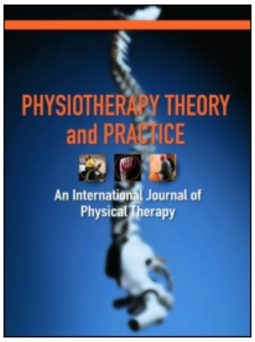

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Physiotherapy Theory and Practice
An International Journal of Physical Therapy

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/iptp20

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To cite this article: Sara Frygner-Holm , Helena Igelström & Ingrid Demmelmaier (2020): Development, preliminary validation and reliability testing of SEDA – Self-Efficacy in Daily Activities for children with pain, Physiotherapy Theory and Practice, DOI: 10.1080/09593985.2020.1771797

To link to this article: https://doi.org/10.1080/09593985.2020.1771797

Published online: 30 Jun 2020.

PHYSIOTHERAPY THEORY AND PRACTICE
https://doi.org/10.1080/09593985.2020.1771797

Development, preliminary validation and reliability testing of SEDA – Self-Efficacy in Daily Activities for children with pain

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ABSTRACT

Background: Self-efficacy can affect a child's ability to perform important activities, infuse him/her with a sense of control and is likely an integral target for successful treatment in pediatric pain rehabilitation. Modern physical therapy treatment includes behavioral aspects and valid measures of self-efficacy are important for both research and clinical practice. In this study, the aim was to develop and perform preliminary testing of a self-efficacy scale for children and adolescents with pain.

Methods: Children and adolescents participated, along with researchers and healthcare staff, in developing the Self-Efficacy in Daily Activities (SEDA) measure. A total of 109 children and adolescents seeking physical therapy treatment for pain lasting longer than 3 months responded to the SEDA. Pain and pain-related disability were assessed using the Functional Disability Inventory (FDI). Exploratory analyzes for testing validity and reliability – principal component analyses (PCA), intraclass correlation coefficients (ICCs) and bivariate correlations – were performed.

Results: The PCA revealed a 16-item SEDA and a three-component scale. The components represented self-efficacy for physical activities, self-efficacy for personal care and self-efficacy for daily exertion. Validity correlation analyses showed moderate association between SEDA and FDI, −0.72 ($p < .01$), and low correlation with pain intensity, −0.29 ($p = .03$).

Conclusions: The 16-item SEDA has satisfactory psychometric properties in children moderately affected by long-term pain. Further validation of the SEDA in other populations and confirmatory analyses are warranted.

ARTICLE HISTORY
Received 22 May 2019
Revised 13 March 2020
Accepted 14 April 2020

KEYWORDS
Pain; children; self-efficacy; measure

Introduction

A high incidence of musculoskeletal pain in children and adolescents has been noted in the past decades; approximately 8–32% experience weekly musculoskeletal pain, and up to 39% experience pain every month, according to systematic reviews (King et al., 2011). It has been estimated that 15–20% of children and adolescents with pain seek care for it (Paananen et al., 2010) and many are assessed and treated with physical therapy.

A biopsychosocial approach aids in the understanding of the multifaceted phenomenon of pain (Riddell, Racine, Craig, and Campbell, 2014). The biopsychosocial model of pain places nociceptive input as one among many factors that affect pain perception and related disability. It is well-known that pain intensity is only weakly correlated with pain-related disability and self-efficacy (Carpino et al., 2014; Claar and Walker, 2006; Logan and Scharff, 2005). In the past decades, integration of psychosocial and behavioral knowledge in physical therapy (PT) has changed treatment significantly. Combining PT and cognitive behavioral techniques improves functioning in children experiencing pain (Ayling Campos, Amaria, Campbell, and McGrath, 2011; Eccleston and Eccleston, 2004; Holm et al., 2016; Lee et al., 2002; Sherry et al., 1999), and PT-delivered cognitive-behavioral interventions have proven more effective than other guideline-based treatments (Hall et al., 2018). In the context of pediatric PT, treatment could include physical exercises and methods for supporting behavioral changes commonly interfering with function, such as anxiety, catastrophizing/negative thoughts, pain-related fear and low self-efficacy (Carpino et al., 2014; Eccleston et al., 2004; Holm, Ljungman, Åsenlöf, and Söderlund, 2013; Simons and Kaczynski, 2012).

