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Transcultural validation of Activities Scale for Kids (ASK): translation and pilot test

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Abstract. *Background and aim of the work:* The Activities Scale for Kids performance (ASKp) is one of the few self-assessment questionnaires in pediatric rehabilitation that measures child perception in performance of daily routine activities. ASKp is composed of 30 questions designed to explore activities and participation in children and teenagers with musculoskeletal disorders. Scores assess level of physical ability, identify appropriate treatment and monitor changes over time. We undertook this cross-cultural validation study to achieve a culturally adapted Italian version of ASKp, to be tested on Italian children. *Methods:* ASKp was converted into Italian by two independent certified translators, supported by two Italian research physiotherapists. Twelve children with musculoskeletal disorders, their parents and eleven expert pediatric physiotherapists independently assessed clarity of language and semantics of each item. Physiotherapists also evaluated content validity of each item. *Results:* One item out of 30 did not reach inter-rater agreement ≥80% for clarity and was modified according to suggestions given. A panel of three research physiotherapists improved clarity of some other items based on suggestions from study participants. Regarding content validity of ASKp, I-CVI was ≥0.59 for all items and overall ASKp was deemed valid (S-CVI/Ave 0.93). *Conclusions:* The Italian version of ASKp is linguistically clear and culturally coherent with a high content validity. It can be extremely useful in assessing activity limitation perspectives in Italian children and adolescent ranging from five to 15 affected by musculoskeletal disorders.

Key words: cross-cultural comparison, disability evaluation, self-assessment, child, adolescent

Background

The International Classification of Functioning Disability and Health defines activities as execution of specific tasks by individuals. During development, these tasks include walking, playing or accomplishment to basic activities or age-related chores (1). The prevalence of limitation in activities among Italian children is not clearly established, but can be estimated approximately at 4,6% (2). Hence, measurement of these phenomena is crucial to quantify limitations of activity dimension and to quantify results of interventions. Measurement must rely on robust assessment tools and procedures (3).

In order to be valid and useful in a clinical setting, assessment tools must possess some basic psychometric requirements, such as reliability, validity, sensitivity to change (responsiveness) and clinical relevance. Furthermore, a very important aspect to consider when choosing an assessment tool is its validation in a given cultural context. In fact, assessment tools are usually developed and validated for specific contexts, but their use is often

extended to areas that differ greatly from their original cultural, linguistic and ethnic background. These differences imply the need for instruments which are linguistically, culturally and semantically adapted to target populations. This adaptation process provides, in addition to language translation, a review and cross-cultural validation that tailors the instrument to the context in which it will be applied, without changing its original measurement purpose (4).

According to research recently conducted by the Italian Society of Physiotherapy, only 48 out of a total of 237 rehabilitation rating scales used both for children and adults have been formally validated in Italian (www.sif-fisioterapia.it).

In the field of pediatric rehabilitation, several rating scales have been developed, most of which have not been formally translated and validated in Italian. One of these is the Activities Scale for Kids (ASK), developed in Canada in the 90s by NL Young (5).

ASK is a child self-report measure of physical disability. It is designed for children and teenagers from five to 15 years, who experience limitations in daily routine activities due to musculoskeletal disorders. This measure, unique among others, had been generated based on interviews with numerous children and their parents, supplemented by the recommendations from expert clinicians and a review of the literature. Phrases used by children to describe their disability during the interviews were used to formulate the questions. ASK may be used to assess child status at a single point in time or monitor changes over time or be associated with therapeutic intervention outcomes (www.activitiesscaleforkids.com).

This assessment tool consists of an initial instruction followed by 30 multiply-choice questions (items) (Table 1, column A) . The 30 items, divided into seven sub-domains, are: personal care (3 items) such as "I put toothpaste on my toothbrush then brushed my teeth by myself", dressing (4 items) such as "I put my shirt on by myself", other skills (4 items) such as "I made a snack (or prepared breakfast or lunch) by myself", locomotion (7 items) such as "I got around inside my home without anyone to help me", play (2 items) such as "I played sports by myself or with a few friends", standing skills (5 items) such as "I got through heavy doors by myself" and transfers (5 items) such as "I got down onto the floor from standing, and got back up again by myself". These sub-domains may be useful for exploring the nature of activity limitations, but have not been independently validated. All the items are aggregated into one summary score.

