

Validation of HCAP: a sub study of A longitudinal Study of Egyptian Healthy Aging “AL-SEHA”

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HCAP
NETWORK



**The American
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Validation of Harmonized Cognitive Assessment Protocol (HCAP) in Egypt

- HCAP validation study will allow us to define, *for the first time*, the landscape of cognitive functions in the older Egyptian population. It will provide a validated standardized approach for cognitive assessment that can be compared and harmonized with data from different countries.
- Harmonized cognitive assessments that support valid international comparisons of dementia incidence and prevalence among the Egyptian elder population via HCAP and AL-SEHA longitudinal study will facilitate identifying dementia risk factors across the life course

Aim and importance

- **Aim of the Study:** Establish a reliable, valid tool for assessing cognitive impairment in Egypt.
- **Importance:**
 - Address the rising burden of dementia and ADRD.
 - Lack of culturally adapted diagnostic tools.
 - Contribution to public health interventions and policy



Objectives and implications

Objectives of Validation:

- Ensure reliability and validity of HCAP.
- Adaptation to Egyptian linguistic and cultural context.

Implications of Validation:

- Early detection and screening of cognitive decline.
- Standardized tool for research and policy-making in Egypt.

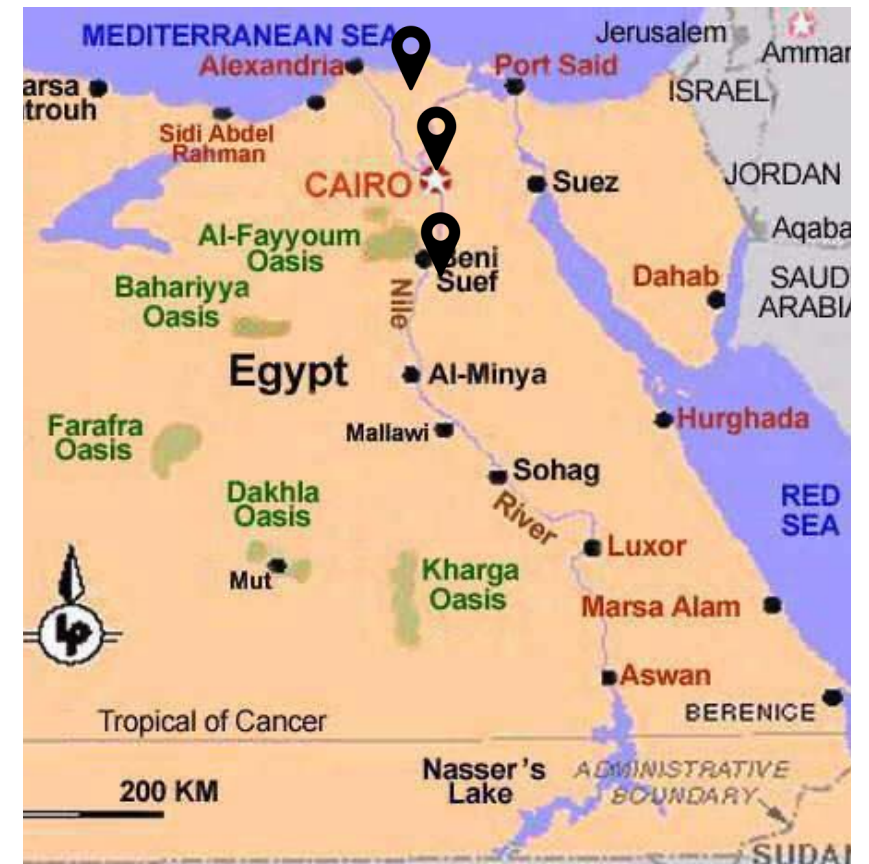
Study Design and Participant

Study Design:

- Participants recruited from three healthcare facilities representing diverse geographic and socioeconomic backgrounds.
- Facilities: Ain Shams Geriatric Hospital (urban Cairo), Outpatient Clinics in Mansoura University Teaching Hospital (urban Nile Delta), Outpatient Clinics in Beni Suef University Teaching Hospital (urban Upper Egypt).

Participant Enrollment:

- Initially enrolled 310 individuals aged 55 and above, reflecting various cognitive abilities.
- Final sample size: 300 after excluding data from 10 interviews without corresponding informant interviews.