Self-efficacy refers to a person's belief in his/her own capability to perform a certain activity or behavior

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(Bandura, 1997). Research among adults has shown low self-efficacy to be a predictor of disability in musculoskeletal pain (Denison, Åsenlöf, and Lindberg, 2004; Foster et al., 2010; Turk and Okifuji, 2002) and a mediator between pain intensity and disability (Söderlund and Asenlof, 2010). On the other hand, high self-efficacy predicts better outcome over time in patients participating in self-management trials for chronic musculoskeletal pain (Miles et al., 2011).

There is no reason to assume that the processes related to self-efficacy are different among children. Pain-related self-efficacy has been reported to impact on the ability to function despite pain (Carpino et al., 2014) and could give a child a sense of control over activities important to him or her. High levels of self-efficacy for different domains of functioning have been reported to be correlated with fewer somatic complaints and higher self-esteem (Bursch, Tsao, Meldrum, and Zeltzer, 2006), while low self-efficacy is associated with higher fear, disability, depression and school impairment (Carpino et al., 2014). Thus, self-efficacy for daily activities is likely important to target in pediatric physical therapy treatment of pain. In physical therapy treatment, the aim should be to diminish the disabilities that pain imposes on children's everyday life, rather than only trying to decrease pain intensity.

According to Bandura (1977, 1997) the main sources of self-efficacy are as follows: mastery experience; vicarious experience (i.e. seeing somebody else perform a desired activity); verbal persuasion from others; and physiological/psychological states eliciting feelings of capability (or lack thereof). Researchers have included pain self-efficacy outcome measures in behavioral intervention studies of adults, but different self-efficacy definitions have been used. Thompson et al. performed a systematic review regarding pain-related beliefs and their effect on adherence to pain rehabilitation treatments. They revealed that pain-related self-efficacy was defined differently in the included studies (Thompson, Broadbent, Bertino, and Staiger, 2016). This can also be seen in a recent systematic review by Stahlschmidt, Hubner-Mohler, Dogan, and Wager (2019). They reviewed measures used in pediatrics targeting pain impact and functioning despite pain, both on a general level and in specific situations and activities. The Self-Efficacy in Daily Activities (SEDA) was one of the measures included. The SEDA has previously been used in a pediatric pain trial, but its psychometric properties have not yet been reported. In a pilot trial targeting pain problem in children and adolescents seeking primary care (Holm et al., 2016), we were interested in young people's self-efficacy for daily activities during a normal day both time in school and leisure time. We aimed to target a variety of activities including physical activities which is especially relevant to physical therapy. Two relevant measures, close to our area of interest, were identified. Bursch, Tsao, Meldrum, and Zeltzer (2006) had constructed a 7-item measure assessing children's self-efficacy for functioning normally when in pain covering self-efficacy for school activities, leisure time activities, and taking care of oneself – all important aspects of daily life. However, self-efficacy for physical activities relevant for physical therapy was not included. The other measure, Self-efficacy Questionnaire for School Situations from 2014 (Heyne et al., 2014) targets the school day and the child is encouraged to rate his/her own perceived ability to cope with potentially stressful situations in school. However, the scale was not developed for children with pain and does not address a child's self-efficacy for activities involving physical functions. The aim of our study was to develop and perform preliminary testing of a self-efficacy measure for children with pain regarding functioning during a normal day, in school and leisure time, including physical activities.

Methods

Participants

The present study was conducted in a city with 200,000 inhabitants in central Sweden, at three physical therapy clinics with open access for children and adolescents. Children and adolescents (8–18 years) who sought physical therapy for a pain-related condition with a duration exceeding three months, regardless of pain location, were invited to participate. Patients with poor understanding of written and spoken Swedish and those with recent trauma, ongoing treatment for any psychiatric illness, or severe cognitive problems, were not eligible. One-hundred and nine patients agreed to participate and eight patients did not return the questionnaire. The final sample consisted of 101 patients.

