

## Psychometric Properties and Derivation of Norms for an Amharic Version of Vineland Adaptive Behavioural Scale for Children with Intellectual Disability in Ethiopia

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Received for publication: 03 July 2022.

Accepted for publication: 01 September 2022.

### Abstract

Adaptive functions of children with intellectual disability are assessed through administration of different tools. This study examined psychometric properties and derivation of norms for an Amharic Version of Vineland adaptive behavioural scale for children with intellectual disability in Ethiopia. The research was a cross-sectional study conducted on children with intellectual disability in Addis Ababa after obtaining an approval from Addis Ababa University. Finding of the present study revealed that, the Amharic version of VABS-II had a high overall internal consistency alpha coefficient (0.83), in the Ethiopian sample which is similar to Western findings; hence VABS-II is a reliable tool for measuring adaptive behavioural functions for children with intellectual disability. VABS II scores of Ethiopian sample were compared to the scale norms developed in the United States. Ethiopian sample means were consistently below the mean in the United States normative sample. The correlations between the VABS and Mekanyesus assessment tool composite and sub-domain scores were all moderate. Even though Mekanyesus's assessment tool didn't follow proper procedure to prepare standardized tool like VABS-II survey form, it helped the school to assess children with intellectual disability modestly. Confirmatory factor analysis indicated that the model fit the VABS-II survey well. Thus, the Amharic version of the VABS-II survey form evidenced sound psychometric properties in Ethiopian children with intellectual disability, supporting its use in identification and intervention of children with intellectual disability. The Amharic translated version of VABS II survey form can be used in Ethiopian context for the purpose of identification and intervention of children with intellectual disabilities. This can overcome the problem of early intervention centres, families and care givers by giving them additional assessment tool that would be used in the country.

**Keywords:** Intellectual disability, adaptive behavior, psychometric property, Vineland Adaptive Behavioral Scale, norms

### Introduction

Nearly 200 million of the world's population is estimated to be people with intellectual disability, with 41 million having long-term or permanent disability (WHO, 2016). It Ranks fourth in the list of leading cases of disability. The overall prevalence of children with intellectual disability is between 1-3%. It is more common in developing countries because of the higher incidence of injuries and anoxia around birth, and early childhood brain infections. Population studies have shown that overall prevalence of mild to severe intellectual disability ranges from 2.5 to 5 per thousand

(Stein & Susser, 1984). The investigations of psychometric properties of adaptive behavioral scales for children with intellectual disability are necessary to assure accuracy, especially when scales are translated and used across cultures.

Varies studies identified the VABS as an internationally recognized and widely used assessment and research tool. However, to use in developing countries like Ethiopia and with children with intellectual disability and limited access to resources, adaptation and consideration of the criteria of the tool is often needed.

Since the Vineland Adaptive Behavioural Scale has been used internationally over the last three decade, it is important to thoroughly re-examine its psychometric properties, in order to assure its effectiveness. Thus, the present study assesses the psychometric property and derivation of norms for VABS-II survey form in Ethiopian context. Specifically, by examining the psychometric properties of Amharic Version of VABSII Survey form and identifying the relationship between locally used adaptive functioning assessment tools and Vineland Adaptive Behavioural Scale II survey form.

### ***VABS in different Cultures and Languages***

With the aim of developing a reliable and valid tool to screen for children who would need early intervention and services in a context of severely limited resources, Goldberg et al, (2009) translated and adopted VABS in Vietnam to use for preschool children between the ages of 3-6 years. They further referred to a number of studies of adaptation of the VABS in a non-western context to support their study. Anjun et al., (1990) cited in Goldberg, (2009) to study social maturity in rural and urban Indian infants they used an adaptation of the Vineland Social Maturity Scale. In 1991, Tombokan-Runtukahu and Nitko (n.d) cited in Goldberg, 2009) described adaptation of the VABS in to an Indonesian setting, that included translation, back translation, expert review of items and content analysis with modification and elimination of certain items. This was then additionally researched, matching children by age, gender, socioeconomic status and intellectual ability. They found that the basic properties of the original VABS matched to the Indonesian VABS, arguing that the transfer of the concept of adaptive behavior to a non-western context is possible.

In Italy, La Malfa et al. (2009) used the VABS in a correlational study between the Schemes of Appraisal of Emotional Development (SAED) and Vineland Adaptive Behavior Scales (VABS). On their study 33 adults, living in residential centers, without behavioral or psychiatric disorders of clinical significance, were assessed with both instruments. The SAED was found to be psychometrically reliable with a strong correlation between emotional development and adaptive functioning. They concluded that VABS provided a means of gathering important information about the emotional needs of the person.

On the other hand in a study conducted in Australia by using VABS and the Kaufman Brief Intelligence Test (K-BIT) to diagnose intellectual disability amongst a forensic sample found strong correlation (Hayes, 2005). There was an over representation of people with intellectual disability amongst the offender population, with prevalence of 20% being found in prisons in New South Wales in Australia. The correlation coefficient between the VABS and the K-BIT was .78. The correlation was less vigorous for young male offenders and further studies need to look at psychiatric and psychosocial characteristics and their effect on adaptive functioning.

Currently, there is an emerging need for cross-culturally reliable and validated research instruments or scales (Beaton et al., 2002; Sousa et al., 2005). According to Geisinger, (1994) whenever the psychometric instrument is used with a population that differs qualitatively from the one for

which it was originally developed, it is necessary to determine its continued validity and usefulness in the new population, even if the test itself remains unchanged.

