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Research Article

Evaluation of Adaptive Behavior in Children and Adolescents with Autism Spectrum Disorder: Dimensions and Contextual Factors

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Abstract

The study evaluated adaptive behavior in children and adolescents with Autism Spectrum Disorder (ASD) using the ICAP as the assessment tool. A total of 105 subjects from Uruguay and Spain, intentionally selected from middle socioeconomic families, participated. The results revealed significant correlations between ICAP factors and symptomatic characteristics of ASD, particularly in the areas of motor skills, social and communication skills, and personal and community living. Significant age-related differences were also found, with higher scores in adolescents compared to children in the communication and language dimension. Geographical differences were noted in motor skills and personal living skills. These findings underscore the importance of understanding and addressing variations in adaptive behavior within the autism spectrum, highlighting the need for targeted interventions that promote development and quality of life for these individuals.

Key Words: Adaptive behavior; Autism spectrum; ICAP; Quality of Life

Introduction

It was in the 1970s that the term "adaptive behavior" began to be used, relating to disability criteria [1-4]. That is when it was used and included as a diagnostic criterion for intellectual disability (hereinafter ID) after its inclusion in 1959 in the 5th edition of the Diagnostic and Statistical Manual of Mental Disorders (hereinafter DSM) of APA (2013). Initially, the intelligence quotient was used for this, but this leads to a detriment to people from resource-limited environments and limits its use in the planning of programs and strategies for action of the population with ID [5]. Over time, they become aware of the special relevance of the person's interaction with his environment, context or social roles [6].

Adaptive behavior is understood as a set of conceptual, social and practical skills that the individual has learned and allows him to respond to the circumstances of daily life [7]. Adaptive behavior represents the interaction of the personal, cognitive, social and situational variables of the person and its management is necessary for the execution of all the functions of human occupation (self-maintenance, productivity, rest and sleep, play and leisure) [8]. Analyzing adaptive behavior is of great interest, as it represents the person's functioning in activities of daily living and measures the degree of performance at any stage of the life cycle. Currently, this concept is one of the criteria introduced within an inclusive definition of disability [9].

It can also be said that this concept is of vital importance to explain many behaviors and actions of people with Autism Spectrum Disorder (hereinafter ASD) [10,11] because it is part of the critical

indicators of a person's progress [12].

Some of the factors related to adaptive behavior are found in aspects such as hyperactivity [13], oppositional defiant disorder problems [14] anxiety and emotional symptoms [15], and deterioration in activities of daily living [16].

As Baña and Losada [17] explain, these alterations affect learning processes, functioning and school performance, making them less effective than children with neurotypical development due to their low levels of motivation and flexibility, their difficulties in solving problems or their low persistence in a task [18]. This has a direct impact on their development and on a full and quality coexistence [19].

The understanding and treatment of behavioral disorders has always been a widespread issue due to its demand by many people, among them and perhaps the most concerned are parents and educators. When we refer to behavioral alterations, we indicate those behaviors that are altered, poorly adapted, annoying or absorbing for the subject himself or for those around him, which prevent or hinder the development of his daily activities and coexistence within the community [20]. The interest in determining how to deal with behavioral alterations has endured over time, probably as a result of the great difficulties that their attention entails to this day. Traditionally and until recently, one of the priority solutions focused on eliminating altered behaviors in two ways: explaining to the subject the reason for the difficulty of his behavior or through negative reinforcement. What mostly happened is that this behavior was strengthened and reinforced more with its increase and learning [21].

A few years ago, a new paradigm of behavior centered on the person appeared, pointing out that each person has his reasons and seeks different consequences when it comes to behaving; likewise, behavior is conditioned by the culture where we live. Qualifying a behavior as assertive, aggressive or inhibited should not be done in an exhaustive way; there are cultures in which people raise more their tone of voice, or communicate by placing themselves closer in space. Also, there are great cultural variations both in the class and its meaning; differences depending on the role we have at a given time; a person communicates differently if he is with his friends, his family, his coworkers, etc. Talking about an adapted or not behavior depends on the context and the person with whom we communicate. This perspective gives rise to an incipient and increasingly ingrained proposal that these behaviors can be a means of communication in subjects whose communication skills present difficulties given that behavior is the most basic instrument that humans use to communicate. Therefore, if we want to modify behavior, we will have to teach the subjects their communication and the result received based on it [22]. Behavior is the object of analysis of our daily work and, also, the fruit of our mental processes and functions; we behave based on what we think and think in response to what we observe we do or the consequence of our behaviors.

Mental functions and processes find their origin in a biological structure, the brain; which function depends on its development, establishing groups of nerve fibers and nerve structures that determine several functions. One of the most important functions is our ability to use language and communication, key aspects for development and learning. Cognitive functions include skills related to organizational and task planning skills, ability to select appropriate objectives, initiating a plan and holding it in mind while performing, ability to inhibit distractions, change strategies adaptively according to the situation, self-regulation and control of the course of action to ensure the achievement of a goal, among others.