Procedure

Health care staff invited eligible patients to participate and if they agreed, a research assistant subsequently contacted them and their parents. The SEDA measure was one in a larger number of measures collected for the purpose of psychometric studies of measures targeting children with pain. Data were collected online. The participants were e-mailed a personalized login code and a link to the study questionnaires, developed in the Webropol Analytics software (Helsinki, Finland).

For the purpose of test-retest reliability examination, the first 30 participants were asked to complete the SEDA again after one week. The questionnaire was presented in Swedish.

The study was approved by the Uppsala regional ethics review board (Drn: 2013/018). Verbal consent and written consent were obtained from both participants and their parents. It was stated in the consent form that participation was voluntary, that children did not need to participate even if their parents had given consent, that participation or nonparticipation in the study would not in any way affect care and that patients could withdraw at any time without giving any explanation.

Measures

Socio-demographics

Information about age, school year, gender, and nationality were collected using a study-specific questionnaire.

Pain

Pain duration was reported in months or, if exceeding 12 months, in years. Each participant's main pain location and reasons for seeking care were assessed through multiple choice questions (head, neck shoulder back, hip, upper extremity, lower extremity, abdomen, or whole body). Pain intensity for current pain was assessed using a numerical rating scale (NRS)-11 with anchors of 0 = no pain and 10 = worst pain imaginable. NRS-11 has good validity for assessing pain intensity in children (Miro, Castarlenas, and Huguet, 2009; Von Baeyer, 2009).

Pain-related disability

Pain-related disability was assessed using the Functional Disability Inventory (FDI). The FDI consists of 15 items describing limitations of daily activities due to pain during the past two weeks. Each item is scored on a 5-point scale (0–4; performing the activity can be done with no trouble, a little trouble, some trouble, a lot of trouble, or is impossible) with a total score of 0–60, where a higher score indicates greater disability. The FDI has demonstrated sound psychometric properties in children with chronic pain (Claar and Walker, 2006; Walker and Greene, 1991).

Development of the measure

The first step in the development of a measure assessing pain-related self-efficacy for activities on an ordinary day was to conduct focus group interviews to collect information about activities among children and adolescents. One focus group consisted of five children (10–12 years) and another of five adolescents (13–17 years) without a history of any longstanding pain conditions. Participants in the focus groups were recruited through convenience sampling and were children of university staff, neighbors and friends of the authors. The question asked in the focus groups was "Which activities do you normally perform during an ordinary school day?". This question was chosen in order to capture an array of activities on a normal day, in contrast to activities performed on vacations or weekends. The interviews resulted in a list of 21 activities normally included in a Swedish child's day. Based on these 21 activities, a pool of 21 items was developed and constructed in accordance with the recommendations of Bandura (2006) and formed the first version of the SEDA.

The second step was to perform a preliminary content and construct validation by gathering professional input on the items and their compliance with Social Cognitive Theory (SCT). Six researchers and two PhD students from Uppsala University, well-acquainted with SCT in general and self-efficacy in particular, gave their input on the measure. This step resulted in rewording of several items to make them more specific in terms of behavior. "Having lunch" was changed to "Having lunch in the school cafeteria" and "Riding a bike" was changed to "Riding a bike for 10 minutes." Also, one double-barreled question was split into two. The remaining items were perceived to be in line with the construct of SCT and did not need any adjustments. The final questionnaire contained 22 items with the stem "*Right now*, how sure are you that you could, even if you were in pain, do each of the activities described below?" Answers were rated on a numerical rating scale (NRS), NRS-11, as recommended by Bandura (2006), with anchors of 0 = "Very unsure" to 10 = "Very sure" (Appendix).

The third step was to pilot the SEDA in a group of 20 patients aged 9–16 years to test readability, ambiguities in items and instructions, if the included activities were relevant, and if any important activity was missing. The time required to complete the SEDA varied between 10 and 15 minutes and no difficulties in completing the questionnaire or need of changing the included activities were reported. Face validity for the younger ages was tested by asking a group of five 8- and 9-year-olds to complete the SEDA and take part in an interview about the comprehensiveness and appropriateness of the questionnaire. The SEDA was found acceptable also for the younger ages, as no one in the group thought it was difficult to understand the phrasing of the items. The questionnaire was translated into

English by the authors and later checked for readability and understanding by four American students aged 14–16 years. Language proof by professional translator has been done for the purpose of writing this paper. No further testing regarding translation or age-related reading levels in English has been performed.

