Original article

Quantitative measurement of impairment in ADHD: perspectives for research and clinical practice

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Abstract

Background: Functional impairment is needed to make an attention deficit hyperactivity disorder (ADHD) diagnosis, but there is a paucity of instruments addressing this issue. **Objective:** Perform psychometric analysis of a functional impairment scale (FIE). **Methods:** A sample of 320 individuals, including ADHD probands, their siblings and parents, filled the FIE. We analyzed psychometric properties for the entire sample and age groups. Factor structure was determined by a principal component factor analysis, using oblique rotation with Kaiser normalization and Eigenvalues higher than 1. Cronbach's alpha and Spearman-Brown were calculated. **Results:** Family analysis revealed four components: a) "family life", b) "self-perception", c) "performance" and d) "social life". Adults' analysis revealed two components: a) "family life, social life and self-perception" and b) "performance". Children showed the domains: a) "performance and social life", b) "self-perception" and c) "family life" components. Cronbach's alpha were above 0.9 in all components. **Discussion:** Results revealed up to four domains depending on the group considered. Different life demands might explain the variability of domains on the groups.

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Keywords: ADHD, functional impairment, impairment scale, impairment assessment.

Introduction

DSM-IV[1] defined mental disorder "as a clinically significant behavioral or psychological syndrome associated with present distress (a painful symptom) or with disability (impairment in one or more important areas of functioning)". It acknowledges that impairment assessment involves "an inherently difficult clinical judgment" and suggests the use of the GAF as an instrument for assessment of functioning, mainly because of the axis structure of that particular edition (in that case, axis V). In DSM-V[2] such criterion was rephrased as "there must be clear evidence that the symptoms interfere with or reduce the quality of social, academic, or occupational functioning" and GAF was replaced by WHODAS, which was also presented in a separate section which "contains tools and techniques to enhance the clinical decision-making process". It should be noted that both scales are unspecific (i.e., they can be used irrespective of the diagnosis) and although DSM-5 reckons that "severity measures are disorder-specific", there is a lack of comments on impairment measures and their specificity. WHODAS, which use is not mandatory for diagnosis, can be used for both clinical and psychiatric diagnoses.

Symptoms and impairment are distinct dimensions[3], which should be considered as such during the diagnostic process; however those terms are easily confused. According to Barkley[4], symptoms of attention deficit hyperactivity disorder (ADHD) are "the behavioral expressions associated with the disorder", whereas impairments are "the consequences that ensue for the individual as a result of these behaviors". It should be noted that even within the DSM-IV and DSM-V symptom lists, some symptoms may overlap with impairment. For example, avoiding tasks that require sustained mental effort (a symptom) could be a mere consequence (i.e., impairment) of another symptom being distractible[4].

Lack of clarity of what impairment is (or how it can be measured) or even the assumption that symptoms and impairment are equivalent dimensions may underlie the inconsistent use of impairment measures[4,5]. Overlooking impairment leads to false positive diagnoses and overestimates of prevalence rates[6]. For example, in one series[3], 77% of children diagnosed with ADHD using symptom criteria would not have been diagnosed if the impairment criterion had been considered. Gerdes *et al.*[7] stressed the need for impairment assessment besides symptoms investigation in some families of Latin origin. It should be noted, however, that it is still unclear how symptoms and impairment can be combined to affect diagnostic decision.

Although there is extensive data on ADHD-associated impairment both in adults[8] and children and adolescents[9], there are many shortcomings in the measurement of ADHD associated impairment. The vast majority of research data is based on medical records, psychopathology or outcomes (unemployment, divorce, accidents, etc.) and there is no consensus on how to evaluate impairment on clinical practice. Psychopathology, a common measure of impairment, is not necessarily a consequence of ADHD since comorbidities may arise early and even share genetic links to ADHD.

Surprisingly, quantitative instruments are seldom used in research and are often one-dimensional, mixing severity of psychopathology with functional impairment and frequently requiring clinical judgment for scoring. Shorter instruments (like CBCL competency score or the Children's Global Assessment Scale[10]) address overall impairment, which may not be related to ADHD symptoms. Taking into consideration the high prevalence of comorbidities in ADHD, clinicians are often left unsure about the causes of impairment.

