A questionnaire to assess parental perception of barriers towards active commuting to school (PABACS): Reliability and validity

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ABSTRACT

Introduction: Parental barriers are a key factor to determine physical activity behaviors, such as active commuting to school in young people. The purpose of this study was to test the reliability and validity of a questionnaire which addresses parental barriers towards active commuting to school.
Methods: This paper describes the development, following the Delphi method, and the validation of a Likert-scale questionnaire of 23 items (Parental Perception of Barriers towards Active Commuting to School (PABACS)) designed to determine the main parental barriers. These barriers are categorized into 3 scales (general, walking, and cycling barriers) and the overall questionnaire. A total of 207 parents of children and adolescents in Granada (Spain) in 2016 completed the survey on two occasions. The internal consistency was examined using Cronbach's alpha tests and Intra-Class Correlation (ICC) and Kappa index were used to assess the reliability of the different questions. To examine the predictive validity, spearman's rho tests were conducted.
Results: The questionnaire showed a good internal consistency for the overall questionnaire and for the three scales. The Intra-Class Correlation values were moderate. The overall questionnaire and the general and walking barriers scales showed a moderate validity to predict active modes of commuting, as well as the items 'distance' and 'walking convenience'.
Conclusions: This study provides a reliable tool to assess parental barriers towards active commuting to school, which will help future studies to identify the most important barriers on which institutions have to focus to increase active commuting to school rates.

1. Introduction

Physical activity (PA) is associated with numerous health benefits in school-aged children and youth (Janssen and Leblanc, 2010), such as psychological wellbeing (Jakubowski et al., 2015) and improved academic achievement (Bunketorp Kall et al., 2015). Additionally, high PA levels during childhood and adolescence can predict a high level of adult PA (Telama et al., 2005), hence

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developing a healthy lifestyle for youth is necessary. The World Health Organization (WHO) recommends 60 min of moderate-to-vigorous PA daily in order to achieve health benefits (WHO, 2010). However, studies showed that in the USA only 42% of the children aged 6–11 met these health recommendations (Troiano et al., 2008), while, in Spain, the results were lower, with only 12.3% and 30.4% for 2–10-year-old girls and boys, respectively, involved in moderate-to-vigorous PA for 60 min or more per day (Konstabel et al., 2014). Active commuting to school (ACS), defined as walking or cycling to or back from school, is one of the four domains of "active living" (which includes active recreation, household activities, active transport, and occupational activities) (Sallis et al., 2006). Active comuting to and from school is an important source of PA (Faulkner et al., 2009) as it can be easily integrated in daily habits, especially in children and adolescents.

Despite the fact that ACS is a promising behavior to achieve the PA recommendations and broader health effects, a decline of ACS has been observed in the last decades in countries such as Spain (Chillón et al., 2013); nowadays, the percentage of children and adolescents who actively commute is 67% and 60%, respectively, and only 0.3% of them commute cycling (Rodríguez-López et al., 2017). These percentages are relatively high, but there is still room for increasing these rates in Spain, specifically the use of the bicycle as a mode of commuting. The ACS behavior is determined by different personal, social, and environmental factors, according to the socio-ecological perspective proposed by Mandic et al. (2015b). Several studies have previously examined different correlates of ACS such as the distance to school (D'Haese et al., 2011), the weather conditions (Segura-Diaz et al., 2014), the children's and parents' perceptions of self-efficacy (Lu et al., 2015), and the parental concerns and expectations (e.g. convenience of taking their child to school by car or safety of crime) (Fyhri et al., 2011; Mendoza et al., 2014).

Parental influences are a key factor to determine the PA behaviors of preschoolers (Terrón-Pérez et al., 2018), children and adolescents (Ploeg et al., 2013). More specifically, parental perceived barriers such as traffic or crime-related safety may be the main obstacles to allow children to actively commute to school (Zuniga, 2012). In addition, parental concerns about safety are primary modifiable correlates, which makes them interesting to be examined (Chillón et al., 2014). Moreover, the perceived parental barriers towards ACS, such as the absence of traffic lights at intersections (Timperio et al., 2004), absence of social support to active transport (Salmon et al., 2007), or heavy traffic (Lu et al., 2014), have been associated with the decline of ACS levels in children and adolescents.