Analyses

Validity testing

Prerequisites check. Based on data from the validity study (n = 101), each item was analyzed for correlation with the total preliminary SEDA score. The analysis plan was to exclude items with a too weak correlation with the total score (Streiner, Norman, and Cairney, 2015) and a cutoff was set at < 0.3. Also, inter-item correlations were examined to identify if variables correlated too strongly with each other or correlated with too few other variables (Streiner, Norman, and Cairney, 2015) and the cutoff was set at > 0.9. Frequency distributions were examined and plotted to explore low variability or skewed responses. The Kaiser-Meyer-Olkin measure was used to evaluate sampling adequacy, where a value between 0.8 and 1.0 would indicate a satisfactory factorability of the correlation matrix (Kaiser, 1974).

An exploratory principal component analysis (PCA) was performed. Since the components were hypothesized to be related, an oblique rotation with delta = 0 was used. Items with loadings lower than 0.4 and items with cross-loadings higher than 0.3 were excluded. The final components were then examined regarding their inter-correlation and their respective correlations with the total score. Cutoffs were set at as follows: very weak, if any correlation = 0.00–0.25, weak = 0.26–0.49, moderate = 0.50–0.69, strong = 0.70–0.89 and very strong = 0.90–1.00 (Carter and Lubinsky, 2016).

Internal consistency. Internal consistency was calculated for the new total score and all subscales and items contributing negatively to the alpha were to be excluded. No item negatively influenced the alpha score and therefore no further reductions of items were performed (Ponterotto and Ruckdeschel, 2007). Bivariate correlation (Pearson's) was used to investigate inter-correlations between the total scale and subscales. Cutoffs were set at as follows: very weak, if any correlation = 0.00–0.25, weak = 0.26–0.49, moderate = 0.50–0.69, strong = 0.70–0.89 and very strong = 0.90–1.00 (Carter and Lubinsky, 2016).

Concurrent validity. Concurrent validity between the final 16-item SEDA and pain-related disability and pain intensity was examined by performing Pearson's correlation and Spearman's correlation, respectively.

Test-retest reliability

Test-retest reliability of the final version was analyzed by estimating intraclass correlation coefficients (ICC) with 95% confidence intervals (CI) (Kottner, Gajewski, and Streiner, 2011) based on an absolute agreement, 2-way mixed effects model. Standard error of measurement (SEM) was calculated as baseline standard deviation (SD) x $\sqrt{}$ (1-ICC). Minimally detectable change (MDC) values were calculated as SEM x 1.96 x $\sqrt{2}$ (Haley and Fragala-Pinkham, 2006).

Age and gender comparisons

Age and gender differences regarding total SEDA scores were examined Spearman's correlation and Mann-Whitney U-tests, respectively. The analyses were conducted using the Statistical Package for the Social Sciences (SPSS), version 22.0 (SPSS Inc., Chicago, IL, USA). For six study participants, one or two missing items were found and data from these were excluded before running the statistical analyses.

Results

The participants were 101 schoolchildren, in grade 2 to high school year 3, of whom 93% were born in Sweden. All children had pain-related problems, in various locations and of various duration and intensity (Table 1).

When checking the prerequisites for analysis, each item had a correlation coefficient to the total score of between 0.53 and 0.87; therefore, no items were excluded from further analysis. When performing inter-item correlations, no correlation above 0.9 was found. Item level analysis revealed a positively skewed

Table 1. Demographic characteristics of the sample.

Characteristics	n	(%)	mean	range	(sd)
Age (years)			13.3	8–17	(2.4)
Gender					
Male	27	26.7			
Female	74	73.3			
Primary pain location					
Head	34	33.7			
Lower Extremity	21	20.8			
Whole Body	17	16.8			
Back	16	15.8			
Neck	5	5.0			
Hip	3	3.0			
Upper Extremity	2	2.0			
Abdomen	2	2.0			
Shoulder	1	1.0			
Functional Disability Inventory			16.1		(11.7)
			Median	**range**	**(IQR)**
Pain duration (months)			12.0	3–204	(17.0)
Pain intensity NRS*			4.0	0–10	(5.0)

* Numerical Rating Scale 0–10.

