

We are IntechOpen, the world's leading publisher of Open Access books Built by scientists, for scientists

6,900

Open access books available

185,000

International authors and editors

200M

Downloads

Our authors are among the

154

Countries delivered to

TOP 1%

most cited scientists

12.2%

Contributors from top 500 universities



WEB OF SCIENCE™

Selection of our books indexed in the Book Citation Index
in Web of Science™ Core Collection (BKCI)

Interested in publishing with us?
Contact book.department@intechopen.com

Numbers displayed above are based on latest data collected.
For more information visit www.intechopen.com



Review of Tools Used for Assessing Teachers' Level of Knowledge with Regards Attention Deficit Hyperactivity Disorder (ADHD)

Marian Soroa, Arantxa Gorostiaga and
Nekane Balluerka

Additional information is available at the end of the chapter

<http://dx.doi.org/10.5772/54277>

1. Introduction

ADHD is currently one of most widely studied neuro-developmental disorders in children and adolescents. It is a severe disorder that can cause grave problems for sufferers and those around them. The interest in the study of ADHD in the scientific community is undeniable, as proved by the multitude of articles and books on the subject published annually. As indicated by Lavigne and Romero [1], interest in this condition is such that it has breached the boundaries of academic research and study and has become a social phenomenon in itself, to such an extent that any child who shows a certain degree of activity, who does not remain seated and quiet for hours and does not instantly obey each and every instruction he or she receives is immediately suspected of having ADHD. The readiness with which children are labeled as having ADHD is surely due, in part, to the lack of information about the various factors apart from ADHD, that cause lack of attention, hyperactivity and/or impulsiveness.

Neither are teachers free from the tendency to attribute ADHD to too many children in spite of having greater possibilities of obtaining more reliable information about ADHD either through professional articles and books, training courses or other professionals at their schools that work with pupils with ADHD, etc. Despite this greater ease of access to information, various studies have shown that teachers' knowledge of ADHD could be improved [2-7]. Furthermore the knowledge teachers have about ADHD is also the source of ever greater interest among scientists as they are actors with a key role in the development of the condition. The training of educators in this area is of direct benefit to students with ADHD

and their families. For this reason, in order to find out exactly what level of knowledge teachers have about this problem it is crucial to have assessment tools with appropriate psychometric properties, that are reliable and valid and that provide accurate data about teachers' knowledge of ADHD.

In this chapter, the fundamental reasons for which teachers have to have a basic level of knowledge of ADHD are examined, an exhaustive analysis is carried out of the main instruments which have been developed to assess teachers' knowledge of ADHD, and the chapter ends with the main conclusions drawn from this study.

2. ADHD and teachers

ADHD is currently one of the disorders that has generated the largest number of research studies among the scientific community but despite this, in the words of Barkley [8], a lot remains unknown or misunderstood about it. Teachers, along with the family, are one of the most important agents of socialization during infancy, so they are one of the most suitable groups to receive information and training with regard to ADHD. A significant percentage of teachers have false ideas or gaps in their knowledge of ADHD, which causes them to behave inappropriately in the classroom. In this regard, it has been observed that specific training of teachers in the field and positive attitudes on their part have positive consequences for children with ADHD.

Soraa, Balluerka and Gorostiaga [9] hold that infant and primary school teachers should have general and specific knowledge about ADHD for six fundamental reasons. Firstly, because ADHD is one of the most common psychological disorders among children. The American Psychiatric Association [10] indicates that between 3% and 5% of school children suffer from ADHD, that is to say that on average there is one pupil with ADHD in every classroom of 25 [11-13].

Secondly, teachers are in a uniquely advantageous position for detecting possible cases of ADHD. They can pretty accurately distinguish normal development from what is not. Therefore, increasing teachers' knowledge about ADHD can facilitate, among other factors, early detection of the disorder and the application of the appropriate treatment [4, 14].

Thirdly, it should be noted that the role of the teacher is also essential in establishing the diagnosis. The assessments made of the behavior of the students, along with those of the parents and the results of other tests to which children are subjected, are part of the data that allow the diagnosis to be established [4-6].

Fourthly, it should be noted that teachers play a very important role in the implementation, evaluation and support of the treatment received by children with ADHD [14]. Their cooperation is necessary for the results of the treatment received by the child to be successful, and their evaluation of and opinions about the treatment of ADHD have a profound effect on its efficacy [15].

A fifth reason for teachers to be trained about ADHD lies in direct contact they have with the parents of the children. Several authors have argued that teachers make recommendations, appropriate or inappropriate, about ADHD to the parents, who tend to follow such recommendations [14, 16].

The sixth and final reason is that the knowledge that teachers have about ADHD affects their behavior and attitudes towards children with this condition [17]. Teachers with more knowledge about ADHD have a more favorable conduct and attitudes towards students with this disorder [3, 16, 18].

In spite of the existence of many reasons why teachers should have knowledge on ADHD, various studies have shown that, in general, teachers show only moderate knowledge of ADHD and that it is necessary to improve this level of knowledge [3-6, 19, 20]. Also it must be noted that many teachers present a general lack of knowledge and/or false ideas on the nature, course, consequences, causes and treatment of ADHD [21]. In some research programmes the average percentage of correct answers by teachers to questionnaires prepared in order to measure their knowledge on ADHD was around 80% [14, 18, 22-24], while in other studies the average percentage of correct answers did not exceed 53% [4-6, 20, 25]. At world level there is much research in progress on the knowledge that teachers have on ADHD; however, there is a scarcity of instruments to measure this knowledge precisely [9].

It has been found that teachers who consider that their level of knowledge about ADHD is optimum do not seek additional information; in contrast, those who consider that they do not understand many aspects referring to this topic, do look for it. For this reason, it is important that the teachers should be aware of their actual knowledge about ADHD and the possible repercussions of a lack of knowledge or erroneous knowledge. For this purpose, it is essential to use evaluation instruments which have appropriate psychometric properties for measuring such knowledge.

3. Instruments for assessing the level of knowledge of teachers regarding ADHD

Over recent decades, many instruments have been developed in order to assess the level of knowledge of teachers regarding ADHD. Given that the school setting is probably the place where children and young people spend most of the day, it is important to have a range of instruments to measure teacher knowledge about ADHD throughout the different stages of child development. These instruments, in addition to identifying gaps that teachers may have in their knowledge of the disorder, can be useful to educate the teachers about the need for more training in this area.

In this section a review is carried out of each of the main instruments developed for the evaluation of teachers' knowledge about ADHD. In the course of the description of each instrument their general characteristics are set out (the construct evaluated, items, response

format, dimensionality, etc.), as well as their scoring rules and psychometric properties. Their strengths and weaknesses are also evaluated. The instruments are presented in chronological order.

3.1. ADHD Knowledge Scale (Jerome, Gordon & Hustler, 1994) [23]

3.1.1. Description and development

This instrument was developed by American and Canadian researchers, in the English language, in order to assess the general knowledge of teachers regarding ADHD. It consists of two sections, the first includes 20 items that are socio-demographic in nature (age, sex, training about ADHD, etc.) in a multiple choice format, and a second section with 20 items, 13 positive and 7 negative, with a dichotomous (True/False) response format.

In the preparation of the questionnaire, the authors contacted several teachers and directors of special education to review the instrument. The authors do not provide more information about the process.

The instrument was applied to a sample of 1289 elementary school teachers, 439 in the United States and 850 in Canada. No information is given about the sampling procedure. 46% of the sample in the United States was made up of teachers from the state of New York school district, and 54% by teachers from Broward County in Florida. The majority were women (86%), aged between 31 and 50 (67%) and had been teachers for 9 or more years. 79% taught the general school population in ordinary classes while 21% were special education teachers. The Canadian sample consisted of teachers from a wide area of south west Ontario and no further information is given by the authors about it.

3.1.2. Scoring rules

Correct answers receive 1 point and incorrect ones 0 points. So the range of possible scores goes from 0, the lowest level of knowledge, to 20, for the highest.