Many diverse instruments have been used to assess parental perceptions of barriers towards ACS; however, such instruments cannot be compared across countries. Consequently, until now, comparing results between studies has been a difficult task due to the high heterogeneity of instruments used to assess the parental perceptions of barriers. Parental barriers to ACS have been studied in different countries (e.g. Spain, Australia, or USA) (Forman et al., 2008; Huertas-Delgado et al., 2017; Salmon et al., 2007). The only study conducted in Spain focusing on parental barriers (Huertas-Delgado et al., 2017) used the Safe Routes to School scale for their assessment (McDonald et al., 2011). Other scales that had previously been used focused only on environmental perceptions (De Meester et al., 2014), without including personal and social barriers (Forman et al., 2008), thus not providing a global vision of parental barriers. Furthermore, some scales used in previous studies showed poor reliability values (McDonald et al., 2011) or did not report reliability or validity indicators (Salmon et al., 2007). A common, valid and reliable instrument would facilitate comparison of findings, which is crucial for a better understanding of the barriers that should be addressed in order to increase and maintain ACS in children and adolescents.

To the best of our knowledge, there are no valid and reliable instruments in the Spanish context to assess parents' perception of barriers towards ACS. Therefore, the purpose of this study is to test the reliability (i.e., internal consistency and test-retest reliability) and validity (i.e., predictive validity) of a new survey instrument developed to assess parental barriers (including personal, social, and environmental factors) towards ACS in children and adolescents.

2. Methods

2.1. Procedure and participants

The data were collected during May 2016 as a preliminary phase of the PACO (*Pedalea y Anda al Colegio*) Project. The PACO Project examines ACS in Spanish children and adolescents and aims at implementing strategies to promote ACS. The Medical Ethics Committee of the *Hospital Virgen de las Nieves* (Granada, Spain) approved the study design, study protocols, and informed consent procedure (case no. 817).

In total, 674 parents of children (aged 6–12) and adolescents (aged 13–16) from five different schools in the city of Granada were asked to participate in this study, by non-random sampling. Out of the 51 total schools in Granada, the selected schools were mainly Primary Schools (n = 4). All of them were public and belonged to the metropolitan area of Granada. Firstly, the research team contacted the schools' staff, teachers, and families to provide them information about the study purposes. The participants completed surveys on two occasions separated by a two-week interval to test the reliability of the questionnaire. In the first administration, the parental survey was given to children at school accompanied by a guiding letter. The survey was returned 3 days later. A total of 399 (59.2%) parents who received the survey returned it. Two weeks later, the same parent filled out the same survey for the second time, following the same procedure. The survey took 10 min to be completed. Finally, a total of 207 parents (53.3%) of children and adolescents completed the survey correctly both the first and second time. Recruitment is often time-consuming, especially when the study includes the whole family (Bergmann et al., 2017). The lack of time that parents reported is the main reason to not participate in research studies (Levickis et al., 2013). A total of 275 did not participate in the study (first survey). Concerning the parents that did not return the second questionnaire; this might be due to the fact that some of them might have misunderstood the purpose of the second round or because they thought that was not necessary to fill in the questionnaire again. The mean age of the parents who did

not complete the second survey were 44.1 (± 9.0) years old; they were mainly fathers (n = 119, 72.1%) and, almost half of them were parents of children from Primary school (n = 84, 50.9%).

2.2. Questionnaire development and content

We developed a questionnaire of perceived parental barriers towards ACS using the Delphi Method (Monfort-Pañego et al., 2016), comprising 23 items and 4 phases: i) searching for references and selecting the evidence indicators; ii) elaborating items; iii) pilot administration in adolescents; and iv) administration of the questionnaire.

The first phase (i) was a search through specialized literature, focusing on questionnaires about perceived parental barriers. We identified several studies developed in the USA, which used questionnaires of parental barriers toward ACS in children (Forman et al., 2008), adolescents (McDonald et al., 2011), or both children and adolescents (Carlson et al., 2014; Rosenberg et al., 2009). Regarding the determinants of ACS (Mandic et al., 2015a), we focused on personal (e.g. it is boring to actively commute to school), social (e.g. there are no other adults walking the route from home to school), and perceived environmental (e.g. perceived distance from home to school) barriers in order to elaborate a preliminary list of barriers. In addition, we organized three focus groups with the parents of children and adolescents from different schools in Granada. A total of 12 parents participated in the focus groups: one focus group with parents of children (n = 5), one with parents of adolescents (n = 4), and one mixed-group, (n = 8). The parents who participated reported information about their oldest child and provided their perceptions of the route from home to school. The first session focused on explaining the importance of ACS and their attitude towards this behavior. The second session focused on their perceptions of the most important barriers that make ACS difficult and on how these could be changed. Then, based on the specialized literature research and the parental focus groups, a first 30-item Likert-scale version of the questionnaire was developed. Each item assessed the perception of a potential barrier and, a question was added for every item to assess if a change in the barrier would affect the parents' decision to let their children commute actively to school.