Table 2. Items removed from the original preliminary 22-item questionnaire due to cross loadings.

Item #	Items	Mean	(sd)
1	To get to and from school the way I normally do	7.1	(2.9)
2	To spend time with my friends at school	7.3	(2.9)
5	To have lunch in the school cafeteria	7.3	(3.1)
15	To have breakfast at home on a school-day	7.5	(3.3)
16	To have dinner at home	8.2	(3.3)
17	To get to and from recreational activities the way I normally do	7.1	(3.0)

distribution for all items. Means ranged from 4.8 to 8.6, indicating that the study sample scored relatively homogenously at the higher end of the scale, but had a satisfactory Kaiser-Meyer-Olkin measure (0.89).

The PCA revealed no items with loadings < 0.4. Six items had cross-loadings higher than 0.3 and were removed from the SEDA (Table 2). Thus, the final solution consisted of 16 items (Table 3). The mean total score of the 16-item SEDA was 113.7 (SD 37.1).

After the removal of items, the PCA was repeated, revealing three components with an eigenvalue greater than 1.0. The scree plot also indicated a three-component solution. The components were labeled: 1) self-efficacy for physical activities (4 items); 2) self-efficacy for personal care (3 items); and 3) self-efficacy for daily exertion (9 items). Daily exertion includes various types of daily activities at school, at home and in social situations. The data for variables loading in each component in the final version of the SEDA are presented in Table 3.

Table 3. Descriptive data and factor loadings for the final 16 items in the SEDA (n = 101).

Item #	Items	Mean	(sd)	*SE Physical activities*	*SE Personal care*	*SE Daily exertion*
3	To walk up and down stairs	7.0	(3.1)	**.897**	.106	−.148
4	To be active in physical education	4.8	(3.3)	**.820**	−.162	.112
8	To walk for 10 minutes	7.5	(2.7)	**.685**	.189	.137
19	To ride a bike for 10 minutes	7.1	(3.1)	**.682**	.192	.162
7	To shower at home	8.6	(2.4)	.074	**.867**	−.029
18	To get dressed at home	8.3	(2.7)	.025	**.795**	.112
20	To wash my hair at home	8.4	(2.6)	.067	**.836**	.046
6	To be active in academic classes	6.8	(3.3)	−.067	−.031	**.976**
9	To do homework	6.6	(3.4)	.016	.060	**.833**
10	To be active in non-academic classes	7.1	(3.2)	.143	.045	**.812**
11	To use the computer at home	7.2	(3.1)	−.140	.166	**.822**
12	To clean my room at home	7.1	(3.2)	.180	.111	**.710**
13	To meet with friends outside home	6.7	(3.2)	.099	.015	**.827**
14	To be able to concentrate during classes	6.1	(3.6)	−.023	−.122	**1.003**
21	To get out of bed in the morning	6.6	(3.4)	.174	−.122	**.804**
22	To watch TV at home	7.7	(2.9)	−.164	.354	**.722**

The internal consistency (Cronbach's alpha) for the total score of the 16-item SEDA was 0.95. The internal consistencies for the subscales were Cronbach's alpha 0.85 (physical activities), 0.86 (personal care) and 0.96 (daily exertion), respectively, all indicating a high degree of consistency (Bland and Altman, 1997). The subscales' descriptives, and correlations among subscales and with the SEDA total score, are presented in Table 4. The test-retest of the new 16-item SEDA revealed a low to moderate within-subject reliability (Kottner et al., 2011), as indicated by ICC values of between 0.47 and 0.68 (Table 5).

Discussion

The present study describes the construction of a scale measuring self-efficacy for daily activities during an ordinary school day in children and adolescents experiencing pain. The SEDA shows acceptable psychometric properties and can be used to screen which everyday activities are limited by low self-efficacy, at least in primary care samples in Sweden and possibly in other countries with similar socioeconomic status and school systems.

Three subscales emerged during the analytical process: 1) self-efficacy for physical activities; 2) personal

Table 4. Descriptive statistics subscales; inter correlation with each other and total score.

