The American University in Cairo

Institute of Global Health and Human Ecology

A longitudinal Study of Egyptian Healthy Aging “AL-SEHA” an Update!

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AL-SEHA Pilot 2, 3

- U24AG037866 - Harmonization of Cross-National Studies of Aging to HRS

- U24AG065182 - Research Network for the Harmonized Cognitive Assessment Protocol (HCAP)

Harmonization of Cross-National Studies of Aging to HRS (Pilot 2)

- To test the feasibility of a probability sample representative of the older Egyptian population (50 years and older)
- To obtain estimates of the expected unit response rates.
- To obtain estimates of the expected item response rates for critical variables such as the willingness to income and wealth questions.
- To obtain the main parameters of the distribution of key variables as a base for power calculations.

Sample Design

- The method for designing and drawing the sample followed closely the sample design approach in large national surveys in Egypt, such as the Demographic and Health Surveys in Egypt (Demographic Health Survey - Egypt 2021).

- The two governorates were stratified by type of place of residence (urban and rural areas) using GIS maps. A complete list of all shiakhas (urban administrative units) and villages (rural administrative units) in each of the selected governorates served as the primary sampling frame for the pilot study.

Sample Design

The population was divided into four strata:

(1)The first stratum represented Urban Ismailia

(2)The second stratum represented Urban Beni Suef

(3)The third stratum represented Rural Ismailia

(4)The fourth stratum represented Rural Beni Suef

Sample Allocation

- The total sample included 1290 households where 645 households are drawn from each governorate using systematic random sample of households that have older persons (eligible respondent is 50 years and above).
- The sample was divided into 240 households in urban areas and 360 households in rural areas, in each governorate. All the information about the heads of the households in these areas were already registered during the listing process as well as the number of the qualified respondents (50 years and above).

Study Tools

The study used five questionnaires to collect the required data from the target groups which include: Household questionnaire, Individual questionnaire for the qualified respondent (50 years+), Individual questionnaire (Qualified respondent's spouse living in the same household – no specific age group), Physical test Questionnaire (for a subsample of the eligible individuals) and Quality Control questionnaire (the questionnaire includes a total of (19 questions) from the (14 sections) of the individual questionnaire (qualified respondent 50 years+

Data Collection Training

The training focus on:

- Interviewing skills with an aging population and dealing with any issues that might occur during the interview .
- An overview of the objectives of the study and clear understanding of the main concepts covered by the study.
- Thorough discussion of the study tools to clarify the flow of the questions and any related concepts The discussion was carried out using the questionnaires hard copy to allow the interviewers see the flow of the questions.
- Training on the use of the automated surveys on electronic tablets to ensure no technical problem in the use of the table in the field
- Role playing sessions to train interviewers on a mock interviews. This was followed by discussions to assess researchers' performance and to ensure that all researchers are ready for fieldwork.

Data Collection Training

A separate training was devoted for the physical examination. The trainees were trained by a specialist in gerontology physical Therapy. The training included (5) measurements: Weight, Height, Balance; Grip's strength and Fingers strength. The training depended on a practical training on the measurement and the use of the different tools. The trainer provided thorough instructions on the use of the different measurement tools taking in consideration the age of the respondents and the precautions needs in carrying out the physical test.

The organizational structure of the data collection team

The organizational structure comprised of two teams, each included a fieldwork supervisor, five interviewers or researchers, quality control officer as well as one researcher for the application of the physical examination questionnaire. It is worth mentioning that the fieldwork teams were handed the needed materials including: Security Letter; an electronic handheld (tablet) and its supplements, a hardcopy of the sample frame to allocate the sample required for the researchers in addition to the needed equipment for the physical examination (scale - meter - dynamometer - watch).

Table 1. Demographics.

Modules	Variables
Community	Population and area characteristics
Household	Roster, durables, housing tenure, housing prices, housing characteristics (rooms, aiding utilities for the disabled, access to utilities, durable goods), building characteristics
Background (demographics)	Age, migratory status, educational attainment, marital status and spouse attributes, parents, and siblings.
Health Status	Self-rated health, diagnosed diseases, other health problems and disabilities, hearing and vision, physical function, ADL, IADL and access to support in them, smoking, physical activity, and its frequency of practice, Covid-19 experience
Cognition	Subjective reading and writing ability, time orientation; immediate recall; Delayed recall; Numeracy; Incidental memory; word fluency; Proxy cognition
Mental health	CES-D Depression, sleep and appetite disturbance
Health care	Access to health services, obstacles to access to health services, hospitalization, mental health hospitalization, nursing house, home care, health expenditure, and access to health insurance, vaccination
Employment and Retirement	Employment status, work attributes (sector, nature, responsibility), Satisfaction with work conditions, work income, retirement, unemployment or not working reasons, source of income, and access to retirement benefits and social safety net
Perceptions of social engagement	Relationship with children and grandchildren, social networks; Caregiving and receiving, financial exchanges, receiving financial support, exchange of support
Household income and expenditure	Main contributors to household income and the amount of their contribution, receiving any type of social support or access to a social safety net, total household expenditure, cost of basic utilities in the household, and subjective assessment of the household financial status.
Household financial possessions	Financial assets, managing financial assets, ownership of projects, debts and their types and amount
Social activities and future expectations	Participation in social activities (frequency and reasons), future expectations
Performance test	Standing, grip and pinch strength and walk speed

