بسم الله الرحمن الرحيم

∞∞∞∞∞

تم رفع هذه الرسالة بواسطة / حسام الدين محمد مغربي

بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى مسئولية عن محتوى هذه الرسالة.

ملاحظات:
.....
.....
.....
.....
.....

Screening for mild cognitive impairment and dementia using Montreal cognitive assessment -Basic in illiterate and low educated community dwelling Egyptian elderly

Thesis

Submitted for partial fulfillment of M.D. Degree in Geriatric Medicine and Gerontology

By

Eman Saad Elsayed

Assistant lecture of Geriatrics and Gerontology
Faculty of Medicine -Ain Shams University

Under Supervision of

Prof. Dr. Hala Samir Sweed

Professor of Geriatrics and Gerontology
Faculty of Medicine - Ain Shams University

Dr. Rania Mohamed Elakkad

Assistant Professor of Geriatrics and Gerontology
Faculty of Medicine - Ain Shams University

Dr. Heba Mohamed Tawfik

Lecturer of Geriatrics and Gerontology
Faculty of Medicine - Ain Shams University

Faculty of Medicine
Ain Shams University
2021

سورة البقرة الآية: ٣٢

Acknowledgment

First and foremost, I feel always indebted to ***ALLAH,*** *the Most Kind and Most Merciful.*

I'd like to express my respectful thanks and profound gratitude to ***Prof. Dr. Hala Samir Sweed,*** *Professor of Geriatrics and Gerontology, Faculty of Medicine - Ain Shams University for her keen guidance, kind supervision, valuable advice and continuous encouragement, which made possible the completion of this work.*

I am also delighted to express my deepest gratitude and thanks to ***Dr. Rania Mohamed Elakkad,*** *Assistant Professor of Geriatrics and Gerontology, Faculty of Medicine - Ain Shams University, for her kind care, continuous supervision, valuable instructions, constant help and great assistance throughout this work.*

I am deeply thankful to ***Dr. Heba Mohamed Tawfik,*** *Lecturer of Geriatrics and Gerontology, Faculty of Medicine - Ain Shams University, for her great help, active participation and guidance.*

And thanks to all the help of ***My Family*** *especially* ***My Husband****,* ***My Mother*** *and* ***My Father*** *for this work would not have been completed; to them I dedicate this work.*

Eman Saad

List of Contents

Title	Page No.
List of Abbreviations	i
List of Tables	iii
List of Figures	v
Introduction	1
Aim of the Work	5
Review of Literature	
Cognition and Aging	6
Mild Cognitive Impairment and Dementia	16
Evaluation of mild Cognitive Impairment	30
Intervention for mild Cognitive Impairment	51
Patients and Methods	65
Results	72
Discussion	98
Summary	112
Conclusion and Recommendations	115
References	116
Master Sheet	146
Appendix	150
Arabic Summary	—

List of Abbreviations

Abb.	Full term
Aβ	Amyloid-beta
AD	Alzheimer disease
ADL	Activities of daily living scale
a-MCI	Amnestic mild cognitive impairment
ApoE	Apolipoprotein E
BMI	Body mass index
CAMCOG	The the Cambridge Cognitive Examination
CAMDEX	Cambridge Mental Disorders of the Elderly Examination
CDR	Clinical dementia rating scale
CERAD-NB	Consortium to Establish a Registry for Alzheimer's Disease Neuropsychological Battery
CES	Cranial electrical stimulation
CI	Cognitive impairment
CORT	Color and Object Recognition Test
CSF	Cerebral spinal fluid
DLB	Dementia with Lewy bodies
DSM-5	Diagnostic and Statistical Manual of Mental Disorders, 5th Edition
FDG	Fludeoxy-glucose
FTD	Frontotemporal dementia
GM	Gray matter
HIV	Human immunodeficiency virus
IADL	Instrumental activities of daily living scale
LMIC	Low-income and middle-income countries
MCI	Mild cognitive impairment
MMSE	Mini Mental State Examination
MNA	Mini Nutritional Assessment
MoCA	Montreal Cognitive Assessment

List of Abbreviations Cont...