Subscale	Mean	(sd)	Total	Physical activities	Personal care
Total score	113.7	37.1	-		
Self-Efficacy Physical activities (4 items)	26.4	10.2	.75**	-	.66**
Self-Efficacy Personal care (3 items)	25.3	6.8	.72**		-
Self-Efficacy Daily exertion (9 items)	55.4	23.0	.92**	.67**	.74**

** Significant at $p < 0.01$ level (2-tailed).

Table 5. ICC values with 95% CI, SEM and MDC for the new, 16-item SEDA and three subscales.

	ICC	95% CI	P-value	SEM	MDC95
Total SEDA, 16 items	0.50	−0.21, 0.79	0.059	25.5	70.1
Subscale physical activities	0.47	−0.17, 0.75	0.059	8.6	23.8
Subscale personal care	0.68	0.30, 0.86	0.003	3.5	9.6
Subscale daily exertion	0.51	−0.13, 0.78	0.047	18.6	51.1

ICC = intraclass correlation coefficients; CI = Confidence Interval; SEM = Standard Error of Mean; MDC = Minimal Detectable Change.

care; and 3) daily exertion. The Cronbach's alpha demonstrated good internal consistency (Bland and Altman, 1997), both for the total and for the subscales. The subscales demonstrated strong correlation (Carter and Lubinsky, 2016) with the total score, indicating that the subscales are measuring aspects connected to the total SEDA score. As the inter-correlations between the subscales were only moderate, it seems that the subscales provide unique information. This was supported by the PCA, demonstrating a stable three-component solution with high loadings (Kaiser, 1974) within each component.

One of the strengths of the present study was that the testing of the SEDA was extensive and carried out using a systematic step-by-step approach, starting with young people's own descriptions of their daily activities. The SEDA measures self-efficacy for important daily activities as put forward by young people themselves. Potential research participants can elicit items that clinicians cannot (Streiner, Norman, and Cairney, 2015), and children and adolescents gave their input at several stages of development in this study. In addition, content and construct validation were ensured by professional input from clinicians and researchers, on the items and on if the content in the SEDA was in line with SCT.

The distribution plots revealed positive skewedness of the item responses for most items. While this is not a problem for the performance of the PCA itself, it may affect its sensitivity to change and thus limit the clinical use of the SEDA. The original 22-item SEDA has been used as an outcome measure in a pilot study targeting teenagers experiencing pain. In this study of a behavioral medicine intervention, where a systematic increase of self-efficacy was seen, the participants raised their SEDA scores by 24.5% on average (Holm et al., 2016), indicating that self-efficacy for daily activities as measured by the SEDA is possible to modify during treatment. However, the sensitivity and responsiveness to clinically meaningful changes need further investigation. The patient-specific questions in the SEDA may contribute to increased knowledge of clinically valuable changes, since these questions relate to activities important to the patient and may guide the goals of PT treatment. It is plausible that the SEDA needs to include more challenging activities, in order to give a full picture of self-efficacy in daily activities for children with mild or moderate pain.

The analysis of test-retest reliability resulted in a low to moderate ICC and sizable MDC values, indicating low stability over time for total SEDA as well as the physical activities and daily exertion subscales. The personal care subscale demonstrated higher stability with higher ICC and lower MDC values. Unlike many other psychological constructs, self-efficacy beliefs are hypothesized to vary depending on external circumstances, and since self-efficacy is regarded as situation-specific, it is likely to change over time (Bandura, 1977). Therefore, only moderate reliability over time is to be expected. A shorter time span than two weeks may have been more appropriate to assess SEDA´s stability over time. The fluctuation in self-efficacy during shorter or longer time frames would be interesting to study in future. To the best of our knowledge, studies exploring this are lacking.

Further, when constructing the SEDA, the time frame was emphasized and the instructions called upon the participants to rate their self-efficacy "right now." Thus, the risk of recall bias was probably reduced, but there is a risk that the ratings reflected self-efficacy when the participant experienced a certain level of pain intensity. However, the analysis of concurrent validation revealed a weak correlation between SEDA scores and pain intensity, indicating that pain intensity and self-efficacy for daily activities do not substantially interact with one another. This is in line with Carpino et al. (2014), who also found a weak correlation between self-efficacy and pain intensity in children. This may indicate that children's belief in their ability to perform activities are less affected by pain intensity, at least in populations with mild/moderate pain.