According to Sparrow et al., (2005), norms for VABS-II were established in US in 3692 participants from the general population divided in 20 subgroups aged from 0 to 90 years old. The majority of the participants, 3,290 participants were aged 0 to 18 years old. They included equal number of girls and boys in ethnicity, socio-economic status and geographical representation of US general population. Meanwhile population with mental disability and handicap were also included in the sample. In addition to this according to Sparrow et al. (2005), a cross-sectional study was performed so as to show the ability of VABS-II to discriminate participants with intellectual disability and autism compared with the general population. Based on their study, participants with mental disabilities showed a lower score on VABS-II  $< 2$  standard deviation from the control group. However, unlike to the above study, in the present study the participants of this study were children with intellectual disability in two schools in Addis Ababa. The main objective of the present study was to determine the psychometric properties and derivation of norms for an Amharic Version of Vineland adaptive behavioral scale for children with intellectual disability in Ethiopian.

### **Methodology**

There were 171 boys and 128 girls with intellectual disability who were taking class in kindergarten in Addis Ababa. In the other hand there were 63 males and 94 females who had been trained with special needs education and taking class in the whole Addis Ababa government schools. For the purpose of this study the researchers purposefully selected two sub cities and two schools. These were Yeka and Nifase Silk Sub City; and Kokebe Tsibha and Mekaniyesus schools from the respective sub cities. The reason the researcher selected these schools purposefully were; one, these schools were pioneers in giving education for children with intellectual disability and the second, they had been using different assessment tools to identify & assess adaptive functions of children with intellectual disability.

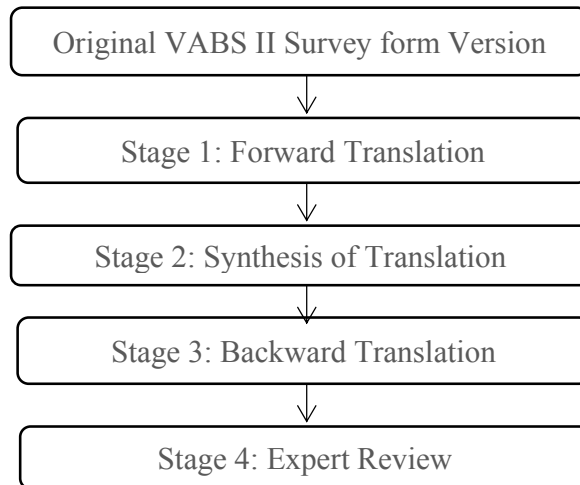
A stratified sampling was used for selecting children with intellectual disability from both schools using gender as strata. This technique was employed to ensure a fairly equal representation of children with intellectual disability and their respective families based upon their gender. Accordingly the researcher selected forty one boys and thirty nine girls with intellectual disability from Mekaniyesus and forty seven boys and thirty three girls from Kokebe Tsibha. On the other hand out of eleven special needs teachers in Kokebetsibha the researcher purposefully selected five of them based on their experience in the school. Similarly to the above the researcher purposefully selected five informants out of thirty two special needs teachers. In both schools teachers who had more experience were selected rather than juniors.

In order to obtain valid result the researcher in collaboration with the data collectors carefully selected qualified respondents. These respondents were adults who were most familiar with the everyday behavior of the children with intellectual disability. 132 of the respondents were parents (fathers & mothers), 9 of them were grandparents, and 19 of them were relatives and caregivers of the children with intellectual disability.

### **Instruments**

The researcher used Vineland Adaptive Behavioral Scales, Second Edition (Vineland-II) Survey form and the result of Mekanyesus assessment tool. The Vineland-II is a norm-based standardized measure of adaptive behavior that assesses the adaptive skills of individuals ranging in age from birth to 90 years (Sparrow, Cicchetti, & Balla, 2005).

The process of translation of the VABS-II into multiple languages follows guidelines prescribed by Beaton et al. (2000) or Guillemin, Bombardier, and Beaton (1993) (Figure 1). The methodology that is used in the process of translation strives to achieve the maximum level of equivalence between the original VABS II and the translated version of the VABS-II, while considering the cultural differences.



**Figure 1. The Process of Translation Guideline;**  
**Source: Beaton et al. (2000)**

The Ethiopian Evangelical Church Mekane Yesus (EECMY) adopted an educational program for children with intellectual disability and a support system for their parents in its Child and Youth Care Program (CYCP) since 1986. They are pioneers in the early identification and intervention of children with intellectual disability in Ethiopia. They have developing identification and assessment tools that would be used for children with intellectual disability. The current tool that they are using was adopted from the United States and India. This tool was divided into ten different domains. These were: communication skills, daily living skills, functional academics, Amharic writing, mathematics, matching numbers with objects, ordination, environmental science, sex education; and physical education. In each section, there were brief descriptions and subsections that described each domain. There were written assessment and marking techniques: they used the marks 80-100 for children who performed things without the help of others (excellent), 69-79 for children who performed things with little help of others (very good), 50-59 for children who performed most things with the help of others (good) and below 50 for children who performed everything with the help of others (unsatisfactory). For the purpose of the present study, in order to compare the VABSII with Mekanyesus assessment tool, the researcher used the three domain scores which had similarity to VABSII. These were: communication skills, daily living skills and cumulative adaptive behavioral scores of the children with intellectual disability.

