcomes. Future research is needed to examine whether patterns of acute function in the hospital predict functional outcomes at home.

Following the recommendation of the Joint Commission on Accreditation of Health Care Organizations in 2000[15], regular assessment of pain intensity is standardized in most hospital settings[1]. However, as highlighted by the Pediatric Division of the Initiative on Methods, Measurement, and Pain Assessment in Clinical Trials (Ped-IMMPACT) group, it is critically important to assess physical function along with pain intensity to understand the severity and impact[10] of acute pain, and to inform treatment decisions. As proposed, a brief form of the YAPFAQ could improve the clinical utility of the measure, making it more feasible to integrate into daily clinical assessments in the hospital after surgery, and decrease the burden of self-report on children who are ill after surgery. The high Cronbach's alpha of the full measure suggests redundancy among the original items, further supporting development of a short form. The proposed short form, the YAPFAQ-3, consisting of 3 items showed promising psychometric properties comparable to the full version.

A strength of our study was use of a large clinical sample of children, hospitalized for a range of surgeries, which enabled us to split the sample into a primary development group and a test group to develop and test a new short form. A further strength of the study included obtaining daily assessments in a sample of children admitted after major surgery, which enabled examination of measure responsiveness to expected recovery after major surgery. A limitation of the present study was that while self-report may decrease the burden of measure administration, some patients may be too sick initially to complete the measure. However, we were able to obtain self-report in a large cohort of postsurgical inpatients, and most children in our major surgery cohort were also able to complete self-report on the full 12 item measure. The proposed short form may further reduce patient burden. While this measure was designed for self-report, future research could examine the validity of nurse or parent proxy- report when youth are too sick to self-report. A further limitation of the study is that functional ability may be impacted by factors other than pain which we did not assess in

our study; for example, medical equipment such as casts or drains, or side effects from medication, may impact acute functional ability. These factors should be assessed in future studies. Further, investigators may want to include the phrase ‘because of pain’ in the stem of the measure in future validation studies, to ensure that they are assessing function specifically related to pain.

In conclusion, the YAPFAQ showed good psychometric properties in an inpatient postsurgery sample, demonstrating good convergent validity, and responsiveness to expected functional improvement during hospitalization. Assessment of functional ability alongside pain intensity during acute recovery in the hospital will not only allow multidimensional assessment of pain severity, but could identify children experiencing early problems with recovery and permit early intervention to prevent persistence of postsurgical problems at home.

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Table 1. Sample characteristics.

	Study 1 (N=564)		Study 2 (N=53)	
	N	%	N	%
Sex				
Female	284	50.4	34	64.2
Male	280	49.6	19	35.8
Race and Ethnicity				
Caucasian	317	56.2	40	75.5
African-American	15	2.7	4	7.5
Hispanic	108	19.1	3	5.7
Asian	31	5.5	2	3.8
Mixed race or other	93	16.5	1	1.9
Not reported	0	0	3	5.7
Parental education level				
High school or less	152	27	8	15.1
Some college	174	30.9	13	24.5
Bachelor's Degree or higher	234	41.5	30	56.6
Not reported	4	0.7	2	3.8

Table 2. YAPFAQ item factor loadings from exploratory factor analysis in Study 1

YAPFAQ Item	Factor 1	Factor 2
1. Take a bath or shower?	**.771**	.436
2. Put on or change your hospital gown or clothes?	**.754**	.489
3. Wash your body?	**.797**	.432
4. Get up from the bed?	.402	**.807**
5. Walk around in the room?	.318	**.883**
6. Wash or shampoo your hair?	**.805**	.337
7. Go outside your room?	.413	**.811**
8. Be up without needing to rest?	.515	**.643**
9. Put on or change pants?	**.630**	.628
11. Turn over or roll over in bed?	**.546**	.532
12. Put on or change your shirt?	**.805**	.311

YAPFAQ Youth Acute Pain Functional Ability Questionnaire;

Factor 1 = Activities of daily living; Factor 2 = Movement

Table 3. YAPFAQ change scores and standardized response means over first three postoperative days in Study 2.

YAPFAQ Change	Mean	Standard Error	SRM
ΔDay 1 to Day 2	4.03	6.69	0.60
ΔDay 2 to Day 3	5.06	6.80	0.74
ΔDay 1 to Day 3	8.68	7.73	1.23

YAPFAQ Youth Acute Pain Functional Ability Questionnaire, range 0-48;

Δ = change; SRM = standardized response mean

**Higher change scores indicate greater improvement in function*

Table 4. Descriptive statistics for YAPFAQ items in primary development group of Study 1.

Item	Mean	Standard Deviation	Skewness	Skewness *z*-score
1. Take a bath or shower?	1.93	1.42	0.00	-0.01
2. Put on or change your hospital gown or clothes?	1.64	1.28	0.30	2.05*
3. Wash your body?	1.75	1.34	0.16	1.07
4. Get up from the bed?	1.68	1.25	0.38	2.57*
5. Walk around in the room?	1.70	1.37	0.31	2.11*
6. Wash or shampoo your hair?	1.53	1.44	0.44	3.00*
7. Go outside your room?	1.59	1.37	0.39	2.62*
8. Be up without needing to rest?	1.76	1.37	0.28	1.91
9. Put on or change pants?	1.86	1.46	0.10	0.69
11. Turn over or roll over in bed?	2.01	1.42	-0.07	-0.49
12. Put on or change your shirt?	1.51	1.40	0.46	3.11*

YAPFAQ Youth Acute Pain Functional Ability Questionnaire, range 0-48; *$z < 1.96$

Table 5. Item-scale correlations of relevant items used to determine final items for inclusion in YAPFAQ-3 (Study 2).

	Activities of Daily Living Total	Movement Total
1. Take a bath or shower?	0.89	
2. Put on or change your hospital gown or clothes?	0.91	
3. Wash your body?	0.92	
4. Get up from the bed?		0.90
5. Walk around in the room?		0.92
6. Wash or shampoo your hair?	0.85	
7. Go outside your room?		0.93
12. Put on or change your shirt?	0.84	

Youth Acute Pain Functional Ability Questionnaire – 3-Item Short Form

Appendix 1.

Youth Acute Pain Functional Ability Questionnaire – 3-Item Short Form

(YAPFAQ-3)

When people are in the hospital they sometimes are too sick or uncomfortable to do all of their normal activities. We want you to think about how difficult it would be to do these things today – not whether or not you like to do these things, or whether you did them today.

Today, how difficult are these things for you to do?

	Not difficult	A Little Difficult	Somewhat Difficult	Very Difficult	Extremely Difficult
1. Put on or change your hospital gown or clothes?					
2. Wash your body?					
3. Go outside your room?					

The YAPFAQ showed good psychometric properties in a pediatric postsurgical population

YAPFAQ showed good responsiveness to expected recovery

The YAPFAQ-3 short form showed promising psychometric properties