Some former diagnostic instruments, such as the Diagnostic Interview Schedule for Children[11] ask respondents whether the symptoms led to distress or to impairment in school or social functioning in order to fulfill DSM stipulations. Instruments which allow a more extensive investigation of specific areas of functioning (like The Home Situations and School Situations Questionnaire[12]) are excessively lengthy and time-consuming and may be also non-specific to ADHD. Weiss Functional Impairment Rating Scale Self-Report (WFIRS-S)[13] seems to be the most comprehensive scale for clinical practice but also suffers from its lengthy administration. Some other instruments require information not available at the time of the consultation (like the Teacher's Report Form)[14] which is not practical for both the clinician and the researcher.

In our experience, two aspects also deserve consideration: a) When the clinician does not assess impairment immediately after

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ADHD symptoms, patients (or parents) often find it difficult to distinguish between the impairment associated with ADHD and the one associated with highly frequent comorbid conditions which are also investigated during clinical interview. Since the correlation between ADHD symptoms and impairment may be only moderate[5], it is necessary for the clinician to minimize as much as possible any potentially interfering aspects during consultation. b) Although research data does not support the idea that ADHD is a cultural construct[15], we and others have suggested[16] that there is a wide variation in beliefs related to ADHD among countries – both cultural and historical. An assessment of ADHD-associated impairment should take this into consideration.

Most scales and questionnaires have been developed in a paucity of developed countries, where differences related to family and social functioning (parental availability for supervision of children home tasks being one example) may not apply to other cultures. Finally, many available instruments are copyright protected, limiting their use, especially in lower income countries.

In order to address the above-mentioned shortcomings, we designed an instrument to provide a clinician- friendly and more disease-specific measure of ADHD-associated impairment (GEDA Impairment Scale; Grupo de Estudos do Déficit de Atenção). The objective of the current study was to perform the preliminary psychometric validation of this instrument. Based on both clinical and literature, we hypothesized that the selected questions referent to performance, family life, social life and self-perception are relevant to the evaluation of ADHD-associated impairment.

Methods

Some *a priori* decisions regarding the general design were: a) It should be administered immediately after the investigation of the 18 ADHD symptoms from DSM-IV (addressed through a semi-structured interview, K-SADS) and before the investigation of comorbid psychiatric conditions, in order to emphasize the correlation between ADHD symptoms and impairment; b) Items should be read aloud by the professional because it allowed further clarification if necessary and overcome problems associated with reading disabilities and/or low educational levels; c) For each item, respondents would be asked to evaluate the impairment using a five-point Likert-like response scale, allowing quantitative scores.

The development process of the instrument followed the principles of measure development for patient reported outcomes[17]. This included qualitative data collected from parents, adult patients, experts and the literature, aiming at understanding the links between DSM-IV symptomatology and functional impairment on several domains.

Since our aim was to develop a new instrument meeting the above requirements, we evaluated the existing ones[13,18-28] for different age groups, taking into consideration time for administration, comprehensiveness (coverage of domains) and psychometric properties when available. From these, we have identified six different domains (family, learning and work, social activities, activities of daily living, self-perception and risky activities); four of them were selected for the GEDA instrument: family life, social life, self-perception and performance.

Such domains are the ones identified by our group previously, regarding self-evaluated burden[29] and also quality of life, a similar and somewhat overlapping dimension[30]; those results seem to be in accordance to data from other countries as well[31]. The listed domains in our instrument are in accordance to the results from research with children and adolescents both in Brazil as well in other countries[9,32]. The Ipub Research Ethics Committee approved this study. All participants signed an informed consent form for the study; participants under 18 years had their consent signed by a parent or a guardian.

Sample

In this study, we have included families with an ADHD proband (ADHD families) aged 7 to 17 and families with a typically developing child or adolescent (TDC or control families) of the same age range. We recruited families via two distinct routes: a) Families requiring consultation for their children in a specialized university outpatient clinic; b) Voluntary control families from two regular schools. For ADHD families, the first screening phase comprised telephone conversations in order to gather clinical information about the children (probands). During this phase, two trained psychologists evaluated 299 families, using items from Module A of the DSM-IV system for ADHD diagnosis; 102 were included. Index children of the 102 families were submitted to intelligence assessment (estimated IQ using the Block design and Vocabulary subtests of the Wechsler Intelligence Battery). We excluded from the study children with an estimated IQ below 80 (n = 25).

