Validation of a New version for Memory Assessment in a Group of Farsi Speaking, Shiraz residents

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Abstract: The general population is increasing due to factors such as promotion of public health and advancement of medical technology. Thus, investigating problems of older people is of paramount importance. Dementia disorders and the related cognitive and memory problems and lack of valid instruments for evaluations of cognitive factors have created a need to validate memory test batteries for the age group of 65-75 years. The present study sample included 90 subjects consisting of 45 men and women suffering from dementia and 45 normal subjects in Shiraz. The instruments used were the new sub-tests adapted from Wechsler Memory Scale–Third Edition, California Verbal Learning Test (CVLT) and Mini-Mental State Examination. The results showed that the alpha coefficients was between (.66) and (.94) and for the memory subtest scores, and between (.51) and (.68) for Californian Verbal Learning Test. The validity indices for this scale were also assessed. The results were consistent with theoretical predictions. Taking into account the reported alpha coefficient and validity it can be concluded that the new memory test battery has satisfactory psychometric characteristics for 65-75 years population in Shiraz. [Fatemeh Hassani, Hassan Ahadi, Parviz Askari, Abdolhamid Shariat. **Validation of a New version for Memory Assessment in a Group of Farsi Speaking, Shiraz residents**. *Life Sci J* 2012;9(4):4353-4359]. (ISSN: 1097-8135). http://www.lifesciencesite.com. 654

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1. Introduction

The world's elderly population has been growing in recent years, so it is of great importance to take the disease and problem of aging into consideration. Among developing societies, the disease called dementia as a consequence of brain problems cause the affected to practically experience death twice. They die for the first time when they forget the whole past issues and memories especially the immediate past and even are not capable of managing their daily affairs and their second death is the common physical death experienced by every human. One of the important and also dangerous effects of dementia is the gradual loss and damage to cognitive functions which is remarkably evident as damage to memory. This problem emphasize on the necessity of study and increment of instruments which could inspect the memory, measure the level of damage to the brain and identify the areas in which the memory has suffered disorders. Determining the damaged parts, quantitative estimation of level of damage and distinguish it from the individual's natural mental disorders has significant importance in clinical diagnosis and adjustment of treatment process. Although a major part of the peoples' cognitive abilities increases during adulthood or is in a stable flow at least, however most of the people start to

experience some cognitive defects after sixty years of age.

2. Literature review

In this direction Shein (1996; quoting from Berger1998) concluded in an longitudinal research that most of elderly have shown significant reductions in some of several major mental abilities such as verbal means, spatial orientation, deductive reasoning, numerical ability and fluent speech. Cognitive disorder happens when there is significant difference between the level of individual performance in the present time and his ability before the happening of mental disorder (Nelson and Vilson, 1991; quoting from Lezak1995).

Among all the neural-behavioral syndromes, the problem of dementia and the age-related changes are the most well known and harmful ones for the public health of society (Ernest Vahy, 1994). Memory is one of the parts that could be affected with the cognitive problem of dementia. Therefore it is essential to measure this cognitive factor in the recognition and treatment process of disorders from which the memory disorder is the most important one.

Among the most well-known instruments for measuring memory we can point to the Wechsler test that is a collection of compound tests which is run individually and is designed for the better comprehension of different parts of memory. Now the

third edition is normalized with WAIS-III. Since it provides a complete domain of memory function, Wechsler test is considered the essential part of the full cognitive assessment process (Marnet, 2003).

America, Canada, Australia, New Zealand, and England and any of these countries, depend on cultural characteristi Now the fourth edition of Wechsler memory scale (WMS-IV) is applied in several countries such as cs of their own society, has created some changes.

Also these tests are used for diagnosing memory impairments among the elderly in Iran and today revised edition WMS-R is being used. The purpose of this research is to give the highest norm of the evaluations for clients, and also maintaining the high level of credit, lasting and assuring of the most effective usage type in these examination in that used in Iran from Wechsler test from first to forth edition.

