

Validation of the Spanish Version of the Test for Respiratory and Asthma Control in Kids (TRACK) in a Population of Hispanic Preschoolers

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What is already known about this topic? The only questionnaire intended to measure asthma control in children younger than 5 years old, the Test for Respiratory and Asthma Control in Kids, needs additional validation studies.

What does this article add to our knowledge? The Spanish version of the Test for Respiratory and Asthma Control in Kids questionnaire has excellent content validity, sensitivity to change, and usability; adequate criterion validity, construct validity, and test-retest reliability; and an acceptable internal consistency when used in preschoolers with asthma.

How does this study impact current management guidelines? Clinicians who work with Spanish-speaking communities have a validated, easy-to-use, parent- and/or caregiver-completed questionnaire with which to assess respiratory control in children younger than age 5 years with symptoms consistent with asthma.

BACKGROUND: There is a critical need for validation studies of questionnaires designed to assess the level of control of asthma in children younger than 5 years old.

OBJECTIVE: To validate the Spanish version of the Test for Respiratory and Asthma Control in Kids (TRACK) questionnaire in children younger than age 5 years with symptoms consistent with asthma.

METHODS: In a prospective cohort validation study, parents and/or caregivers of children younger than age 5 years and with symptoms consistent with asthma, during a baseline and a follow-up visit 2 to 6 weeks later, completed the information required to assess the content validity, criterion validity, construct validity, test-retest reliability, sensitivity to change,

internal consistency reliability, and usability of the TRACK questionnaire.

RESULTS: Median (interquartile range) of the TRACK scores were significantly different between patients with well-controlled asthma, patients with not well-controlled asthma, and patients with very poorly controlled asthma (90.0 [75.0-95.0], 75.0 [55.0-85.0], and 35.0 [25.0-55.0], respectively, $P < .001$). TRACK scores were significantly different between patients classified as currently symptomatic and symptomatic in the recent past (42.5 [25.0-55.0] vs 85.0 [75.0-90.0]; $P < .001$). The intraclass correlation coefficient of the measurements was 0.755 (95% CI, 0.503-1.00). All patients whose clinical status changed showed an increase of 10 or more points in TRACK score between baseline and follow-up visits. The Cronbach α was 0.77 for the questionnaire as a whole.

CONCLUSION: The Spanish version of the TRACK questionnaire has excellent sensitivity to change and usability; adequate criterion validity, construct validity, and test-retest reliability; and an acceptable internal consistency, when used in children younger than age 5 years with symptoms consistent with asthma. © 2014 American Academy of Allergy, Asthma & Immunology (J Allergy Clin Immunol Pract 2014;2:326-31)

Key words: Asthma; Asthma control; Preschool children; Risk; Validation studies; Reliability; Validity

The prevalence of asthma has increased since 2001 in the United States¹ and is a major public health problem in many countries, for example, Colombia, which has a prevalence estimated at 10% to 12%.^{2,3} Over the past decade, the concept of asthma control as the degree to which manifestations of the disease are reduced or removed by therapy has been clearly defined and has been incorporated into current asthma guidelines as a therapeutic goal. Childhood asthma causes considerable morbidity, interference with normal daily activities, and a burden

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Abbreviations used

EPR-3-Expert Panel Report-3

IQR-Interquartile range

NAEPP-National Asthma Education and Prevention Program

TRACK-Test for Respiratory and Asthma Control in Kids

for the whole family. It is a major reason for absences from school, admissions to the hospital, and visits to the emergency department, especially during periods when the asthma is inadequately controlled.⁴ Identification of asthma is particularly important in infants and preschoolers because almost 80% of patients with asthma start having symptoms during the first 5 years of their life.⁵ Moreover, compared with older children with this condition, young children with asthma experience less favorable responses to asthma treatments, thus increasing the health care utilization and overall burden of the disease.^{6,7} Also, in developed countries, among all the pediatric population, children younger than 3 years old have the poorest asthma control.⁸

Several asthma symptom questionnaires that combine individual variables to generate a composite score have been developed to measure asthma control in children.⁹⁻¹¹ These asthma symptom questionnaires typically assess patient-reported elements of impairment. Some of them also include information about the history of exacerbations and pulmonary function parameters.¹² Most of these pediatric asthma control questionnaires have the shortcoming that they only assess the impairment domain and not the risk of exacerbation domain as recommended in the Expert Panel Report-3 (EPR-3) of the National Asthma Education and Prevention Program (NAEPP)¹³ and in the Global Initiative for Asthma guidelines¹⁴ (the number of exacerbations that requires oral corticosteroids during the previous 12 months).

