

Normative data for healthy adult performance on the Egyptian–Arabic Addenbrooke's Cognitive Examination III

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Introduction

The Addenbrooke's Cognitive Examination III (ACE-III) (2012) is a brief cognitive battery that assesses various aspects of cognition. Its five subdomains (attention and orientation, memory, verbal fluency, language and visuospatial abilities) are commonly impaired in Alzheimer's disease and frontotemporal dementia.

Objective

The aim of the study was to provide normative data for healthy adult performance on Egyptian–Arabic ACE-III.

Participants and methods

We adapted the ACE-III (2012) to the Egyptian population. We evaluated this version on 139 cognitively healthy volunteers aged 20 years or older (54.7% male and 45.3% female). We stratified the participants both by age (<60 years and >60 years) and by degree of education (basic, secondary or university education). None of the participants had any complaints of cognitive decline.

Results

We established normative data for healthy Egyptian adults below 60 years and above 60 years on each of the subdomains of the ACE-III. The data generated from the performance was assigned according to percentiles. We found a significant difference ($P < 0.001$) between the performance of older and younger adults on the category task of the verbal fluency test.

Conclusion

By adapting the ACE-III to the Egyptian–Arabic population, we were able to establish normative data for healthy Egyptian adults.

Keywords:

Addenbrooke's Cognitive Examination, Addenbrooke, aging, Arabic, cognitive, dementia, Egypt, memory, neuropsychology, normative

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Introduction

The Addenbrooke's Cognitive Examination III (ACE-III) (2012) is a brief cognitive battery that assesses various aspects of cognition and is one of the most widely used assessment tools used in routine clinical practice in the UK [1]. It examines five subdomains of cognition: attention and orientation, memory, verbal fluency, language and visuospatial abilities. The total score is out of 100 with higher scores indicating better cognitive functioning. ACE-III takes about 15–20 min to complete and can be easily applied, scored and interpreted by the nonspecialist. The ACE-III replaced the previous Addenbrooke's Cognitive Examination-Revised (ACE-R) (2005). This was due to copyright restrictions on the Mini-Mental State Examination (MMSE), which was originally incorporated verbatim into the ACE-R and therefore had to be substituted [2].

The previous version ACE-R is available in many languages, including English [3], German [4], Greek [5],

Korean [6], Portuguese [7], Spanish [8] and Arabic for Saudi Arabia [9].

Many of the neuropsychological tests used for cognitive assessment were developed in the USA and Europe. Hence, the use of these tests in a different cultural context could lead to inaccurate interpretation when applying the norms to other cultures, especially as the interpretation of neuropsychological tests requires setting reference points that constitute the normal performance in a population. These normative data provide a numerical frame of reference [10].

Arabic is the fourth most commonly spoken language in the world. There are an estimated 221 million native Arabic speakers, who comprise 3.7% of the world's population [11]. Moreover, Egypt's population alone makes up 23.6% of the total Arabic-speaking population [12].

The aim of the current study was to provide normative data for healthy adult performance on the Egyptian–Arabic ACE-III.

Participants and methods

Adaptation of Addenbrooke's Cognitive Examination III

After obtaining permission from the author to translate and culturally adapt the ACE-III to the Egyptian population, we used the Delphi method to survey each item of the scale to examine which of the items had to be adapted to the Egyptian culture. Forward translation into Egyptian–Arabic was done for the following items of the ACE-III: orientation, registration, concentration, recall, language comprehension, writing and visuospatial tasks. Other items of the test used the Delphi method to arrive at a culturally equivalent replacement. The Egyptian translated and adapted version was then back-translated into English. The expert group then rated the degree of agreement between the back-translated version and the original version. As a final step to ensure the equivalence of the translated ACE-III, we sought the author's opinion on the back-translated version.