Inclusion/Exclusion Criteria, Data Collection, and Adaptation

- **Inclusion Criteria:**
 - Age 55 and older to capture increased risk of cognitive decline.
- **Exclusion Criteria:**
 - Age below 55 years.
 - Severe neuropsychological impairment hindering participation.
- **Data Collection and Instruments:**
 - Face-to-face or phone questionnaires administered to participants and informants.
 - Instruments adapted from L'SAHA study at American University in Beirut, translated into Arabic for cultural appropriateness.
- **Cultural and Linguistic Adaptation:**
 - Meticulous process of adapting HCAP for Egyptian context, including adjustments for cultural relevance and literacy considerations.
 - Pilot testing conducted to ensure cultural acceptability and comprehensibility, informing further refinements for validity and reliability.

Cognitive Assessment Domains and Test Selection

Overview:

- Cognitive assessment covered key domains including Orientation, Executive Functioning, Language/Fluency, Memory, and Visuospatial abilities.

Cognitive Test Selection:

- Tests were chosen meticulously to comprehensively assess each domain, ensuring alignment with the original HRS-HCAP scheme.
- Examples of tests for each domain were provided, such as Orientation (date and place questions), Executive Functioning (Go/No-Go Test), Language Fluency (Verbal Fluency Test), Memory Function (Word List Learning - Delayed Recall), and Visuospatial Abilities (Intersecting Circle Drawing Test).

Training and Standardization

Training Program:

- **Field teams** underwent a rigorous three-day training program covering project orientation, participant consent procedures, interview techniques, and guidelines for administering neuropsychological tests.

Team Structure and Coordination:

- Dedicated team leaders appointed at each research center to facilitate communication and coordination with the central research coordinator.
- Team composition included professionals from various disciplines within geriatric and neurological care to provide a holistic perspective on cognitive assessment and older adult care.

Ongoing Communication and Support:

- Weekly meetings held between team leaders and the research coordinator to discuss progress, share insights, and address challenges related to test administration and participant engagement.

Participant and Informant Questionnaires



Participant Questionnaires:

Administered face-to-face, targeting specific cognitive domains such as Orientation, Executive Functioning, Language Fluency, Memory Function, and Visuospatial Abilities. Completed in an average of 45 minutes.

Examples of tests included in each questionnaire were listed, such as the Cognitive Assessment Module (CAM), Montreal Cognitive Assessment (MOCA), Verbal Fluency Test (FAS), Word List Learning, and Delayed Story Recall.



Informant Questionnaire:

Designed for self-administration, completed on average in 20 minutes.

Components of the questionnaire included the Informant Demographics Module (IDM), Short Form of the Informant Questionnaire on Cognitive Decline among the Elderly (IQ), Blessed Dementia Rating Scale (Parts 1 & 2), and Informant Community Screening Interview for Dementia (IF).

Flexible procedures implemented to accommodate participants without informants, ensuring thorough data collection.

Clinical Assessment, Software, and Ethical Considerations

Clinical Assessment:

- Utilized the **Global Deterioration Scale (GDS)** for diagnosing cognitive impairments, ensuring consistency across all centers.
- Condensed the seven-stage GDS into the tripartite HCAP classification system for normal cognition, Mild Cognitive Impairment (MCI), and dementia.

Ethical Considerations:

- Received IRB approval from the AUC IRB committee for the study titled "Validation of Harmonized Cognitive Assessment Protocol (HCAP) in Egypt" (Case# 2022-2023-019).
- All study subjects and informants provided written informed consent, adhering to strict ethical standards and data protection measures aligned with GDPR.

Analysis Plan

Methodology:

Utilized unidimensional factor analysis to uncover the underlying structure of the Harmonized Cognitive Assessment Protocol (HCAP), examining the relationships between different tests and cognitive abilities.

Variables:

Cognitive tests categorized into broad domains: Orientation, Executive Functioning, Language Fluency, Memory Function, and Visuospatial Abilities.


Adaptations:

Modifications made to the HCAP battery to ensure cultural and contextual appropriateness, particularly minimizing dependency on formal education and literacy.

Examples of adapted tests within each domain were provided, such as Animal Naming and Oral Sentence Formation for Language Fluency, and Constructional Praxis for Visuospatial Abilities, GO/NO GO for executive function

Analysis plan: Classification Criteria and Comparative Analysis

Classification Criteria for Egyptian HCAP Sample:



Dementia: T-score ≤ 35 in ≥ 2 domains + informant-rated functional impairment.
MCI: T-score ≤ 35 in ≥ 2 domains without functional impairment.
Normal Cognitive Function: T-score > 35 in all domains without cognitive concerns.

Collection of Clinical Diagnoses for Comparison:

Gather existing clinical diagnoses (normal, MCI, dementia) for each participant.