Behavior is a form of communication; that is, through a behavior we are communicating with the environment in which we are, so that everything in it responds to this behavior. In children with neurotypical development, a wide variety of maladaptive or dysfunctional behaviors can be observed which objective can be to attract attention, avoid situations that are not pleasant to them, obtain something they want, among others. These behaviors are also shown by people who present a developmental disorder, such as autism spectrum disorder, attention deficit hyperactivity disorder, language delay, among others. However, the difference in people with a neurotypical development is that they evolve from these maladaptive or dysfunctional behaviors through language, being replaced by effective and socially adapted communications becoming functional for them and their environment. On the other hand, in children with developmental disorders, they do not always improve over time, so they do not acquire these functional communication skills, maintaining maladaptive behavior that communicates in a dysfunctional and altered way, determining highly inoperative communications.

Adaptive behavior implies the usefulness of the competencies to act in any area of life, especially in people with ASD, since they favor the ability to perform successfully and independently of others the daily tasks of life and coexistence. The development of the evaluation of the function of problem behaviors leads to a reorientation of attention on behavior, increasing the effectiveness of reinforcement-based treatments and decreasing the use of punitive techniques [23]. In this sense, there are different works based on the functional assessment of behavior; Forteza and Vara [24], for their part, analyze the differences between two ways of presenting a functional assessment of behavior. Other authors have focused on behavioral problems in subjects with disabilities or developmental disorders, based on a functional assessment of their behavior [25]. Different studies have also been found with preschool children, based on behavior change on the basis of a

functional assessment [26]. Functional behavior assessment is a good resource for planning attention, causing change to go beyond the simple manipulation of consequences, to include, on the one hand, context modification before the problematic behavior occurs and, on the other hand, teaching effective alternative behaviors to reduce behaviors that are not socially accepted [20].

This research is made in the context of the need to better understand the adaptive and symptomatic characteristics of ASD in different socio-cultural contexts, with the aim of implementing interventions that significantly improve the lives of these individuals and their families.

Methodology

Research objective

Explore and analyze the characteristics of adaptive behavior in children and adolescents with autism spectrum disorder, as well as describe the relationship between the variables of adaptive behavior and the characteristics of the autism spectrum.

Specific objectives

- Identify and analyze the main characteristics of the adaptive behavior of the participating children and adolescents.
- Describe the relationship between independent variables—age, sex, place of origin—and the variables of adaptive behavior and symptomatic characteristics of the autism spectrum.

Participants

According to data from the ASD Specialized Unit of the Pereira Rossell Hospital Center and the Uruguayan Autism Federation (FAU), 1 in 100 Uruguayans has autism spectrum disorder, which represents more than 30,000 people (Presidency of the Republic, 2015), in a population of 3,286,314 (National Institute of Statistics, 2011). Similarly, in Spain we also find that 1 in 130 citizens has some type of ASD (Belinchón, 2010), which implies a proportion similar to that of Uruguay, with just over 300,000 cases in a population that, according to data from the National Institute of Statistics (2015), is 46,439,864.

These data highlight the importance of investigating the behavior of children and adolescents with ASD to develop effective interventions that promote their development, learning, independence and, ultimately, their quality of life. This study involved 105 individuals with ASD, aged between 2 and 18 years, from Uruguay and Spain. The sample was intentionally selected, focusing on families of medium socioeconomic level to avoid the influence of extraneous variables related to extreme levels of education and income, as well as access to health services.

All participants from Uruguay attend specialized ASD care and counseling centers, and the same goes for participants from Spain. Participation in the study was voluntary, and all subjects were previously informed about the characteristics and objectives of the study, as well as about the confidentiality of the data provided.

Instrument

The ICAP is a scale developed by Bruininks, Hill, Woodcock, and Weatherman [17] as an instrument that assesses adaptive behavior skills with the primary purpose of contributing to the guidance, monitoring, and planning and evaluation of services for people with disabilities or for the elderly. The ICAP is often used to also record descriptive information, current diagnosis, behavior problems, performance in social activities, rehabilitation services and support networks, etc.

The ICAP can be applied from 3 months of age and without age limit; it lasts approximately 20 minutes, and can be self-administered or completed by someone who has contact with the person evaluated. The necessary materials are the response questionnaire and the manual for subsequent correction and analysis.

The adaptive behavior section is composed of four scales; it measures the level of the person in relation to the basic skills that would enable them to integrate and develop independently in their environment. These include: social and communicative skills (expressive and receptive language), personal life skills (e.g., satisfaction independent of immediate personal needs), community living skills (e.g., a person's ability to use money), and motor skills (fine and gross).