To the best of our knowledge, at present the only questionnaire intended to measure asthma control in children younger than 5 years old that has been developed and validated is the Test for Respiratory and Asthma Control in Kids (TRACK). The TRACK is a 5-item caregiver-completed questionnaire that assesses both the risk and impairment domains in children younger than 5 years of age with either physician-diagnosed asthma or recurrent respiratory episodes suggestive of asthma.¹¹ Although the TRACK questionnaire has been validated for use in young children,¹¹ the recent Asthma Outcomes Workshop recommended that additional validation data be gathered before the TRACK questionnaire can be recommended as a core or supplemental measure of asthma control.¹² Accordingly, there is a critical need for additional validation studies performed in different population subgroups (eg, race or ethnicity, socioeconomic status, health literacy) and in more languages. In this context, validating the Spanish version of the questionnaire is crucial because, according to the last phase III International Study of Asthma and Allergies in Childhood report, 2 of 4 countries with the highest prevalence of asthma in children around the world are Latin American countries where Spanish is the language (37.6% in Costa Rica and 22.7% in Panama)¹⁵; Spanish is one of the most widely spoken languages in the world, with approximately 500 million native speakers.¹⁶ The aim of the present study was to validate the Spanish version of the TRACK questionnaire in a population of Hispanic children

younger than age 5 years with either physician-diagnosed asthma or recurrent respiratory episodes suggestive of asthma.

METHODS

Study population

The study was undertaken in The Fundación Hospital La Misericordia, a tertiary care university-based children's hospital located in the metropolitan area of Bogotá, Colombia. Parents of children younger than 5 years old evaluated in our pediatric respiratory service from January 2012 to July 2013 with a history of a child having been diagnosed with asthma or with symptoms consistent with asthma were invited to participate in the study. Parents of participating children were native Spanish speakers, with widely varied educational backgrounds (at least 5 years of formal education) and socioeconomic status but with an acceptable reading speed and ability. Symptoms consistent with asthma were operationally defined as either 2 or more episodes of wheezing, shortness of breath, cough that lasted more than 24 hours, or use of aerosolized bronchodilator for respiratory symptoms. Children with respiratory conditions not consistent with asthma that might affect the cardiopulmonary status (eg, chronic lung disease or congenital heart disease) and those with other significant chronic disorders or congenital abnormalities were excluded from the study.

TRACK questionnaire

The TRACK questionnaire is a 5-item caregiver-completed questionnaire useful in assessing and monitoring respiratory symptoms in children younger than age 5 years with either physician-diagnosed asthma or recurrent respiratory episodes suggestive of asthma. This tool is particularly appealing for asthma care because it assesses both the risk and the impairment domains.¹¹ The first 4 items of the TRACK questionnaire evaluate the impairment domain (frequency of respiratory symptoms, activity limitation, nighttime awakenings in the past 4 weeks, and rescue medication use in the past 3 months). The fifth item of TRACK assesses the risk domain (oral corticosteroid use in the previous year) (Table 1). The score for the response to each item ranges from 0 to 20 points, and the scores for the individual items are added to obtain the unweighted TRACK questionnaire score. The possible total score ranges from 0 to 100, with a higher score that indicates better respiratory control and a score less than 80 indicates poor control.¹¹ The TRACK questionnaire was developed by AstraZeneca (London, UK), with the assistance of QualityMetric (Lincoln, RI), and is a trademark of AstraZeneca. To perform the present study, AstraZeneca provided the Spanish version of the TRACK questionnaire and granted us permission to use and validate it. The questionnaire was forward translated from the original English version into Spanish, but no back translations were done. Before using this version of the TRACK questionnaire, we changed the brand names of the quick-relief medications (item 4) and oral corticosteroids (item 5) to brand names available in our country (Table 1).