#### ***Ethical Considerations***

Ethical clearance letter was obtained from the institute to reassure participants that their participation in the research was voluntary and that they were free to withdraw at any point and for any reason. In addition to this, participants were fully informed regarding the objectives of the study,

while they were reassured that their answers would be treated anonymously and used only for the research purpose. In contrast, the researcher attempted to create and maintain a climate of comfort.

### Results

This section presents a summary of the major findings of the study. It is organized in line with the specific objectives of the study. The section began with presenting the findings of the study, by presenting the demographic information of the participants, developing the norms of children with intellectual disability by using Amharic version of VABS II, comparing the VABSII result with Mekanyesus assessment tool and finally assessed the psychometric properties of the Amharic translated version of VABS-II survey form.

**Table 1. Representation of Norm Sample by Demographic Characteristics of the Comparability Analysis, Age & Mother's & Father's Educational Background**

Demographic Information		Age Groups										Total	
		6-8		9-11		12-15		16-21		22 +			
		N	%	N	%	N	%	N	%	N	%	N	%
Sex	Female	6	8.33	12	16.66	17	23.61	29	40.27	8	11.11	72	100
	Male	9	10.22	14	15.9	25	28.4	34	38.63	6	6.81	88	100
Mother's Educational Status	Can't Read & Write	4	8.33	11	22.91	14	29.16	17	35.41	2	4.16	48	100
	Grade 1-8	6	12.76	8	17.02	10	21.27	17	36.17	6	12.76	47	100
	High School	2	4.76	7	16.66	10	23.8	19	45.23	4		42	100
	Degree & Above	2	13.33	0	0	6	40	7	46.66	0	0	15	100
<b>Total N</b>		15	9.433	26	16.35	42	26.41	62	38.99	14	8.8	159	100
Father's Educational Status	Can't Read & Write	2	9.52	5	23.8	5	23.8	7	23.8	2	9.52	21	100
	Grade 1-8	5	17.85	6	21.42	8	28.57	8	28.57	1	3.57	28	100
	High School	3	5.26	12	21.05	16	28.07	19	33.33	7	12.28	57	100
	Degree & Above	2	10.53	1	5.26	3	15.59	12	63.16	1	5.26	19	100
<b>Total N</b>		15	9.46	26	17.57	42	25.68	63	38.51	14	8.78	148	100

### *Demographic Characteristics of the Norm Sample*

The representative norm sample of the Amharic Version of VABS-II survey form supports comparison of the individual level of functions with that of his/her age peers. According to Sparrow (2005), the original version was normed on a national sample of 3,695 individuals aged birth through ninety years. Whereas in the present study there were 160 individuals with intellectual disability aged six through forty-seven. This sample was relatively balanced by sex, age and was representative of Addis Ababa City in regard of geographic region.

Table 1 above, shows the demographic characteristics of the sample 160 children with intellectual disability who were assessed under Vineland Adaptive Behavioural Scale II semi structured interview. Girls and boys were fairly represented from each school. Overall girls comprised 45 percent of the sample, the rest were boys. Whereas regarding the age of the participants, 14 (9.46%) of the children were aged 6 through 8, 26 (17.57%) were aged 9 through 11, 38 (25.68%) were aged 12 through 15, 57 (38.51%) 16 through 21 and the rest 13 (8.78%) of them were above 22 years.

On the other hand 48 (30%) of the parents/caregivers considered as mothers that can't read & write, 47 (29.4%) of them had studied up to grade 8, 42 (26.3%) completed high school; and 15 (9.4%) had first degree and above. Whereas, 21 (13.1%) of parents/caregivers considered as fathers that can't read & write, 28 (17.5%) had studied up to grade 8, 57 (35.6%) had completed high school and 19 (11.9%) of them had first degree and above.

**Table 2. Means & Standard Deviations of Subdomain Raw Scores, by Age**

Age Groups		Re- cep- tive	Ex- pres- sive	Writ- ten	Per- sonal	Do- mestic	Com- munity	Inter- personal	Play & leisure	Cop- ing skill
6-8	Mean	20	41.2	1.47	34.8	4.93	10.87	24.8	17.2	4.6
	N	15	15	15	15	15	15	15	15	15
	Std. De- viation	4.09	22.03	1.73	15.53	3.59	7.55	11.55	9.52	4.67
9-11	Mean	21.92	41.46	6.54	34.46	7.08	16.31	31.69	27.92	8.5
	N	26	26	26	26	26	26	26	26	26
	Std. De- viation	8.02	31.32	8.42	20.06	5.08	13.96	15.83	12.92	7.38
12-15	Mean	24.81	61.74	6.83	48.38	18.74	24.14	39.36	33.5	12.05
	N	42	42	42	42	42	42	42	42	42
	Std. De- viation	8.1	22	8.53	18.37	14.48	15.89	14.7	12.75	10.47
16-21	Mean	30.4	72.13	11.19	59.37	21.95	34.29	43.22	36.17	15.57
	N	63	63	63	63	63	63	63	63	63
	Std. De- viation	6.07	19.06	13.7	14.23	9.79	14.28	15.69	12.65	12.34
22-90	Mean	6.07	19.06	13.7	14.23	9.79	14.28	15.69	12.65	12.34
	N	14	14	14	14	14	14	14	14	14
	Std. De- viation	9.99	28.73	14.52	6.64	11.09	17.17	10.47	11.55	11.86
To- tal	Mean	26.7	61.57	8.92	50.93	17.44	27.75	39.93	33.05	13.34
	N	160	160	160	160	160	160	160	160	160
	Std. De- viation	8.23	26.29	11.67	19.49	12.4	17.64	16.7	13.86	11.67

Subdomain, domain and Adaptive Composite norms were developed by using numerous stages. Raw subdomain scores were input to produce subdomain v-scales. On the other hand to generate the domain standard scores the researcher used the sum of sub-domain v-scale scores within the domain, and the sum of the domain standard scores was used to make the Adaptive Composite

standard score. In each stage converting the input scores into another metric using a normalization algorithm, and then hand smoothing the results of remove the effects of sampling discrepancy were involved. The analysis was done using the five age groups as described in the demographic table.

