

Reliability and Validity of the Psycho-Educational Profile, Third Edition (PEP-3) Test in Children With Autism Spectrum Disorders and Children With Intellectual Disability in Morocco

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Abstract

The purpose of this study was to examine the internal consistency and validity of the Psychoeducational Profile-Third Edition (PEP-3) among children having Autism Spectrum Disorders (ASD) and other ones having Intellectual Disability (ID). This study has involved 44 children, including 30 children affected with Autism Spectrum Disorders (ASD) and 14 children affected by Intellectual Disability (ID). The psychometric evaluation of the PEP-3, in this study, has shown good internal consistency including cronbach's alpha = 0.943 for the ten subtests of the performance test and cronbach's alpha = 0.803 for the three subtests of the caregiver's report; thus, indicating the homogeneity of all items in each subtest. The total- domain correlation used to determine the role of each of the PEP3 subtests in relation to the overall measure has shown that all fields contributed effectively to the total score. Therefore, this piece of work, contributes to the educational program planning field in Morocco by validating all subtests of the Performance Test and Caregiver Report (PEP-3) that can help to identify children having ASD and other developmental disorders early and reliably in Morocco.

Keywords: *Autism Spectrum Disorders, Intellectual Disability, Psycho-Educational Profile-third edition (PEP-3), Validation, Reliability.*

Introduction

Autism Spectrum Disorders, including autistic disorder, Asperger's syndrome, and pervasive developmental disorder which is not specified (PDD-NOS), are neurodevelopmental disorders characterized by persistent deficits in social communication noticed in a variety of settings and by the existence of the restricted and repetitive nature of behavior, interest, or activities (1).

Intellectual disability is a neurodevelopmental disorder characterized by a deficit in intellectual functions such as reasoning, problem solving, planning..., associated with significant limitations in adaptive functioning in conceptual, social, and practical domains, that occur during the developmental period (1).

Introduction

The developmental assessment of a child having an Intellectual Disability or Autism Spectrum Disorder is of paramount importance to develop an individualized educational plan.

Assessment information for children affected with ASD must be based on multiple sources and contexts, as the performance and symptoms of children affected with ASD may depend on characteristics of the environment. Therefore, parent reports and direct observation in various settings are included in comprehensive assessments of children having ASD.

The Psycho-Educational Profile, Third Edition (PEP-3), is an assessment tool designed for children with developmental disabilities, specifically ASDs whose age is from 2 years old to 7 years old and a half (6). PEP-3 assesses the level of development in the areas of communication, motor skills, and personal autonomy, as well as maladaptive behaviors that are consistent with diagnostic criteria. The PEP-3 consists of 2 parts: The first is the Performance Test, the assessment of which is based on the provider's direct observation of the child, and the second is the caregiver's report through which the parent or caregiver records his or her observations. Taking into account parents' input into treatment programs for children's performance in various situations, it is necessary to include parents as members of the treatment team and to examine the transfer of treatment effects to home.

To be clinically useful, an assessment tool must have strong psychometric properties, namely reliability and validity (11). Reliability refers to the consistency or repeatability of a set of measures, and validity indicates the degree to which the assessment measures what it claims to measure (5). The evidence for the psychometric properties of the PEP-3 is limited and inconclusive. Therefore, the purpose of this study was to examine the reliability and validity of the Psycho-Educational Profile, Third Edition as a diagnostic assessment test in children with autism spectrum disorders and children with intellectual disabilities.

Methods

1) Participants

The subject of this study was 44 children with a diagnosis of autism spectrum disorder or intellectual disability. The children with ASD were diagnosed at the neuropsychological center "Universal Healthy Brain Center" in TEMARA and at the "Association Marocaine Vie Meilleure" in KENITRA. The children with intellectual disabilities were recruited within the association. Our study is based on a population made up of 70.45% boys and 29.55% girls whose ages range from 4 to 13 years. The population studied is divided into 2 samples: The first sample is diagnosed with ASD with a percentage of 68.18%; whereas the other one has ID with a percentage of 31.82%.

2) Procedure

The two samples recruited to participate in the present study consist of two groups of children, one having ASD and another one having ID. The participants completed the performance test PEP3-PT individually.

The purpose and procedure of the study as well as the instructions were explained to parents or caregivers for the PEP3-CR report.

The caregiver report was completed by the parents or caregiver who have been taking care of the child more than 4 hours per day, 5 days per week.

Concerning PEP-3 validity, all children were tested by the PEP3-PT and PEP3-CR.

3) Instruments

3.1) The Psycho-Educational Profile Performance Test, third edition (**PEP3-TP**)

The PEP3-PT consists of 172 items, which are combined to form 10 subtests, 6 of which address developmental abilities; they are the following: Verbal-Preverbal Cognition (**VPC**), Expressive Language (**EL**), Receptive Language (**RL**), Fine Motor Skills (**FMS**), Gross Motor Skills (**GMS**), and Oculomotor Imitation (**OMI**).