Study design and procedures

We conducted a prospective cohort validation study that followed up a convenience sample of children ages younger than 5 years old who fulfilled the eligibility criteria (inclusion and exclusion criteria) and whose parents and/or caregivers agreed to participate and signed the informed consent. All parents and/or

TABLE I. Spanish version of the TRACK

1. En las <u>últimas 4 semanas</u> , ¿con qué frecuencia le molestaron a tu niño/a los problemas respiratorios, como sibilancias (silbidos), tos o dificultad para respirar?					
Nunca	1 ó 2 veces	1 vez a la semana	2 ó 3 veces a la semana	4 veces o más a la semana	
☐ 20	☐ 15	☐ 10	☐ 5	☐ 0	
2. En las <u>últimas 4 semanas</u> , ¿con qué frecuencia despertaron a tu niño/a sus problemas respiratorios (sibilancias (silbidos), tos, dificultad para respirar)?					
Nunca	1 ó 2 veces	1 vez a la semana	2 ó 3 veces a la semana	4 veces o más a la semana	
☐ 20	☐ 15	☐ 10	☐ 5	☐ 0	
3. En las <u>últimas 4 semanas</u> , ¿hasta qué punto interfirieron los problemas respiratorios de tu niño/a, como sibilancias (silbido), tos y dificultad para respirar, con su habilidad para jugar, ir al colegio o participar en las actividades cotidianas que un niño/a debería hacer a su edad?					
Nunca	Un poco	Moderadamente	Bastante	En Extremo	
☐ 20	☐ 15	☐ 10	☐ 5	☐ 0	
4. En los <u>últimos 3 meses</u> , ¿con qué frecuencia tuviste que tratar los problemas respiratorios de tu niño/a (sibilancias (silbidos), tos, dificultad para respirar) con medicinas de alivio rápido (salbutamol, Ventilan, Salbutan, Seramar, Combivent, Berodual)?					
Nunca	1 ó 2 veces	1 vez a la semana	2 ó 3 veces a la semana	4 veces o más a la semana	
☐ 20	☐ 15	☐ 10	☐ 5	☐ 0	
5. En los <u>últimos 12 meses</u> , ¿con qué frecuencia necesitó tu niño/a tomar corticosteroides orales (prednisona, prednisolona, Fisopred, Pepred, Medrol, Meticorten) para sus problemas respiratorios no controlados con otras medicinas?					
Nunca	1 vez	2 veces	3 veces	4 veces o más	
☐ 20	☐ 15	☐ 10	☐ 5	☐	

caregivers had an initial visit (baseline), and some of them were scheduled for a follow-up visit 2 to 6 weeks later. At baseline, we used standardized forms to collect demographic data of children (age, sex) and their respective parents and/or caregivers (age, highest level of education), and assessed all the children by using the TRACK questionnaire. In addition, at baseline, separately and blinded to the caregiver questionnaire responses, we collected the timing of respiratory symptoms, the level of asthma control based on NAEPP EPR-3 guidelines recommendations, and whether the baseline visit resulted in a step-up in therapy, no change, or a step-down in therapy. The timing of respiratory symptoms was divided into 3 categories based on the presence or absence of these symptoms in the previous 4 weeks and in the previous 12 months as currently symptomatic (episodes of wheezing, shortness of breath, or coughing in the past 4 weeks), symptomatic in the recent past (episodes of wheezing, shortness of breath, or coughing in the past 12 months but not within the past 4 weeks), or asymptomatic (without symptoms for more than 12 months).

To assess the level of asthma control based on NAEPP EPR-3 guidelines recommendations from 0 to 4 years of age,¹³ we completed 5 specific questions that assessed the frequency of wheeze, nighttime awakenings from respiratory symptoms, activity limitation caused by respiratory symptoms, use of rescue medications for respiratory symptoms, and oral corticosteroid use in the previous year. Each question was scored on a 3-point Likert-type scale (1, well controlled; 2, not well controlled; 3, very poorly controlled). The scoring of these questions was used to stratify the sample into categories of very poorly controlled asthma (if a score of 3 was selected for any question), not well-controlled asthma (if a score of 2 was selected for 1 or more questions and a score of 3 was not selected for any question), or well-controlled asthma (if a score of 1 was selected for all 5 questions). Fifty-eight parents and/or caregivers were selected randomly from the currently symptomatic group at baseline and from those with stepped-up therapy after the baseline visit to complete the TRACK questionnaire again 4 to 6 weeks after the initial assessment to evaluate the sensitivity to change. Likewise, 69 parents and/or caregivers selected randomly from the

symptomatic in the recent past group with a baseline visit that resulted in no change or a step-down in therapy, completed the TRACK questionnaire a second time (2-4 weeks later) to evaluate test-retest reliability.