Raw scores on the Vineland- II subdomains as it shown in Table 2, is not directly interpretable, since subdomains contain different numbers of items, are not equally difficult, have unique growth curves, and produce widely varying distributions of scores, raw scores are not comparable from one subdomain to the next. Table 2, above shows the progression of subdomain mean raw scores for 5 age groups from 6 years up to 22+. Generally as it is shown in the table 2, above mean subdomain scores increase rapidly during the childhood and continue to increase, but at a slower rate, up through late adolescence, when the rate of increase tapers off.

**Table 3. Mild Intellectual Disability Sample: Means and Standard Deviations of Domains, Subdomains, and Adaptive Behaviour Composite with Comparison to Norm Sample, by age**

	Mean	SD	Difference from non-clinical reference group	Percentage scoring at or below 70
Age 6-18 (N=73)				
<b>Communication</b>	<b>54.1</b>	<b>9.2</b>	<b>-45.9</b>	<b>61</b>
Receptive	7.9	2.1	-7.1	
Expressive	6.2	2.7	-8.8	
Written	5.2	1.9	-9.8	
<b>Daily Living Skills</b>	<b>58.1</b>	<b>7.8</b>	<b>-41.9</b>	<b>62.8</b>
Personal	6.9	2.9	-8.1	
Domestic	7.9	2	-7.1	
Community	6.1	2.4	-8.9	
<b>Socialization</b>	<b>57.9</b>	<b>8.4</b>	<b>-42.1</b>	<b>63</b>
Interpersonal	7.1	2.5	-7.9	
Play & Leisure	7.3	2.2	-7.7	
coping skill	6.6	1.8	-8.4	
<b>Adaptive composite score</b>	<b>56.4</b>	<b>4.5</b>	<b>-43.6</b>	<b>59</b>
Age 19-47(N=24)				
<b>Communication</b>	<b>52.5</b>	<b>9.9</b>	<b>-47.5</b>	<b>59</b>
Receptive	8.9	2.5	-6.1	
Expressive	6.3	3.1	-8.7	
Written	5	2.2	-10	
<b>Daily Living Skills</b>	<b>56.5</b>	<b>9.5</b>	<b>-43.5</b>	<b>61.5</b>
Personal	7.3	3	-7.7	
Domestic	7.9	2.1	-7.1	
Community	5.6	2.7	-9.4	
<b>Socialization</b>	<b>59.3</b>	<b>5.5</b>	<b>-40.7</b>	<b>63.5</b>
Interpersonal	8.1	1.8	-6.9	
Play & Leisure	7.6	2.4	-7.4	
coping skill	6.8	2.2	-8.2	
<b>Adaptive composite score</b>	<b>55.4</b>	<b>3.7</b>	<b>-44.6</b>	<b>57.5</b>

Based on the VABS-II result individual with mild intellectual disability sample comprised of 73 individual aged 6 through 18; and 24 individuals aged 19 through 47, with 41 male and 56 females. The demographic Characteristics of these individuals are displayed on Table 3 above.

From the finding for age 6 through 18, the mean score for the clinical group on the Adaptive Behaviours Composite is 66.3, more than two standard deviations below the mean in the nonclinical reference group. The pattern of Subdomain mean scores describes this group as having poor skills in the coping and written skills subdomain. In the daily living sub-domain, the lowest mean score occurs in domestic functioning, where the individual has deficits in housekeeping and kitchen chores. With socialization, this group shows the greatest deficits in behaviours used in apologizing, responsibility and appropriate social caution.

Whereas the finding for age 19 through 47, this portion of the individuals with mild intellectual disability relatively shows a lower level of adaptive behaviour functioning than the younger group. The adaptive behaviour composite mean score of 55 is more than three standard deviations below the mean score of the nonclinical reference group. The mean score of socialization domains are higher than the Daily living skills and approximately both are three standard deviations below the means in the nonclinical reference groups. The communication domain score is the lowest of all.

**Table 4. Moderate Intellectual Disability Sample: Means and Standard Deviations of Domains, Subdomains, and Adaptive Behaviour Composite with Comparison to Norm Sample, by age**