Participants

Data from 139 cognitively healthy participants were collected. We included individuals who were 18 years or older from both sexes and who were apparently healthy. We excluded any person who had a history of major neurological or psychiatric disorder, those with a history of stroke or head injury, those who had been hospitalized for any reason in the 2 years before recruitment and those who were illiterate. People who were illiterate were excluded because several items of the ACE-III require literacy skills.

Participants were recruited from a community-based sample from cultural centres and elderly clubs as well as from volunteers who were relatives and friends of patients, or from the general public. These included individuals attending the Outpatient Clinic at the Neurology and Gerontology Departments at Ain Shams University, Cairo, Egypt, with relatives and friends. The tests were carried out over a single session. Ethical approval for the study was granted by the Ain Shams Faculty of Medicine Ethical Committee. The purpose of the test was fully explained to all participants, who gave informed consent to take part in the study. In explaining the purpose of the test to the participants we decided to use the term Major Neurocognitive Disorder [13] in our translation instead of the term 'dementia' because of the negative connotation of the Arabic translation of the word dementia. Data for the study were collected from July 2013 until April 2014.

Statistical analysis

Before displaying the percentiles for the various subscales of the ACE-III, we had to transform verbal fluency raw responses into standardized scores according to percentiles, but because of the wide age range of the participants we had to examine the effect of age on letter and category fluency. We compared the performance on both letter and category fluency between the two groups according to age: a younger group who were less than 60 years old and an older group who were 60 years or older. We used the Mann–Whitney *U*-test to compare between the two groups.

Table 1 Demographics

	Younger group (<i>n</i> = 83)	Older group (<i>n</i> = 56)
Age (years)		
Minimum–maximum	20–59	60–93
Median (IQR)	36 (15)	71 (13.75)
Sex (%)		
Male	53	57.1
Female	47	42.9
Education (%)		
Basic	8.4	25
Secondary	41	28.6
University	50.6	46.4

Table 2 Letter and category fluency between the older and younger groups

Groups	<i>N</i>	Mean rank	Mann–Whitney <i>U</i> -test	<i>Z</i>	<i>P</i> (2-tailed)
Letter fluency					
Younger	83	73.84	612005	– 1.378	0.17
Older	56	64.30			
Category fluency					
Younger	83	82.27	1306	– 4.385	<0.001
Older	56	51.82			

With the other subscales of ACE-III, we did not examine the effect of age because performance was based on standardized scores and not on raw data. Statistical analysis was carried out using SPSS (v22; SPSS Inc., Chicago, Illinois, USA) on OS X 10.9.

Results

We recruited a total of 139 apparently healthy community dwellers. Their demographic characteristics are outlined in Table 1.

Table 2 shows the results of a comparison between the two groups (<60 years and ≥60 years) on letter and category verbal fluency performance, demonstrating a statistically significant difference between the two groups in the category fluency subscale.

Table 3 shows the number of words generated in the category fluency task in those individuals below 60 years of age according to percentiles and the score assigned to each percentile.

Table 4 shows the number of words generated in the category fluency task in those individuals aged 60 years or older according to percentiles and the score assigned to each percentile.

Table 5 shows the number of words generated in the letter fluency task in all individuals according to percentiles and the score assigned to each percentile.

Table 6 shows the percentiles of the performance on Egyptian ACE-III total score as well as ACE-III subscales.

Discussion

The ACE-III is a valuable add-on to the armamentarium of cognitive tests available to practitioners in Arabic-speaking

Table 3 Category fluency for the younger group

	Percentile							
	<5	5–10	10–25	25–50	50–75	75–90	90–95	>95
Number of words generate	<9	9	10–11	12–15	16–19	20–23	24–26	>26
Score	0	1	2	3	4	5	6	7

Table 4 Category fluency for the older group

	Percentile							
	<5	5–10	10–25	25–50	50–75	75–90	90–95	>95
Number of words generated	<9	9	10	11	12–13	14–15	16–18	>18
Score	0	1	2	3	4	5	6	7