Assessment of the psychometric characteristics of the TRACK questionnaire

To evaluate the TRACK's criterion validity (ie, the degree to which the measurement correlates with some other measure of the specific construct of control of asthma, such as another validated severity instrument or another criterion standard for the control of asthma), we compared TRACK scores at baseline across the 3 categories of the NAEPP EPR-3 guidelines criteria of asthma control (poorly controlled, not well-controlled, and well-controlled asthma). To assess the TRACK's construct validity (ie, the degree to which the measurement corresponds to other variables and measures not identical but related to the construct of control of asthma), we compared baseline TRACK scores across the 3 categories of the timing of respiratory symptoms (currently symptomatic, symptomatic in the recent past, and asymptomatic), and across the 3 categories of therapeutic decision (a step-up in therapy, no change, or a step-down in therapy). To evaluate the TRACK's test-retest reliability (ie, the consistency of the instrument results measured on 2 occasions with no change in asthma control in between), we compared TRACK scores in patients classified as symptomatic in the recent past or asymptomatic at baseline in whom no change or a step-down in therapy occurred and who were classified in the same manner in the follow-up visit 2 to 4 weeks later. To assess the TRACK's sensitivity to change (ie, the ability of a score to detect a clinically important change over time), we compared TRACK scores in patients classified as currently symptomatic at baseline, in whom the baseline visit resulted in a step-up in therapy, and who were classified as symptomatic in the recent past in the follow-up visit 4 to 6 weeks later. To examine the TRACK's internal consistency reliability (ie, the degree of correlation between a scale's items), we used the responses given for all the parents and/or caregivers at baseline. To assess the TRACK's usability (ie, the speed, understandability, and subjective experience when completing

the questionnaire), parents and/or caregivers were asked to qualify the ease of scoring of the TRACK questionnaire as easy to score, moderately easy to score, or difficult to score. In addition, the time to complete the questionnaire was reported. The study protocol was approved by the local ethics board.

Statistical analysis

To assess the TRACK's criterion validity, we compared TRACK scores across the 3 categories of the NAEPP EPR-3 guidelines criteria of asthma control (poorly controlled, not well-controlled, and well-controlled asthma) by using 1-way ANOVA or the Kruskal-Wallis nonparametric method, as appropriate. To assess the TRACK's construct validity, we contrasted TRACK scores across the 3 categories of the timing of respiratory symptoms (currently symptomatic, symptomatic in the recent past, and asymptomatic) and across 2 categories of therapeutic decision (a step-up in therapy vs no change or a step-down in therapy) by using the 1-way ANOVA or the Kruskal-Wallis test, as appropriate. Test-retest reliability was assessed with the intraclass correlation coefficient and the Lin concordance correlation coefficient,¹⁷ and through the construction of the Bland and Altman plot.¹⁸ The TRACK's sensitivity to change was determined by comparing TRACK scores at baseline and follow-up with the paired Student *t* test or the Wilcoxon signed rank test, as appropriate, and by calculating the proportion of patients with an increase of 10 or more points in TRACK scores between baseline and follow-up measurements because this value represents a clinically meaningful change in respiratory control status when using the TRACK questionnaire.¹⁹ Internal consistency reliability was assessed by using the Cronbach α coefficient.²⁰

The use of the method proposed by Walter et al²¹ to calculate the required number of subjects in a reliability study, in which reliability is measured, yielded a sample size of 64 patients, 2 methods to be reported in the diagnosis, a kappa for the null hypothesis of 0.5, a kappa for the alternative hypothesis of 0.7, a statistical significance level of .05, and a power of 80%. In the assessment of criterion and construct validity, 64 participants provide at least 80% power (effect size, 0.4; $\alpha = 0.05$; 2-sided test) to detect differences among the groups by using 1-way ANOVA.²² Statistical analysis was done with Stata 12.0 (Stata Corp, College Station, Tex).