The ICAP was standardized, and with regard to its reliability, the research carried out mainly on samples of people with disabilities showed that it has an adequate internal consistency, satisfactory test-retest reliability and that the estimates made by independent evaluators are consistent with each other [27]. Subsequent studies provided additional evidence of its reliability with nondisabled (α=.86-.98) and disabled (α=.88-.98) individuals. Recently, its validity and reliability have also been studied in Chile [28,29] with excellent results.

Procedure

This research follows a non-experimental, transversal, exploratory and descriptive design. It is not experimental because variables are not manipulated; existing contexts are simply observed without intentionally provoking them, as indicated by Hernández, Fernández and Baptista (2006). It is transversal because all the information is obtained at a single moment, despite the fact that children and adolescents are from different centers and associations. Likewise, it is descriptive since it details the characteristics of children and adolescents with ASD evaluating components of adaptive behavior, all variables of this study. The methodological approach is quantitative, using scales present in the questionnaires and the variables identified.

Information Analysis

Data were analyzed with IBM SPSS 27.0 (Statistical Package for Social Sciences). Before starting the analyses, the data were prepared for statistical treatment by imputation of the missing values. A quantitative study was carried out using the SPSS statistical package, performing a factorial, reliability and validity analysis of the ICAP. In addition, non-parametric statistical tests were used.

Results

Table 1 shows a statistically significant correlation (p=.000) between the four factors that make up the adaptive behavior of the ICAP; likewise, the symptomatic characteristics of ASD have presented a statistically significant correlation (p=.000).

Also, Table 1 shows a significantly negative correlation between most adaptive behavior factors and ASD symptomatic factors. The four factors of adaptive behavior—Factor 1: Motor skills; Factor 2: Social and Communication skills; Factor 3: Personal Living skills, and Factor 4: Community Living skills— negatively correlate with a significance level of $p \leq .05$ on the Stereotyped Behavior Scale 1 and the Communication and Language Scale 2. Regarding Scale 3: Social Interaction, only Factors 2 and 3 of adaptive behavior have been correlated ($p \leq .05$).

		Factor 1 Motor skills	Factor 2 Social and Communication skills	Factor 3 Personal Living skills	Factor 4 Community Living skills	Scale 1 Stereotyped Behavior	Scale 2 Communication and Language	Scale 3 Social Interaction
Factor 1: Motor skills	Pearson Correlation	1	**.689****	**.721****	**.553****	**-.286****	**-.216***	-.183
	Sig. (bilateral)		**.000**	**.000**	**.000**	**.003**	**.027**	.061
	N	105	105	105	105	105	105	105
Factor 2: Social and Communication skills	Pearson Correlation	**.689****	1	**.691****	**.688****	**-.331****	**-.401****	**-.250***
	Sig. (bilateral)	**.000**		**.000**	**.000**	**.001**	**.000**	**.010**
	N	105	105	105	105	105	105	105
Factor 3: Personal Living skills	Pearson Correlation	**.721****	**.691****	1	**.688****	**-.356****	**-.332****	**-.193***
	Sig. (bilateral)	**.000**	**.000**		**.000**	**.000**	**.001**	**.049**
	N	105	105	105	105	105	105	105
Factor 4: Community Living skills	Pearson Correlation	**.553****	**.688****	**.688****	1	**-.370****	**-.351****	-.186
	Sig. (bilateral)	**.000**	**.000**	**.000**		**.000**	**.000**	.057
	N	105	105	105	105	105	105	105
**. Significant correlation at level 0.01 (bilateral).								
*. Significant correlation at level 0.05 (bilateral).								

Table 1: Bivariate correlations of ICAP factors and ASD characteristics.

The analyses presented in Table 2, according to age group, indicate significant differences (p<.05) in all the factors that make up adaptive behavior and the ASD dimension on Communication and Language. These differences point to higher scores from adolescence compared to childhood.

	Factor 1 Motor skills	Factor 2 Social and Communication skills	Factor 3 Personal Living skills	Factor 4 Community Living skills	Scale 1 Stereotyped Behavior	Scale 2 Communication and Language	Scale 3 Social Interaction
Mann–Whitney U	838.000	778.500	750.500	640.500	1040.000	971.500	1268.000
Wilcoxon W	2918.000	2858.500	2830.500	2720.500	1860.000	1791.500	2088.000
Z-scores	-2.958	-3.354	-3.540	-4.279	-1.606	-2.064	-.080
Asymptotic significance (bilateral)	**.003**	**.001**	**.000**	**.000**	.108	**.039**	.936
a. Grouping variable: age group							

Table 2: Comparison analysis of means for the age variable.