The concurrent validity with FDI, measuring pain-related disability, demonstrated that the measures target different constructs, since there was a negative correlation. The result is important but not surprising since self-efficacy beliefs and function are two separate constructs (Bandura, 1997). However, the negative correlation also indicate that self-efficacy and disability may go hand in hand and that future intervention studies should target self-efficacy in order to study the effects on disability.

In this sample, self-efficacy did not differ between genders but age had a weak negative correlation with SEDA scores. In studies using other measures of self-efficacy for functioning despite pain, no differences were reported regarding neither gender (Bursch, Tsao, Meldrum, and Zeltzer, 2006) nor age (Bursch, Tsao, Meldrum, and Zeltzer, 2006; Kalapurakkel, Carpino, Lebel, and Simons, 2015). Future research should look further into how self-efficacy for functioning despite pain may vary across age groups.

One methodological limitation was that the criterion validity was insufficiently explored. Due to the number of questionnaires already included in the data collection process, it was not possible to include the scale developed by (Bursch, Tsao, Meldrum, and Zeltzer, 2006), the most commonly used self-efficacy measure. In future validation studies, the criterion validity could be approached and to explore the SEDA's predictive value. Further, future validation studies could investigate if a shorter measure shows the same result. The SEDA comprises 16 items, which is more than the measure developed by Bursch Tsao, Meldrum, and Zeltzer (2006) and may therefore impose a larger burden in filling out, especially for young patients.

Another limitation is the SEDA's unevenness regarding levels of specificity for different items. The construct of self-efficacy for a certain behavior is dependent on the specific situation in which the behavior is performed (Bandura, 2006). This highlights the importance of specifying both the behavior and the situation in self-efficacy measurements.

When developing the SEDA the items were based on how the participants in the focus groups described their daily activities during an ordinary weekday during the school year. Our goal was to develop items targeting specific activities in specified surroundings, but we did not fully succeed. We decided to stay as close to their descriptions as possible, at the cost of specificity for some items.

Low self-efficacy may lead to symptoms of depression and anxiety (Bandura, 1997) and therefore these factors could have been important to assess. Both anxiety and depression are common in children experiencing chronic pain (Campo et al., 2004; Dufton, Dunn, and Compas, 2009; Kashikar-Zuck et al., 2008; Tran et al., 2016), and Bandura, Pastorelli, Barbaranelli, and Caprara (1999) demonstrated that low self-efficacy could be seen as an antecedent of childhood depression. Anxiety and depressive symptoms have been reported to correlate with low general self-efficacy (Carpino et al., 2014; Muris, 2002; Tahmassian and Jalali Moghadam, 2011). However, it is not clear whether high levels of depression and anxiety lead to low self-efficacy or if low self-efficacy results in high levels of depression and anxiety, since these studies do not allow for causal interpretations.

The generalization of the results should be considered in light of the study population. While all participants had a pain duration exceeding three months, their disability levels (i.e. an average FDI of 16) and pain intensities (i.e. median NRS 4) indicated mild pain problems (Kashikar-Zuck et al., 2011). In earlier studies, we have reported that pediatric patients with pain seeking primary care physical therapy include youths only slightly affected by pain, but also youths highly affected by pain and displaying many features common to patients attending pain specialist care (Holm, Ljungman, Åsenlöf, and Söderlund, 2013; Holm, Ljungman, and Soderlund, 2012). Given these variations, the validation of the SEDA should be continued in different populations (i.e. children assessed for various severities of pain-related problems and in different health care settings). The SEDA may, for example, fit better for children with more severe pain problems, since a positive skewedness of the item responses was found. Children with primarily abdominal pain, one of the most common and frequently studied pediatric pain populations, are less likely to seek PT treatment. This group is therefore not well-represented in this study. For enhanced generalizability, this study needs to be replicated in children with abdominal pain (as well as other types) in order to determine if the measure can be used more broadly. In future studies, the SEDA's validity should be explored in different languages and countries, since the measure has been tested only in Swedish and in Sweden.