Table 5 Age inclusive letter fluency performance

	Percentile							
	<5	5–10	10–25	25–50	50–75	75–90	90–95	>95
Number of words generated	<4	4	5	6–7	8–10	11–12	13–14	>14
Score	0	1	2	3	4	5	6	7

Table 6 Performance percentiles of Addenbrooke’s Cognitive Examination III subscales

	Percentile						
	5	10	25	50	75	90	95
Attention subscale	15	15	17	18	18	18	18
Memory subscale	20	21	23	24	25	26	26
Language subscale	21	22	24	25	26	26	26
Visuospatial subscale	12	13	14	15	16	16	16
ACE total score	74	77	83	88	92	95	96

ACE-III, Addenbrooke’s Cognitive Examination III.

nations. The availability of normative data for healthy adults across all age groups is important to subsequently use this tool across different patient populations. Other available tools include a validated version of the Montreal Cognitive Assessment (MoCA) tool [14] and the Test Your Memory (TYM) test [15]; both were validated in an Egyptian elderly population. The MMSE [16] was validated in a small Saudi sample of young adults.

With regard to the benefits of these tests, there are differential advantages for the MoCA and ACE when compared with the MMSE, as they both offer higher sensitivity, specificity and positive and negative predictive values. In contrast, the TYM test does not offer better diagnostic accuracy over MMSE [17]. MMSE lacks the sensitivity to identify frontotemporal dementias [18], whereas both MoCA and ACE have been validated on patients with frontotemporal dementia [18,19]. Yet, out of the two tools, the literature indicates that ACE is able to differentiate between frontotemporal dementia and Alzheimer’s disease [18,19]. In addition, ACE has been validated in language variants of frontotemporal dementia [20]. We report normative data for healthy individuals aged 20 years and above, dividing them into two

subgroups. We chose the cutoff age according to the age of retirement in Egypt, which is 60 years. This is the cutoff age suggested by the UN to define ‘elderly’ in Africa [21].

In our study, age influenced only the performance on the category fluency task and not on letter fluency. Being 60 years or older was a predictor of fewer number of words generated on the category fluency task. It is suggested that the greater effect of age on category fluency may be a reflection of the fact that performance on verbal fluency tasks is a function of the size of the set being searched, with category sets tending to be larger than letter sets, thus requiring more effort to perform and thus being more vulnerable to the slowdown in search processes that occurs with ageing [22]. Several studies have also demonstrated that performance on the category fluency test declined with age [23–30].

The main contribution of our study is to adapt a brief and comprehensive bedside cognitive assessment tool for an Egyptian population that can be used in routine clinical practice in the assessment of various cognitive disorders. Our study also provides norms for the performance of Egyptian–Arabic speakers on the ACE-III, which will provide clinicians with a reference that will enable them to determine to what degree an individual’s performance reflects cognitive impairment.

Our study provides normative data for individuals aged between 20 and 93 years. This will help in the assessment of a variety of cognitive disorders in different age groups. These range from dementia in the elderly to traumatic brain injury and multiple sclerosis in younger adults. Validation of the Egyptian–Arabic ACE-III in dementia and mild cognitive impairment has been completed by our group, and its validation in other cognitive disorders is also underway.

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Conflicts of interest

There are no conflicts of interest.

References


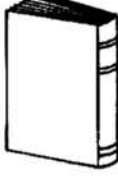

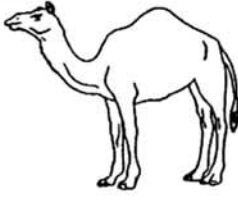



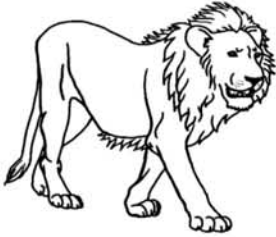

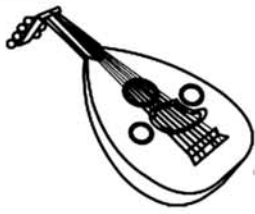
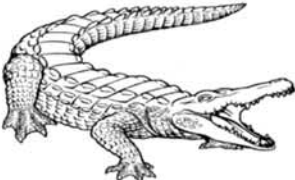