In the revised text of forth edition, diagnostic and statically guide of dementia psychosis is specified with multiple deficiency knowledge including paramnesia but there is not any destruction awareness. Severe brain damage, passenger vascular diseases, and stroke include the main symptoms of dementia. Cognitive functions which may be damaged in dementia include general intelligence (G factor), learning and memory, language and problem-solving, navigation, conception, concentration and judging (Kaplan, 2003)

Dementia as a disease had multiple deficiency cognitive function including damage to memory or at least one of cognitive problems was recognized such as apraxia, aphasia, and tilt executive task brain. About 5% of the people in America suffer from sever dementia at the age over 65 and about 15% of elderly suffer from slight dementia. Increasing the age is the most important factor in this regard. The most prevalent cause for dementia after Oxidative stress consequence is vascular diseases or alcoholic trauma and the other cases.

The most prevalent type of Alzheimer and second type of prevalent dementia is vascular dementia (Kaplan, 2003; translated by Mohseni Fard). Alzheimer and vascular dementia in some dementia type altogether formed 75% of total dementia cases (ibid). In early twentieth century, Alovis Alzaymer reported that one of his patients named Agovest D shows sever impairment in his memory. He found some plaques album in his autopsy. Research about Alzheimer began seriously. Comprehensively pathology and neurology was studied and new and important information was evident (Volesh, Boohemran & Vanes, 2006).

Dementia syndrome is introduced as a problem that follows mal-functioning of the brain cortex or nerve system. The most important disorder occurs in the most part of brain cortex which is the result of aggressive memory disorder, behavioral changes, language functions and all consequences of cellular death that is usually worsen in older ages. (Jones series, 2004)

Perhaps memory is the most essential cognitive function that relates to dementia and can be described through different methods and in various abstract levels. Memory is one of the brain functions in cognitive category in dementia pathology that is highly studied in dementia pathology researches.. Free psychology dictionary, memory is defined as: the ability of reminding past experience or learned information that might include advanced mental processes like learning, maintaining, reminding and recognition that result from chemical changes between neurons and several different areas in the brain like hippocampus. Immediate memory only maintains information for few seconds. Short term memory saves and processes information for several minute and then transfers them to long term memory and can be settled for many years. Whenever the stored information was used repeatedly the neorochemical changes are facilitated to help the individual remember them. Losing memory as the result of diseases and brain impairment is called amnesia.

Dementia is so destructive for his family and relatives. To the extent that it affects the whole society. While dementia may be beginning with considerable symptoms like slight memorial impairments, it finally leads to sever general cognitive impairment so that they cannot do their works only. At the present time there is no curable method for dementia. At best some medicines can lessen these symptoms and lessen the recognition symptoms but the disorder returns again (Quming, 2004).

Without having any cognitive and mental instrument for saving and processing past events, human being cannot his past experiences. (Kelstorm, 1998)

Herman Ebinghavense is the foremost memory researcher that studied it through a practical and precise scientific method. (Solsoo, 2002)

William James (1901) divided memory into primary and secondary. Sometimes later, he called the former short term memory and the latter long term memory.

Atkinson and Shiffren (1968) divided memory to sensory memory, short term memory and long term memory (Ness, 2003). It is clear that for executing and giving any treatment we need instruments to collect essential and description data. Collecting initial data in psychology especially in examinations related to group distinctions and the role living factors play requires their application. However, psychology examinations are useful in diagnosis and treatment

(Kaplan, Sadook; 1996). In the present time memory evaluation and determining the degree and type of disorder is the most important area in neurology, psychology and psychometric. The lack of memory measurement instrument in Iran thus leads us to provide the tools to solve the problem. According to the above mentioned discussion, the main purpose of this study is the scale study for examining psychometric characteristic of new memorial examination. Elderly people who suffer from dementia and healthy old people were examined by differential diagnosis of this examination.

3. Material and Method

The method used in this research is field research. Observation instrument include the new memorial tests part of which is taken from Wechsler tests along with mini mental statuses examination (MMSE), and California verbal learning examination (CVLT) which provide the measuring memorial test and verbal learning that is done by giving questionnaires to the respondents. The data is recorded by the tester after it is answered by the respondents. The scores for each respondent show the memory status for him/her so that memorial impairment will be examined.