3.1.3. Psychometric properties

No publications have been found which provide validity evidences or reliability indices.

3.1.4. Strengths and weaknesses

This is believed to be the first study designed to test the knowledge of elementary school teachers about ADHD. A great number of subsequent studies have used this questionnaire or been inspired by it due to its simplicity and that the fact that it was a pioneer in the field that concerns us here. Furthermore, the sample used is very broad and heterogeneous. However, the response format is dichotomous, so does not provide detailed information about the real knowledge the teachers have about ADHD. Furthermore, the psychometric properties of the questionnaire are not provided.

3.2. Knowledge of Attention Deficit Disorder Questionnaire (Riley, 1994) [26]

3.2.1. Description and development

This is an instrument drawn up in the United States and in the English language to investigate teachers', counselors' and principals' knowledge of ADHD in school age children. The instrument has two sections. The first is made up of six items that gather information of a socio-demographic character (sex, training, education experience, etc.) and a second made up of 35 items which evaluates participants' knowledge of ADHD. The 35 items were taken from the DSM-III: 15 related to Attention Deficit Disorder (ADD), 11 related to diagnostic criteria for Conduct Disorder (CD) and 9 that deal with Oppositional Defiant Disorder (ODD). Participants are asked to identify the 15 statements that best characterize children with ADHD with an X marking the space before each statement.

The instrument was applied to a stratified sample of 303 participants in the Kansas School district: 160 teachers, 61 principals and 82 counselors. 91 were male and 212 female. Hardly any other information is given about the sample.

3.2.2. Scoring standards

Correct answers to the items received 1 point, while the rest of the answers received 0 points. Thus, the possible scores ranged from 0, for the lowest level of knowledge, to 15, for the highest.

3.2.3. Psychometric properties

No publications have been found which provide validity evidences or reliability indices.

3.2.4. Strengths and weaknesses

This is a simple and easy instrument to apply. The problem is that the response format is similar to the dichotomous one and respondents can try to guess the right answer. Furthermore, the psychometric properties of the instrument are not known.

3.3. ADHD Knowledge Questionnaire (Barbaresi & Olsen, 1998) [21]

3.3.1. Description and development

This is an instrument developed in the United States and in the English language in order to examine the effectiveness of a training program on ADHD given to infant and primary school teachers. The questionnaire is based on the items produced by Jerome et al. [23] and consists of two sections: A first socio-demographic section and a second section consisting of 27 items that assess teachers' knowledge regarding ADHD. The response format of the instrument is dichotomous (True, False), and includes positive and negative items (the authors do not specify the number of positive and negative items).

The questionnaire was administered to 44 teachers, of whom 33 were women and 11 men. The mean age of participants was 42 years, and they had an average of 15 years of teaching experience. 66% were ordinary classroom teachers while the remaining 34% were specialists (art, music, physical education, etc.). They had an average of 24 students per teacher. 77% had not received any training on ADHD while being trained as teachers and 27% had received no training in the subject after completion of their studies.

3.3.2. *Scoring standards*

Correct answers received a score of 1 and incorrect ones 0. Thus, the possible scores ranged from 0, for the lowest level of knowledge, to 27, for the highest.

3.3.3. *Psychometric properties*

No publications have been found which provide validity evidences or reliability indices.

3.3.4. *Strengths and weaknesses*

This is a simple and easy instrument to apply. However, the sample is very small and the dichotomous response format (True/False) places limits on the possibility of assessing the real level of knowledge of the teachers as the absence of a third (Don't Know) option invites respondents to guess the right answer. Furthermore, the psychometric properties of the instrument are not known.

3.4. The Knowledge of Attention Deficit Disorders Scale (KADDS)

3.4.1. *Original version of The Knowledge of Attention Deficit Disorders Scale (KADDS) (Sciutto, Terjesen & Bender, 2000) [5]*

3.4.1.1. *Description and development*

It was developed in the United States and in the English language. This is one of the most widely used instruments to assess the level of knowledge of teachers regarding ADHD, and is the first instrument whose indices of reliability and validity were published in this field. It consists of 36 items, 18 positive and 18 negative, and measures three areas of knowledge related to ADHD: 1) Symptoms/Diagnosis of ADHD (9 items), 2) General information on the nature, causes and impact of ADHD (15 items), and 3) Treatment of ADHD (12 items). It has a three option response format (True, False, Don't Know), which allows it to overcome the limits of previously used dichotomous formats (True, False) and collect more detailed information about the knowledge of teachers with respect to ADHD. The use of the three option response format allows the authors to discern those areas in which teachers have more knowledge, areas where they have the least knowledge and the areas in which they commit the greatest number of errors.

In the drawing up of the items the authors strove to include only those with the support of the scientific literature, citing references for each item in the manual accompanying the in-

strument. They also sought to include positive and negative aspects relating to ADHD, and positive and negative statements in nature.

Once they had drawn up the items the authors contacted a group of 40 students working for doctorates in clinical and child psychology. The participants, based on the three sub-scales provided by the authors, had to assign each item to one of the sub-scales provided. An item was considered as belonging to a particular sub-scale if at least 75% of the group was in agreement with the decision.

The authors then conducted a series of preliminary investigations to explore the reliability coefficients of the instrument. They administered an instrument of 27 items with a dichotomous response format (True, False) to 73 teachers of kindergartens and elementary schools [27] and obtained a *Cronbach's alpha* of 0.38 for the total scale. In a subsequent study they modified the items that had an inadequate item-total correlation and incorporated the three option (True, False, Don't Know) response format. The resulting scale was administered to 46 undergraduate and graduate education students and the overall *alpha* coefficient obtained for this version was 0.71 [27]. Several items were reformulated and 9 new items were included in the final version of the instrument which now had 36 items and which Bender [28] administered to 63 prospective elementary teachers, obtaining a coefficient *alpha* of 0.81.

Finally, Sciutto et al. [5] administered the resulting 36 item scale along with a socio-demographic questionnaire (age, sex, teaching experience, teaching speciality, etc.) and a scale of seven points dealing with respondents' self-perception of their effectiveness as teachers of children with ADHD to a broader sample. 149 primary school teachers from six public schools participated in the validation of the instrument. The sampling procedure is not explained. There were 134 female and 9 male participants; the sex of six participants was not given. Their average age was 41 years ($SD=11.43$) and they had an average of 12.57 years of experience as teachers ($SD=8.06$). 19% of the sample were special needs teachers and 37% said they had done special needs teaching at some point. 79% of participants had a Master's degree, whereas the other 21% reported having a Bachelor's degree. With regard to ADHD, 52% of the teachers said that had taught at least one pupil who had been diagnosed with this condition.

It is worth pointing out that Sciutto and Terjesen [29] carried out an additional study on primary school teachers and university students in the state of Ohio to expand the reliability and the evidence of validity of KADDS. This study has not been published and no more data is available about the sample. However, the authors refer to this study along with the study Sciutto, Nolfi & Bluhm [30] carried out on primary school teachers with the KADDS manual.

3.4.1.2. Scoring standards

1 point was given for correct answers and 0 for incorrect ones and gaps in knowledge. Thus, the possible scores ranged from 0, for the lowest level of knowledge, to 36, for the highest.

3.4.1.3. Psychometric properties

For reliability analysis, internal consistency was first calculated, producing a *Cronbach's alpha* of 0.71 for each sub-scale and 0.86 for the scale as a whole. Furthermore, it was also seen that each KADDS sub-scale had a high correlation with the total KADDS score (range $r=0.85$ to $r=0.91$) and that there was a correlation between the three sub-scales (range $r=0.63$ to $r=0.69$). In order to analyze the stability of the scale, Sciutto and Terjesen [29] administered the KADDS in two occasions to a group of 185 university students (what they were students of is not stated) leaving an interval of two weeks between one application and the other. The test-retest correlations for the KADDS scores range between $r=0.59$ and $r=0.70$ for the three sub-scales and were $r=0.76$ for the scale as a whole.