In the second phase (ii), four independent active transportation experts (i.e. three national and one international) were selected to evaluate the questionnaire. Most of the expert-input focused on the correct formulation of each item in order to make it fully understandable for the parents, and on the differentiation between the walking and cycling barriers. Furthermore, some of the items were combined into one item (e.g. activities before and after school). After the discussion with the expert team, we decided to establish three scales: general barriers including those common to both walking and cycling to school (e.g. distance or weather), walking barriers (e.g. it is boring to walk), and cycling barriers (e.g. there is no place to park the bike at school). Finally, following this process, 23-item were selected to develop the questionnaire to evaluate the perceived parental barriers towards ACS.

In the third phase (iii), the second version of the questionnaire was evaluated by 3 parents in individual sessions. The researchers presented the questions about barriers toward ACS and registered the parents' suggestions. These were mainly focused on improving the legibility of the items.

In the final phase (iv), the final version of the questionnaire PABACS (*PArental BArriers towards Active Commuting to School*) was developed (Electronic Supplementary Material Appendix I). Ten items of the questionnaire assessed the general perceived parental barriers towards ACS, six items focused specifically on walking, and seven items focused on cycling. Therefore, the final questionnaire included 23 items. All items used a Likert-type response format of "strongly disagree" = 1, "disagree" = 2, "agree" = 3, and "strongly agree" = 4. Higher scores indicate greater concern about situations related to walking and cycling to school. A final open question was included to record any other perceived parental barrier related to ACS. In addition, a yes-no question was included for every barrier to report if a change in a specific barrier would affect their decision of their child's mode of commuting to school. The final questionnaire is presented in the additional file 1. In addition, the questionnaire is provided in English, after implementing the back-translation process. For that, two experts conducted the translation process: one expert translated the PABACS to English and the other expert translated it back to Spanish. Finally, the two experts agreed through consensus the final version (additional file 2).

2.3. Other variables

The parents self-reported their gender, age, highest educational level, mode of commuting to work, and their children's mode of commuting to school. The parents' educational level was categorized as "university" if one of the parents had a university degree and "primary or secondary school" if none of the parents had completed their university studies. The children's mode of commuting was assessed using separate questions for traveling to and from school. The parents were asked to select only one of the response categories (i.e. walking, cycling, car, motorbike, bus, train, or other) for each question. The children and adolescents were categorized as "active" if the parents reported that their child usually walked or biked to school and/or from school, and "passive" if their child usually traveled to and from school by car, motorbike, bus, or train. The parental mode of commuting was assessed using separate questions for mothers and fathers if they worked. The parents were categorized as "active" if one of the two parents usually walked or biked to work, and the parents were categorized as "passive" if none used active modes of commuting.

2.4. Statistical analysis

The descriptive data of the participants are reported by frequencies (and percentages) for categorical variables and means (and standard deviations) for continuous variables. The statistical analyses were conducted for both the individual items and the three scales for general barriers, walking barriers, and cycling barriers. We calculated the total score for the overall questionnaire (i.e., total barriers) and for each scale (i.e., total general barriers, total walking barriers, total cycling barriers) with the mean of the items within

Table 1
Descriptive data of the participants.

Variables	Frequency (n = 207) n (%)
Parents' gender	
Father	147 (73.1)
Mother	54 (26.9)
Age[a]	43.2 (6.88)
Parents' highest educational level	
Primary or secondary school	94 (45.9)
University	111 (54.1)
Parents' mode of commuting to work	
Active	63 (30.4)
Passive	106 (51.2)
Unemployed parents	38 (18.4)
Children's age[a]	9.9 (2.92)
Children's gender	
Boys	80 (40)
Girls	120 (60)
Children's mode of commuting	
Active	82 (40)
Passive Public transport	49 (23.9)
Passive Private transport	74 (36.1)

[a] Parents' and children's ages are represented by means and standard deviations.

the overall questionnaire and each scale, respectively.