3-1.subject

Statistical population in this research was considered all elderly between 65 to 75 ages that live in Shiraz as a sample group and their education at least were reading and writing. The sample group includes 90 people. It includes 45 male and female who were determined as suffering from dementia, and 45 male and female healthy respondents.

3-2measurement tools

In this study, the collection of new memory tests includes several quizzes that together form the memorial measurement test. Some selected quizzes from Wechsler memory scale (third and forth ed.) for measuring active memory indices, immediate memory (immediate audio, immediate visual), delay (inconsistent audio, visual inconsistent, delayed audio) was given with some changes. According to following description:

Information and navigation, logical memory I, II, lists I, II, mental control, audio inconsistent II, numerical consult.

To study the validity of these scales the researcher paid attention to 3 aspects of criterion-related validity, constructed validity, and interrelationship correlation. In 1997, psychological corporation of criterion-related validity examined the validity of this scale through examining its correlation with Wechsler memory scale revised (WMS_R), child memory scale (CMS) and Wechsler adult intelligence scale (third edition) (WAIS-III). The result of this study shows a mean correlation coefficient between WAIS-III and these

scales that shows the validity of this criterion. Factorial analyses conducted so far confirms these validity scales (Wild et al, 2003; Toleski et al, 2004).

Saed (2007) examined Wechsler memory scale (third edition) characteristics during his studying on students in Shahed University and Teacher Training University of Tehran. This study was conducted on a sample of 266 individuals. For estimating the reliability of the test, similar interior methods (Cronbach's Alpha), partition methods, and adaption method between evaluators were used. For estimating the validity of the criterion-related test, as well as examining the inter-correlation between sub-scales, factorial analysis was conducted. For determining the reliability the Cronbach's Alpha was used the result of which shows an alpha coefficient of 94% to 96% for memory components.

CVLT that quantifies the below parameters:

Reminding and recognition level in all attempts, learning inclination for all attempts, memorizing information along short pauses and long pauses, reinforcing reminding function through some clues, classification and recognition examination(adult version of the test is appropriate for individuals who had 17-80 years (Asprin & Astres, 1998).

In this research Cronbach's alpha was used to determine the reliability of the measures. So the results show alpha coefficient between 0.51 to 0.68 for CVLT which proves the validity of this scale.

MMSE examination was used for examining and initial estimating and general estimating of public mental statues examinations.

For examining the reliability of this factor, Cronbach's alpha and retesting was used. The results are shown in Table 3-4.

Table 1. The results of reliability test for memory scale

Variable	Cronbach's alpha
Information	88%
Logical I memory	91%
Story B Logical memory I	92%
faces I recognition	80%
Visual reproduction I	86%
Mental control	66%
Digit span	84%
Logical memoryII	92%
Story B Logical memory II	84%
Logical memory cued recognition	86%
Faces II recognition	86%
Visual reproductionII	88%
MMSE	92%

As the results show for the memory component Cronbach's alpha coefficient was obtained between 66% -94% components.

For determining the reliability of CVLT scale Cronbach's alpha coefficient and retesting was used. The results are shown in Table 2.

Table 2. Result for the reliability of CVLT

variable	Cronbach's alpha
Learning slope	65%
Words list B	65%
Immediate free recall	51%
Immediate cued recall	60%
Short Delay free recall	60%
Short delay cued recall	59%
Irrelevant words in free recall	60%
Irrelevant words in cued recall	60%
Whole irrelevant words	60%
Repeated words	65%
Long Delay recognition	68%
Positive mendacious in long delay recognition	65%

As the results of the table shows, Cronbach's alpha coefficient between 51%-68% was created for component CVLT which shows the reliability of this component. While these coefficients are not highly significant, but they prove the relative reliability of this test.

3-4.Data analysis

In table 3, mean and standard derivation and mean of examinations scores was shown for the memory component in the sub-test. As table 3 shows, you consider means of participators in this study generally or separately were gathered. Findings of this table clearly show how participants function. As you see non dementia had more scores than dementia group in a little scales of memory.