No test was carried out on the factorial structure of the instrument. In order to find evidence of validity, the correlations between the scale scores and a series of variable related to the construct to be measured were examined. With regard to the previous exposure of teachers in their classrooms to pupils diagnosed with ADHD, statistically significant differences were found in the KADDS scores obtained ($p<0.01$), as well as in various sub-scales ($p<0.01$ for the General information and Symptoms/Diagnosis sub-scales). The same occurred with the university students who knew a person with ADHD. In the KADDS and the Treatment sub-scale they achieved significantly higher scores ($p<0.01$) than those that had no contact whatever with people with ADHD [29]. Furthermore the authors of the KADDS have pointed out that the scores obtained by the teachers on the scale correlated in a statistically significant and positive way with the number of ADHD students that had in their classes ($r=0.23$, $p<0.01$ for the New York sample and $r=0.31$, $p<0.01$ for the Ohio sample in the KADDS total) [5, 30]. In this case, the same phenomenon also occurred with the university students that had some kind of contact with people with ADHD ($r=0.18$, $p<0.01$ for the KADDS total) [29]. Finally, they found that people with more information about ADHD had higher KADDS scores, both in the case of teachers ($r=0.40$, $p<0.001$ for the KADDS total) [30] and in the case of university students ($r=0.36$, $p<0.001$ for the total KADDS score) [29].

3.4.1.4. Strengths and weaknesses

Considering that the validation of the KADDS was carried out mainly based on the study of Sciutto et al. [5], it should be emphasized that the sample used is fairly small in size and geographically homogenous. Furthermore, the specific data from the Ohio sample are not known [29].

The reliability of the KADDS was analyzed satisfactorily. As to evidence of validity, we believe that it could be improved but this is understandable considering it was the first instrument constructed to assess knowledge of teachers regarding ADHD whose psychometric properties have been published. The authors provide information on content validity, thanks to which it is known that they tried to be careful in their selection of test items but they do not provide detailed information about the construction of the instrument (number of items initially created, etc.), and the panel of experts consulted in the process for getting content validity was fairly homogeneous (students in the same doctoral program). Further-

more, there is no factorial analysis which would justify the sub-scales defended by the authors of the KADDS.

In any case we regard the instrument developed by Sciutto et al. [5] to be a significant reference point for any researcher trying to create one with a similar purpose because it was a pioneering effort in the field with good reliability and sufficient external validity. As well as that, it is an instrument that is easy to answer due to its brief and precise instructions, its small size and its three option response format. It is also worth mentioning that it has a simple scoring system and thanks to the aforementioned response format, it provides information regarding the knowledge, false beliefs and areas of lack of knowledge of the teachers, information which the previous instruments, with their dichotomous response format, could not provide.

3.4.2. The Spanish version of The Knowledge of Attention Deficit Disorders Scale (KADDS) (Jarque, Tárraga & Miranda, 2007) [4]

3.4.2.1. Description and development

This is the Spanish adaptation of the KADDS [5]. Like the original instrument it has 36 items, 18 positive and 18 negative, and it measures three areas of knowledge related to ADHD: 1) Symptoms/Diagnosis of ADHD (9 items), 2) General information on the nature, causes and impact of ADHD (15 items), and 3) Treatment of ADHD (12 items). The three option response format (True, False, Don't Know) is the same as that of the original instrument and it has a more extensive socio-demographic section than the original instrument (age, sex, years of experience as a teacher, teaching speciality, etc.).

In the first phase of the adaptation process of the instrument, two doctoral students in developmental and educational psychology translated KADDS into Spanish making the adjustments required for the new socio-cultural context. After that, native speakers of English translated the text back into English to test the validity of the original translation. In this second phase the authors found 18 words different from the original version and agreed on a final version of the translation of those words and drew up initial version of the instrument. The initial version was sent to 15 experts in ADHD (ADHD researchers and educational psychologists) who were asked to place each of the items on one of the three sub-scales that make up the instrument. The level of agreement on the assignment of items to the sub-scales was 94%. Finally, a pilot study was conducted on a sample of 35 primary school teachers who were asked to reply to the scale and indicate errata, difficulties to understand expressions or doubts that may have arisen during completion of the questionnaire. Corrections were made and the final version was thus produced.

For the analysis of reliability and validity of the final version of the instrument, the authors contacted various public and subsidized schools in the province of Valencia. The sampling was not random. The Spanish version of the KADDS was administered to 193 teachers, 68 from infant education and 125 from primary education, of whom 130 were women and 43 men (20 teachers did not specify their sex). They had a mean age of 42 years ($SD=11.40$), and an average of 17 years of teaching experience ($SD=12.03$). 13.8% were special education

teachers. 51.6% had received specific training on ADHD, with an average of 7.80 hours ($SD=17$) training. In addition, 59.1% of the teachers had had some experience teaching children with ADHD, and the average number of children with ADHD that they had in their classrooms during the previous two school years was 1.39 ($SD=1.89$).

3.4.2.2. Scoring standards

Identical to KADDS [5].

3.4.2.3. Psychometric properties

The reliability of the scale, measured by the *Cronbach's alpha* coefficient showed adequate internal consistency. The *alpha* coefficient ranged between 0.74 and 0.77 for the three sub-scales and was 0.89 for the total scale. These rates were higher than those obtained by Sciutto et al. [5] in the original instrument. In addition, each of the sub-scales showed a high correlation with the total scale score (range $r=0.85$ to $r=0.90$), and there also was correlation between the three sub-scales (range $r=0.62$ to $r=0.69$). These data are also consistent with those provided by Sciutto et al. [5]. There was no test-retest reliability check conducted.

The validity of the scale was studied using a series of *Pearson correlations* between teacher knowledge of ADHD and various socio-demographic variables, specifically, teachers' knowledge of ADHD correlated in a statistically significant way with the number of hours of training they had received, $r(152)=0.17$, $p=0.036$; with the number of children with ADHD they had taught, $r(180)=0.29$, $p=0.001$; with the number of courses during which they had children with ADHD in their classes, $r(172)=0.23$, $p=0.002$; and their self-perceived level of effectiveness as teachers of children with ADHD, $r(179)=0.50$, $p=0.001$.

3.4.2.4. Strengths and weaknesses

The sample used for the KADDS adaptation was quite small and geographically homogeneous. Also, test-retest reliability was not checked and the factorial structure of the scale was not analyzed. Apart from these weaknesses and those mentioned in the original version of KADDS, it should be noted that the instrument has adequate internal consistency and some evidence of external validity.

3.5. Attention-Deficit Hyperactivity Disorder Knowledge and Opinion Survey (AKOS-IV) – Knowledge Scale (Power & Rostain, 2003) [31]

3.5.1. Description and development

This instrument was developed in the United States in the English language and consists of 21 items, 8 positive and 13 negative with a dichotomous response format (True, False). The lead author of AKOS-IV participated in the development of different versions of the instrument. The first version was designed to analyze the level of knowledge among parents regarding ADHD [see 32]. There is a lack of published information about the second version. The third version was used to assess the level of knowledge that teachers of primary and

secondary education have regarding ADHD [33], and the fourth and final version [31] has not been published, so its target population is unknown.

3.5.2. Scoring standards

1 point was given for correct answers and 0 for incorrect ones and gaps in knowledge. Thus, the possible scores ranged from 0, for the lowest level of knowledge, to 21, for the highest.

3.5.3. Psychometric properties

No publications have been found which provide validity evidences or reliability indices.

3.5.4. Strengths and weaknesses

On the positive side, it should be noted that the questionnaire is short and simple to complete, but it uses a response format with two options (True, False) which can lead to a bias in the collection of information as those subjects who did not know what to answer are required to choose one of the two alternatives provided. In addition, there is a lack of published information relating to the development of the instrument and its psychometric properties.