Table 3 presents the results of the analyses carried out according to the place of origin of the participants. These results reflect the existence of significant differences ($p<.05$) in Factor 1: Motor skills and in Factor 3: Personal Living skills. However, the dimensions corresponding to the ASD symptom areas do not show significant differences in relation to this variable.

	Factor 1 Motor skills	Factor 2 Social and Communication skills	Factor 3 Personal Living skills	Factor 4 Community Living skills	Scale 1 Stereotyped Behavior	Scale 2 Communication and Language	Scale 3 Social Interaction
Mann–Whitney U	880.500	999.500	709.500	1001.000	1000.000	1125.500	1160.500
Wilcoxon W	1510.500	1629.500	1339.500	1631.000	1630.000	3610.500	1790.500
Z-scores	-2.346	-1.534	-3.506	-1.525	-1.532	-.677	-.439
Asymptotic significance (bilateral)	**.019**	.125	**.000**	.127	.126	.498	.661
a. Grouping variable: place of origin							

Table 3: Comparison analysis of means according to the place of origin.

Discussion and Conclusion

This research highlights the difficulty in determining adaptive behavior, a very relevant and topical construct to evaluate the ability or difficulty of people with autism spectrum disorder. Assessing adaptive behavior and considering it in interventions is a significant challenge. In addition, determining its dimensions with an effective assessment instrument remains a critical area of study. Researchers such as Canal [20], Greenspan and Driscoll [31], Luckasson et al. [4], Montero [32] and Schalock [33] have attempted to categorize the skills and abilities that make up adaptive behavior, striving to define and explain it.

Adaptive behavior is a broad and complex construct, capable of influencing various communicative and experiential functions. These functions are subject to both learning and the conditions of the environment in which they occur. Our study underscores the need for precise and reliable assessment instruments to measure adaptive behavior in children and adolescents with ASD.

In the research, a significant relationship is observed in which the greater the difficulty and complexity in ASD, the lower the adaptive and functional behavior. This corroborates the theoretical exposition and assumptions about adaptive behavior as significant in the determination of intellectual disability. From another perspective, the higher the score in adaptive behavior, the lower the presence of ASD symptomatology.

The development of motor, social and communicative skills or abilities, of personal life and in the community, is inversely related to the presence of stereotyped behaviors and alterations in communication and social interaction. These correlations coincide with the work of Baumgart, et al. (1996), Carr, et al. [23], and Gomez, et al. (1995), who also found that improvement in adaptive behavior is associated with a decrease in ASD symptoms.

There is a correlation between most of the factors of adaptive behavior with the diagnostic characteristics of ASDs. This is the case of the four factors of adaptive behavior —Factor 1: Motor skills, Factor 2: Social and Communication skills, Factor 3: Personal Living skills, and Factor 4: Community Living skills—, which correlate with Stereotyped Behavior and with Communication and Language. Working on aspects of adaptive behavior will help lower behavioral stereotype and echolalia, and will improve communication and language use in individuals with ASD. So is suggested by Lerman and Vorndran (2002), Tamarit (1992) and Casey et al. [22] for cases of disruptive disorders and disability.

The age of the participants shows a significant correlation with all dimensions of adaptive behavior, as well as with the communication and language dimension of ASD. The older the age, increased adaptive behavior and improved skills in motor, communication, personal skills, and community living skills are observed.

When considering the sex of the participants, it is observed that there are no significant differences ($p \leq .05$) in any of the factors that make up the adaptive behavior or in the symptomatology of the autism spectrum. However, a more detailed analysis of the items in the questionnaire reveals certain correlations. Women show greater skills compared to men in items corresponding to the social and communication areas. This highlights the need for people-centered programs, as women appear to be a more vulnerable group and at greater risk of exclusion. As already mentioned above, greater adaptive behavior translates into a better ability to adapt and function in the nearby environment, as well as to face risky situations, both personal and collective [34-47].

Regarding the place of origin of the participants, the results indicate significant differences within adaptive behavior, especially in Motor skills and Personal Living skills. In the items corresponding to Personal skills, the greatest number of correlations is perceived, with participants from Montevideo presenting higher scores than those from Galicia. These differences can be influenced by cultural factors, such as roles within the family and community and social educational conceptions, which allow for more integrated development in the community. As for Motor skills, although there are fewer correlations with the place of origin, the means are higher in the Montevideo sample. This suggests that cultural and social contexts may have a significant impact on the development of these skills.

The research underscores the importance of assessing adaptive behavior in people with ASD, highlighting the need for accurate and reliable instruments. The results indicate the need to foster adaptive skills in interventions for people with ASD, in order to improve their quality of life and overall functioning.

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Ethical Guidelines: The administration of the questionnaires and the preparation of the article followed and complied with the ethical standards proposed by the APA.

Conflict of Interest: Both authors declare no conflicts of interest.

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