Pilot study

The GEDA impairment scale was first used in 10 separate families with probands with ADHD diagnosis according to DSM-IV; families consisted of both biological parents and a sibling of similar age whenever possible (n = 40). At this stage, a large number of questions addressing all four domains were evaluated for clarity and sociocultural adequacy.

Final sample

Our final ADHD sample included 10 families from the pilot study and 77 families as indicated above.

Controls families were included in order to obtain data from a sample with less or no ADHD symptoms. In a preliminary phase, teachers were trained in the SNAP-IV questionnaire and were then asked to employ it in their respective classes to rate a previously determined number of random students in each class. Children and adolescents (and their corresponding families) were invited to participate if their questionnaire scores were below DSM-IV suggested cutoff. Thirty families reported having a sibling from the same biological parents as the index control child and having both biological parents available and willing to participate; 13 of these families completed the protocol. Screened children and adolescents were interviewed to confirm their status as Typically Developing Children (TDC) using the same diagnostic procedures used in the ADHD group.

Our total sample comprised 320 individuals from all families (ADHD and control).

Measures

All interviews were performed by the same group of psychiatrists, trained in the use of a semi-structured interview (Kiddie-Schedule for Affective Disorders and Schizophrenia or K-SADS PL) for ADHD diagnosis and supervised by a board-certified psychiatrist. Probands and their siblings were interviewed with either one of their parents; parents were interviewed about themselves in separate.

Some questions, which can be found in somewhat similar phrasing in different existing scales, had to be modified in order to emphasize the correlation with ADHD symptoms and maintain their semantic equivalence at the same time. For example, "how much do you like yourself?" was changed into "how much did those symptoms affect the way you see/like yourself?".

We also opted for keeping the total number of questions of the GEDA instrument to a minimum for each single domain due to: first, because we intended the instrument to be practical and short. Second, because it is not evident why some distinctions are relevant for ADHD (for example, one scale[13] asks about the ability for making new friendships and the ability for maintaining them). Third, many questions seemed to address similar or imbricated situations (for example, one scale[13] asks about "problems performing required duties" and "problems getting work done efficiently").

The two final versions, one for children and adolescents and one for adults, portrayed the same general structure, consisting of

12 questions (items). The first one addressed impairment in general and served as an introduction to the impairment in specific domains that followed. This question, posed immediately after the ADHD symptoms investigation, intended to make it clear to the individual that impairment should be judged in relation to those symptoms.

There were 2 questions for academic performance (or work performance, for adults), 3 questions about family life, 3 questions about social life and 3 questions about self-perception. The Likert-like answer options used were: None, Very little, More or less, A lot and Extremely (Figures 1 and 2).

GEDA Impairment Scale

Adulto					
Esses sintomas causam sofrimento importante ou perturbam de maneira significativa os estudos, as relações sociais, ou outras áreas importantes?					
	Sim	Não			
Quanto estes SINTOMAS de desatenção/inquietude/impulsividade ATRAPALHAM sua vida acadêmica? ☐ Não estuda					
As notas / O desempenho nos estudos	① Nada	① Muito pouco	② Mais ou menos	③ Bastante	④ Extremamente
Frequência e pontualidade	① Nada	① Muito pouco	② Mais ou menos	③ Bastante	④ Extremamente
Quanto estes SINTOMAS de desatenção/inquietude/impulsividade ATRAPALHAM sua vida profissional? ☐ Não trabalha					
Rendimento no trabalho	① Nada	① Muito pouco	② Mais ou menos	③ Bastante	④ Extremamente
Frequência e pontualidade	① Nada	① Muito pouco	② Mais ou menos	③ Bastante	④ Extremamente
Quanto estes SINTOMAS de desatenção/inquietude/impulsividade ATRAPALHAM sua vida familiar?					
Relacionamento no dia a dia (brigas, discussões)	① Nada	① Muito pouco	② Mais ou menos	③ Bastante	④ Extremamente
Cumprir obrigações ou compromissos	① Nada	① Muito pouco	② Mais ou menos	③ Bastante	④ Extremamente
A capacidade de a família se divertir em conjunto	① Nada	① Muito pouco	② Mais ou menos	③ Bastante	④ Extremamente
Quanto estes SINTOMAS de desatenção/inquietude/impulsividade ATRAPALHAM sua vida social?					
Relacionamento no dia a dia (brigas, discussões)	① Nada	① Muito pouco	② Mais ou menos	③ Bastante	④ Extremamente
Fazer e manter amigos	① Nada	① Muito pouco	② Mais ou menos	③ Bastante	④ Extremamente
A capacidade de sair e se divertir	① Nada	① Muito pouco	② Mais ou menos	③ Bastante	④ Extremamente
Quanto estes SINTOMAS de desatenção/inquietude/impulsividade ATRAPALHAM como você se vê?					
Sua capacidade para resolver as coisas	① Nada	① Muito pouco	② Mais ou menos	③ Bastante	④ Extremamente
Você fica chateado/aborrecido com você mesmo	① Nada	① Muito pouco	② Mais ou menos	③ Bastante	④ Extremamente
Sua vida em geral	① Nada	① Muito pouco	② Mais ou menos	③ Bastante	④ Extremamente