ASK also includes three questions that investigate aid devices used by children and degree of assistance required in performing activities. Multiple-choice answers are given for each question.

There are two versions of the scale: ASK performance (ASKp) and ASK capability (ASKc). The performance version measures what the child 'did do', whereas the capability version measures what the child 'could do' during the previous week. So, ASKp is suitable to measure what children usually do in their habitual context, whereas ASKc measures what children can do in a defined situation, apart from real life (6). Clinicians may choose to administer either version alone or concurrently, depending on assessment objectives.

To date, ASK is one of the few questionnaires which measures child perspectives on disability and limitation, provides an option of examining performance and/or capability and requires no special training or equipment (5, 6).

The original English version of ASK has been tested for its validity through appropriate studies (5, 7, 8), showing excellent reliability (7) and good content, concurrent, construct and discriminative validity (7, 9) even when administered via web or by mail (10, 11). Two recent systematic reviews confirmed the high reliability and validity of ASKp in children ranging from five to 15 (12, 13). Moreover, compared to other physical activity rating scales, ASK showed robust psychometric properties in most areas (13) and ASKp was judged more reliable and valid when applied in field-based studies in children with physical disabilities (12).

A clear advantage of using ASKp in clinical practice is that subjective judgments by young patients on impact that disabilities or limitations have on daily life can be assessed directly, and not mediated by a third party (5, 13). Integration of this data is of paramount importance in rehabilitation planning, because it directs treatment to the real needs of children.

For this reason, rehabilitation professionals frequently use this scale in clinical practice and research

(12, 13). This is also the case in Italy, despite the fact that ASKp has never been previously validated in Italian.

Thus, even if further studies are suggested (14), we choose to formally validate ASKp to verify its psychometric properties and make possible its use in the Italian context.

Aims

This study provides the basis for validation of the Italian version of ASKp, in order to respond to the need of having cross-culturally validated tools that contribute to the development of evidence-based pediatric rehabilitation.

The aim of this study is to attain a culturally and linguistically adapted Italian version of ASKp, which will subsequently be tested for its comprehensive psychometric characteristics.

Methods

Before starting the study, we individually consulted a convenience sample composed of twelve rehabilitation professionals (physiotherapists and physicians) who worked in two Italian child rehabilitation centers (Unit for Severe Disability of the Developmental Age – Hospital Santa Maria Nuova of Reggio Emilia and Pediatric Hospital Meyer of Florence) and routinely used ASK in their clinical practice. When asked for their opinion about the usefulness of ASK, they affirmed that children can provide more reliable information if they are asked to report on activities they actually carry out (performance, assessed by ASKp), rather than on activities they think they would be capable of doing (capability, assessed by ASKc). They also stated they frequently use the ASKp to measure physical disability in their practice because, in their habitual population of chronically disabled children, the intent of treatment is primarily to improve the quality of existing functions. Consequently, a direct assessment of community function and limitations of direct relevance to patients is needed. Therefore, they suggested that validation of ASKp would be clinically meaningful.

Participants

In order to carry out this study we selected the following convenience samples:

- 12 children and teenagers with musculoskeletal disorders, similar to the sample of the original validation study (4), referred to the Hospital Meyer of Florence from January 2013 to March 2013 for rehabilitation;
- one parent for each child/teenager included in the study;
- 11 physiotherapists in pediatric field, working or attending as a consultant the Unit of Child Rehabilitation at the Hospital Meyer of Florence from January 2013 to March 2013;
- two certified translators.

Inclusion criteria for children and teenagers were the following:

- five to 15 years old;
- musculoskeletal disorders (neuromuscular diseases, rheumatic diseases, fractures, diseases of the peripheral nervous system, spina bifida);
- native Italian speaker;
- who had at least one Italian parent.

We excluded children and teenagers suffering from cognitive impairment, based on data reported in medical record.