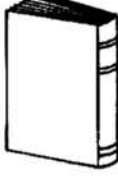

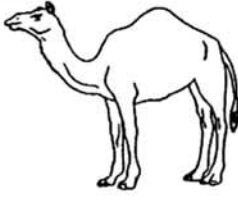



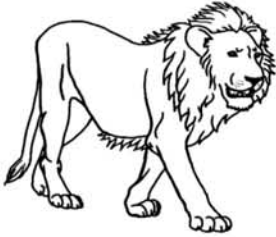

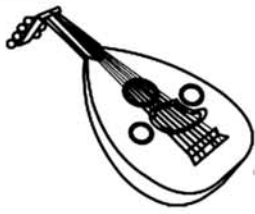
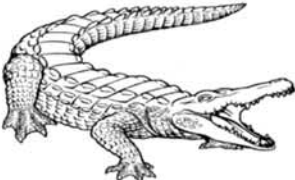


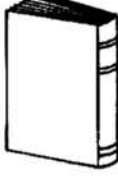

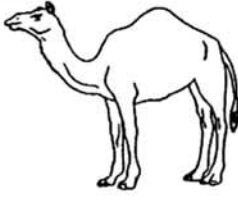



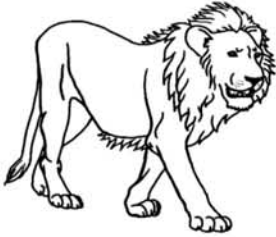

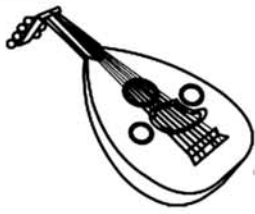
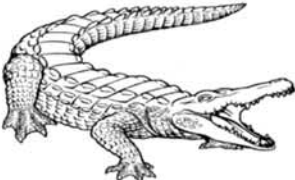