Figure 1. GEDA Impairment Scale for Adults.

GEDA Impairment Scale

Crianças e Adolescentes					
Esses sintomas causam sofrimento importante ou perturbam de maneira significativa os estudos, as relações sociais, ou outras áreas importantes?					
	Sim	Não			
Quanto estes SINTOMAS de desatenção/inquietude/impulsividade ATRAPALHAM sua vida acadêmica? ☐ Não estuda					
As notas/O desempenho nos estudos	① Nada	① Muito pouco	② Mais ou menos	③ Bastante	④ Extremamente
Frequência e pontualidade	① Nada	① Muito pouco	② Mais ou menos	③ Bastante	④ Extremamente
Quanto estes SINTOMAS de desatenção/inquietude/impulsividade ATRAPALHAM sua vida familiar?					
Relacionamento no dia a dia (brigas, discussões)	① Nada	① Muito pouco	② Mais ou menos	③ Bastante	④ Extremamente
Cumprir obrigações ou compromissos	① Nada	① Muito pouco	② Mais ou menos	③ Bastante	④ Extremamente
A capacidade de a família se divertir em conjunto	① Nada	① Muito pouco	② Mais ou menos	③ Bastante	④ Extremamente
Quanto estes SINTOMAS de desatenção/inquietude/impulsividade ATRAPALHAM sua vida social?					
Relacionamento no dia a dia (brigas, discussões)	① Nada	① Muito pouco	② Mais ou menos	③ Bastante	④ Extremamente
Fazer e manter amigos	① Nada	① Muito pouco	② Mais ou menos	③ Bastante	④ Extremamente
A capacidade de sair e se divertir	① Nada	① Muito pouco	② Mais ou menos	③ Bastante	④ Extremamente
Quanto estes SINTOMAS de desatenção/inquietude/impulsividade ATRAPALHAM como você se vê?					
Sua capacidade para resolver as coisas	① Nada	① Muito pouco	② Mais ou menos	③ Bastante	④ Extremamente
Você fica chateado/aborrecido com você mesmo	① Nada	① Muito pouco	② Mais ou menos	③ Bastante	④ Extremamente
Sua vida em geral	① Nada	① Muito pouco	② Mais ou menos	③ Bastante	④ Extremamente

Figure 2. GEDA Impairment Scale for Children and Adolescents.

Psychometric properties of the instrument were analyzed in separate for adults and children and adolescents, since impairment was expected to be different in those age groups.

Factor analysis, with principal component analysis using oblique rotation with Kaiser normalization and Eigenvalues higher than 1, was performed by dividing the subjects into three groups: family (all subjects), parents (mothers and fathers) and children (case and sibling). The number of factors was not previously specified so as not to force an inappropriate solution. Correlation coefficients lower than 0.40 were considered evidence of poor association. Cronbach's alpha and Spearman-Brown were calculated for each factor (except for the domain with only 2 questions).

ADHD diagnosis were made using semi-structured interviews by trained mental health professionals using K-SADS and K-SADS adapted for adults; some items were corrected to correspond to DSM-IV criteria[33].

Results

Analysis of the family (all subjects): four components emerged (Table 1): they were the same four areas previously defined in the scale (Table 2): Component 1 = family life, Component 2 = self-perception, Component 3 = academic or work performance and Component 4 = social life.