	Mean	Std. Deviation	Difference from nonclinical reference group	Percentage scoring at or below 70
Age 6-18 (N=44)				
<b>Communication</b>	<b>42.6</b>	<b>8.3</b>	<b>-57.4</b>	<b>47</b>
Receptive	5.7	2.7	-9.3	
Expressive	3.8	1.8	-11.2	
Written	3.8	1.7	-11.2	
<b>Daily Living Skills</b>	<b>48.3</b>	<b>8.3</b>	<b>-51.7</b>	<b>51</b>
Personal	5.1	2.5	-9.9	
Domestic	5.9	2.3	-9.1	
Community	4.5	2.3	-10.5	
<b>Socialization</b>	<b>46.3</b>	<b>7</b>	<b>-53.7</b>	<b>48</b>
Interpersonal	4.8	2	-10.3	
Play & Leisure	4.4	2.4	-10.6	
coping skill	4.7	1.8	-10.3	
<b>Adaptive composite score</b>	<b>44.1</b>	<b>3.7</b>	<b>-55.9</b>	<b>46</b>
Age 19-47(N=5)				
<b>Communication</b>	<b>37.6</b>	<b>10.1</b>	<b>-62.4</b>	<b>44</b>
Receptive	5.2	2.4	-9.8	
Expressive	5.4	2.3	-9.6	
Written	3.8	3	-11.2	
<b>Daily Living Skills</b>	<b>44.8</b>	<b>9</b>	<b>-55.2</b>	<b>50</b>
Personal	4.4	1.9	-10.6	
Domestic	6	2.3	-9	



	Mean	Std. Deviation	Difference from nonclinical reference group	Percentage scoring at or below 70
Community	4.6	2.9	-10.4	
<b>Socialization</b>	<b>51.4</b>	<b>7.4</b>	<b>-48.6</b>	<b>54</b>
Interpersonal	6.8	2.6	-8.2	
Play & Leisure	6.8	2.6	-8.2	
coping skill	6.8	1.1	-8.2	
<b>Adaptive composite score</b>	<b>43.4</b>	<b>3.6</b>	<b>-56.6</b>	<b>46</b>

Based on the VABS-II result the Moderate intellectual disability sample comprised of 49 individual with intellectual disability aged 6 through 18 and 24 individuals aged 19 through 47, with 24 male and 25 females. The demographic Characteristics of these individuals are displayed in Table 4.

The level of adaptive behaviour functions for 6 through 18 years aged individuals with moderate mental retardation consistently lower than for those with mild intellectual disability. The adaptive composite score for the sample is 44.1, more than three and half standard deviations below the population mean. The mean domain scores are four to ten scale points lower than those observed in the group with mild intellectual disability. Greater percentages of individuals with moderate intellectual disability are identified by a domain score that is at least three standard deviations below the mean, ranging from 44 percent in communication domain to 54 percent in socialization domain.

The mean adaptive behaviour composite score for the individuals more than 18 years in the sample is 43.4, more than three standard deviations lower than for the nonclinical reference group and 11 points lower than among the adults with mild intellectual disability. Thus all the participants above eighteen years would qualify for a diagnosis of intellectual disability based on the adaptive behaviour composite score alone because all scored more than two standard deviations below the mean. The pattern of mean domain and subdomain scores resembles that seen in aged above eighteen years with mild intellectual disability. The mean score in the socialization is higher than all and the lowest domain was communication. The lowest subdomain scores occur in the personal and coping skills.

**Table 5. Severe Intellectual Disability Sample: Means and Standard Deviations of Domains, Subdomains, and Adaptive Behaviour Composite with Comparison to Norm Sample, by age**

	Mean	Std. Deviation	Difference from nonclinical reference group	Percentage scoring at or below 70
Age 19-47(N=5)				
<b>Communication</b>	<b>30.8</b>	<b>5.1</b>	<b>-69.2</b>	<b>33</b>
Receptive	2.2	0.8	-12.8	
Expressive	2	1.2	-13	
Written	2.8	1.3	-12.2	
<b>Daily Living Skills</b>	<b>31.2</b>	<b>5.3</b>	<b>-68.8</b>	<b>35</b>
Personal	1.4	0.9	-13.6	
Domestic	3	1.2	-12	

	Mean	Std. Deviation	Difference from nonclinical reference group	Percentage scoring at or below 70
Community	2	1.2	-13	
<b>Socialization</b>	<b>39.4</b>	<b>7.3</b>	<b>-60.6</b>	<b>43</b>
Interpersonal	1.8	0.8	-13.2	
Play & Leisure	3.4	2.3	-11.6	
coping skill	4.6	1.7	-10.4	
<b>Adaptive composite score</b>	<b>30.8</b>	<b>4</b>	<b>-69.2</b>	<b>34</b>
Age 6-18 (N=9)				
<b>Communication</b>	<b>21.4</b>	<b>1.3</b>	<b>-78.6</b>	<b>21</b>
Receptive	6.1	2.5	-8.9	
Expressive	3	2.6	-12	
Written	1.3	0.7	-13.7	
<b>Daily Living Skills</b>	<b>37.6</b>	<b>7.2</b>	<b>-62.4</b>	<b>44</b>
Personal	5.8	2.6	-9.2	
Domestic	4.7	2.6	-10.3	
Community	2.8	1.4	-12.2	
<b>Socialization</b>	<b>31.7</b>	<b>8.6</b>	<b>-68.3</b>	<b>33</b>
Interpersonal	5.8	2.6	-9.2	
Play & Leisure	6	3.1	-9	
coping skill	4.8	1.6	-10.2	
<b>Adaptive composite score</b>	<b>26.4</b>	<b>4.7</b>	<b>-73.6</b>	<b>30</b>

Based on the VABS-II result the Moderate intellectual disability sample consisted of 14 individual with intellectual disability aged 6 through 18 and 5 individuals aged 9 through 47, with an equal number of males and females. The demographic Characteristics of these individuals are displayed in Table 5.