RESULTS

Patient population

Of the total number of patients who fulfilled the eligibility criteria (*n* = 242), 2 were excluded because their parents refused to participate in the study, so 240 (99.2%) were finally enrolled in the study. Likewise, 2 of the total of 52 patients (3.8%) eligible for sensitivity to change assessment and 1 of the total of 65 patients (1.5%) eligible for test-retest reliability evaluation did not attend the follow-up visit, so, finally, 50 and 64 patients were included in these groups, respectively. The mean (SD) of the age of the 240 patients included in the study was 40.02 ± 10.9 months. The age group distribution was as follows: 17 (7.1%) < 24 months, 167 (69.6%) between 25 and 48 months, and the remaining 56 (23.3%) between 49 and 60 months. Of the total of patients, 136 patients (56.7%) were men. With respect to the timing of respiratory symptoms at baseline, 124 (51.7%) were classified as currently symptomatic and 116 (48.3%) as symptomatic in the recent past. No patient was classified as asymptomatic. At baseline, the level of asthma control based on

NAEPP EPR-3 guidelines recommendations was well-controlled asthma in 82 children (34.2%), not well-controlled asthma in 52 (21.7%), and very poorly controlled asthma in 106 (44.2%). In relation to the therapeutic decision, in 70 patients (29.2%), the baseline visit resulted in no change in therapy, in 116 (48.3%) in a step-up in therapy, and in 54 (22.5%) in a step-down in therapy. The median (interquartile range [IQR]) of the TRACK scores of the 240 patients included in the study was 65.0 (40.0-85.0) points. With respect to the most frequent responses for each item, 100 (41.7%) of the parents and/or caregivers responded "not at all" to the first item, 124 (51.7%) responded "not at all" to the second item, 118 (49.2%) responded "not at all" to the third item, 84 (34.2%) responded "once or twice" to the fourth item, and 56 (23.3%) responded "twice" for the fifth item.

Criterion validity

TRACK scores were significantly different among patients with well-controlled asthma, patients with not well-controlled asthma, and patients with very poorly controlled asthma (median [IQR] 90.0 [75.0-95.0], 75.0 [55.0-85.0], and 35.0 [25.0-55.0], respectively; $P < .001$) (see Table E1 in this article's Online Repository at www.jaci-inpractice.org).

Construct validity

TRACK scores were significantly different between patients classified as currently symptomatic and symptomatic in the recent past (median [IQR] 42.5 [25.0-55.0] vs 85.0 [75.0-90.0]; $P < .001$) (see Table E2 in this article's Online Repository at www.jaci-inpractice.org). Likewise, TRACK scores were significantly different between patients whose baseline visit resulted in a step-up in therapy compared with patients for whom this visit resulted in no change or a step-down in therapy (40.0 [25.0-55.0] vs 85.0 [75.0-90.0]; $P < .001$) (see Table E3 in this article's Online Repository at www.jaci-inpractice.org).

Test-retest reliability

The median (IQR) of the TRACK scores at baseline and in the follow-up visits were not significantly different (85.0 [76.2-90.0] vs 90.0 [80.0-90.0]; $P = .11$). The intraclass correlation coefficient of the measurements was 0.755 (95% CI, 0.503-1.00), and the Lin concordance correlation coefficient was 0.814 (95% CI, 0.733-0.894). The Bland and Altman plot shows the agreement of TRACK scores between baseline and follow-up visits. The mean difference in the TRACK score between the 2 visits was -2.50 , and their corresponding 95% limit of agreement was -12.53 to 7.53 (Figure 1). Two outliers were found, and the points in the plot show a random distribution.

Sensitivity to change

TRACK scores at baseline were significantly lower than those obtained in the follow-up visit (median [IQR] 35.0 [10.0-50.0] vs 72.5 [65.0-80.0]; $P < .001$). All the patients showed an increase of 10 or more points in TRACK score between baseline and follow-up visits.

Internal consistency

The Cronbach α was 0.77 for the questionnaire as a whole. For the individual items, this statistic ranged from 0.65 to 0.85.