Inclusion criteria for physiotherapists were the following:

- professional experience of at least five years in pediatric physical therapy;
- native Italian speaker.

To be included in the study, parents had to be Italian and native Italian speakers, whereas the two certified translators had to be experts in medical terminology.

Study design

This transcultural validation study received a favorable opinion from the Ethics Committee of the Hospital Meyer of Florence. We also got the permission to use the original ASKp for research purposes from its Author. We undertook the following steps to obtain cross-cultural validation of the Italian version of ASKp:

a) translation of assessment tool from original language to target language by a certified translator; back-translation of the tool from target language to original language by a certified translator, who worked independently; comparison of the two versions in the original language (the former validated one in English and the latter back-translation) and resolution of any discrepancies by way of agreement among translators and two Italian research physiotherapists, skilled in pediatrics and authors of the study;

b) assessment of ASKp for linguistic and semantic clarity of each component of the tool in target language, namely instructions, 30 items concerning activities, three questions regarding aid devices and degree of assistance required by child and answer options. This assessment was carried out independently by participants (children/teenagers, parents and physiotherapists) using a dichotomous scale. Study participants could also provide suggestions to improve clarity of text;

- assessment of ASKp for relevance of questions and answers in target language. This assessment was carried out independently by the physiotherapists who, for this purpose, used a score scale of 1 to 4, where 1= not relevant; 2= little relevant; 3= quite relevant; 4= very relevant (15);

c) examination of suggestions provided by study participants by a panel composed of three research physiotherapists (skilled in pediatrics and authors of the study) and consensus regarding changes to be made to the Italian version of ASKp, through formal consent.

Data analysis

Data collected were statistically processed to determine the following measures:

- linguistic and semantic clarity of the instrument, by calculating percentage of analyzed components judged unambiguous and explicitly clear. Level of inter-rater agreement had to be at least 80% (4);
- degree of relevance assigned to each question of the instrument, by calculating the Item-Content Validity Index (I-CVI). I-CVI represents the proportion of experts who attribute a score of 3 or 4 to each analyzed item. For the purpose of this study, critical value for I-CVI is 0.59. This value is due to the number of judges employed in validation process (16,17,18);
- degree of global relevance of the instrument, by calculating the Scale-Content Validity Index/ Average (S-CVI/Ave), which represents the average value of individual I-CVI. A degree of global relevance ≥0.80 is considered good and values ≥0.90 as excellent (17);
- degree of universal agreement on relevance, by calculating the Content Validity Index Universal Agreement (CVI-UA). CVI-UA is the proportion of items that receive a relevancy score of 3 or 4 by judges, with respect to the total number of items of the instrument. In literature, there is no clear agreement on the critical value to interpret this parameter, which is contingent on the number of judges involved in the validation process (17).

Results

During a routine session, a physiotherapist explained the purpose of the study to eligible children and parents and asked for consent to participate.

Thus, the Italian version of ASKp was then administered to twelve enrolled children and one of their parents of Italian nationality, who were native speakers (Table 1, column B). Of the twelve children, eight were female and four were male, with a mean age of 11 years (min. 6 – max. 15). The participating children had the following diseases: Duchenne muscular dystrophy (n. 2), rheumatoid arthritis (n. 2), functional limitations resulting from fractures (n. 2), spina bifida (n.4), hereditary sensory motor neuropathy (disease of Charcot-Marie-Tooth) (n. 1) and obstetric brachial plexus injury (n.1). Of the twelve parents, nine were mothers and three were fathers with a mean age of 39 years (min. 25 – max 56).

The Italian version of ASKp was given to both children and parents independently, asking them to indicate the linguistic and semantic clarity of each component of the instrument. Children and parents could provide suggestions for improving clarity of the final Italian version.