In conclusion, the results indicate that the 16-item SEDA has satisfactory psychometric properties in children and adolescents moderately affected by longstanding pain. Given the preliminary nature of the development of this scale, further exploration is required. Hence, validation of the SEDA in other populations, further examination of criterion validity and performance of confirmatory factor analyses for the three-factor solution in the present study are warranted.

Acknowledgments

The authors would like to thank the health care staff contributing to data collection and Dr. Ronnie Pingel for valuable assistance with the statistical analyses.

Funding

This work was supported by the The Swedish Research council; The Uppsala County Council..

Conflicts of interest

The authors report no conflicts of interest.

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Appendix. Self-efficacy for daily activities (New 16-item SEDA numbers in italics)

We would like to know how confident you are in doing some of the things that are normally part of a child's or adolescent's life.

Right now, how sure are you that you could, even if you were in pain, do each of the activities described below? Mark a number between 0 and 10.

1 3	Walk up and down stairs	0 1 2 3 4 5 6 7 8 9 10 Very unsure Moderately sure Very sure
2 4	Be active in physical education at school	0 1 2 3 4 5 6 7 8 9 10 Very unsure Moderately sure Very sure
3 6	Be active in academic classes (for example math, history or foreign languages)	0 1 2 3 4 5 6 7 8 9 10 Very unsure Moderately sure Very sure
4 7	Take shower at home	0 1 2 3 4 5 6 7 8 9 10 Very unsure Moderately sure Very sure
5 8	Walk for 10 minutes	0 1 2 3 4 5 6 7 8 9 10 Very unsure Moderately sure Very sure
6 9	Do my homework	0 1 2 3 4 5 6 7 8 9 10 Very unsure Moderately sure Very sure
7 10	Be active in non-academic classes (for example home economics, music, arts and crafts)	0 1 2 3 4 5 6 7 8 9 10 Very unsure Moderately sure Very sure
8 11	Use the computer at home (surfing the web or gaming)	0 1 2 3 4 5 6 7 8 9 10 Very unsure Moderately sure Very sure
9 12	Clean my room at home	0 1 2 3 4 5 6 7 8 9 10 Very unsure Moderately sure Very sure
10 13	Meet with friends outside home (downtown, at the mall, in a coffee shop, at the movies)	0 1 2 3 4 5 6 7 8 9 10 Very unsure Moderately sure Very sure
11 14	Be able to concentrate during classes	0 1 2 3 4 5 6 7 8 9 10 Very unsure Moderately sure Very sure
12 18	Get dressed at home	0 1 2 3 4 5 6 7 8 9 10 Very unsure Moderately sure Very sure
13 19	Riding a bike for 10 minutes	0 1 2 3 4 5 6 7 8 9 10 Very unsure Moderately sure Very sure
14 20	Wash my hair at home	0 1 2 3 4 5 6 7 8 9 10 Very unsure Moderately sure Very sure
15 21	Get out of bed in the morning on a school day	0 1 2 3 4 5 6 7 8 9 10 Very unsure Moderately sure Very sure
16 22	Watch TV at home	0 1 2 3 4 5 6 7 8 9 10 Very unsure Moderately sure Very sure

On the lines below, please write any activities that you usually do in your everyday life that were not included in the questions above. These could be things like playing an electric guitar, reading, dancing, and doing arts.

Scoring

SEDA is rated on a numerical rating scale with anchors of 0 = Very unsure and 10 = Very sure.

Scores are calculated as follows:

- Self-efficacy for physical activities, add up items 1, 2, 5 and 13. Minimum 0 and maximum 40, where a high score indicates a higher self-efficacy for physical activities.
- Self-efficacy for personal care, add up items 4, 12 and 14. Minimum 0 and maximum 30, where a high score indicates a higher self-efficacy for personal care activities.
- Self-efficacy for daily exertion, add up items 3, 6, 7, 8, 9, 10, 11, 15 and 16. Minimum 0 and maximum 90, where a high score indicates a higher self-efficacy for daily exertion.
- Total SEDA, add up all 16 items: minimum 0 and maximum 160, where a high score indicates a higher self-efficacy for daily activities.