3.6. Attention Deficit Hyperactivity Disorder and Stimulant Medication Survey (Snider, Busch & Arrowood, 2003) [34].

3.6.1. Description and development

This is an instrument developed in the United States in the English language and it is aimed at primary school and special education teachers. Its aim is to test their knowledge of the nature of ADHD and its treatment through stimulant medication. The questionnaire is divided into six sections. The first consists of 8 socio-demographic items: The number of students the teacher has, the number of students diagnosed with ADHD, years of teaching experience, etc. The second section is made up of 47 Likert scale items with 5 options (1=Strongly Disagree, 2=Disagree; 3=Neutral/Don't know, 4=Agree, 5=Strongly Agree) divided into three blocks: A first block of 13 items to assess factual knowledge about ADHD and the use of stimulant medication, a second block of 23 items that asked participants to indicate their views about the effects of stimulant medication on classroom behavior, and a third block of 11 items assessing teachers' experience and involvement with students who have ADHD. In the third section the subjects have to state which sources they regard as most reliable for obtaining information about ADHD. In the fourth section they had to state which people usually recommend that children suspected of having ADHD be evaluated by. In the fifth section the teachers are asked about what teaching techniques they have most frequently used for dealing with children with ADHD. In the sixth and final section, there is an open question which enquires about teachers' opinions regarding the use of stimulant medication for the treatment of students with ADHD.

The pilot version was administered to 15 teachers participating in a graduate clinical experience at the University of Wisconsin. Small changes were made in the wording of the items and it was confirmed that the time required to respond to the questionnaire was about 10 to 15 minutes.

The definitive version of the questionnaire was administered to 145 teachers in Wisconsin, 29 women and 116 men. The subjects were randomly chosen from the Department of Public Instruction. Among the participants 43% were special education teachers and 30% general education teachers. The teachers had an average of 16.5 years of teaching experience ($SD=9.46$).

3.6.2. Scoring standards

Not provided.

3.6.3. Psychometric properties

No publications have been found which provide validity evidences or reliability indices.

3.6.4. Strengths and weaknesses

On the positive side, it should be noted that this is a questionnaire with clear instructions and is easy to fill out. However, the response format used by the authors (Likert 5 options) may complicate the interpretation of the results, since it offers the option to partially agree or disagree with the questionnaire items. Moreover, the sample used for the application of the instrument was small and geographically homogeneous, and the psychometric properties of the instrument are not known. Finally, it should be noted that one of the main objectives of the questionnaire was to analyze teachers' knowledge of stimulant medication, a very specific purpose and one distinct from the object of study of the other questionnaires that have been examined in this chapter.

3.7. Attention Deficit Hyperactivity Disorder (ADHD) Questionnaire (Kos, Richdale & Jackson, 2004) [20]

3.7.1. Description and development

This instrument was drawn up in Australia in the English language to test the perceived and real knowledge of primary teachers and trainee teachers of ADHD. Section b) of the questionnaire was drawn up to examine this main point and contains some items from Jerome et al. [23], Sciutto et al. [5] and another series of items taken from the scientific literature related to ADHD. The instrument was made up of 131 items divided into six sections. Section a) collects information on socio-demographic aspects of the sample and included an analog scale of 10 cm on which respondents had to indicate what they thought they knew about ADHD. The bottom end of this scale indicates the minimum level of knowledge (Very Little), while the upper level indicates the maximum level (A Lot). Section b) includes 27 items, 11 positive and 16 negative, with a three option response format (True, False, Don't know)

drawn up to assess respondents real knowledge of ADHD. Section c) has a focus on identifying the teaching strategies which subjects might use with pupils with ADHD. For this purpose they were given a brief description of a practical case and a series of multiple choice and open questions. Section d) collects information about participants' beliefs about ADHD and the possibility of having pupils with it in their classes. For this purpose it had 31 items which required a response on an analog scale of 10 cm the bottom of which indicated complete agreement with the statement (Strongly Agree) and the top of which indicated complete disagreement (Strongly Disagree). Section e) was designed to evaluate beliefs regarding the different strategies for action possible in classes with pupils with ADHD. It has 56 items divided into various sub-sections to which respondents had to respond on 10 cm analogical scales the bottom ends of which indicated complete agreement (Strongly Agree) and the upper ends of which indicated complete disagreement (Strongly Disagree). Finally, section f) includes two multiple choice items to which subjects have to respond regarding whether or not they want more training on ADHD and to specify the way they believe most appropriate to find out more about ADHD.

The questionnaire was revised by two educational and developmental psychologists not associated with the study. It was later piloted on a sample of 9 primary school teachers from Victoria (Australia), arising from which no change was made. The questionnaire was finally administered to 120 primary school teachers in Victoria, 91 women and 29 men with an average age of 39.2 years ($SD=10.2$), and 45 students in the last year of their education degree, all women and with an average age of 23.6 years ($SD=5.6$). The sampling procedure was not explained.

3.7.2. *Scoring standards*

Section b) of the questionnaire had 27 items. Correct responses received a score of 1 and incorrect ones, 0. Thus, the possible scores ranged from 0, for the minimum level of knowledge, to 27, for the maximum level. The scoring standards for the other sections were not given.

3.7.3. *Psychometric properties*

No publications have been found which provide validity evidences or reliability indices.

3.7.4. *Strengths and weaknesses*

On the positive side, it should be noted that the authors have attempted to develop an instrument that collects a variety of information relating to ADHD. However, the instrument has many weaknesses: The sample used is quite small and geographically homogeneous, the information given relating to the development of the instrument is scant, the presentation of the items and response formats vary from one section to another, and there are questions with 34 possible answers and analog scales of 10 cm which make it difficult to interpret the response provided by the subject. In short, it is a long and complex questionnaire for the subject. Additionally, the psychometric properties are not known.

3.8. Knowledge of ADHD Rating Evaluation (KARE) (Vereb & DiPerna, 2004) [35]

3.8.1. Description and development

This instrument was developed in the United States and in the English language. Its purpose is to analyze the knowledge that elementary school teachers have about ADHD and assess their level of acceptance with respect to the medication and behaviorist treatments that are used with children with ADHD. The instrument is divided into three sections. The first section collects socio-demographic data. The second section consists of 43 items, positive and negative in nature (the authors do not specify the number of each), and is divided into two sub-scales: A first sub-scale assesses knowledge of the etiology, symptoms and prognosis of ADHD (31 items), and a second sub-scale assesses knowledge about treatments that are used most frequently in ADHD cases (12 items). The third and final section consists of 10 items divided into two sub-scales: The first sub-scale assesses the level of acceptance that subjects presented with respect to medication (5 items), and the second sub-scale assesses the level of acceptance of the behavioral intervention guidelines used with children with ADHD (5 items). The second section of the instrument has a response format of three options (True, False, Don't Know) and the third section, being an opinion section, has a Likert-type response format of 4 options (1=Not at all Likely, 2=Somewhat Likely, 3=Moderately Likely, 4=Very Likely).

The preliminary version of the instrument was made up of 59 items. 20 experts, members of the International Society for Research in Child and Adolescent Psychopathology who had conducted research in the area of ADHD and/or treatment acceptability were called upon to revise it. The items that received a negative evaluation from these experts were modified or removed.

Finally, the study was carried out on 47 elementary school teachers in five different districts of Pennsylvania and New Jersey. The sampling procedure was not specified. 94% of the sample was female and had an average of 13 years of teaching experience ($SD=8.76$). 85% of the teachers were general teachers, while 4.35% worked in special education and 10.6% worked in both areas.

3.8.2. Scoring standards

In the second section of the instrument 1 point was given for correct answers and 0 for incorrect ones and gaps in knowledge. Thus, the possible scores ranged from 0, for the lowest level of knowledge, to 43, for the highest. The scoring standards for the third section of the questionnaire are unknown.

3.8.3. Psychometric properties

For the reliability analysis, the internal consistency was first calculated, obtaining a *Cronbach's alpha* coefficient that ranged from 0.58 (Knowledge of treatments sub-scale) to 0.81 (Behavioral management acceptability sub-scale) for the four sub-scales in the questionnaire.

In order to analyze the stability of the instrument, the authors administered the KARE a second time to a sample of 24 subjects (without further details being given of the sample) with a time interval of four weeks between the first and the second administration. The test-retest reliability ranged from 0.76 (Behavioral management acceptability sub-scale) to 0.80 (Medication acceptability and Knowledge of treatment sub-scales).