The other 4 subtests, that address maladaptive behaviors, are: Affective Expression (**AE**), Social Reciprocity (**SR**), Characteristic Motor Behaviors (**CMB**) and Characteristic Verbal Behaviors (**CVB**). Based on 10 subtests, we can identify 3 categories: Communication Category (**VPC, EL, RL**), Motor Category (**FMS, GMS, OMI**) and maladaptive Behavior Category (**AE, SR, CMB, CVB**) (6).

3.2) The Psycho-Educational Profile Caregiver's Report, Third Edition (**PEP3-CR**)

The PEP3-CR consists of 38 items combined into 3 subtests which are: Behavior Problems (**BP**), Personal Autonomy (**PA**), and Adaptive Behaviors (**AB**) (6).

4) Data analysis

Data was analyzed using Excel and Statistical Package for Social Science (SPSS) software (V.23.0. Armonk, NY: IBM Corp). The internal consistency of the PEP-3 was examined by calculating Cronbach's alpha for the performance test and the Caregiver report. Cronbach's alpha coefficients above 0.9 were considered excellent internal consistency; above 0.8, good; and above 0.7, acceptable (4). The validity of the PEP-3 test was examined by Spearman's rank correlation coefficients between the percentiles of the caregiver report subtests and those of the performance subtests. Spearman rank correlation coefficients greater than 0.75 were considered high, those between 0.5 and 0.75, moderate; those between 0.25 and 0.5, fair; and those below 0.25 low (5).

Results

1) Internal consistency

In the whole sample, Cronbach's alpha for the percentile ranks of the 10 Performance subtests and the percentile ranks of the 3 Caregiver Report subtests were 0.94 and 0.80, respectively, indicating a high degree of internal consistency (Table 1).

Table 1. Reliability Statistics.

	Alpha de Cronbach	Number of elements
Performance Test	,943	10
Caregiver Report	,803	3

2) Correlations

Validity results are presented in Table 2, 3 and 4.

*The correlations between the Performance subtests were fair to superior, ranging from 0,405 à 0,845.

*The correlations between the Caregiver Report subtests were fair to moderate, ranging from 0.48 to 0.75.

*The correlations between the Performance and Caregiver Report subtests were fair to superior, ranging from 0.392 to 0.765.

Table 2. Correlations between Performance subtests.

	<i>VPC_PR</i>	<i>EL_PR</i>	<i>RL_PR</i>	<i>FMS_PR</i>	<i>GMS_PR</i>	<i>OMI_PR</i>	<i>AE_PR</i>	<i>SR_PR</i>	<i>CMB_PR</i>	<i>CVB_PR</i>
<i>VPC_PR</i>	1,000	,790**	,821**	,721**	,676**	,722**	,666**	,635**	,686**	,688**
<i>EL_PR</i>	,790**	1,000	,696**	,505**	,534**	,631**	,545**	,492**	,405**	,575**
<i>RL_PR</i>	,821**	,696**	1,000	,718**	,553**	,736**	,632**	,671**	,665**	,707**
<i>FMS_PR</i>	,721**	,505**	,718**	1,000	,725**	,774**	,573**	,634**	,779**	,662**
<i>GMS_PR</i>	,676**	,534**	,553**	,725**	1,000	,737**	,667**	,631**	,686**	,478**
<i>OMI_PR</i>	,722**	,631**	,736**	,774**	,737**	1,000	,650**	,714**	,806**	,719**
<i>AE_PR</i>	,666**	,545**	,632**	,573**	,667**	,650**	1,000	,845**	,736**	,644**
<i>SR_PR</i>	,635**	,492**	,671**	,634**	,631**	,714**	,845**	1,000	,776**	,758**
<i>CMB_PR</i>	,686**	,405**	,665**	,779**	,686**	,806**	,736**	,776**	1,000	,774**
<i>CVB_PR</i>	,688**	,575**	,707**	,662**	,478**	,719**	,644**	,758**	,774**	1,000

** Correlation is significant at the 0.01 level (two-tailed).

Table 3. Correlations between subtests of the caregiver’s report.

	<i>BP_PR</i>	<i>PA_PR</i>	<i>AB_PR</i>
<i>BP_PR</i>	1,000	,480**	,631**
<i>PA_PR</i>	,480**	1,000	,755**
<i>AB_PR</i>	,631**	,755**	1,000

** Correlation is significant at the 0.01 level (two-tailed).

Table 4. Correlations between Performance Test and Caregiver Report Subtests.