Table 1. Principal component analysis – Number of compents by group (family, parents and probands)

Total variance explained								
	Component	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings[a]
		Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total
Family	1	**4.289**	**38.989**	38.989	4.289	38.989	38.989	3.365
	2	**2.843**	**25.847**	64.835	2.843	25.847	64.835	3.125
	3	**2.034**	**18.495**	83.330	2.034	18.495	83.330	2.029
	4	**1.826**	**16.604**	99.934	1.826	16.604	99.934	3.483
	5	0.005	0.049	99.983				
	6	0.001	0.008	99.991				
	7	0.001	0.006	99.997				
	8	0.000	0.002	99.999				
Parents	1	**8.714**	**79.220**	79.220	8.714	79.220	79.220	8.712
	2	**2.021**	**18.370**	97.590	2.021	18.370	97.590	2.069
	3	0.250	2.277	99.867				
	4	0.005	0.048	99.915				
	5	0.003	0.024	99.939				
	6	0.002	0.016	99.954				
	7	0.002	0.015	99.970				
	8	0.001	0.013	99.982				
	9	0.001	0.010	99.992				
	10	0.001	0.007	100.000				
Probands	1	**5.445**	**49.501**	49.501	5.445	49.501	49.501	5.157
	2	**2.944**	**26.760**	76.261	2.944	26.760	76.261	3.091
	3	**2.494**	**22.669**	98.930	2.494	22.669	98.930	3.360
	4	0.115	1.047	99.978				
	5	0.001	0.010	99.988				
	6	0.001	0.006	99.994				
	7	0.000	0.004	99.998				
	8	0.000	0.001	99.999				
	Extraction method: principal component analysis							

Table 2. Principal component analysis – Pattern matrix. Table shows the GEDA Impairment Scale questions related to each component

	Family				Parents		Proband		
	Component				Component		Component		
	1	2	3	4	1	2	1	2	3
Grades/school or work achievement	0.000	0.000	**1.001**	0.000	-0.001	**0.999**	**0.985**	0.000	-0.011
Attendance at school/work	0.000	0.000	**0.999**	0.000	-0.000	**0.999**	**0.985**	-0.005	-0.007
Day to day family relationship	**0.999**	0.000	0.011	0.003	**0.933**	0.123	-0.000	0.000	**1.000**
Fulfill duty/chores at home	**0.999**	0.001	0.009	0.002	**0.934**	0.116	-0.000	0.001	**1.000**
Family's ability of have fun together	**0.997**	-0.002	-0.019	-0.005	**0.997**	-0.030	0.001	-0.001	**1.000**
Day to day relationship (social life)	0.000	0.000	-0.001	**-0.999**	**0.998**	-0.035	**0.990**	0.001	0.006
Having friends	0.000	0.001	-0.003	**-0.999**	**0.998**	-0.040	**0.990**	0.003	0.006
Ability to have fun	0.000	-0.001	0.004	**-0.999**	**0.997**	-0.030	**0.990**	0.001	0.006
Your ability to solve things	0.000	**0.999**	0.000	0.000	**0.997**	-0.034	-0.000	1.000	-0.000
Make you upset/annoyed with yourself	0.000	**0.999**	0.000	0.000	**0.997**	-0.031	-0.000	1.000	0.000
Your life in general	0.000	**0.999**	0.000	0.000	**0.997**	-0.035	0.000	1.000	-0.000
Extraction method: principal component analysis. Rotation method: Oblimin with Kaiser normalization									

Analysis of parents (adults): two components emerged (Table 1): Component 1 evaluating: family life, social life and self-perception altogether; and Component 2 evaluating: work and academic performance (Table 2).

Analysis of Probands (children and adolescents): three components emerged (Table 1): Component 1 evaluating academic performance and social life; Component 2 evaluating self-perception and Component 3 evaluating family life (Table 2).

Analysis of all items (questions) regarding their reliability (Cronbach's alpha) is presented in table 3 and confirms that all items are strongly related as a group

Results of Cronbach's alpha:

- Family: component 1 = 0,999; component 2 = 1,00; component 3 = 1,00; component 4 = 1,00.
- Parents component 1 = 0,995 and component 2 = 1,00.
- Children component 1 = 0,994; component 2 = 1,00; component 3 = 1,00.

Discussion

The present study aimed to conceive a user-friendly impairment scale, more specific to ADHD, which could be used for both clinicians and researchers alike.