The mean adaptive behaviour composite score for under eighteen sample with sever intellectual disability is 30, above four standard deviations below the mean of the nonclinical reference group. The performance of this is more than one standard deviation below that observed in under eighteen individuals with moderate mental retardation. The minimum attainable domain or adaptive behaviour composite standard score is 26.4, and many individuals obtain this minimum. The pattern of deficits at the subdomain level is different from the under eighteen individuals. The greatest deficits occur in the receptive, personal and interpersonal subdomains.

The mean adaptive behaviour composite score for above eighteen years sample is 26.4, more than four standard deviations below the mean of the nonclinical reference group. The performance of this group is about one standard deviation below above eighteen years group with moderate intellectual disability.

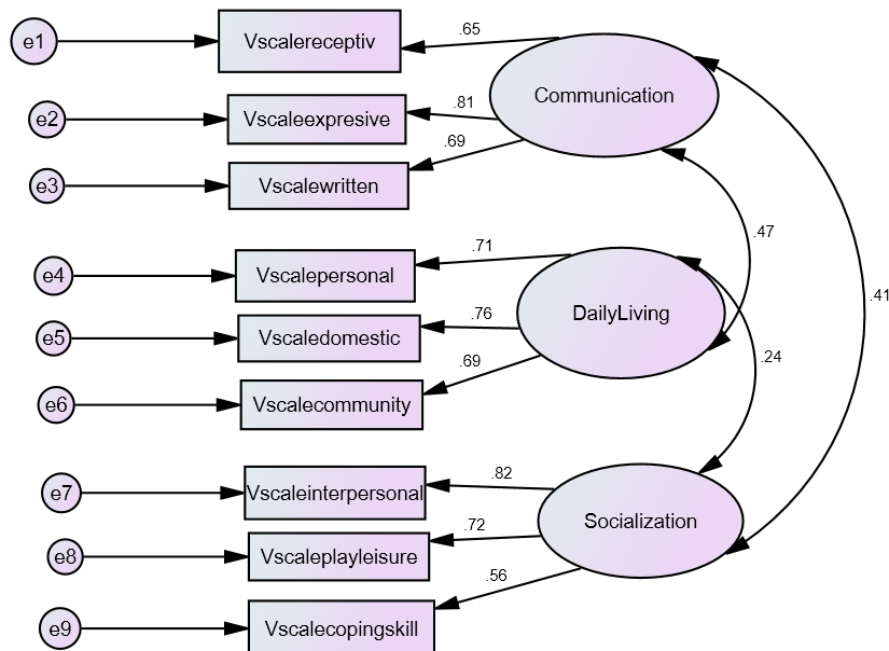
Correlation coefficients were calculated for each of the three domain and adaptive composite score (Table 6). All the correlations were significant at the  $P < .05$ . The correlation between communication and daily living domain was 0.46 ( $p < .05$ ), communication and socialization was 0.46 ( $p < .51$ ); and communication & Adaptive composite score was 0.83 ( $p < 0.05$ ).

**Table 6. Intercorrelation Coefficients of Domain and Adaptive Behaviour Composite Scores**

		Communica- tion domain	Daily living domain	Socialization domain	Adaptive composite score
Communication domain	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	160			
Daily living do- main	Pearson Correlation	.456**	1		
	Sig. (2-tailed)	.000			
	N	160	160		
Socialization do- main	Pearson Correlation	.457**	.339**	1	
	Sig. (2-tailed)	.000	.000		
	N	160	160	160	
Adaptive compos- ite score	Pearson Correlation	.829**	.736**	.737**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	160	160	160	160

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Confirmatory Factor Analysis (CFA) was performed on all measuring items using AMOS software. The measurement model was evaluated using the fit measures recommended by various scholars (Byrne, 2010; Hair et al., 2010). These researchers advised including the chi-square ( $\chi^2$ ) value and the associated degrees of freedom (df), as well as at least one incremental and one absolute index. As a result, reporting the  $\chi^2$  value, degrees of freedom, comparative fit index (CFI), and root mean square error of approximation (RMSEA) provides enough unique information to evaluate the model (Hair et al., 2010).



**Figure 2. Factor Structure and Standardized factor loading of Subdomains**

The measurement model was evaluated in this study using chi-square ( $\chi^2$ ), the comparative fit index (CFI), the goodness of fit index (GFI), and the root mean square error of approximation (RMSEA). However, because the  $\chi^2$  is highly sensitive to sample size, this study employed a normed chi-square ( $\chi^2/df$ ), as recommended by Byrne (2010) and Hair et al (2010). A review of the measurement model revealed no unsupported estimates and that the fit indices also support the proposed model. The measurement model was confirmed to be fit with a normed chi-square ( $\chi^2/df$ ) value of 1.495 ( $\chi^2 = 35.873$ ,  $df = 24$ ), which was within the maximum point of 5.0. Furthermore, all standardise regression weights are greater than 0.5, indicating that the scales meet the convergence value (Figure 2). Furthermore, the baseline fit indices (CFI = 0.969 and GFI = 0.956) were greater than the 0.90 cut-off point, indicating that the measurement model was well-fitted. Finally, the RMSEA value of 0.056 was clearly less than the cut-off value of 0.08, indicating that the measurement model was well-fitting.