Abb.	Full term
MoCA B	Montreal Cognitive Assessment basic
MRI	Magnetic Resonance Imaging
na-MCI	Non-amnestic mild cognitive impairment
NCD	Neurocognitive disorder
NIA-AA	National Institute on Aging and the Alzheimer's Association
NMDA	N-methyl-d-aspartate
PET	Positron emission tomography
PHQ 2	Patient health questionnaire
RCTs	Randomized clinical trials
SD	Standard deviations
TBI	traumatic brain injury
TMS	Transcranial magnetic stimulation
VaD	Vascular dementia

List of Tables

Table No.	Title	Page No.
Table (1):	Clinical and Cognitive Evaluation for MCI Due to AD	24
Table (2):	The Scores of elderly in the pilot study	73
Table (3):	MOCA B cognitive subtests for the pilot study	74
Table (4):	Socio demographic data for whole study group.	77
Table (5):	Comorbidities in the whole study group.	78
Table (6):	Functional, Nutritional and mood assessment for whole study group.	79
Table (7):	Diagnosis of cognitive impairment using CDR (clinical dementia rating scale).	80
Table (8):	MMSE (Mini Mental State Examination) for whole study group.	81
Table (9):	Comparison between socio demographic data in both groups.	82
Table (10):	Comorbidities in both groups.	83
Table (11):	Functional nutritional and mood assessment in both groups.	85
Table (12):	MOCA –B (*Montreal Cognitive Assessment basic*) for whole study group.	86
Table (13):	ROC MOCA basic to detect MCI among illiterates group.	87
Table (14):	ROC curve for MOCA basic to detect MCI ≤ 4years education group.	89
Table (15):	Comparison between normal elderly and demented elderly regarding different cognitive subtests in the MOCA B test.	91

List of Tables Cont...

Table No.	Title	Page No.
Table (16):	Comparison between normal cognition and MCI elderly regarding different cognitive sub test in the MOCA B test in Illiterate group.	93
Table (17):	Comparison between normal cognition and MCI elderly regarding different cognitive sub test in the MOCA B test in low educated group	95
Table (18):	Agreement between diagnosis of MCI by CDR and diagnosis of MCI by MOCA B among the study group	96
Table (19):	Agreement between diagnosis of MCI by CDR and diagnosis of MCI by MMSE among the study group.	96
Table (20):	Comparison between MMSE and MOCA basic regarding their MCI diagnosis.	97

List of Figures

Fig. No.	Title	Page No.
Figure (1):	Mild cognitive impairment	22
Figure (2):	ROC curve for MOCA basic to detect MCI among illiterates group.	88
Figure (3):	ROC curve for MOCA basic to detect MCI ≤ 4years education group.	90

ABSTRACT

Introduction: Few studies have examined the performance of cognitive assessment tools in elderly with limited education particulary Mild cognitive impairment which is a clinical transitional state between normal cognitive aging and the initial pathological features of dementia.

Objective: To detect the psychometric properties of Arabic MOCA- B in screening for mild cognitive impairment among illiterate and low educated community dwelling elderly**.**

Methods: A cross sectional study was conducted among 310 elderly, 60 years and older, illiterate and low educated community dwelling elderly**.** All subjects were assessed using the Montreal cognitive assessment basic (MoCA-B), Mini-Mental State Examination (MMSE), and the Clinical Dementia Rating Scale (CDR).

Results: The recommended cut off values of MOCA B test to detect MCI among illiterates was 20 out of 30 points with 100% sensitivity and 97.46 % specificity and 21 points with 100% sensitivity and 95.71% specificity among low educated elderly.

Conclusion: The Arabic MoCA-B is an accurate cognitive assessment tool in diagnosing MCI among illiterates and low educated elderly.

Keywords: Dementia, MCI, MOCA- B.