According to table 4, the scores of dementia and non dementia group in indices of learning inclination, list B, reminding clues, delay of free reminding, delay reminding with clues, inconsistent delay, positive mendacious are significantly different. That is non dementia group in all indices- except Positive mendacious - had higher scores than dementia group. In other indices like irrelevant reminding and repeated reminding difference between two groups is not meaningful. These results, on the one hand, show the difference between the two groups. On the other hand, examination authority mentioned according to diagnosis characteristic of individuals who suffered dementia acted weakly in learning and memory. Another method for discriminating dementia and non dementia groups is

diagnosis analysis. For this purpose a sub-test scales of memory was analyzed as variant for dividing two groups. In this analysis, an equation in formulated through regressing the dependent variable on independent variable. The equation determines the maximum discrimination between the two groups which is used for determining the group membership in future. We need to mention that the researcher examined that presumptions were analyzed before congenial variance and covariance. The results show that presumptions are good.

In fact Welcinz lambda is the proportion of total in-group squares to total squares ratio that is a proportion of the variance that cannot be stated by the distinction of groups. The fewer lambdas are, the more is meaningful possibility. As you see in the above table, all values for lambda are small so that the two groups have meaningful differences in sub-scales of memorial examination. Also another method for discriminating the two groups of dementia and non dementia is using diagnosis analysis method. For this purpose CVLT was analyzed as a predictive variable in order to distinct the two groups. In this analysis, the type of dependent variable (criterion) leads into an equation that creates maximum distinction between the two groups and the equation is used for predicating membership group in the future. We need to mention that before analysis, presumptions - including congenial variance and covariance - were examined where presumption was appropriate.

Table 6 shows Welcinz lambda and one direction variance analysis and the level of meaningfulness.

In fact Welcinz lambda is the proportion of total in-group squares to total squares ratio that is a proportion of the variance that cannot be stated by the distinction of groups. The fewer lambdas are, the less is the possibility of meaningfulness. As you see in the above table, all scales of lambda are small to delay reminding with clues, delay of free reminding, reminding clues, immediate reminding, and learning inclination that these scales by delay inconsistent and positive mendacious can create a distinction between two groups if there is not any distinction between two groups of irrelevant reminding of indexes, whole irrelevant words and repeated words.

4. Result and discussion

The purpose of present study is examining the validity of memorial examination in a group of elderly individuals who suffered dementia and disorder of Persian language from Shiraz. Using the obtained scores from this measurement which include examination scores in memory sub-test and CVLT, this study calculated and reported validity indices and reliability scales and also terminal indices. The results for Cronbach's alpha test shows sub- scales of

memorial examination that obtained coefficient in mini memorial examination are 0.94 and in scale of verbal leaning in high surface is 0.68 and all emphasized interring parallelism of whole scales. Earned alpha coefficient in Saeed project (2007) was reported Wechsler memory scales (third edition) is 0.93. Orangi (1999) also reported reliability coefficient of 0.28 to 0.98.

To examine research questions, in line with examining the ability of these tests in diagnosis of old people suffering from dementia and health old group, the results show that by using memory sub-tests in 97.8 percent of evaluations, we can create correct distinction between elderly individuals who suffered dementia and normal individuals. CVLT is another part of this study in Delay reminding with clues, immediate reminding, immediate of free reminding in this manner had high weight in diagnosis of two groups that had 94.9 percent of evaluation can be created correct distinction between elderly individuals who suffered dementia and disorder.

The result on a subject of whole function of elderly individuals who suffered dementia compared to normal individuals show that function of dementia groups have lower level than normal individuals. This difference in function of whole memory sub-tests and all total indices include verbal memorial, visual memory, audio memory, delay memory and public memory, and in all obtained cases were meaningful. These results are in line with the results for researches done by Laung &Clawm (2006); Gonzled, Joudar & Predrics (2009), Backe, Esstin & Davins (2003).

The results of this study much in line with previous researches emphasized the fact that elderly individuals who suffered cortical dementia lose their different ability of diagnosis. This problem was created limitation to person and has great cost.

According to findings of the research we can say that all results have proper reliability and validity for examination and by using these findings we can evaluate elderly function to diasgnosis pathology scales.