Analysis plan: Classification Criteria and Comparative Analysis



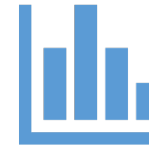
Comparative Analysis of HCAP Classifications and Clinical Diagnoses:



Calculation of Sensitivity and Specificity:



Reliability Assessment:



Sensitivity Analysis:

HCAP Sensitivity and Specificity in the Egyptian cohort

Metric	Results
True Positives	57
True Negatives	196
False Positives	30
False Negatives	17
Total	300
Sensitivity	87.68%
Specificity	89.2%
Accuracy	89.7%

Discussion

- Our study aimed to validate the effectiveness of the Harmonized Cognitive Assessment Protocol (HCAP) in identifying cognitive impairment, including Mild Cognitive Impairment (MCI) and dementia, within the Egyptian population.
- **HCAP Evaluation:**
- The HCAP demonstrated strong performance in detecting cognitive impairment, with high sensitivity (87.68%) and specificity (89.2%) using a 1.5 standard deviation (SD) threshold.
- Sensitivity indicates the HCAP's ability to correctly identify individuals with cognitive impairment (true positives), while specificity reflects its accuracy in identifying those without impairment (true negatives).
- **Normative Data:**
- We established normative data for the HCAP in the Egyptian population, considering factors like age and education that can influence cognitive performance. This allows for accurate interpretation of scores relative to expected levels within the same demographic group.

Implications of HCAP Validation for Clinical Practice and Research

- **Early Intervention:**
 - High sensitivity (87.68%) suggests the HCAP is effective in detecting cognitive impairment early, enabling timely intervention strategies that could potentially slow or manage decline.
- **Comprehensive Assessment:**
 - High specificity (89.2%) combined with a multi-domain assessment makes the HCAP a valuable tool for non-clinical settings like primary care or research.
 - Standardized design allows for consistent application across diverse populations, facilitating global research efforts on cognitive health.
- **Reduced Misdiagnosis:**
 - High specificity helps minimize false positives, reducing unnecessary stress and additional evaluations for individuals without cognitive impairment.
- **Limitations and Future Directions:**
 - **Sample Size:** A larger and more geographically diverse sample could strengthen the generalizability of these findings.
 - **Longitudinal Studies:** Future research employing a longitudinal design is needed to track cognitive changes over time and establish causal relationships between HCAP performance and cognitive decline.

التحويلات النقدية غير المشروطة

يستهدف الفئات الفقيرة والأكثر احتياجاً والأولى بالرعاية بما في ذلك كبار السن (فوق 65 عاماً) والأيتام والأرامل وذوي الإعاقة.

حتى ديسمبر 2023، استفادت 2,02 مليون أسرة من برنامج كرامة.

يحصل ذوي الإعاقة وكبار السن الذين تجاوزوا 65 عاماً على تحويلات شهرية تبلغ 110 جنيهاً، ويحصل الأيتام على 490 جنيهاً شهرياً، وتحصل النساء اللاتي ليس لديهن أطفال على 490 جنيهاً شهرياً. وتحصل غير المتزوجات البالغات من العمر 50 عاماً على 490 جنيهاً شهرياً.



برنامج فرصة



- **برنامج فرصة للشمول الاقتصادي** تم إطلاقه في عام 2020 لمساعدة المستفيدين من برنامج تكافل وكرامته على التحول من الاعتماد على التحويلات النقدية إلى تحقيق دخل مستدام من خلال العمل وتعزيز قدرتهم الاقتصادية على الصمود في وجه الأزمات، فضلاً عن تحقيق الاستقلال المالي لهم. والغرض من برنامج فرصة هو تحقيق أهداف محددة من خلال مسارين:
 - توفير فرص عمل بأجر للمستفيدين.
 - تزويدهم بالأصول اللازمة التي من خلالها يمكنهم إقامة مشاريعهم الصغيرة.
- وإلى الآن، وبفضل دعم البنك الدولي، استطاع برنامج فرصة تحقيق المنفعة لهؤلاء:
 - 2,621 مواطناً، 76% منهم نساء و 24% شباب.
 - 18,312 مستفيداً في إطار المسار الخاص بنقل الأصول.
 - 8,099 مستفيداً في إطار مسار التوظيف.

Conclusion

- Egypt will significantly contribute to aging research since it adds an enormous richness to the international family of aging studies.
- Egypt's culture and genetic diversity, its spatial and socioeconomic variation, its geographical location and historical background will allow the discovery of new pathways of aging, and provide opportunities for testing hypotheses and allow cross-country comparisons of the complex dynamics of forces shaping healthy aging.
- With the help of national and international support we can do this!





Thank You!