INTRODUCTION

Dementia is a disorder characterized by problems with memory and at least one other cognitive function (learning, reasoning, language, spatial ability and orientation, and handling complex tasks) that are severe enough to interfere with activities of daily living. Dementias have different etiologies and Alzheimer's disease (AD) is the most common form of dementia ***(Varlibas, 2020).***

Dementia was estimated to affect 44 million people worldwide in 2013. This number is expected to reach 76 million in 2030 and 135 million by 2050. Families are profoundly affected because over 75% of people are cared for by family or friends at home ***(Prince et al., 2013).***

Mild cognitive impairment (MCI) refers to a clinical transitional state between normal cognitive aging and the earliest pathological features of dementia.

Patients with MCI may progress to dementia due to several diseases such as Alzheimer's disease (AD), vascular dementia (VaD), dementia with Lewy body (DLB), and frontotemporal lobar degeneration (FTLD). As an evolving concept, MCI is heterogeneous in clinical characteristics, etiology, and prognosis ***(Shim et al., 2015).***

The prevalence of MCI in the community is difficult to determine accurately, since different studies have used slightly

different definitions of MCI. In community-dwelling adults over 65 years old, MCI prevalence is variously reported as between 3% and 25%, with variability arising from factors such as the mean age of the sample,sceening tests that used ***(Breton et al., 2019).***

Mild cognitive impairment (MCI) is a potentially significant diagnosis. It is regarded as a prodrome of dementia, involving greater forgetfulness than one would expect for their age, yet retaining all or almost all of day-to-day independence and not meeting criteria for clinically probable dementia. Around half of those diagnosed with MCI will develop dementia within 3 years, and from the point of MCI diagnosis, 6% to 15% of patients will convert to dementia per year ***(Breton et al., 2019).***

The category of 'MCI' has the advantage of flexibility, accepting that it encompasses significant heterogeneity both with respect to etiology and prognosis (conversion rate to dementia). Other terminology may also sometimes be used to denote such patients, such as 'mild cognitive disorder' (as in ICD10), 'cognitive impairment no dementia', and 'mild cognitive dysfunction'. Criteria are partly based around sophisticated neuroimaging and cerebrospinal neurochemistry biomarkers, tapping into the clinicobiological aspects of disease ***(Larner, 2016).***

However, such investigations may not be readily available outside of specialist centers, and hence the simpler cognitive screening instruments, which may be used to supplement clinical history taking, may still be the initial investigation in patients suspected of dementia or MCI, the Addenbrooke's Cognitive Examination which usually take around 15–20 minutes to administer, Mini-Mental State Examination (MMSE Mini-Mental Parkinson, Montreal Cognitive Assessment (MoCA); Test Your Memory Mini-Addenbrooke's and the Six-item Cognitive Impairment Test are cognitive screening instruments ***(Larner, 2016).***

The use of a standardized cognitive test is a typical starting point for the formal neuropsychological assessment of patients with a cognitive complaint and is recommended by current MCI consensus guidelines. Several factors may influence the choice of test, such as clinicians' familiarity with the test, availability of translations, copyright, ease of administration, time constraints, evidence base of the test, and its perceived accuracy ***(Breton et al., 2019).***

Some of the most widely used Sreening Tests, such as the Memory Impairment Screen and Addenbrooke's Cognitive Examination, include tasks that require reading and writing ability and cannot be used on illiterates. Other tests, including the, General Practitioner Assessment of Cognition, Montreal Cognitive Assessment, Mini-Cog, Seven Minute Test, and Rowland Universal Dementia Assessment Scale, do not require

reading or writing but involve the use of pencil and paper, which can generate aversion among illiterates and individuals of low educational level ***(Carnero-Pardo et al., 2011).***

The MoCA was originally validated in a sample of individuals with a high level of approximately 13 years of formal education. Montreal Cognitive Assessment – Basic (MoCA-B) was developed for screening MCI in illiterate and low education populations ***(Julayanont et al., 2015).***

Increasing interest is directed at early diagnosis of dementia; even though current drug treatments are not indicated for MCI. Early diagnosis has benefits: the future care needs of the patient can be to some degree anticipated, and arrangements can be made in good time, with the patient being involved in these decisions at a stage where their decision-making is relatively unimpaired ***(Breton et al., 2019).***