- Noad R, Newman C. ACE mobile; 2014. Available at: <http://www.acemobile.org/aboutace.html>. [Accessed 15 May 2014].
- Hsieh S, Schubert S, Hoon C, Mioshi E, Hodges JR. Validation of the Addenbrooke's cognitive examination III in frontotemporal dementia and Alzheimer's disease. *Dement Geriatr Cogn Disord* 2013; 36 (3-4): 242-250.
- Mioshi E, Dawson K, Mitchell J, Arnold R, Hodges JR. The Addenbrooke's Cognitive Examination revised (ACE-R): a brief cognitive test battery for dementia screening. *Int J Geriatr Psychiatry* 2006; 21:1078-1085.
- Alexopoulos P, Ebert A, Richter Schmidinger T, Schöll E, Natale B, Aguilar CA, et al. Validation of the German revised Addenbrooke's Cognitive Examination for detecting mild cognitive impairment, mild dementia in Alzheimer's disease and frontotemporal lobar degeneration. *Dement Geriatr Cogn Disord* 2010; 29:448-456.
- Konstantinopoulou E, Kosmidis MH, Ioannidis P, Kiosseoglou G, Karacostas D, Taskos N. Adaptation of Addenbrooke's Cognitive Examination-Revised for the Greek population. *Eur J Neurol* 2011; 18:442-447.
- Kwak YT, Yang YK, Kim GW. Korean Addenbrooke's Cognitive Examination Revised (K-ACER) for differential diagnosis of Alzheimer's disease and subcortical ischemic vascular dementia. *Geriatr Gerontol Int* 2010; 10:295-301.
- Carvalho VA, Caramelli P. Brazilian adaptation of the Addenbrooke's Cognitive Examination-Revised (ACE-R). *Dement Neuropsychol* 2007; 1:212-216.
- García Caballero A, García Lado I, González Hermida J, Recimil M, Area R, Manes F, et al. Validation of the Spanish version of the Addenbrooke's Cognitive Examination in a rural community in Spain. *Int J Geriatr Psychiatry* 2006; 21:239-245.
- Al Salman ASA. *The Saudi Arabian adaptation of the Addenbrooke's Cognitive Examination-Revised (Arabic ACE-R)*. Glasgow: University of Glasgow; 2013.
- Feigin VL, Barker Collo S. Normative neuropsychological data: do we need them in New Zealand? *N Z Family Physicians* 2007; 34:441-443.
- Lewis MP. *Ethnologue: languages of the world*. 16th ed. Dallas, TX: SIL International; 2009.
- United Nations/Department of Economic and Social Affairs. *World population prospects: The 2008 revision*. Popul News 2009; 87:1-20.
- American Psychiatric Association. *Diagnostic and statistical manual of mental disorders: DSM-5*. 5th ed. Washington DC: American Psychiatric Publishing; 2013.
- Rahman TT, El Gaafary MM. Montreal Cognitive Assessment Arabic version: reliability and validity prevalence of mild cognitive impairment among elderly attending geriatric clubs in Cairo. *Geriatr Gerontol Int* 2009; 9:54-61.
- Abd-Al-Atty MF, Abou-Hashem RM, Abd El Gawad WM, El-Gazzar YA, Abd Elaziz KM. Test Your Memory test, Arabic version: is it practical in a different culture? *J Am Geriatr Soc* 2012; 60:596-597.
- Al-Rajeh S, Ogunniyi A, Awada A, Daif A, Zaidan R. Preliminary assessment of an Arabic version of the Mini-Mental state examination. *Ann Saudi Med* 1999; 19:150-152.
- Larner AJ. Comparing diagnostic accuracy of cognitive screening instruments: a weighted comparison approach. *Dement Geriatr Cogn Dis Extra* 2013; 3:60-65.
- Mathuranath PS, Nestor PJ, Berrios GE, Rakowicz W, Hodges JR. A brief cognitive test battery to differentiate Alzheimer's disease and frontotemporal dementia. *Neurology* 2000; 55:1613-1620.
- Freitas S, Simões MR, Alves L, Duro D, Santana I. Montreal Cognitive Assessment (MoCA): validation study for frontotemporal dementia. *J Geriatr Psychiatry Neurol* 2012; 25:146-154.
- Leyton CE, Hornberger M, Mioshi E, Hodges JR. Application of Addenbrooke's Cognitive Examination to diagnosis and monitoring of progressive primary aphasia. *Dement Geriatr Cogn Disord* 2010; 29:504-509.
- Kowal P, Peachey K. *Indicators for the minimum data set project on ageing: a critical review in Sub-Saharan Africa*. Dar es Salaam, United Republic Tanzania: WHO; 2001.
- Diaz M, Sailor K, Cheung D, Kuslansky G. Category size effects in semantic and letter fluency in Alzheimer's patients. *Brain Lang* 2004; 89:108-114.
- Benito-Cuadrado MM, Esteba-Castillo S, Böhm P, Cejudo-Bolivar J, Peña-Casanova J. Semantic verbal fluency of animals: a normative and predictive study in a Spanish population. *J Clin Exp Neuropsychol* 2002; 24: 1117-1122.
- Cavaco S, Gonçalves A, Pinto C, Almeida E, Gomes F, Moreira I, et al. Semantic fluency and phonemic fluency: regression-based norms for the Portuguese population. *Arch Clin Neuropsychol* 2013; 28:262-271.
- Crossley M, D'Arcy C, Rawson NS. Letter and category fluency in community-dwelling Canadian seniors: a comparison of normal participants to those with dementia of the Alzheimer or vascular type. *J Clin Exp Neuropsychol* 1997; 19:52-62.
- Gladso JA, Schuman CC, Evans JD, Peavy GM, Miller SW, Heaton RK. Norms for letter and category fluency: demographic corrections for age, education, and ethnicity. *Assessment* 1999; 6:147-178.
- Herrmann MJ, Walter A, Ehlig AC, Fallgatter AJ. Cerebral oxygenation changes in the prefrontal cortex: effects of age and gender. *Neurobiol Aging* 2006; 27:888-894.
- Kosmidis MH, Vlahou CH, Panagiotaki P, Kiosseoglou G. The verbal fluency task in the Greek population: normative data, and clustering and switching strategies. *J Int Neuropsychol Soc* 2004; 10:164-172.
- Tomer R, Levin BE. Differential effects of aging on two verbal fluency tasks. *Percept Mot Skills* 1993; 76:465-466.
- Van der Elst W, Van Boxtel MP, Van Breukelen GJ, Jolles J. Normative data for the Animal, Profession and Letter M Naming verbal fluency tests for Dutch speaking participants and the effects of age, education, and sex. *J Int Neuropsychol Soc* 2006; 12:80-89.