The internal consistency of the scales was examined using Cronbach's alpha tests. The test-retest reliability for each barrier of the scale was assessed with two-way, random effect model intra-class correlation coefficients (ICC). Intra-class correlation coefficient values below 0.5 indicated poor reliability, values between 0.5 and 0.75 indicated moderate reliability, values between 0.75 and 0.9 indicated good reliability, and values greater than 0.90 indicated excellent reliability (Koo and Li, 2016). The Kappa index was used to assess the reliability of the second question about the parental decision about their child's mode of commuting if the barrier changed. Kappa values of 0.0 were considered as "poor agreement", from 0–0.20 as "slight agreement", from 0.21–0.40 as "fair agreement", from 0.41–0.60 as "moderate agreement", from 0.61–0.80 as "substantial agreement", and from 0.81–1.00 as "almost perfect agreement" (Landis and Koch, 2017). To examine the predictive validity of each item in the questionnaire and of the three scales of barriers, spearman's rho tests were conducted to assess the relation of the perceived parental barriers and the children's mode of commuting. The correlations were interpreted as low (< 0.30), moderate (0.30–0.50), and high (> 0.50) (Van Dyck et al., 2015). The analyses were performed using SPSS (v. 20.0 for Windows, Chicago, IL, USA), and the level of significance was set at $p < 0.05$.

3. Results

3.1. Descriptive data of the participants

The participants of this study were mostly male (73.1%), with a mean age of 43.2 (6.88) and they preferred using passive modes to commute to work (62.7%). Their children's mean age was 9.9 years old (2.9), mostly girls (60%), and 40% of them used ACS (Table 1).

3.2. Parental barriers to ACS

The descriptive results of the barriers reported by parents are shown in Table 2. The main barriers were heavy traffic (3.24), schoolbag weight (3.23), no bike lanes (3.21), and absence of other children cycling (3.20). On the other hand, the least reported parental barriers were "walking is boring" (1.57) and "cycling is boring" (1.66). The yes-no question regarding whether changing the barrier would promote active commuting, the most frequently reported items with a yes were heavy traffic (62.2%), absence of policemen (61.8%), and intersection safety (61.1%); and the items least answered with yes were "cycling is boring" (40.3%), absence of parents cycling (46%), and absence of children cycling (48.7%).

3.3. Internal consistency

The Cronbach's alpha for the overall questionnaire, consisting of all 23 items, was α = 0.86. When divided by scales, the Cronbach's alpha values were α = 0.83 for the general items, α = 0.66 for the walking items, and α = 0.73 for the cycling items. According to these results, the PABACS questionnaire showed a good internal consistency for the overall questionnaire and also for each of the three scales.

Table 2
Reliability measures of the perceived parental barriers´ questionnaire.

Barrier	Parental perception of the barrier			Improving the barrier would increase active commuting	
	Mean (SD)	ICC	CI (95%)	n (%)	Kappa
General barriers					
Distance	2.8 (1.2)	.58	0.47–0.66	109 (59.9)	.54
Heavy traffic	3.2 (1.1)	.53	0.41–0.62	112 (62.2)	.57
Afterschool activities	2.2 (1.2)	.42	0.29–0.53	83 (52.2)	.59
Traffic speed	3.1 (1.1)	.52	0.41–0.62	100 (60.2)	.56
Time required to actively commute to school	2.7 (1.2)	.56	0.45–0.65	99 (60.0)	.58
Intersection security	3.1 (1.1)	.51	0.39–0.61	107 (61.1)	.52
Absence of policeman	3.2 (1.1)	.57	0.46–0.65	107 (61.8)	.51
Crime	2.0 (1.1)	.54	0.43–0.63	79 (50.0)	.48
Weather	2.5 (1.1)	.39	0.26–0.51	88 (55.3)	.55
Schoolbag weight	3.2(1.0)	.51	0.39–0.61	103 (60.9)	.48
Total general barriers	2.8 (0.7)	.55	0.44–0.65	101 (70.6)[a]	.49
Walking barriers					
Walking convenience	2.4 (1.3)	.52	0.41–0.62	93 (58.9)	.61
Absence of adults walking	2.5 (1.3)	.47	0.35–0.58	92 (57.9)	.49
No sidewalks	2.1 (1.1)	.55	0.44–0.64	84 (53.5)	.51
Absence of kids walking	2.4 (1.2)	.52	0.39–0.62	78 (57.4)	.41
Walking is boring	1.6 (0.8)	.51	0.39–0.61	86 (55.5)	.51
Absence of parents walking	2.4 (1.3)	.42	0.29–0.53	80 (53.7)	.56
Total walking barriers	2.2 (0.7)	.51	0.38–0.62	82 (73.2)[a]	.55
Cycling barriers					
Cycling convenience	2.6 (1.3)	.43	0.29–0.54	86 (53.8)	.65
Absence of adults cycling	3.0 (1.2)	.41	0.28–0.52	81 (51.6)	.55
No bike lanes	3.2 (1.1)	.51	0.39–0.61	83 (51.6)	.62
Absence of bike parking	3.1 (1.2)	.51	0.39–0.61	88 (54.7)	.64
Absence of kids cycling	3.2 (1.1)	.46	0.33–0.57	76 (48.7)	.60
Cycling is boring	1.7 (1.0)	.46	0.33–0.57	58 (40.3)	.57
Absence of parents cycling	2.9 (1.2)	.51	0.39–0.61	69 (46.0)	.62
Total cycling barriers	2.8 (0.7)	.51	0.38–0.61	86 (61.4)[a]	.59
Total barriers	2.5 (0.5)	.60	0.48–0.71	73 (77.7)[a]	.49