**Table 7. Estimates of the Measurement Model**

Statistic	Suggested	Obtained	Decision
Chi-square significance	$\geq 0.05$	0.056	Supported
Normed chi-square (CMIN/df)	$\leq 5.00$	1.495	Supported
Comparative fit index (CFI)	$\geq 0.90$	0.969	Supported
Goodness-of-fit index (GFI)	$\geq 0.90$	0.956	Supported
Root mean error square of approximation (RMSEA)	$\leq 0.08$	0.056	Supported

Model based on 9 subdomains, excluding the 2 motor subdomains

Table 8 shows the correlation between VABS II and locally prepared assessment tools. The correlation was conducted in the same domain between the two tools. There was significant correlation between VABS II & locally prepared assessment tool in communication (0.53), daily living skill domain (0.56), and adaptive composite score (0.63)

**Table 8. Correlations between VABSII & Mekanyesus's Children with intellectual disabilities records**

Domains		VABSII Communi- cation Domain	VABSII Daily living domain	VABSII Adap- tive composite score
Mekanyesus Communication	Pearson Correlation	.536**	.448**	.635**
	Sig. (2-tailed)	.000	.000	.000
	N	80	80	80
Daily Living Skill	Pearson Correlation	.421**	.563**	.620**
	Sig. (2-tailed)	.000	.000	.000
	N	80	80	80
Composite Score	Pearson Correlation	.412**	.450**	.533**
	Sig. (2-tailed)	.000	.000	.000
	N	80	80	80

\*\* . Correlation is significant at the 0.01 level (2-tailed).

## Discussion

The psychometric evaluation of an assessment instrument is an important consideration when determining which measurement tools are included as a tool for identification and assessment of children with intellectual disability; and as a part of a research study. A commonly used method to investigate construct validity is confirmatory factor analysis (CFA) (Boelen et al., 2008) Like EFA, CFA is a tool that a researcher can use to attempt to reduce the overall number of observed variables into latent factors based on commonalities within the data. The results of the present study revealed that evidence for the use of the Amharic Version of Vineland Adaptive Behavioural Scale II- Survey as identification and assessment tool for children with intellectual disability. This use of confirmatory factor analysis to support a model was intended to provide early intervention specialists, teachers, special need experts and directors with great confidence when making identification and assessment of children with intellectual disability based upon scores from this tool.

Diagnosis of intellectual disability, the level of adaptive functioning of an individual should be two standard deviations or more below the mean on at least one domain or the composite score when compared to the functioning of a normative sample (AAMR, 2002; APA, 2000). The results for this sample, with mean domain scores ranging from 21.4 to 59.3, showed the consistency of VABS-II survey forms data with the criterion. On other hand all the sample domain mean scores were at least two standard deviations below the corresponding mean scores in the nonclinical reference group as required in the VABS-II manual. Thus, this also satisfies the requirements set by IDEA (1999) as cited in Sparrow et al., (2005).

The correlation size between each Vineland Domain score and PEP-R Developmental Score ranged from 0.78 (Vineland socialization and PEP-R Developmental Score) to 0.87 (Vineland composite and PEP-R Developmental Score). The Vineland and PEP-R Developmental Age score correlations ranged from 0.75 (daily living skills and socialization) to 0.85 (Vineland composite scores). These values show a very large overall correlation, based on the criteria used by McCarthy et al. (1991), who expanded on Cohen's (1988) effect size criteria. The present study showed that the correlation of VABS II and Mekanyesus assessment tool was, 0.53 (communication domain), 0.44 (daily living domain) and 0.63 (adaptive composite score). These value shows that there were moderate correlation between the VABS-II and Mekanyesus assessment tool. Thus the result shows that even though the assessment tool of Mekanyesus was not developed by using standardized procedures, it can be moderately compared with the VABS-II.

Several studies conducted and approved that the psychometric property of the translated version of VABS, has good psychometric property. Goldberg al. et al., (2009) cited in Vietnam; Anjun et al., (1990) in India and Tombokan-Runtutahu and Nitko (1991) in Indonesia. These all studies found that the basic properties of the translated version of VABS matched those of the original VABS, arguing that the transfer of the concept of adaptive behavior to a non-western context is possible. Similar to the above studies, the present study has confirmed that the possibility of using Amharic version of VABS II in Ethiopian context. In contrary Zhang et al., (2006) indicated the difficulties of using a western concept of adaptive behavioral scale in different cultural context.

Similarly, Abd et al., (2020), concluded that the Arabic version is an appropriate scale for assessing adaptive behaviors in Palastain context. They argued the creation of the Arabic version of the VABS-II offers the Palestinian population an additional appropriate method of assessing children with intellectual disability. They further argued that their finding showed the Arabic version guidelines in offering services appropriate to these children. Similar to this the finding of the present study also confirmed the use of Amharic version of VABS-II in Ethiopian context. When comparing

with the Mekanyesus assessment tool, the VABS-II adds specificity in item complexity in measuring behavioral milestones across major life function. In Addition to this it is based on a large number of adaptive behaviours and functioning skills with specific questions as opposed to the Mekanyesus tool, which is smaller and age specific.

### Conclusion

Assessment of adaptive functions is critical for children with intellectual disability. As such, special needs teachers require measures that accurately capture the adaptive strength and weakness of these children. VABS-II and Mekanyesus assessment tool both captured the adaptive behavioural functions of the children with intellectual disability. The correlations between the VABS and Mekanyesus assessment tool composite and subdomain scores were all moderate. Even though Mekanyesus's assessment tool didn't follow proper procedure to prepare standardized tool like VABS-II survey form, it helped the school to assess children with intellectual disability modestly.