Table 1. Yhe ASKp original version and Italian version

Area	Column A: original version	Column B: italian version
Personal care	I put toothpaste on my toothbrush then brushed my teeth by myself	Ho messo il dentifricio sullo spazzolino e mi sono lavato i denti da solo
	I used the toilet at home by myself	Ho usato il gabinetto di casa da solo
Dressing	I put my shirt on by myself	Mi sono messo la maglietta da solo
	I fastened my clothes by myself	Mi sono chiuso i vestiti da solo
Other skills	I took care of my medical needs	Mi sono curato da solo
	I made a snack (or prepared breakfast or lunch) by myself	Mi sono preparato uno spuntino da solo (oppure ho preparato la colazione o il pranzo)
Locomotion	I got around inside my home without anyone to help me	Mi sono spostato in casa senza l'aiuto di nessuno
	I walked (or wheeled) in crowded areas	Ho camminato (oppure usato la sedia a rotelle) in luoghi affollati
	I got around outside without anyone to help me	Mi sono mosso all'aperto senza l'aiuto di nessuno
Play	I played sports by myself or with a few friends	Ho fatto sport da solo o con degli amici
Standing skills	I carried things in 2 hands by myself	Ho trasportato delle cose da solo usando 2 mani
	I got through heavy doors by myself	Ho aperto porte pesanti da solo
Transfers	I got down onto the floor from standing, and got back up again by myself	Mi sono abbassato al pavimento da in piedi e poi mi sono rialzato da solo
	I got in and out an automobile by myself	Sono entrato e uscito da un'automobile da solo

In parallel, eleven physiotherapists eligible for the study were contacted and asked to contribute to the study at the Hospital Meyer of Florence (Table 2). So, the Italian version of ASKp was distributed to physiotherapists experienced in pediatric area who worked in the Unit of Child Rehabilitation at the Hospital Meyer of Florence (n. 8), or at the Local Health Units of Ravenna and Imola (n. 3). At the time of this study, these physiotherapists were attending Hospital Meyer as consultants. The physiotherapists included in the study were all female, mean age 38 (min. 32 – max. 51), with an average of 8 years' experience in pediatrics (SD ± 3.2). Of the eleven physiotherapists in the study, nine have completed or were attending a postgraduate program in Pediatric Physiotherapy.

The physiotherapists were asked to indicate linguistic and conceptual clarity of each component of the Italian version of ASKp, to provide suggestions to improve comprehensibility of text and to assess relevance of each question and answer options.

Data regarding clarity of assessment tool showed that:

1) 30 multiply-choice questions were judged clearly understandable by all children and physiotherapists, with an overall inter-assessor agreement ≥80%.

In particular, children reported a complete inter-assessor agreement for 25 questions, an inter-assessor agreement equal to 92% for three questions (n. 12, n. 13, n. 25) and an inter-assessor agreement equal to 83% for the remaining two questions (n. 8, n. 14) (Figure 1).

Expert physiotherapists reported complete agreement for twenty questions, an inter-assessor agreement equal to 91% for seven questions (n. 7, n. 10, n. 12, n. 15, n. 16, n.17, n. 18) and an inter-assessor agreement equal to 82% for the remaining three questions (n. 8, n. 9, n. 23) (Figure 2).

According to the parents, 29 questions were judged clearly understandable, registering an inter-assessor agreement ≥80%. Among these, 21 questions

Table 2. Characteristics of the sample

	N.	Average age (range)	Gender (F/M)	Characteristics
Children	12	11 (6-15)	8/4	DMD (n.2), RA (n.2), functional limitations due to fractures (n.2), SB (n.4), C-M-T (n.1) OBPI (n.1)
Parents	12	39 (25-56)	9/3	n/a
Physiotherapists	11	38 (32-51)	11/0	experience in pediatrics 8 years (SD ± 3.2)

n.=number; F=female; M=male; DMD=Duchenne muscular dystrophy; RA=rheumatoid arthritis; SB=spina bifida, C-M-T=Charcot-Marie-Tooth; OBPI=obstetric brachial plexus injury; n/a=not applicable; SD=standard deviation