No publications have been found which provide validity evidences.

3.8.4. Strengths and weaknesses

On the positive side, it should be noted that this is a not too long instrument with response formats that are easy to fill out. It also has an acceptable internal consistency for three of the four subs-scales that compose it, and has good test-retest stability. However, the sample used for obtaining the reliability indices is small, and no published validity evidences of the instrument have been found.

3.9. Educator ADHD knowledge (Niznik, 2004) [36]

3.9.1. Description and development

This instrument was drawn up in the United States in the English language. The main purpose of it is to assess the level of knowledge of elementary school teachers regarding ADHD before and after they received a specific training program on the subject. The instrument consists of 23 items and has a multiple choice format: Each item is followed by five possible answers, one correct and four distractors.

In the course of its development process, the instrument was administered to 10 doctors working as psychologists in the Cypress-Fairbanks school district (Texas) to receive their feedback. Adjustments have been made for a better understanding of the items and response options (the authors did not provide further details). The test authors also conducted a pilot study with 133 participants (no further description were given of the sample), as a result of which a number of items were removed.

The resulting instrument was administered to 47 elementary school teachers in the Cypress-Fairbanks school district. 91.5% of the participants were female and 8.5% male. 55.3% of them were general teachers while 44.7% were special education teachers. The age of the teachers ranged from 18 upwards, and they had an average of 11 years teaching experience. 30% of the sample had never received training about ADHD, and 95.7% had a child in their classroom with the disorder diagnosed in recent years.

3.9.2. Scoring standards

1 point was given for each correct answer so the possible scores ranged from 0, for the lowest level of knowledge, to 23, for the highest level.

3.9.3. Psychometric properties

The reliability of the instrument was calculated using the *Kuder-Richardson formula 20*, and a reliability of 0.65 was obtained. No publications have been found that provide validity evidences.

3.9.4. Strengths and weaknesses

On the positive side, it should be noted that this is a not too long instrument with a novel response format in the field that concerns us. However, the authors provide few details about the construction process of the test, the sample that has been used with the final instrument is quite small and homogeneous, and has a low reliability index. Furthermore, the validity evidences of the instrument were not provided.

3.10. The knowledge about Attention Deficit Disorder Questionnaire (KADD-Q) (West, Taylor, Houghton & Hudyma, 2005) [6]

3.10.1. Description and development

This is an instrument that was drawn up in Australia in the English language in order to assess the knowledge about ADHD of primary and secondary teachers and parents of children with the same condition. It consists of a scale of 67 items, constructed on the basis of 20 items from the KADDS [5]. It has a three option response format (True, False, Don't Know) and measures three areas of knowledge connected to ADHD: 1) Causes of ADHD, 2) Characteristics of ADHD, and 3) Treatment of ADHD. Like the KADDS scale it has positive and negative items, and for the drawing up of which the authors made efforts to use only those items with support in the scientific literature.

The KADD-Q authors obtained the sample needed for the analysis of reliability and validity of the scale by making a random selection of schools in metropolitan Perth (Western Australia) and by way of the Centre for Attention and Related Disorders of The University of Western Australia. The sample consisted of 348 participants: 256 teachers (51% primary and 43% secondary) and 92 parents. Of the teachers involved in the sample, 22% were male and 78% female. 180 teachers were recruited in their workplaces and had an average of 20.2 years ($SD=10.3$) of teaching experience, the remaining 76 teachers were recruited through the Centre for Attention and Related Disorders, and had an average amount of teaching experience of 15.8 years ($SD=10$). 96% of teachers said they had a student with ADHD in the classroom at some point and 20% were qualified in special education. As for the group of 92 parents participating in the study, it should be noted that 8% were male and 92% female. In addition, the average age at which their child had been diagnosed with ADHD was 10.3 years ($SD=3.1$). 23% of the parents were attending a support group for parents of children with ADHD and 31% had attended informational seminars about ADHD in the preceding 12 months.

3.10.2. Scoring standards

In the SPSS statistical package correct answers were coded with a 1, incorrect ones with a 0, and the gaps as a missing value. Possible answers ranged from 0, for the minimum level of knowledge, to 67, for the maximum level.

3.10.3. Psychometric properties

The reliability of the KADD-Q and its sub-scales was estimated using *Cronbach's alpha* coefficient. The results suggest that the internal consistency of the KADD-Q is high for the sample of teachers ($\alpha=0.91$) and parents ($\alpha=0.93$). For the sub-scales Causes, Characteristics and Treatment, α s obtained were of 0.86, 0.80 and 0.79 for teachers and 0.85, 0.84 and 0.84 for the parents, respectively. In addition, each of the sub-scales of the KADD-Q had a high correlation with the total scale score (range $r=0.73$ to 0.92) in both the sample of teachers and parents. There were moderate correlations between the three sub-scales of teachers in the sample (range $r=0.34$ to 0.56), and somewhat ones higher in the sample of parents (range $r=0.56$ to 0.77). There was no test re-test reliability conducted.

Convergent validity was not evaluated, nor was any test of the factorial structure of the instrument made. The scale authors present data on a series of relationships that exist between the scale scores and several variables related to the construct they purport to measure, which provide certain information concerning the external validity. The level of teachers' knowledge about ADHD was significantly higher depending on the stage of their profession they were at. Primary school teachers obtained higher scores than their secondary education colleagues ($p=0.001$). Teachers who had attended to professional development sessions about ADHD in the previous 12 months and those who had specific training in special education had higher scores on the scale ($p<0.001$ and $p=0.024$, respectively).

3.10.4. Strengths and weaknesses

On the positive side, it is noteworthy that the authors of KADD-Q have tried to create a single instrument to assess the knowledge of teachers in primary and secondary education and the parents of children with ADHD. This instrument has an easily completed response format and has good internal consistency. However, the teachers and parents samples used for the study were small and geographically homogeneous, the information relating to the development of the instrument is scant, the instrument lacks test-retest reliability indices, evidence of convergent validity is not provided, and nor is there any factorial analysis to confirm the presence of the three sub-scales of the instrument. To all this must be added the fact that data concerning the external validity of the instrument are scarce.

3.11. Teacher knowledge about ADHD (Jones & Chronis-Tuscano, 2008) [24]

3.11.1. Description and development

This instrument was drawn up in the United States and in the English language for the purpose of assessing teachers' knowledge of ADHD after they have receiving training related to

it. It consists of 25 items with a dichotomous response format (True, False). The items were designed to cover six areas of content: 1) Causes of ADHD, 2) Assessment of ADHD, 3) ADHD sub-types, 4) Associated problems of ADHD, 5) Treatment of ADHD, and 6) Specific school-based behavioral strategies for children with ADHD.

The questionnaire was administered to a non-random sample of 142 elementary school teachers in the Washington DC metropolitan area, of whom 74 belonged to the experimental group receiving training in ADHD and the remaining 68 to a control group that did not receive such training. The average age of all participants in the sample was about 37 years ($SD=12.45$) and they had an average amount of teaching experience of 11.34 years ($SD=10.40$). 92% were women and only 17% were special education teachers. Approximately 34% of the sample had had experience of a child with ADHD in their classroom.

3.11.2. Scoring standards

1 point was given for correct answers and 0 for incorrect ones, so the range of possible scores went from 0, for the lowest possible level, to 25, for the highest possible level.

3.11.3. Psychometric properties

Internal consistency scores were 0.68 and 0.97 before and after training, respectively. No publications have been found which provide validity evidences of the instrument.

3.11.4. Strengths and weaknesses

On the positive side, it should be noted that the questionnaire is short and easy to fill out. However, it uses a dichotomous response format which prevents information being collected about the areas where the teachers' lack of knowledge is concentrated. Furthermore, information about the validity of the instrument is not available.