Note. SD: standard deviation; ICC: intra-class correlation coefficient; CI: confidence interval.

[a] Sum of barriers.

3.4. Test-retest reliability

The results of the test-retest reliability for the 3 scales and for each item of the questionnaire are presented in Table 2. The overall questionnaire showed moderate ICC values. For the three scales, the ICC values were moderate: 0.55 for general barriers, 0.51 for walking barriers, and 0.51 for cycling barriers. Concerning individual items, 8 items had poor reliability and the other 16 had moderate reliability (ICC range = 0.39 to 0.58). In relation to the second part of the question about the improvement of the barrier and its effect on ACS, 19 items had moderate agreement and 4 items had substantial agreement (Kappa range = 0.41 to 0.65).

3.5. Predictive validity

The predictive validity of the parental barriers for children's active mode of commuting is presented in Table 3. The overall questionnaire and the general and walking barriers scales showed moderate validity with active modes of commuting to school and the cycling barriers scale showed low validity. On the item level, distance and walking convenience showed moderate validity to predict ACS.

4. Discussion

This study assessed the reliability and validity of the questionnaire of PArental BArriers towards Active Commuting to School (PABACS). Overall, the test-retest reliability of the PABACS questionnaire was adequate, supporting the psychometric appropriateness of this tool to assess the parental barriers toward ACS. The internal consistency of the overall questionnaire and the three scales was high and acceptable for the specific barriers for walking and cycling. The validity was moderate for the overall questionnaire, the general scale, and the walking scale, as well as for distance and convenience.

The reliability of the overall questionnaire, as well as the three scales (general, walking, and cycling barriers) was moderate. Other studies showed similar reliability results for the parental barriers towards active commuting to school (ranged 0.4–0.8) (Forman et al., 2008; McDonald et al., 2011). Therefore, since the current reliability properties of the questionnaire are similar to those of previous questionnaires, there is confidence about the appropriateness of the questionnaire to be used.

Regarding each individual item, the most highly reliable items were distance, time required to ACS, and no presence of sidewalks.

Table 3
Predictive validity between parental barriers and children's passive mode of commuting.

Barriers	rho-value	p-value
General barriers		
Distance	.32	< .0001
Heavy traffic	.20	.005
Afterschool activities	.08	.284
Traffic speed	.18	.012
Time required	.28	< .0001
Intersection security	.08	.286
Absence of policeman	.10	.185
Crime	.07	.371
Weather	.14	.056
Schoolbag weight	.09	.203
Total general barriers	.31	< .0001
Walking barriers		
Walking convenience	.44	< .0001
Absence of adults walking	.17	.019
No sidewalks	.16	.034
Absence of kids walking	.13	.089
Walking is boring	-.02	.771
Absence of parents walking	.25	.001
Total walking barriers	.30	< .0001
Cycling barriers		
Cycling convenience	.26	< .0001
Absence of adults cycling	.20	.007
No bike lanes	-.07	.315
Absence of bike parking	.07	.377
Absence of kids cycling	.13	.085
Cycling is boring	-.02	.808
Absence of parents cycling	.09	.253
Total cycle barriers	.20	.010
Total barriers	.33	< .0001