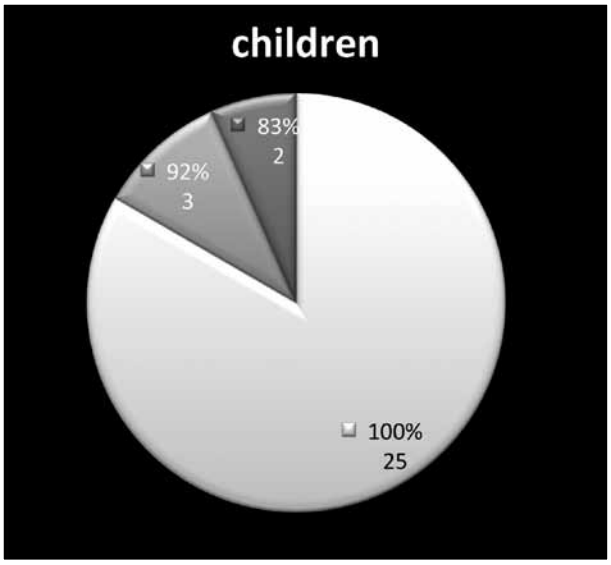

Figure 1. Child report. Level of inter-assessor agreement expressed by children

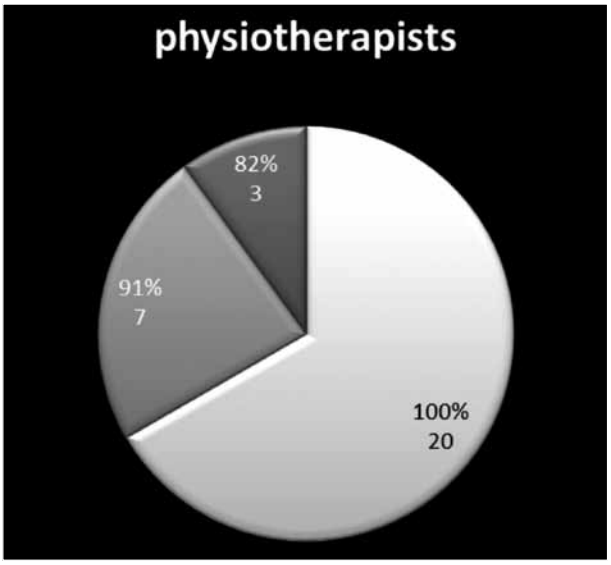

Figure 2. Physiotherapist report. Level of inter-assessor agreement expressed by physiotherapists

obtained complete agreement, six questions obtained an inter-assessor agreement equal to 92% (n. 7, n. 16, n. 23, n. 25, n. 27, n. 28) and the remaining two questions obtained an inter-assessor agreement equal to 83% (n. 8, n. 12) (Figure 3). Question n. 13, which states, "I got around my home without anyone helping me" reached an inter-assessor agreement of only 75%. Parents deemed the Italian translation unclear because the Italian word "*mosso*" translated from the English "got around" was judged to be ambiguous. They suggested replacing it with the synonym "*spostato*".

2) the instructions, the three questions investigating use of aid devices and the degree of assistance for activities and the answer options reached an inter-assessor agreement ≥80% by both children, parents and physiotherapists participating in the study.

Hence, the Italian version of ASKp was judged overall understandable and clear in terms of semantic and language for all interviewed participants.

Even if they had been judged clear, some participants recommended improving comprehensibility of the following questions:

- question n. 7 "I put my shoes on and did them up by myself" was judged clear by 92% of the parents and 91% of the physiotherapists. However, four physiotherapists and one parent suggested a structural change to the question because the two activities listed, being very different, should be treated as two distinct