3.12. Questionnaire to Assess Teachers' Knowledge about ADHD

3.12.1. *Basque language version of the Questionnaire to Assess Teachers' Knowledge about ADHD (Irakasleek AGHNari buruz duten ezagutza ebaluatzeko galdera-sorta – IRA-AGHN) (Soroa, Balluerka & Gorostiaga, unpublished)*

3.12.1.1. Description and development

This is a newly developed questionnaire produced in Spain in the Basque language and which has yet to be published. Its purpose is to assess the knowledge of infant and primary school teachers about ADHD. It is divided into two sections. The first collects socio-demographic data (age, sex, teaching speciality, teaching experience, etc.) as well as data on the perceived knowledge of teachers of ADHD and their perceived capacity to teach children suffering from this condition. The second section assesses their real knowledge of these matters with 26 items that use a three option response format (True, False, Don't Know). The questionnaire items, 21 positive and 5 negative, assessed four areas of knowledge related to

ADHD: 1) General information about ADHD (4 items), 2) Symptoms/Diagnosis of ADHD (11 items), 3) Etiology of ADHD (4 items), and 4) Treatment of ADHD (7 items). The questionnaire items were developed from an extensive review of the literature on ADHD.

To obtain data on content validity, the authors of the instrument sought the cooperation of 8 experts in ADHD (university lecturers from different fields of knowledge and clinical or educational psychologists). Thanks to their participation the initial questionnaire of 105 items was reduced to 76 which were distributed into their corresponding sub-scales of the questionnaire when there was an agreement level of 70% among the experts. Subsequently, a pilot study was conducted on 98 infant and primary school teachers in the Autonomous Community of the Basque Country and Navarre. 83 participants were women and 15 men, with a mean age of 40 years ($SD=9.8$). They had an average of 15 years ($SD=10$) in the teaching profession, 50.5% had never received training about ADHD, and 47% said they had experience of having a child with ADHD in their classroom. 86% were infant education specialists or primary teachers and 8% were special education teachers. Thanks to the participation of these teachers, the authors of the questionnaire selected those items with high discrimination power and revised the wording of 6 statements, obtaining a preliminary instrument of 51 items.

The draft instrument was finally applied to a sample of 752 infant and primary education teachers in 84 schools in the Autonomous Community of the Basque Country and Navarre. The schools were randomly selected. 86% of participants were female and 14% male, with a mean age of 42 years ($SD=9.68$). They had an average of 17 years ($SD=10.55$) experience as teachers, 80% were infant and primary teachers and 12% special education teachers. 59% said they never received training about ADHD, and 54% stated that they had had experience of children with ADHD during their careers. The final instrument of 26 items as described earlier in this section was thus obtained.

3.12.1.2. *Scoring standards*

1 point was given for each correct answer and 0 for incorrect ones and gaps in knowledge. Thus, the possible scores ranged from 0, for the minimum level of knowledge, to 26, for the highest level.

3.12.1.3. *Psychometric properties*

With the purpose of selecting the final items for the IRA-AGHN, a factor analysis with oblique rotation was carried out. Items with a factor loading equal to or greater than .35, and which adequately reflected the underlying construct, were selected. Using the 26 selected items, the dimensionality of the instrument was examined by means of an exploratory factor analysis based on polychoric correlations. The Unweighted Least Squares (ULS) estimation method was used. Kaiser procedure was used to decide the number of factors, and the Direct Oblimin rotation method was selected in order to simplify the factor structure. The resulting structure confirmed the multi-dimensional character of the construct. Four factors were obtained which explained 53.2% of the variance: The first factor, Etiology of ADHD,

explained 29.15% of the variance; the second factor, Symptoms/Diagnosis of ADHD, explained 9.8% of the variance; the third factor, General information about ADHD, explained 7.8% of the variance; and the fourth and final factor, Treatment of ADHD, explained 6.4% of the variance.

For the reliability analysis, the internal consistency was first calculated, with an *Omega* coefficient which ranged from 0.76 to 0.90 being obtained for the four sub-scales. For the purpose of analyzing the stability of the instrument the authors administered the IRA-AGHN a second time to a sample of 123 teachers with a period of four weeks between the first and second administration. The *Spearman's Rho* test-retest correlations for the IRA-AGHN scores ranged from $r=0.49$ to $r=0.77$ ($p<0.01$) for the four sub-scales.

Convergent validity was tested by comparing the results obtained by the subjects in the IRA-AGHN with the results obtained in the Spanish version of the KADDS [4]. The correlation between the scores obtained by the subjects in the dimensions shared by both questionnaires was $r=0.54$ for the General information sub-scale, $r=0.45$ for the Symptoms/Diagnosis sub-scale and $r=0.33$ for the Treatment sub-scale ($p<0.01$ in all cases).

Finally, to obtain evidence of external validity, the relationships between the scores obtained by the participants in the IRA-AGHN sub-scales and a series of variables related to the construct that it was sought to measure were examined. The data showed that the scores obtained by the teachers in the Symptoms/Diagnosis sub-scale had a moderate correlation with variables such as the number of children diagnosed with ADHD the teachers had taught in the course of their careers ($r = .29$, $p = .001$), the teachers' perceived knowledge of ADHD ($r = .37$, $p = .001$), and the teachers' perceived capacity to teach effectively children with ADHD ($r = 0.30$, $p = 0.001$). Meanwhile, it was observed that the scores obtained by the teachers in the General information sub-scale showed a moderate correlation with the teachers' perceived knowledge of ADHD variable ($r = .30$, $p = .001$). In addition, using the Mann-Whitney U test a comparison was drawn between the average score ranges obtained by teachers who had taught children diagnosed with ADHD in the course of their careers and those who hadn't. Results showed that there were statistically significant differences between the groups' mean score ranges in the Symptoms/Diagnosis sub-scale (*Mann-Whitney U test* = 44503; $p = .0001$; $r = .29$).

3.12.1.4. Strengths and weaknesses

On the positive side, it should be noted that this is a short questionnaire and easy to complete with a three option response format (True, False, Don't Know), and that it successfully evaluates teachers' knowledge, false beliefs and areas of lack of knowledge regarding ADHD. The sample used for the validation of the instrument is geographically diverse and extensive, being representative of the target population for the questionnaire. The instrument development process was thorough and rigorous, and has appropriate psychometric properties, although evidence of external validity is not supported by high levels of correlation.

3.12.2. Spanish version of the Questionnaire to Assess Teachers' Knowledge about ADHD (Cuestionario para evaluar el conocimiento de los maestros acerca del TDAH – MAE-TDAH) (Soroa, Balluerka & Gorostiaga, unpublished)

3.12.2.1. Description and development

This is a questionnaire recently produced in Spain in the Spanish language and which has yet to be published. The description is the same as that for the above mentioned version of the instrument in the Basque language.

To obtain evidence of content validity, the authors of the instrument sought the cooperation of 8 experts in ADHD (university lecturers from different fields of knowledge, child and youth psychiatrists, pediatricians, one educational psychologist and one education expert who are members of various associations of families of children with ADHD). Thanks to their participation, the initial questionnaire of 105 items was reduced to 76 items that were distributed in the corresponding sub-scales of the questionnaire with the agreement of at least 70% of the judges. Subsequently, a pilot study was conducted on 68 infant and primary school teachers in the Autonomous Community of the Basque Country and Navarre. 53 participants were women and 15 men, with a mean age of 43 years ($SD=10.87$). They had an average of 18 years ($SD=11.67$) in the teaching profession, 47% had never received training regarding ADHD, and 73% said they had a child diagnosed with ADHD in their classroom at some point in their career. 73% were infant or primary school teachers, and 15% were special education teachers. Thanks to the participation of these teachers, the authors of the questionnaire selected those items with high discrimination power and revised the wording of two of the statements, obtaining a preliminary instrument of 51 items.

Finally, the draft instrument was applied to a sample of 526 infant and primary school teachers in 57 schools in the Autonomous Community of the Basque Country and Navarre. The schools were randomly selected. 85% of participants were female and 15% male, with a mean age of 43 years ($SD=10.89$). They had an average of 17 years ($SD=11.31$) experience as teachers, 77% were infant or primary teachers and 11% were special education teachers. 56% said they had never received training regarding ADHD, and 67% stated that they had a child diagnosed with ADHD in their classroom at some point in their career. From this study the final 26 items instrument was obtained.