AL-SEHA questionnaire

Response rates for different interviews

	Total Sample	Urban Sample	Rural Sample	Spouse Sample	Physical testing
Number of eligible individuals	1340	566	774	691	388
Number of eligible individuals interviewed	1173	462	711	641	367
Response rate	88%	82%	92%	93%	95%

Distribution of elderly by age in Census 2017 and pilot

CHARACTERISTIC	BENI SUEF		ISMALIA	
	Census 2017	Pilot2	Census 2017	Pilot2
Mean age	61.4	61.03	60.58	62.04
50-	29%	29%	30%	25%
55-	23%	22%	25%	20%
60-	19%	16%	20%	17%
65-	13%	15%	12%	18%
70-	8%	9%	7%	10%
75-	4%	4%	4%	6%
80-	3%	3%	2%	3%
85+	1%	2%	0	1%
	100	100	100	100

Egyptian HCAP validation (pilot 3)

- A cross-sectional study was conducted from January to June 2023, recruiting participants from three healthcare facilities strategically located in Egypt: Ain Shams Geriatric Hospital in Cairo (Lower Egypt), Mansoura University Teaching Hospital (Nile Delta region), and Beni Suef University Teaching Hospital (Upper Egypt).

- Participants were eligible if they were 55 years or older, fluent in Arabic, and capable of providing informed consent. Both individuals with and without cognitive complaints were included to capture a broad range of cognitive abilities.

Cultural and Linguistic Adaptation of the HCAP

- The Egyptian HCAP version was adapted from the Lebanese cognitive study, L'SAHA, conducted by the American University of Beirut.

- Several cultural and linguistic differences between the Lebanese and Egyptian contexts necessitated adaptation. References to Lebanese-specific events, such as the Lebanese civil war, were replaced with references relevant to Egypt, including the 1981 assassination of the Egyptian president.

- Additionally, phrases and expressions were adjusted to align with the Egyptian dialect. For example, "خيط حرير على حيط ام خليل" was modified to "خيط حرير على حيط خليل" for greater familiarity.

Cultural and Linguistic Adaptation of the HCAP

- To accommodate Egypt's higher illiteracy rates, tests that required literacy, such as the Symbol Digit Modalities Test (SDMT), were replaced by the Go/No-Go test, which assesses executive functioning without relying on literacy. This adaptation was informed by similar challenges faced in the LASI-DAD study in India (Lee et al., 2018), where literacy considerations were paramount.

- A small pilot study with 10 participants was conducted to test the cultural acceptability and comprehensibility of the adapted HCAP. Feedback from participants informed further refinements to ensure that the assessment tool was culturally appropriate, linguistically accurate, and easy to understand. Adjustments were made based on short interviews after the taking the test or phone conversations with participants, allowing them to express any concerns or suggestions.

Cognitive Domains and Test Selection

The cognitive tests were selected to evaluate key domains relevant to dementia diagnosis while ensuring alignment with the HCAP framework.

The domains assessed included: orientation, executive functioning, language fluency, memory, and visuospatial abilities. Orientation was evaluated using questions assessing awareness of time and place, while executive functioning was measured using the Go/No-Go test.

Language fluency was assessed through the Verbal Fluency Test (FAS), which required participants to generate words starting with specific Arabic letters.

Memory was tested through immediate and delayed recall tasks adapted for the Egyptian context, and visuospatial abilities were measured by having participants draw intersecting circles and copy geometric shapes.

Participant and Informant Questionnaires

- Both participants and their informants completed standardized questionnaires. The participant questionnaire, which lasted approximately 45 minutes, evaluated cognitive domains such as orientation, memory, executive functioning, and language fluency. Informants, typically family members or caregivers familiar with the participants over the past decade, provided additional information on cognitive and functional decline. If informants were unavailable for face-to-face interviews, they completed the questionnaires via telephone.

- The informant questionnaire included the Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE) and the Blessed Dementia Rating Scale, which focused on behavioral and psychological symptoms of dementia. This combined approach provided a holistic view of the participant's cognitive status.

Clinical Assessment

Participants had clinical assessments conducted by psychiatrists and neurologists using the Global Deterioration Scale (GDS), a widely accepted tool for classifying dementia severity. The diagnostic process involved a thorough clinical interview, mental status examination, and physical assessment to evaluate cognitive, motor, and sensory functions.