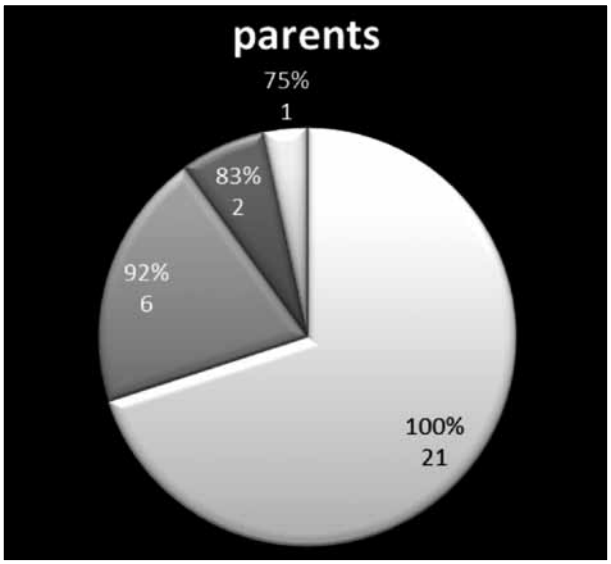

Figure 3. Parent report. Level of inter-assessor agreement expressed by parents

items. However, we decided not to integrate this suggestion because it would introduce a structural change with respect to the original valid ASKp.

- question n. 8 "I took care of my medical needs – Examples: put on splints or took medication" was judged clear by 83% of both children and parents and by 82% of physiotherapists. It is interesting to note that among the ten children who judged this question clear, four reported that they understood it by only after reading the example. Moreover, five physiotherapists reported that the example is of fundamental importance for understanding the meaning of the question. Two children judged the Italian translation of this question unclear and reported that the Italian word "*curato*", translated from the English "took care", is difficult to understand. Some parents and physiotherapists suggested replacing it with a synonym (*preso cura*), which was deemed too broad and vague by the translators. Therefore, we decided not to act on this suggestion because we believed it could lead to a misinterpretation of the question.

- question n. 9 "I did my printing (or script writing) by myself" was declared clear by 82% of the physiotherapists. One physiotherapist who judged the question unclear, suggested changing its content to "I did my homework alone", while the other reported that the two activities, printing and writing, are different from each other, but did not suggest any changes. We did not modify this item because all children and parents, to whom it is addressed the ASKp, judged it clear.

- question n. 12 "I did my usual job or chores – Examples: paper route, babysitting, or doing the dishes" was judged clear by 83% of both children and parents. One child who judged the question unclear reported that he did not understand the examples while another reported that he was not allowed to babysit. Parents who judged the question as unclear, pointed out that in Italy it is not usual for children to perform chores reported in the examples. They advised replacing them with activities more suited to Italian culture, such as "I've tidied my room, I set the table or I washed the dishes". Thus, we decided to change the examples as suggested.

- question n. 23 "I got down onto the floor from standing, and got back up again by myself" was judged clear by nine physiotherapists (82%). Two physiotherapists, who judged the question unclear, reported that the technical Italian translation for the English "from standing" (*dalla posizione eretta*) may be difficult to understand, especially for younger children, and suggested changing it to a more common lay term (*da in piedi*). Three out of nine physiotherapists, who judged the question clear, suggested the same change. So, we adapted the item as suggested since, even though in Italian both these terms mean standing position, only the latter is used in everyday communication.

Also, as advocated, we changed the original Anglo-Saxon names showed in the instructions with Italian ones.

Evaluation of relevance, or content validity, shows that the minimum value of I-CVI scored in four items was equal to 0.63, slightly higher than the critical value of 0.56 determined by Lawshe (16) on the basis of the number of judges. CVI-UA, i.e. the proportion of items deemed relevant by all judges with respect to the total number of items rated, was equal to 0.76 (17). The value of S-CVI/Ave was 0.93, which is higher than the cut-off indicated by guidelines (4).

Finally, the panel of research physiotherapists analyzed suggestions provided by participants in this study and, through the process of formal consent, agreed on a culturally and linguistically adapted Ital-

ian version of ASKp (www.activitiesscaleforkids.com) which, in the near future, will be further tested for complete psychometric characteristics.

Discussion

The aims of this study were to cross-culturally adapt the ASKp questionnaire to Italian and to determine content validity of the this version in young patients with musculoskeletal dysfunction. In pediatric rehabilitation, there is a lack of suitable and reliable assessment tools validated in the Italian language. Thus, professionals often rely on non-validated instruments, among which the ASKp, that has previously proven to be valid, reliable, responsive to change and showed minimal ceiling effects and no floor effects. Therefore, we consider appropriate to validate this tool to evaluate physical disability in the population of Italian children and adolescents.