3.12.2.2. Scoring standards

Identical to those in the Basque language version of the questionnaire.

3.12.2.3. Psychometric properties

With the aim of selecting the final items for the MAE-TDAH, a factor analysis with oblique rotation was carried out. Items with a factor loading equal to or greater than .35, and which adequately reflected the underlying construct, were selected. Using the 26 selected items, the dimensionality of the instrument was examined by means of an exploratory factor analysis based on polychoric correlations. The Unweighted Least Squares (ULS) estimation meth-

od was used. Kaiser procedure was used to decide the number of factors, and the Direct Oblimin rotation method was selected in order to simplify the factor structure. The resulting structure confirmed the multi-dimensional character of the construct. Four factors were obtained which explained 60.73% of the variance: Etiology of ADHD explained 34.04% of the variance, General information about ADHD explained 12.14% of the variance, Treatment of ADHD explained 8.92% of the variance, and the fourth and final factor, Symptoms/Diagnosis of ADHD, explained 5.6% of the variance.

For reliability analysis, the internal consistency was first calculated and an *Omega* coefficient which ranged from 0.83 to 0.91 for four sub-scales was obtained. In order to analyze the stability of the instrument, the authors administered the MAE-TDAH a second time to a group of 112 teachers four weeks after the first application. The *Spearman's Rho* test-retest correlations for the MAE-TDAH scores ranged from $r=0.62$ to $r=0.79$ ($p<0.01$) for the four sub-scales.

Convergent validity was tested by comparing the results obtained by the subjects in the MAE-TDAH with the results obtained in the Spanish version of KADDS [4]. The correlations observed between the scores obtained by the subjects in the dimensions shared by both questionnaires were $r=0.58$ for the General information sub-scale, $r=0.43$ for the Symptoms/Diagnosis sub-scale, $r=0.30$ for the Etiology and $r=0.39$ for the Treatment sub-scale ($p<0.01$ in all cases).

In order to find evidence of external validity the authors of the MAE-TDAH examined the correlations between the questionnaire scores and a series of variables related to the construct it was sought to measure. Significant statistical differences were found between the teachers' perceived knowledge of ADHD and the scores they obtained for all the sub-scales of the questionnaire ($r=0.38$ for General information, $r=0.37$ for Symptoms/Diagnosis, $r=0.30$ for Etiology and $r=0.31$ for Treatment; $p=0.001$ for all cases), as well between the teachers perceived capacity to effectively teach children with ADHD and the scores obtained in the sub-scales General information and Symptoms/Diagnosis of ADHD ($r=0.29$, $p=0.001$ and $r=0.30$, $p=0.001$, respectively).

3.12.2.4. Strengths and weaknesses

These are similar to those set out regarding the Basque language version of the questionnaire. The main difference is that in this case the sample used for the validation of the questionnaire was quite homogenous as it was confined to two autonomous communities of the Spanish state.

4. Conclusions

In the review that has been carried out in this chapter, it has been observed that there exist a great number of tools that have been developed to assess the level of knowledge of teachers regarding ADHD. However, most of them do not have good psychometric properties. The authors of this chapter consider necessary to develop and validate instruments with psycho-

metric properties to measure teachers' knowledge of ADHD with rigor. These instruments, in addition to identifying gaps in teachers' knowledge of the disorder, can be useful in raising the awareness of teachers about the need for more training in this area, help in the design of training tailored to the needs of teachers, and ultimately, promote the welfare of children and young people with ADHD.

This lack of methodological rigor in these measurement instruments may cause the obtaining of erratic and false results. With regard to the measurement instruments used to assess teachers' knowledge of ADHD it can be seen that this knowledge varies among the studies examined here. This variability may, in part, be due to an increase in teachers' knowledge of ADHD over recent decades but it might also be due to methodological reasons such as the following: The number and content of the items in the various instruments varies; the response formats also differ and this affects the results; the size of the samples also varies considerably, in some cases being very big and in others quite small; different studies have collected different socio-demographic data from their sample, which affects the description made of it and the interpretations which might be made of the reasons for the knowledge teachers have about ADHD. All these aspects should be taken into account when it comes to interpreting, comparing and generalizing the results obtained from these instruments.

Regarding the dimensionality of the instruments analyzed here, it should be noted that five of the twelve (KADDS [4, 5], KARE [35], KADD-Q [6], Teacher Knowledge About ADHD [24], and IRA-AGHN/MAE-TDAH) used a number of dimensions ranging from 2 to 6 for the assessment of teachers knowledge of ADHD. It can be seen that Treatment is the only common to all the instruments. In general, the various dimensions proposed by the authors deal with the symptoms, sub-types, associated problems, evaluation, prognosis and etiology of ADHD. However, it should be noted that only one of the instruments reviewed, the IRA-AGHN/MAE-TDAH conducted a factor analysis to confirm the multidimensional nature of the construct.

Furthermore, the external validity of the instruments analyzed provides information about the variables that can influence the knowledge that teachers have regarding ADHD. Three of the twelve instruments reviewed (KADDS [4, 5], KADD-Q [6], and IRA-AGHN/MAE-TDAH) provide evidence of external validity. If we focus on those variables that have relationships with knowledge about ADHD with effect size equal to or greater than 0.30 in any of the instruments, it can be concluded that the variables that correlated with teachers' knowledge about ADHD are: Prior exposure of teachers to children diagnosed with ADHD in the classroom, the number of children with ADHD teachers have had in their classrooms, having had specific training about ADHD, the degree of teachers' self-perceived efficacy in teaching children with ADHD and teachers' self-perceived knowledge of ADHD.

Finally, it should be pointed out that we consider the present chapter to be of interest because it provides an exhaustive review of the main instruments identified in the scientific literature to assess teachers' knowledge of ADHD. The identification of instruments with optimal psychometric properties is fundamental because it allows for the obtaining of valid and reliable data about the construct being studied. With regard to teachers' knowledge of ADHD it has been shown that there exist a significant percentage of teachers with gaps in

this area [3-7, 19, 20]. For this reason, we believe that the use of instruments which measure this knowledge with rigor could contribute to devising of training materials and courses appropriate for the needs of teachers. And this would, of course, result in benefits for the children who suffer from this condition.

Acknowledgements

The authors appreciate the cooperation of all those authors who provided additional information about the assessment instruments examined in this chapter.

This work was partially funded by a grant from the Research Bureau of the University of the Basque Country UPV/EHU (General Funding for Research Groups, GIU11/29).

Author details

Marian Soroa¹, Arantxa Gorostiaga² and Nekane Balluerka²

*Address all correspondence to: marian.soroa@ehu.es

1 Developmental and Educational Psychology Department, University Teacher Training College of Donostia of the UPV/EHU, Donostia-San Sebastián, Spain

2 Social Psychology and Methodology of the Behavioral Sciences Department, Psychology Faculty of the UPV/EHU, Donostia-San Sebastián, Spain

References

- [1] Lavigne, R. & Romero, J. F. (2010). El TDAH: ¿Qué es?, ¿qué lo causa?, ¿cómo evaluarlo y tratarlo?. Madrid: Pirámide.
- [2] Canu, W. H. & Mancil, E. B. (2012). An Examination of Teacher Trainees' Knowledge of Attention-Deficit/Hyperactivity Disorder. *School Mental Health*, 4, 105-114.
- [3] Ghanizadeh, A., Bahredar, M. J., & Moeini, S. R. (2006). Knowledge and attitudes towards attention deficit hyperactivity disorder among elementary school teachers. *Patient Education and Counselling*, 63, 84-88.
- [4] Jarque, S., Tárraga, R., & Miranda, A. (2007). Conocimientos, concepciones erróneas y lagunas de los maestros sobre el trastorno por déficit de atención con hiperactividad. *Psicothema*, 19(4), 585-590.