The GDS was chosen for its efficiency and ease of use. The GDS stages were aligned with HCAP classifications: stages 1 and 2 (no cognitive decline to very mild decline) were classified as normal cognitive function, stage 3 (mild cognitive decline) was classified as MCI, and stages 4 through 7 (moderate to severe cognitive decline) were classified as dementia

Educational levels

Education Level	Study Participants (%)	General Older Egyptian Population (%)
University and Higher	6%	13.1% (Men) / 5.7% (Women)
Post-secondary/Secondary	21%	~15%
Primary	28%	35%
Illiterate	46%	54% (Men) / 76% (Women)

Unidimensional Factor Analysis Results

Cognitive Domain	Factor Loading Range	Interpretation	Confidence Interval (CI)
Orientation	0.65 to 0.90	Strong measure of spatial and temporal awareness, indicating robust orientation measurement.	CI [0.62, 0.93]
Memory: Immediate	0.70 to 0.85	Consistent assessment of immediate recall ability, useful for detecting early memory decline.	CI [0.67, 0.88]
Memory: Delayed	0.65 to 0.80	Effective for assessing long-term memory, crucial for diagnosing cognitive impairments like dementia.	CI [0.63, 0.82]
Language, Fluency	0.60 to 0.75	Valid measure of linguistic processing and production abilities, essential for communication assessment.	CI [0.58, 0.77]
Visuospatial Abilities	0.75 to 0.90	Reliable for understanding and manipulating visual-spatial information, important for spatial awareness.	CI [0.72, 0.93]

Classification Distribution Across Age Groups

Age Group	Dementia (%)	MCI (%)	Normal (%)
55-64 years	21.74	26.76	27.50
65-74 years	52.17	49.30	57.00
75-84 years	26.09	19.72	17.00
85+	0.00	4.23	0.50

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%**

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Aging in an Arab country: knowledge gaps in Egypt

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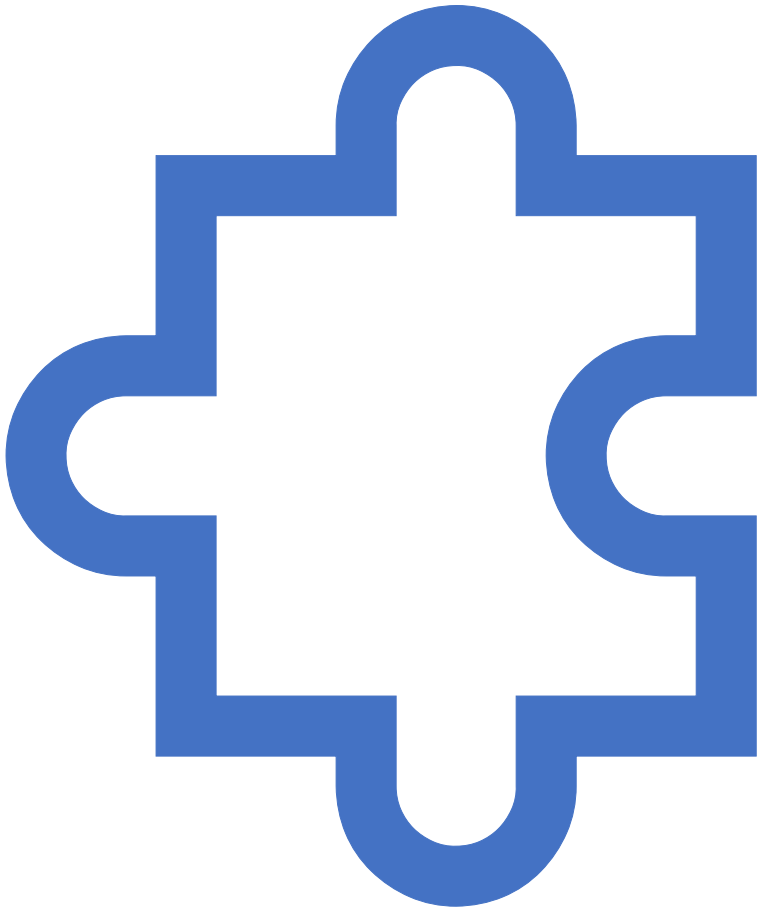
Population aging is a global challenge that poses particular difficulties for low- and middle-income countries (LMICs). So far, there is a dearth of data that describe how aging affects Arab LMICs, which have distinct family structures, caregiving traditions, medical challenges and exposure to climate change. The planned Longitudinal Study of Egyptian Healthy Aging (AL-SEHA) – a member of the cross-nationally comparative family of aging studies around the world – is designed to address these knowledge gaps.

What's next?




Thank You!