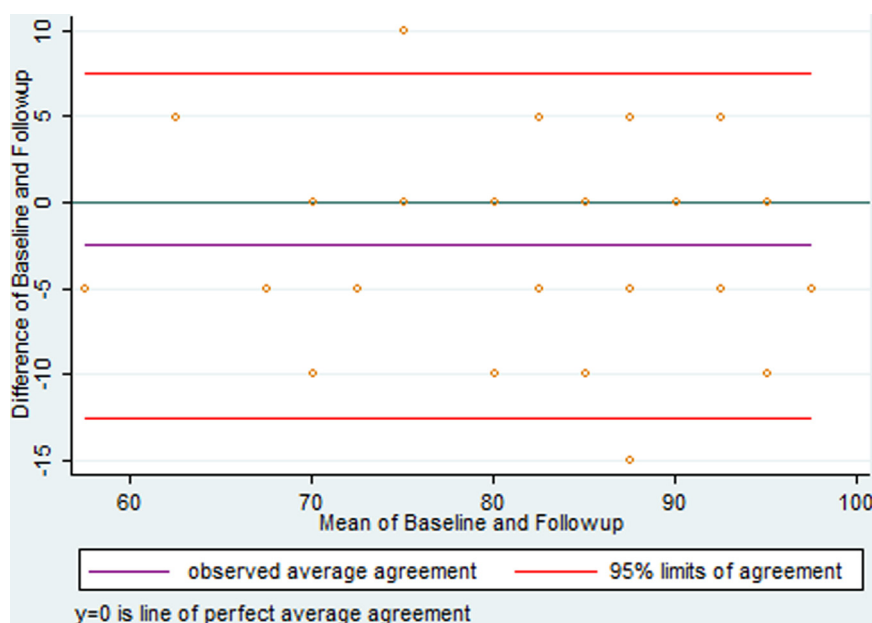


FIGURE 1. Bland and Altman plot, displaying the difference in TRACK scores plotted against the mean TRACK scores. Horizontal lines are drawn at the mean difference and at the mean difference ± 1.96 SD of the differences. In the figure, certain data points are falling on top of each other.

Usability

All parents qualified the TRACK as easy to score, and the time required to complete the questionnaire ranged from 45 to 60 seconds.

DISCUSSION

The present study showed that the Spanish version of the TRACK questionnaire has adequate psychometric characteristics when tested in children younger than age 5 years with either physician-diagnosed asthma or recurrent respiratory episodes suggestive of asthma as demonstrated by (1) an adequate criterion validity when we compared TRACK scores across the 3 categories of the NAEPP EPR-3 guidelines criteria of asthma control, (2) an adequate construct validity when we compared TRACK scores across the 3 categories of the timing of respiratory symptoms and across 2 categories of therapeutic decision, (3) an acceptable internal consistency, and (4) an excellent usability when parents and/or caregivers evaluated its ease of scoring and the time to complete the questionnaire. Likewise, the Spanish version of the TRACK questionnaire showed adequate test-retest reliability and excellent sensitivity to change when we compared baseline and follow-up scores in Hispanic preschoolers with asthma symptoms.

The findings of this study are important because they will encourage physicians who work with Spanish-speaking communities to use the TRACK questionnaire for clinical and research purposes. Implementing the use of the Spanish version of the TRACK questionnaire for assessing asthma control in Hispanic preschoolers with this condition may allow the NAEPP EPR-3 recommended stepwise approach for childhood asthma management (step-up if necessary and step-down when possible) in Spanish-speaking low-middle income countries (eg, Colombia) and among Latino immigrant families worldwide,

which may lead to significant reductions of the disease burden globally.

Our results with respect to criterion and construct validity of the TRACK are consistent with those reported by Murphy et al,¹¹ who found that mean scores of the TRACK differed significantly in the expected direction for 3 levels of NAEPP EPR-3 guidelines–based respiratory control, physician-recommended change in therapy, and symptom status. Similarly, Chipps et al²³ also found significant differences in mean TRACK scores among children categorized according to the physician's NAEPP EPR-3 guidelines–based control table ratings. In agreement with our results, they also found that children who received a recommendation for a step-up in therapy from their physician scored significantly lower on TRACK at baseline relative to children who received a recommendation for maintained or stepped-down therapy. With respect to TRACK's test-retest reliability, the point estimate value of the intraclass correlation coefficient that we found was higher than that reported in the study by Chipps et al,²³ although the 95% CI of our estimation contains the value found in their study. This higher value in our study is probably because our time period between the baseline and follow-up was shorter than that used in the study by Chipps et al,²³ thus increasing the likelihood of a major consistency of the questionnaire results between the baseline and follow-up visits.