- [5] Sciutto, M. J., Terjesen, M. D., & Bender, A. S. (2000). Teachers' knowledge and misperceptions of Attention-Deficit/Hyperactivity Disorder. *Psychology in the Schools*, 37, 115-122.
- [6] West, J., Taylor, M., Houghton, S., & Hudyma, S. (2005). A Comparison of Teachers' and Parents' Knowledge and Beliefs About Attention-Deficit/Hyperactivity Disorder (ADHD). *School Psychology International*, 26(2), 192-208.
- [7] White, S. W., Sukhodolsky, D. G., Rains, A. L., Foster, D., McGuire, J. F., & Scahill, L. (2011). Elementary School Teachers' Knowledge of Tourette Syndrome, Obsessive-Compulsive Disorder, & Attention-Deficit/Hyperactivity Disorder: Effects of Teacher Training. *Journal of Developmental and Physical Disabilities*, 23, 5-14.
- [8] Barkley, R. A. (2005). Prólogo. In I. Moreno, *El niño hiperactivo* (pp. 13). Madrid: Pirámide.
- [9] Soroa, M., Balluerka, N., & Gorostiaga, A. (2012). Evaluation of the level of knowledge of infant and primary school teachers with respect to the Attention Deficit Hyperactivity Disorder (ADHD): Content validity of a newly created questionnaire. In J. M. Norvilitis (Ed.), *Contemporary trends in ADHD research* (pp. 127-152). Rijeka: InTech. (available from: <http://www.intechopen.com/articles/show/title/evaluation-of-the-level-of-knowledge-of-infant-and-primary-school-teachers-with-respect-to-the-atten>)
- [10] American Psychiatric Association (APA, 2000). *Diagnostic and statistical manual of mental disorders* (4th. ed.). Washington: Author text revision.
- [11] Barkley, R. A. (1999). *Niños hiperactivos: Cómo comprender y atender sus necesidades especiales*. Barcelona: Paidós.
- [12] Moreno, I. & Servera, M. (2002). Intervención en los trastornos del comportamiento infantil. In M. Servera (Coord.), *Los trastornos por déficit de atención con hiperactividad* (pp. 217-253). Madrid: Pirámide.
- [13] Moreno, I. (2008). *Hiperactividad infantil: Guía de actuación*. Madrid: Pirámide.
- [14] Ohan, J. L., Cormier, N., Hepp, S. L., Visser, T. A. V., & Strain, M. C. (2008). Does Knowledge About Attention-Deficit/Hyperactivity Disorder Impact Teachers' Reported Behaviors and Perceptions?. *School Psychology Quarterly*, 23, 436-449.
- [15] Sherman, J., Rasmussen, C., & Baydala, L. (2008). The impact of teacher factors on achievement and behavioural outcomes of children with Attention Deficit/Hyperactivity Disorder (ADHD): A review of the literature. *Educational Research*, 50(4), 347-360.
- [16] Kos, J., Richdale, A. L., & Hay, D. A. (2006). Children with Attention deficit Hyperactivity Disorder and their Teachers: A review of the literature. *International Journal of Disability, Development and Education*, 53(2), 147-160.

- [17] Barkley, R. A. (2006). *Attention deficit hyperactivity disorder: A handbook for diagnosis and treatment*. (3rd. ed.). New York: Guilford Press.
- [18] Bekle, B. (2004). Knowledge and attitudes about Attention-Deficit Hyperactivity Disorder (ADHD): A comparison between practicing teachers and undergraduate education students. *Journal of Attention Disorders*, 7(3), 151-161.
- [19] Graczyk, P. A., Atkins, M. S., Jackson, M. M., Letendre, J. A., Kim-Cohen, J., Baumann, B. L., & McCoy, J. (2005). Urban Educators' Perceptions of Interventions for Students with Attention Deficit Hyperactivity Disorder: A Preliminary Investigation. *Behavioral Disorders*, 30(2), 95-104.
- [20] Kos, J. M., Richdale, A. L., & Jackson, M. S. (2004). Knowledge about Attention-Deficit/Hyperactivity Disorder: A comparison of in-service and preservice teachers. *Psychology in the Schools*, 41(5), 517-526.
- [21] Pfiffner, L. J. (1999). Potenciar la educación en la escuela y en casa: métodos para el éxito desde párvulos hasta el bachillerato. In R. Barkley (Ed.), *Niños hiperactivos. Cómo comprender y atender sus necesidades especiales* (pp. 245-263). Barcelona: Paidós.
- [22] Barbaresi, W. J. & Olsen, R. D. (1998). An ADHD Educational Intervention for Elementary Schoolteachers: A pilot Study. *Developmental and Behavioral Pediatrics*, 19(2), 94-100.
- [23] Jerome, L., Gordon, M., & Hustler, P. (1994). A comparison of American and Canadian Teachers' Knowledge and Attitudes Towards Attention Deficit Hyperactivity Disorder (ADHD). *Canadian Journal of Psychiatry*, 39, 563-567.
- [24] Jones, H. A. & Chronis-Tuscano, A. (2008). Efficacy of teacher in-service training for Attention-Deficit/Hyperactivity Disorder. *Psychology in the Schools*, 45(10), 918-929.
- [25] Stacey, M. A. (2003). *Attention-Deficit/Hyperactivity Disorder: General Education Elementary School Teachers' Knowledge, Training, and Ratings of Acceptability of Interventions*. (Doctoral Thesis, University of South Florida, 2003). Available from: <http://etd.fcla.edu/SF/SFE0000084/Thesis.pdf>
- [26] Riley, N. K. (1994). *Educators' Knowledge of Attention Deficit Disorder*. (Doctoral Thesis, Fort Hays State University, 1994). Available from: <http://catalogue.nla.gov.au/Record/5576323>
- [27] Sciutto, M. J. & Terjesen, M. D. (1994). (Preliminary test development data). Unpublished raw data.
- [28] Bender, A. S. (1996). Effects of active learning on student teachers' identifications and referrals of attention deficit hyperactivity disorder. Unpublished doctoral dissertation, Hofstra University, Hempstead, NY.
- [29] Sciutto, M. J. & Terjesen, M. D. (2004). Psychometric properties of the Knowledge of Attention Deficit Disorders Scale (KADDS). Unpublished test development data.

- [30] Sciutto, M. J., Nolfi, C. J., & Bluhm, C. A. (2004). Effects of child gender and symptom type on elementary school teachers' referrals for ADHD. *Journal of Emotional and Behavioral Disorders*, 12, 247-253.
- [31] Power, T. J. & Rostain, A. L. (2003). The Attention-Deficit/Hyperactivity Disorder Knowledge and Opinion Survey (AKOS-IV) – Knowledge Scale. Unpublished manuscript.
- [32] Rostain, A. L., Power, T. J., & Atkins, M. S. (1993). Assessing parents' willingness to pursue treatment for children with attention deficit hyperactivity disorder. *Journal of Academical Child and Adolescent Psychiatry*, 32, 175-181.
- [33] Power, T. J., Hess, L. E., & Bennett, D. S. (1995). The Acceptability of Interventions for Attention Deficit Hyperactivity Disorder Among Elementary and Middle School Teachers. *Developmental and Behavioral Pediatrics*, 16(4), 238-243.
- [34] Snider, V. E., Busch, T., & Arrowood, L. (2003). Teacher Knowledge of Stimulant Medication and ADHD. *Remedial and Special Education*, 24(1), 46-56.
- [35] Vereb, R. L. & DiPerna, J. (2004). Teachers' Knowledge of ADHD, Treatments for ADHD, and Treatment Acceptability: An Initial Investigation. *School Psychology Review*, 33(3), 421-428.
- [36] Niznik, M. E. (2004). An exploratory study of the implementation and teacher outcomes of a program to train elementary educators about ADHD in the schools. (Doctoral Thesis, University of Texas, 2004). Available from: <http://repositories.lib.utexas.edu/bitstream/handle/2152/1282/niznikd24758.pdf?sequence=2>