Preliminary analysis revealed that all items seemed to measure a single underlying or latent construct, with high Cronbach's alpha values. Although our results showed that fewer questions would potentially lead to somewhat similar conclusions, it must be noted that the instrument was also designed for clinical use; it is thus important having all questions, so that clinicians could address how symptoms impair different aspects of daily functioning. In addition, if the scale is to be used for follow-up and treatment evaluation, it is necessary to investigate different aspects portrayed in each domain.

In accordance to our hypothesis, when responses for the entire family were analyzed, factor analysis has shown four different components. These were the same as predicted by our previous selection of impairment domains related to ADHD in the literature (performance, family life, social life and self-perception).

The distribution of each domain in a component indicate that each area of life (domain) can be affected in separate, and that the presence of one affected domain/area does not necessarily indicate the impairment of another. This result reinforces the idea that different aspects of daily life should be questioned to properly address ADHD associated impairment.

When responses by parents and children were analyzed in separate, different profiles emerged for each group. The adults (parents) factor analysis showed only two components. The first one comprised self-perception, social and family life. The second related to work performance. In children and adolescents, the performance domain (school performance) and the social domain formed a single component. Family life and self-perception were two separate components.

This result seems reasonable since life demands are very different for adults and children. The combination of domains in a single component may be understood as an age-dependent association of some aspects of life. Being linked domains, when one is affected the other will probably be as well. The component formed by the performance and the social life in children can illustrate this association pattern. For children and adolescents school represents a place of academic and social development. When a child with ADHD begins to experiences academic difficulties, very frequently they also suffer rejection by peers[34]. In a situation of learning problems the children academic and social values might be simultaneously diminished.

Table 3. Results of Cronbach's alpha between GEDA Impairment Scale items (questions)

		Parents										
		Grades or work achievement	Attendance	Day to day family relationship	Fulfill duty chores	Family's fun together	Day to day relationship (social life)	Have friends	Ability to have fun	Ability to solve things	Make you upset or annoyed with yourself	Life in general
Probands	Grades or work achievement	1.000	0.587	0.417	0.382	0.541	0.619	0.593	0.561	0.558	0.581	0.638
	Attendance	0.488	1.000	0.359	0.385	0.264	0.337	0.290	0.285	0.324	0.305	0.351
	Day to day family relationship	0.556	0.602	1.000	0.550	0.575	0.454	0.488	0.409	0.450	0.534	0.506
	Fulfill duty chores	0.682	0.618	0.625	1.000	0.381	0.428	0.435	0.390	0.420	0.407	0.426
	Family's fun together	0.372	0.303	0.517	0.469	1.000	0.579	0.687	0.596	0.472	0.568	0.588
	Day to day relationship (social life)	0.370	0.224	0.488	0.358	0.636	1.000	0.766	0.680	0.586	0.545	0.516
	Have friends	0.333	0.179	0.459	0.379	0.598	0.768	1.000	0.759	0.525	0.546	0.594
	Ability to have fun	0.333	0.199	0.444	0.340	0.677	0.722	0.825	1.000	0.486	0.483	0.536
	Your ability to solve things	0.430	0.154	0.469	0.375	0.460	0.518	0.523	0.418	1.000	0.739	0.774
	Make you upset/ annoyed with yourself	0.367	0.278	0.373	0.292	0.409	0.479	0.483	0.504	0.582	1.000	0.840
	Your life in general	0.367	0.130	0.413	0.339	0.445	0.628	0.617	0.601	0.681	0.669	1.000

Work performance appears as a single component in the parents analysis. Occupation life is usually a major aspect of adult life and its disturbances are not necessarily related to alterations in others aspects of life. Work related problems are the main complain of adults with ADHD. They are more likely to be dismissed from employment, and/or to change jobs, and/or to experience more interpersonal difficulties with employers and colleagues in the workplace[35].

The different components distribution for parents and children may allow a more age-appropriate impairment assessment. As the family analysis strengthens the necessity of addressing each domain for a more thoroughly understanding of impairment impact, the parent and children analysis point out that some domains tend be simultaneously affected. In practice, performance, family life, social life and self-perception domains must be always questioned. When an impaired domain had an associated domain (as performance and social life in children, for example) the latter must be careful examined since there is a high chance of also being affected. A quantitative impairment scale as GIS can be useful to ensure that impairment was adequately evaluated.

The preliminary analysis of this new instrument showed good internal consistency, providing different impairment profiles for adults, children and adolescents. Further studies are being developed to establish its other psychometric properties.

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