Regarding the TRACK's sensitivity to change, our findings are consistent with those reported by Chipps et al,²³ who found significant differences in TRACK scores across patient subsets that differed in change status (better, same, or worse) on the basis of the physician's guidelines-based control table ratings and caregivers' reports. In terms of TRACK's internal consistency, in agreement with our findings, the Cronbach α values reported in the studies by Murphy et al¹¹ and Chipps et al²³ were above the 0.7 recommended reliability threshold value for multi-item

scales. However, in the study by Chipps et al,²³ this value was obtained only after deleting item 5 from the scale, so it may reflect not only the different nature of the domain that assesses item 5 (risk) compared with that assessed by items 1 to 4 (impairment) but also the independence in the variation of these 2 domains. To the best of our knowledge, no other studies have previously reported the usability parameters of speed, understandability and subjective experience that we found in our study when parents and/or caregivers completed the TRACK questionnaire.

The main limitations of our study comprise the relatively small number of patients included and that the study was performed in a single center and in a unique clinical setting (outpatients). Although it is probable that the Spanish version of the TRACK questionnaire exhibits similar psychometric properties in other populations and other clinical settings, it is necessary to conduct additional studies to determine the psychometric characteristics of the TRACK questionnaire in a larger number of patients, in different settings, with a more varied educational background, and with a more representative sample of the general population of preschoolers with symptoms consistent with asthma. The main strength of our study is the assessment of all of the recommended psychometric characteristics in the validation process of severity scores and other outcome measures of the TRACK questionnaire in Spanish, one of the most widely spoken languages in the world. In addition, to the best of our knowledge, a formal assessment of TRACK's usability had not been previously reported.

In summary, analysis of our results suggests that the Spanish version of the TRACK questionnaire has an adequate criterion validity, an adequate construct validity, an adequate test-retest reliability, an excellent sensitivity to change, an acceptable internal consistency, and an excellent usability when used in children younger than age 5 years with either physician-diagnosed asthma or recurrent respiratory episodes suggestive of asthma. Given that asthma is highly prevalent among Hispanic children who live in Latin America and in non-Spanish speaking countries (eg, the United States), the validation of the Spanish version of the TRACK questionnaire may lead to significant reductions in health disparities in pediatric asthma care worldwide.

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TABLE E1. Frequency of responses for each item of the TRACK questionnaire at baseline according to the level of asthma control based on Expert Panel Report-3 of the National Asthma Education and Prevention Program (NAEPP EPR-3) guidelines

Item no.	Well-controlled asthma, no. (%), n = 82 (34.2%)	Not well-controlled asthma no. (%), n = 52 (21.7%)	Very poorly controlled asthma no. (%), n = 106 (44.2%)
1			
Not at all	72 (87.8)	28 (53.8)	0 (0.0)
Once or twice	10 (12.2)	12 (23.1)	20 (18.9)
Once every wk	0 (0.0)	6 (11.5)	16 (15.1)
Two or 3 times a wk	0 (0.0)	4 (7.7)	40 (37.7)
Four or more times a wk	0 (0.0)	2 (3.8)	30 (28.3)
2			
Not at all	76 (92.7)	42 (80.8)	6 (5.7)
Once or twice	4 (4.9)	2 (3.8)	28 (26.4)
Once every wk	2 (2.4)	8 (15.4)	8 (7.5)
Two or 3 times a wk	0 (0.0)	0 (0.0)	44 (41.5)
Four or more times a wk	0 (0.0)	0 (0.0)	20 (18.9)
3			
Not at all	74 (90.2)	38 (73.0)	8 (7.5)
Slightly	8 (9.8)	8 (15.4)	26 (24.5)
Moderately	0 (0.0)	6 (11.5)	30 (28.3)
Quite a lot	0 (0.0)	0 (0.0)	34 (32.1)
Extremely	0 (0.0)	0 (0.0)	8 (7.5)
4			
Not at all	16 (19.5)	6 (11.5)	2 (1.9)
Once or twice	38 (46.3)	18 (34.6)	26 (24.5)
Once every wk	8 (9.8)	2 (3.8)	8 (7.5)
Two or 3 times a wk	6 (7.3)	14 (26.9)	28 (26.4)
Four or more times a wk	14 (17.1)	12 (23.1)	42 (39.6)
5			
Never	28 (34.1)	2 (3.8)	22 (20.8)
Once	28 (34.1)	6 (11.5)	16 (15.1)
Twice	12 (14.6)	18 (34.6)	26 (24.5)
Three times	6 (7.3)	14 (26.9)	24 (22.6)
Four or more times	8 (9.8)	12 (23.1)	18 (17.0)

