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ASSESSMENT OF DISABILITY IN PERSONS SUFFERING FROM MENTAL RETARDATION –THE ADPMR SCALE - PART II: RELIABILITY REPORT

Alka Nizamie[1], Baxi Neeraj Prasad Sinha[2], Vinay Kumar Singh[3], Sumita Sinha[4], Masroor Jahan[5], S. Haque Nizamie[6]

ABSTRACT

Background: Disability certification in mental retardation has been an area of concern. However, lack of reliable and validated tools has hampered progress in the field. A new tool, Assessment of Disability in Mental Retardation (ADPMR) has been developed. Here we present the psychometric properties of the ADPMR scale. **Method:** A five item semi-structured, fully anchored, trained observer rated scale (Assessment of Disability in Persons suffering from Mental Retardation, ADPMR) was field tested first on 51 consecutively presenting children suffering from mental retardation and associated conditions, after taking informed consent from their guardians. Intelligence Quotient (IQ) and Social Quotient (SQ) were also determined. The scale was again applied on 39 children after a period of 4 weeks to assess test-retest reliability. **Results:** Scale items were well correlated with each other and with the disability percentage showing good internal consistency. Linear regression revealed that neither IQ nor SQ were predictors for disability percentage, proving the discriminant validity of the scale. Reliability of the scale was good, as evident by Cronbach's Alpha value of 0.8091. Test- retest reliability was also good [Single measure Intra Class Correlation coefficient = 0.8280, 95% C.I.: 0.8206 - 0.9507]. **Conclusions:** The ADPMR scale is a reliable tool to assess disability in mental retardation. Disability as a construct is different from intelligence level and social functioning.

Key words: disability, assessment, mental retardation, scale, reliability.

Declaration of interest: none.

Introduction

Quantification of disability in persons suffering from Mental Retardation has been a contentious issue. Certain methods in vogue like using IQ scores (or 100-IQ) are conceptually and functionally not sound as they do not measure disability. Moreover, a sizable proportion of children suffering from mental retardation also suffer from other co-morbid psychiatric and medical conditions such as multiple disabilities (Carvill, 2001; Arnold, 1993). Single domain assessments (like IQ) are consequently insufficient in assessing disability from a holistic perspective. Lack of specific instruments has hampered research in this area in the past. A new scale, "Assessment of Disability in Persons suffering from Mental Retardation" (ADPMR) has been developed keeping in view this need. The scale and its development have been detailed separately. Here we present the psychometric properties of ADPMR.

Materials and Methods

ADPMR was administered on all children presenting consecutively in the special school "Deepshikha Institute of Child Development &Mental Health" during a two-month period who were diagnosed as having mental retardation as per ICD-10, DCR (WHO, 1993), after taking informed consent from their key relatives. The socio-demographic details were recorded in a specially designed data sheet. IQ scores were obtained using Binet-

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Kulshreshtha Test (standardized for Indian population; Kulshreshtha, 1971) and Social Quotient (SQ) scores were determined using Vineland Social Maturity Scale (VSMS; Malin, 1992). Each instrument was applied by different, suitably trained persons, who were blind to each other and to other details of the subjects. All ratings of a particular tool were done by a single rater.

Statistical Package for Social Sciences (SPSS) for Windows version 11.0 was used for data analyses. Correlations between disability percentage and scale items were explored. Linear Regression was used to find the predictor variables for disability percentage.

The scale was again applied after 4 weeks by the same rater, to assess the test-retest reliability of the instrument.

Results

The total sample size was 51 for the first rating. The socio-demographic characteristics have been summarized separately in our previous paper (preceding this paper).

Bivariate Point Bi-serial correlations revealed significant correlations between disability percentage and scale items. The scale items had good correlation with the disability percentage (Table 1). Linear regression revealed that neither IQ nor SQ were predictors of disability percentage (Table 2).

Table 1: Correlation between Disability percentage and other scale items Point Bi-serial Correlation Coefficients

	Perceptual Motor	Self Care	Communication & Socialization	Academics	Occupational
Perceptual Motor	1	**			**
Sig. (2-tailed)					
Self Care	0.734**	1	**	**	**
Sig. (2-tailed)	0.000				
Communication & Socialization	0.273	0.493**	1	**	**
Sig. (2-tailed)	0.053	0.000			
Academics	0.199	0.529**	0.553**	1	**
Sig. (2-tailed)	0.161	0.000	0.000		
Occupational	0.508**	0.542**	0.476**	0.379**	1
Sig. (2-tailed)	0.000	0.000	0.000	0.006	
Disability Percentage	0.743**	0.880**	0.729**	0.700**	0.711**
Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000