Some limitation of this study necessitates further investigations on the subject. The main problem was accessing elderly individuals suffering from dementia with the ability to cooperate with this research that led to a fewer sample.

Table 3. Mean and standard derivation examination scores for the memory component

variable	Mean			Standard deivation		
	dementia	non dementia	total	dementia	non dementia	total
Information	8.2	13.51	10.8	3.02	0.62	3.4
Logical memoryI	6.5	16.1	11.3	3.7	2.8	5.9
Story B Logical memory I	6.7	16.9	11.8	3.8	3.2	6.2
faces I	11.5	20.28	15.9	3.5	3.5	5.6
Visual reproduction I	7.2	24.2	15.6	7.3	8.1	11.6
Mental control	4.3	5.6	4.9	1.2	0.8	1.2
Digit span	5.3	11.7	8.5	2.5	3.3	4.4
Logical memory II	4.9	15.5	10.2	3.1	3.4	6.2
Story B Logical memory II	4.8	16.6	10.7	3.9	2.9	6.8
Logical memory cued recognition	13	24.7	19.2	6.05	2.7	7.2
faces II	9.8	19.2	14.5	3.5	2.5	5.6
Visual reproduction II	6.4	21.7	14.1	7.6	6.9	10.5
MMSE	14.7	27.7	21.2	5.4	1.6	7.6

Table 4.The results for variance analysis in CVLT

variable	SS	Df	MS	F	Sig
Learning slope	8744.3	1	8744.9	21.28	0.0001
Words list B	133.5	1	133.5	80.26	0.0001
Immediate free recall	738.1	1	738.1	110.8	0.0001
Immediate cued recall	774.5	1	774.5	100.58	0.0001
Short Delay free recall	787.7	1	787.7	106.5	0.0001
Short delay cued recall	803.2	1	8.03.2	123.6	0.0001
Irrelevant words in free recall	0.06	1	0.06	0.006	N.S
Irrelevant words in cued recall	0.26	1	0.26	0.15	N.S
Whole irrelevant words	0.46	1	0.46	0.04	N.S
Repeated words	3.67	1	2.67	0.52	N.S
Long Delay recognition	191.3	1	191.3	15.3	0.0001
Positive mendacious in long delay recognition	455.34	1	455.34	11.58	0.0001

Table 5. Shows Welcinz lambda and variance analysis of one direction memorial components

Variable	Welcinz lambda	Emancipation degree (I)	Emancipation degree (II)	F	meaningful
Information	0.39	1	88	134.1	0.001
Logical I memory	0.32	1	88	185.1	0.001
Story B Logical memory I	0.32	1	88	182	0.001
faces I recognition	0.39	1	88	138.8	0.001
Visual reproduction I	0.44	1	88	110.5	0.001
Mental control	0.73	1	88	32.1	0.001
Digit span	0.45	1	88	106.5	0.001
Logical memoryII	0.27	1	88	234.4	0.001
Story B Logical memory II	0.25	1	88	253.7	0.001
Logical memory cued recognition	0.42	1	88	122.1	0.001
Faces II	0.30	1	88	203.6	0.001
Visual reprocuctionII	0.47	1	88	98.8	0.001
MMSE	0.27	1	88	238.1	0.001

Table 6. Welcinz lambda and one direction variance analysis and the level of meaningfulness in CVLT

variable	Welcinz lambda	Emancipation degree (I)	Emancipation degree (II)	F	meaningfulness
Learning slope	0.72	1	57	21.9	0.0001
Words list B	0.40	1	57	83.7	0.0001
Immediate free recall	0.34	1	57	110.8	0.0001
Immediate cued recall	0.36	1	57	100.58	0.0001
Short Delay free recall	0.34	1	57	107.59	0.0001
Short delay cued recall	0.31	1	57	123.16	N.S
Irrelevant words in free recall	1	1	57	0.009	N.S
Irrelevant words in cued recall	0.99	1	57	0.15	N.S
Whole irrelevant words	0.999	1	57	0.03	N.S
Repeated words	0.99	1	57	0.52	0.0001
Long Delay recognition	0.79	1	57	15.2	0.0001
Positive mendacious in long delay recognition	0.83	1	57	21.9	0.0001

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