TABLE E2. Frequency of responses for each item of the TRACK questionnaire at baseline according to the timing of respiratory symptoms

Item no.	Current symptomatic, no. (%), n = 124 (51.7%)	Recent past symptomatic, no. (%), n = 116 (48.3%)
1		
Not at all	2 (1.6)	98 (84.5)
Once or twice	26 (21.0)	16 (13.8)
Once every wk	22 (17.7)	0 (0.0)
Two or 3 times a wk	42 (33.9)	2 (1.7)
Four or more times a wk	32 (25.8)	0 (0.0)
2		
Not at all	16 (12.9)	108 (93.1)
Once or twice	28 (22.6)	6 (5.2)
Once every wk	16 (12.9)	2 (1.7)
Two or 3 times a wk	44 (35.5)	0 (0.0)
Four or more times a wk	20 (16.1)	0 (0.0)
3		
Not at all	18 (14.5)	102 (87.9)
Slightly	28 (22.6)	14 (12.1)
Moderately	36 (29.0)	0 (0.0)
Quite a lot	34 (27.4)	0 (0.0)
Extremely	8 (6.5)	0 (0.0)
4		
Not at all	6 (4.8)	18 (15.5)
Once or twice	28 (22.6)	54 (46.6)
Once every wk	8 (6.5)	10 (8.6)
Two or 3 times a wk	36 (29.0)	12 (10.3)
Four or more times a wk	46 (37.1)	22 (19.0)
5		
Never	24 (19.4)	28 (24.1)
Once	22 (17.7)	28 (24.1)
Twice	32 (25.8)	24 (20.7)
Three times	28 (22.6)	16 (13.8)
Four or more times	18 (14.5)	20 (17.2)

TABLE E3. Frequency of responses for each item of the TRACK questionnaire at baseline according to the therapeutic decision at baseline

Item no.	No change in therapy, no. (%), n = 70 (29.2%)	Set-up in therapy, no. (%), n = 116 (48.3%)	Step-down in therapy, no. (%), n = 54 (22.5%)
1			
Not at all	54 (77.1)	0 (0.0)	46 (85.2)
Once or twice	10 (14.3)	24 (20.7)	8 (14.8)
Once every wk	4 (5.7)	18 (15.5)	0 (0.0)
Two or 3 times a wk	2 (2.9)	42 (36.2)	0 (0.0)
Four or more times a wk	0 (0.0)	32 (27.6)	0 (0.0)
2			
Not at all	62 (88.6)	12 (10.3)	50 (92.6)
Once or twice	4 (5.7)	28 (24.1)	2 (3.7)
Once every wk	4 (5.7)	12 (10.3)	2 (3.7)
Two or 3 times a wk	0 (0.0)	44 (37.9)	0 (0.0)
Four or more times a wk	0 (0.0)	20 (17.2)	0 (0.0)
3			
Not at all	60 (85.7)	14 (12.1)	46 (85.2)
Slightly	6 (8.6)	28 (24.1)	8 (14.8)
Moderately	4 (5.7)	32 (27.6)	0 (0.0)
Quite a lot	0 (0.0)	34 (29.3)	0 (0.0)
Extremely	0 (0.0)	8 (6.9)	0 (0.0)
4			
Not at all	8 (11.4)	4 (3.4)	12 (22.2)
Once or twice	30 (42.9)	26 (22.4)	26 (48.1)
Once every wk	6 (8.6)	8 (6.9)	4 (7.4)
Two or 3 times a wk	8 (11.4)	36 (31.0)	4 (7.4)
Four or more times a wk	18 (25.7)	42 (36.2)	8 (14.8)
5			
Never	16 (22.9)	24 (20.7)	12 (22.2)
Once	12 (17.1)	20 (17.2)	18 (33.3)
Twice	20 (28.6)	28 (24.1)	8 (14.8)
Three times	12 (17.1)	26 (22.4)	6 (11.1)
Four or more times	10 (14.3)	18 (15.5)	10 (18.5)