إختبار أدنيبروك لفحص الحالة المعرفية النسخة العربية (مصر) (2013) نسخة كبار السن (من هم في سن الستين أو أكبر)						
الإسم: تاريخ الميلاد: رقم المستشفى/العنوان: أيمن/أيسر:			تاريخ إجراء الاختبار: إسم القائم بالاختبار: أعلى مؤهل دراسي: الوظيفة:			
الإنتباه: (0-5) <input type="text"/>	إحنا في سنة كام	إحنا في فصل إيه من فصول السنة	إحنا في شهر إيه	النهارده كام في الشهر	النهارده إيه في أيام الأسبوع	قل لى: ■
الإنتباه: (0-5) <input type="text"/>	إسم البلد	إسم المحافظة	إسم المدينة، القرية أو المركز اللي إحنا فيه	إسمه إيه المكان اللي إحنا فيه	إحنا في أى دور	قل لى: ■
الإنتباه: ■ أنا حاوذك 3 كلمات عايزك تعيدهم ورايا (لمونة، مفتاح، كورة) حاول تفكر الكلمات دي علشان هسالك عليهم بعدين ■ أعط الدرجة للمحاولة الأولى فقط (كرر المحاولة ثلاث مرات إذا لزم الأمر). ■ سجل عدد المحاولات: _____						
الإنتباه: (0-3) <input type="text"/>	الإنتباه: عندي 100 خد منهم 7 يبقى كام افضل خد 7 من كل رقم يطعلك لحد ماقولك كفاية إذا أخطأ الشخص في أحد الأرقام لا توقفه. اتركه يستمر وتحقق من الأرقام التالية (مثلا: 93، 84، 77، 70، 63 – أعطه 4 درجات). قف بعد خمس مرات طرح (93، 86، 79، 72، 65)					
الذاكرة (0-3) <input type="text"/>	الذاكرة: فاكر الثلاث كلمات اللي قتلكت تفكرهم؟					
الطلاقة اللفظية: الحروف: أنا حاقلك حرف من الحروف الأبجدية. أنا عايزك تقولي أكثر عدد من الكلمات اللي بيتبدي بالحرف ده، بشرط مايكونش زي بعض، يعني مثال، ماينفعلش تقولي كرسى و بعدين كراسي.. برضه ما ينفعلش تقولي أسماء أشخاص أو أماكن (ماينفعلش تقول كوثر أو كندا) مستعد؟ معاك دقيقة واحدة. الحرف اللي أنا عايزك تستخدمه هو حرف "ش".						
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	13-14	6				
	11-12	5				
	8-10	4				
	6-7	3				
	5	2				
	4	1				
	<4	0				
	الصحیح المجموع					
الحيوانات: "قول لى كل الحيوانات اللي تعرفها وتبدأ بأى حرف".						
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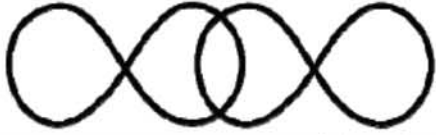
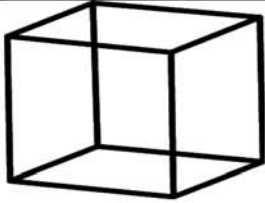
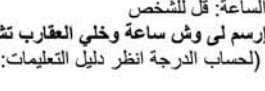
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الذاكرة:				
الذاكرة: (0-7) <input type="text"/>	قل: "حقولك إسم وعنوان وعاوزك تكرر الإسم والعنوان ورايا . علشان يبقى عندك فرصة أنك تحفظ حنعمل ده ثلاث مرات. حسالك عن الإسم والعنوان بعدين." أعط الدرجة للمحاولة الثالثة فقط.			
	المحاولة الثالثة	المحاولة الثانية	المحاولة الاولى	
	عادل إبراهيم 42 سكة الفضل طنطا الغربية
الذاكرة:				
الذاكرة: (0-4) <input type="text"/>	مين رئيس الجمهورية الحالي؟ مين رئيس الوزراء الحالي؟ إسم الرئيس الأمريكي الحالي؟ الرئيس المصري اللي أقتل في الثمانينات؟			
اللغة:				
اللغة (0-3) <input type="text"/>	ضع قلما وورقة أمام الشخص. على سبيل التجربة ، أطلب منه " خذ القلم من علي الترابيزة و بعدين خذ الورقة ". إذا فشل، أعطه صفرا ولا تكمل الاختبار. إذا نجح في التجربة أكمل الثلاث أوامر التالية. أطلب من الشخص " حط الورقة علي القلم " أطلب من الشخص " شيل القلم و سيب الورقة " أطلب من الشخص " إديني القلم بعد ما تلمس بيه الورقة " ملاحظة: ضع القلم والورقة أمام الشخص قبل كل أمر.			
اللغة:				
اللغة (0-2) <input type="text"/>	اكتبلي جملتين أو اكثر علي آخر اجازة أخذتها (أو فسحة رحتها) أو آخر عيد قضيته. اكتب جمل كاملة وما تستخدمش اختصارات. أعط درجة واحدة إذا كتب جملتين كاملتين (أو أكثر) عن موضوع واحد، وأعط درجة أخرى إذا كان تركيب الجملة سليما			
اللغة:				
اللغة (0-2) <input type="text"/>	كرر ورايا "سلسبيل"، "خز عيلات"، "شاه بندر"، "استشفاء" أعط درجتين إذا كرر كل الكلمات بشكل صحيح؛ درجة واحدة إذا كرر 3 كلمات بشكل صحيح، وأعط صفرا إذا كرر كلمتين أو أقل بشكل صحيح.			