However, the least reliable items were related to the weather, the presence of adults or other children, afterschool activities, and "cycling is boring". The weather conditions may show an inherent variability since they are influenced by diverse climatic parameters (Höppe, 1999). In this regard, the weather may have differed between the two measurement moments and, consequently, the perception about better/worse weather may be different. In order to minimize this individual perception of the weather, the original item (i.e., "Bad weather (cold, rain, or hot)") will be replaced by 2 items including specific weather characteristics such as "Very high or low temperatures", and "Heavy rain or snow". The presence of adults and children was one of the least reliable items in the current study as well as in other studies examining the reliability of parental barriers towards ACS (McDonald et al., 2011). Again, a possible explanation would be that the presence of other people could have differed between the two measurement moments. These barriers related to the presence of other children or adults are very important because they are associated with ACS (Salmon et al., 2007). Consequently, the question should be retained in the final questionnaire, but it requires more specificity. It should clearly describe the absence of children or adults 'in a usual day' instead of the presence of children or adults. The proposal is to use the following statements: "There are usually no other adults walking on the route from home to school" and "There are usually no other adults cycling on the route from home to school". The question about after school activities also showed low values for reliability. This might be related to the non-regularity of these activities, which do not occur daily, so they may have influenced some of the days during a week but not all of them. Finally, "cycling is boring" is a concept that is probably not easy to assess in adults since the rates of adult cycling are very low in Spain (< 10%) (INE, 2014). Thus, the parents who do not have much experience cycling might find cycling an unclear barrier for their children. Still, researchers consider that this question should remain in the questionnaire due to new cycling promotions that some institutions are developing in Spain.

In relation to the questions that assessed whether the change of a specific barrier would affect their decision of their children's mode of commuting, the reliability of all questions was moderate to substantial. Still, it has to be analyzed with caution because parents could report some items as important to change, but those barriers may be the least reported.

Concerning the predictive validity, the overall questionnaire, the general scale, and the walking scale showed moderate validity to predict ACS, as well as the items 'distance' and 'convenience'. Traffic (amount and speed), time required, cycling convenience, other adults or parents walking or cycling, and the cycling scale showed low validity. Moderate validity has been considered as sufficient for health questionnaires used in previous studies (Spittaels et al., 2010; Van Dyck et al., 2015). Most items of the questionnaire did not show valid results as they probably do not have enough weight to predict ACS. This may have been caused by the fact that ACS is a behavior that is related to personal, social, and environmental factors that can be perceived by parents, children, and adolescents. Thus, it is not possible to predict ACS only with the parents' perceptions. In fact, some of the barriers may not be decisive for this specific sample. In any case, the overall questionnaire and the two scales (general and walking) were sufficiently valid to predict ACS. This agrees with the body of literature where parental barriers are associated with ACS (Zuniga, 2012). The cycling scale presents a

low validity to predict ACS, which might be due to the low rates of cycling in young people in Spain (0.25%) (Rodríguez-López et al., 2017). The overall scales are very useful in Health research, therefore the recommendation is to use the scales in the analysis.

One of the strengths of this study included the adequate sample size and the use of the Delphi method to develop the questionnaire. In addition, it is the first study to propose a reliable and moderately valid questionnaire to assess parental perceptions of barriers towards active commuting to school in Spain. Nevertheless, the main limitation is that since parents answered the questionnaire at home, they could not ask the researcher about some doubts that may have arisen when completing the questionnaire. Furthermore, it was difficult for parents to understand correctly that they had to answer the questionnaire on a second occasion. Finally, the study was limited by its execution in only one city, meaning that the results may not be generalizable.

5. Conclusion

This study provides a reliable questionnaire to assess the parental barriers towards ACS. The PABACS questionnaire showed moderate validity for the total barriers in relation to ACS. In this sense, and by introducing the modifications proposed, an useful tool will be available for researchers and public administrations to determine the parental perceived barriers towards ACS. Furthermore, this questionnaire will also help future studies to identify the most important barriers on which the administration, schools, and social services have to focus to increase children's and adolescents' ACS.

Conflict of interest declaration

The authors have no conflict of interest to disclose.

Appendix A. Supplementary material

Supplementary data associated with this article can be found in the online version at https://doi.org/10.1016/j.jth.2018.12.004.

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