ASKp for Italian patients was cross-culturally adapted to the Italian context following a systematic standardized approach (4). This approach required a forward and back-translation, a review by experts and testing of the semi-final version to ensure that the meaning of original items regarding idiomatic expressions and content was maintained. Consequently, the final version of this assessment tool met all the original aims.

Overall, no difficulties were encountered in translating the questionnaire and the back-translation corresponded accurately to the original version. The ASKp reached an inter-assessor agreement ≥80% for clarity.

Only one item, n. 13 "I got around inside my home without anyone to help me", did not reach the cut-off requested for clarity because the first Italian translation for the English "got around" (*mosso*) was considered ambiguous and unclear in this context; hence, we agreed to replace it with a synonym (*spostato*). In Italian, both terms mean moved around, although they are used in different contexts.

All other components of ASKp were judged clear. However, we found some critical issues in the linguistic and semantic translation of some entries, which in Italian culture were uncommon or difficult to understand. Thus, in accordance with the translators, we decided to accept some participants' suggestions and deemed clarity of the text improved (items n. 12 and n. 23).

As for the relevance, or validity of content, we highlight that all the components of the Italian version of ASKp exceeded the cut-off required by guidelines; in fact, percentages of agreement and both I-CVI and S-CVI/Ave exceeded critical values reported in literature. To our knowledge, the resulting value of CVI-UA reflects an overall high degree of content validity, taking into consideration that using eleven judges makes total agreement for this parameter very difficult to achieve.

This study represents the first step required to correctly extend the use the ASKp in the Italian clinical and research contexts. To our knowledge, there are no other validated Italian instruments specifically addressed to self-report the activities habitually carried out by children in their context of life. This is of great importance considering that the perspectives of children have been further overlooked in pediatric physical disability assessment. In fact, pediatric physical disability has most often been measured either by clinician observation in a clinical setting or by proxy report, even if previous research demonstrated that children are competent reporters of physical activities (5) and their opinion should be consequently considered the gold standard to measure disability. Furthermore, self-report is desirable to appropriately address the intervention, because abilities observed in clinical setting do not consistently reflects abilities performed in the community and in daily life. Concerns about child self-report might arise from beliefs that cognition is not completely developed in children. However ASK questionnaire may be unique in that the items were worded specifically for children. Likewise, in this cross-cultural adaptation a large sample of children assessed the clarity of the Italian adaptation and prompted more appropriate words from their perspective.

The strengths of this study include standardized methods used for all procedures and a sufficiently large sample for a preliminary test. We interviewed three different population (children, parents and physiotherapists) to assess clarity of the instruments. Moreover, a wide variety of musculoskeletal conditions was in-

cluded, similar to the validation process of the original assessment tool (7).

In the future, we recommend further investigation to document all the psychometric properties of the Italian version of ASKp and to determine its responsivity to clinical changes in children with musculoskeletal conditions similar to those involved in the development of the original assessment tool. Additionally, as ASK is widely used among patients with conditions different from the spectrum for which it was originally developed (11-13), we suggest to document measurement properties of the Italian version of ASKp also in children with Cerebral Palsy.

In conclusion, the Italian version of ASKp is a clear and culturally adapted tool addressed to young Italian patients and their parents. Furthermore, it has good content validity and is helpful in assessing and measuring activity limitation in children with musculoskeletal dysfunction.

Limits of the study

There are several potential limitations associated with this study. First, children and parents included were recruited from a single hospital and their cultural backgrounds may not fully reflect the wide-ranging Italian culture. Nevertheless, AOU Meyer is a reference center for the treatment of pediatric diseases for patients coming from all Italy.

In addition, its central geographic position is in Florence, which is considered "the cradle of the Italian language" by linguistic scholars. Hence, we can say with a fair degree of confidence that the Italian version of ASKp can be easily understood throughout the Italian peninsula.

A second potential limitation is that our sample of health professionals included only physiotherapists but, in fact, this constraint reflects the current approach to physical activity assessment in Italy, which is predominantly performed by physiotherapists.

The study took place at Pediatric Hospital Meyer, Florence, Italy.

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