**Significant at 0.01 level

Table 2: Linear Regression with disability Percentage as dependent variable Coefficients

Variables	Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	1.966	4.763		0.413	0.685
Age (years)	0.0004259	0.087	0.000	0.005	0.996
Sex	-0.206	0.735	-0.008	-0.280	0.783
Socio- Economic Status	-0.04635	0.350	-0.003	-0.133	0.896
Intelligence Quotient	-0.03023	0.044	-0.025	-0.680	0.506
Social Quotient	0.01069	0.026	0.013	0.404	0.691
Associated Condition	0.145	0.144	0.035	1.002	0.330

a) **Predictors:** (Constant), Age (years), Sex, Socio- Economic Status, Intelligence Quotient, Social Quotient, Associated Condition.
b) **Dependent Variable:** Disability Percentage

Table 3: Correlation between Total Disability in initial and retest ratings

Point Bi-serial Correlation Coefficients		Disability in 2nd rating	Intra Class Correlation Coefficient (single measure)
Disability in 1st rating	Correlation	0.843	0.8280
	Significance (2-tailed)	0.000	[95% C.I.: 0.8206 - 0.9507]
	N	39	

The second rating could be completed on only 39 children (remaining 12 children and their parents could not come for follow-up during the study period, hence they were taken up for analyses for test-retest reliability). The Cronbach's Alpha value was 0.8091. The retest scores correlated well with the initial disability scores with single measure Intra-Class-Correlation coefficient of 0.8280 [95% C.I.: 0.8206 - 0.9507] (Table 3).

Discussion

A robust internal consistency was indicated by good correlation among all the 5 the items of the scale (Table 1).Linear regression failed to demonstrate IQ as predictive variables for disability (Table 2). This finding is important as it highlights the shortcomings when IQ is used to quantify disability for legal purposes. It shows that IQ scores do not predict the disability of an individual suffering from mental retardation. This finding is consistent with the earlier reports describing the use of IQ as a less than adequate predictor of social or adaptive competence (Flynn, 1991; Herrnstein & Murray, 1994; Howe, 1997).

Moreover, even though disability appears closer to a social construct, SQ was not a predictor of disability percentage (Table 2), thereby lending discriminant validity to the concept of disability as assessed by the ADPMR scale.

These findings further highlight the fact that disability is a unique concept, different from intelligence as well as from mere adaptive functioning, being more attuned to quantify the restriction in activities that in turn may be due to combination of a multitude of factors.

Cronbach's Alpha is a measure of internal consistency and reliability of a scale. An Alpha value of 0.8091 shows that the reliability of the ADPMR scale is good. A robust Intra-Class-Correlation coefficient of 0.8280 [95% C.I.: 0.8206 - 0.9507] indicated that the scale had good retest reliability at 4 weeks, further adding credence to the overall psychometric properties of the scale.

Conclusion

The ADPMR scale appears to be a reliable tool to assess disability in persons suffering from mental retardation. It has sufficient internal consistency and retest reliability. Thus, it may be well suited to quantify the overall percentage of disability in persons previously diagnosed as suffering from mental retardation, who may additionally have associated conditions (as multiple disabilities). A small number of items and use of minimal jargon appear to be helpful for easy administration.

Lack of comparison with a gold standard for comparison of disability level in case of mental retardation was a major limiting factor; however, the very need for developing this instrument was the non-availability of such specific and validated instrument. Work is continuing at "Deepshikha" and allied institutes and multi-centric reliability studies are in progress.

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1. **Dr. Alka Nizamie**, Ph.D, D.M&SP, (Corresponding author) Associate Professor of Clinical Psychology & Director (Academics), Deepshikha Institute of Child Development and Mental Health, Ranchi-06. Emails: alkanizamie@yahoo.com
2. **Dr. Baxi Neeraj Prasad Sinha**, DPM, MD, DNB; Sr. Resident
3. **Mr. Vinay Kumar Singh**, M.Ed, BMR; Asst. Prof. (Spl. Edn.)
4. **Ms. Sumita Sinha**, M.Ed, BMR; Lecturer (Spl. Edn.)
5. **Dr. Masroor Jahan**, Ph.D., MM&SP; Assistant Professor of Clinical Psychology & Incharge, Academic Programs
6. **Prof. S. Haque Nizamie**, M.D, D.P.M
Professor of Psychiatry & Director, Central Institute of Psychiatry, Ranchi, Jharkhand-06