When comparing Ethiopian to US raw score on Vineland Adaptive Behavioral Scale survey form two, scores based on Ethiopian norms fluctuated around values based on US norms on all subdomains. The extent of the deviations differed across ages and subdomains. Ethiopian norms were systematically smaller than US for all subdomains and all ages.

One important finding of the present study is that the VABS-II survey form single factor structure fit the data from Ethiopian children with intellectual disability well. Even though no other alternative models have been tested, the present finding revealed that the Amharic version of the VABS II survey form preserves the conceptual document of the original version of VABS-II survey form. Thus, the Amharic version of the VABS-II survey form evidenced sound psychometric properties in Ethiopian children with intellectual disability, supporting its use in identification and intervention of children with intellectual disability.

Finally, the development of the Amharic version is one of the strengths of this study. The findings demonstrated that the Amharic version of VABS-II had acceptable psychometric properties as a means of measuring adaptive functions of children with intellectual disability. It had a high overall internal consistency alpha co-efficient (0.83), in the Ethiopian sample which is similar to Western findings; hence VABS II is a reliable tool for measuring adaptive behavioural functions for children with intellectual disability. This scale would be useful for identification and intervention of children with intellectual disability, future researchers and people with different disability in the Amharic speaking population. However, the need for more research, particularly on the measurement of adaptive behaviour is crucial to enhance the identification & intervention of children with intellectual disability in Ethiopia. Even though Mekanyesus's assessment tool didn't follow proper procedure to prepare standardized tool like VABS-II survey form, it helped the school to assess children with intellectual disability modestly.

### References

- AAMR (American Association of Mental Retardation) (2002). *Mental Retardation: Definition, Classification and Systems of Supports* (10th ed.). Washington, DC: AAMR.
- Abd, C.E., Ziya, D., Barakat, A., & Mahamid, F. (2020). Adaptive Behavior Scale in Arabic Language within a Palestinian Context. *The International Journal of Indian Psychology*, 8(4).
- American Psychiatric Association (2000). *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., Text Rev.). Washington, DC: Author.

- Beaton, D. E., Bombardier, C., Guillemin, F., & Ferraz, M. B. (2002). Recommendations for the cross-cultural adaptation of health status measures. *New York: American Academy of Orthopaedic Surgeons*, 1-9
- Boelen PA, van den Hout MA, van den Bout J. (2008). The factor structure of posttraumatic stress disorder symptoms among bereaved individuals: a confirmatory factor analysis study. *Journal of Anxiety Disorder*, 22, 1377–1383.
- Byrne, B. M. (2010). *Structural equation modeling with AMOS: Basic concepts, applications, and programming* (2nd ed.). New York: Taylor and Francis Group.
- Geisinger, K. F. (1994). Cross-cultural normative assessment: Translation and adaptation issues influencing the normative interpretation of assessment instruments. *Psychological assessment*, 6(4), 304
- Goldberg, M. R., Dill, C. A., Shin, J. Y., & Nhan, N. V. (2009). Reliability and validity of the Vietnamese Vineland Adaptive Behavior Scales with preschool-age children. *Research in Developmental Disabilities*, 30(3), 592-602
- Guillemin, F., Bombardier, C., & Beaton, D. E. (1993). Cross-cultural adaptation of health-related quality of life measures: Literature review and proposed guidelines. *Journal of Clinical Epidemiology*, 46, 1417–1432.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8<sup>th</sup> ed.). New Jersey: Pearson Prentice Hall.
- Hayes, S. C. (2005). Diagnosing intellectual disability in a forensic sample: Gender and age effects on the relationship between cognitive and adaptive functioning. *Journal of Intellectual and Developmental Disability*, 30(2), 97–103. Kline, R. B. (2011). *Principles and practice of structural equation modeling* (3rd ed.). New York: The Guilford Press
- La Malfa, G., Lassi, S., Bertelli, M., Albertini, G., Dosen, A., (2009). Emotional Development and Adaptive Abilities in Adults with Intellectual Disability. *Research in Developmental Disabilities: A Multidisciplinary Journal*, v30 n6 p1406-1412 Nov-Dec 2009
- McCarthy, P. L., Cicchetti, D. V., Sznajderman, S. D., Forsyth, B. C., Baron, M. A., Fink, H. D., et al. (1991). Demographic, clinical and psychosocial predictors of the reliability of mothers' clinical judgments. *Pediatrics*, 88, 1041–1046.
- Sousa, V. D., Zauszniewski, J. A., Mendes, I. A., & Zanetti, M. L. (2005). Cross-cultural equivalence and psychometric properties of the Portuguese version of the Depressive Cognition Scale. *Journal of nursing measurement*, 13(2), 87-99
- Sparrow, S. S., Balla, D. A., & Cicchetti, D. V. (2005). *Vineland Adaptive Behavior Scales Second Edition Survey Forms Manual*. AGS Publishing.
- Stein ZA, Susser MW. (1984). The epidemiology of mental retardation. Proceedings of the 34th Symposium of Colston Research Society, held in the University of Bristol in March 1982. Bristol: Wright; 21–46.
- Tombokan-Runtukahu, J., & Nitko, A. J. (1991). *Translation, Cultural Adjustment, and Operationalization of the Construct of Adaptive Behavior*.
- WHO (2016). *Global health Observatory*. <http://apps.who.int/gho/data/view.main.680>. Accessed on January 1, 2021
- Zhang, J., Wheeler, J. J., & Richey, D. (2006). Cultural Validity in Assessment Instruments for Children with Autism from a Chinese Cultural Perspective. *International Journal of Special Education*.