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اللغة:																									
اللغة (0-1) <input type="checkbox"/>	اطلب من الشخص أن يكرر: "علي قد لحافك مد رجلك"																								
اللغة (0-1) <input type="checkbox"/>	اطلب من الشخص أن يكرر: "إيد لوحدها ما تسقفش"																								
اللغة:																									
اللغة (0-12) <input type="checkbox"/>	اطلب من الشخص تسمية الصور التالية:																								
	<table border="1"> <tbody> <tr> <td><input type="checkbox"/></td> <td></td> <td><input type="checkbox"/></td> <td></td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td><input type="checkbox"/></td> <td></td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td><input type="checkbox"/></td> <td></td> <td><input type="checkbox"/></td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td><input type="checkbox"/></td> <td></td> <td><input type="checkbox"/></td> <td></td> </tr> </tbody> </table>	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
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<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>																					
اللغة:																									
اللغة (0-4) <input type="checkbox"/>	<p>مستخدماً الصور الأعلى، اطلب من الشخص:</p> <p>شاور على الحاجة التي مرتبطة بالنظام الملكي</p> <p>شاور على الحاجة التي بتطير</p> <p>شاور على الحاجة الموجودة في الصحراء</p> <p>شاور على الحاجة التي الموجودة في النيل</p>																								