	<i>VPC_PR</i>	<i>EL_PR</i>	<i>RL_PR</i>	<i>FMS_PR</i>	<i>GMS_PR</i>	<i>OMI_PR</i>	<i>AE_PR</i>	<i>SR_PR</i>	<i>CMB_PR</i>	<i>CVB_PR</i>
<i>BP_PR</i>	,492**	,493**	,396**	,392**	,496**	,463**	,477**	,522**	,437**	,559**
<i>PA_PR</i>	,668**	,552**	,575**	,765**	,721**	,718**	,537**	,596**	,711**	,594**
<i>AC_PR</i>	,646**	,453**	,579**	,683**	,673**	,653**	,596**	,634**	,682**	,571**

** Correlation is significant at the 0.01 level (two-tailed).

Discussion

We found PEP3 to be reliable and valid for assessing the developmental level of children affected with ASD by providing information about performance, behavior problems, personal autonomy, and adaptive behaviors of children affected with ASD and children with intellectual disabilities. Because the adaptive behaviors and symptom severity of children having ASD may depend on different environments, the PEP3 can provide clinicians with information about children in different settings and sources.

1) Internal consistency

In this piece of work, the PEP-3 performance test and caregiver report have good internal consistency. The good internal consistency of the ten Performance subtests (**cronbach's alpha = .943**) and the three caregiver report subtests (**cronbach's alpha = .803**) indicate the consistency of all items within each subtest.

2) Correlations

Our results provide strong evidence for the validity of the PEP-3.

Indeed, the total- domain correlation used to determine the role of each of the PEP3 subtests in relation to the overall measure showed that all fields contributed effectively to the total score. This study contributes to the field of educational program planning for children with ASD in Morocco by validating all subtests of the Performance Test and Caregiver Report (PEP-3) that can help identify children with ASD early and reliably in Morocco.

Firstly, the use of this instrument can facilitate the development and implementation of individualized educational and treatment programs for those children, although in recent years, a number of ASD screening and diagnostic tools have been developed.

With the PEP-3, professionals will be able to obtain detailed data and an overall schematic picture of a child's developmental strengths and weaknesses, maladaptive behaviors, learning style, and interests, which can inform individualized educational planning. The detailed data also provides important insights into developmentally appropriate expectations for the children involved.

Secondly, because the PEP-3 can be administered in a flexible manner without requiring a certain level of verbal ability, attention, and focus from participants, it can help clinicians identify ASD in young children that was previously considered untestable. Clinicians can use the PEP-3 in conjunction with other diagnostic tools to improve the accuracy of ASD diagnosis, which in turn can reduce the rate of unrecognized cases in Morocco. Moreover, the PEP-3 measures behavioral characteristics of a child specifically associated with ASD and can be used to differentiate ASD from other types of developmental disorders.

Another advantage of the PEP-3 is that it includes both a performance test and a caregiver report. It has been recommended that a comprehensive assessment of children affected with ASD should be based not only on standardized observational scores from trained examiners, but also on information provided by the child's caregiver, usually the parents. While the standardized scores help professionals understand a child's development in relation to typically developing children, the caregiver's report provides a broader context for understanding children's day-to-day behavior, as well as family and other environmental factors that may influence children's performance. Through the use of the PEP-3, researchers and clinicians are able to integrate information from different sources and obtain a complementary picture of child development.

Finally, the PEP-3 can be used as an outcome measure to evaluate the treatment effects of different ASD programs in Morocco.

For further information, it should be well noted that this study is the first to validate the PEP-3, a well-established educational assessment tool for children with ASD in Morocco. A comprehensive evaluation of the different types of psychometric properties of the PEP-3 was established.

Based on a small sample (N = 63), researchers in Taiwan investigated the reliability and validity of the Chinese PEP-3 Caregiver's Report, but not the main performance test (3). In contrast, researchers in Hong Kong have conducted systematic validation studies based on a large sample of children affected with ASD and a comparable number of typically developing children (7).

Conclusion

The PEP-3 Test assessment showed significant differences between the autism spectrum disorders group and the intellectual disability group. Children having autism spectrum disorders had lower mean scores than the mean scores of those having intellectual disability on most of the subtests of PEP-3 test, showing that children with ASD differ from children with intellectual disability (not with ASD) in several specific behaviors and that the autistic trait negatively influences children's performance and behavior.

We have also found that the internal consistency of the PEP-3 was good. Correlations between the PEP3-PT and PEP3-CR also supported the validity of the PEP-3.

The validity of the PEP-3 provides Moroccan practitioners with a useful tool for obtaining an early and detailed assessment of children affected with autism spectrum disorders and other developmental disorders, this is of a paramount importance for planning and evaluating therapeutic and educational intervention programs based on children's current developmental states and their changes in different developmental fields over time.

Conflict of Interest

The authors declare that they have no conflict of interest.

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