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اللغة:	
اللغة (0-1) <input type="checkbox"/>	اقرأ الكلمات دي: (أعط درجة واحدة فقط لو قرأها كلها صحيحة) يس حتى عمرو كذلك ناموا
القدرات الإبصارية الفراغية:	
الإبصارية الفراغية (0-1) <input type="checkbox"/>	علامة اللانهاية: قل للشخص قلد لي الرسمة دي
	
الإبصارية الفراغية (0-2) <input type="checkbox"/>	رسم المكعب: قل للشخص قلد لي الرسمة دي (لحساب الدرجة، انظر دليل التعليمات).
	
الإبصارية الفراغية (0-5) <input type="checkbox"/>	الساعة: قل للشخص إرسم لي وشن ساعة وخلي العقارب تشاور على الساعة خمسة وعشر دقائق (لحساب الدرجة انظر دليل التعليمات: الساعة = 1، الأرقام = 2، العقارب = 2 إذا كان الكل صحيحاً).
	

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المقدرات الإبصارية الفراغية	
(0-4)	أطلب من الشخص أن يعد النقاط بدون الإشارة إليها بإصبعه
<input style="width: 30px; height: 15px; border: 1px solid black;" type="text"/>	<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; width: 150px; height: 150px; position: relative;"> <!-- Pattern 1 --> </div> <div style="border: 1px solid black; width: 150px; height: 150px; position: relative;"> <!-- Pattern 2 --> </div> </div>
<input style="width: 30px; height: 15px; border: 1px solid black;" type="text"/>	<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; width: 150px; height: 150px; position: relative;"> <!-- Pattern 3 --> </div> <div style="border: 1px solid black; width: 150px; height: 150px; position: relative;"> <!-- Pattern 4 --> </div> </div>

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القدرات الإبصارية الفراغية			
(0-4)	أطلب من الشخص أن يتعرف على الأحرف		
			
الذاكرة			
اسأل "فكر الاسم والعنوان التي كررناه في البداية"			
الذاكرة (0-7)	عادل إبراهيم 42 سكة الفضل طنطا الغربية		
الذاكرة			
الذاكرة (0-5)	هذا الاختبار يلزم عمله إذا فشل الشخص في تذكر بند أو أكثر من البنود السابقة. إذا كان الشخص قد تذكر كل البنود، تجاوز الاختبار وأعطه 5 درجات. إذا كان قد تذكر جزءاً فقط ابدأ بوضع علامات على البنود التي تذكرها في العمود المظلل على اليسار؛ ثم اختبر البنود التي لم يتذكرها بأن تقول له: "أنا حديدك بعض اختيارات: عايزك تختار الاجابة الصحيحة؟" وهكذا أعط درجة واحدة لكل بند يتم التعرف عليه، وأضفها إلى الدرجات التي حصل عليها بالتذكر.		
تذكر	عادل ناصر	عادل إبراهيم	ماجد إبراهيم
تذكر	48	42	24
تذكر	سكة الفضل	سكة النهضة	ميدان الفضل
تذكر	بنها	طنطا	الزقازيق
تذكر	الشرقية	القليوبية	الغربية
مجموع النقاط			
100\	مجموع النقاط الكلي لاختبار أدنبروك لفحص الحالة المعرفية		
18\	الانتباه		
26\	الذاكرة		
14\	الطلاقة اللفظية		
26\	اللغة		
16\	القدرات الإبصارية الفراغية		

القيم المعيارية لنسخة كبار السن مبنية على عينة ضابطة مكونة من 56 شخصاً بين سن 60 و 93 أما عينة مرضى الإضطراب المعرفي الجسيم فكانت مكونة من 37 شخصاً تتراوح أعمارهم من 61 إلى 92 عاماً عند الدرجة الفاصلة >75 كان معدل حساسية المقياس %91 و معدل التمييز %96

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